

Great Lakes Aquatic Invasives TCN:

DOCUMENTING THE OCCURRENCE THROUGH SPACE & TIME OF AQUATIC NON-INDIGENOUS
FISH, MOLLUSKS, ALGAE, & PLANTS THREATENING NORTH AMERICA'S GREAT LAKES

Ken Cameron, University of Wisconsin-Madison



Digitization TCN: Great Lakes Invasives- Collaborator Map



- [1. Univ of WI-Madison \(WIS\)](#)
- [2. Univ of WI-Steven's Point](#)
- [3. Univ of WI-Milwaukee](#)
- [4. Univ of WI-LaCrosse](#)
- [5. University of Minnesota](#)
- [6. Michigan State University](#)

- [7. Field Museum \(F / FMNH\)](#)
- [8. University of Illinois / ILNHS](#)
- [9. Morton Arboretum ***](#)
- [10. University of Notre Dame](#)
- [11. Butler University](#)

- [12. Univ of Michigan \(MICH\)](#)
- [13. Central Michigan University](#)
- [14. MI Small Herbaria Network ++](#)
- [15. Miami University](#)
- [16. Ohio State University](#)
- [17. Ohio University](#)

- [18. NY Botanical Garden \(NY\)](#)
- [19. New York State Museum](#)

- [20. Université de Montréal /Canadensys](#)

- [\(21. Arizona State Univ / Symbiota\)](#)

Taxonomic Targets:



GLANSIS maintains a Database of invasive and potentially invasive species

- *plants: 49 genera (2147 spp. of these genera in North America)*
 - *fish: 38 genera (290 spp.)*
 - *mollusks: 14 genera (113 spp.)*
- = 2,550 Species in 101 Genera**

<http://GreatLakesInvasives.org>



GREAT LAKES INVASIVES NETWORK

Aquatic Invasives Homepage

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[Mollusk Collections](#)

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One of the greatest threats to the health of North America's Great Lakes is invasion by exotic species, several of which already have had catastrophic impacts on property values, the fisheries, shipping, and tourism industries, and continue to threaten the survival of native species and wetland ecosystems. This bi-national thematic collections network of >20 institutions from eight states and Canada will digitize 1.73 million historical specimens representing 2,550 species of exotic fish, clams, snails, mussels, algae, plants, and their look-alikes documented to occur in the Great Lakes Basin. Others have been placed on watchlists because of their potential to become aquatic invasives.

Several initiatives are already in place to alert citizens to the dangers of spreading aquatic invasives among our nation's waterways, but this project will develop complementary scientific and educational tools for scientists, wildlife officers, teachers, and the public who have had little access to images or data derived directly from preserved specimens collected over the past three centuries. This award is made as part of the National Resource for Digitization of Biological Collections through the Advancing Digitization of Biological Collections program and all data resulting from this award will be available through the national resource (iDigBio.org).

Join the network as a regular visitor and please send your feedback to Ken Cameron

Final Results:

PLANTS: USA
PLANTS: Canada
FISH
MOLLUSKS

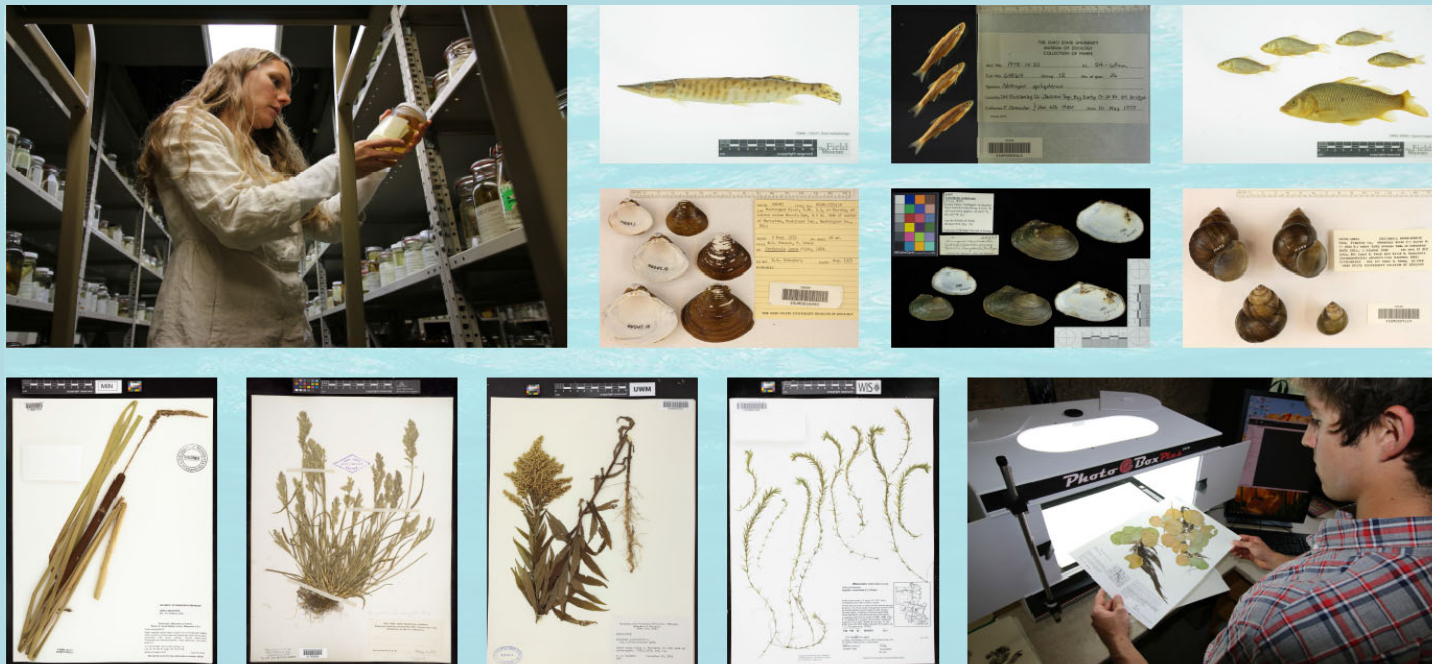
Objectives
>637,000 sheets

>102,000 lots
> 44,000 lots

Results
762,725 records
+122,143
107,712 records
45,991 records

>783,000 'specimens'

TOTAL RECORDS IN PORTAL: 1,038,571



Broader impacts . . .

Aquatic Invasive Plant Guide Species List Games

Authors: Andrea Miller, Lindsey Worcester, Andrew Hipp, and Kenneth Cameron

Citation: <http://midwestherbaria.org/portal/misc/guide/AquaticInvasivePlantGuide.pdf>

[More Details](#)

Families: 12

Genera: 21

Species: 26 (species rank)

Total Taxa: 26 (including subsp. and var.)

Invasive

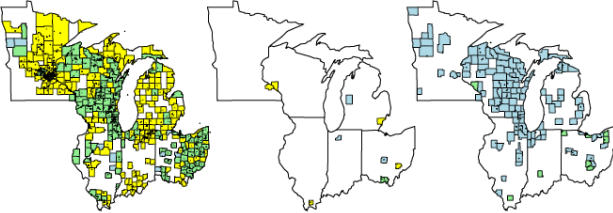
Eurasian Watermilfoil
Myriophyllum spicatum L.

Invasive


Parrotfeather
Myriophyllum aquaticum (Vell.) Verdc.

Native


Northern Watermilfoil
Myriophyllum sibiricum Kom.



Example Populations/Habitat



General Form




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Eurasian Watermilfoil
Myriophyllum spicatum L.

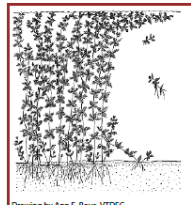
Parrotfeather
Myriophyllum aquaticum (Vell.) Verdc.

Northern Watermilfoil
Myriophyllum sibiricum Kom.

Leaves




Eurasian Watermilfoil	Parrotfeather	Northern Watermilfoil
Branches numerous near surface of water	Branches numerous near surface of water	Branches few
Leaflets in 12 or more pairs per leaf	Leaflets in 10-15 pairs per leaf	Leaflets in 5-12 pairs per leaf



Drawing by Ann E. Bow-VIDEC

Eurasian watermilfoil habit and fragments



Parrotfeather habit and leaves

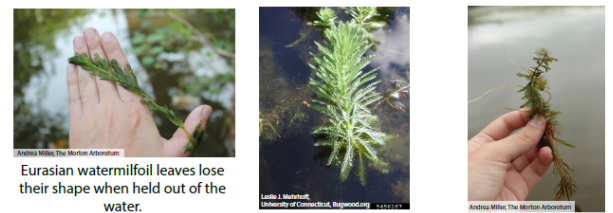
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Eurasian Watermilfoil
Myriophyllum spicatum L.

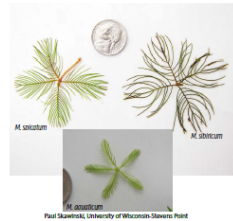
Parrotfeather
Myriophyllum aquaticum (Vell.) Verdc.

Northern Watermilfoil
Myriophyllum sibiricum Kom.

Easy ID



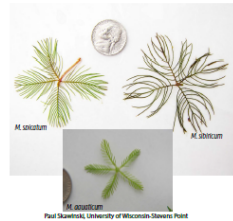
Eurasian watermilfoil leaves lose their shape when held out of the water.



While Eurasian and northern milfoil have emergent flowers, only parrotfeather has emergent stems and leaves.

Northern watermilfoil leaves remain rigid when held out of the water.

Myriophyllum spicatum (top left) has four leaves/whorl, *M. sibiricum* (top right) has four leaves/whorl, and *M. aquaticum* (bottom center) has five leaves/whorl.



Prevention and Removal

Watch for and remove fragments of milfoil or parrotfeather caught on boat propellers, accidentally pumped into livewells, and entwined in boating equipment.

Eurasian watermilfoil and parrotfeather stems easily fragment. These tiny bits can reproduce and propagate so mechanical pulling of large populations is not recommended. If the population is small, carefully pull each plant out by hand.

Report any sightings: www.eddmaps.org

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Consortium of Midwest Herbaria



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Welcome to the Consortium of Midwest Herbaria

While focused around the Great Lakes drainage basin, the region includes the six states that border the western Great Lakes: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. 132 herbaria are listed in Index Herbariorum (Thiers, B. [continuously updated]) from this region; we hope to eventually make data available from a majority of those collections.

The Great Lakes basin includes 84% of North American surface fresh water and includes a mixture of habitat types amidst a landscape that has been highly modified by agricultural and industrial uses and is home to 16% of the US population (US Census Bureau, 2014 estimates). Areas to the south and west of the lakes include lands which form portions of the Mississippi and Ohio River basins; much of this land escaped major glaciation. Plants and communities in the region are diverse, ranging from boreal forest to southern hardwoods, prairies, bogs and fens.

Search Taxon

Plant of the Day



What is this plant?

[Click here to test your knowledge](#)

SEINet Network. Please send questions or comments to

47 collections

- 1,929,668 occurrence records
- 493,018 (26%) georeferenced
- 1,314,812 (68%) occurrences imaged
- 1,799,805 (93%) identified to species
- 741 families
- 6,455 genera
- 47,846 species
- 56,279 total taxa (including subsp. and var.)

Show Statistics per Collection

<http://MidwestHerbaria.org>

