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

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Asian carp DNA found in Fox River

Tests for DNA are sensitive and can detect material shed in mucus or waste from fish, or from birds who have eaten the fish elsewhere. Bob Wakeman, aquatic invasive species coordinator for the DNR, noted in a written statement. Elige water from boats also could carry traces of the fish.

Multiple positive tests over time indicate the likelihood of live fish, Wakeman said.

In addition to the federal DNA monitoring, DNR fisheries team members conduct a variety of netting, electroshocking and trawling operations in state waters as part of an ongoing monitoring effort.

To date, these efforts have not captured any Asian carp in any waters of the Fox River near Green Bay, Green Bay or Lake Michigan.

The species includes bighead and silver carp and the fish were introduced into the southern U.S. in the 1970s, according to the DNR. The DNA has been found upstream of barriers in Lake Calumet, seven miles from Lake Michigan on the Indiana-Illinois border, as well as in Lake Erie, the DNR noted.

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U.S. Fish and Wildlife Service employees Todd Ellybe and Demitra Suko filter water samples from the Lower Fox River in the mobile eDNA lab.

(Photos: Submitted by U.S. Fish and Wildlife Service)

Wisconsin Outdoor Fun WOF-Fishing Section

Authorities are testing Fox River waters to see if live invasive Asian carp are present. (Photo: File/AP)
Background

The Great Lakes have a long history of aquatic nonindigenous species (ANS) introductions – both intentional and unintentional. As of 2012, over 180 nonindigenous species have been reported to have reproducing populations in the Great Lakes basin, i.e. lakes Superior, Michigan, Huron, St. Clair, Erie, Ontario, and their connecting channels and water bodies within their respective drainages (Mills et al. 1993, Ricciardi 2001, Ricciardi 2006, Ricciardi Unpubl. data). The two most recent ANS reported and verified established in the Great Lakes basin were Hemimysis anomala and Procambarus clarkii (fact sheet pending review).

The number of Great Lakes aquatic nonindigenous species documented in GLANSIS must be interpreted as a minimum. Identification depends on our ability to find, recognize, verify, and document new species, which is, in turn, dependent on our ability to adequately sample the Great Lakes ecosystem.

Species Included in GLANSIS

Species are assessed for inclusion in the database on a case-by-case basis. The present database not include waterfowl.

The present database consists of three lists:

- a core list of species nonindigenous to the Great Lakes basin (not native to any part of the basin),
- a list of range expansion species (native only to a portion of the basin),
- and a watchlist (not currently found in the Great Lakes but assessed in the peer-reviewed literature as of 2010 as likely to invade via current pathways).
<table>
<thead>
<tr>
<th>Target Genus</th>
<th>Watchlist Genus</th>
</tr>
</thead>
<tbody>
<tr>
<td>(no. spp. In North America)</td>
<td>2,550 species</td>
</tr>
<tr>
<td>101 genera</td>
<td></td>
</tr>
</tbody>
</table>
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 Univ
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. Western Michigan Univ
14. Central Michigan Univ
15. MI Small Herbaria Network ++
16. Miami University
17. Ohio State University
18. Ohio University
19. NY Botanical Garden (NY)
20. New York State Museum
21. Université de Montréal
22. AZ State Univ / Symbiota
The Freshwater Mussels (Unionoida) of the World (and other less consequential bivalves)

FMUCeetW(dodc) is the web version of the MUSSEL Project Database. Follow the links to browse the data or use the search fields. Either way, you will.

Taxis known only as fossils are highlighted in gray. Those without representatives in fresh waters are highlighted in gold.

Search: [ ] scientific name [ ] Submit

Bivalvia: orders

- Arcoidea: 1 family
  Arcoidea are primarily marine. However, one family is represented in fresh waters.

- Myoida: 5 families
  Myoida are also primarily marine bivalves, but there are freshwater species as well.

- Mytiloidea: 1 family
  There are a few secondarily freshwater species in this order, but otherwise mytiloids are primarily marine.

- Pterioidea: 1 family
  There are not really any freshwater pterioiда, but at least one fossil family has been assigned to a freshwater clade.

- Unionoida: 12 families
  These are the freshwater mussels. There are six modern families, restricted entirely to fresh waters. In addition, there are several fossil families.

- unknown: 2 families
  Some bivalve families (typically fossils) can't be convincingly assigned to an order at this time.

- Veneroida: 20 families
  There are several groups of freshwater veneroids, including Sphaeridae, Gysinidae (= Corbiculidae) and Dreissidae. There are also a number of freshwater species in primarily marine families.
1. Skeletal record is created by imagers

2. Label data is extracted via OCR

3. Data is parsed and edited in Symbiota by regional data managers

4. Fed to / ingested by iDigBio
GREAT LAKES INVASIVES NETWORK

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 program through the Advancing Digitization of Biological Collections program and all data resulting from this award will be available through the national resource (DigBio.org).

Join the network as a regular visitor and please send your feedback to Ken Cameron.
Using Specimens to Recognize the Good from the Bad

Points of Origin and Patterns of Invasion

Occurrence Data Based on Vouchers!

Lag Time