

# FLORISTIC QUALITY ASSESSMENT AND ECOSYSTEM ANALYSIS OF THE DUNCAN BAY NATURE PRESERVE, CHEBOYGAN COUNTY, MICHIGAN

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## Abstract

Here we provide a comprehensive list of flora found within the Duncan Bay Nature Preserve, for which we report a Native Floristic Quality Index number of 69.3. Furthermore, we provide recommendations for site management including a geolocated list of alien and invasive species with potential removal suggestions, details of a geolocated population of Michigan's threatened state wildflower *Iris lacustris*, a detailed walking-trail plan including a proposed parking lot location, and informational signs at key locations.

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## INTRODUCTION

Duncan Bay Nature Preserve was acquired by the Little Traverse Conservancy in September 2014. Little Traverse Conservancy (LTC) is a regional land trust that is funded through private donations, and has more than one hundred fifty dedicated volunteers. It is active in northern Michigan in Chippewa, Mackinac, Emmet, Cheboygan, and Charlevoix counties. The mission of the LTC is to protect the natural diversity and beauty of northern Michigan by preserving significant land and scenic areas, and fostering appreciation and understanding of the environment. Recreational, educational, and scientific use of preserves is encouraged. Located near Cheboygan, the Duncan Bay Nature Preserve is tightly linked to the local community and presents a unique opportunity to educate a large semi-urban population on many biotic and abiotic principles. This land is a widely diverse sample of the variety of ecosystems of northern Michigan, ranging from sandy open meadows to thick *Schoenoplectus* stands. The variable terrain has concentrated a vast biotic diversity, however, this productive land has been infested by many invasive species. Invasive species are non-natives that thrive in local soils, and often cause detrimental effects to native communities, such as the crowding out and poisoning of native species. One prominent example of an invasive is *Typha × glauca*. This aggressive wetland invader can grow as high as 10-12 feet, and it is difficult to exterminate, due to its persistent rhizomes.

The surveyed portion of land is composed of a total of 33.46 acres, including 750 feet of Lake Huron shoreline; this undeveloped shoreline acts in the filtration of pollution, reduces turbulence near the shore, creates an erosion buffer zone, and is a highly productive zone for fish reproduction and nutrient acquisition. Approximately 40% of Michigan's wetlands have been devastated through irresponsible construction habits (Tip of the Mitt Watershed Council), raising the value of the diverse wetlands on this site.

Students from the University of Michigan Biological Station's Field Botany class conducted a floristic quality assessment to contribute to the Conservancy's understanding of this natural area. We summarized the botanical diversity of this site using the Floristic Quality Index (FQI), which expresses the relative quality of a site in terms of species population coverage using each species' coefficient of conservatism (C). Particular attention was given to rare species and invasive species, and we reviewed the literature specific to the species identified in the Preserve to propose management plans. Lastly, we proposed development plans aimed at engaging the public in the conservation of this Preserve.

Duncan Bay contains ephemeral and transitional wetlands in flux with Great Lakes fluctuating water levels, which make it important for wetland and upland birds (LTC 2015). It also has a submergent and emergent marsh, shade intolerant successional woodlands, and shrubby/herbaceous openings. The shade intolerance of the woodland species show that these areas were much more open when the trees established. Duncan Bay received a perfect score for greenbelt vegetation, which mean it reduces erosion, stabilizes soil, slows runoff, filters nutrients, sediments, and other pollution and has a variety of valuable wildlife habitat.

## MATERIALS AND METHODS

Students enrolled in the Northern Michigan Field Botany class through the University of Michigan Biological Station conducted a floristic survey of the land. Between July 27th and August 17th, we walked the preserve to identify all plant species, working in teams specializing in woody, herbaceous, and wetland species. Wherever possible, we identified groups of species representing natural communities or microhabitats. Populations of particularly rare or significant plants, such as *Iris lacustris*, were individually geolocated. Plants which were not identifiable in the field were collected for later identification if found in sufficient abundance; otherwise, we recorded details and photographed the specimen.

The surveys were compiled in a species list. The University of Michigan Herbarium website (Reznicek *et al.* 2011) provided additional information on habitat, common name, and coefficient of conservatism for each species. Each species' habit (tree, shrub, vine, forb, grass, sedge, rush, or fern), and habitat affinity (facultative wetland, obligate wetland, facultative habitat, facultative upland, or obligate upland) was designated. There are distinct differences among the habitat of the types of wetlands and the types of uplands. In an obligate wetland, 99% of the plants live strictly in areas of saturated soil or standing water. In a facultative wetland, however, 67% or more of the plants live in areas of extended flooding, standing water, or saturated soil, but approximately 33% of these types of plants can also live in upland habitats. Therefore, facultative wetland plants grow in a variety of areas, but they are most commonly in standing water or saturated soils. Facultative habitats have an equal susceptibility, or 50% chance, to having wetland-type plants and upland-type plants. On the other hand, in an obligate upland, 99% of plants live strictly in upland habitats. Facultative upland plants usually live in non-wetland habitats where the moisture is well-balanced, but they can occur in saturated soils or standing water. Therefore, approximately 67% of facultative upland plants live in uplands, while approximately 33% can live in wetlands. Upland plants almost always do not occur in standing water and saturated soil.

We calculated the FQI for the total number of species on the property as well as only the native species to ascertain the quality of the site and its significance to conservation. We mapped identifiable microhabitats in ArcGIS, as well as the paths we used to navigate the Preserve during our field work. We scouted sites for additional trails that could be established, taking into account the microhabitats and rare species identified.

## RESULTS

A total of 294 plant species were found on the Duncan Bay Nature Preserve, a great majority of which are native to Michigan. The Preserve has an FQI of 59.3 when all species used in the calculation, and 68.4 when only native species were considered (Table 1).

The dominant physiognomy in the plant species list are deciduous flowering plants, followed by shrubs and sedges (Figure 1). The habitat composition of the Preserve demonstrates a fairly even distribution of species habitats, with facultative wetland, obligate wetland, facultative habitat, and facultative upland, and obligate upland habitats making up 25.9%, 12.6%, 11.9%, 22.8%, and 26.9% respectively (Figure 2). Additionally, we identified nine different

floral communities (Figure 4), including Cedar stands, Cedar stands/*Carex spp.* hollows, open meadows, wetland, *Typha spp./Salix spp.* marsh, wet meadows, dune ridges, deciduous forest, and the sandy shore (Appendix 3).

There was a near normal distribution of native species' coefficient of conservatism (Figure 3), although weedy generalist species ( $C = 0$ ) made up a high proportion of the total species found (24.8%). Notably, we found populations of *Iris lacustris* near the Northeast, lake-side of the Cedar/*Carex* meadow treeline. Ten invasive species were found in various levels of abundances throughout the Preserve, with *Typha × glauca* dominating the marsh. Of these, we identified species that have never been documented in Cheboygan County before: *Berberis thunbergii*, *Dipsacus laciniatus*, *Rhamnus cathartica*, and *Frangula alnus*. The remaining four invasives are *Acer platanoides*, *Melilotus albus*, *Centaurea stoebe*, and *Berteroa incana*. Though not invasive throughout the state, it will be also worth monitoring *Betula pendula*, *Crataegus monogyna* and *Sorbus aucuparia* in case they display invasive tendencies on this site.

## DISCUSSION

### *Habitat Successional Patterns*

The habitats on the Preserve have been greatly influenced by isostatic rebound. As the crust uplifts, low sand ridges become elevated, and the wet depressions between ridges develop into wet meadows, and new ridges form lakeward, on the emerging shore, continuing the process of ridge and swale formation. Due to succession, the oldest ridges, the Cedar/*Carex* ridges and hollows, are more densely forested and have dense populations of *Carex stricta*. As the habitats get closer to the shore from the Cedar/*Carex* habitat, the populations are younger, so they are less densely vegetated.

### *Floristic Quality Index*

According to the US Fish and Wildlife Service, a Floristic Quality Index value of 35 or greater indicates a “natural area” of high floristic diversity (USFWS 2015). This is calculated by aggregating the coefficient of conservatism (or C-value) of the surveyed plants. The C-value is a rating from 0 to 10 given to a native plant based on how specialized it is to a natural pre-settlement environment. A greater concentration of specialized and native plants increase the FQI rating, and invasive or generalized plants decreases it. A high rating indicates that the area has a great deal of highly specialized plants and that the area is very important to their survival. The Preserve's FQI value of 59.3 means that the Duncan Bay site indicates a great significance to local native species with high fidelity to their habitat.

### *Wetland management*

Given the ecological value of the wetlands found in Duncan Bay Nature Preserve, management strategies should focus first and foremost on wetland management. These wetlands should be conserved for their ecosystem services, which include erosion control; filtration of nutrients, sediments, and other pollution; and its role as an important habitat for waterfowl,

migratory birds, and other wildlife. In addition to managing the wetlands, secondary areas around the wetlands should be established as a buffer against threats (Morse 1996).

The Federal Emergency Management Agency Flood Map Service indicate a 1% chance that the entire Duncan Bay Nature Preserve can be flooded with rising Lake levels (FEMA 2015) Such natural disturbance can be important to maintaining native plant communities, and should not be prevented. Rather, it is important to consider the potential effects of flooding in designing the management plan. Lastly, state permits are necessary for any shoreline management activities, including removal of vegetation and creating structures (Tip of the Mitt Watershed Council 2015).

### *Invasive species management*

It is important to eliminate invasive species from the area, as they can crowd out native species or disturb the local ecosystem. Many of the invasives were also found for the first time in Cheboygan county, making them newer threats that should be addressed before they establish further in the area and their removal becomes even more difficult.

Physical removal is optimal for larger or woody established plants, including *Berberis thunbergii* and *Rhamnus cathartica*. Many of these invasive species are difficult to remove with physical or mechanical removal alone, as they can regrow shoots from fragmented root parts and reestablish if the root system is not entirely extracted. It is suggested to follow up with herbicides to deal with new shoots or kill off regenerating stumps. Extreme care should be taken with herbicides near the wetlands, since the high water level could make it easy for herbicides to wash off into the lake or affect other plants. Wetland safe herbicides should be sought out, and other methods such as suffocation or continued weeding can be substituted if the risk is considered too high. These species are very easily dispersed by birds, so regular surveys and weeding should be carried out to avoid reinvasion.

*Centaurea stoebe* is a very versatile invasive plant, and its removal is of particular importance. It has allelopathic chemicals which kill nearby plants and has an incredible dispersal system with tens thousands of seeds which can remain viable for years before germinating. Biological control may be pursued to effectively reduce populations in a matter of years, but the possible ecological impact must be completely ascertained before the introduction of new species.

*Typha ×glauca* has become a clear and recent presence in the northwestern wetland corner of the property, greatly reducing the biodiversity of the area. A satellite picture from August 2005 (Figure 6c) shows that this invasive *Typha* had yet to dominate the north western corner of the property. This plant is very difficult to completely remove and would require drastic measures, potentially damaging the property more than helping. We believe that the *Typha* has probably already dominated all potential habitats on the property, and should be left as an educational tool. However, the population should be monitored and if needed, efforts should still be taken to prevent its spread and to preserve more sensitive native plants. Crushing or shearing down vegetation can reduce leaf litter and over-shadowing, which can allow for more opportunities for native species to establish. This can be performed at the edges of the marsh to

prevent spreading. Cutting new vegetation during late spring can also stress the plants starch formation and prevent rhizomes from propagating as effectively. This unfortunately can do nothing for seed dispersal, and any found growing in elsewhere on the property should be removed as quickly as possible. Removal of flowering or seed bearing heads may help.

*Melilotus albus*, *Berteroa incana*, *Acer platanoides*, and *Betula pendula* do not represent significant dangers to nearby vegetation, or thrive as well in the area as other invasives. The small *Melilotus* and *Berteroa* can be hand-removed easily enough, and girdling is suggested to kill off larger *Acer* and *Betula*, pulling shoots and herbiciding regenerating stumps. The non-native variety, *Juniperus communis* var. *communis* is also found on the site and has the possibility of hybridizing with the native *J. communis* var. *depressa*.

### *Management of rare plants*

Duncan Bay Nature Preserve contains 12 species (Table 1) with the highest coefficient of conservatism ( $C = 10$ ). These species show high fidelity to their environment, and can be considered as indicators of natural, undisturbed habitats. Little is known about many of these species, so management strategies should focus on preserving habitats where they are found (Morse 1996) and conduct annual surveys to track the abundances of these species. Most of the species we have identified need calcareous wetlands; *Anticlea elegans*, *Juniperus communis*, and *Salix cordata* will need dunes and sandy substrates (Reznicek *et al.* 2011). The preservation of rare plants found on this property provides further justification for management of the wetland habitats found in this Preserve.

Special attention should be given to one particular species found in the Duncan Bay Nature Preserve. We identified a few populations of the Dwarf Lake Iris (*Iris lacustris*), Michigan's state wildflower, on the Preserve (Figure 6a). This species is endemic to the Great Lakes shores and was federally listed as a threatened species in 1988 (USDA 2015), and given the proximity of *I. lacustris* to inundated meadows and dune habitats, development and management practices may require permits. Current literature suggests that *I. lacustris* is surprisingly persistent, and thriving colonies can be maintained without active management as long as intensive recreational use is avoided (Penskar *et al.* 2001). Periodic flooding does play an important role in opening up habitat for this species (Chittenden 2015), and successful management of wetlands here will also help these populations.

### *Overview before Trails/community*

We have been informed that any alteration to the land will be performed on a volunteer basis. Keeping this in mind, we have several recommendations to make the land more approachable, including creating a woodchip path, and installing benches and informational signs. The proposed woodchip trail is approximately 4,400 ft long (Figure 5). A boardwalk through the *Typha* marsh is approximately 300 ft long, though this could be made shorter given a different route. Another proposed boardwalk over the wet meadow on the eastern side of the property is approximately 170 ft long. Recommended signs include: an overview of the preserve located at the entrance of the park to aid in identification of poison ivy and the types of habitats

included, a sign near the shoreline describing the shifting shorelines and the specific adaptations of plants for these conditions, a sign located near an *Iris lacustris* population describing the native plant and its unique mutualism with ants, and finally a sign within the Typha marsh informing visitors of the dangers of invasive alien plants, which can crowd out native diversity (Figure 6).

Furthermore, trash is accumulating on the shores. A remedy for this issue would be conducting a voluntary community clean-up of this region, which would be cost effective and improve the local ecosystem. Making the preserve more accessible through trails and a parking lot could lead to increased visitation and community involvement.

A parking lot would also need to be constructed in order to accommodate the visitors. We propose site that is easy to access from the road and conveniently located in regard to the proposed trails (Figure 5). A man who lives near Duncan Bay Nature Preserve and owns a landscaping business offered to clear plants and construct the parking lot at this site. Unfortunately we did not get his information, but we suggest trying to find and contact him further.

## FUTURE DIRECTIONS

This study was conducted throughout the span of a few weeks, which, while thorough, will not capture the full diversity of plants. Additional surveys should be undertaken during different seasons of growth to capture additional species with restricted phenologies. We were unable to map instances of invasive species, which would be necessary for effective management of the invasive species described in this report. The next level of expanding the floristic quality assessment would involve tracking ecological succession of the area, as well as the influence of the changing climate patterns.

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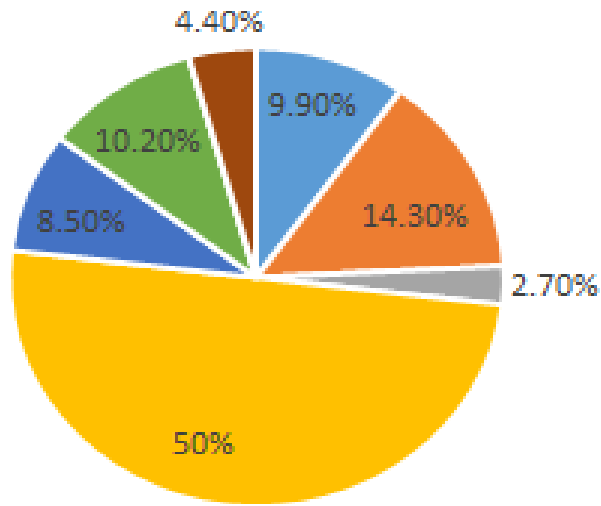
<<http://www.fws.gov/midwest/endangered/section7/s7process/plants/FQA.html>>.

## TABLES

Species Richness	294
Percent Native Species	77%
Percent Non-Native Species	23%
Mean Coefficient of Conservation (C)	3.6
Mean Native Coefficient of Conservation (C)	4.6
Coefficient of Conservation (0)	24.8%
Coefficient of Conservation (1-3)	25.2%
Coefficient of Conservation (4-6)	34%
Coefficient of Conservation (7-10)	16%
Total FQI	61.7
Native FQI	69.3
Adjusted FQI	40.4

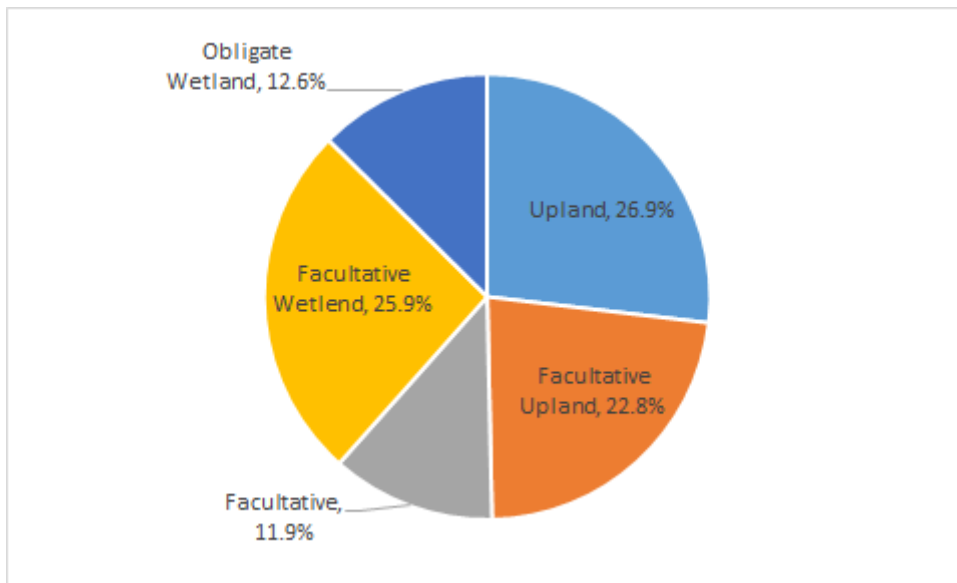
**Table 1:** Summary of Floristic Quality Indicator results.

FIGURES

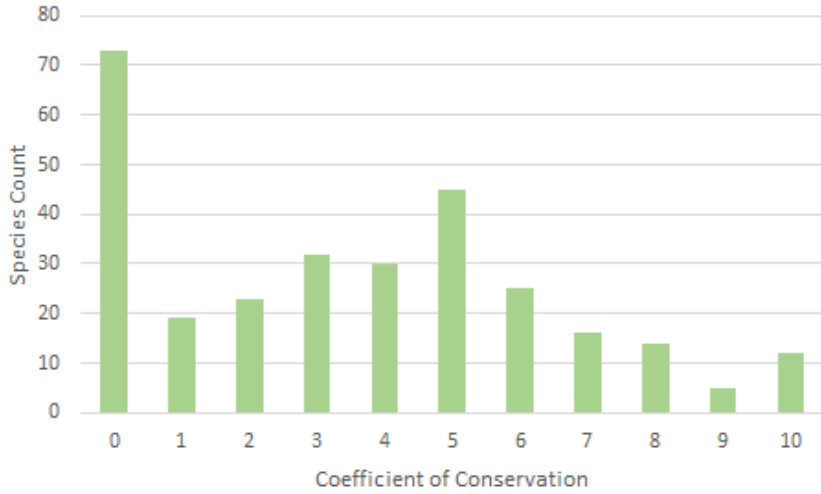


Tree ■ Shrub ■ Vine ■ Forb ■ Grass ■ Sedge ■ Rush ■ Fer

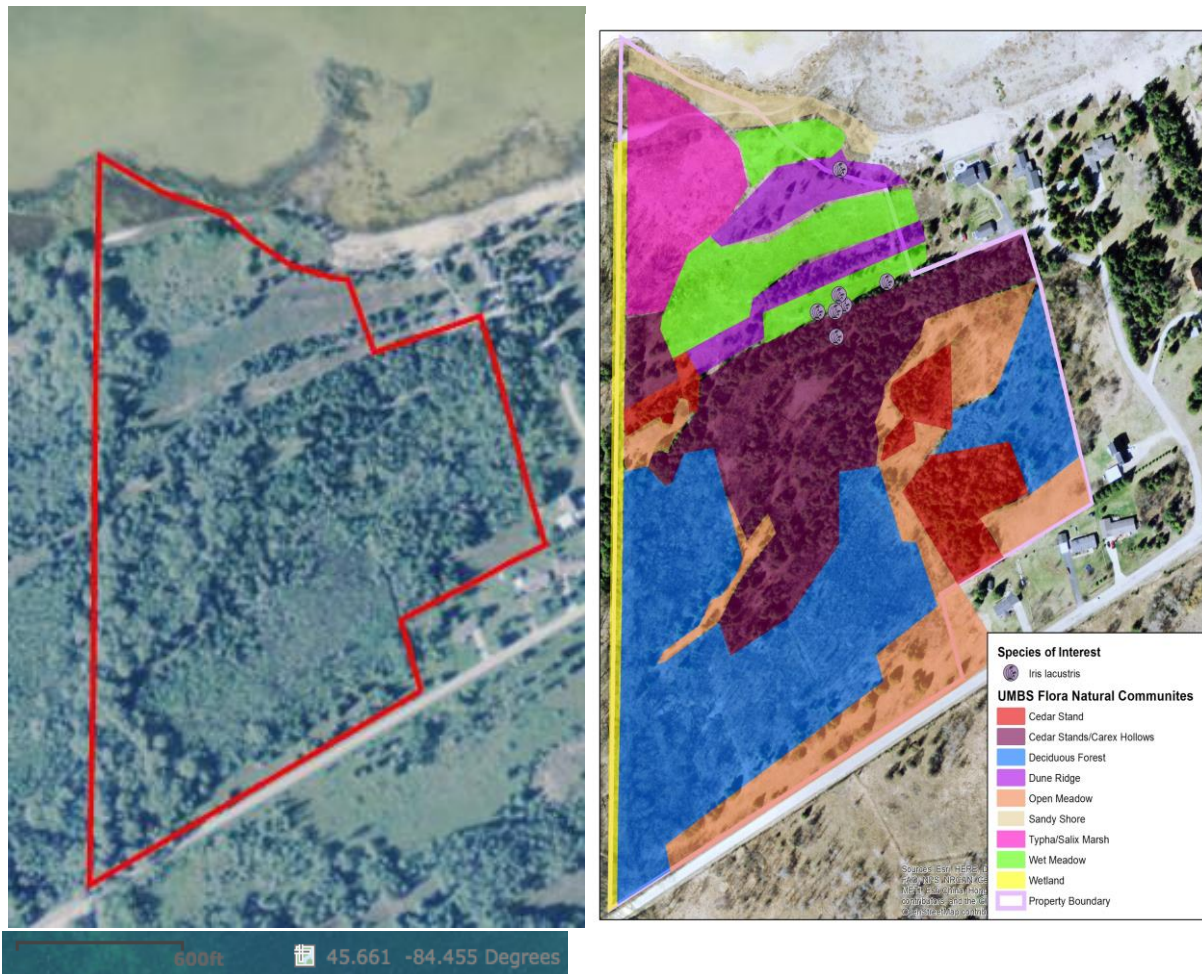
**Figure 1:** Plant habit composition in the Duncan Bay Nature Preserve.



**Figure 2:** The habitat preference of species of the Duncan Bay Nature Preserve.



**Figure 3:** Number of species with each coefficient of conservatism.



**Figure 4:** Property boundaries and locations of individual habitats.



**Figure 5:** Proposed trail system through the property. Many trails currently exist on the property, probably a remnant from previous development. The red line is a proposed woodchip trail that would visit most of the major habitats. It follows current trails, though some tree and underbrush removal would be necessary to complete the loop (as indicated by the purple). We believe a boardwalk through the large *Typha*-dominated marsh would be both beautiful, and an interesting educational opportunity. A second boardwalk across the wet meadow may be necessary during wetter summers.

**Red** -- proposed woodchip trail

**Orange** -- current conspicuous trails

**Gray** -- proposed parking lot site

**Brown lines** -- potential boardwalks

**Purple** -- site that would need significant trailbuilding i.e. tree/underbrush removal

**Blue Dots** -- informational signs (see Figure 6)





**Figure 6a:** A sample sign indicating a population of *Iris lacustris*, and relevant information. Ahead is a small population of *Iris lacustris*, Michigan's state wildflower. Also known as the Dwarf Lake Iris, this plant is endemic to the Great Lakes Region, with the majority of the populations found only within Michigan. This iris typically blooms in May or June, has flowers about 2 inches wide that range from dark purple to light blue. It is listed as a threatened species by federal, state, and provincial laws throughout its distribution. Tread lightly!



1998



2005



2013

**Figure 6b:** A sample set of images and text for a beach-located sign. These images depict the shifting shorelines characteristic of the Great Lakes Region. The dynamic nature of the water level is important for the shoreline ecology. During high-water years, the inundation of water drowns trees that may have colonized this area. This regular clearing of trees creates a relatively open area during low-water years, allowing smaller herbaceous plants to thrive.



**Figure 6c:** A sample sign located within/near *Typha* ×*glauca* marsh. The *Typha* ×*glauca* cattail is a highly invasive hybrid between the native *Typha latifolia* and the introduced *Typha angustifolia*. *Typha* ×*glauca* is extremely vigorous and can often easily outcompete native wetland species. Here you can see the spectacular nearly complete domination of the marsh by this invasive hybrid. The satellite picture above taken in 2005 shows no *Typha* ×*glauca* on the property indicating that the current *Typha* stand has invaded sometime since then.

## APPENDICES

### APPENDIX 1: Floral communities

The perimeters of various habitats were recorded via GPS location data, the results of which can be observed in Figure 4. All habitats on the map are general distinctions and do not have clearly defined borders. For example, the Cedar Stands/Carex Hollows areas on the map are dominated by a specific pattern of plant communities. Succession is taking place in areas that were cleared by the people potentially developing the property and on the edges of meadows. Satellite imagery shows some areas that were not previously forested but now early successional species like *Betula papyrifera* are moving in. Another example of changing habitats is seen in the satellite image of the site that now consists of almost exclusively *Typha × glauca*. It appears that it had previously been an upland area dominated by deciduous trees.

**Cedar Stands:** These stands of trees are dominated by *Thuja occidentalis* and very few herbaceous plants because the canopy is mostly closed due to the *Thuja*, but often *Carex eburnea* is present near the stand.

**Cedar Stands/Carex Hollows:** These areas are characterized by a constant pattern of ridges of *Thuja occidentalis* and periodically wet hollows dominated by *Carex stricta* and *Alnus incana* or *Cornus sericea*.

**Dune Ridges:** These upland areas in between the interdunal hollows are dominated by *Thuja occidentalis*, *Larix laricina*, *Abies balsamea*, and *Picea glauca*. There are two dune ridges between the shore and the woodlands. The ridge closer to the woodland has a groundcover dominated by *Linnaea borealis*. The ridge closer to the shore is less densely forested. Each ridge has trails cut through that could be used by LTC for future paths.

**Deciduous Forest:** Areas dominated primarily by *Alnus incana*, *Betula papyrifera* and other large deciduous trees that have fallen with little understory. They are dominated by *Carex stricta*, which shows that it is a wooded wetland meadow. This also includes some other wetland meadows with mainly *Phalaris arundinacea* with some *Scirpus atrovirens*.

**Open Meadows:** These open meadows are mainly dominated by Poaceous and Asteraceous species. Open meadows include *Carex stricta* meadows, wet meadows and upland meadows. Wet meadows, as above, are dominated by tall *Phalaris arundinacea*. *Carex stricta* meadows have dense tussocks and are potential wet meadows. Upland open meadows have many Poaceous and Asteraceous species. Many of these meadows have *Cornus sericea* edging them or interspersed, as this was a common wet meadow species on the preserve.

**Wet Meadows:** These are meadows having different characteristics as they are of different ages and therefore, at different stages of succession. The interdunal meadow farthest from shore is the oldest and is more secluded. Being older, it has more wooded species of *Larix Laricina* and *Myrica gale*. The woody species included scattered *Larix laricina* and clusters of *Myrica gale*. The meadow between the two dune ridges is younger and less wooded. Herbaceous plants include *Solidago sp.*, *Daucus carota*, *Fragaria virginiana*, and *Potentilla anserina*.



Typha/Salix Marsh: This marsh is dominated *Typha* × *glauca* and is edged by a marsh of *Salix* sp. The *Typha* marsh has extremely limited diversity -- a habitat feature often characteristic of this invasive *Typha* hybrid. However, the area surrounding the *Typha* marsh is more diverse. On the west side of the *Typha* marsh *Calamagrostis canadensis* is dominating the understory of *Salix* shrubs. On the Northeast side of the *Salix* marsh is a stand of *Larix laricina*.

Wetland: This ditch marks the property line of the preserve and is filled the water. This ditch has a great increase in diversity compared to the adjacent marsh. There are a great number of invasive species present near the ditch likely from the process of creating the ditch. Currently conspicuous flora includes *Persicaria amphibia* and *Lemna minor*.

Sandy Shore: The sandy area is on the shore of the freshwater Lake Huron. Due to the very sandy soil, there are no dominant species. However, *Anticlea elegans*, commonly known as the Mountain Death Camas and is fatal if the bulbs are consumed, can be found here.

APPENDIX 2: FQI Equations

Species richness	$N_a$
Native species richness	$N_n$
Non-native species richness	$N_e$
Index of conservatism	$C_x$
Percent native species	$\frac{N_n}{N_a} \times 100$
Percent non-native species	$\frac{N_e}{N_a} \times 100$
Mean Coefficient of Conservation	$\frac{\sum_{x=1}^n C_x}{N_a}$
Mean Native Coefficient of Conservation	$\frac{\sum_{x=1}^n C_x}{N_n}$
Total FQI	$\frac{\sum_{x=1}^n C_x}{N_a} \times \sqrt{N_a}$
Native FQI	$\frac{\sum_{x=1}^n C_x}{N_n} \times \sqrt{N_n}$
Adjusted FQI	$\frac{\sum_{x=1}^n \frac{C_x}{N_n}}{10} \times \frac{\sqrt{N_n}}{\sqrt{N_a}} \times 100$

APPENDIX 3: Complete species list of Duncan Bay Nature Preserve

Scientific Name	Family	Type	C	W	Physiognomy	Duration	Common Name
Abies balsamea	Pinaceae	native	3	0	tree	perennial	balsam fir
Acer negundo	Sapindaceae	native	0	0	tree	perennial	box-elder
Acer platanoides	Sapindaceae	non-native	0	5	tree	perennial	norway maple
Acer rubrum	Sapindaceae	native	1	0	tree	perennial	red maple
Acer saccharum	Sapindaceae	native	5	3	tree	perennial	sugar maple
Achillea millefolium	Asteraceae	native	1	3	forb	perennial	yarrow
Acorus americanus	Acoraceae	native	6	-5	forb	perennial	sweet-flag
Agalinis purpurea	Orobanchaceae	native	7	-3	forb	annual	purple false foxglove
Agrimonia gryposepala	Rosaceae	native	2	3	forb	perennial	tall agrimony
Agrostis gigantea	Poaceae	non-native	0	-3	grass	perennial	redtop
Agrostis stolonifera	Poaceae	non-native	0	-3	grass	perennial	creeping bent
Alisma triviale	Alismataceae	native	1	-5	forb	perennial	northern water-plantain
Alnus incana; a. rugosa	Betulaceae	native	5	-3	shrub	perennial	speckled alder
Ambrosia psilostachya	Asteraceae	non-native	0	0	forb	perennial	western ragweed
Amelanchier laevis	Rosaceae	native	4	5	tree	perennial	smooth shadbush
Amelanchier sanguinea	Rosaceae	native	5	5	shrub	perennial	round-leaved serviceberry
Anemone canadensis	Ranunculaceae	native	4	-3	forb	perennial	canada anemone
Anemone cylindrica	Ranunculaceae	native	6	5	forb	perennial	thimbleweed
Anemone virginiana	Ranunculaceae	native	3	3	forb	perennial	thimbleweed
Anticlea elegans	Melanthiaceae	native	10	-3	forb	perennial	white camas
Aquilegia canadensis	Ranunculaceae	native	5	3	forb	perennial	wild columbine
Arabidopsis lyrata	Brassicaceae	native	7	3	forb	biennial	sand cress
Aralia nudicaulis	Araliaceae	native	5	3	forb	perennial	wild sarsaparilla
Arctium minus	Asteraceae	non-native	0	3	forb	biennial	common burdock
Arctostaphylos uva-ursi	Ericaceae	native	8	5	shrub	perennial	bearberry
Arenaria serpyllifolia	Caryophyllaceae	non-native	0	0	forb	annual	thyme-leaved sandwort
Artemisia campestris	Asteraceae	native	5	5	forb	biennial	wormwood
Asclepias incarnata	Apocynaceae	native	6	-5	forb	perennial	swamp milkweed
Asclepias syriaca	Apocynaceae	native	1	5	forb	perennial	common milkweed
Bellis perennis	Asteraceae	non-native	0	5	forb	perennial	english daisy
Berberis thunbergii	Berberidaceae	non-native	0	3	shrub	perennial	japanese barberry
Berteroia incana	Brassicaceae	non-native	0	5	forb	annual	hoary alyssum
Betula papyrifera	Betulaceae	native	2	3	tree	perennial	paper birch
Betula pendula	Betulaceae	non-native	0	3	tree	perennial	european white birch
Bidens beckii	Asteraceae	native	10	-5	forb	perennial	water-marigold
Bromus ciliatus	Poaceae	native	6	-3	grass	perennial	fringed brome
Bromus inermis	Poaceae	non-native	0	5	grass	perennial	smooth brome
Calamagrostis canadensis	Poaceae	native	3	-5	grass	perennial	blue-joint
Calamagrostis stricta	Poaceae	native	10	-3	grass	perennial	narrow-leaved reedgrass
Caltha palustris	Ranunculaceae	native	6	-5	forb	perennial	marsh-marigold
Calystegia sepium	Convolvulaceae	native	2	0	vine	perennial	hedge bindweed
Campanula aparinoides	Campanulaceae	native	7	-5	forb	perennial	marsh bellflower
Campanula rotundifolia	Campanulaceae	native	6	3	forb	perennial	harebell
Carex aquatilis	Cyperaceae	native	7	-5	sedge	perennial	sedge
Carex aurea	Cyperaceae	native	3	-3	sedge	perennial	sedge
Carex bebbii	Cyperaceae	native	4	-5	sedge	perennial	sedge
Carex buxbaumii	Cyperaceae	native	10	-5	sedge	perennial	sedge
Carex castanea	Cyperaceae	native	6	-3	sedge	perennial	sedge
Carex cristatella	Cyperaceae	native	3	-3	sedge	perennial	sedge
Carex eburnea	Cyperaceae	native	7	3	sedge	perennial	sedge
Carex flava	Cyperaceae	native	4	-5	sedge	perennial	sedge
Carex gracillima	Cyperaceae	native	4	3	sedge	perennial	sedge
Carex granularis	Cyperaceae	native	2	-3	sedge	perennial	sedge
Carex hystericina	Cyperaceae	native	2	-5	sedge	perennial	sedge
Carex interior	Cyperaceae	native	3	-5	sedge	perennial	sedge
Carex intumescens	Cyperaceae	native	3	-3	sedge	perennial	sedge
Carex lasiocarpa	Cyperaceae	native	8	-5	sedge	perennial	sedge
Carex peckii	Cyperaceae	native	3	5	sedge	perennial	sedge
Carex pellita	Cyperaceae	native	2	-5	sedge	perennial	sedge
Carex retrorsa	Cyperaceae	native	3	-5	sedge	perennial	sedge
Carex stipata	Cyperaceae	native	1	-5	sedge	perennial	sedge
Carex stricta	Cyperaceae	native	4	-5	sedge	perennial	sedge
Carex utriculata	Cyperaceae	native	5	-5	sedge	perennial	sedge
Carex viridula	Cyperaceae	native	4	-5	sedge	perennial	sedge
Carex vulpinoidea	Cyperaceae	native	1	-5	sedge	perennial	sedge
Centaurea stoebe	Asteraceae	non-native	0	5	forb	biennial	spotted knapweed
Cerastium fontanum	Caryophyllaceae	non-native	0	3	forb	perennial	mouse-ear chickweed
Chelone glabra	Plantaginaceae	native	7	-5	forb	perennial	turtlehead
Cichorium intybus	Asteraceae	non-native	0	3	forb	perennial	chicory
Cicuta maculata	Apiaceae	native	4	-5	forb	biennial	water hemlock
Cirsium arvense	Asteraceae	non-native	0	3	forb	perennial	canada thistle
Cirsium vulgare	Asteraceae	non-native	0	3	forb	biennial	bull thistle
Cladium mariscoides	Cyperaceae	native	10	-5	sedge	perennial	twig-rush

Scientific Name	Family	Type	C	W	Physiognomy	Duration	Common Name
Clinopodium vulgare	Lamiaceae	native	3	5	forb	perennial	wild-basil
Comandra umbellata	Santalaceae	native	5	3	forb	perennial	bastard-toadflax
Comarum palustre	Rosaceae	native	7	-5	forb	perennial	marsh cinquefoil
Coreopsis lanceolata	Asteraceae	native	8	3	forb	perennial	sand coreopsis
Cornus amomum	Cornaceae	native	2	-3	shrub	perennial	silky dogwood
Cornus canadensis	Cornaceae	native	6	0	shrub	perennial	bunchberry
Cornus sericea	Cornaceae	native	2	-3	shrub	perennial	red-osier
Corylus cornuta	Betulaceae	native	5	3	shrub	perennial	beaked hazelnut
Crataegus monogyna	Rosaceae	non-native	0	3	tree	perennial	english hawthorn
Dactylis glomerata	Poaceae	non-native	0	3	grass	perennial	orchard grass
Danthonia spicata	Poaceae	native	4	5	grass	perennial	poverty grass; oatgrass
Dasiphora fruticosa	Rosaceae	native	8	-3	shrub	perennial	shrubby cinquefoil
Daucus carota	Apiaceae	non-native	0	5	forb	biennial	queen-annes-lace
Dianthus armeria	Caryophyllaceae	non-native	0	5	forb	annual	deptford pink
Dichanthelium lindheimeri	Poaceae	native	8	-5	grass	perennial	panic grass
Dipsacus laciniatus	Dipsacaceae	non-native	0	3	forb	biennial	cut-leaf teasel
Dryopteris carthusiana	Dryopteridaceae	native	5	-3	fern	perennial	spinulose woodfern
Dryopteris cristata	Dryopteridaceae	native	6	-5	fern	perennial	crested shield fern
Eleocharis elliptica	Cyperaceae	native	6	-5	sedge	perennial	golden-seeded spike rush
Eleodea canadensis	Hydrocharitaceae	native	1	-5	forb	perennial	common waterweed
Elymus canadensis	Poaceae	native	5	3	grass	perennial	canada wild rye
Elymus repens	Poaceae	non-native	0	3	grass	perennial	quack grass
Elymus trachycaulus	Poaceae	native	8	3	grass	perennial	slender wheatgrass
Epilobium hirsutum	Onagraceae	non-native	0	-3	forb	perennial	great hairy willow-herb
Epipactis helleborine	Orchidaceae	non-native	0	0	forb	perennial	helleborine
Equisetum arvense	Equisetaceae	native	0	0	fern	perennial	common horsetail
Equisetum fluviatile	Equisetaceae	native	7	-5	fern	perennial	water horsetail
Equisetum hyemale	Equisetaceae	native	2	0	fern	perennial	scouring rush
Equisetum laevigatum	Equisetaceae	native	2	-3	fern	perennial	smooth scouring rush
Equisetum palustre	Equisetaceae	native	8	-3	fern	perennial	marsh horsetail
Equisetum sylvaticum	Equisetaceae	native	5	-3	fern	perennial	woodland horsetail
Equisetum variegatum	Equisetaceae	native	6	-3	fern	perennial	variegated scouring rush
Erigeron philadelphicus	Asteraceae	native	2	0	forb	perennial	philadelphia fleabane
Erigeron strigosus	Asteraceae	native	4	3	forb	perennial	daisy fleabane
Eupatorium perfoliatum	Asteraceae	native	4	-3	forb	perennial	boneset
Euthamia graminifolia	Asteraceae	native	3	0	forb	perennial	grass-leaved goldenrod
Eutrochium maculatum	Asteraceae	native	4	-5	forb	perennial	joe-pye-weed
Fallopia convolvulus	Polygonaceae	non-native	0	3	vine	annual	false buckwheat
Fragaria virginiana	Rosaceae	native	2	3	forb	perennial	wild strawberry
Frangula alnus	Rhamnaceae	non-native	0	0	shrub	perennial	glossy buckthorn
Fraxinus americana	Oleaceae	native	5	3	tree	perennial	white ash
Fraxinus nigra	Oleaceae	native	6	-3	tree	perennial	black ash
Fraxinus pennsylvanica	Oleaceae	native	2	-3	tree	perennial	red ash
Galium tinctorium	Rubiaceae	native	5	-5	forb	perennial	stiff bedstraw
Galium trifidum	Rubiaceae	native	6	-3	forb	perennial	small bedstraw
Galium triflorum	Rubiaceae	native	4	3	forb	perennial	fragrant bedstraw
Gaultheria procumbens	Ericaceae	native	5	3	shrub	perennial	wintergreen
Gentianopsis virgata	Gentianaceae	native	8	-5	forb	annual	small fringed gentian
Geocaulon lividum	Santalaceae	native	9	0	forb	perennial	geocaulon
Geranium robertianum	Geraniaceae	native	3	3	forb	annual	herb robert
Geum aleppicum	Rosaceae	native	3	0	forb	perennial	yellow avens
Geum rivale	Rosaceae	native	7	-5	forb	perennial	purple avens
Glyceria striata	Poaceae	native	4	-5	grass	perennial	fowl manna grass
Halenia deflexa	Gentianaceae	native	7	0	forb	annual	spurred gentian
Hieracium aurantiacum	Asteraceae	non-native	0	5	forb	perennial	orange hawkweed
Hieracium caespitosum	Asteraceae	non-native	0	5	forb	perennial	king devil
Hieracium piloselloides	Asteraceae	non-native	0	5	forb	perennial	king devil
Hierochloë hirta	Poaceae	native	9	-3	grass	perennial	sweet grass
Hypericum kalmianum	Hypericaceae	native	10	-3	shrub	perennial	kalms st. johns-wort
Hypericum perforatum	Hypericaceae	non-native	0	5	forb	perennial	common st. johns-wort
Ilex verticillata	Aquifoliaceae	native	5	-3	shrub	perennial	michigan holly
Impatiens capensis	Balsaminaceae	native	2	-3	forb	annual	spotted touch-me-not
Iris lacustris	Iridaceae	native	9	0	forb	perennial	dwarf lake iris
Iris versicolor	Iridaceae	native	5	-5	forb	perennial	wild blue flag
Juncus alpinoarticulatus	Juncaceae	native	5	-5	forb	perennial	rush
Juncus balticus	Juncaceae	native	4	-5	forb	perennial	rush
Juncus canadensis	Juncaceae	native	6	-5	forb	perennial	canadian rush
Juncus dudleyi	Juncaceae	native	1	-3	forb	perennial	dudleys rush
Juncus effusus	Juncaceae	native	3	-5	forb	perennial	soft-stemmed rush
Juncus nodosus	Juncaceae	native	5	-5	forb	perennial	joint rush
Juniperus communis	Cupressaceae	native	4	3	shrub	perennial	common or ground juniper
Juniperus horizontalis	Cupressaceae	native	10	3	shrub	perennial	creeping juniper
Lapsana communis	Asteraceae	non-native	0	3	forb	annual	nipplewort
Larix laricina	Pinaceae	native	5	-3	tree	perennial	tamarack

Scientific Name	Family	Type	C	W	Physiognomy	Duration	Common Name
Lathyrus palustris	Fabaceae	native	7	-3	vine	perennial	marsh pea
Lathyrus pratensis	Fabaceae	non-native	0	3	vine	perennial	yellow vetchling
Leersia oryzoides	Poaceae	native	3	-5	grass	perennial	cut grass
Lemna minor	Araceae	native	5	-5	forb	perennial	common duckweed
Lepidium campestre	Brassicaceae	non-native	0	5	forb	biennial	field cress
Linaria vulgaris	Plantaginaceae	non-native	0	5	forb	perennial	butter-and-eggs
Linnaea borealis	Linnaeaceae	native	6	0	forb	perennial	twinflower
Liparis loeselii	Orchidaceae	native	5	-3	forb	perennial	loesels twayblade
Lobelia kalmii	Campanulaceae	native	10	-5	forb	perennial	bog lobelia
Lonicera x bella	Caprifoliaceae	non-native	0	3	shrub	perennial	hybrid honeysuckle
Lonicera dioica	Caprifoliaceae	native	5	3	vine	perennial	red honeysuckle
Lycopus uniflorus	Lamiaceae	native	2	-5	forb	perennial	northern bugle weed
Lysimachia ciliata	Myrsinaceae	native	4	-3	forb	perennial	fringed loosestrife
Lysimachia terrestris	Myrsinaceae	native	6	-5	forb	perennial	swamp-candles
Lysimachia thyriflora	Myrsinaceae	native	6	-5	forb	perennial	tufted loosestrife
Maianthemum canadense	Convallariaceae	native	4	3	forb	perennial	canada mayflower
Maianthemum racemosum	Convallariaceae	native	5	3	forb	perennial	false spikenard
Maianthemum stellatum	Convallariaceae	native	5	0	forb	perennial	starry false solomon-seal
Malus pumila	Rosaceae	non-native	0	5	tree	perennial	apple
Medicago lupulina	Fabaceae	non-native	0	3	forb	annual	black medick
Melampyrum lineare	Orobanchaceae	native	6	3	forb	annual	cow-wheat
Melilotus albus	Fabaceae	non-native	0	3	forb	biennial	white sweet-clover
Melilotus officinalis	Fabaceae	non-native	0	3	forb	biennial	yellow sweet-clover
Mentha x piperita	Lamiaceae	non-native	0	-5	forb	perennial	peppermint
Mentha canadensis	Lamiaceae	native	3	-3	forb	perennial	wild mint
Mycelis muralis	Asteraceae	non-native	0	5	forb	biennial	wall lettuce
Myrica gale	Myricaceae	native	6	-5	shrub	perennial	sweet gale
Myriophyllum spicatum	Haloragaceae	non-native	0	-5	forb	perennial	eurasian water-milfoil
Najas flexilis	Hydrocharitaceae	native	5	-5	forb	annual	slender naiad
Oenothera oakesiana	Onagraceae	native	7	5	forb	biennial	evening-primrose
Onoclea sensibilis	Onocleaceae	native	2	-3	fern	perennial	sensitive fern
Osmunda regalis	Osmundaceae	native	5	-5	fern	perennial	royal fern
Packera aurea	Asteraceae	native	5	-3	forb	perennial	golden ragwort
Packera paupercula	Asteraceae	native	3	0	forb	perennial	balsam ragwort
Parthenocissus inserta	Vitaceae	native	4	3	vine	perennial	thicket creeper
Persicaria amphibia	Polygonaceae	native	6	-5	forb	perennial	water smartweed
Phalaris arundinacea	Poaceae	native	0	-3	grass	perennial	reed canary grass
Phleum pratense	Poaceae	non-native	0	3	grass	perennial	timothy
Phragmites australis var. americanus	Poaceae	native	5	-3	grass	perennial	reed
Physalis heterophylla	Solanaceae	native	3	5	forb	perennial	clammy ground-cherry
Picea glauca	Pinaceae	native	3	3	tree	perennial	white spruce
Picea mariana	Pinaceae	native	6	-3	tree	perennial	black spruce
Pinus strobus	Pinaceae	native	3	3	tree	perennial	white pine
Pinus sylvestris	Pinaceae	non-native	0	3	tree	perennial	scotch pine
Plantago lanceolata	Plantaginaceae	non-native	0	3	forb	perennial	english plantain
Plantago major	Plantaginaceae	non-native	0	3	forb	perennial	common plantain
Platanthera psycodes	Orchidaceae	native	7	-3	forb	perennial	purple fringed orchid
Poa compressa	Poaceae	non-native	0	3	grass	perennial	canada bluegrass
Poa palustris	Poaceae	native	3	-3	grass	perennial	fowl meadow grass
Poa pratensis	Poaceae	non-native	0	3	grass	perennial	kentucky bluegrass
Polygala paucifolia	Polygalaceae	native	7	3	forb	perennial	gay-wings
Populus alba	Salicaceae	non-native	0	5	tree	perennial	white poplar
Populus balsamifera	Salicaceae	native	2	-3	tree	perennial	balsam poplar
Populus deltoides	Salicaceae	native	1	0	tree	perennial	cottonwood
Populus tremuloides	Salicaceae	native	1	0	tree	perennial	quaking aspen
Potamogeton epiphydrus	Potamogetonaceae	native	8	-5	forb	perennial	ribbon-leaved pondweed
Potamogeton gramineus	Potamogetonaceae	native	5	-5	forb	perennial	pondweed
Potamogeton richardsonii	Potamogetonaceae	native	5	-5	forb	perennial	richardsons pondweed
Potentilla anserina	Rosaceae	native	5	-3	forb	perennial	silverweed
Potentilla argentea	Rosaceae	non-native	0	3	forb	perennial	silvery cinquefoil
Potentilla norvegica	Rosaceae	native	0	0	forb	annual	rough cinquefoil
Potentilla recta	Rosaceae	non-native	0	5	forb	perennial	rough-fruited cinquefoil
Prenanthes racemosa	Asteraceae	native	8	-3	forb	perennial	glaucous white lettuce
Prunella vulgaris	Lamiaceae	native	0	0	forb	perennial	self-heal
Prunus pumila	Rosaceae	native	8	5	shrub	perennial	sand cherry
Prunus virginiana	Rosaceae	native	2	3	shrub	perennial	choke cherry
Pteridium aquilinum	Dennstaedtiaceae	native	0	3	fern	perennial	bracken fern
Quercus rubra	Fagaceae	native	5	3	tree	perennial	red oak
Rhamnus alnifolia	Rhamnaceae	native	8	-5	shrub	perennial	alder-leaved buckthorn
Rhamnus cathartica	Rhamnaceae	non-native	0	0	tree	perennial	common buckthorn
Ribes americanum	Grossulariaceae	native	6	-3	shrub	perennial	wild black currant
Ribes hirtellum	Grossulariaceae	native	6	-3	shrub	perennial	swamp gooseberry
Ribes hudsonianum	Grossulariaceae	native	10	-5	shrub	perennial	northern black currant

Scientific Name	Family	Type	C	W	Physiognomy	Duration	Common Name
<i>Rosa acicularis</i>	Rosaceae	native	4	3	shrub	perennial	wild rose
<i>Rosa palustris</i>	Rosaceae	native	5	-5	shrub	perennial	swamp rose
<i>Rubus pubescens</i>	Rosaceae	native	4	-3	shrub	perennial	dwarf raspberry
<i>Rubus strigosus</i>	Rosaceae	native	2	0	shrub	perennial	wild red raspberry
<i>Rudbeckia hirta</i>	Asteraceae	native	1	3	forb	perennial	black-eyed susan
<i>Sagittaria latifolia</i>	Alismataceae	native	4	-5	forb	perennial	common arrowhead
<i>Salix amygdaloides</i>	Salicaceae	native	3	-3	tree	perennial	peach-leaved willow
<i>Salix bebbiana</i>	Salicaceae	native	1	-3	shrub	perennial	bebbs willow
<i>Salix candida</i>	Salicaceae	native	9	-5	shrub	perennial	hoary willow
<i>Salix cordata</i>	Salicaceae	native	10	0	shrub	perennial	sand-dune willow
<i>Salix discolor</i>	Salicaceae	native	1	-3	shrub	perennial	pussy willow
<i>Salix eriocephala</i>	Salicaceae	native	2	-3	shrub	perennial	willow
<i>Salix exigua</i>	Salicaceae	native	1	-3	shrub	perennial	sandbar willow
<i>Salix fragilis</i>	Salicaceae	non-native	0	0	tree	perennial	crack willow
<i>Salix lucida</i>	Salicaceae	native	3	-3	shrub	perennial	shining willow
<i>Salix myricoides</i>	Salicaceae	native	9	-3	shrub	perennial	blueleaf willow
<i>Salix petiolaris</i>	Salicaceae	native	1	-3	shrub	perennial	slender willow
<i>Salix purpurea</i>	Salicaceae	non-native	0	-3	shrub	perennial	basket willow
<i>Saponaria officinalis</i>	Caryophyllaceae	non-native	0	3	forb	perennial	bouncing bet
<i>Schedonorus arundinaceus</i>	Poaceae	non-native	0	3	grass	perennial	tall fescue
<i>Schedonorus pratensis</i>	Poaceae	non-native	0	3	grass	perennial	meadow fescue
<i>Schizachne purpurascens</i>	Poaceae	native	5	3	grass	perennial	false melic
<i>Schizachyrium scoparium</i>	Poaceae	native	5	3	grass	perennial	little bluestem
<i>Schoenoplectus acutus</i>	Cyperaceae	native	5	-5	sedge	perennial	hardstem bulrush
<i>Schoenoplectus pungens</i>	Cyperaceae	native	5	-5	sedge	perennial	threesquare
<i>Schoenoplectus tabernaemontani</i>	Cyperaceae	native	4	-5	sedge	perennial	softstem bulrush
<i>Scirpus atrocinctus</i>	Cyperaceae	native	5	-5	sedge	perennial	wool-grass
<i>Scirpus atrovirens</i>	Cyperaceae	native	3	-5	sedge	perennial	bulrush
<i>Scirpus cyperinus</i>	Cyperaceae	native	5	-5	sedge	perennial	wool-grass
<i>Scrophularia lanceolata</i>	Scrophulariaceae	native	5	3	forb	perennial	early figwort
<i>Scutellaria galericulata</i>	Lamiaceae	native	5	-5	forb	perennial	marsh skullcap
<i>Scutellaria lateriflora</i>	Lamiaceae	native	5	-5	forb	perennial	mad-dog skullcap
<i>Shepherdia canadensis</i>	Elaeagnaceae	native	7	5	shrub	perennial	soapberry
<i>Silene vulgaris</i>	Caryophyllaceae	non-native	0	5	forb	perennial	bladder campion
<i>Sisyrinchium montanum</i>	Iridaceae	native	4	0	forb	perennial	mountain blue-eyed-grass
<i>Sium suave</i>	Apiaceae	native	5	-5	forb	perennial	water-parsnip
<i>Solanum dulcamara</i>	Solanaceae	non-native	0	0	vine	perennial	bittersweet nightshade
<i>Solidago altissima</i>	Asteraceae	native	1	3	forb	perennial	tall goldenrod
<i>Solidago canadensis</i>	Asteraceae	native	1	3	forb	perennial	canada goldenrod
<i>Solidago gigantea</i>	Asteraceae	native	3	-3	forb	perennial	late goldenrod
<i>Solidago hispida</i>	Asteraceae	native	3	5	forb	perennial	hairy goldenrod
<i>Solidago juncea</i>	Asteraceae	native	3	5	forb	perennial	early goldenrod
<i>Solidago ohioensis</i>	Asteraceae	native	8	-5	forb	perennial	ohio goldenrod
<i>Solidago rugosa</i>	Asteraceae	native	3	0	forb	perennial	rough-leaved goldenrod
<i>Sonchus arvensis</i>	Asteraceae	non-native	0	3	forb	perennial	perennial sow-thistle
<i>Sorbus aucuparia</i>	Rosaceae	non-native	0	5	tree	perennial	european mountain-ash
<i>Sorbus decora</i>	Rosaceae	native	4	3	tree	perennial	mountain-ash
<i>Spiraea alba</i>	Rosaceae	native	4	-3	shrub	perennial	meadowsweet
<i>Symphyotrichum ciliolatum</i>	Asteraceae	native	4	5	forb	perennial	northern heart-leaved aster
<i>Symphyotrichum lanceolatum</i>	Asteraceae	native	2	-3	forb	perennial	panicled aster
<i>Symphyotrichum lateriflorum</i>	Asteraceae	native	2	0	forb	perennial	calico aster
<i>Symphyotrichum novae-angliae</i>	Asteraceae	native	3	-3	forb	perennial	new england aster
<i>Symphyotrichum pilosum</i>	Asteraceae	native	1	3	forb	perennial	hairy aster
<i>Teucrium canadense</i>	Lamiaceae	native	4	-3	forb	perennial	wood-sage
<i>Thalictrum dasycarpum</i>	Ranunculaceae	native	3	-3	forb	perennial	purple meadow-rue
<i>Thelypteris palustris</i>	Thelypteridaceae	native	2	-3	fern	perennial	marsh fern
<i>Thuja occidentalis</i>	Cupressaceae	native	4	-3	tree	perennial	arbor vitae
<i>Toxicodendron rydbergii</i>	Anacardiaceae	native	3	0	shrub	perennial	poison-ivy
<i>Tragopogon pratensis</i>	Asteraceae	non-native	0	5	forb	biennial	common goats beard
<i>Triadenum fraseri</i>	Hypericaceae	native	6	-5	forb	perennial	marsh st. johns-wort
<i>Trientalis borealis</i>	Myrsinaceae	native	5	0	forb	perennial	star-flower
<i>Trifolium pratense</i>	Fabaceae	non-native	0	3	forb	perennial	red clover
<i>Triglochin maritima</i>	Juncaginaceae	native	8	-5	forb	perennial	common bog arrow-grass
<i>Typha x glauca</i>	Typhaceae	non-native	0	-5	forb	perennial	hybrid cat-tail
<i>Typha latifolia</i>	Typhaceae	native	1	-5	forb	perennial	broad-leaved cat-tail
<i>Utricularia intermedia</i>	Lentibulariaceae	native	10	-5	forb	perennial	flat-leaved bladderwort
<i>Utricularia minor</i>	Lentibulariaceae	native	10	-5	forb	perennial	small bladderwort
<i>Utricularia vulgaris</i>	Lentibulariaceae	native	6	-5	forb	perennial	common bladderwort
<i>Vaccinium angustifolium</i>	Ericaceae	native	4	3	shrub	perennial	low sweet blueberry
<i>Vallisneria americana</i>	Hydrocharitaceae	native	7	-5	forb	perennial	eel-grass
<i>Verbascum thapsus</i>	Scrophulariaceae	non-native	0	5	forb	biennial	common mullein
<i>Veronica officinalis</i>	Plantaginaceae	non-native	0	3	forb	perennial	common speedwell
<i>Viburnum opulus</i>	Adoxaceae	non-native	0	-3	shrub	perennial	european highbush-cranberry
<i>Vitis riparia</i>	Vitaceae	native	3	0	vine	perennial	river-bank grape