Citizen Lake Monitoring Network

Lakes Convention

April 2011

Laura Herman

Brenda Nordin

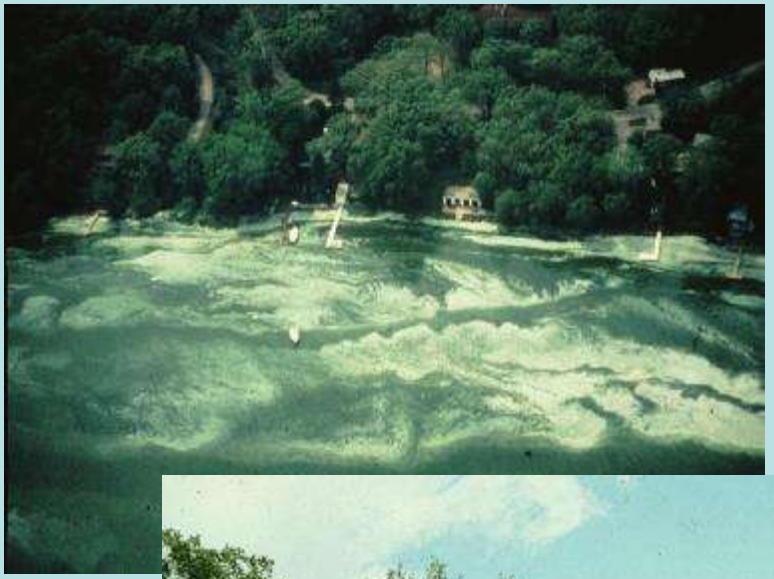
Jay Schiefelbein

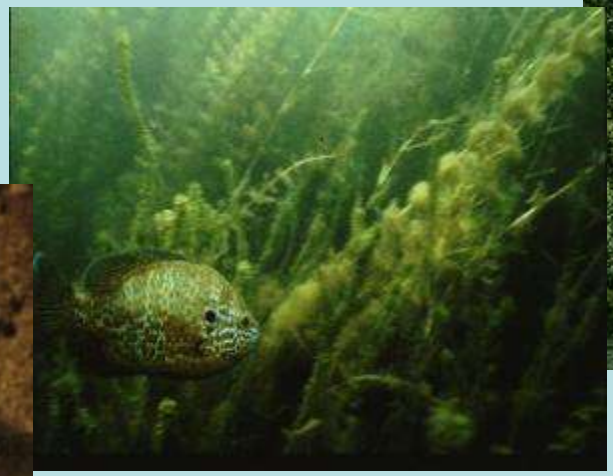
Wisconsin's Lakes are Changing Faster than Ever:

Algae blooms
(phosphorus pollution)

Destruction of
shoreline habitat

Invading plants and animals





Steve Carpenter 2004

Differences Between CBCW & CLMN

- Protecting lake from AIS
- Preventing AIS from spreading to another lake
- Defined hours (high use periods)
- A lot of contact with public
- Monitoring along shoreline near landings

- Checking to see if AIS is in lake
- Some defined monitoring times (based upon AIS monitoring for)
- Minimal contact with public
- Monitoring along shorelines, beaches, shallow water areas, & deep water areas
- Casual observer vs True Monitor

Citizen Lake Monitoring Network

1986 – 126 volunteers collecting secchi data on 113 Lakes

1990 – expansion – 25 lakes for

Secchi, total phosphorus, chlorophyll, temperature and dissolved oxygen

1991 – 2005

Secchi, total phosphorus, chlorophyll, temperature, and dissolved oxygen with some regions having volunteers collect data on Aquatic Exotics

2006 - Statewide effort to monitor for Aquatic Invasives

2007 – Statewide effort to have Trainers teach Secchi and AIS monitoring

2009 – Additional AIS added

What can we help you do?

- Become familiar with common native aquatic plants & animals in your lake.
- Monitor for the more common non-native aquatic invasive species that could get into your lake.
- Communicate findings from your lake monitoring efforts to others.

Why are we concerned about Aquatic Invasive Species?

- **Negatively impact our water resources**
  - Destroy, disrupt, or change natural habitat
  - Disrupt food chains
  - Out-compete and replace native plants and animals
  - Impact lake quality and water quality
  - Interfere with recreational use of lakes and rivers
- **Nearly impossible to eradicate or remove once present creating a new, likely permanent & often expensive, course for management**

Why conduct AIS monitoring?

- Protect your property value
- Protect your lake
- Cost savings – catch the invasive species early and save money controlling that invasive
- Protect neighboring lakes
- Because you can!!

Casual Observer vs Trained Monitor

- Casual observer
  - More general observer (simplified training)
  - Do not follow protocols
  - Volunteer selects species they monitor for
  - Often do not do data entry
  - Seldom report if they do **NOT** find AIS
- Examples -
  - Shoreline sweep
  - Chain of Lakes volunteers
  - Lake meeting presentations

- Trained monitor
  - More technical training (longer & more detailed)
  - Monitoring follows standard monitoring protocols (meshes with DNR protocols)
  - Volunteer selects species they monitor for
  - Enter data into SWIMS
  - Report if they do **NOT** find AIS

Manual components

- Contacts
- Section 1 – Getting Started
- Sections 2-11 monitoring by Species
  - Overview of each species
  - ID tips
  - Monitoring protocols by species
  - Data entry
  - Herbarium labels & equipment building directions as needed
  - Reporting forms
- Section 12 monitoring for the native water-milfoil weevil

What other equipment/materials will I or might I need?

- A rake, either one or two sided, on a rope or on a pole.
- An underwater view scope
- Waders or hip boots
- Snorkeling gear
- A boat
- Crayfish traps, nets, zebra mussel substrate sampler, beetle rearing materials, weevil sampling gear
- Identification & information pamphlets

Setting up a monitoring team

- Designate a contact person
- Obtain a map
- Divide up the work
- Report the findings

Contact person

- Coordinates monitoring
  - Makes sure entire lake is covered
  - Checks on volunteers to see how monitoring is going
  - Vouchers plants
  - Takes “suspect” plants in to LWCD, UWEX, or DNR
  - Complies data

Obtain Lake Maps

- DNR
- Fishing Hot Spots
- Bait Shops
- Web sites

Divide up the Work (examples)

- Have volunteers monitor 1-mile of shoreline
  - Shoreline Weed Action Team (SWAT)
- Have volunteers monitor specific species
- Volunteers without boats can do beach monitoring or zebra mussel monitoring
- Bring in Bait Dealers to “store” plants
- Maps for lake users to mark where they found suspect plants

Report Findings

- Let people know what your results are
  - Newsletters
  - News articles
  - County Land & Water Conservation Dept.
  - DNR, UWEX, GLIFWC
  - Surface Water Inventory Management System (SWIMS)

When to monitor

- Native plants – June through August
- Eurasian water-milfoil – May through October
- Curly-leaf pondweed – May through July
- Purple Loosestrife – July and August
- Rusty crayfish – June through August
- Zebra mussels – Ice out to ice on
- Mystery snails – Ice out to ice on
- Waterfleas – June through September
- Freshwater jellyfish – Aug. through Sept.
- Hydrilla – May through October
- New Zealand mudsnail – Ice out to ice on

Where to look

- Beaches
- Launches
- Marinas
- Camps
- High use private landings
- Inlets
- Entire Lake

Eurasian Water-milfoil

Exotic Eurasian Water-milfoil

- 11 Native Species of Water-milfoil in USA
- 7 Native Species of Water-milfoil in WI
- EWM Native to Asia and Europe
- EWM Arrived in US in 1942 & WI in 1960s

Out Competing Native Plants

- Reproduces by seeds, runners & fragmentation
- Begins to grow at colder temperatures and lower light levels
- Possesses canopy growth pattern
- Not susceptible to native pathogens

EWM

- Early spring – late fall
- Fast grower
- Up to 20 feet tall
- Distance between whorls
- Lower leaflets same length
- 12-21 leaflet pairs
- Pink coloring at tip
- NO WINTER BUDS


Non-native

NATIVE

Eurasia water-milfoil will form monoculture stands. Plants can be 20 feet tall


AUTOFRAGMENTATI
ON
UGA1624031

Native milfoils form turions

Northern water-milfoil on left

Eurasian water-milfoil on right


Eurasian Water-milfoil
Little Saint Germain Lake
June 30, 2003
Advantageous roots
This sample was found free floating

Map the milfoil beds.

•Is it an isolated bed?

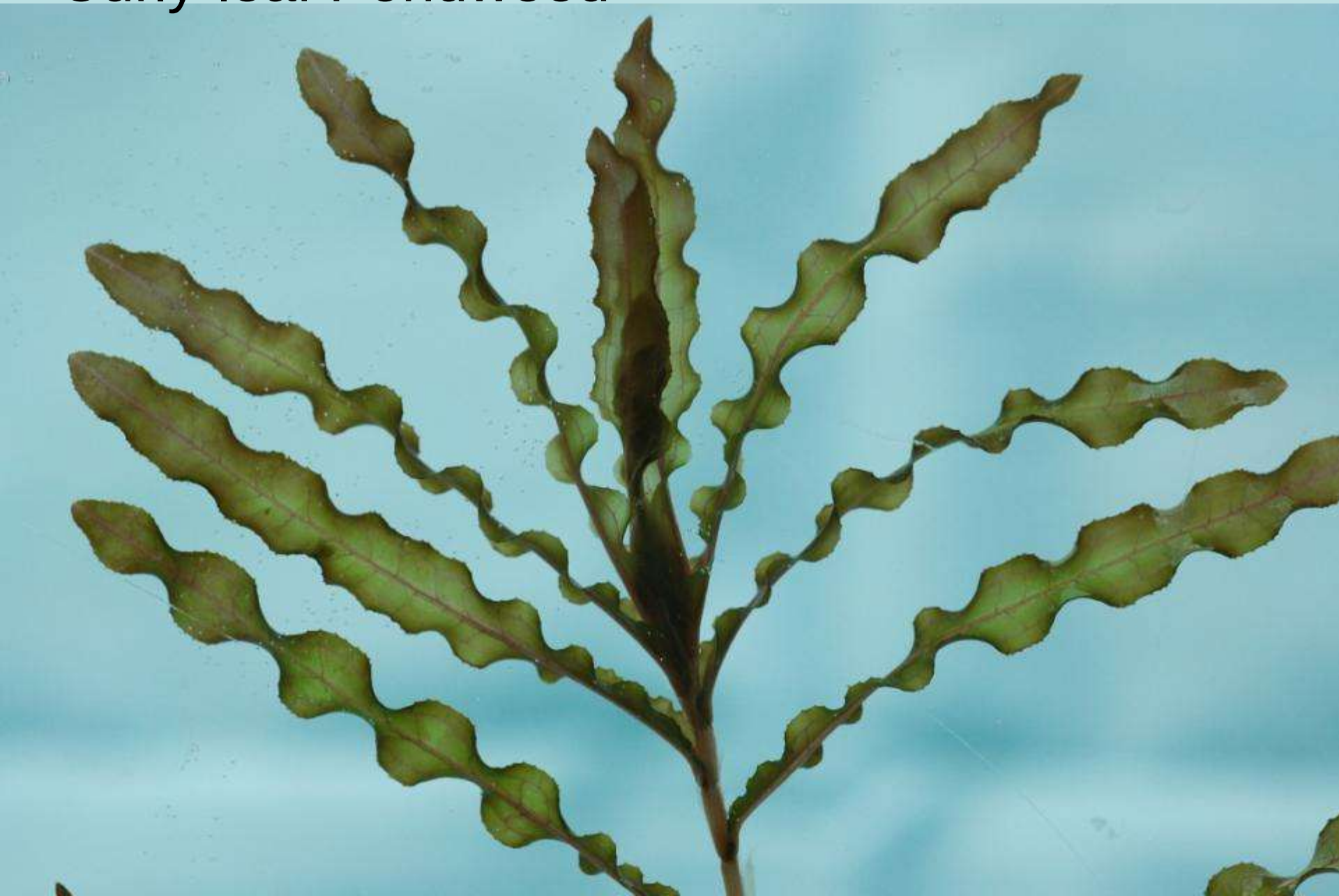
•Is it over the entire lake

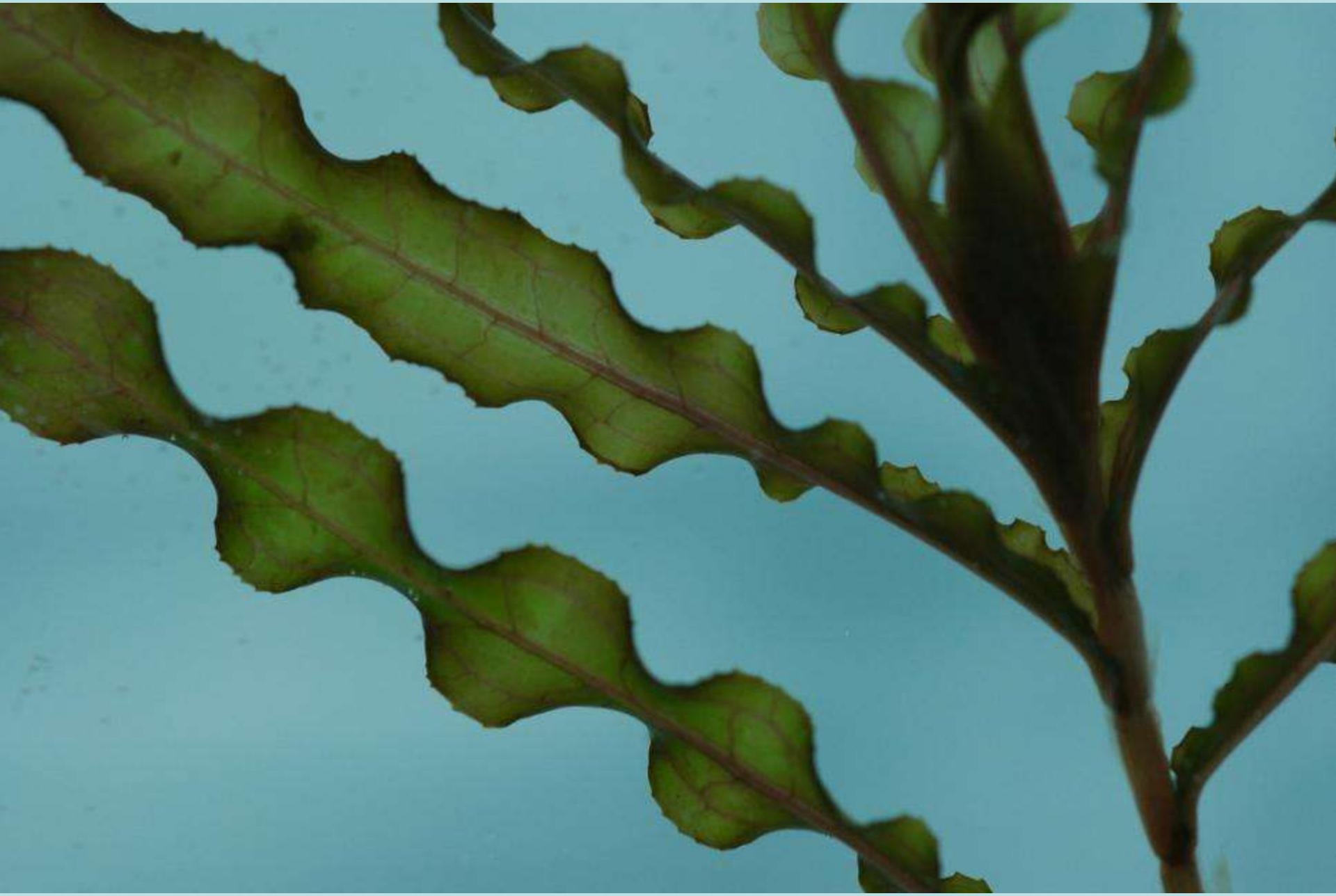
2008 – Pilot study
Refined & statewide in 2009

Eurasian water-milfoil Weevil Monitoring
Euhrychiopsis lecontei

- Weevils are native to the US
- Weevils eat native water-milfoils but prefer EWM
- They may produce several generations in a season
- Weaken EWM growth and vigor, often causing it to collapse in the lake
- Overwinter in undisturbed shorelines.

Curly-leaf Pondweed





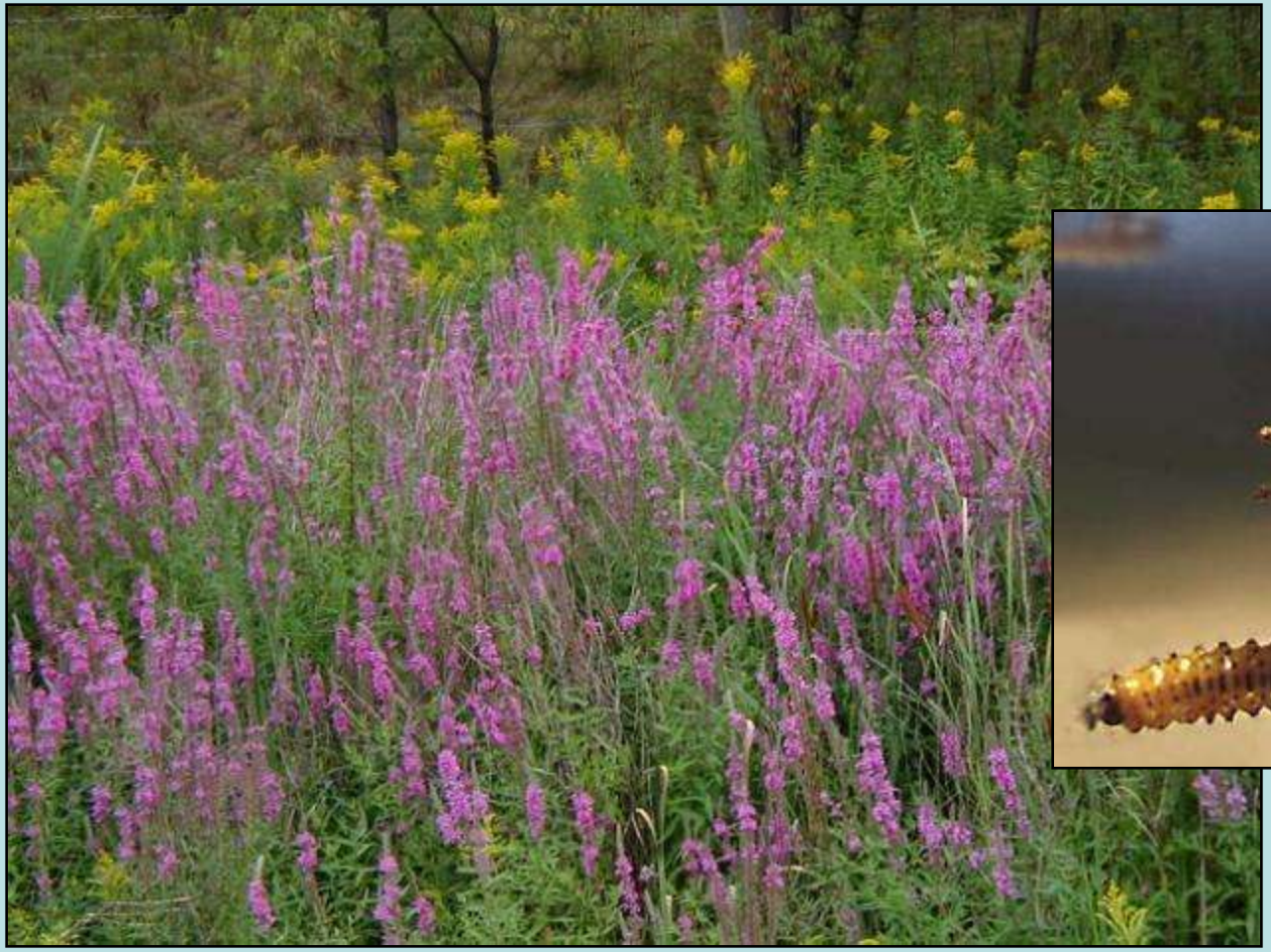
Curly-leaf seeds and turions

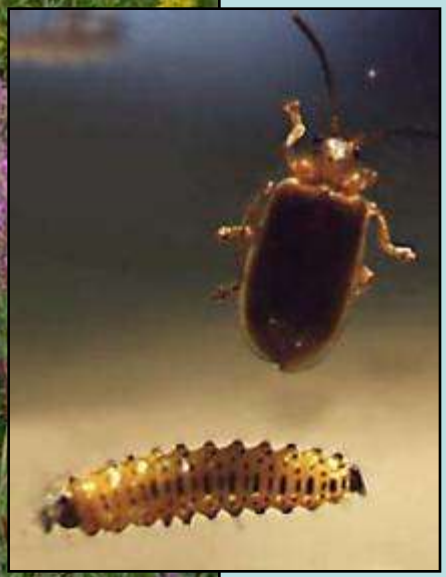
Loosestrife Watch Program

Where to Look

- Roads
- Hiking trails
- Lake Shore
- Streams

Raising Galerucella Beetles





DIGGING

PLANTING

GROWING

Host plant roots are dug up and planted in pots. Pots are covered in netting to protect the loosestrife beetles from predators. Beetles are added once the plants reach 2 feet tall.

Beetle larvae damage on host plant


Rusty Crayfish

Impacts from Rusties

- Destroy native plant beds
- Eat fish eggs and macroinvertebrates
- Outcompete native crayfish
- Hybridize with native crayfish
- Really hard on native snails especially if the lake has the non-native Chinese mystery snails.

Regulations When Collecting Crayfish

- Fishing License or Small Game License
- Cannot have fishing gear
- Traps
  - Trap dimensions – length and width
  - Opening size
- Netting
  - Net size
  - Have to be lifted vertically

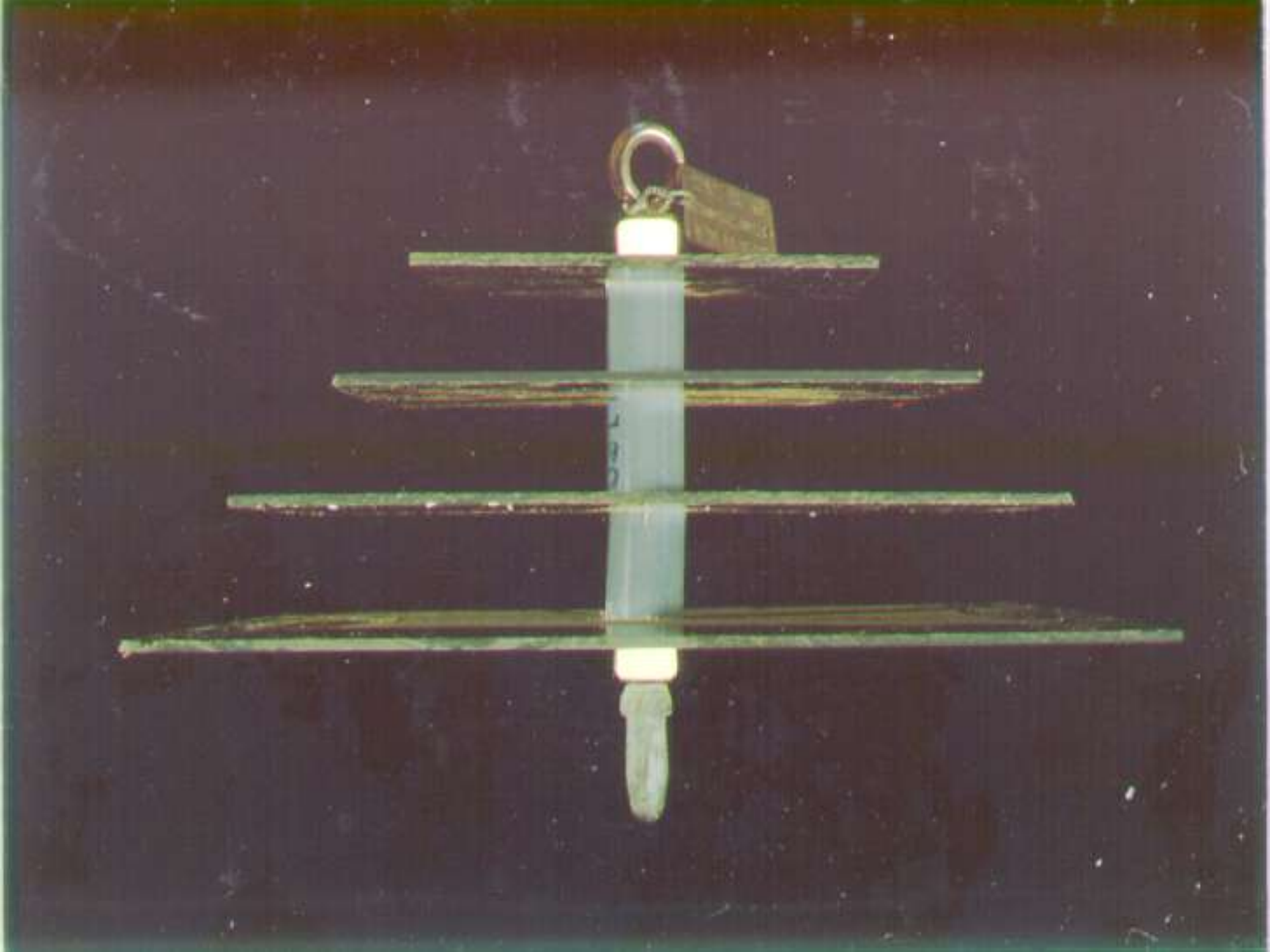

FRABILL


16 8:09 AM


16 6:51 AM

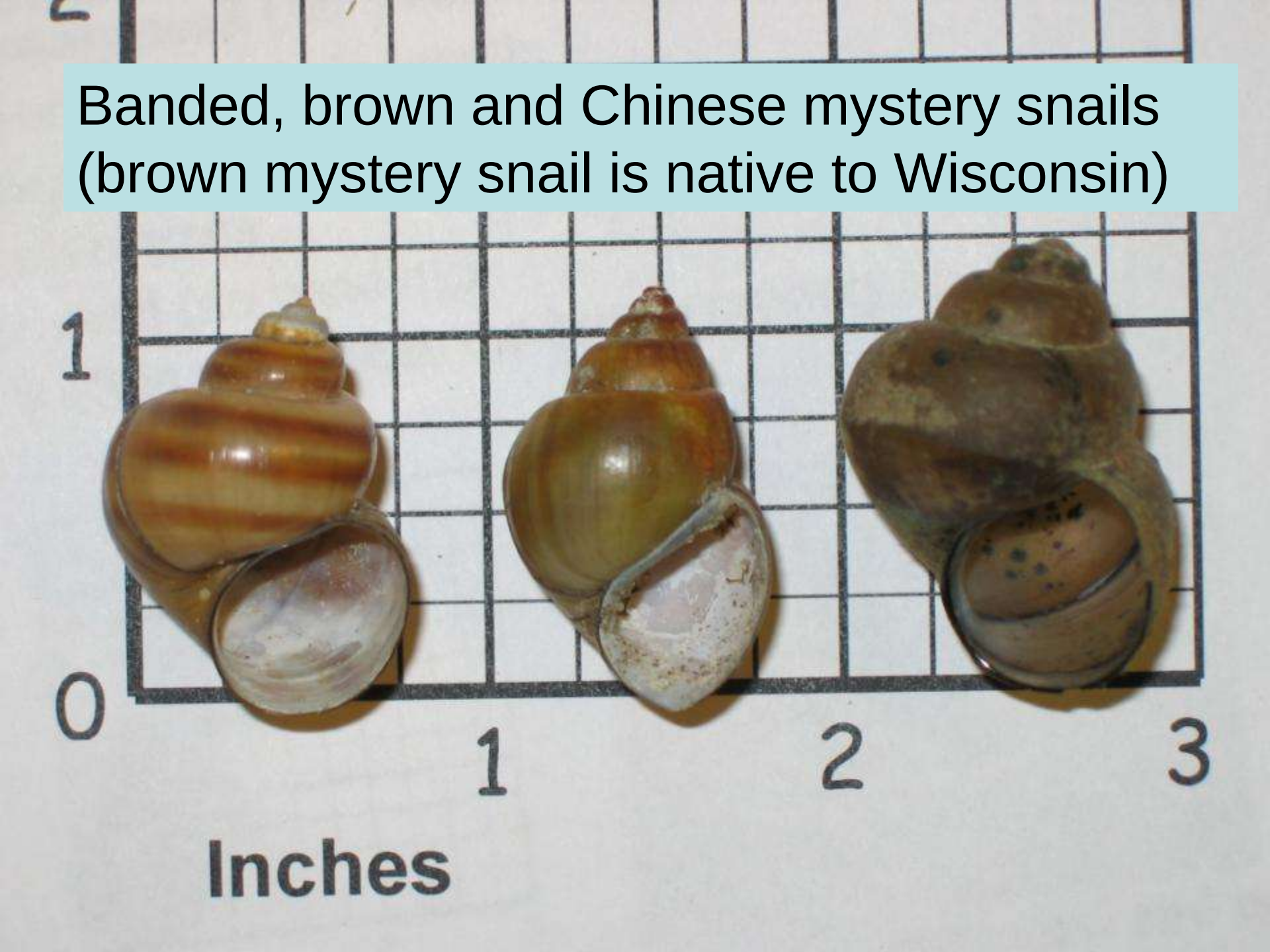
uagga on the left and zebra mussel on the right.
ote the round hinge edge on the Quagga as
mpared to the flat hinge area on the zebra mussel.

Quagga mussel on the left and zebra mussel on the right.

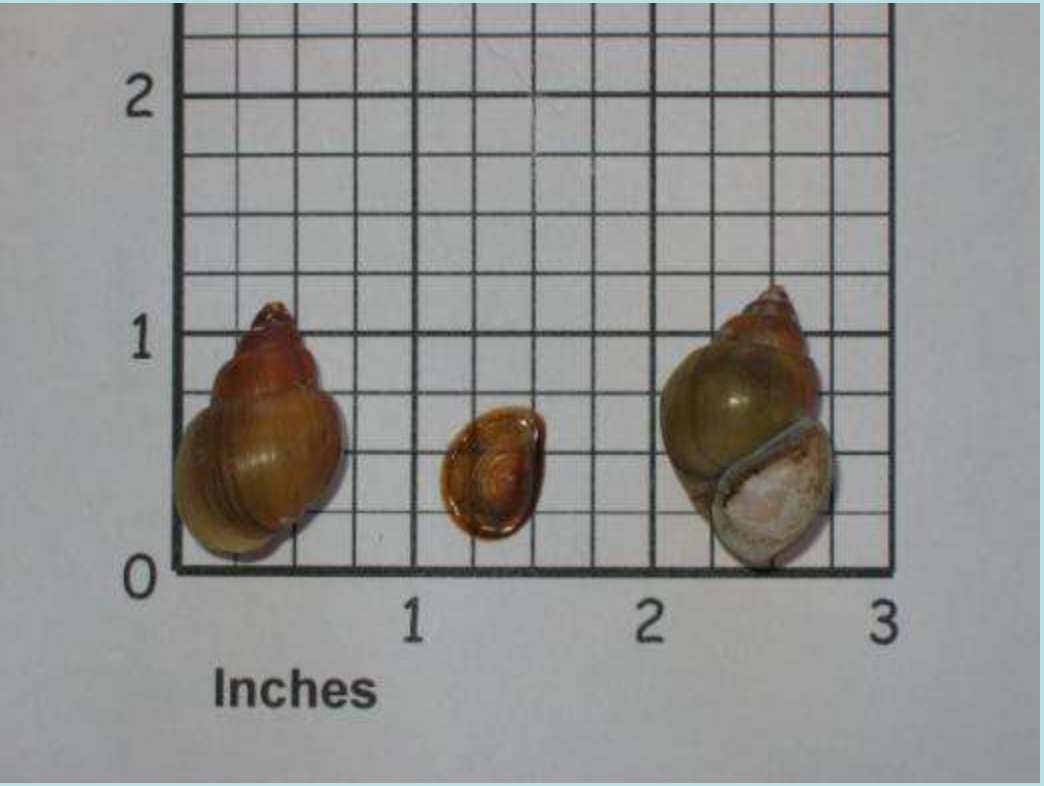



17 6'97

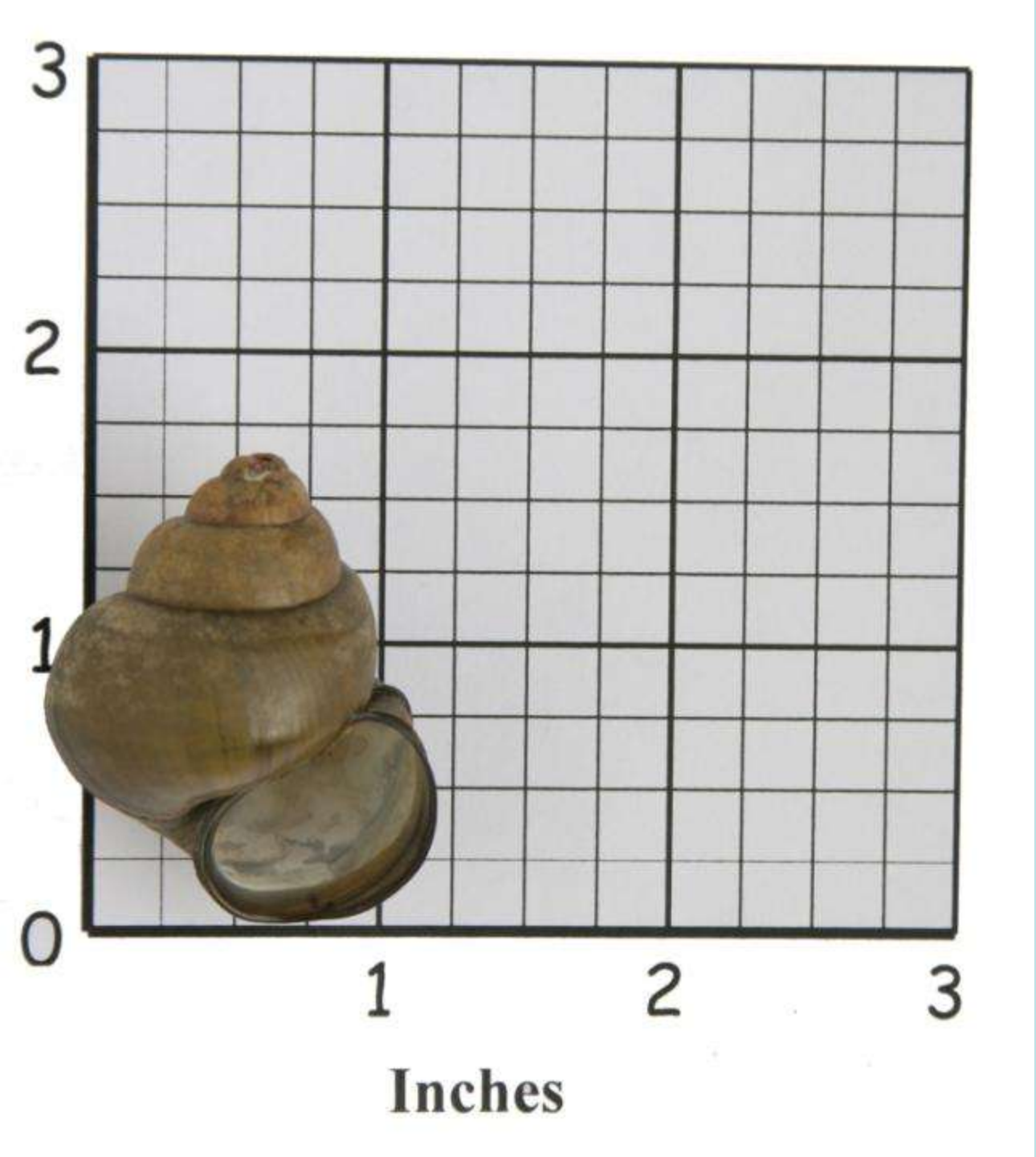
Staff monitoring for zebra mussel veligers


Banded, brown and Chinese mystery snails
(brown mystery snail is native to Wisconsin)
0
1
2
3
Inches

Brown Mystery Snail – Native to Wisconsin



- Adults rarely reach 1.5 inches in height
- No bands
- Have hard operculum



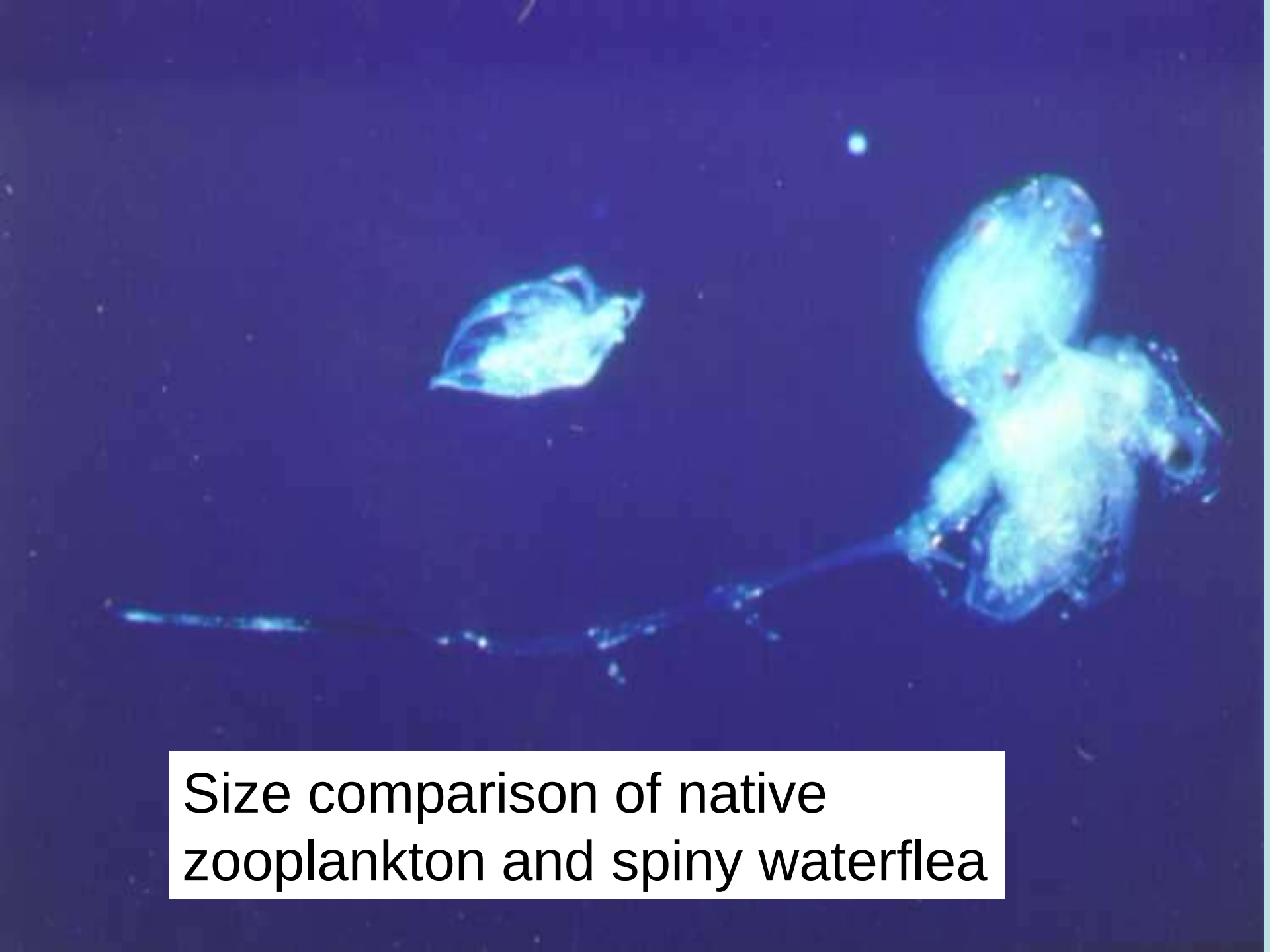
Chinese Mystery Snail

- Adults are over 1.5 inches in height
- No bands
- Have hard operculum

Banded Mystery Snail

- Adults are up to 1.5 inches in height
- bands
- Have hard operculum

Spiny and Fishhook waterfleas



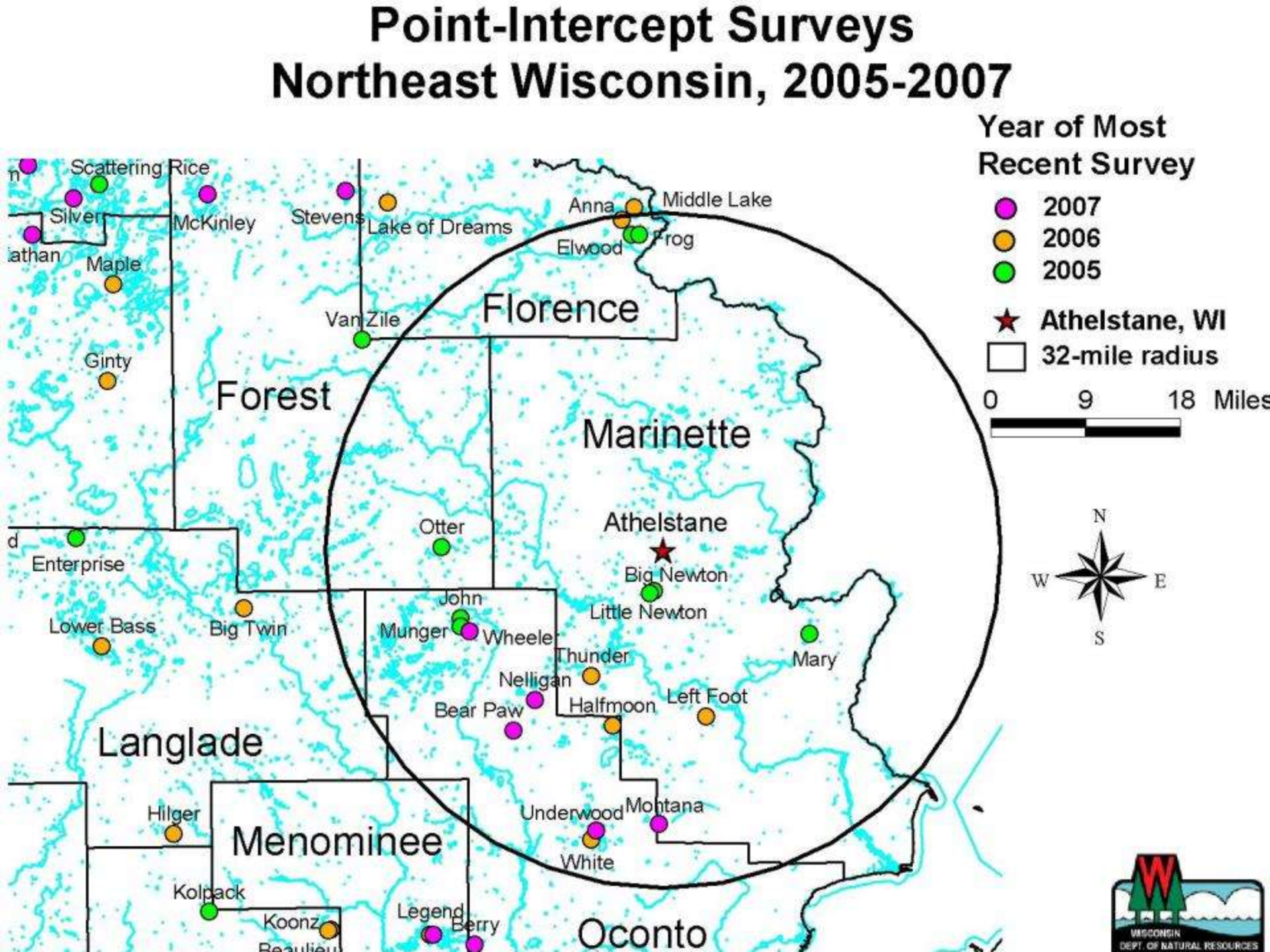
Size comparison of native zooplankton and spiny waterflea

Freshwater jellyfish

Wisconsin's Success Story!

HYDRILLA VERTICILLATA

Point-Intercept Surveys
Northeast Wisconsin, 2005-2007




Hydrilla
Hydrilla verticillata
Photo by Vic Ramey
Copyright 1999 Univ. Florida


Hydrilla tubers
Photo by Alison Fox


1
2
3
4
5
6
Hydrilla verticillata turions
Photo by David Sutton
Copyright 1997 University of Florida

Hydrilla turions showing scale

Hydrilla specimen is a preserved specimen – that is why it is so pale.

Hydrilla showing whorls

Hydrilla above is from the pond in Marinette 2007


Marinette Pond
Hydrilla 2006


Marinette Pond 2007
(same location)

Detection in Upper Midwest will be difficult

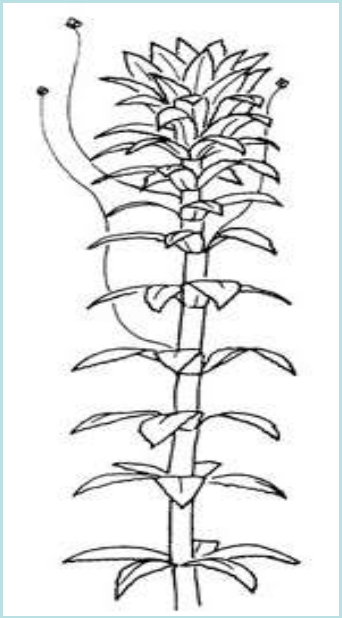
Commonly mistaken for elodea.

Brazilian elodea "egeria" in MN a look alike

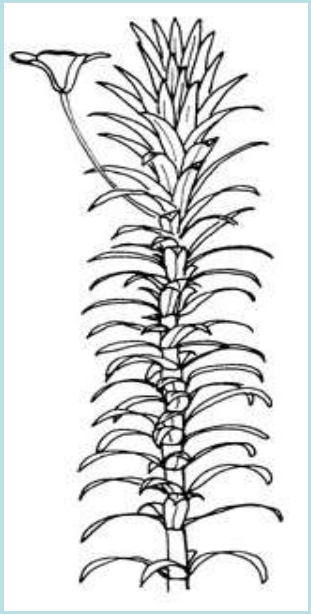
Key is 5 + whorls and spines. Not a vigorous looking plant , initially.

Nut like tubers are only hydrilla

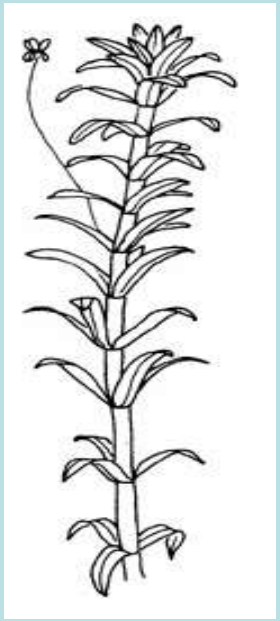
Hydrilla



Egeria



Elodea



Upper left: Hydrilla

Above: Brazilian waterweed (Egeria)

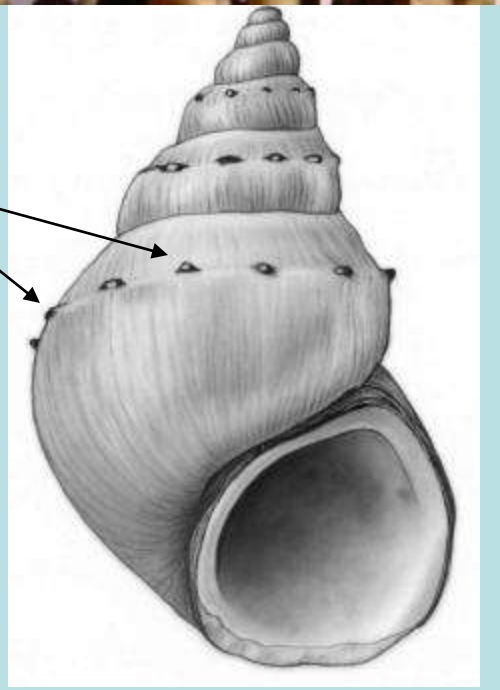
Left: Elodea Canadensis

New Zealand mudsnail

- St Louis River harbor (Duluth Superior Harbor) and near Milwaukee
  - Densities up to 500,000 / meter^2
  - Asexual reproduction
  - Wide tolerance range
    - Brackish to fresh waters
    - Lives in estuaries, lakes, rivers & streams
    - Tolerates waters with high & low calcium
    - Found on soft and firm substrates
    - Inhabits turbid and clear waters
    - Tolerates water from 32^0 to 80^0 F
    - Does well in eutrophic waters

New Zealand Mudsnail

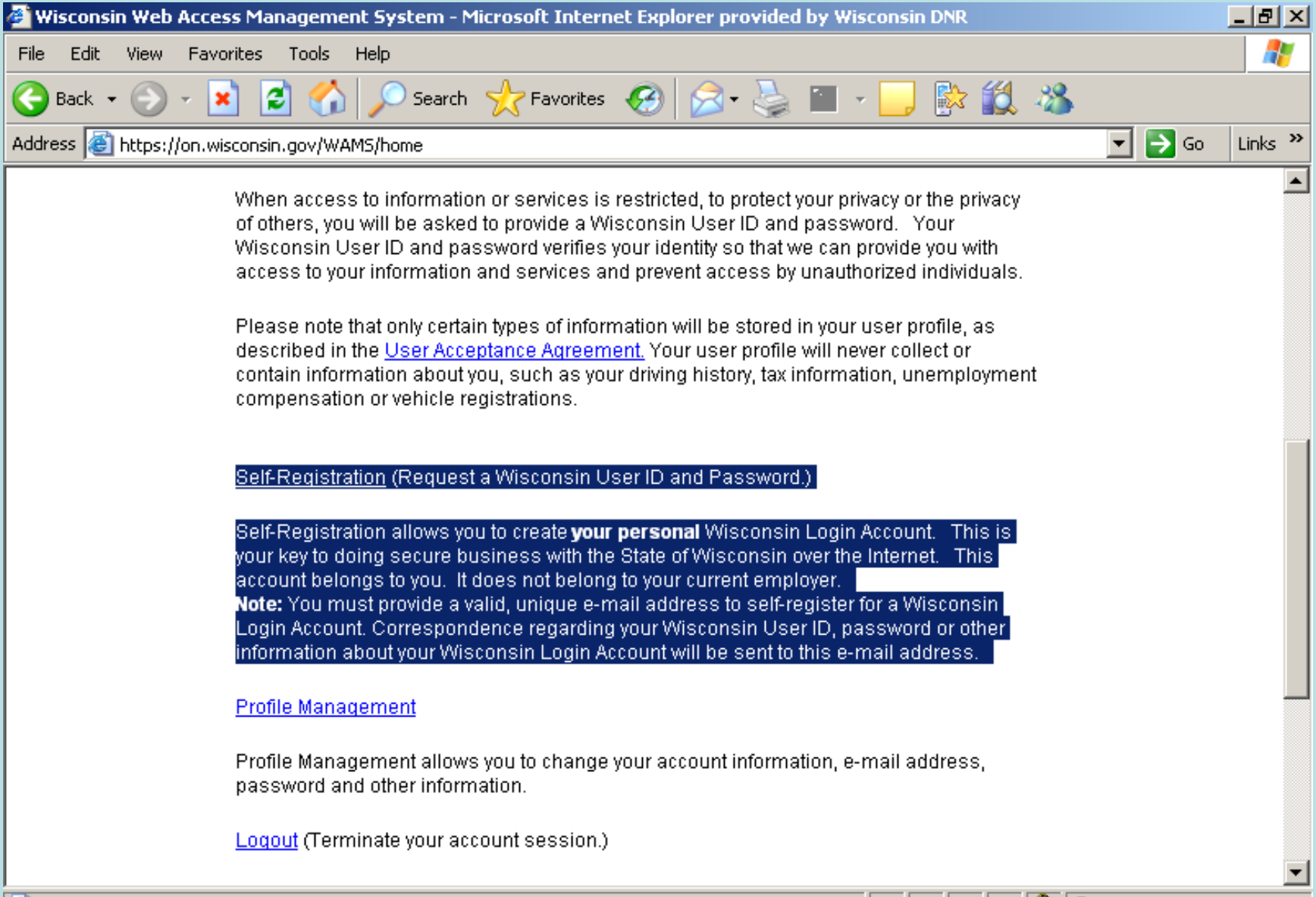
- 1/10 to ¼ inch high
- Operculum present
- Light to dark brown
- Cone shaped shell with 5-6 whorls
- Raised carina (keel) on whorls



Tailor the program for the volunteers.

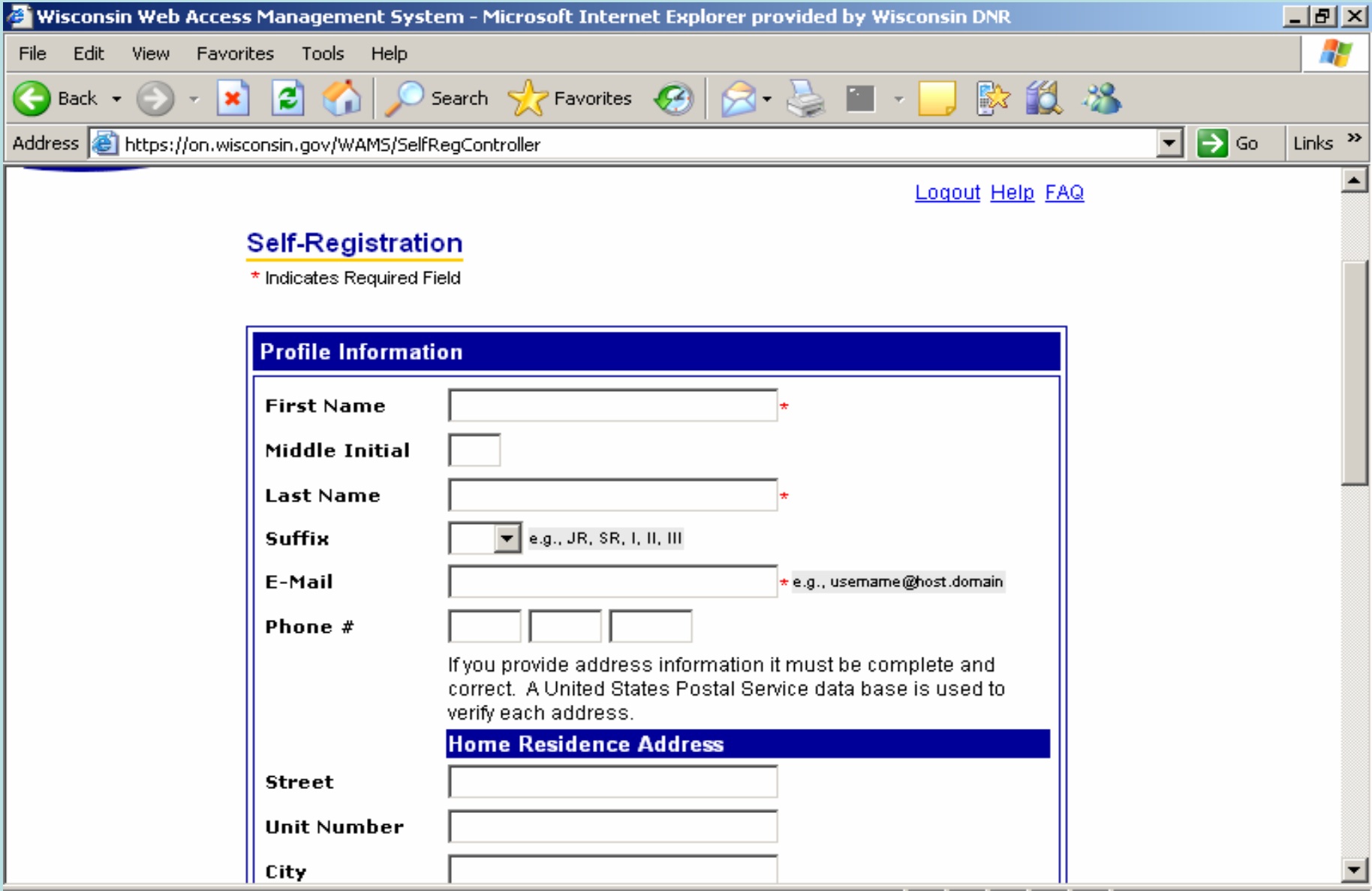
Getting Ready For SWIMS

Getting Ready For SWIMS



Getting Ready For SWIMS

Getting Ready For SWIMS

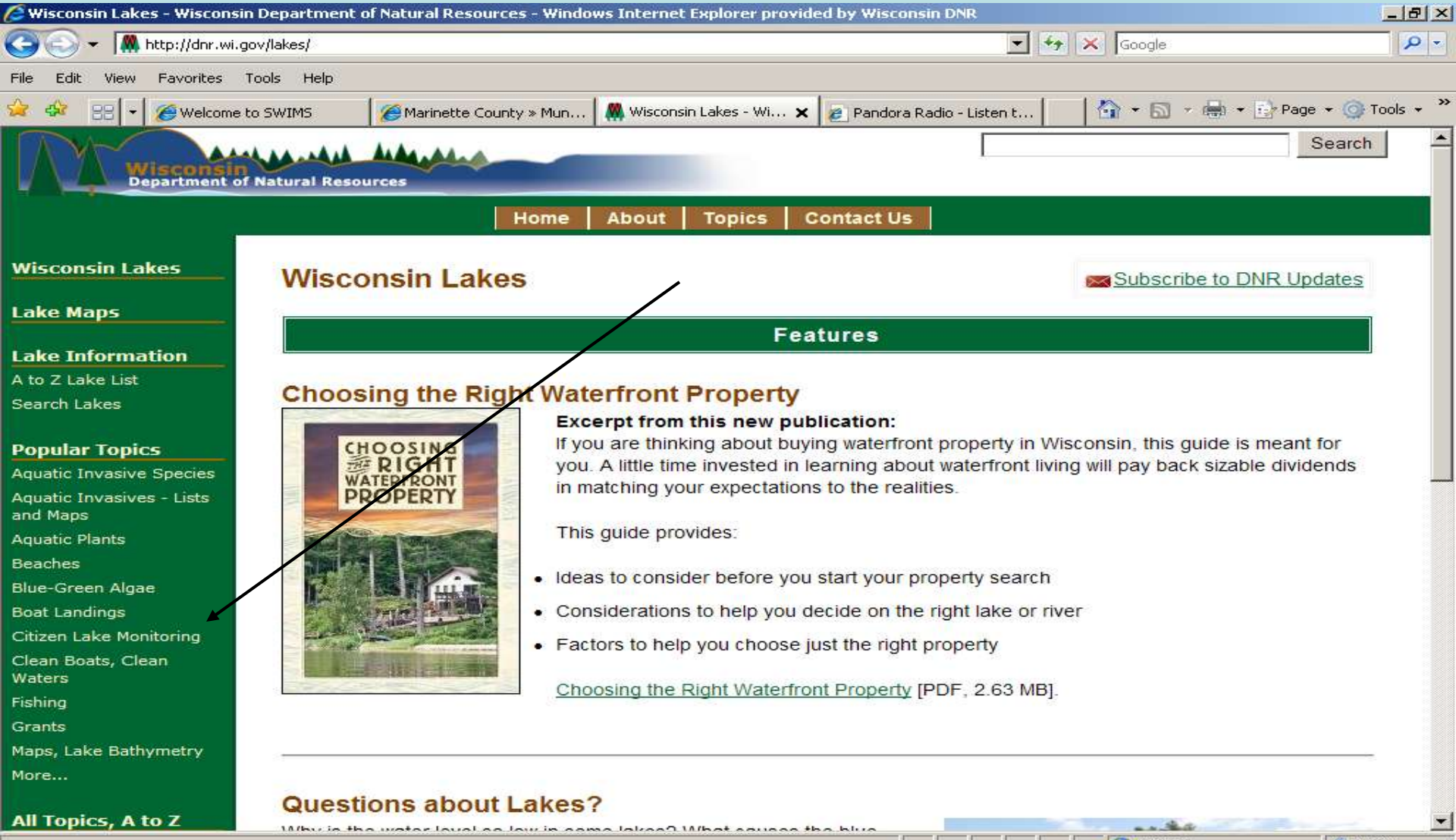


Authorize Your Account

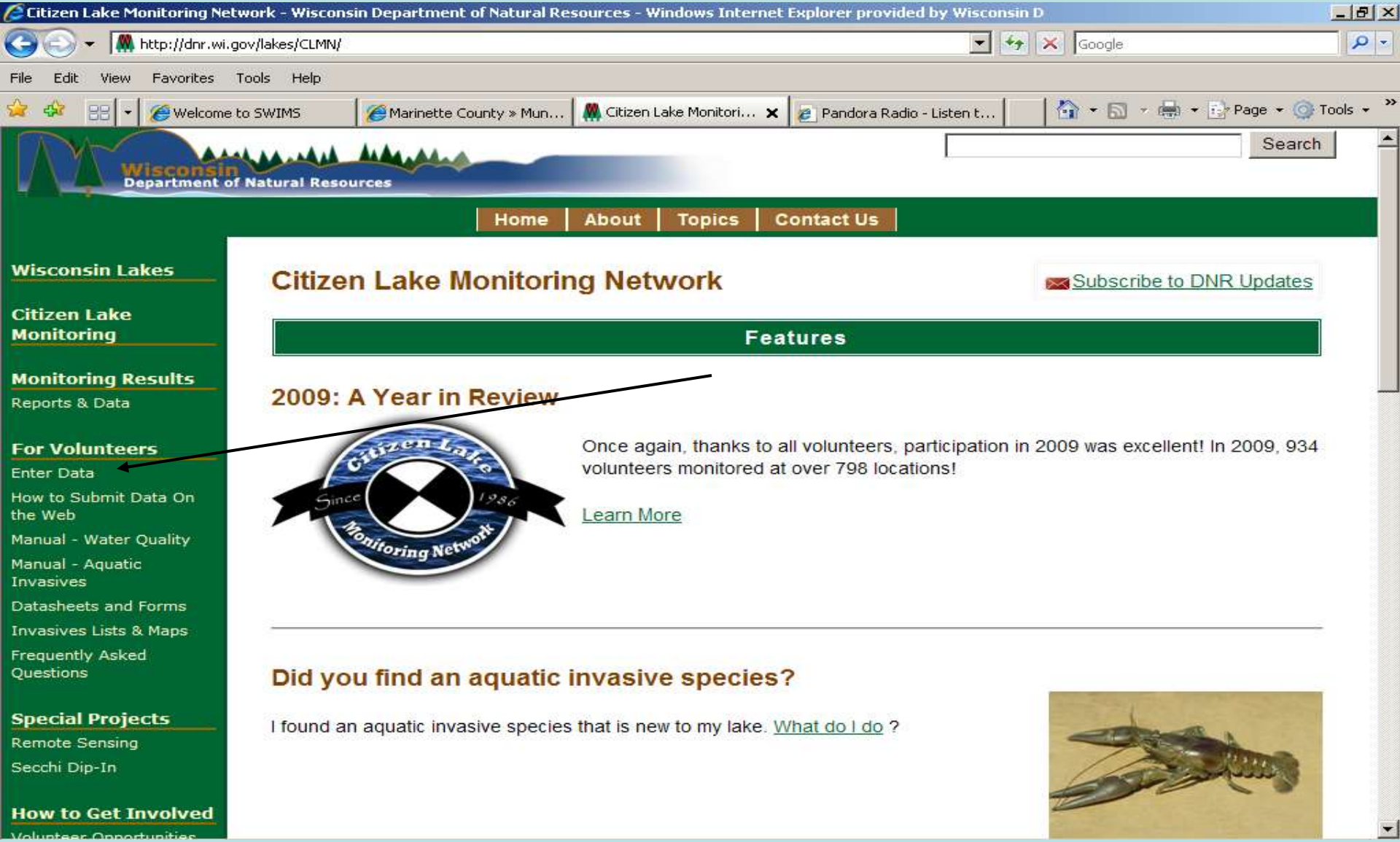
- After you have created your user name and password:
  - Email the username to Jen Filbert (Jennifer.Filbert@wisconsin.gov)
  - She will activate your account
- Personal Information??

How Do I find SWIMS??

http://dnr.wi.gov/lakes/

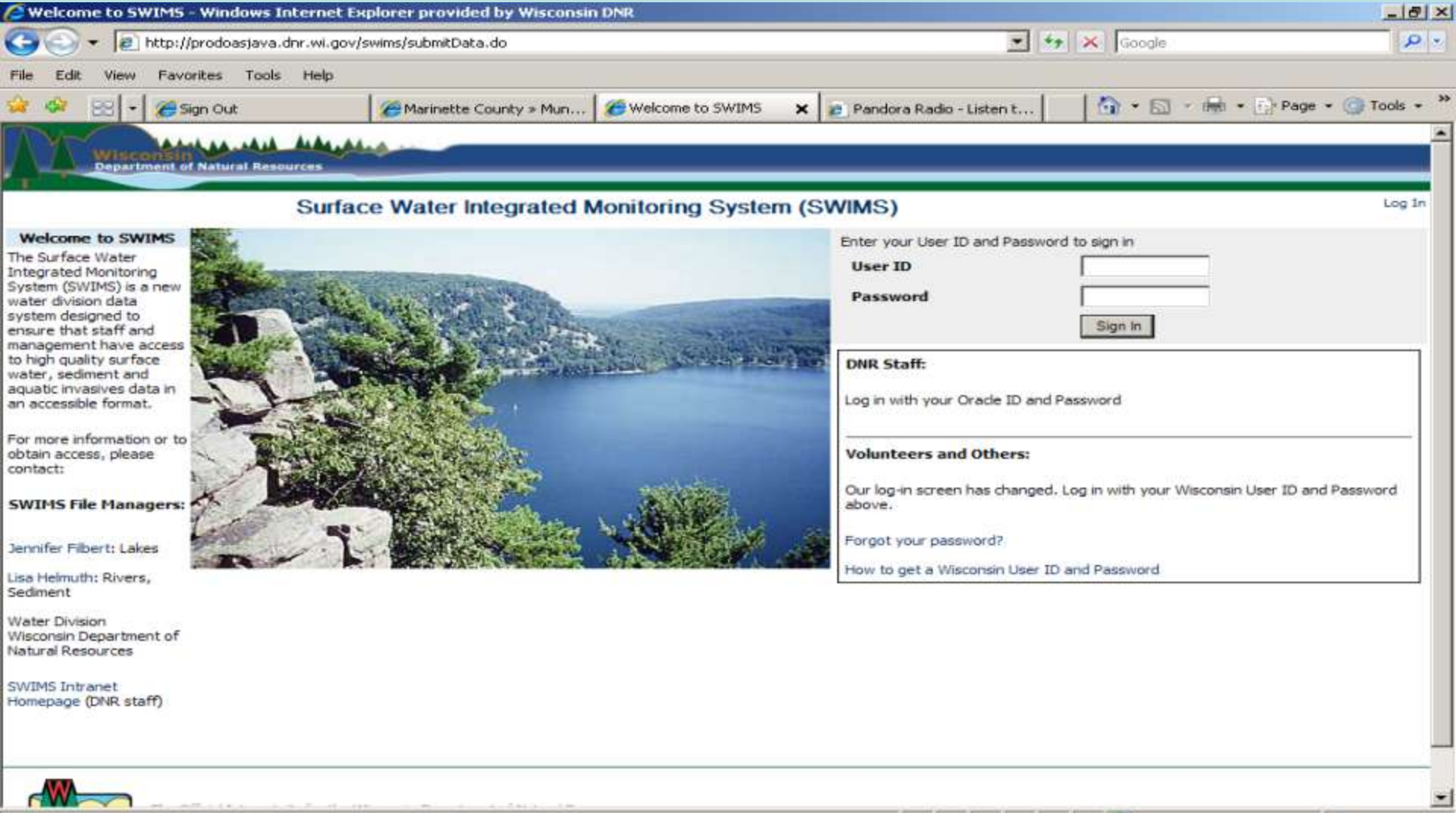


Directions to SWIMS

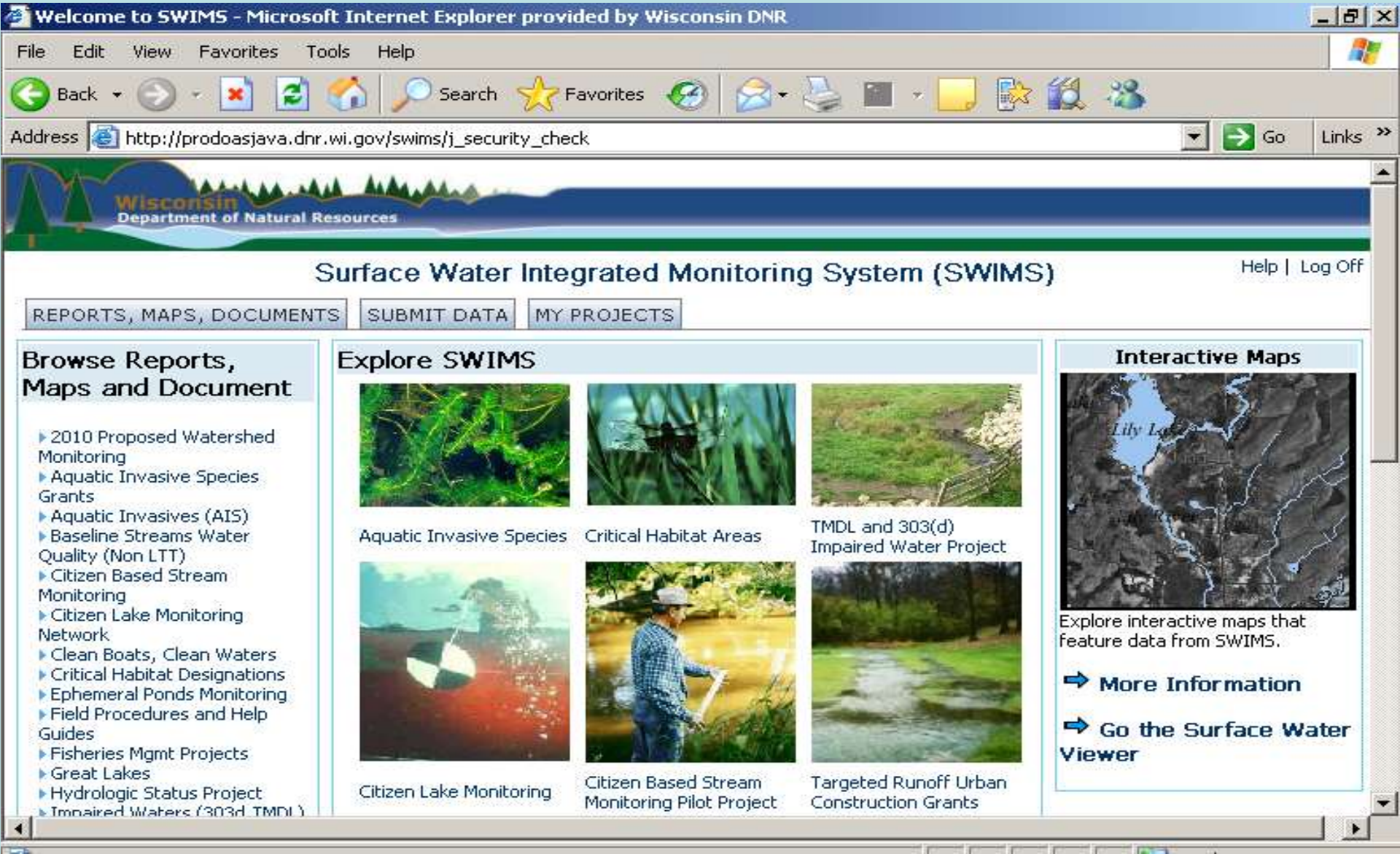


SWIMS Location:

http://prodoasjava.dnr.wi.gov/swims/submitData.do



SWIMS Data Entry



SWIMS Data Entry

Welcome to SWIMS - Microsoft Internet Explorer provided by Wisconsin DNR

File Edit View Favorites Tools Help

Back Search Favorites

Address http://prodoasjava.dnr.wi.gov/swims/submitData.do Go Links

Wisconsin Department of Natural Resources

Surface Water Integrated Monitoring System (SWIMS)

Help | Log Off

REPORTS, MAPS, DOCUMENTS | SUBMIT DATA | MY PROJECTS

Submit Data

Monitoring Data

View List

View what you've already entered. To edit data, or to add field results to lab samples that have come in, use the "pencil icon". There is also an option to "Add New Monitoring Data".

Add New

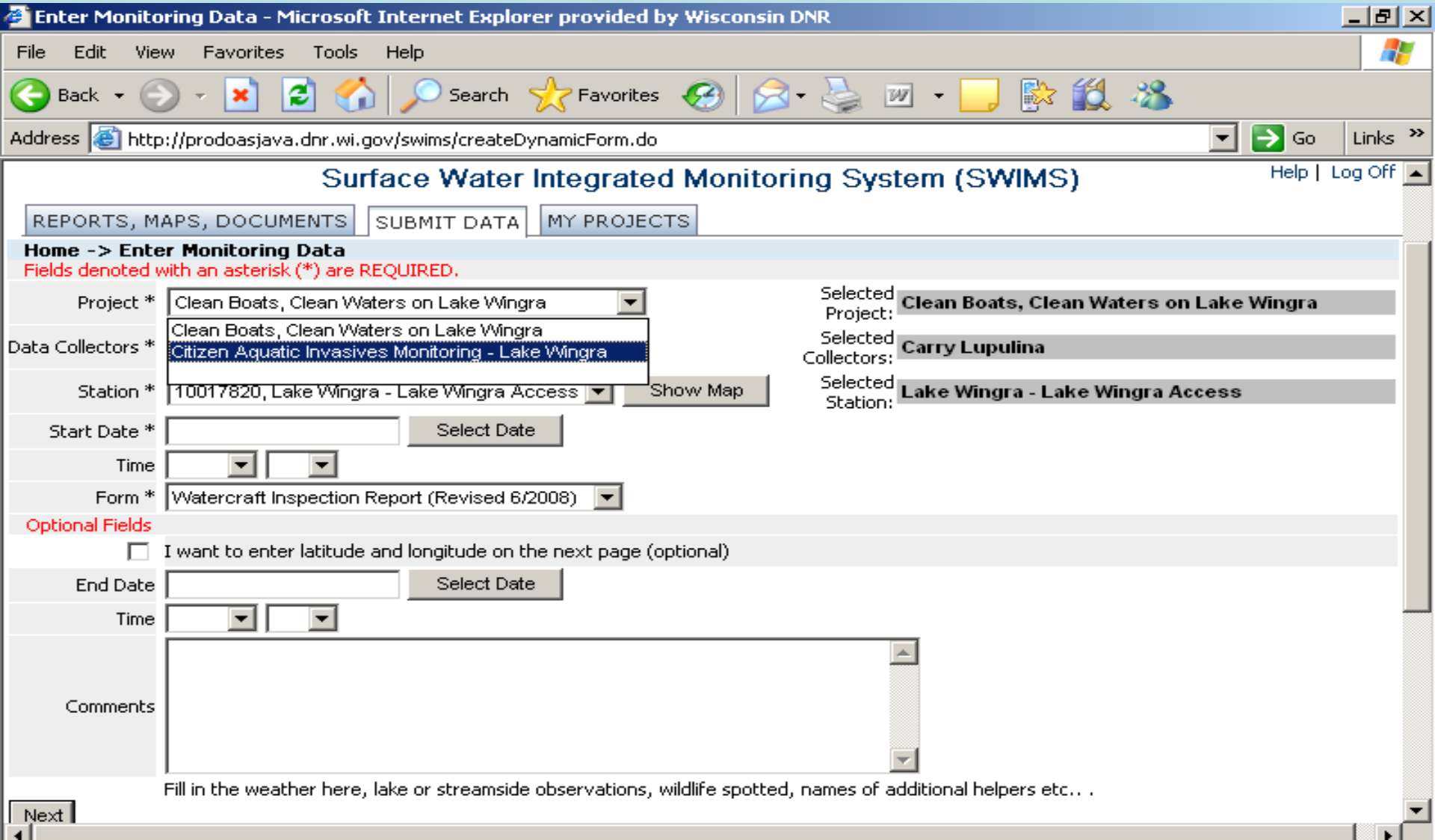
Add new monitoring data. This option will add a new "Fieldwork Event" (date/time, station, etc.), which you can then add field results to.

Peshtigo River

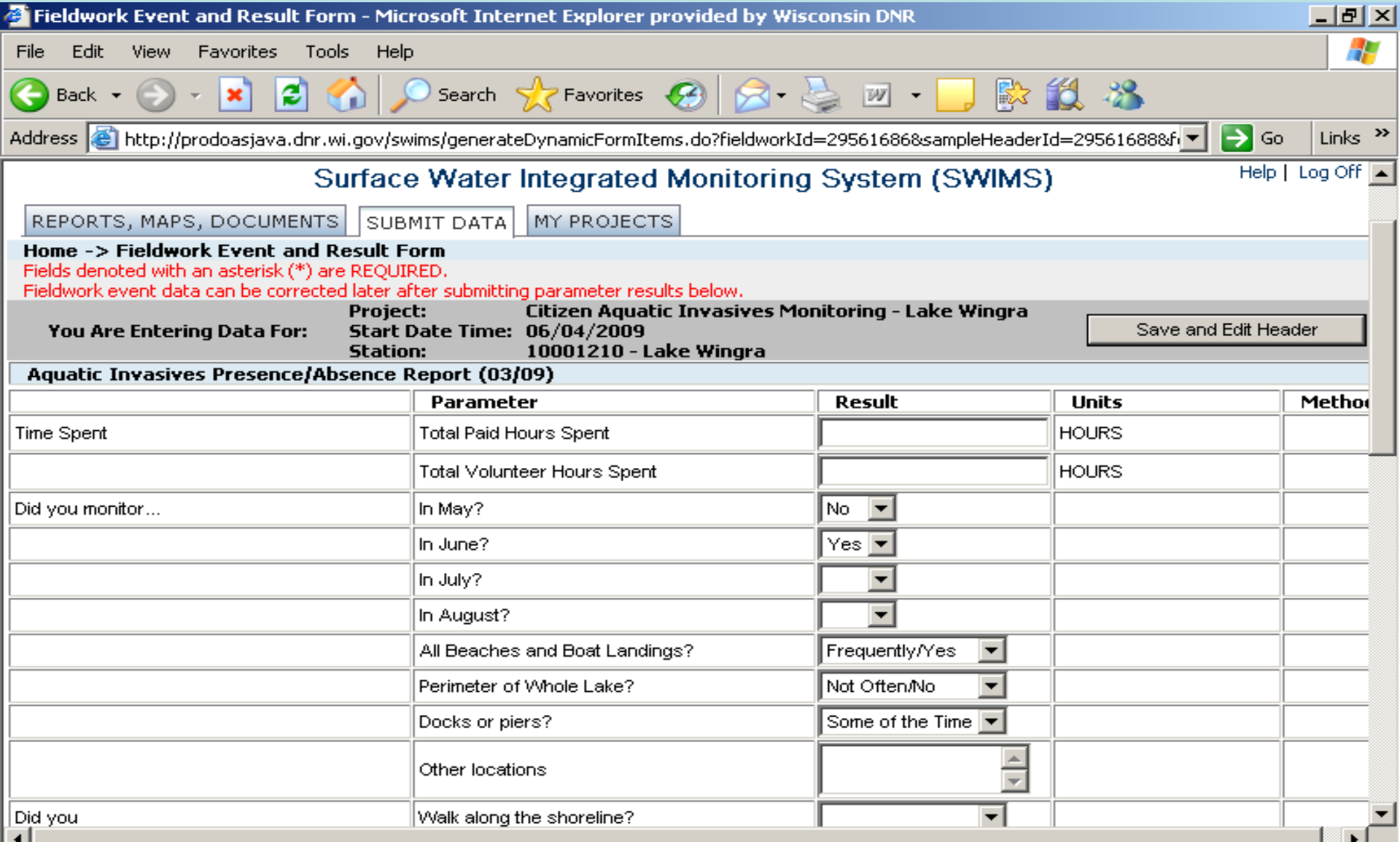
Quick Links

Helpful Hints

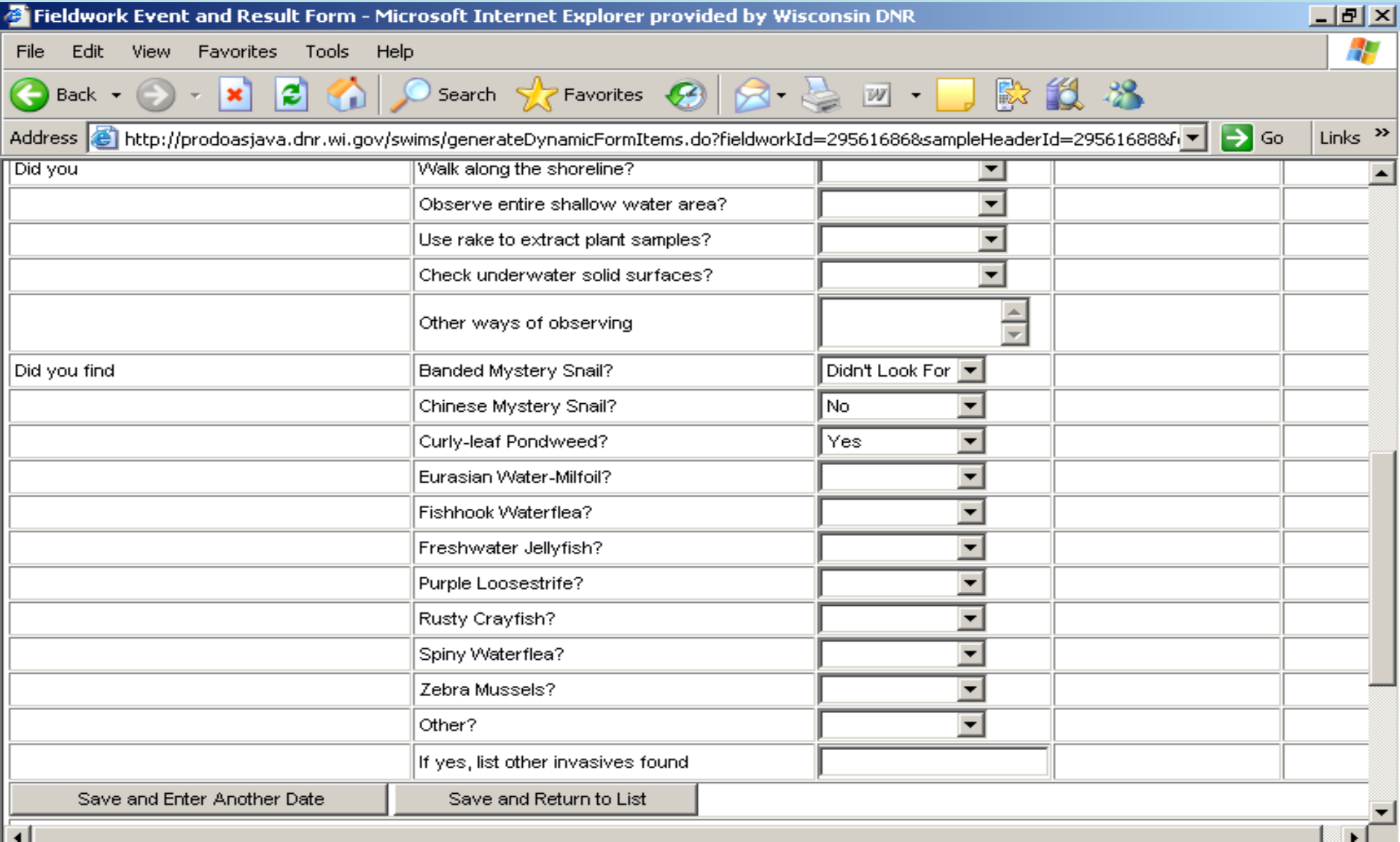
SWIMS Data Entry
AIS Data



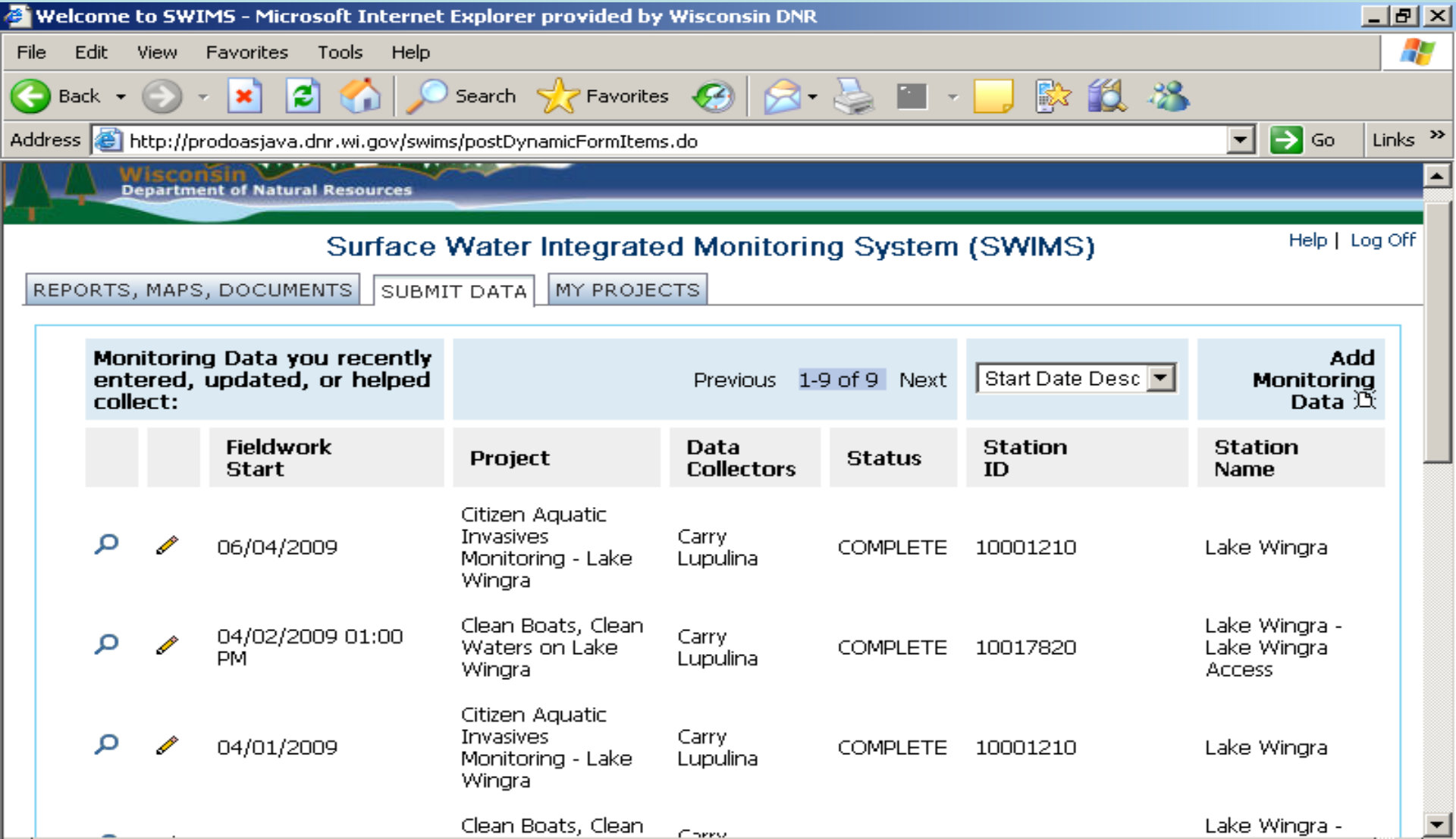
SWIMS Data Entry
AIS Data



SWIMS Data Entry
AIS Data



SWIMS Data Entry
AIS Data



Changes on the web and future invasives

- Jen and the data management crew are always trying to make things easier.
  - Easier reports
  - Easier mapping
  - Easier distribution lists

FW: AIS lists and detail pages - Message (Rich Text)

File Edit View Insert Format Tools Actions Help

Reply Reply to All Forward

This message was sent with Low importance.

From: Filbert, Jennifer M - DNR
To: Herman, Laura J - DNR
Cc:
Subject: FW: AIS lists and detail pages

Sent: Wed 03/17/2010 11:05 AM

Wisconsin Lakes

Lake Information

A to Z Lake List

Search Lakes

Shawano Lake - Banded Mystery Snails

Details of Initial Discovery

Year Found	2008
Found By	BRENDA NORDIN Wisconsin DNR

Banded Mystery Snails on Shawano Lake

Banded Mystery Snails on Shawano Lake (2)

BANDED MYSTERY SNAILS ON SHAWANO LAKE (3)

About Shawano Lake

Waterbody	Shawano Lake
Waterbody ID Code	322800
County	Shawano
Size	6215.37 ACRES
Maximum Depth	42 FEET

More Details >>

Species Profile

Done

Unknown Zone (Mixed) 100%

Wisconsin DNR Surface Water Data Viewer - Windows Internet Explorer provided by Wisconsin DNR

http://dnrmaps.wi.gov/imf/imf.jsp?site=SurfaceWaterViewer

File Edit View Favorites Tools Help

Wisconsin DNR Surface Water Data Viewer

Wisconsin Department of Natural Resources

Surface Water Data Viewer

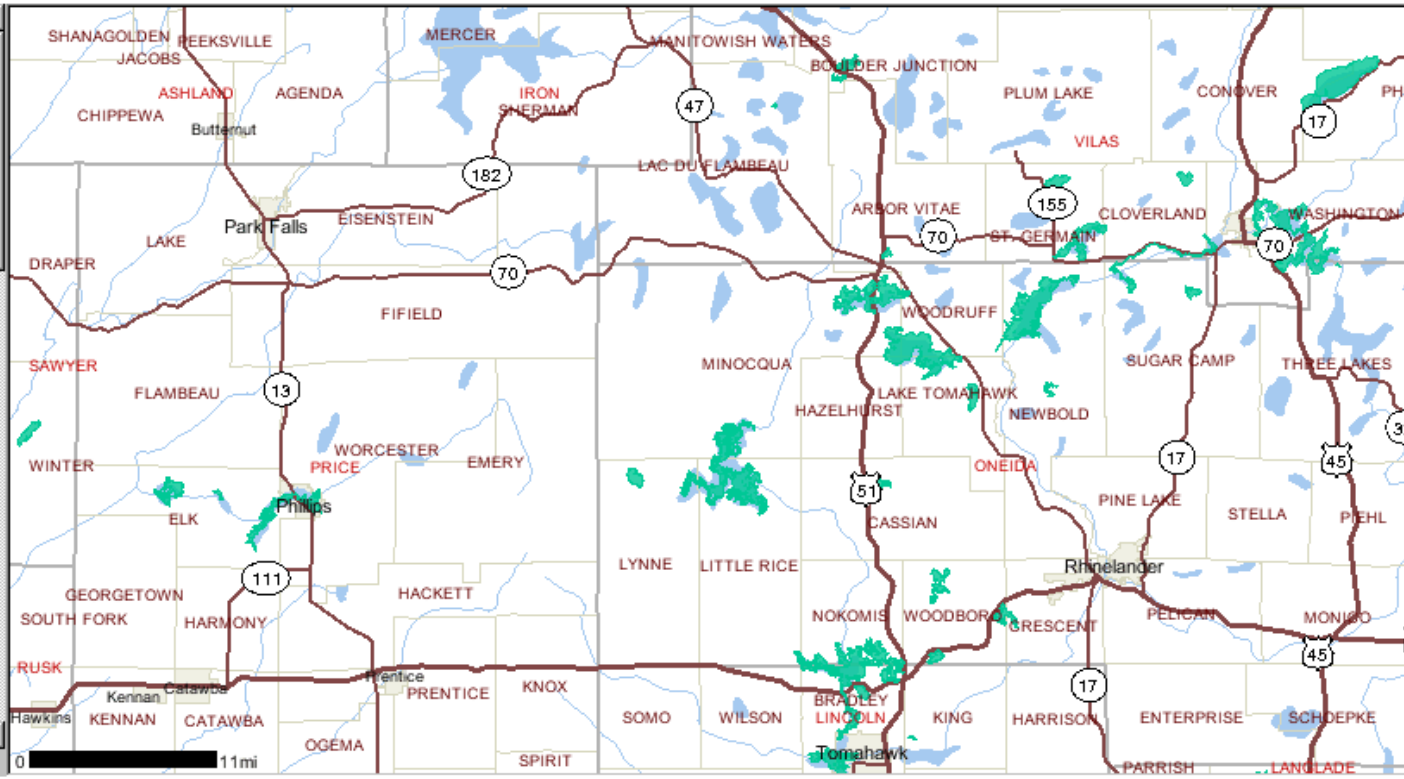
Layers · Legend · Find Location · Themes · Designated Waters · Select · Help · Print

Full State | Zoom In | Zoom Out | Move | Zoom Last | Zoom to... | Identify | Download | Advanc

Map Layers

HELP

- Inland Water Resources
  - Federal Hydrologic Units (HUCs)
  - Wisconsin Buffer Initiative Watershe
  - Watersheds
  - Great Lakes & Mississippi Basins
  - DNR Water Mgmt Units
  - [x] Open Water
  - [x] Rivers and Streams
  - Waterbody Details
- Dam and Floodplain Program
- Fisheries Management Waters
- Aquatic Invasives
  - [x] Eurasian Water-Milfoil
  - Milfoil Hybrid
  - Zebra Mussels
  - Reed Canary Grass Infestations
  - Curly Leaf Pondweed
  - Rusty Crayfish
  - Banded Mystery Snail
  - Chinese Mystery Snail
  - Japanese Mystery Snail
  - Freshwater Jellyfish
  - Rainbow Smelt

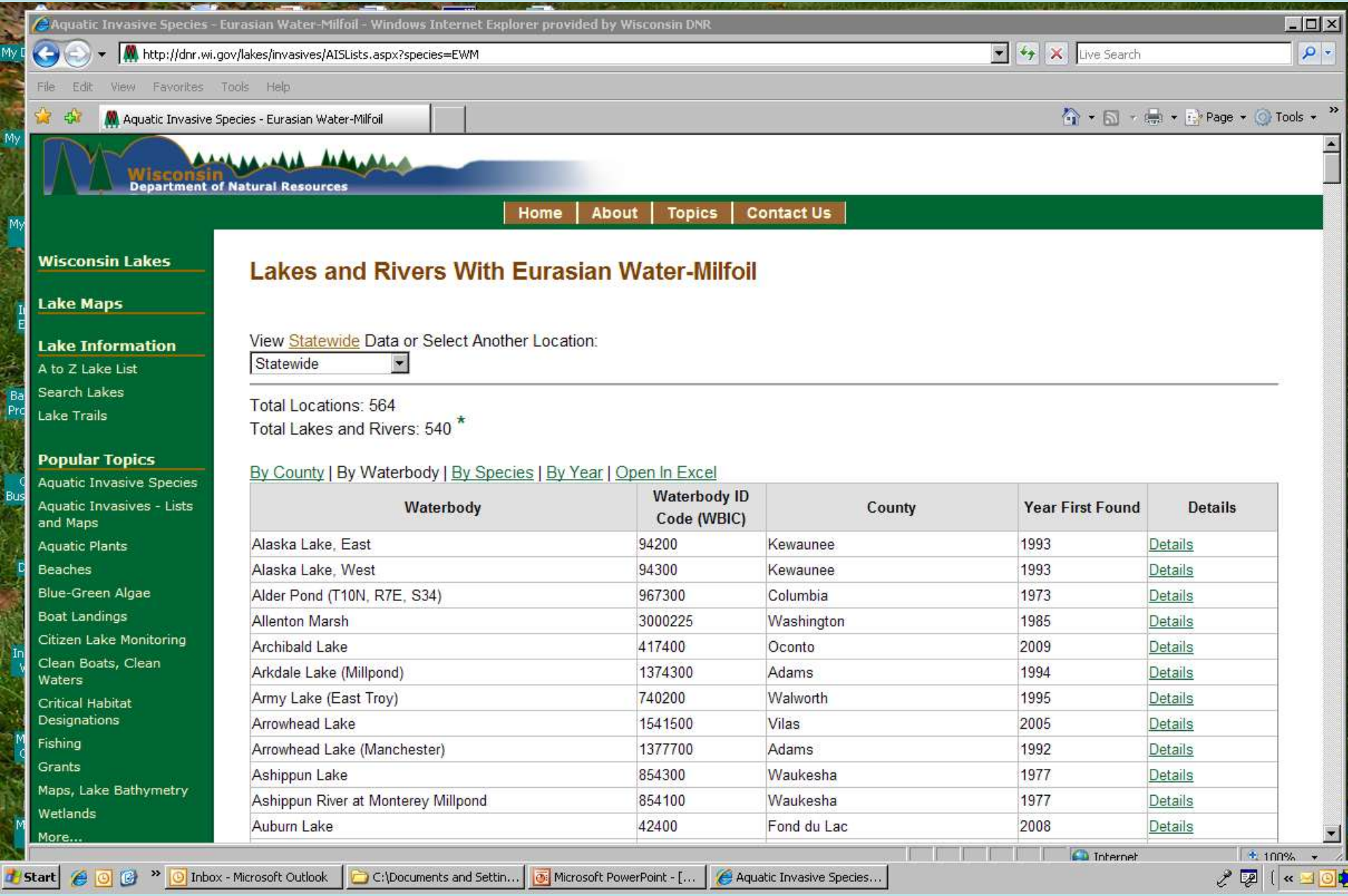


Scale: 1:617,153 go | Quick View: Select a location | Selected Map Tool: Zoom In | Zoom In

| DNR Maps & Aerial Photography | DNR GIS Overview | Division of Water | Remediation and Redevelopment Sites | Comments on this website |

Done | Internet

Start | Inbox - Microsoft ... | C:\Documents and... | Microsoft PowerPo... | Aquatic Invasive S... | Surface Water Dat... | Wisconsin DNR S... | Microsoft Word


Aquatic Invasive Species - Eurasian Water-Milfoil - Windows Internet Explorer provided by Wisconsin DNR
http://dnr.wi.gov/lakes/invasives/AISLists.aspx?species=EWM
Live Search
File Edit View Favorites Tools Help
Aquatic Invasive Species - Eurasian Water-Milfoil
Page Tools
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Home About Topics Contact Us
Wisconsin Lakes
Lake Maps
Lake Information
A to Z Lake List
Search Lakes
Lake Trails
Popular Topics
Aquatic Invasive Species
Aquatic Invasives - Lists and Maps
Aquatic Plants
Beaches
Blue-Green Algae
Boat Landings
Citizen Lake Monitoring
Clean Boats, Clean Waters
Critical Habitat Designations
Fishing
Grants
Maps, Lake Bathymetry
Wetlands
More...
Lakes and Rivers With Eurasian Water-Milfoil
View Statewide Data or Select Another Location:
Statewide
Total Locations: 564
Total Lakes and Rivers: 540 *
By County | By Waterbody | By Species | By Year | Open In Excel
Waterbody
Waterbody ID Code (WBIC)
County
Year First Found
Details
Alaska Lake, East 94200 Kewaunee 1993 Details
Alaska Lake, West 94300 Kewaunee 1993 Details
Alder Pond (T10N, R7E, S34) 967300 Columbia 1973 Details
Allenton Marsh 3000225 Washington 1985 Details
Archibald Lake 417400 Oconto 2009 Details
Arkdale Lake (Millpond) 1374300 Adams 1994 Details
Army Lake (East Troy) 740200 Walworth 1995 Details
Arrowhead Lake 1541500 Vilas 2005 Details
Arrowhead Lake (Manchester) 1377700 Adams 1992 Details
Ashippun Lake 854300 Waukesha 1977 Details
Ashippun River at Monterey Millpond 854100 Waukesha 1977 Details
Auburn Lake 42400 Fond du Lac 2008 Details
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Aquatic Invasive Species...

Data entry pilot (2011?)

- I-Phone & Palm pilot technology

Pros
•Uses the infrastructure we have set up in SWIMS (security, etc.)
•Can avoid programming for specific brands of phones
•Would automatically work for all of our data entry forms (Secchi, AIS, River monitoring, Loons, etc).
•Cost to develop would be minimal

Cons
Would require user to have
• phone/PDA with a Data Plan & Access to a 3G network or Wi-Fi
•3G coverage will be more widely available & more folks will have the phones by the time we have pilot complete
•Sometimes a 3G network would NOT be accessible @ a landing. Inspector would have to resort to paper/entering the data later
•A phone & data plan costs money.

Any Interest?

Newer Invasives to Wisconsin

- Red Swamp Crayfish
- Brazilian Waterweed
- Yellow Floating Heart

Red Swamp Crayfish

- Dark red in color (a genetic mutation may turn the body and/or claws blue)
- Raised bright red spots covering the body and claws
- Black wedge-shaped stripe on the top of the abdomen
- Vary in length from 2 to 5 inches.
- Prefer marshes, swamps, ponds and slow moving rivers and streams, but have become established in lakes. They are tolerant of fluctuating water levels and can survive long dry spells by remaining in burrows or crawling over land to other water sources.
- Mate in autumn and lay eggs in spring to early summer.
- The number of eggs varies with the size of the female, (as many as 650 eggs at a time).
- Distribution in Wisconsin in 2009 - ponds in German Town, Washington Co. and City of Kenosha, Kenosha Co.

Brazilian Waterweed

- **Stems can reach 15 feet in length.**
- **Leaves arranged in whorls of 4-6 leaves. Leaves are ¾ - 2 inches long & serrated.**
- **Leaves are attached directly to the stem. and often curve downwards.**
- **Adventitious roots are freely produced on the stem.**
- **Plant Reproduces by stolons & stem fragments.**
- **Plant forms dense mats. <u>It can out compete Eurasian water milfoil</u>.**

Look-alikes: hydrilla (AIS) and our native waterweeds (Elodea canadensis & Elodea nuttallii)

Brazilian waterweed, a top selling aquarium and pond plant, is often sold under the name Anacharis and is also known as Brazilian elodea or "oxygenating plant". It is believed to have been introduced in the United States by the aquarium trade.

Found in one pond in Portage Co.

Yellow Floating-Heart

- Circular to slightly heart shaped floating leaves are 1-6” in diameter. Leaf edges are slight wavy or scalloped
- Leaves are green to yellow-green above, and are often purple underside
- Yellow flowers arise above the water surface
- The fruit is a ½-1” beaked capsule that contains many flat, seeds with winged margins (which help with floatation and attachment to avian vectors)

- Prefers slow moving rivers, lakes, reservoirs and ponds, but can also grow in damp mud, swamps and wetlands.
- Look-a-likes - water lilies, Spadderdock and Watershield
- Yellow-floating heart is a popular water garden plant. In areas where it has been introduced, it has often become the dominant plant species.
- Yellow-floating heart is very difficult to control due to its ability to form a new plant from rhizomes, stolons, separated leaves, or seeds.