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
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
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 2,560 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 (DiGBeo.org).

Join the network as a regular visitor and please send your feedback to Ken Cameron.
Final Results:

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLANTS: USA</td>
<td>&gt;637,000 sheets</td>
</tr>
<tr>
<td>PLANTS: Canada</td>
<td>762,725 records</td>
</tr>
<tr>
<td>FISH</td>
<td>&gt;102,000 lots</td>
</tr>
<tr>
<td>MOLLUSKS</td>
<td>+122,143</td>
</tr>
<tr>
<td></td>
<td>&gt;44,000 lots</td>
</tr>
<tr>
<td></td>
<td>107,712 records</td>
</tr>
<tr>
<td></td>
<td>45,991 records</td>
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</tbody>
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>783,000 ‘specimens’

TOTAL RECORDS IN PORTAL: 1,038,571
**Aquatic Invasive Plant Guide Species List**

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

Citation: [http://midwestherberia.org/portal/misc/guide/AquaticInvasivePlantGuide.pdf](http://midwestherberia.org/portal/misc/guide/AquaticInvasivePlantGuide.pdf)

**Families:** 12  
**Genera:** 21  
**Species:** 26 (species rank)  
**Total Taxa:** 26 (including subsp. and var.)

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**Eurasian Watermilfoil**  
*Mnioldonum aquaticum* L.

**Parrotfeather**  
*Mnioldonum cicutarium* (L.) Vell.

**Northern Watermilfoil**  
*Mnioldonum sibiricum* Kom.

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**Leaves**

- **Eurasian Watermilfoil:** Branches numerous near surface of water, leaflets in 12 or more pairs per leaf.
- **Parrotfeather:** Branches numerous near surface of water, leaflets in 0-15 pairs per leaf.
- **Northern Watermilfoil:** Branches few, leaflets in 5-12 pairs per leaf.

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**Example Populations/Habitat**

- 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.

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**General Form**

- Eurasian watermilfoil habit and fragments.
- Parrotfeather habit and leaves.

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**Prevention and Removal**

Watch for and remove fragments of milfoil or parrotfeather caught on boat propellers, accidentally pumped into livestock, 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.wildmaps.org](http://www.wildmaps.org)
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.

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.)

SEINet Network. Please send questions or comments to

http://MidwestHerbaria.org