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MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Michigan's Wetland Monitoring and Assessment Program

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Michigan's Wetland Monitoring & Assessment Strategy

State of Michigan
Wetland Monitoring and
Assessment Strategy

Department of Environmental Quality
Water Resources Division

March 2015

- Quantity and Quality
- Status & Trends
- Evaluation of regulatory program

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Wetland Assessment and Monitoring: Intensive Site Assessment

- Michigan Wetland Monitoring Project (MIWM)
- Began field work in 2016
- Currently in second 5-year cycle
- Aligned with National Wetland Condition Assessment - intensification

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MIWM Protocols – EGLE

- NWCA Point Verification and Assessment Area
- NWCA Vegetation Protocol
- MiRAM (Michigan Rapid Assessment Method)

MIWM Protocols – CMU

- Only sites with water
- Macroinvertebrates (CMU) dip netting and timed pick count, ID in lab
- Water Chemistry
  - Field: temperature, DO, pH, specific conductivity, transparency tube clarity
  - Lab: alkalinity, turbidity, phosphorus (P), [nitrate+nitrite]-nitrogen, ammonium-nitrogen, chlorophyll-a, total nitrogen (TN), total phosphorus (TP), chloride, color

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Assessment Area

- Follows NWCA site layout
- 2 hectare circle (standard)
- Directional Transects
- 5 Vegetation Plots

Plate 1. Standard Veg Plot Layout – *Circular AA (½ hectare)*

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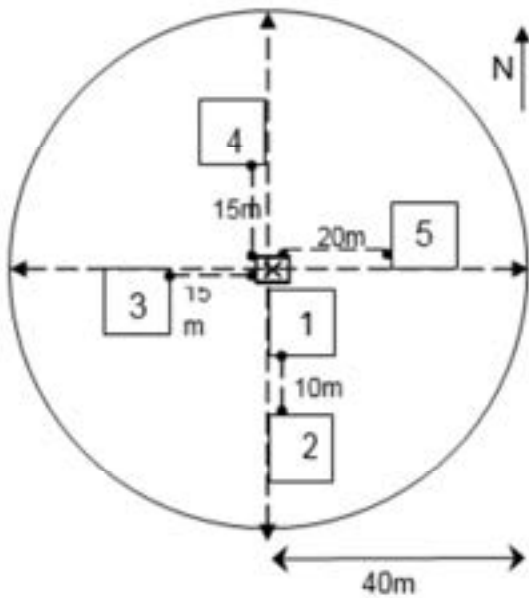
Place Veg Plots at specified locations on plot placement lines oriented through the AA CENTER on cardinal directions. Veg Plot 1 is placed 2m from the CENTER.

**Plate 2. Wide Polygon AA Veg Plot Layout –** *AA = ½ hectare polygon, width and length > 30m.*
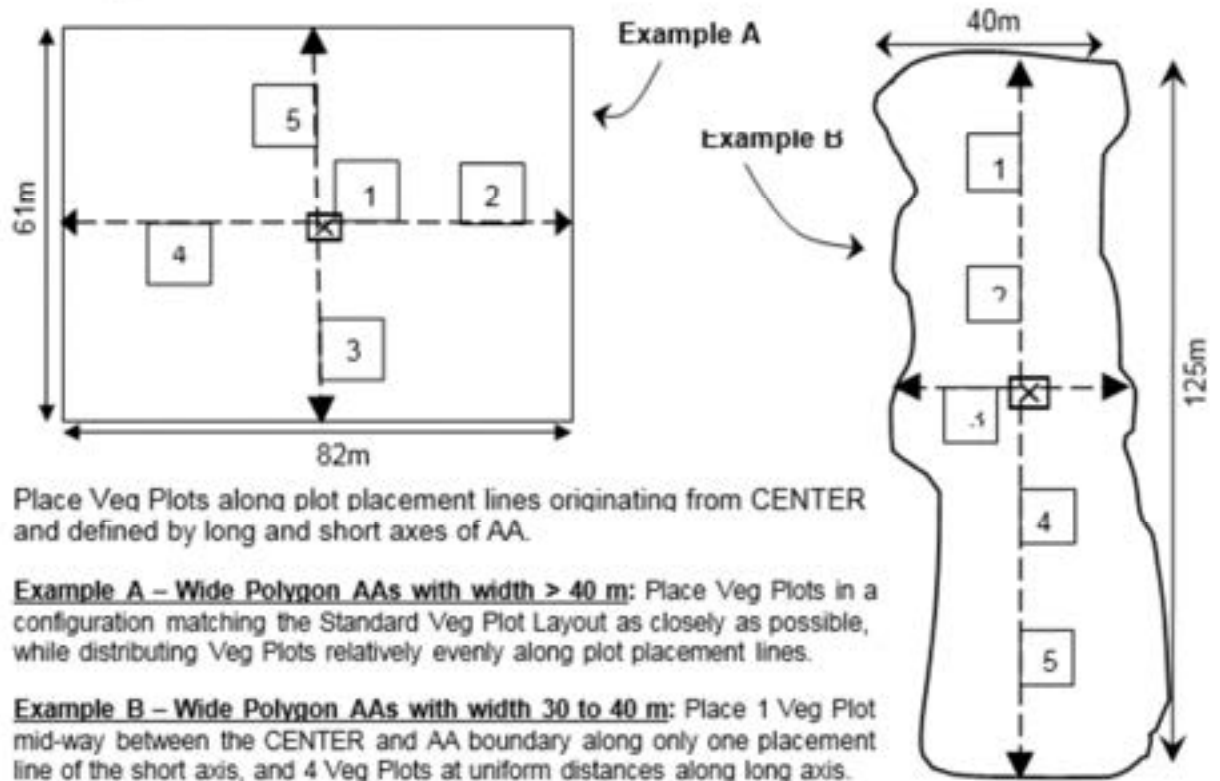
Example A

Example B

Place Veg Plots along plot placement lines originating from CENTER and defined by long and short axes of AA.

Example A – Wide Polygon AAs with width > 40 m: Place Veg Plots in a configuration matching the Standard Veg Plot Layout as closely as possible, while distributing Veg Plots relatively evenly along plot placement lines.

Example B – Wide Polygon AAs with width 30 to 40 m: Place 1 Veg Plot mid-way between the CENTER and AA boundary along only one placement line of the short axis, and 4 Veg Plots at uniform distances along long axis.

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Vegetation

- Species Presence and Percent Cover
- Cover by Vertical Strata
- Bryophytes, Lichens, Algae
- Ground Surface Attributes
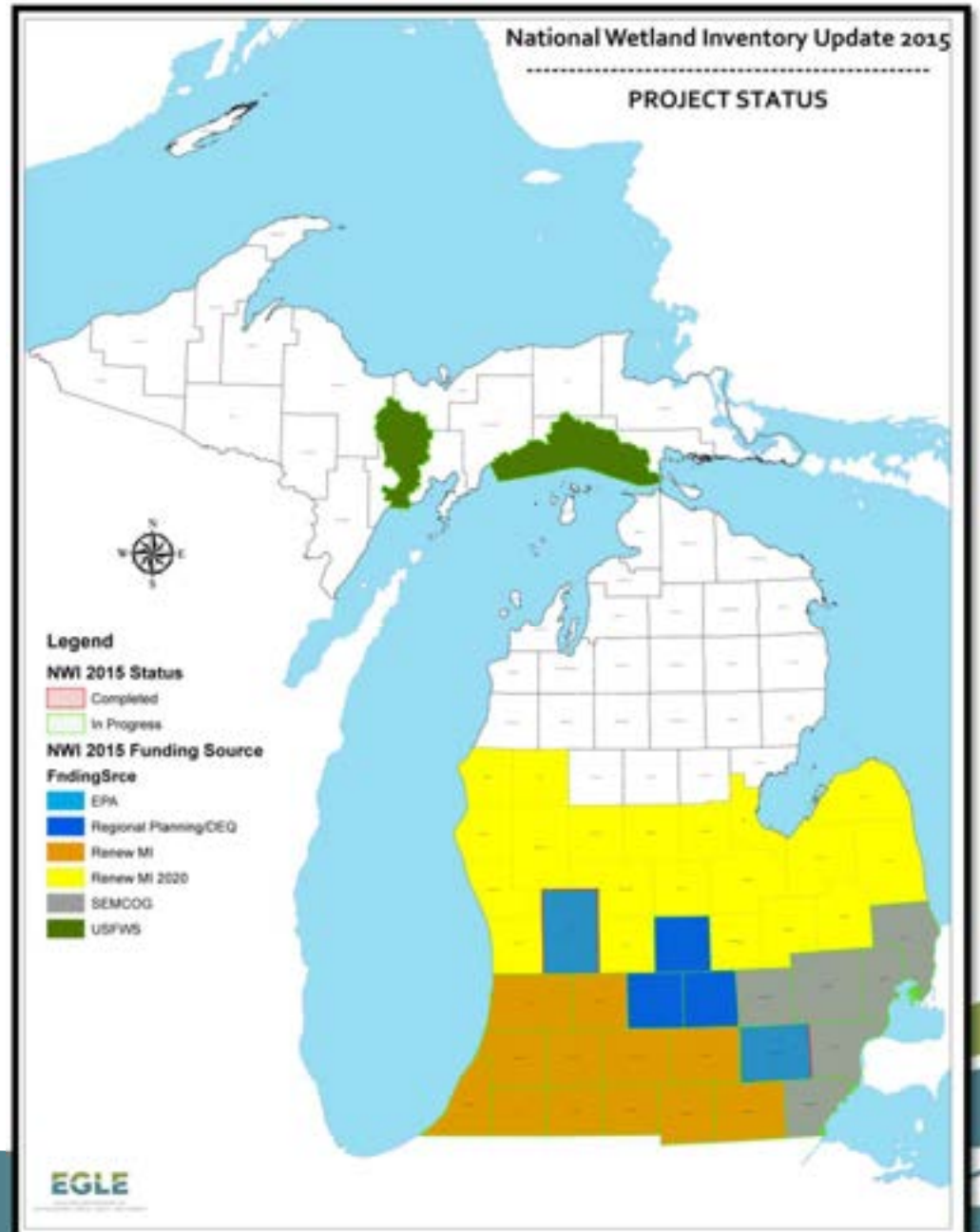- Standing Dead Trees
- Tree Species Cover and Counts

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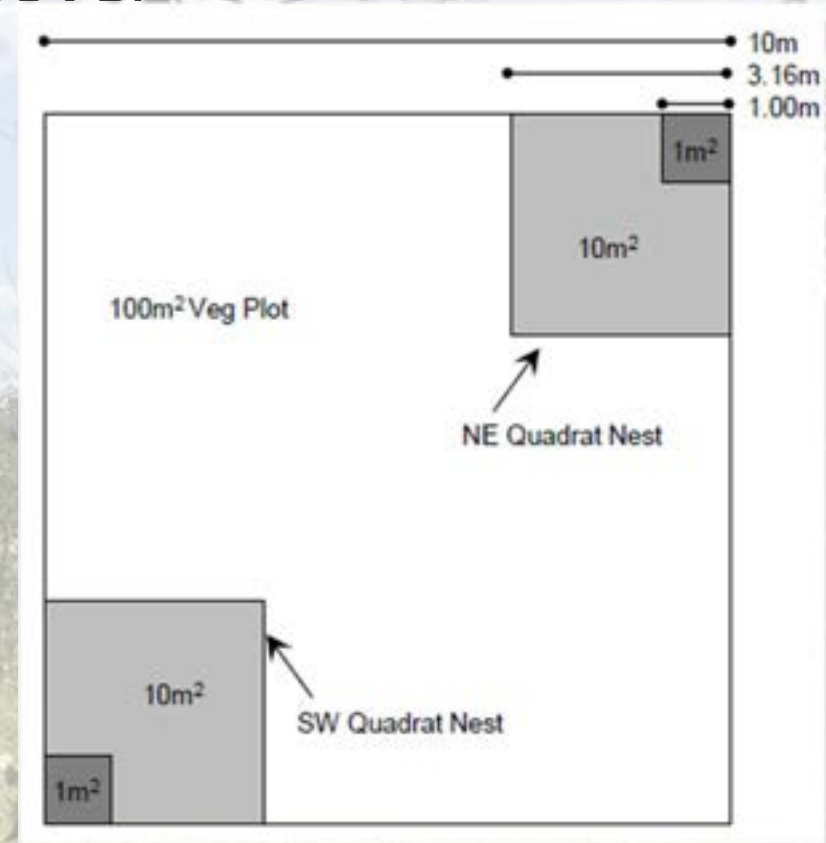
MiRAM

7 Metrics for Measuring Wetland Functional Value
1) Wetland Size and Distribution
2) Buffers and Surrounding Land Use
3) Hydrology
4) Habitat Alteration and Habitat Structure Development
5) Special Situations
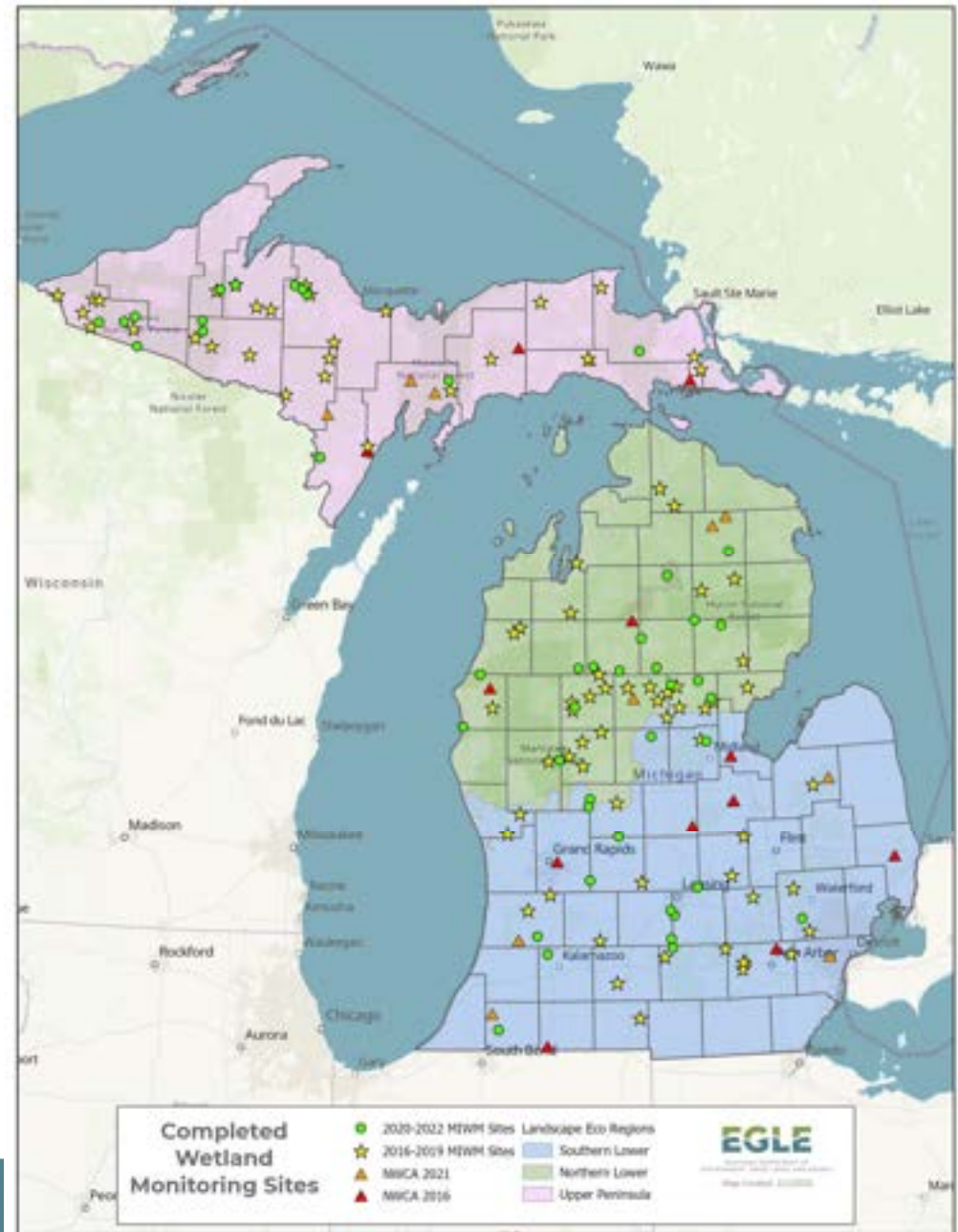6) Vegetation, Interspersion, and Habitat Features
7) Scenic, Recreational, and Cultural Value

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Site Selection

- 2005 NWI polygons
- Points randomly generated by region
- Property owner permission, aerial evaluation, etc.
- Working on updating NWI in MI to 2015 NWI
  - Partners
  - Funding

National Wetland Inventory Update 2015

PROJECT STATUS

Legend

NWI 2015 Status
- Completed
- In Progress

NWI 2015 Funding Source

FndingSrce
- EPA
- Regional Planning/DEQ
- Renew MI
- Renew MI 2020
- SEMCOG
- USFWS

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Site Distribution

- Goal of 100 sites per 5-year cycle
  - Including NWCA sites
  - Subset of revisit sites
- Three Ecoregions
  - Southern Lower Peninsula
  - Northern Lower Peninsula
  - Upper Peninsula

Wetlands Map Viewer

www.mi.gov/wetlands

Monitoring Information

Wetlands Monitoring Database

Database Reports

2016 – 2019 Report

Michigan's Wetland Monitoring Program
2016-2019

May 2023

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- Preliminary findings on first cycle of sites
- Baseline to inform future evaluation
- Consider which data to track for trends

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Vascular Species Presence and Cover

- Min: 13 Max: 127   Mean: 53.68

Vegetation Species Per Site

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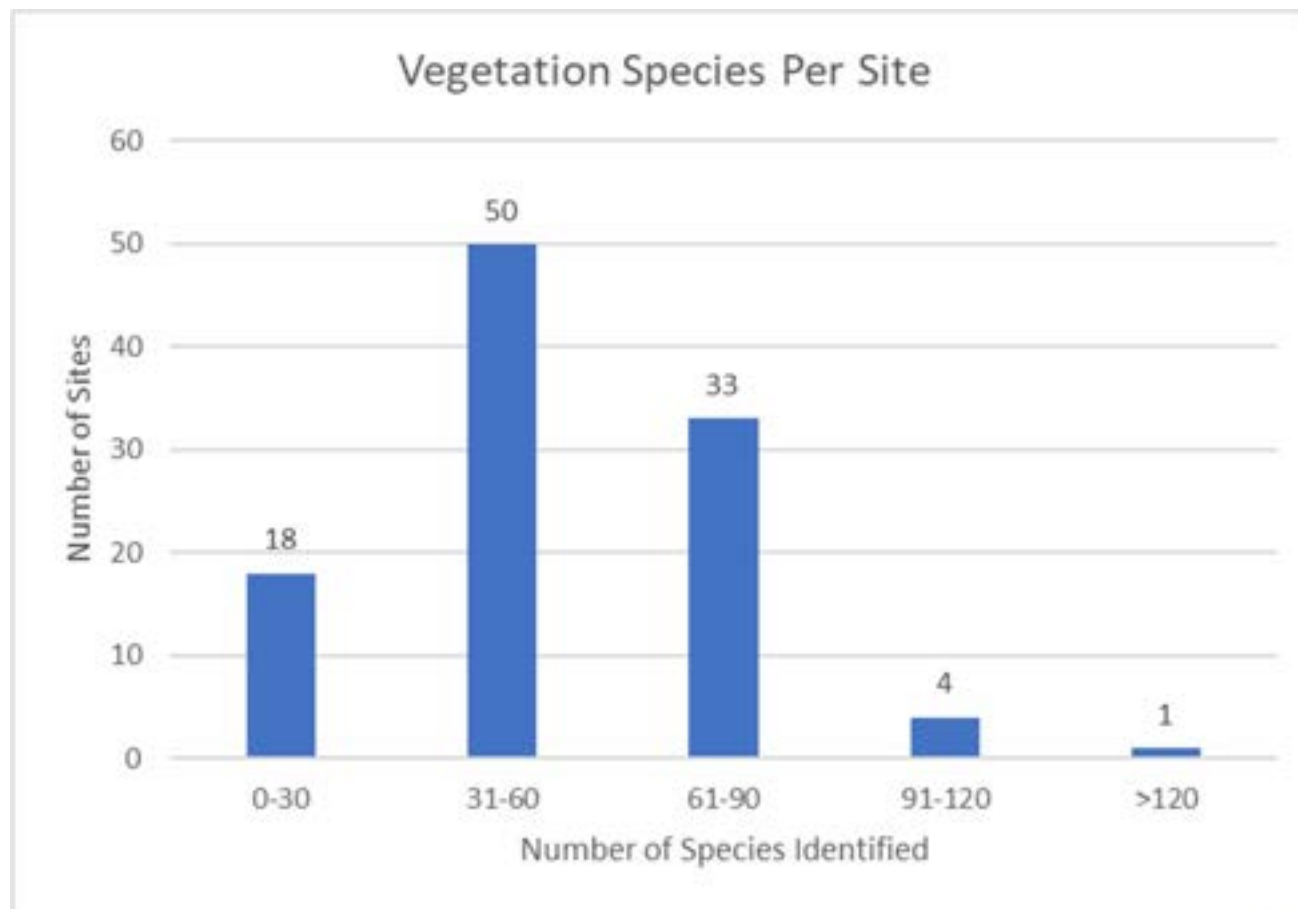
Percent Cover and Categorical Data for Non-Vascular Taxa

- Of the 97 sites sampled, 35 sites had bryophytes dominated by Sphagnum (36% of all sites sampled)

- Of those 35 sites, there was an average of 48% total cover of Sphagnum.

Average Cover of Bryophytes

■ Dominated by Sphagnum   ■ Not Dominated By Sphagnum

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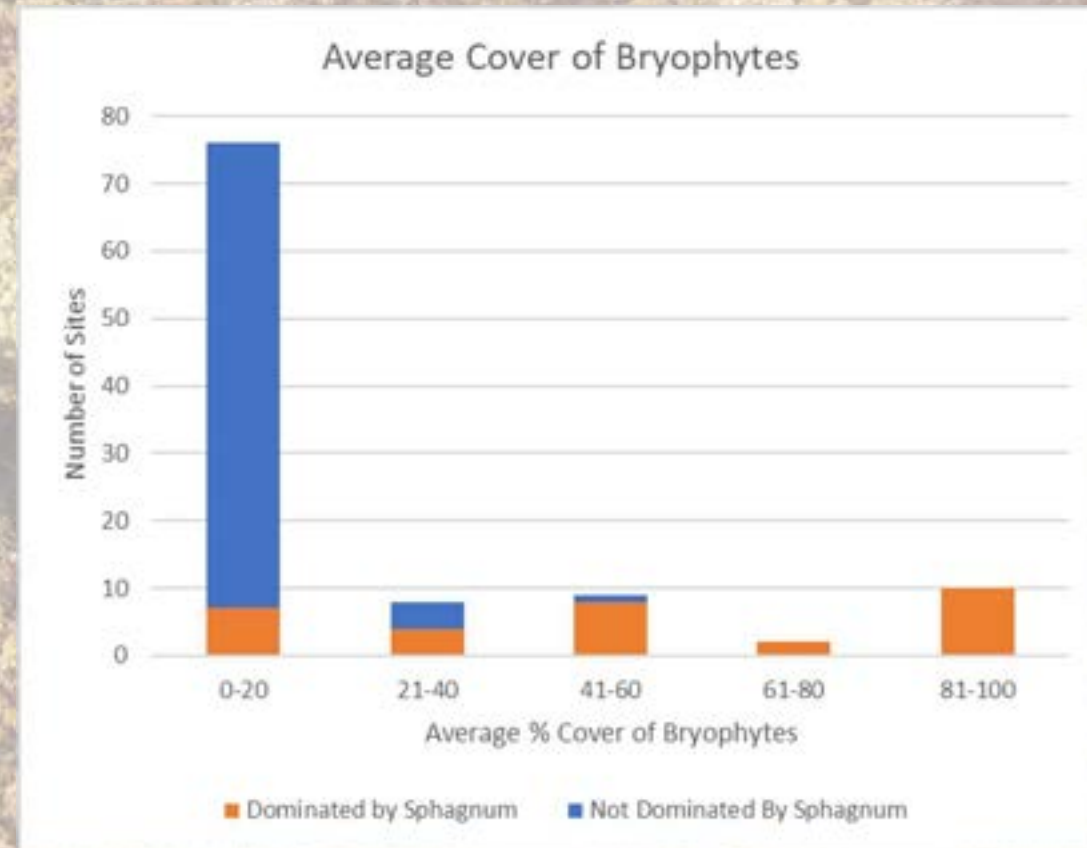
Snag and Tree Counts and Tree Cover

- Fraxinus pennsylvanica is the second most frequently found tree species on sites with living trees. This is despite the severe losses across the state from the spread of emerald ash borer since 2002.
- Of the top 10 most frequently found tree species, Acer saccharinum has the highest mean percent cover and largest mean dbh.
  - a mean percent cover of 17.92%, reaching larger DBH than the other top 10 most frequently found tree species.

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Snag and Tree Counts and Tree Cover

Top 10 Tree Species			
Species	**Frequency**	**Mean % Cover**	**Top DBH**
Acer rubrum	68	11.26	5-10CM
Fraxinus pennsylvanica	44	6.76	5-10CM
Ulmus americana	38	7.08	11-25CM
Betula papyrifera	31	6.33	5-10CM
Quercus rubra	31	2.48	11-25CM
Pinus strobus	28	2.53	5-10CM
Abies balsamea	27	8.57	5-10CM
Acer saccharinum	23	17.92	26-50CM
Picea mariana	23	9.92	5-10CM
Prunus serotina	22	2.3	5-10CM

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Non-native Species

- Min: 0   Max: 11   Mean: 3.71
- Of the top 10 most frequently observed non-native species, only two have an average percent cover of more than 2% - Frangula alnus and Lonicera tatarica.
- Many of the non-native species found most frequently are not wetland rated species. This is especially common in wetland types that do not stay inundated or saturated throughout the year, such as forested wetlands.
- Site with the highest avg % with 16% nonnative coverage:
  - Typha angustifolia present in all 5 plots (95%, 95%, 95%, 85%, and 90%, respectively).
  - This site also had additional nonnative species present, but the percent coverage across all plots for the others were in the single digits, with the exception of Phalaris arundinacea with 10% coverage in plot five.
  - This site is located in Kent County – SLP Region.
- Of sites with non-native recorded, average % cover is 1.695

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Non-native Species

Top 10 Non Native Species		
Species	**Frequency**	**Avg % Cover**
Solanum dulcamara	32	0.36
Taraxacum officinale	21	0.03
Rosa multiflora	17	1.37
Rhamnus cathartica	13	1.76
Agrostis gigantea	11	1.3
Alliaria petiolata	11	1.28
Elaeagnus umbellata	10	0.45
Frangula alnus; rhamnus frangula	9	4.69
Rumex crispus	8	0.25
Lonicera tatarica	6	4.21

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MiRAM Scores

- High: 90 (70 species)
- Low: 24 (32 species)
- Average: 64.11

MiRAM Score x Number of Species
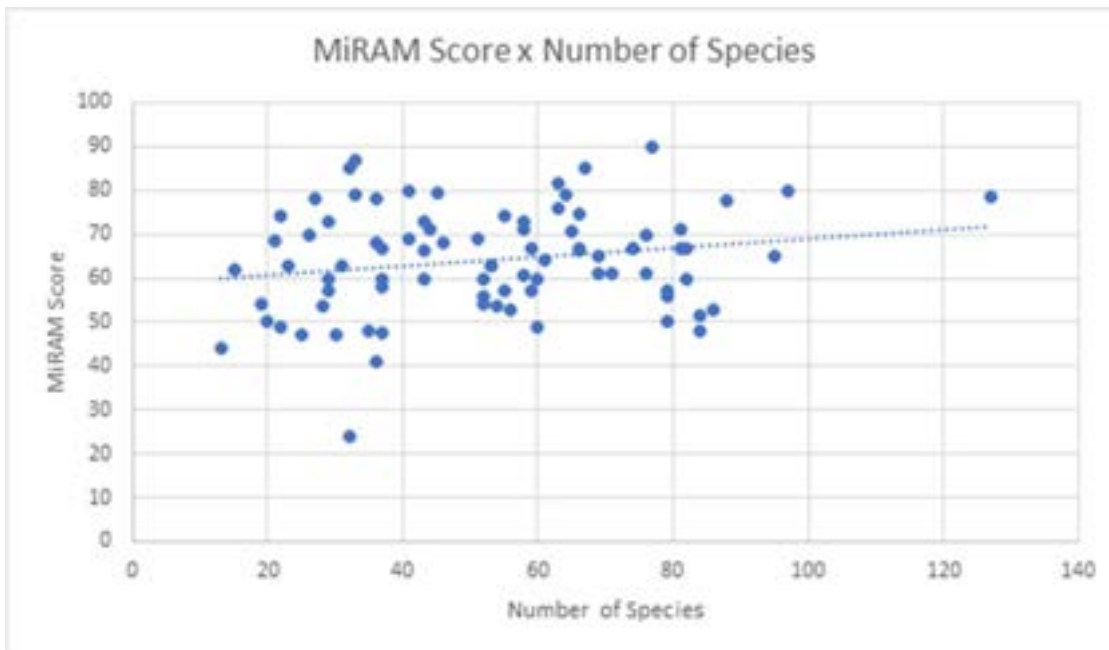
- General trend of increasing MiRAM scores as species number increases.
- This could be attributed to increases in habitat features and interspersion allowing for an increased diversity of vegetation.
- Sites with a relatively lower number of total species can receive higher MiRAM scores due to a variety of factors. This demonstrates that total number of species alone is not the only indicator of wetland functional value

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Looking Ahead

- Finalize report of 2016-2019 MIWM data

- Developing Web and Outreach Content on MIWM findings

- Continued app and database improvements

- Planning year 5 of 2020-2024 cycle

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