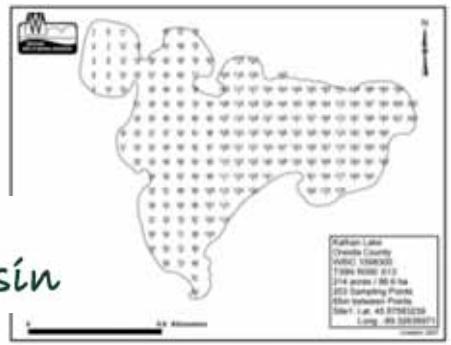
# Finding and stopping the next invaders

Maureen Ferry
Aquatic Invasive Species Monitoring Coordinator

Wisconsin Lakes Partnership Convention
Thursday, April 19, 2018

# Background

- Citizen scientist
- Staff
- Partners



# Background

- GLRI Partnership in 2010 for prevention, education, and **monitoring**.

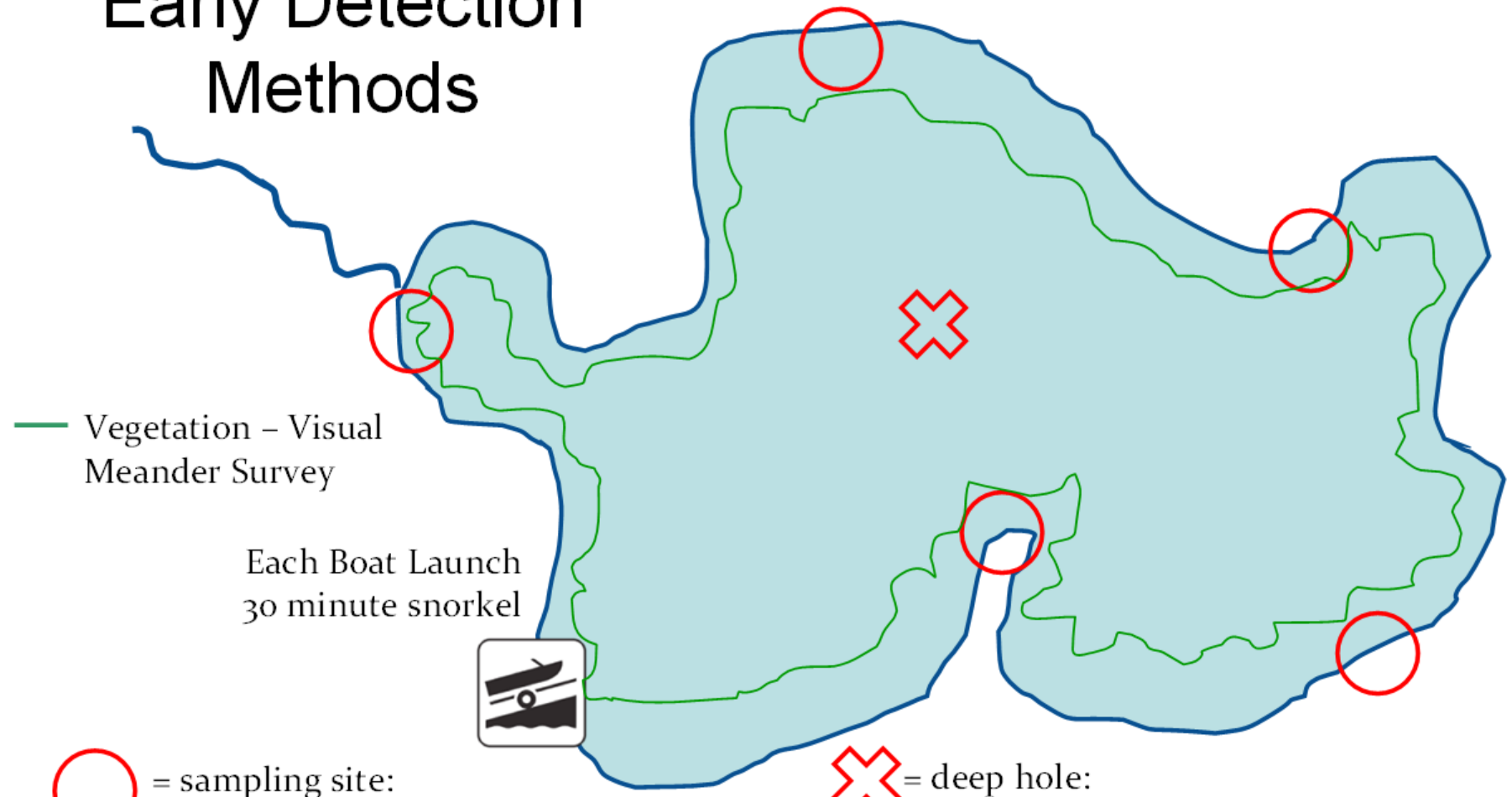
# 5-Year Lake Project

Objective

1. Rate of AIS spread
2. Baseline data
3. Early detection

# Early Detection Methods

**Any new species found will be counted as a "detect."**



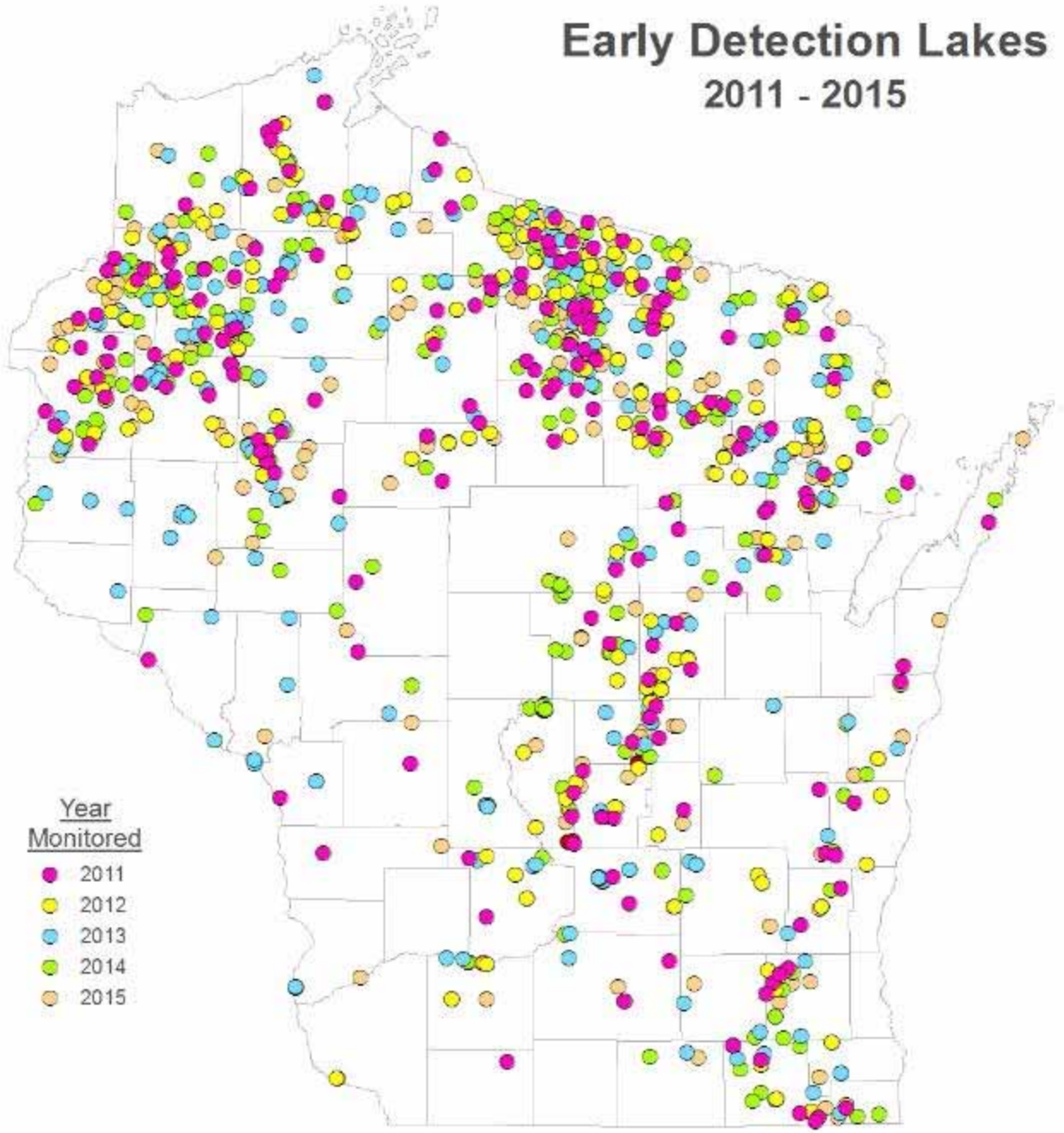
Vegetation – Visual Meander Survey

Each Boat Launch
30 minute snorkel

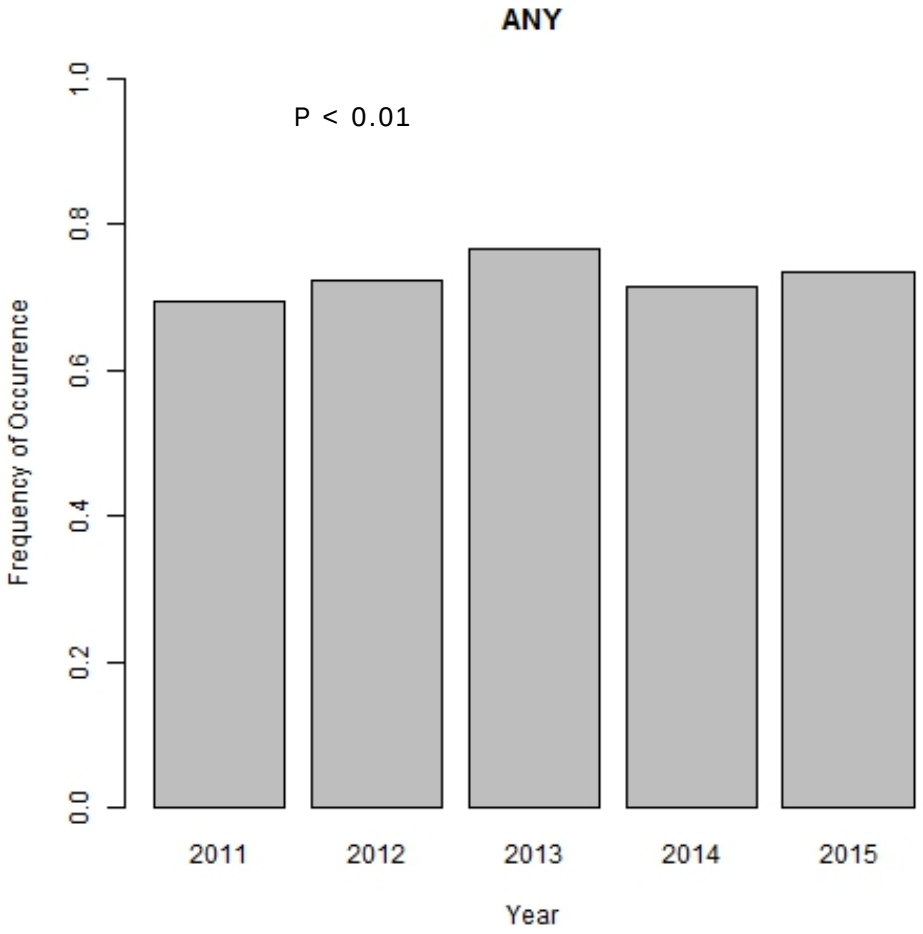
= sampling site:
10 minute snorkel
veliger tows at 3 of the 5 sites

= deep hole:
3 spiny waterflea tows
Water quality (Secchi depth DO/Temp Profile, chlorophyll) if needed for suitability models

# Early Detection Lakes
## 2011 - 2015



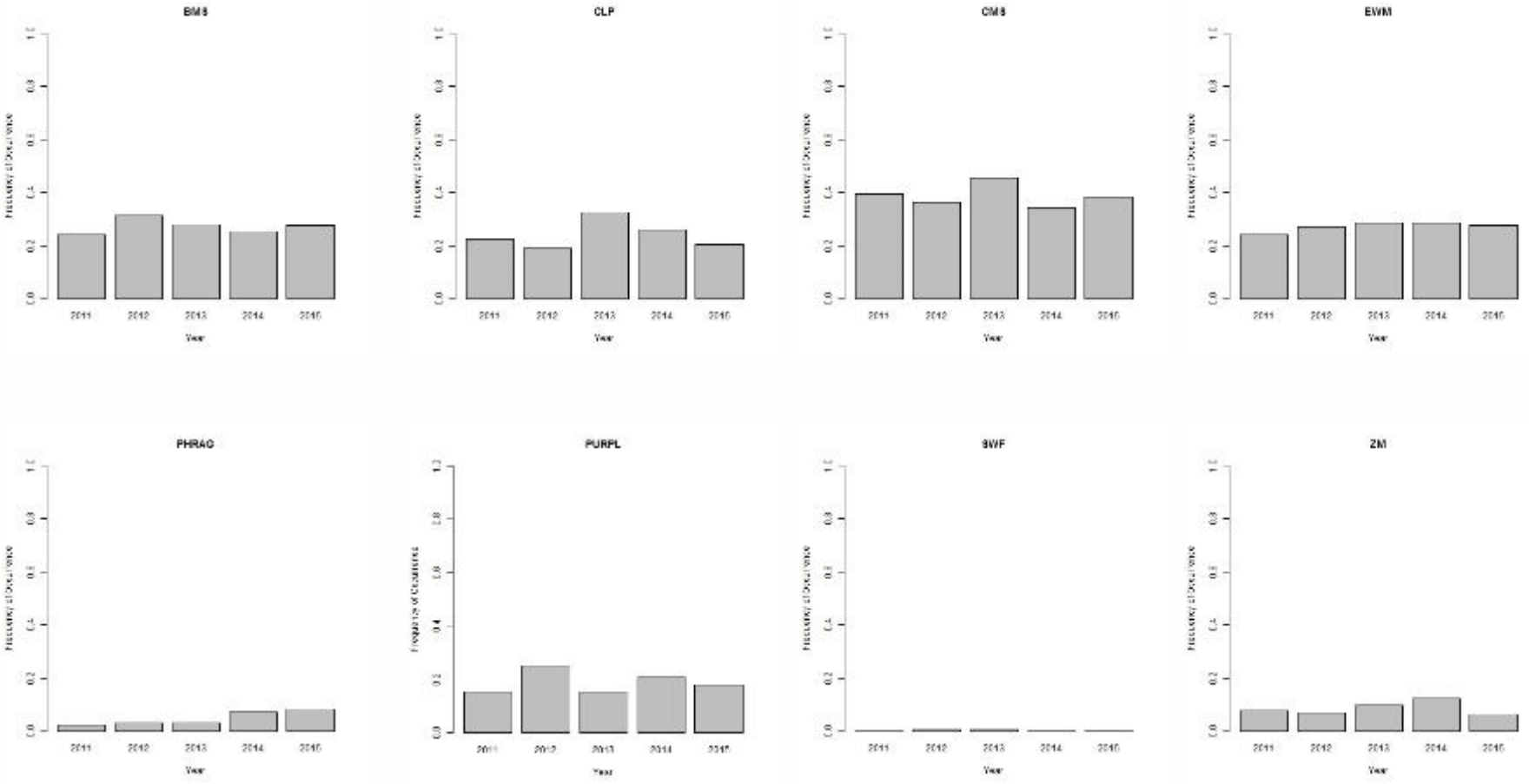
# 5-Year Results



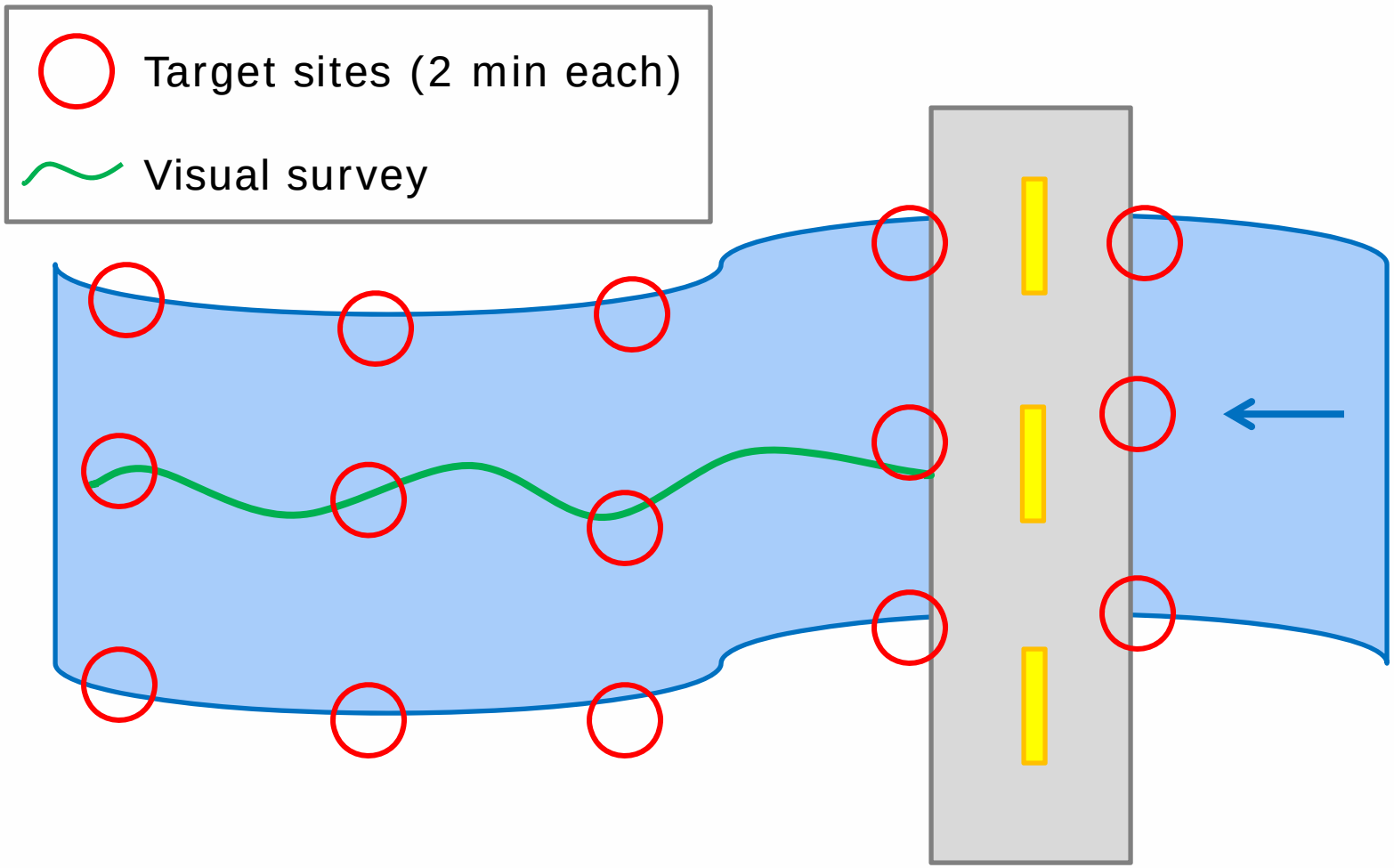

- Logistic regression
- No change in the rate of spread ($p<0.001$)

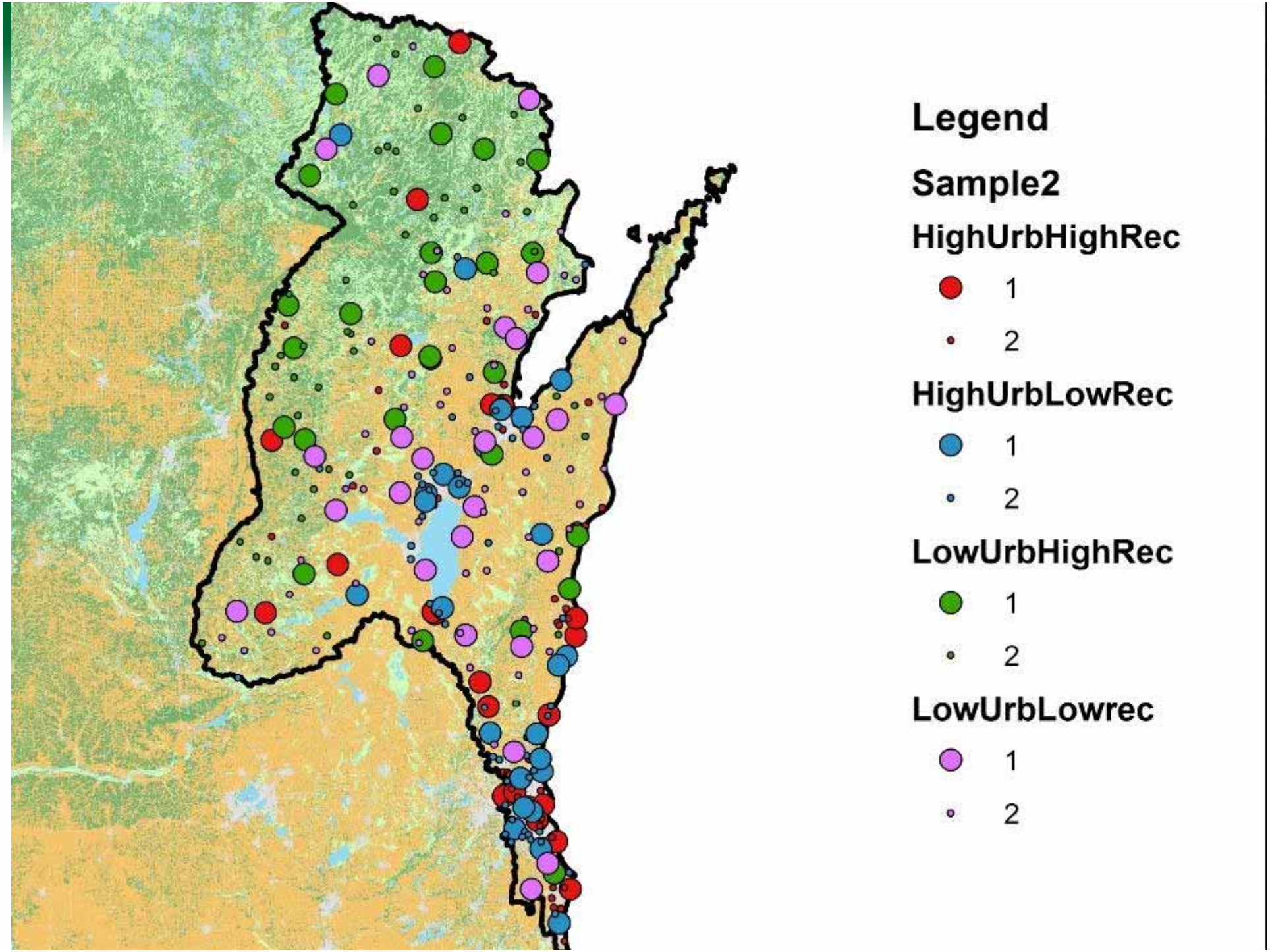
# 5-Year Results

- No change for species – all $p < 0.001$



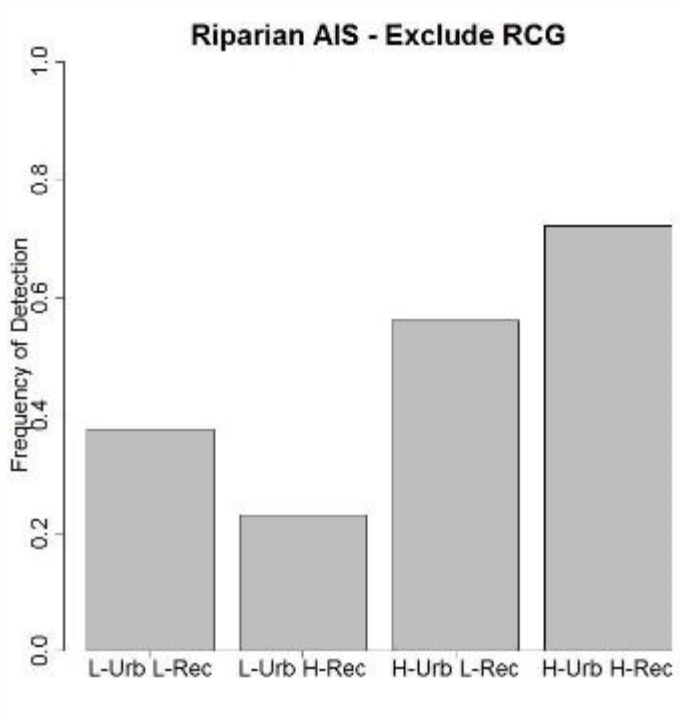
# Early Detection Methods on Stream

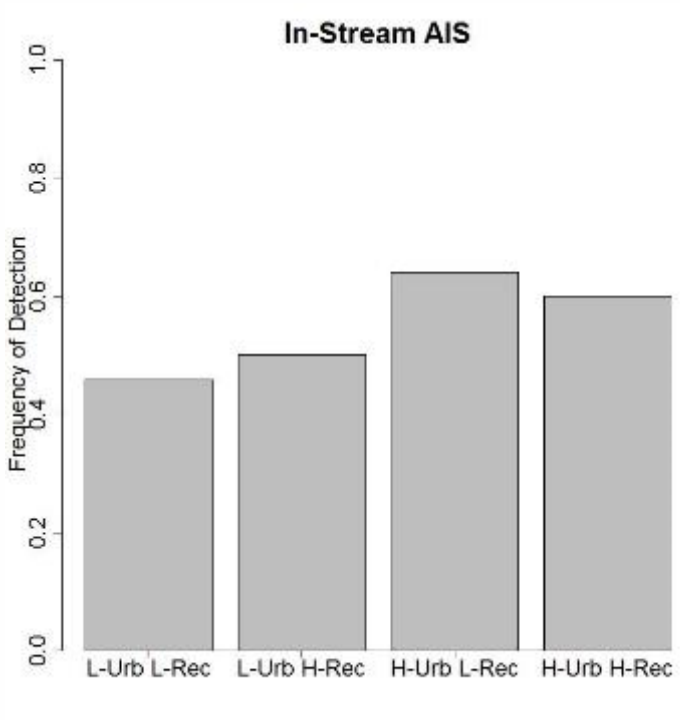



Legend
Sample2
HighUrbHighRec
1
2
HighUrbLowRec
1
2
LowUrbHighRec
1
2
LowUrbLowrec
1
2

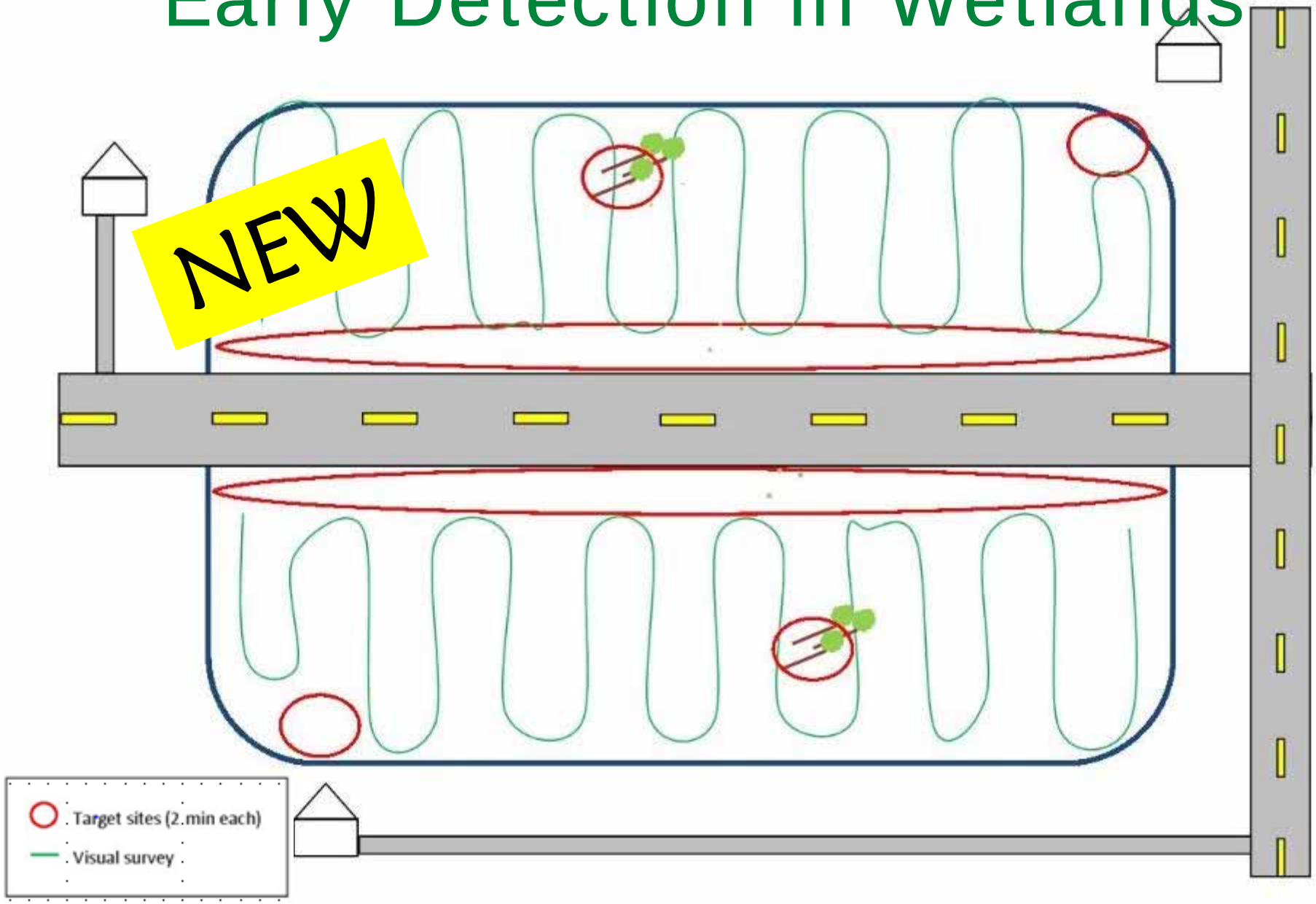
# Stream Pilot Results

- Riparian more frequent with high land use and high recreation
- In-stream no relationship

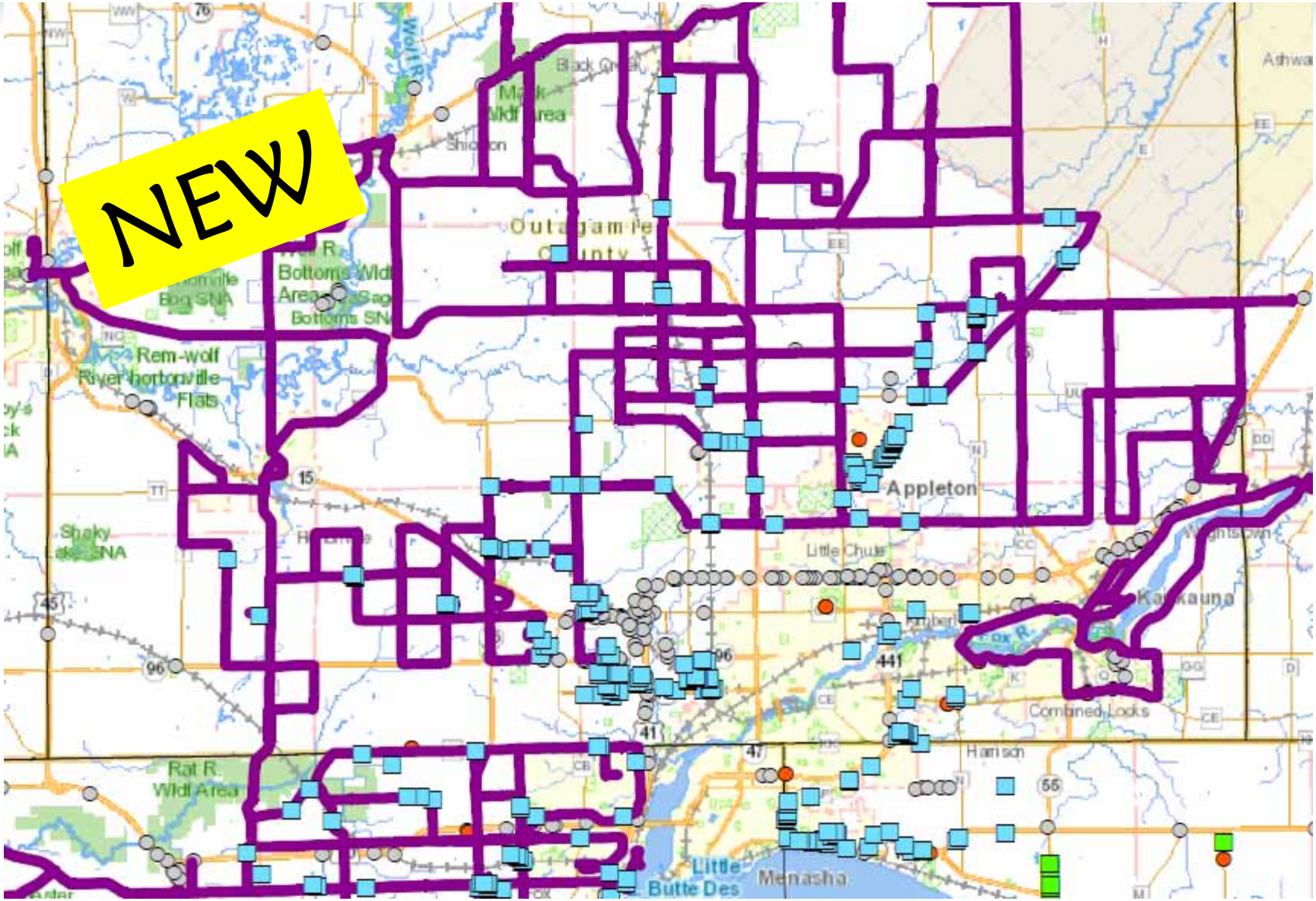


# Early Detection in Wetlands



# Early Detection on Roadsides



# AIS Snapshot Day

Count of prohibited species within 15 miles

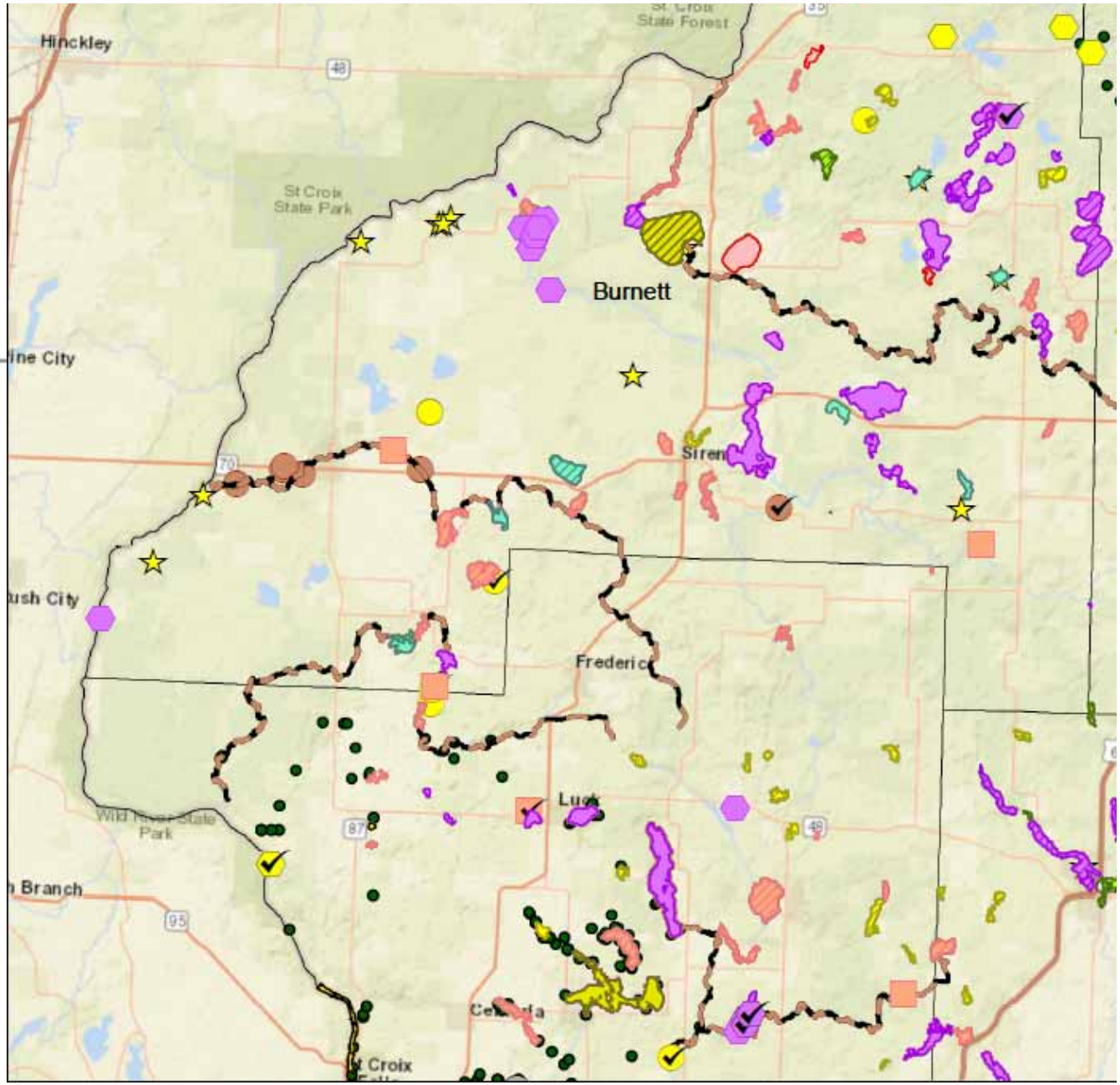
- 1 - 11
- 12 - 21
- 22 - 36
- 37 - 55
- 56 - 77

Unverified archive records

- Bohemian Knotweed
- Common Reed
- Japanese Knotweed
- Reed Mannagrass

Lakes and AIS Mapping Tool records

- Invasive Invertebrates
  - Asiatic Clam (Corbicula fluminea)
    - Verified (Asiatic Clam)
      - Verified Asiatic Clam Points
      - Verified Asiatic Clam Lines
      - Verified Asiatic Clam Areas
    - Observed (Asiatic Clam)
      - Observed Asiatic Clam Points
      - Observed Asiatic Clam Lines
      - Observed Asiatic Clam Areas
    - No Longer Observed (Asiatic Clam)
      - No Longer Observed Asiatic Clam Points
      - No Longer Observed Asiatic Clam Lines
      - No Longer Observed Asiatic Clam Areas



# Invasive species rule – NR 40

The invasive species rule (Wis. Adm. Code ch. NR 40) makes it illegal to possess, transport, transfer, or introduce certain invasive species in Wisconsin without a permit. Everyone is responsible to comply with these regulations. What you need to do as an individual, business, or organization may vary depending on your type of work and activities. The regulated species list and the details of the rule are shown in the tabs below.


View the full text of the invasive species rule [exit DNR].

**What the rule does** | Species list | Compliance | Business resources | Background

## What the rule does

View a quick summary [PDF] of the invasive species rule.

The invasive species rule creates a comprehensive, science-based system with criteria to classify invasive species into two categories: "prohibited" and "restricted." With certain exceptions, the transport, possession, transfer and introduction of Prohibited species is banned. Restricted species are also subject to a ban on transport, transfer and introduction, but possession is allowed, with the exception of fish and crayfish. The department may issue permits for research or public display of any listed invasive species. For species other than invasive fish and crayfish, permits may also be issued for other purposes. The rule also defines the terminology used.

**Invasive species**

**Learn**
about invasive species in Wisconsin.

**Subscribe**
to the invasive species rules and regulations email list.

**Report**
an invasive species in your area.

**Order**
invasive species publications.

**Laws & Policies**

- Invasives Rule – NR 40
- Boats & Bait
- Firewood
- Permits & Licenses
- VHS

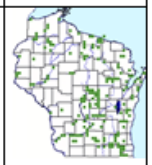
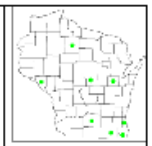
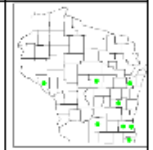
**Related links**

- Official NR 40 rule [exit DNR]
- Compiled NR 40 species list [PDF]

## Aquatic Invasive Species Identification Guide

### SUBMERGED AQUATIC

| Species – code<br>*Scientific name* | Identification | Distribut |
|---|---|---|
| **European frog-bit - EFB**<br>**(*Hydrocharis morsus-ranae*)**<br>  <br>Photo: Erich Haber | **Leaves:** Usually floating; heart-shaped with long stems; 1.2-6.3 cm (0.5-2.5 in) in diameter; smooth margins; often dark purple beneath; lateral veins are arching and make a 75-90° angle with the midvein; tissue containing airpockets are located mostly along the midvein.<br>**Flowers:** Three white petals with yellow center; blooms mid-summer.<br>**Fruits & seeds:** Rarely produces viable seeds and instead relies on vegetative stolons and turions for reproduction.<br>**Similar species:** Often confused with American frog-bit (*Limnobium spongia*; not known in WI), whose leaves have lateral veins that make a 30-80° angle with the midvein, and whose leaf tissue contains large air pockets throughout. White water lilies (*Nymphaea odorata*) have circular leaves with a triangular slit, and large, multi-petaled white flowers. *Nuphar* spp. have yellow cup-like flowers. | Not repo<br>Wisconsi |
| **Yellow floating heart - YFH**<br>**(*Nymphoides peltata*)**<br>  | **Leaves:** Floating; heart-shaped with slightly wavy margins; 3-15 cm (1.2-6.0 in) in diameter; alternately arranged near the stem base and oppositely arranged near the top; frequently have purplish undersides.<br>**Flowers:** 2-5 bright yellow flowers arise from erect flower stalks; 3-4 cm (1.2-1.6 in) in diameter; 5 petals arranged like the spokes of a wheel, each with a distinctive fringe along the edge.<br>**Fruits & seeds:** Fruit is a pod-like capsule (1.2-2.5 cm; 0.5-1.0 in) that splits on one side. One fruit is produced from each flower, and contains many smooth, oval seeds with winged margins.<br>**Similar species:** Spatterdocks (*Nuphar* spp.) have much larger leaves, and cup-like flowers without fringed petals. Watershield (*Brasenia schreberi*) has small oval floating leaves often with a jelly-like covering on the undersides, and small purple flowers. Other species of *Nymphoides* such as *N. aquatica* and *N. cordatum* (native |  |
| Photos: ???, | to the southern U.S.), and *N. cristata* and *N. indica* (non-native and sold as ornamental plants) are also similar in appearance. | |
| **Brazilian waterweed - BWW**<br>**(*Egeria densa*)**<br>  <br>  <br>Photos: ???? (left): Washington State Department of Ecology (right) | **Leaves:** Finely serrated (under magnification); 1-3 cm (0.4-1.2 in) long and up to 5 mm (0.2 in) wide; occur in whorls of 4-8.<br>**Flowers:** Small (1.8-2.5 cm; 0.7-1.0 in); three white petals with yellow center; float on or rise above the surface of the water.<br>**Fruits & seeds:** Seeds are not known to be produced outside of its native range. Spreads through vegetative reproduction - plant fragments containing double nodes can produce new plants.<br>**Roots:** Slender, and white or pale. Adventitious roots are freely produced from double nodes on the stem.<br>**Similar species:** Common and slender waterweed (*Elodea* spp.) have leaves in whorls of 3, and leaf edges appear smooth to the naked eye. *E. densa* is overall more robust than native *Elodea* spp. Non-native hydrilla (*Hydrilla verticillata*), often produces tubers and has small teeth on the underside of the leaf midrib, while *E. densa* does not produce tubers and the leaf underside is smooth. |  |
| **Hydrilla - HYD**<br>**(*Hydrilla verticillata*)**<br>  | **Leaves:** Occur in whorls of 3-8; 6-20 mm (0.2-0.8 in) long and 1-4 mm (0.04-0.16 in) wide; small spines give leaf margins a visible toothed appearance; midrib on underside of leaf is often reddish and has visible spines; rough to the touch.<br>**Flowers:** Tiny (4-8 mm; 0.16-0.31 in); female flowers are white, have 3 petals and 3 sepals, and are located on threadlike stalks emerging from the leaf axils; male flowers are white to red/brown.<br>**Fruits & seeds:** Monoecious variety can set viable seed although primarily |  |

| | | |
|---|---|---|
| **Parrot feather - PF**<br>**(*Myriophyllum aquaticum*)**<br>  <br>Photos: ???, Paul Skawinski | **Leaves:** Feather-like; emergent leaves are bright blue-green, stiff and 2-5 cm (0.8-2 in) long, arranged in whorls of 4-6 leaves, and divided into 6-18 leaflet pairs; underwater leaves are often decayed, but if present, they are limp, 1.5-3.5 cm (0.6-1.4 in) long, and are divided into 20-30 leaflet pairs per leaf.<br>**Flowers:** Tiny (1.5mm; 0.06 in) flowers with 4 white sepals occur individually on short stalks in the axils of the emergent leaves; male and female flowers are on separate plants, but only female plants are known in North America.<br>**Fruits & seeds:** Because there are only female plants in North America, no fruits are produced here. Spreads through fragmentation of the stems and rhizomes.<br>**Roots:** Many, thin, from rhizomes<br>**Similar species:** Similar to other milfoils (*Myriophyllum*) species. Non-native Eurasian watermilfoil (*M. spicatum*) typically has 4 leaves in a whorl, and does not produce any emergent leaves. Other native milfoils generally have less than 12 leaflet pairs. | Documented in Pool 5 of the Mississippi River in 2012 |
| **Eurasian water-milfoil - EWM**<br>**(*Myriophyllum spicatum*)**<br>  <br>Photos: Paul Skawinski | **Leaves:** Feather-like; leaves with 12 or more pairs of leaflets; typically arranged in whorls of 4 leaves around the stem; leaves fall limp when pulled out of water; whorls of leaves spaced 1-3 cm (0.4-1.2 in) apart on stem.<br>**Flowers:** Small, yellow or reddish, 4-parted on a spike that projects 5-10 cm (2-4 in) above the water surface.<br>**Fruits & seeds:** A hard, segmented capsule containing four seeds.<br>**Roots:** Fibrous, often developing on plant fragments.<br>**Similar species:** There are several native water-milfoils (*Myriophyllum* spp.) which may be confused with EWM, however these milfoils generally have fewer than 12 pairs of leaf segments, whereas Eurasian water-milfoil leaves have 12 or more. *M. spicatum* can cross with native *M. sibiricum*, forming a viable hybrid with intermediate characteristics. Non-native parrot feather (*M. aquaticum*) often produces more than 4 leaves in a whorl and has emergent leaves. Native coontail (*Ceratophyllum demersum*) has leaves that are forked like a wishbone (not feather-like) and toothed, giving the plant a rough feel when pulled through the hand. |  |
| **Water hyacinth WH**<br>**(*Eichhornia crassipes*)**<br>  <br>Photos: Graves Lovell, Paul Skawinski | **Leaves:** Free-floating; thick green waxy leaves, rounded, circular or elliptical in shape with gently incurved sides. Leaves are formed in rosettes up to 15 cm (6 in) wide and can rise 0.3-1 m (1-3 ft) above the water.<br>**Flowers:** Lavender blue with a yellow blotch. Flowers have 6 petals and are 5 cm (2 in) wide.<br>**Fruits & seeds:** Three celled capsule with many seeds.<br>**Roots:** Submersed roots blue-black to dark purple, feathery, dense near root crown, tips with long dark root caps.<br>**Similar species:** Native pickerelweed (*Pontederia cordata*) is a rooted emergent plant with numerous tiny bluish-purple flowers densely packed into 7.5-15 cm (3-6 in) spikes atop flower stalks which rise 0.3-0.6 m (1-2 ft) above the water surface. May also be confused with emergent form of American frog-bit (*Limnobium spongia*; not known from WI). Non-native anchored water hyacinth (*E. azurea*) has leaves which are alternate rather than in a rosette, and is typically found rooted in mud rather than free-floating. |  |
| **Water lettuce - WL**<br>**(*Pistia stratiotes*)**<br>  | **Leaves:** Free-floating; light green to grayish green; soft and spongy, formed in rosettes; leaves 2-20 cm (0.8-8 in) long; raised parallel ridges (veins); covered in short hairs; leaf margins slightly wavy, top margins scalloped.<br>**Flowers:** Inconspicuous; nearly hidden in the center amongst the leaves; on small stalk, single female flower below and whorl of male flowers above; flowers in late summer to early winter.<br>**Fruits & seeds:** Seeds cylindrical, light brown, and 1-2 mm (0.04-0.08 in).<br>**Roots:** Hang submersed beneath floating leaves; feathery, numerous. |  |

# Suitability Models

- Zebra mussel
- Round goby
- Rusty crayfish
- Eurasian watermifoil
- Starry stonewort

# US Fish and Wildlife Service Risk Assessment Mapping Program

## Climate Matching

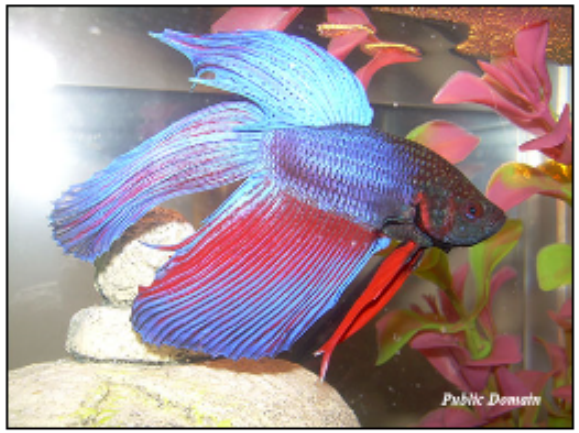
Please not ... tates. Great caution is needed when tradi... s suitable for the survival of the high-ris... category. If new species are being cons...

For specie... e the species' risk to U.S. environme... not yet in trade and is uncertain r...

Low-risk sp...

Risk inform... rticular situation. If further assessmen... overnmental organizations trained in invasive species risk assessment and risk analysis.


- Ecological Risk Screening Summaries High Risk FISHES
- Ecological Risk Screening Summaries High Risk CRUSTACEANS
- Ecological Risk Screening Summaries High Risk MOLLUSKS
- Ecological Risk Screening Summaries High Risk PLANTS
- Ecological Risk Screening Summaries High Risk OTHER VERTEBRATES




- Ecological Risk Screening Summaries Low Risk FISHES
- Ecological Risk Screening Summaries Low Risk CRUSTACEANS
- Ecological Risk Screening Summaries Low Risk MOLLUSKS
- Ecological Risk Screening Summaries Low Risk PLANTS
- Ecological Risk Screening Summaries Low Risk OTHER VERTEBRATES


- Ecological Risk Screening Summaries Uncertain Risk FISHES
- Ecological Risk Screening Summaries Uncertain Risk CRUSTACEANS
- Ecological Risk Screening Summaries Uncertain Risk MOLLUSKS
- Ecological Risk Screening Summaries Uncertain Risk PLANTS
- Ecological Risk Screening Summaries Uncertain Risk OTHER VERTEBRATES

# eDNA

- New Zealand mudsnails
- Round goby
- Zebra mussels
- Asiatic clam

# dnr.wi.gov search “invasives”

Search or Keywords

## Report invasive species

We are working to keep invasive species out of Wisconsin. Early reports of new populations allow us to respond rapidly and control invasives before they spread into new areas. Select from the tabs below to report invasive species you have found.

**Aquatic, Shoreline and Wetland** | **Terrestrial** | **NR40 species**

### Aquatic, Shoreline and Wetland

Check to see if the suspected invasive species has been previously reported on that waterbody or wetland. Search by waterbody or by species. Or, for a mapping tool and instructions, click here. If the invasive species is not known to occur in the waterbody or wetland where you found it, report it to your Regional DNR Aquatic Invasive Species Coordinator by following the steps below. Report every suspected wetland invasive species not associated with a waterbody, except reed canary grass (unless the latter is a new, small stand adjacent to an un-infested, natural wetland).

If it’s a new plant or animal other than a fish
If it’s a new fish
If it’s already known to be in the waterbody or wetland

### If it is a plant:

- Take a digital photo(s) of the plant in the setting where it was found. Using a camera or smartphone, try to capture details such as flowers, leaf shape, leaf and stem arrangement, and fruits. Include a common object in the photo such as a dollar bill, coin or pencil for a size scale, or stand next to tall plants.
- If possible, collect 5 – 10 intact specimens to ensure precise identification. Try to get the root system and all leaves, as well as seed heads and flowers when present. Place in a ziplock bag with a damp paper towel. Place on ice and store in a refrigerator as soon as possible.

### Invasive species

**Learn**
about invasive species in Wisconsin.

**Subscribe**
to the invasive species rules and regulations email list.

**Report**
an invasive species in your area.

**Order**
invasive species publications.

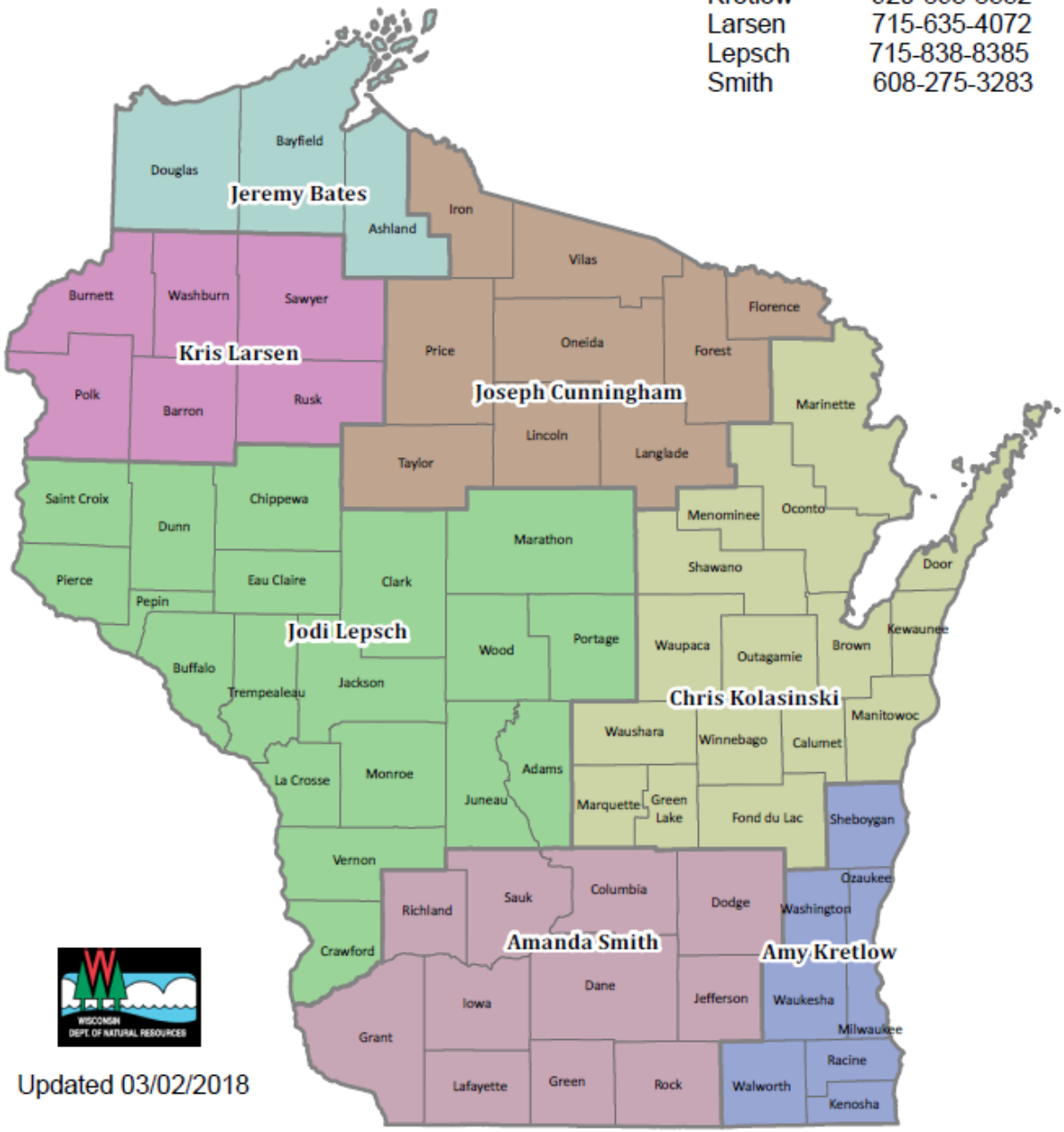
### Take action

- Reporting
- Prevention
- Best management practices
- Control
- Get involved locally

**Contact information**
DNR invasive species staff

# AIS Coordinator Work Areas

| | |
|---|---|
| Bates | 715-392-0807 |
| Cunningham | 715-637-6860 |
| Kolasinski | 920-252-5053 |
| Kretlow | 920-893-8552 |
| Larsen | 715-635-4072 |
| Lepsch | 715-838-8385 |
| Smith | 608-275-3283 |




Updated 03/02/2018

# Suspected New AIS Discoveries – Communication Protocol
## Internal document

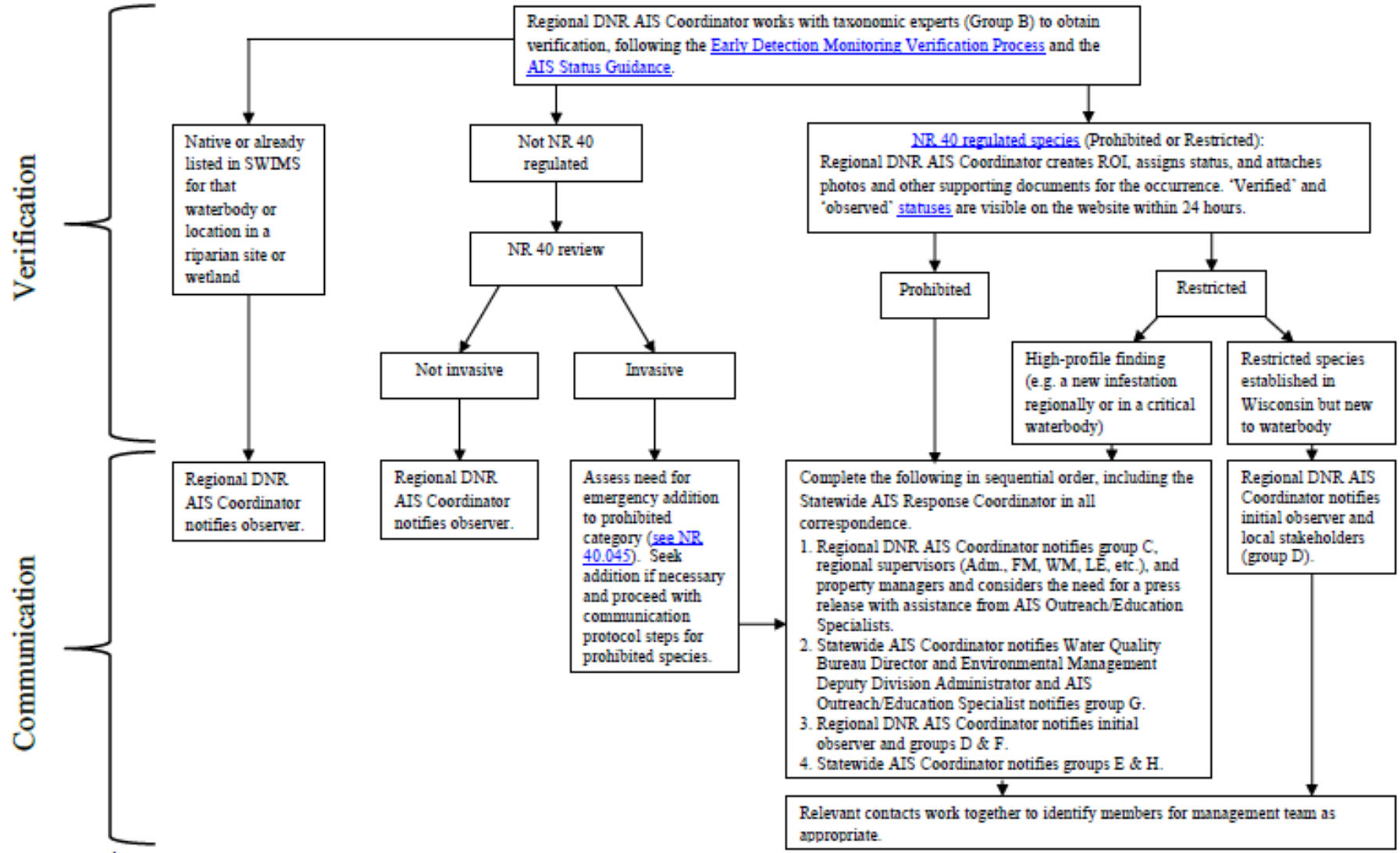
This document is to be used when a suspected aquatic or wetland invasive species (AIS) is discovered in a Wisconsin waterbody (lake, river, or wetland) that it has not been previously reported in. See the Where to Find Invasive Species document or the Report Invasive Species page to determine if the suspected AIS you discovered has been previously reported in the waterbody or location in a riparian site or wetland. Use the following guidance if this is a new discovery.

The Statewide AIS Monitoring Lead generates a biweekly list of new AIS reports from SWIMS and distributes reports to regional field supervisors, regional DNR AIS Coordinators, and groups E, F, and H each month.

### Early Detection & Reporting

Initial observer:

1.) **Report:** report the suspected AIS occurrence.
   a. For occurrences that are part of planned monitoring effort (i.e. CLMN, early detection, DNR field work, etc.): notify the local DNR AIS Coordinator and enter monitoring data into SWIMS. No incident report is needed.
   b. For individuals without access to SWIMS: submit an incident report.
2.) **Submit a specimen:** Follow the directions on the Report Invasive Species website to submit a specimen to the local DNR AIS Coordinator.




*The regional DNR AIS Coordinator may (with Supervisor approval) appoint another person to act as a regional coordinator or to complete individual tasks. However, it is the responsibility of the Regional DNR AIS Coordinator to ensure that assigned steps in the communication protocol are complete.

This document may be updated at any time. Make sure to use the most recent version for up-to-date information.

# Early Detection Monitoring Verification Process

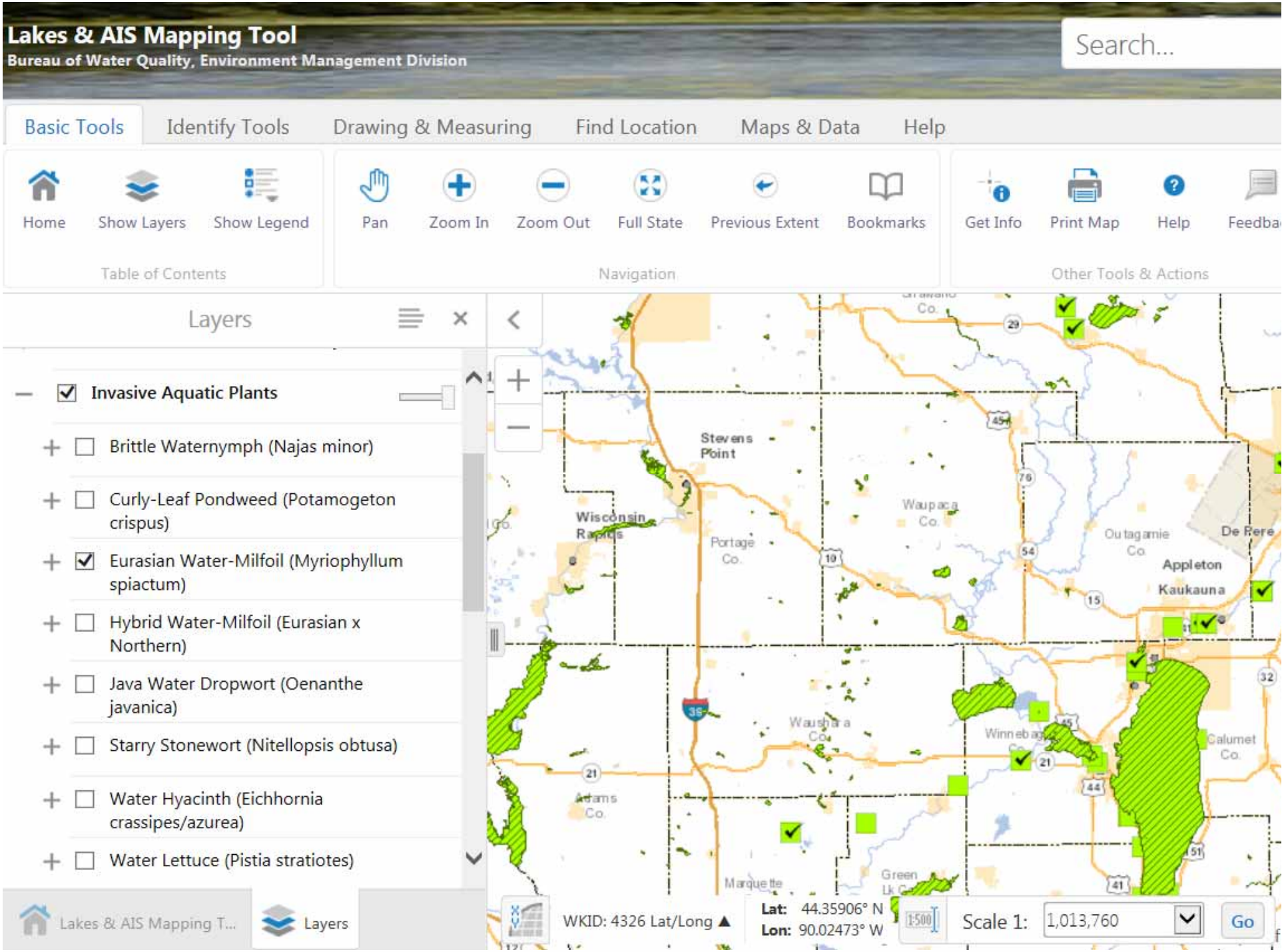
Prior to 2017, WDNR collected and submitted specimens to the herbariums and zoological museums for verification and vouchering. The number of samples submitted for verification/vouchering was not sustainable for the herbariums/museums. Likewise, no funding was provided for this extra workload. In addition, most DNR employees can identify common invasive species. Therefore, we will reduce reliance on herbariums and museums for verifying our invasive species records with photographs or physical specimens. Regional employees have been trained and tested to be verifiers. Voucher specimens will be submitted when prohibited, high profile species (i.e. Eurasian water milfoil or zebra mussel populations in the north, or populations requesting a WI Administrative Code NR 107 Aquatic Plant Management permit), or county records are reported. This draft document outlines the verification process that will be used.

1. **Become familiar.** Field staff should become familiar with the target species by reviewing the attached Early Detection Target Species and AIS Identification Guide and the links in the target species summary sheet.
2. **Check.** Collectors should check what records are known in their work area and whether further verification is needed.
3. **Fieldwork.** Staff and volunteers will conduct monitoring and complete lake, streams, wetland early detection forms, Citizen Lake Monitoring Network, Water Action Volunteers, AIS Bridge Snapshot Day, Project RED, or plant and animal incident reports.
4. **Report.** New discoveries will be reported as soon as possible.
5. **Collect.** Collect 3 specimens of **all NR40 Prohibited** occurrences, high profile species for your area (i.e. Eurasian water milfoil or zebra mussel populations in the north, or populations requesting a WI Administrative Code NR 107 Aquatic Plant Management permit), unusual specimens (i.e. suspected hybrid milfoil, unusual leaf count, unusual size, etc.), first occurrence in a county, or unknown specimens. Be sure that specimens contain all the identifying characteristics that are highlighted in the AIS Identification Guide (i.e. the root system, leaves, flowers, and seeds if a plant or the entire animal). Place aquatic plants in a bag with damp paper towel. Preserve animal specimens by either freezing or refrigerating in water or by using ethanol.

dnr.wi.gov search “AIS efforts”

# Following Verification

- Spatial and tabular records
- Sample from least to most known AIS


Lakes & AIS Mapping Tool
Bureau of Water Quality, Environment Management Division
Search...
Basic Tools
Identify Tools
Drawing & Measuring
Find Location
Maps & Data
Help
Home
Show Layers
Show Legend
Table of Contents
Pan
Zoom In
Zoom Out
Full State
Previous Extent
Bookmarks
Navigation
Get Info
Print Map
Help
Other Tools & Actions
Layers
Invasive Aquatic Plants
Brittle Waternymph (Najas minor)
Curly-Leaf Pondweed (Potamogeton crispus)
Eurasian Water-Milfoil (Myriophyllum spiactum)
Hybrid Water-Milfoil (Eurasian x Northern)
Java Water Dropwort (Oenanthe javanica)
Starry Stonewort (Nitellopsis obtusa)
Water Hyacinth (Eichhornia crassipes/azurea)
Water Lettuce (Pistia stratiotes)
Stevens Point
Wisconsin Rapids
Portage Co.
Waupaca Co.
Outagamie Co.
Appleton
Kaukauna
De Pere
Waushara Co.
Winnebago
Calumet Co.
Adams Co.
Marquette
Green Lk Co.
Lakes & AIS Mapping T...
Layers
WKID: 4326 Lat/Long
Lat: 44.35906° N
Lon: 90.02473° W
Scale 1: 1,013,760
Go

Business Licenses & Regulations Recreation Env. Protection Contact Join D

# Aquatic Invasive Species

Location

Lakes, Rivers, and Wetlands with Aquatic Invasive Species

Aquatic in sed on AIS Status Guidance. ations with the "observed ns with the "no longer observed" cessarily exhaustive so it is important to report occurrences. To report new discoveries visit: http://dnr.wi.gov/topic/Invasives/report.html. See the Aquatic Invasive Species Guidance for information on how statuses are assigned. Personally identifiable information on data collection forms may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

To Excel

| < First | < Prev | Page 1 of 99 | Next > | Last > |
|---|---|---|---|---|

| Waterbody Name | Waterbody ID Code (WBIC) | Invasive Species |
|---|---|---|
| Adams County (28) | | |
| Arkdale Lake | 1374300 | Chinese Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Purple Loosestrife, Rusty Crayfish, Water Hyacinth |
| Big Roche A Cri Creek | 1374100 | Japanese Knotweed, Rusty Crayfish, Water Hyacinth, Zebra Mussel |
| Big Roche a Cri | 1374800 | Chinese Mystery Snail, Curly-Leaf Pondweed, Eurasian Water- |

Business | Licenses & Regulations | Recreation | Env. Protection | Contact | Join DNR

# Asiatic Clam (Corbicula)

Select Another Location:
Statewide

Total Locations: 22

Total Lakes

## Species Locations

Disclaimer: Aquat… longer observed" based on AIS Status Guidance. In general, "verified" populations are established and have been verified by a taxonomic expert. Populations with the "observed" status have not been verified by a taxonomic expert or do not have established populations. Populations with the "no longer observed" status include populations where a reproducing population did not establish. Our inventories are not necessarily exhaustive so it is important to report occurrences. To report new discoveries visit: http://dnr.wi.gov/topic/Invasives/report.html. See the Aquatic Invasive Species Guidance for information on how statuses are assigned. Personally identifiable information on data collection forms may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. St…]

**Aquatic Invasive Species**

**Contact information**
For information on Lakes in Wisconsin, contact:

Wisconsin DNR Lakes
Division of Water
Bureau of Water Quality

Aquatic Invasive Species Contacts

By County | By Waterbody | By Species | By Year | Open In Excel

| Waterbody | Status | Waterbody ID Code (WBIC) | County | Y… |
|---|---|---|---|---|
| Bohners Lake | Verified and Vouchered | 750800 | Racine | 2… |
| Browns Lake | Verified and Vouchered | 750300 | Racine | 2… |
| Eagle Spring Lake | Verified and Vouchered | 768600 | Walworth, Waukesha | 2… |
| Fox River - CTH E | Verified and Vouchered | 742500 | Waukesha | 2… |
| Lake Andrea | Verified and Vouchered | 733850 | Kenosha | 2… |

Business | Licenses & Regulations | Recreation

### Aquatic Invasive Species Locations

- All - New 2016
- All - New 2017

- Asiatic Clam (Corbicula)
- Banded Mystery Snail
- Bighead Carp
- Brittle Waternymph
- Chinese Mystery Snail
- Curly-Leaf Pondweed
- Eurasian Water-Milfoil
- Faucet Snail
- Fishhook Waterflea
- Flowering Rush

# THE INVASIVE SPECIES RESPONSE PROCESS OVERVIEW & CHECKLIST

*Early Detection & Reporting* (p. 6)

- ☐ Report new populations of suspected invasive species on the DNR website at http://dnr.wi.gov/topic/Invasives/report.html or by contacting the Invasive Species Program Specialist at invasive.species@wisconsin.gov.
- ☐ Document possible invasives with photographs when possible

*Verification* (p. 7)

- ☐ Interview the reporter to validate the detection
- ☐ Get verification of identification by a recognized expert, accredited lab, or herbarium
- ☐ Voucher a specimen, when appropriate
- ☐ Conduct a site visit to verify location and population size
- ☐ For Prohibited species, obtain a definitive confirmation of identification via a second expert and/or biological analysis

*Communication* (p. 9)

- ☐ Notify appropriate resource managers at the local, regional, state, and national levels
- ☐ Notify local stakeholders and consider a local or statewide press release
- ☐ Select members for management team and identify a lead coordinator
- ☐ Establish an internal communications plan
- ☐ Begin planning external communications

*Assessment* (p. 12)

- ☐ Delimit the population and determine demographics of population
- ☐ Determine appropriate timeline based on level of threat
- ☐ Compile a knowledge base – literature reviews and species expert interviews
- ☐ Prevent the spread – identify dispersal vectors/pathways and restrict where feasible
- ☐ Begin marshalling resources – estimate needs and identify potential sources

*Planning* (p. 14)

- ☐ Decide on a reasonable and feasible control action (containment, eradication, partial or temporary suppression, or no action)
- ☐ Determine which management actions to undertake for selected control
- ☐ Secure permits, if needed

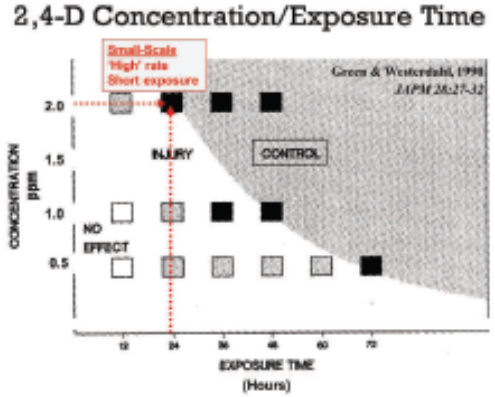
*Implementation* (p. 17)

- ☐ Lead coordinator facilitates implementation of response plan
- ☐ Continue public outreach efforts

# SMALL-SCALE HERBICIDE TREATMENTS FOR CONTROL OF INVASIVE AQUATIC PLANTS

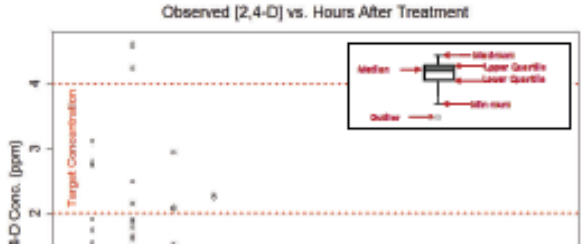
The Wisconsin Department of Natural Resources and U.S. Army Corps of Engineers have been evaluating small-scale herbicide treatments for managing invasive aquatic plants. Monitoring of 2,4-D applications for control of Eurasian watermilfoil (EWM) and endothall for curly-leaf pondweed (CLP) are ongoing, and preliminary information is already available regarding large-scale applications[1,2]. This fact sheet summarizes what researchers have learned so far from monitoring herbicide concentrations following small-scale treatments.

### Concentration and exposure times of 2,4-D required for effective EWM control have been studied in the laboratory.

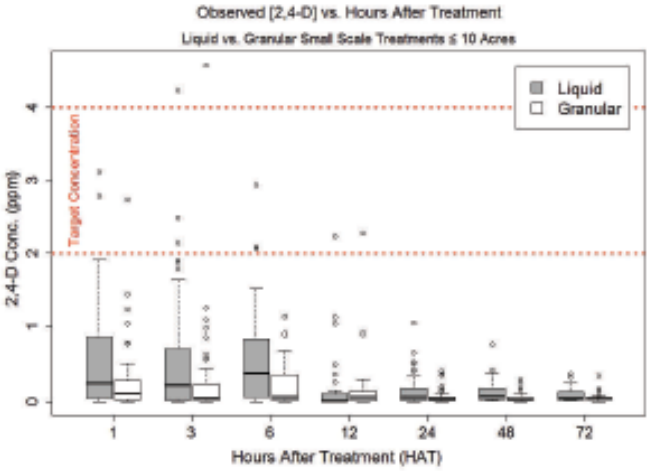



Treatments targeting small areas typically use higher rates of herbicide, since exposure time with the plants will be short. Recommended 2,4-D label rates for a small-scale treatment range from 2 to 4 parts per million (ppm), and based upon laboratory studies, require 12-24 hours of contact time to control EWM effectively.

### Herbicides can dissipate off of a small treatment site very rapidly.




### Granular and liquid formulations dissipate similarly when applied at a small-scale.



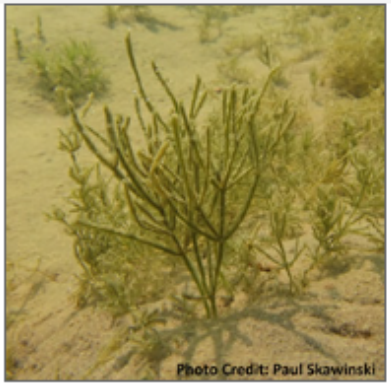

This graph shows the concentrations of granular and liquid 2,4-D detected in the water column after small-scale treatments with application rates of 2-4 ppm.

- Initial concentrations (1-6 HAT) were higher with liquid formulations, however, both formulations dissipated quickly from the treatment area.
- Under most conditions, concentrations of 2,4-D were below detectable limits by 24 HAT.
- Attaining target concentrations and maintaining exposure times required for control is more difficult to achieve in small-scale treatments.
- Dissipation is affected by multiple factors such as treatment size and location, wind, and water flow.

### Treatment of many small-scale areas on a lake may result in cumulative lake-wide effects due to rapid

# Starry Stonewort (*Nitellopsis obtusa*)

Starry stonewort, a submerged annual macroalga, belonging to the order Charales (includes all Chara and Stonewort species), is known to cause nuisance conditions in MI, NY and IN. It can outcompete other vegetation and forms monotypic stands that can reduce fish spawning habitat.




Invasive Species

Species information

- Aquatic invasives
- Terrestrial invasives
- Wetland invasives

Overview | Identification | Distribution | Control | Photos | Resources

Current control methods have not been shown to have a measurable impact on starry stonewort. Special care should be taken to reduce the spread of starry stonewort within and amongst waterbodies, and to educate the public about presence if it is found.

**Contact information**
DNR invasive species staff

Last revised: Monday December 11 2017

NEW

# AQUATIC INVASION PATHWAYS:

**PATHWAY:**
CANALS, DAMS AND DIVERSIONS

**PATHWAY:**
MARITIME COMMERCE

**PATHWAY:**
RECREATIONAL ACTIVITIES AND SERVICE PROVIDERS

**PATHWAY:**
STATE AND FEDERAL AGENCY ACTIVITIES

**PATHWAY:**
NON-RECREATIONAL FISHING AND AQUACULTURE

**PATHWAY:**
ROADSIDE MAINTENANCE AND TRANSPORTATION CORRIDORS

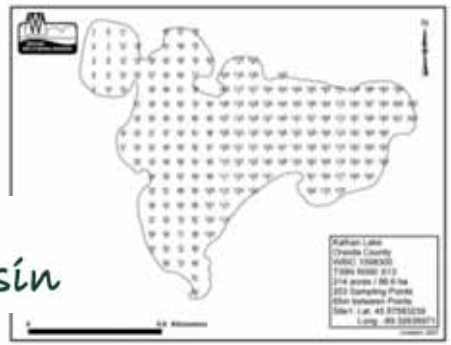
**PATHWAY:**
ORGANISMS IN TRADE

NEW


- Research
- Species?
- Efforts?
- Gaps
- Strategy
- Close

# Background

- Citizen scientist
- Staff
- Partners



# LIFE IS EASIER WHEN YOU'VE GOT A POSSE.