Huron River Watershed Council
Protecting the river since 1965
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Ann Arbor, MI 48104
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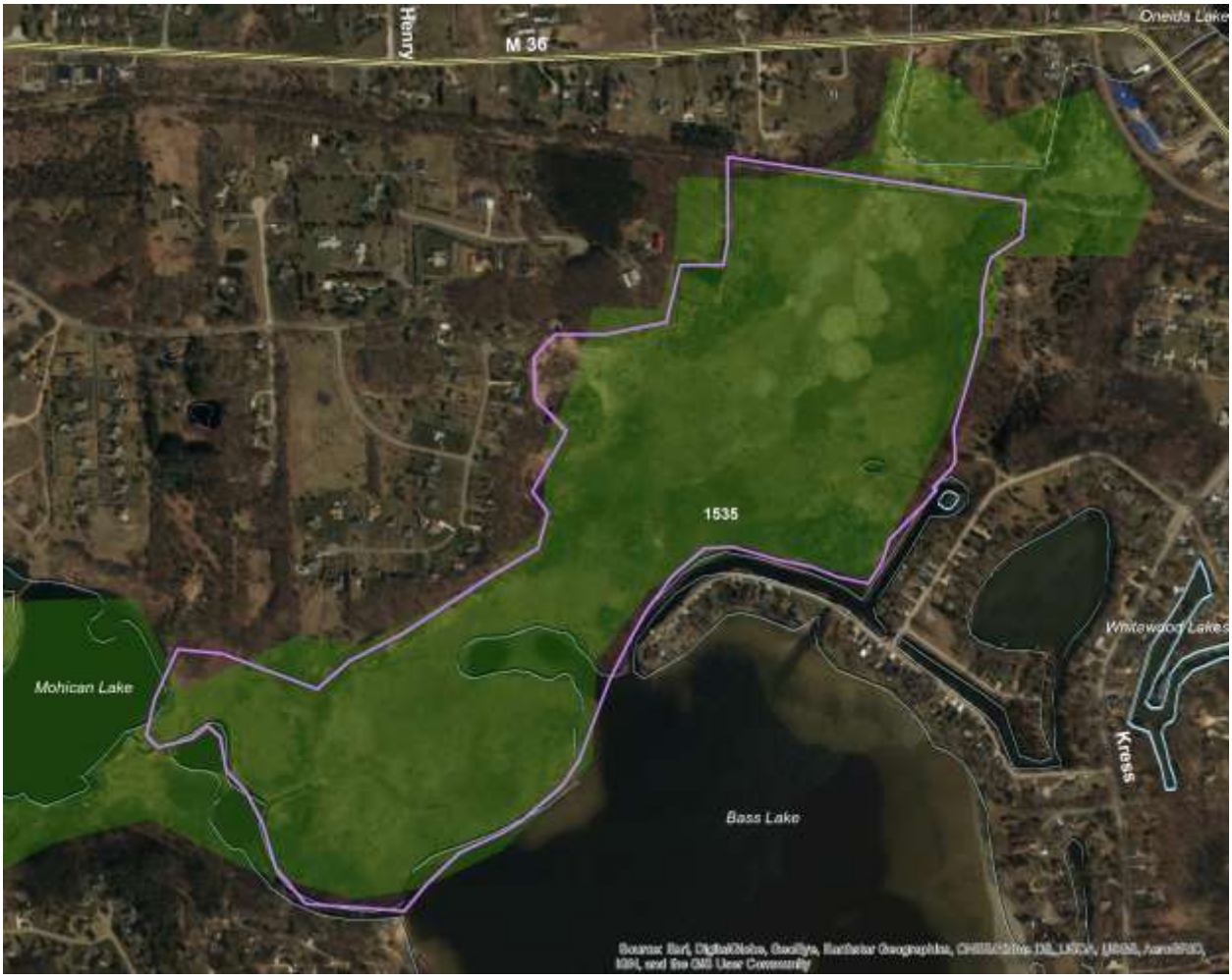
www.hrwc.org

HRWC Bioreserve Site Assessment

I. Site Location and Natural Areas Assessed:



II. Bioreserve Map and Field Assessment Score:

The site receives scores based on the GIS model underlying the Bioreserve Map and based on the field assessment.

The "Bioreserve Map" ranks natural areas based on the ecological services they provide. HRWC used aerial photographs taken over Oakland, Livingston, Wayne, Washtenaw, and Monroe counties to create the map. HRWC drew boundaries around areas on the photographs that appeared to be woodland, wetland, or open field, and then ranked those areas based on 15 ecological criteria such as size, vegetation types, etc.

The first column in the table on page three lists how the Bioreserve Map ranks the site for 15 ecological criteria. Rankings for each criterion range from 0 to 100.

The Bioreserve Map score is 475, which places it in the **mid-range** [lower range: 25-366; mid-range: 366-591; highest range: 591 – 1224] of all the Bioreserve Sites in the watershed ranging from 25 – 1244. For more details on how the sites were scored on the Bioreserve Map, see http://www.hrwc.org/our-work/bioreserve/bioreserve-map/.

The next two columns give Field Assessment scores for each type of natural area visited by the field assessment team. For each answer a team could enter on the worksheet, the site receives a certain number of points. For instance, for each plant a team checks off on the plant list, the site receives 5 points. If invasive species are listed as dominant, the site receives fewer points than if native species are checked as dominant. Each ecosystem within the natural area receives two scores, one for ecological integrity and one for level of disturbance.

Potential maximum points each type of natural area could receive:

Ecosystem Type	Ecological Integrity (higher score indicates higher quality site)	Level of Disturbance (higher score indicates higher level of disturbance on site)
Wetlands		
Bog or fen	255	100
Other wetlands	171	110
Forests	144	154
Grasslands	126	239
Waterways	51	n/a

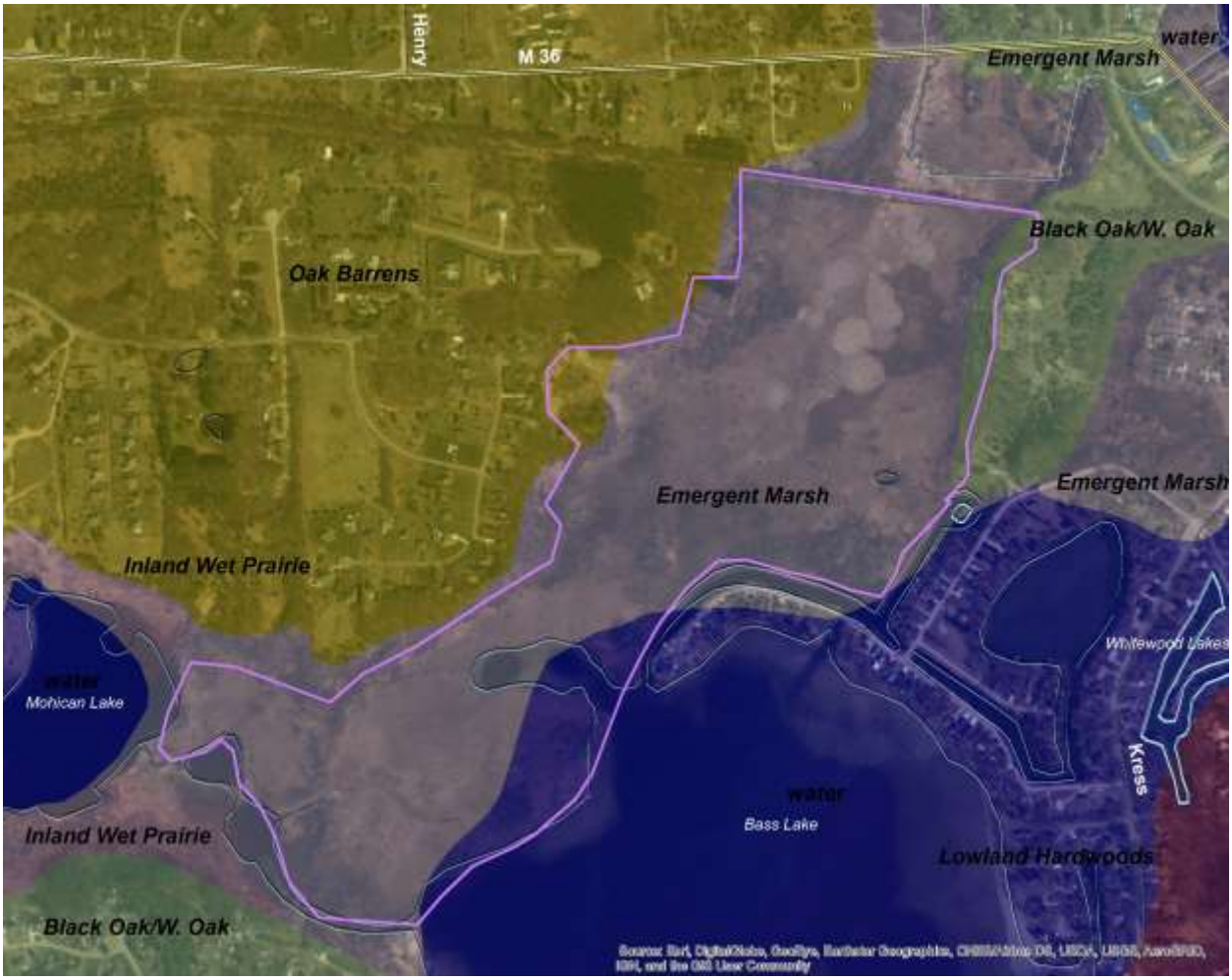
III. Scores for the Natural Area:

SITE NO. 1535			
	Entire site's Bioreserve Map scores	This parcel's field scores	
Ranking Criteria	Site #1535 Ranking	Ecological integrity	Level of disturbance
Rank for Size	25		
Rank for Core Size	25		
Rank for Water	100		
Rank for Wetlands	100		
Rank for Groundwater	0		
Rank for Remnant Ecosystems	50		
Rank for Glacial Diversity	0		
Rank for Topography	25		
Rank for Connectedness Count	0		
Rank for Connectedness%	0		
Rank for Potentially Unchanged %	50		
Rank for Potentially Unchanged Area	25		
Rank for Restorability	25		
Rank for MNFI Communities	0		
Rank for Biorarity	50		
Final Rank	475		
This parcel's natural area sites:			
	Wetland:	134	39

IV. Site Landscape Context:

Landscape of the 1800s: Historically, the site was part of a large emergent marsh system.

Glacial landscape: The area is underlaid with sand and gravel carried and sorted by meltwaters as the glaciers receded.



V. Field Assessment:

The volunteer team visited the site on 7/27/2017 and 8/30/2017, and spent about five hours assessing the site.

For the purposes of the assessment, the team delineated one wetland ecosystem on aerial photos of the site.

VI. Site Overview:

The landscape is flat. Signs of wildlife observed by the team included bird nests, fish, frogs, waterfowl, raptors, song birds, and turtles.

Assessment highlights: The wetland on this site received a significantly higher than average score for the field assessment, falling in the "Top Ten" of all wetlands assessed in the Huron watershed. In addition the wetland is a fen, a unique and endangered wetland type known for its biodiversity.

On the north side, cattails and purple loosestrife are pervasive. On the south side, the team entered the wetland via kayak along Bass Lake and found a pristine prairie fen of very high ecological quality. Glossy buckthorns and other invasives are encroaching, however, especially from the northwest side, where a new development with large, manicured lawns abuts the property.

The University of Michigan owns the property. The University has many opportunities to maintain and protect this special ecosystem, including:

- Having students and classes use the area for research and education
- Working with student volunteers on stewardship of the area and educating surrounding landowners about the value of this site
- Educating the surrounding landowners about the ecological importance of the wetland (especially to the quality of Bass Lake, which has excellent fishing and an active lake association)
- Working with the surrounding landowners on stewarding the wetland
- Working with the Lakeland Trail to promote as a scenic amenity

A. Wetland:

Ecological Integrity Score: 134 out of 171 possible
Disturbance Score: 39 out of 100 possible

The wetland is 141 acres in size and takes up the entirety of the property. The wetland is in a depression, has standing water, and has a water source that is not apparent. Where soils were exposed by animal burrows and fallen trees, the team found smooth mucky and peaty soils. The wetland vegetation has distinct zones, and includes an emergent marsh area, a wet meadow area, a forb/wildflower area, a fen area, and a shrub area.

Emergent and floating-leaf plants, grasses, forbs, shrubs, bog plants, and invasives that together include buttonbush, pickerelweed, water-willow, bluejoint grass, bulrushes, tussock sedge, various sedges, ferns, gentians, Joe-pye weed, lobelias, orchids, skullcaps, buttonbush, cinquefoil, dogwood (red-osier, silky), poison sumac, willow, pitcher plants, sphagnum moss, buckthorn (glossy), purple loosestrife, and reed canary-grass are common, along with a few trees such as ash and red maple.

Invasives are distributed primarily within the wetland interior, occurring pervasively throughout the wetland. Overall human disturbance is mild and includes footpaths.

Functional Values of Wetlands

Smaller wetlands isolated from lakes and streams can serve as many ecological functions as larger wetlands.

Water quality protection
Acting as living filters, wetlands filter pollutants from rain water and snow melt that flows off of developed areas and farm fields. Wetland plants remove phosphorus and nitrogen from the water. Wetlands also adsorb bacteria, toxic metals, pesticides, and grease.

Protection from shoreline/streambank erosion
Wetland plant roots stabilize soil and help prevent soil erosion. Vegetation dampens wave action along lakes and moderates the current of rivers.

Wildlife and plant habitat
Over half of Michigan's wildlife depends upon wetlands for food, shelter, or nesting habitat, including endangered and threatened species like the bald eagle, osprey, loon and sandhill crane. Wetlands support some of the most diverse plant communities of all ecosystems. Nearly all fish species and amphibians require wetlands for food and shelter, and they are the preferred habitat of muskrat, otter, beaver, mink and raccoon.

Aesthetics and recreation
Wetlands provide recreation such as hiking, birdwatching, nature photography, canoeing, hunting, fishing, and trapping, and generate revenues to the local community through these activities. Wetlands greatly enhance the value of neighboring properties.

Flood and stormwater control
Wetlands hold rainwater and snow melt during wet times, decreasing flooding. They release the water gradually in dry times, thus helping streams maintain steady flows.

Groundwater recharge
Just as wetlands can hold water in wet times, they become sources of water during dry periods. They can serve as recharge areas to local aquifers, keeping our groundwater supply constant.

Source: Huron River Watershed Council, Ann Arbor, MI, 2002

<u>Fen Overview:</u>
Fens, are peat-forming wetlands that receive nutrients from sources other than precipitation: usually from upslope sources through drainage from surrounding mineral soils and from groundwater movement. Fens differ from bogs because they are less acidic and have higher nutrient levels. They are therefore able to support a much more diverse plant and animal community. These systems are often covered by grasses, sedges, rushes, and wildflowers. Some fens are characterized by parallel ridges of vegetation separated by less productive hollows. The ridges of these patterned fens form perpendicular to the downslope direction of water movement. Over time, peat may build up and separate the fen from its groundwater supply. When this happens, the fen receives fewer nutrients and may become a bog.

Like bogs, fens are mostly a northern hemisphere phenomenon -- occurring in the northeastern United States, the Great Lakes region, the Rocky Mountains, and much of Canada -- and are generally associated with low temperatures and short growing seasons, where ample precipitation and high humidity cause excessive moisture to accumulate.

Functions & Values:
Fens, like bogs, provide important benefits in a watershed, including preventing or reducing the risk of floods, improving water quality, and providing habitat for unique plant and animal communities.

Status:
Like most peatlands, fens experienced a decline in acreage at a rate of about 8% from 1950 to 1970, mostly from mining and draining for cropland, fuel, and fertilizer. Because of the large historical loss of this ecosystem type, remaining fens are that much rarer, and it is crucial to protect them. It is important to recognize that while mining and draining these ecosystems provide resources for people, up to 10,000 years are required to form a fen naturally.

Source: U. S. Environmental Protection Agency

Wet Meadow Overview:
Wet prairie is a native lowland grassland occurring on level, saturated and/or seasonally inundated stream and river floodplains, lake margins, and isolated depressions in southern Lower Michigan. It is typically found on outwash plains and channels near moraines. Soils are primarily loam or silt loam of neutral pH and have high organic content. Dominant species include bluejoint grass, cordgrass, and sedges.

Marsh Overview:
Marshes are the most prevalent and widely distributed wetlands in North America. They are mostly freshwater marshes, although some are brackish or alkaline. Marshes are defined as wetlands frequently or continually inundated with water, characterized by emergent soft-stemmed vegetation adapted to saturated soil conditions. They frequently occur along streams in poorly drained depressions, and in the shallow water along the boundaries of lakes, ponds, and rivers. Water levels in these wetlands generally vary from a few inches to two or three feet, and some marshes, like prairie potholes, may periodically dry out completely.

It is easy to recognize a marsh by its characteristic soils, vegetation, and wildlife. Highly organic, mineral rich soils of sand, silt, and clay underlie these wetlands, while lily pads, cattails, reeds, and bulrushes provide excellent habitat for waterfowl and other small mammals, such as Red-winged Blackbirds, Great Blue Herons, otters, and muskrats.

Functions & Values:
Due to their high levels of nutrients, freshwater marshes are one of the most productive ecosystems on earth. They can sustain a vast array of plant communities that in turn support a wide variety of wildlife within this vital wetland ecosystem. As a result, marshes sustain a diversity of life that is way out of proportion with its size. In addition to their considerable habitat value, marshes serve to mitigate flood damage and filter excess nutrients from surface runoff.

Marshes recharge groundwater supplies and moderate streamflow by providing water to streams. This is an especially important function during periods of drought. The presence of marshes in a watershed helps to reduce damage caused by floods by slowing and storing flood water. As water moves slowly through a marsh, sediment and other pollutants settle to the substrate, or floor of the marsh. Marsh vegetation and microorganisms also use excess nutrients for growth that can otherwise pollute surface water such as nitrogen and phosphorus from fertilizer. This wetland type is very important to preserving the quality of surface waters. In fact, marshes are so good at cleaning polluted waters that people are now building replicas of this wetland type to treat wastewater from farms, parking lots, and small sewage plants.

Status:
Unfortunately, like many other wetland ecosystems, freshwater marshes have suffered major acreage losses to human development. Some have been degraded by excessive deposits of nutrients and sediment from construction and farming. Severe flooding and nutrient deposition to downstream waters have often followed marsh destruction and degradation. Such environmental problems prove the vital roles these wetlands play. This realization has spurred enhanced protection and restoration of marsh ecosystems.

Source: U. S. Environmental Protection Agency

VII. Species List:

Wetland

Grasses/Sedges
Big Bluestem
Bulrush
Little Bluestem
Phragmites, Native
Sedge, Tussock
Sedges (Various)

Forbs
Arrowhead
Aster, New York
Bellflower, Marsh
Sunflower, Tickseed
Bindweed
Bog Rosemary
Boneset
Burnet, Canadian
Cattail
Clover
Dock, Great Water
Dock, Swamp
Dogbane
Horsetail
Fern, Sensitive
Gentian, Fringed
Gerardia, Purple
Goat's Beard
Goldenrod
Goldenrod, Canada
Goldenrod, Ohio
Grass of Parnassus
Hog Peanut
Iris, Blue Flag
Iris, Yellow Flag
Ironweed
Jewelweed
Joe-Pye Weed
Ladies'-Tresses
Lettuce
Lily Pad
Lobelia
Loosestrife, Fringed
Meadowrue
Milkweed, Common
Milkweed, Swamp
Mountain Mint
Pickerelweed
Pitcher Plant
Poison Hemlock
Primrose

Bouncingbet
Skullcap, Marsh
Smartweed
Smartweed, Water
Smartweed, nodding
Smartweed, swamp
Sphagnum Moss
Spurge, Flowering
Thimbleweed
Thistle, Swamp
Turtlehead, White
Water Parsnip
Water-Willow
Willow Herb, Northern

Shrubs/Vines
Alder
Buttonbush
Cinquefoil, Shrubby
Dogwood, Red-Osier
Nightshade, Deadly
Poison Ivy
Poison Sumac
Raspberry
Rose, Swamp
St. John's Wort
Sumac, Staghorn
Virginia Creeper
Willow, Shrubby

Trees
Aspen, Quaking
Birch, Bog
Box-Elder
Catalpa, Northern
Cedar
Cherry
Elm
Ash, Red
Maple, Red
Mulberry
Oak, Red
Oak, Swamp White
Redcedar, Eastern
Spruce, Norway
Tamarack
Willow Tree

Invasives
Autumn Olive
Buckthorn, Glossy
Honeysuckle
Loosestrife, Purple
Maple, Norway
Mullein
Reed Canarygrass
Rose, Multiflora

A note about invasive species and their management:

Most properties in southeast Michigan have at least some invasive plant species growing on them. Invasive plants are plants which grow quickly and aggressively, spreading and displacing other plants. Invasives are usually introduced by people either accidentally or intentionally, into a region far from their native habitat. Whether your property is found to be minimally or pervasively covered with invasive species now is the time to understand which species grow there and what management options you have to control and, if possible, eradicate them. The following practical steps for managing invasive plants are from the Pennsylvania Department of Conservation and Natural Resources.

What Can I Do about Invasive Plants?

The best insurance against future problems is to avoid the use of known invasive plants and educate others about the problems of invasives. This web site lists many of the plants that are invasive in Pennsylvania. Plants on this list should be avoided because they can escape cultivation and aggressively move into surrounding ecosystems. One way to avoid invasives is to choose plants that are native to your area. Natives often are adapted to a specific environmental niche, and have natural controls that keep them in balance.

Minimize landscape disturbance. Invasive plants thrive on bare soil and disturbed ground where the native plant community has been displaced. The key to controlling invasives is to protect healthy native plant communities.

Use fertilizers wisely. Proper site preparation begins with a soil test before applying fertilizer. High nitrogen levels sometimes give an advantage to invasive species that are better adapted to using plentiful nutrients for explosive growth. For soil fertility, try using organic, slow-decomposing compost and mulches

Have a land management plan for maintenance over time. It makes sense when designing a property to plan for future maintenance. Lawns are maintained by weekly mowing, while gardens are often hand-weeded. Meadows in Pennsylvania may need to be mowed every year. Woodlands are probably the lowest-maintenance landscape, but they too will need to be monitored and invasive plants removed.

Scout your property annually for invasives or other problems. The best way to control invasives is prevention, and prevention can only happen through vigilance. Listed on this web site are resources to help property owners.

Remove invasives before they are a problem. Effective scouting or monitoring means that problems are found while they are still small and easily controllable. For instance, do not let invasive plants go to seed. Mechanical removal through digging or cutting is preferred. Large populations of invasives may need to be stopped chemically with spot applications of herbicide by trained individuals or by homeowners carefully following label instructions.

Replace invasive plants with native or noninvasive species. Invasives are good at exploiting bare soil and empty niches. When you remove an invasive plant, unless there is another plant substituted, the invasive will tend to come right back. What grows in the future depends largely on what is there now; so it is important to fill that niche with a desirable plant that will provide seed for the future.

Remove invasives first when their densities are low. This gives the most immediate success because invasive plant control works best where there is a functioning native plant community still in place which can move right into the empty niche.

- Avoid using known invasive plants
- Minimize landscape disturbance
- Protect healthy native plant communities
- Use fertilizers wisely
- Have a land management plan for maintenance over time
- Scout regularly
- Remove invasive plants when they are present in low numbers or when they are confined to a small area before they become a problem
- Dispose of removed invasive plants wisely
- Replace invasive plants with native or noninvasive species
- Clean equipment that has been used in an area having invasive plants