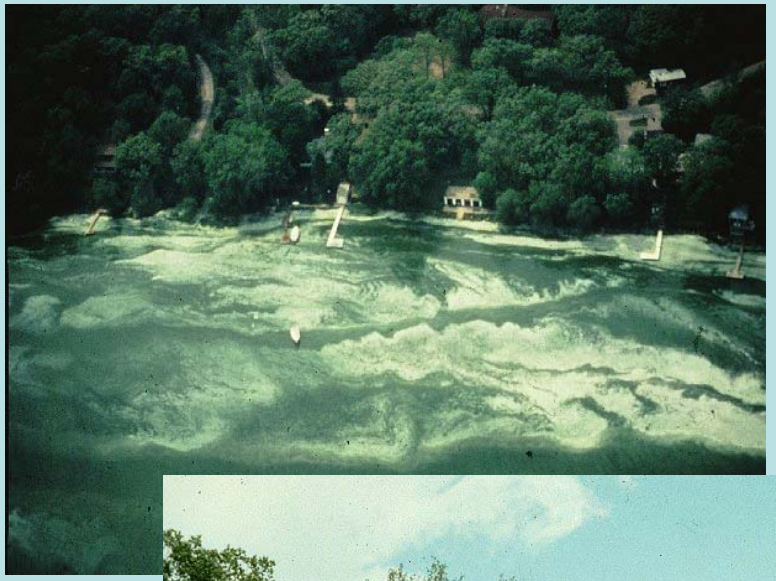
Citizen Lake Monitoring Network

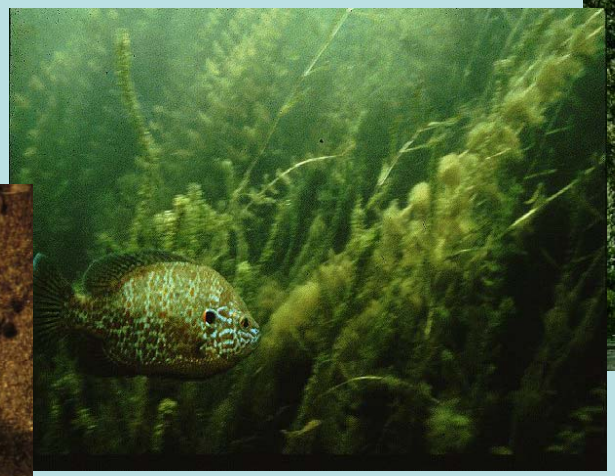
Wisconsin's Lakes are Changing Faster than Ever:

Algae blooms
(phosphorus pollution)

Destruction of
shoreline habitat

Invading plants and animals





Steve Carpenter 2004

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

Aquatic Invasive Species Monitoring

We are after

- Better state coverage
- More volunteers
- Consistency
- Approved protocols
- More species

What do we want to 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!!

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

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

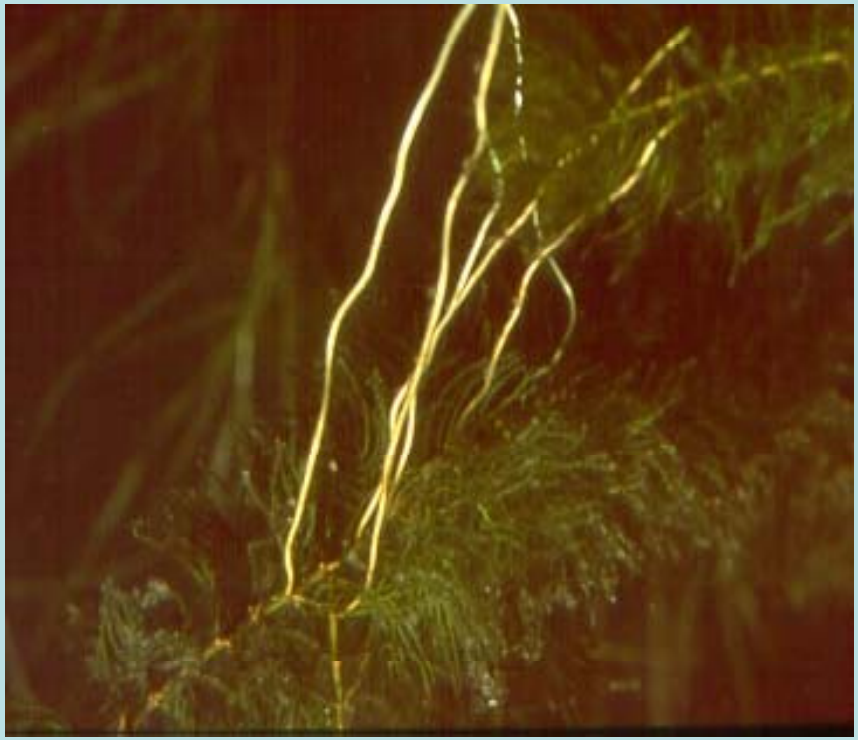
Eurasian Water-milfoil

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



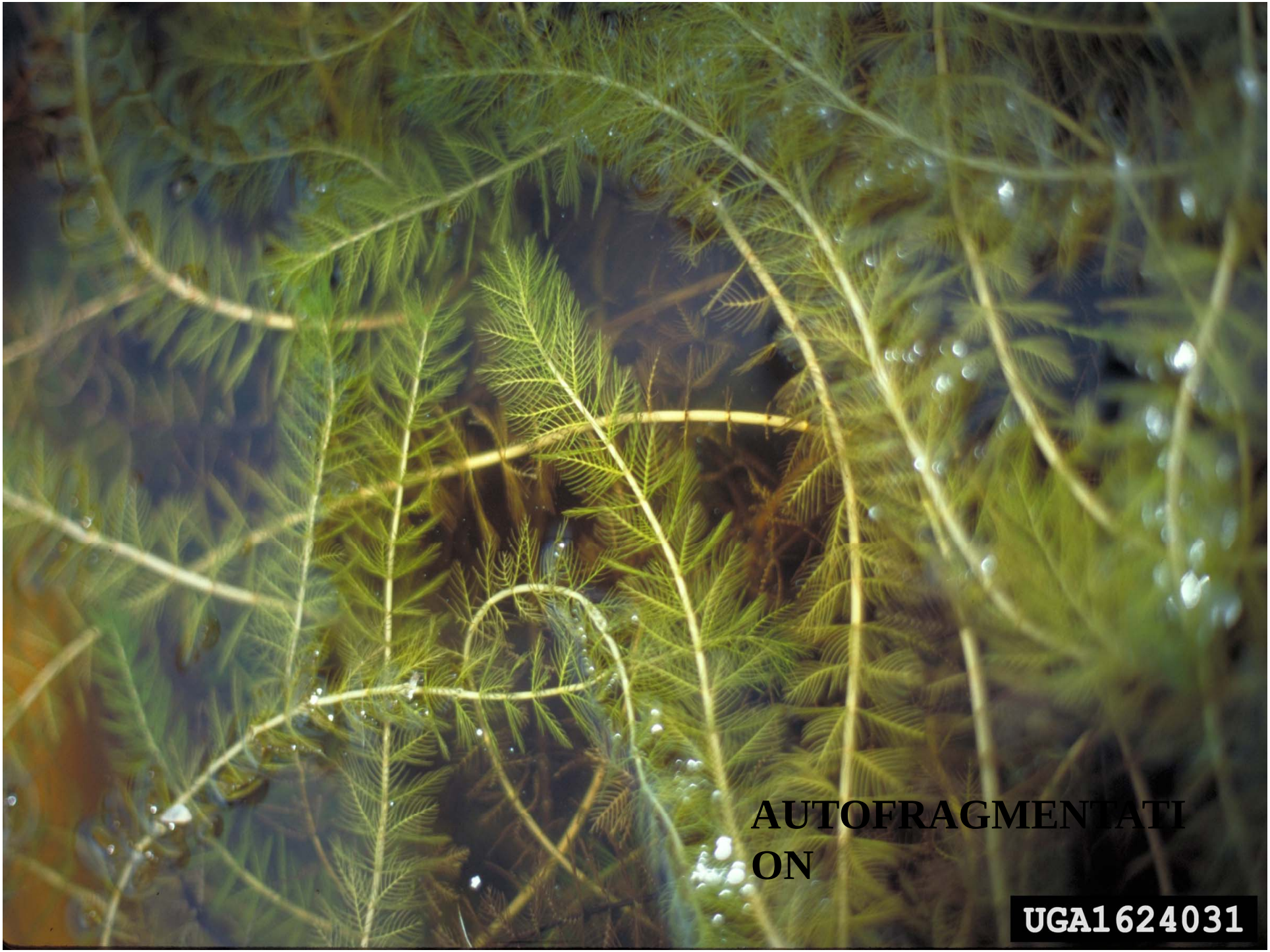
EWM

- 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


LIBERTY
IN GOD WE TRUST
1999

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

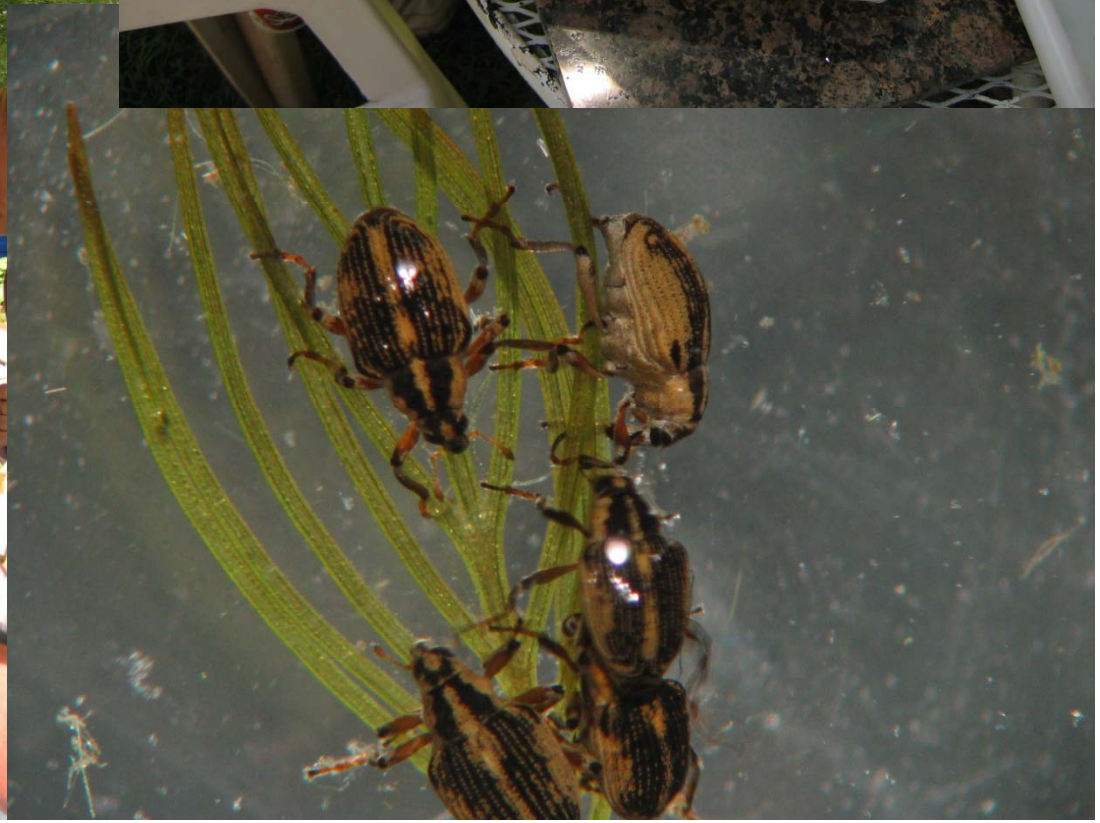
2008 – Pilot study
Refined & statewide in 2009

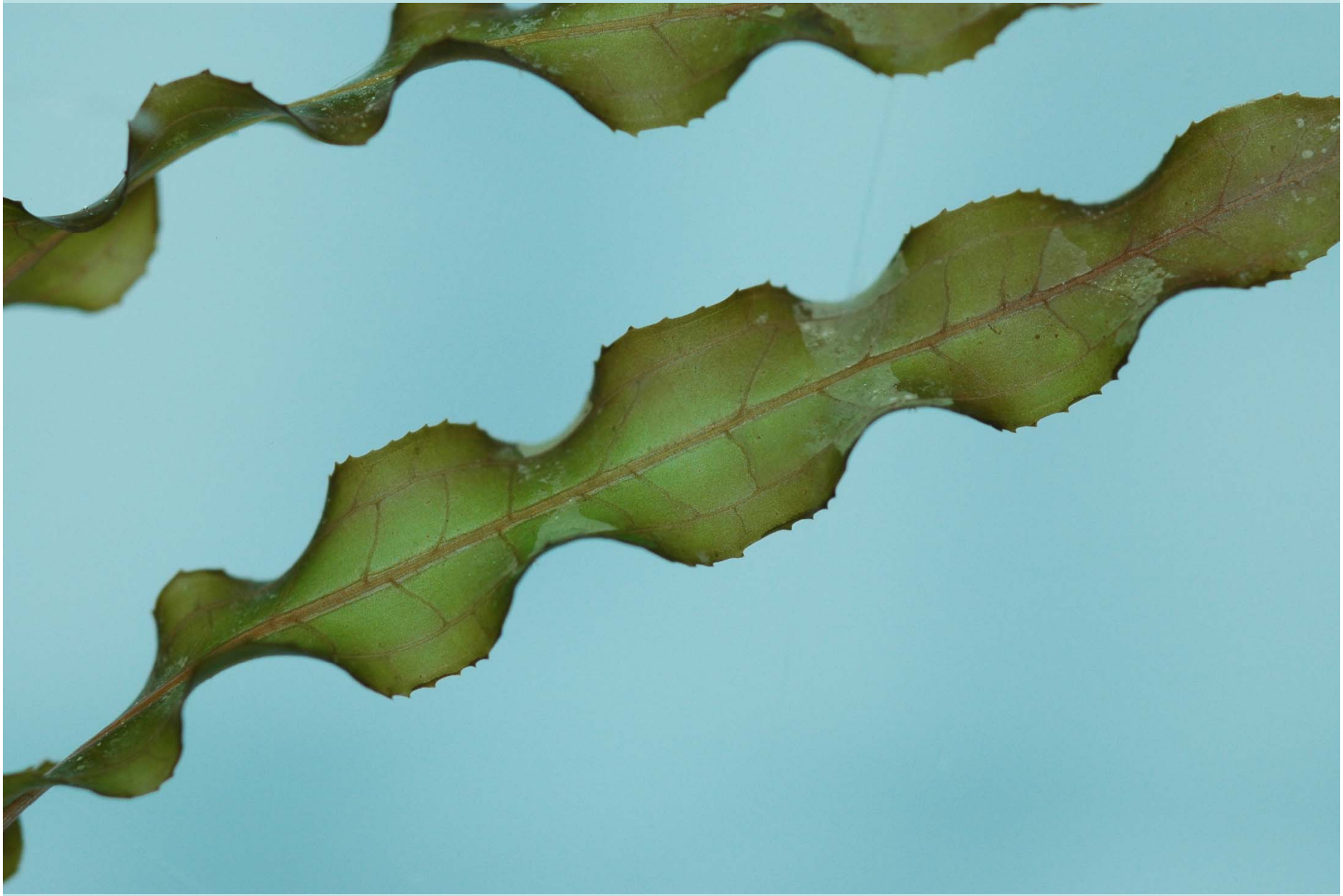
Eurasian water-milfoil Weevil Monitoring

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.


AQUAFINA





Loosestrife Watch Program

Where to Look

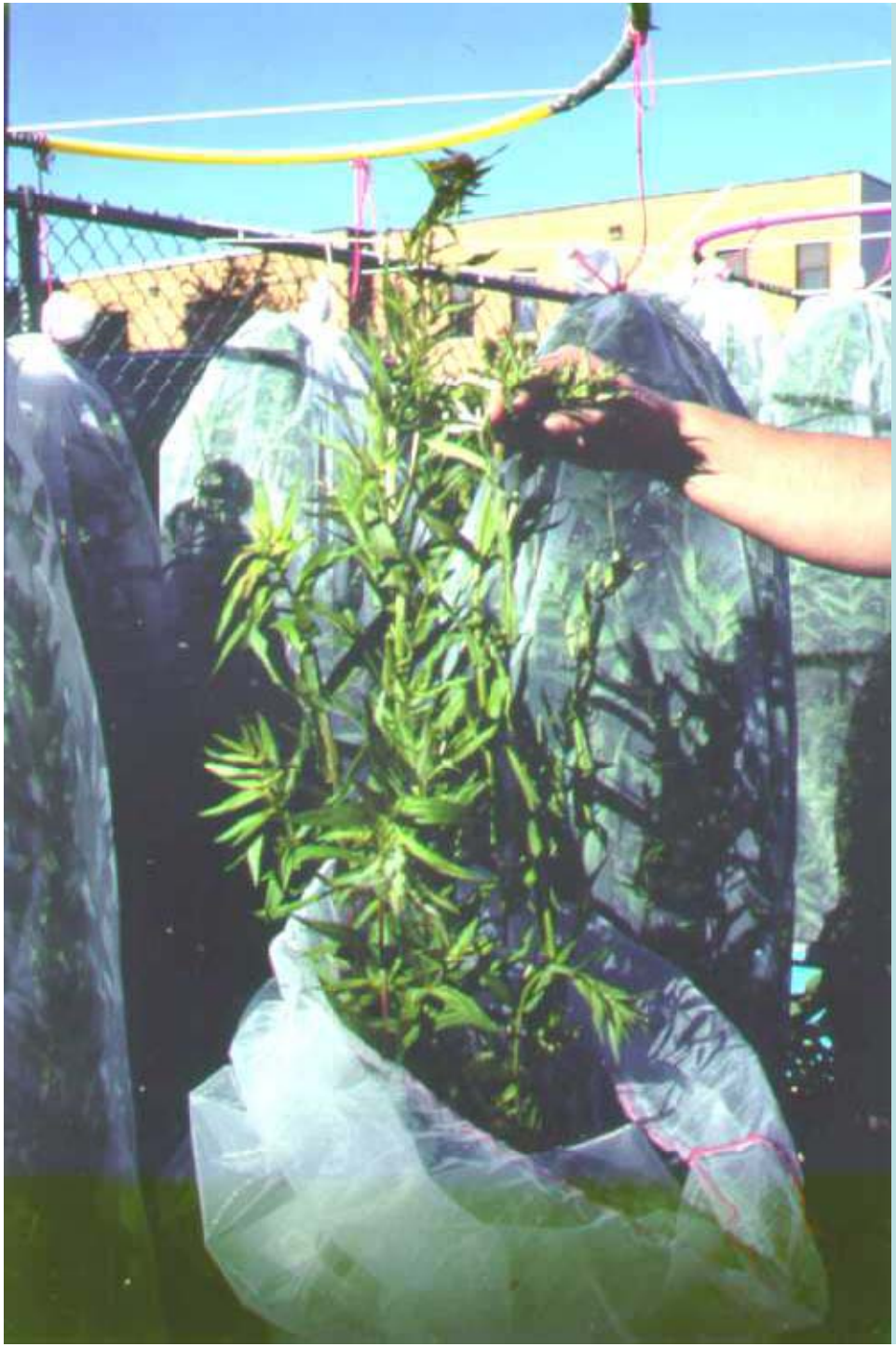
- Roads
- Hiking trails
- Lake Shore
- Streams

Raising Galerucella Beetles

DIGGING

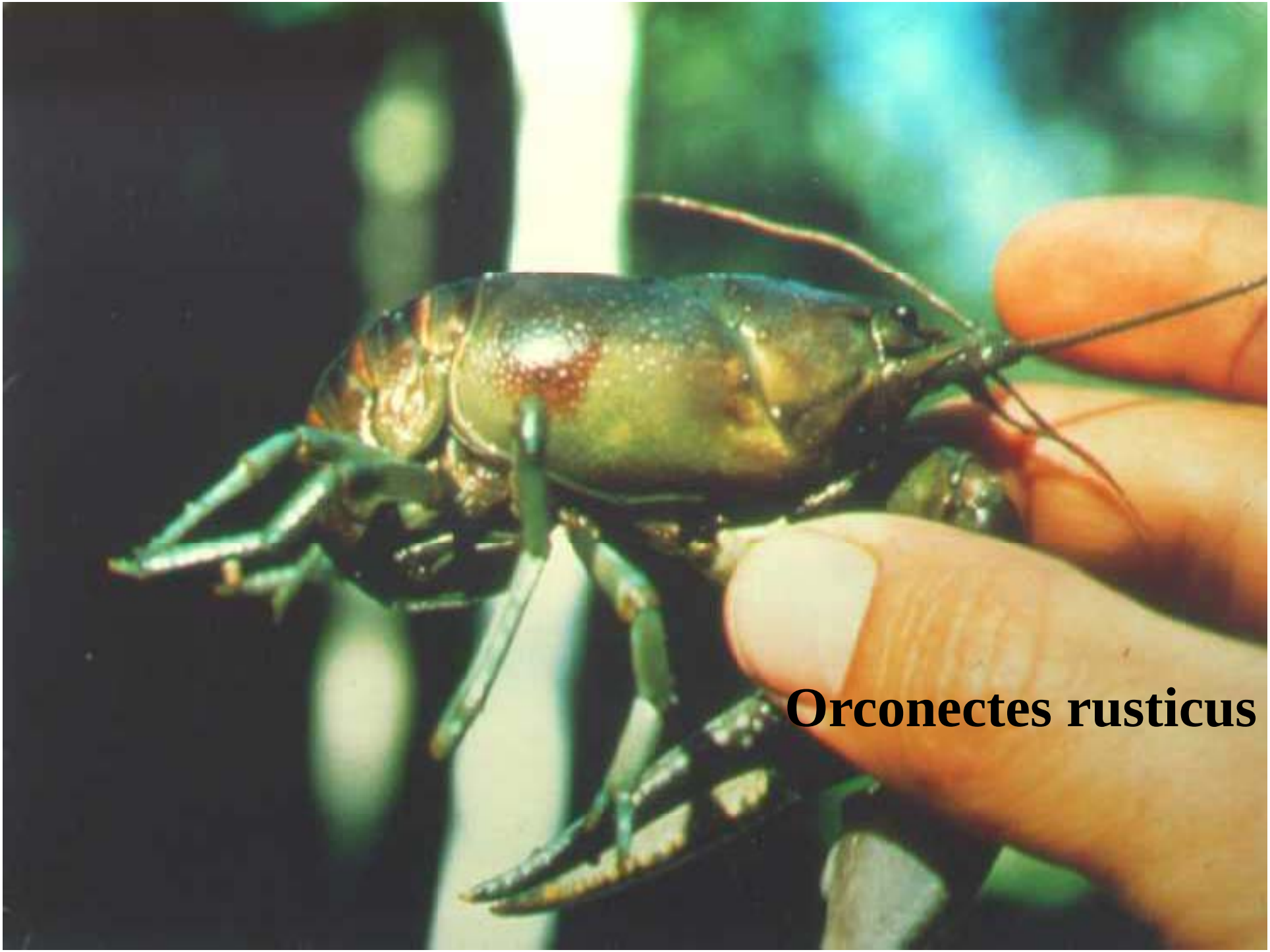
PLANTING

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


Orconectes rusticus

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

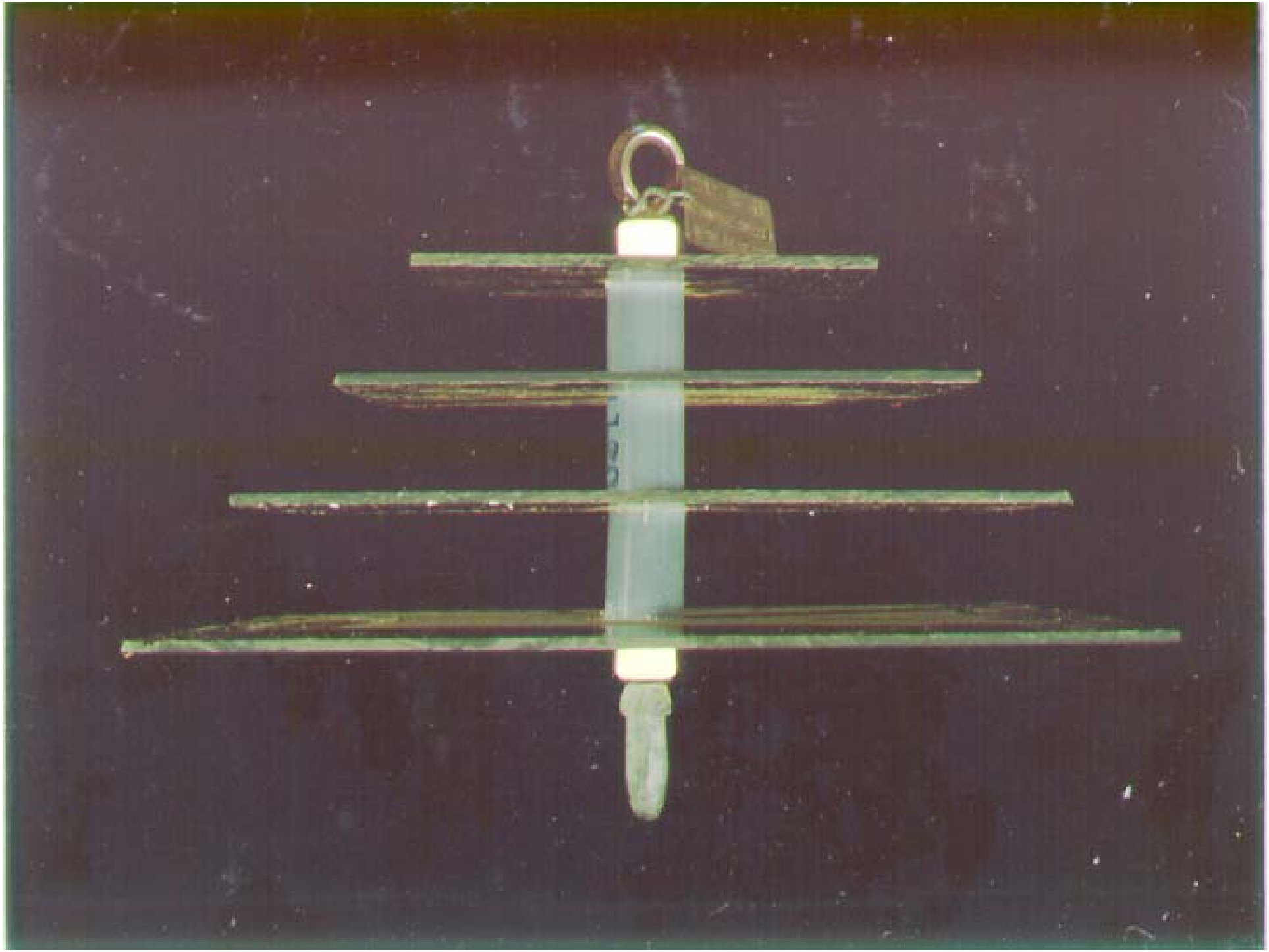

FRABILL


16 8:49 AM

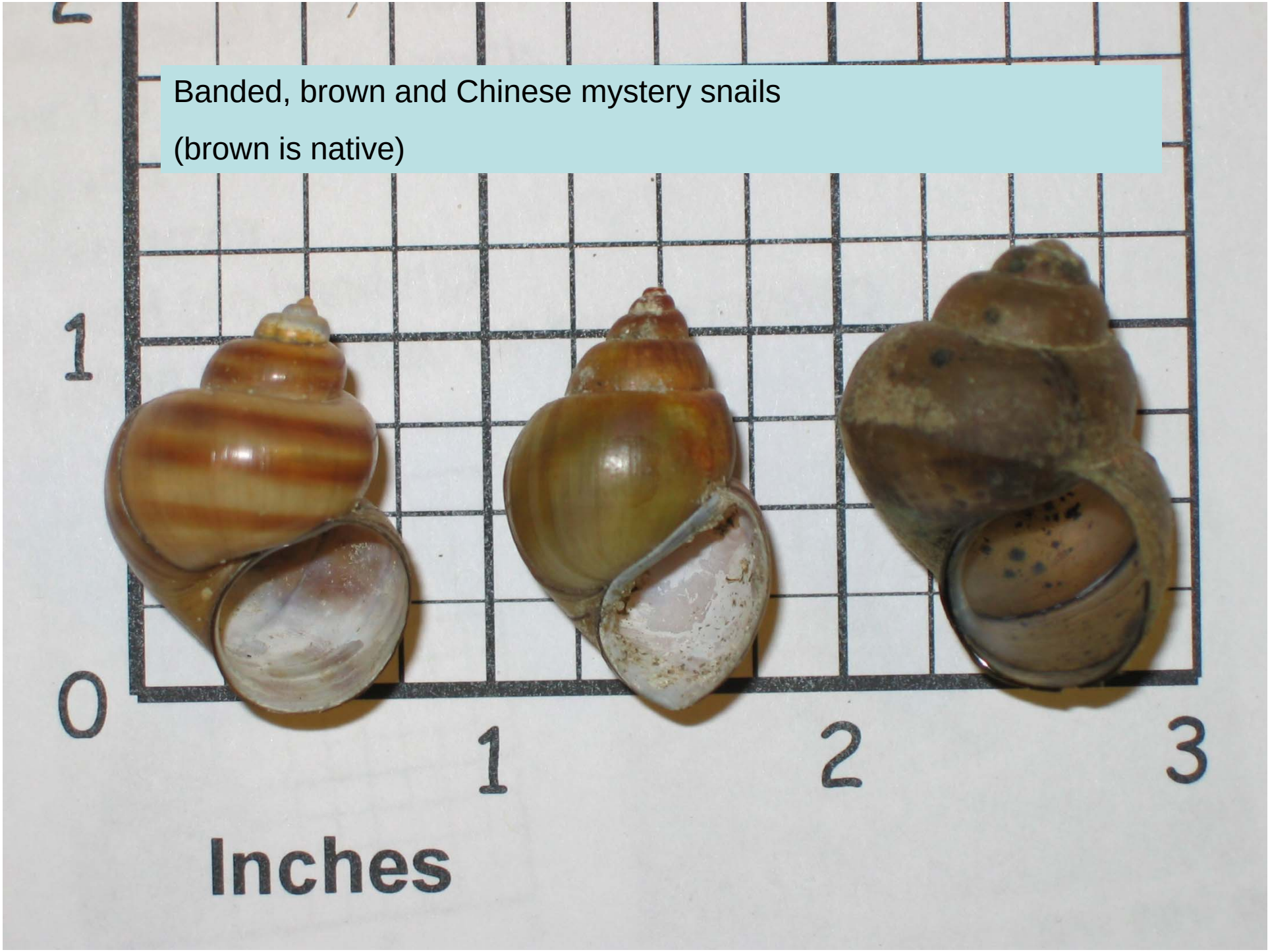

16 6:51 AM

Quagga on the left and zebra mussel on the right. Note the round hinge edge on the Quagga as compared to the flat hinge area on the zebra mussel.

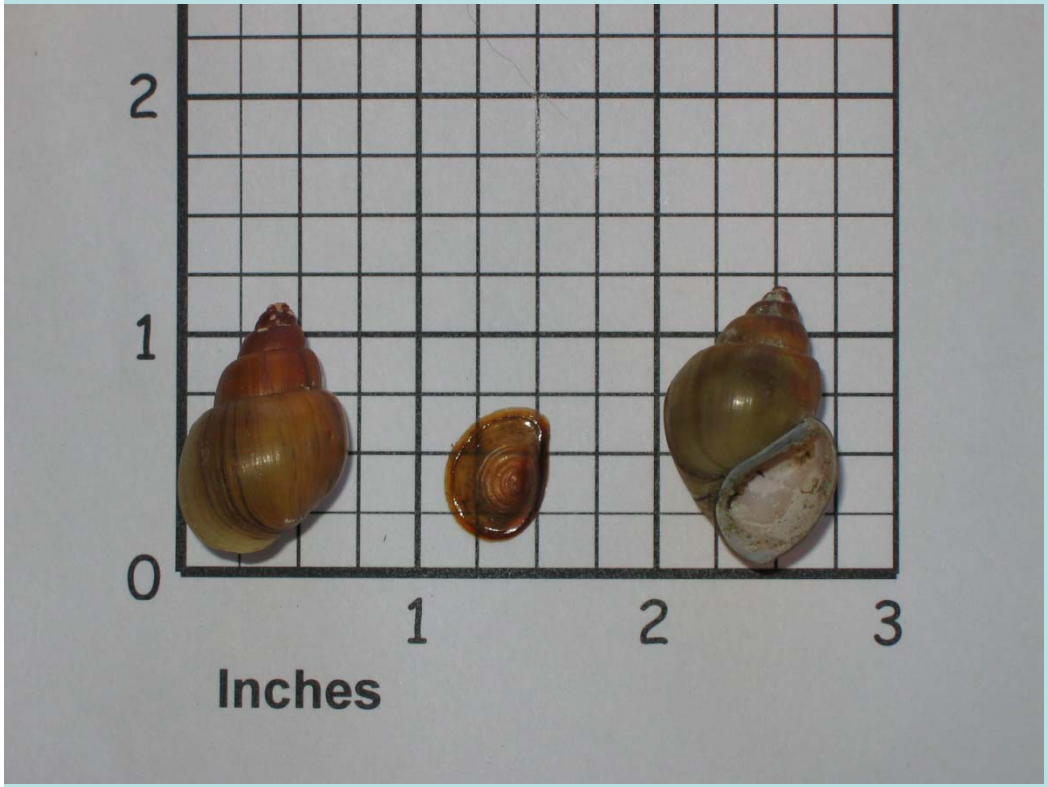
Quagga mussel on the left and zebra mussel on the right.



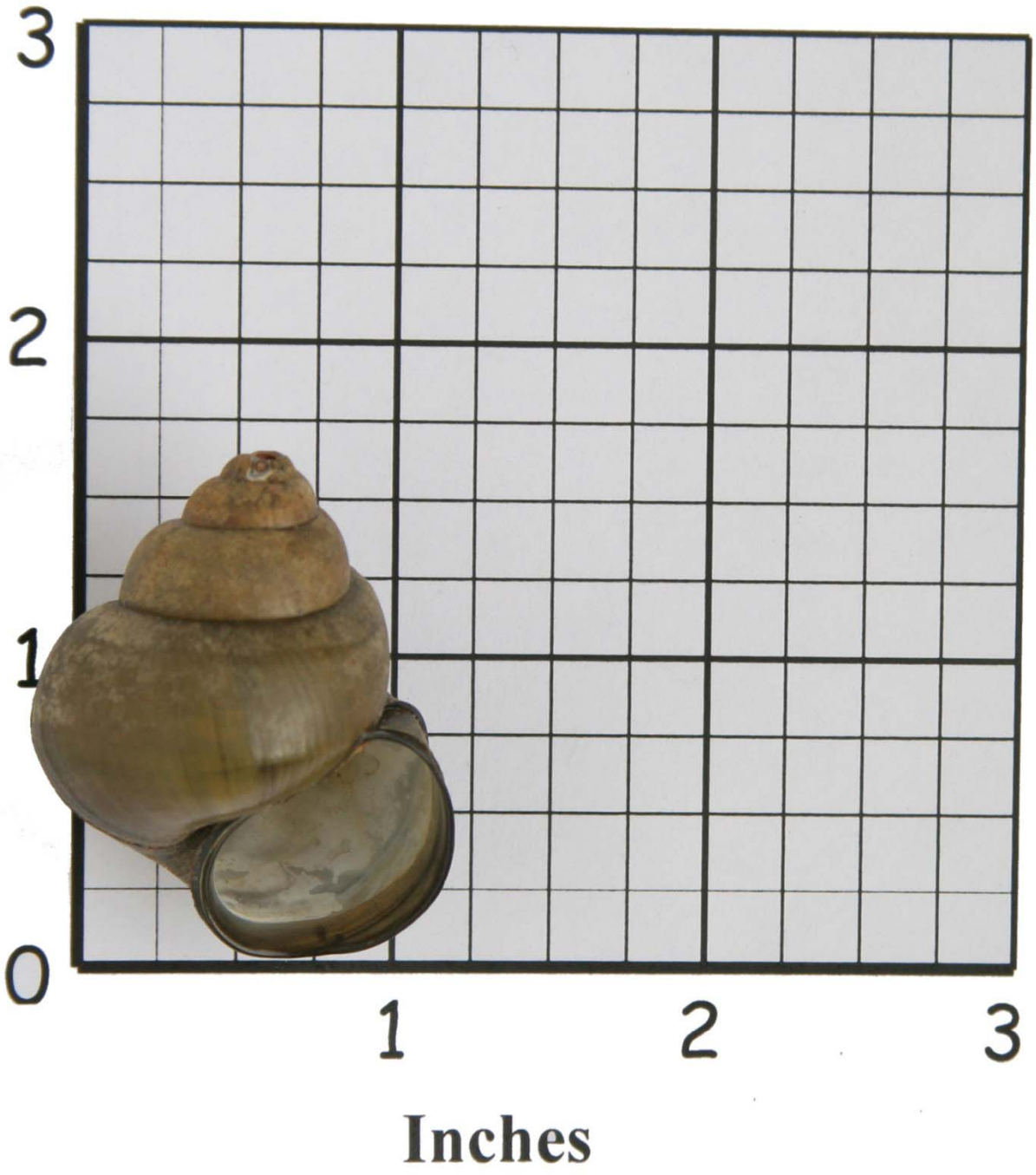

17 6/97


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

Brown Mystery Snail – Native to Wisconsin



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



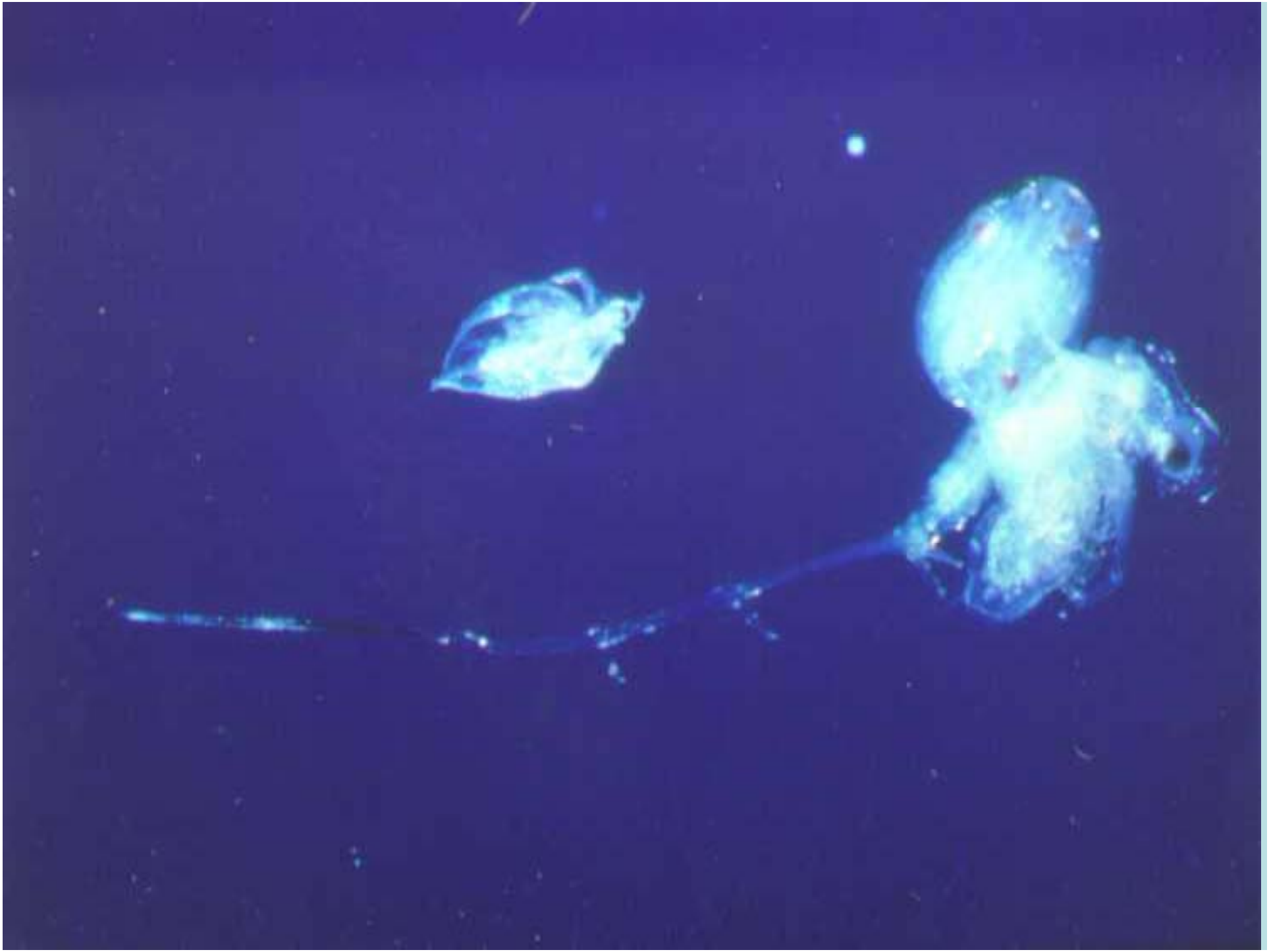
Chinese Mystery Snail

- 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

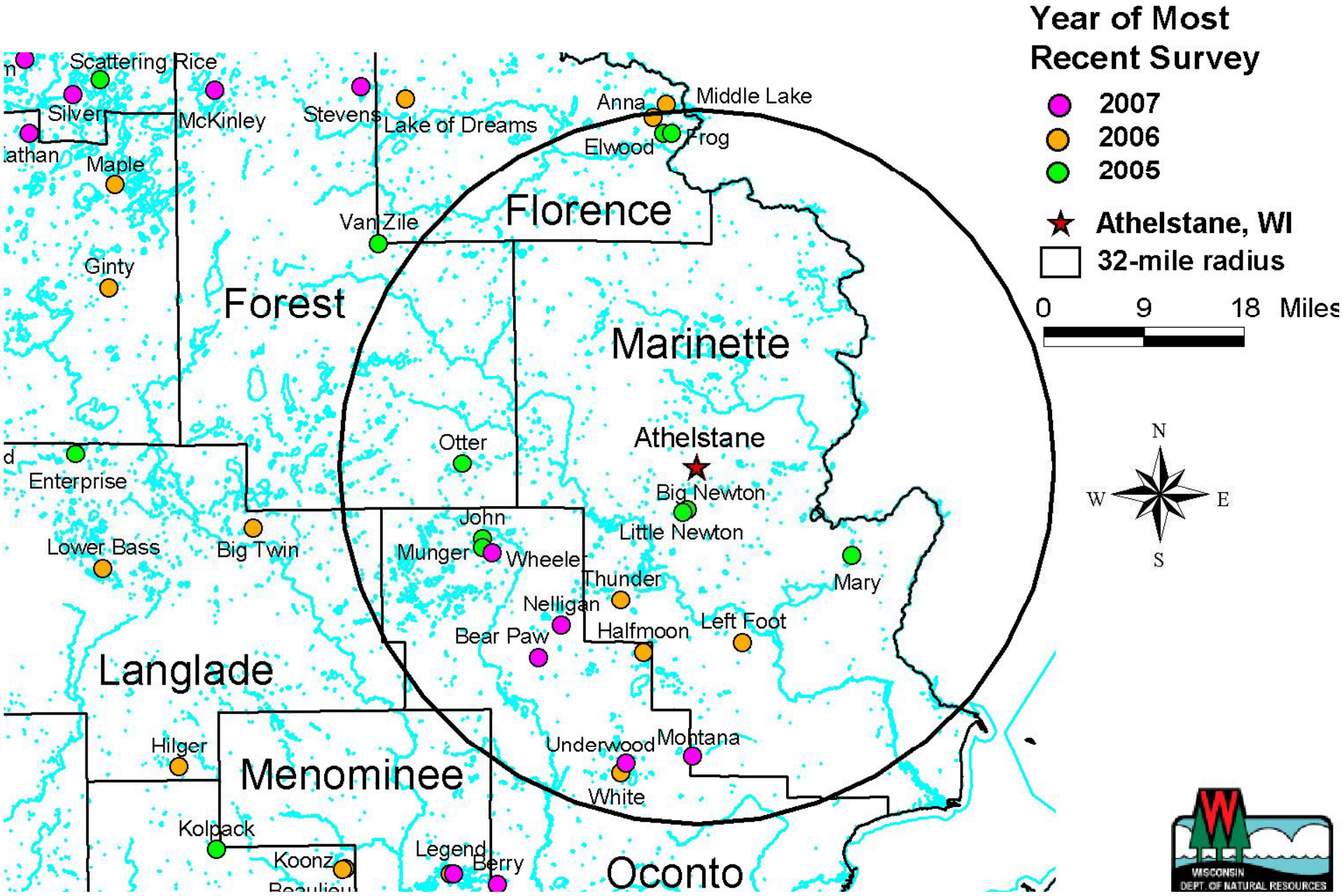


Freshwater jellyfish

Wisconsin's Newest Nasty!

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

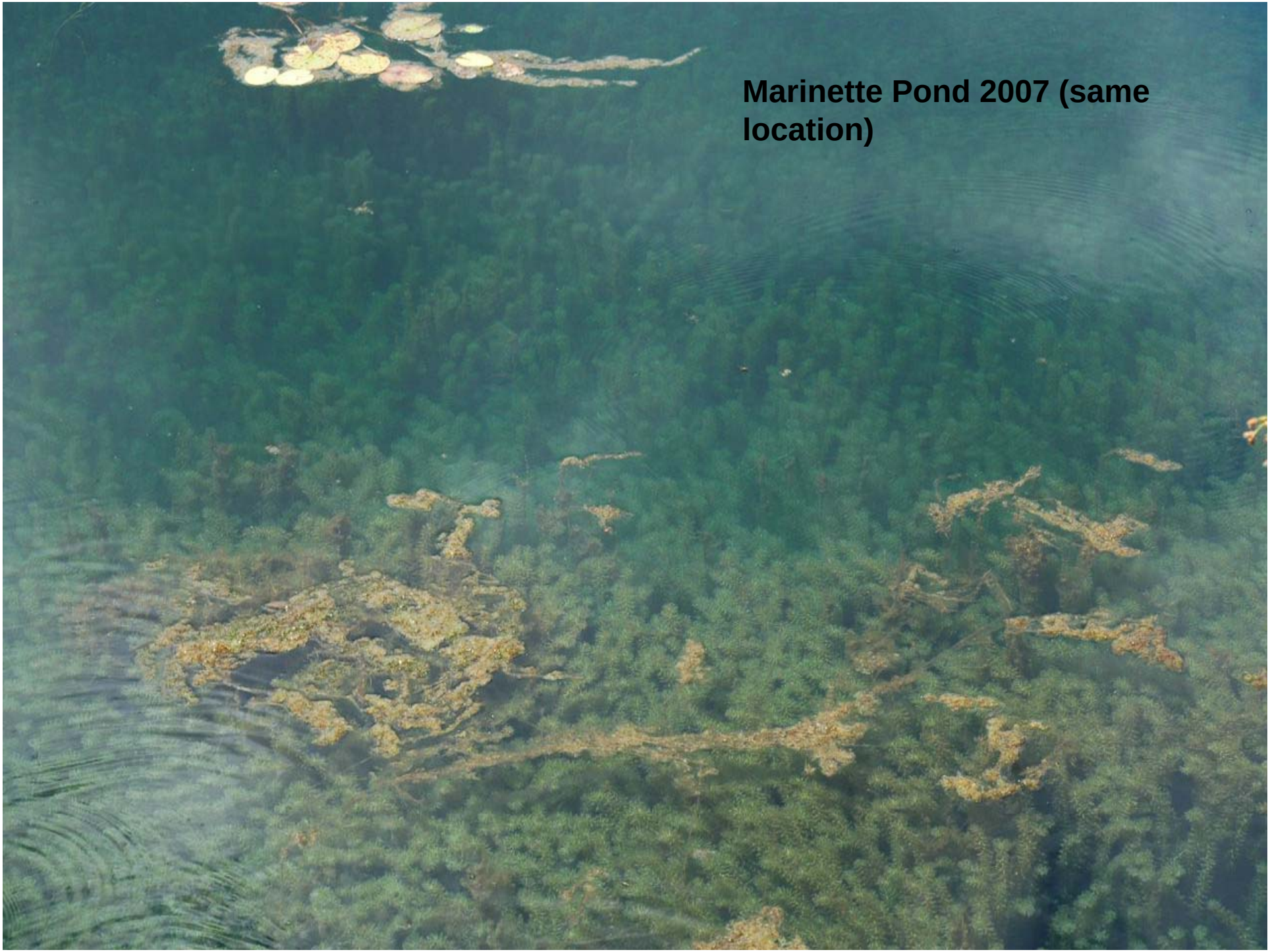
Hydrilla turions showing scale

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

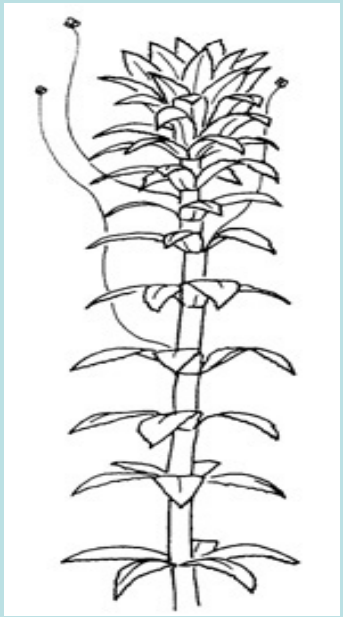
Commonly mistaken for elodea.

Brazilian elodea “egeria” in MN a look alike

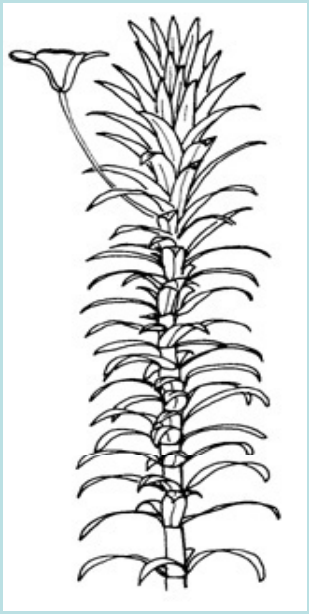
Key is 5 + whorls and spines. Not a vigorous looking plant , initially.

Nut like tubers are only hydrilla

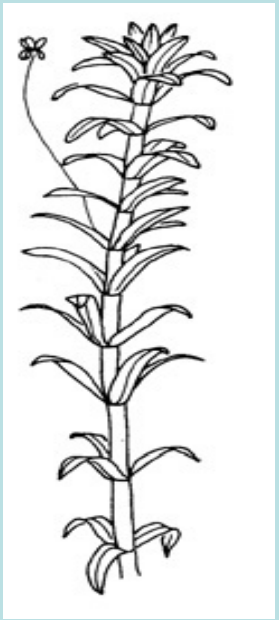
Hydrilla



Egeria



Elodea



Upper left: Hydrilla

Above: Egeria

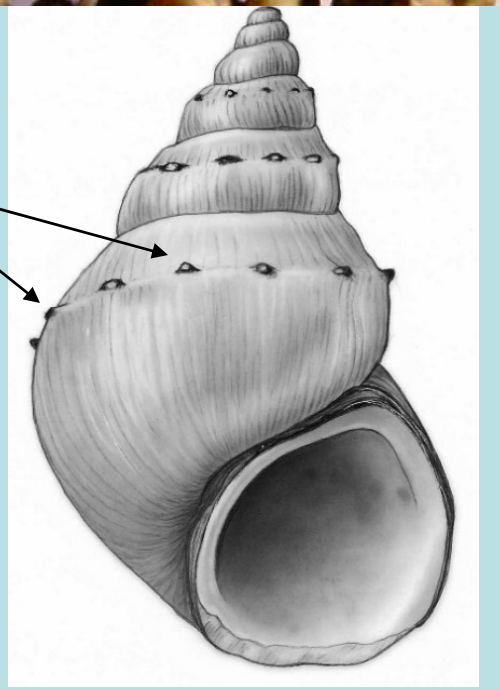
Left: Elodea Canadensis

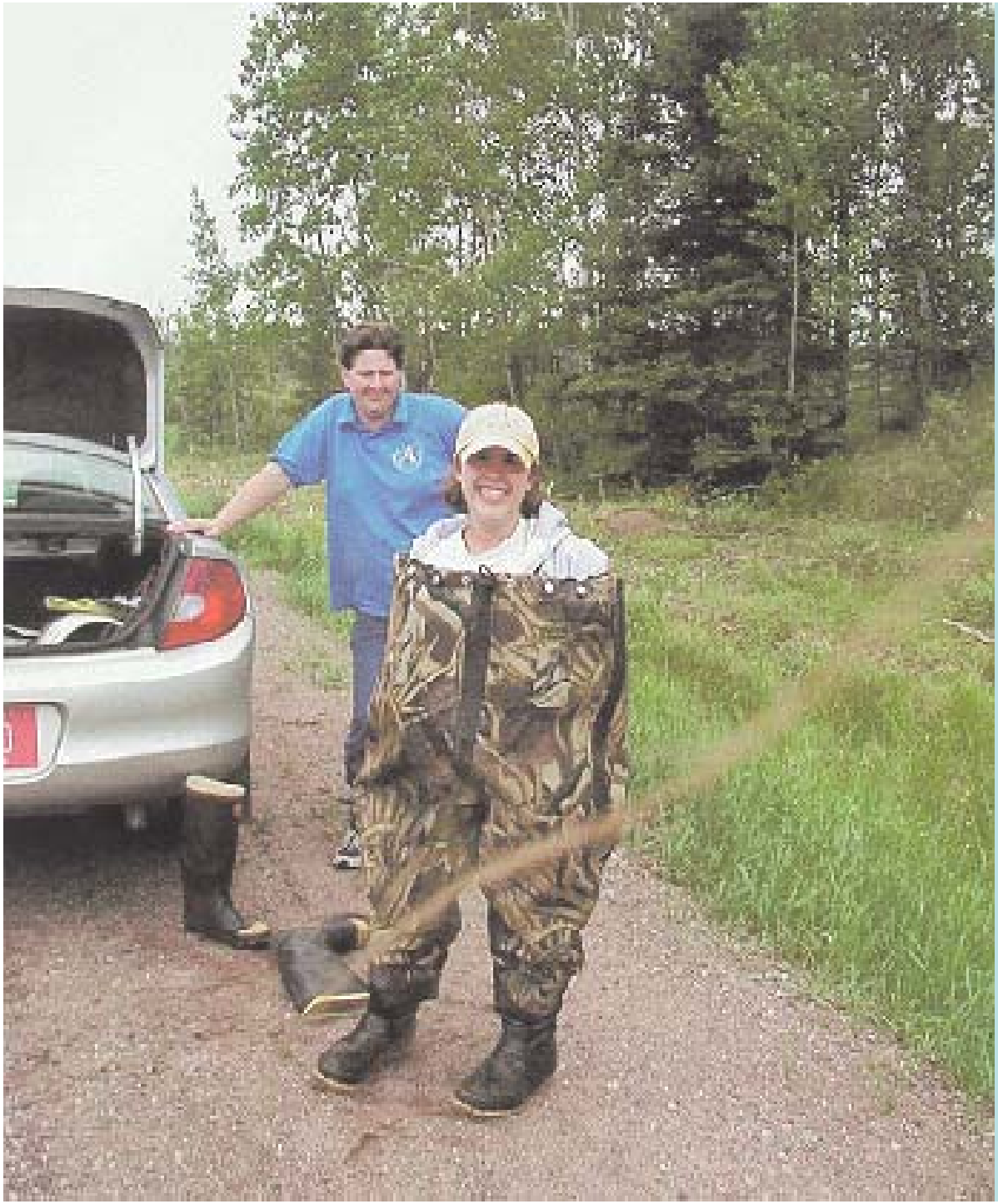
New Zealand mudsnail

- St Louis River harbor (Duluth Superior Harbor)
  - 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.