

A close-up photograph of a hand holding a dark, textured mussel shell. The shell is dark brown to black with some lighter, yellowish-green patches. The hand is holding the shell from the right side, with the thumb and fingers visible. The background is a blurred, greyish-blue water surface.

# Wisconsin Mussel Monitoring Program

*Wisconsin Lakes and Rivers Convention*

[jesse.weinzinger@wisconsin.gov](mailto:jesse.weinzinger@wisconsin.gov)

A close-up photograph of a hand holding a dark, textured mussel shell. The background is a blurred body of water. The text is overlaid on the image.

# Wisconsin Mussel Monitoring Program

*1) Ecology and Conservation*

*2) Identification*

*3) Monitoring*

A close-up photograph of a hand holding a dark, textured mussel shell. The shell is dark brown to black with some lighter, concentric growth lines. The hand is positioned in the lower right, with fingers visible. The background is a blurred, greyish-blue body of water.

# Wisconsin Mussel Monitoring Program

*Ecology and Conservation*

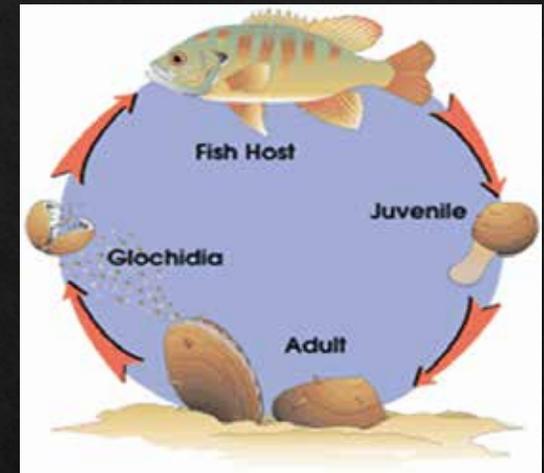
# Why Should We Care?

## Indicators of aquatic health

- Complex life cycle
- Long-lived, slow growing
- Sensitive to change within lakes/streams

## Ecological services

- Improve water quality
- Decrease algal blooms
- Improve substrate health and diversity
- Food source for mammals, birds, fish, etc...
- Build resilience against exotic bivalves





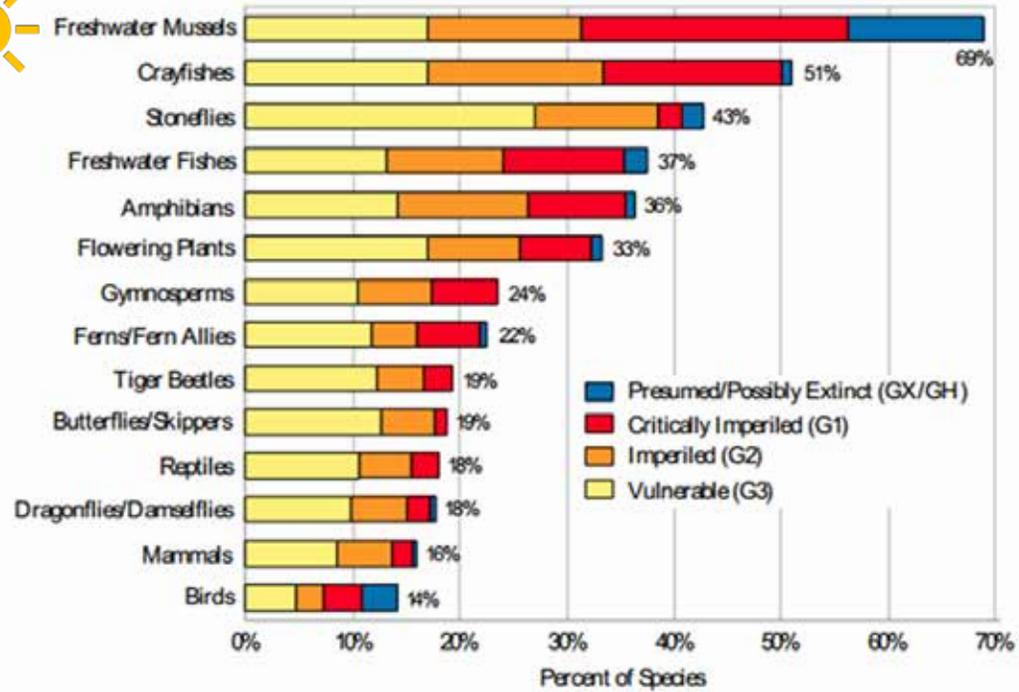
# ! More Reasons to Care !



Minnow  
Worm  
Fly  
Crayfish

Catch &  
Release





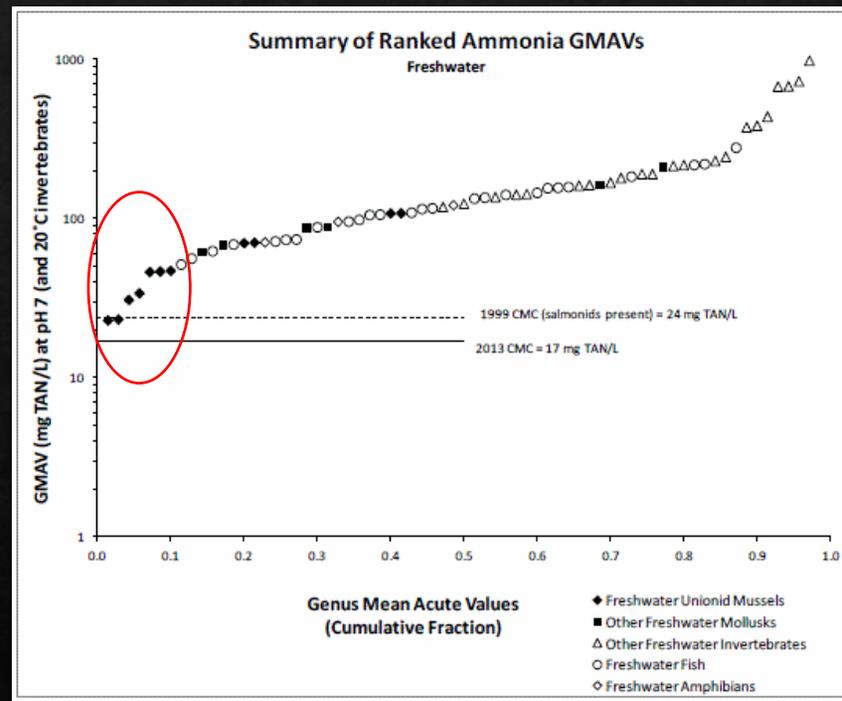
# Mussel Status

## Wisconsin

24 of 50 species listed

## Threats

- ◇ Habitat degradation
- ◇ Connectivity barriers
- ◇ Thermal tolerances
- ◇ Invasive species



# Wisconsin Mussel Monitoring Program



**iNaturalist.org**

# WMMP Activities

## NRF Field Trips



## Salvage



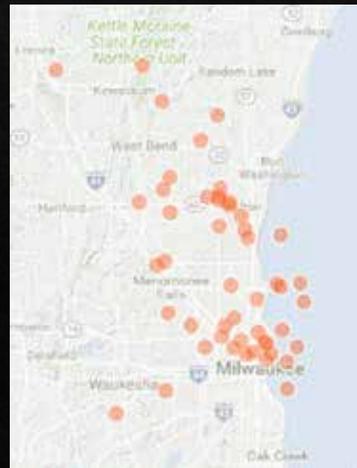
## Mussel Blitz



## Reintroduction



## Assessments



# Questions?





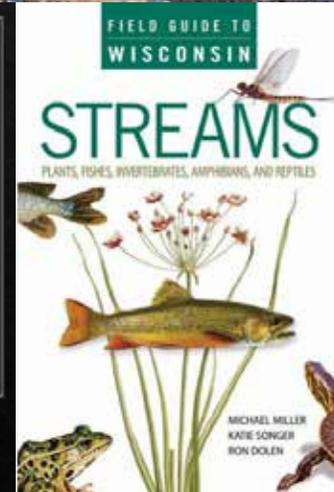
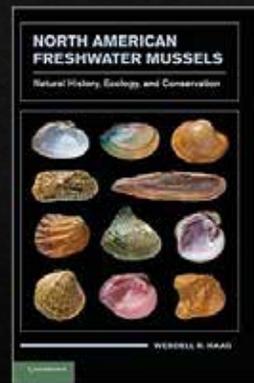
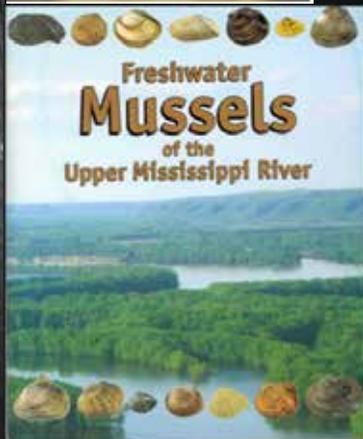
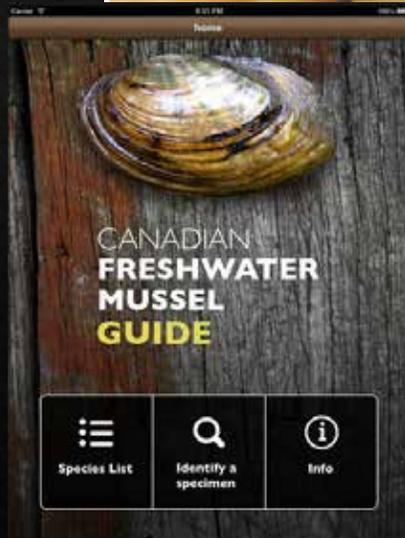
A close-up photograph of a hand holding a dark, textured mussel shell. The shell is dark brown to black with some lighter, fibrous-looking areas. The hand is positioned in the foreground, with the fingers visible. The background is a blurred body of water.

# Wisconsin Mussel Monitoring Program

## *Identification*

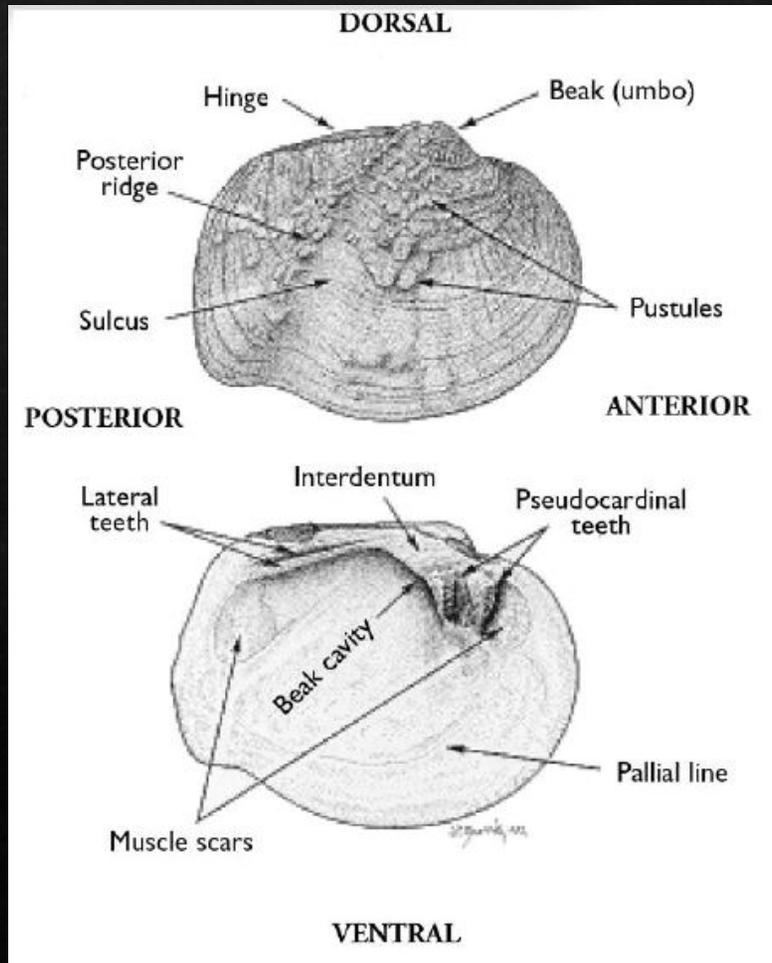
[jesse.weinzinger@wisconsin.gov](mailto:jesse.weinzinger@wisconsin.gov)

# Resources



iNaturalist.org

# General Structure



## Smile at the camera!

- ◆ Side view for identification
  - ◆ Place mussel flat in-hand
- ◆ Interior view of dead shell
- ◆ Use an object for scale
- ◆ Guides are available on our website



Fatmucket



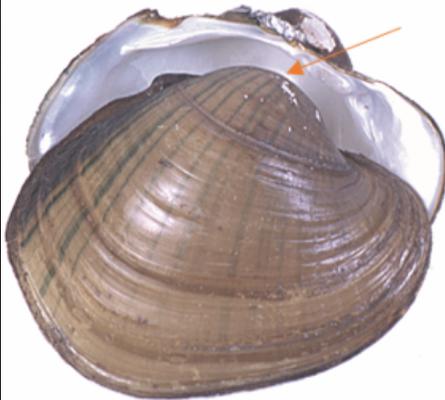
Wabash Pigtoe



Giant Floater



Plain Pocketbook



Lilliput



Flutedshell



Spike



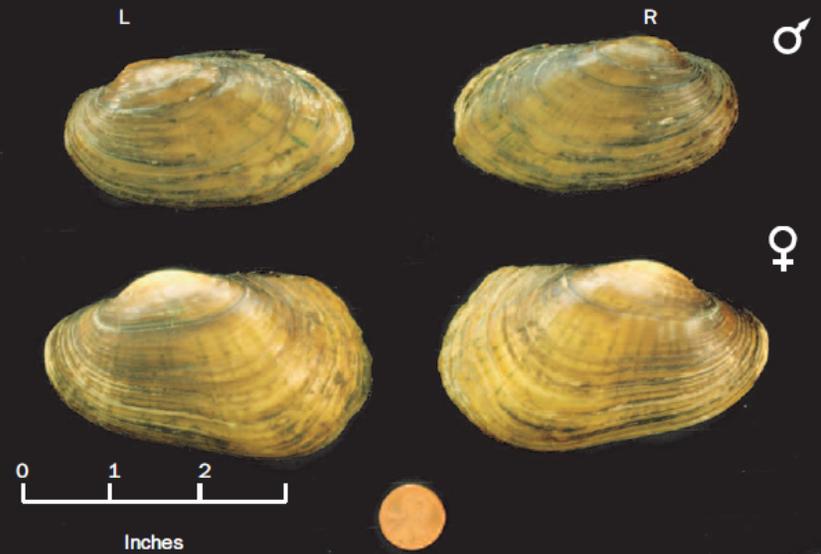
## Fatmucket (*Lampsilis siliquoidea*)

Habitat: Widespread but commonly found in medium-sized rivers

Host fish: basses, minnows, perches, and sunfishes

ID. Aids:

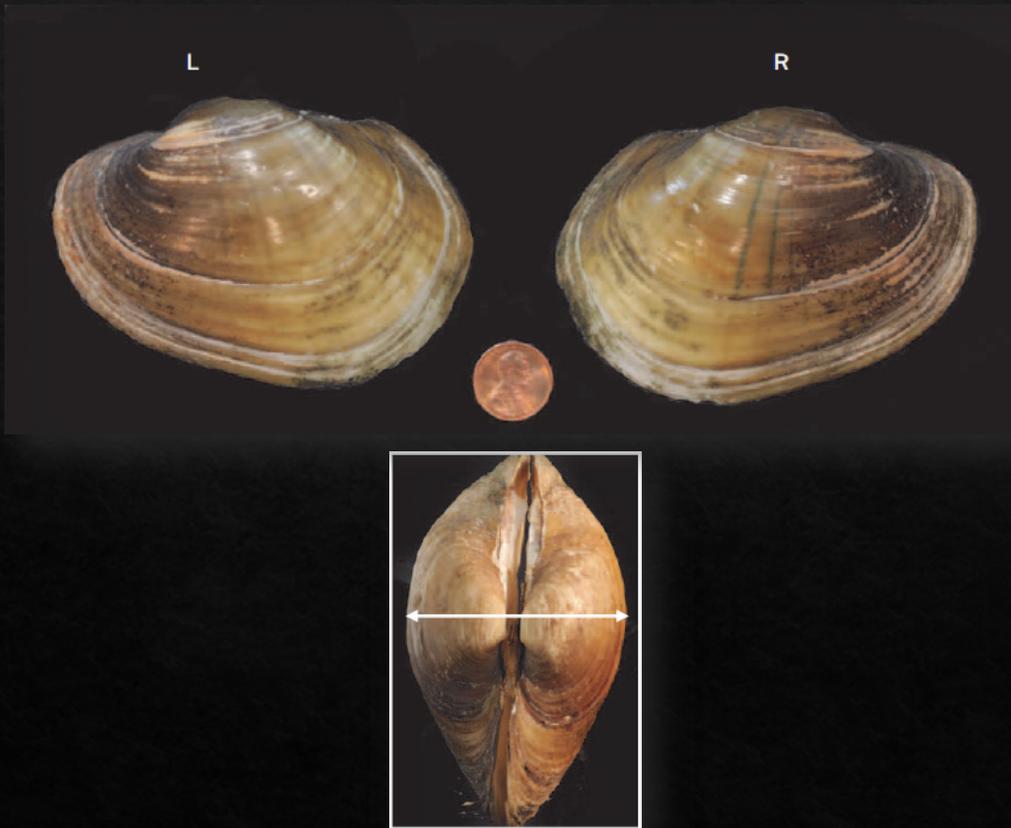
- Double-looped umbo
- Moderately elongated shell
- Green rays and Gold color



# Fatmucket (*Lampsilis siliquoidea*)



## Plain Pocketbook (*Lampsilis cardium*)



Habitat: Widespread and common, buries deep into substrate

Host fish: basses, perch, sunfish, walleye

ID. Aids:

- Thick and inflated
- Umbo angled forward
- Green rays and Gold color

## Plain Pocketbook (*Lampsilis cardium*)



## Wabash Pigtoe (*Fusconaia flava*)

Habitat: widespread in mud, sand, gravel, boulder wedges

Host fish: bluegill, crappie, creek chub, some shiners

ID Aids:

- Triangular in shape
- Thick shell
- Prominent teeth



Iridescence on the posterior surface of the valve.



# Wabash Pigtoe (*Fusconaia flava*)



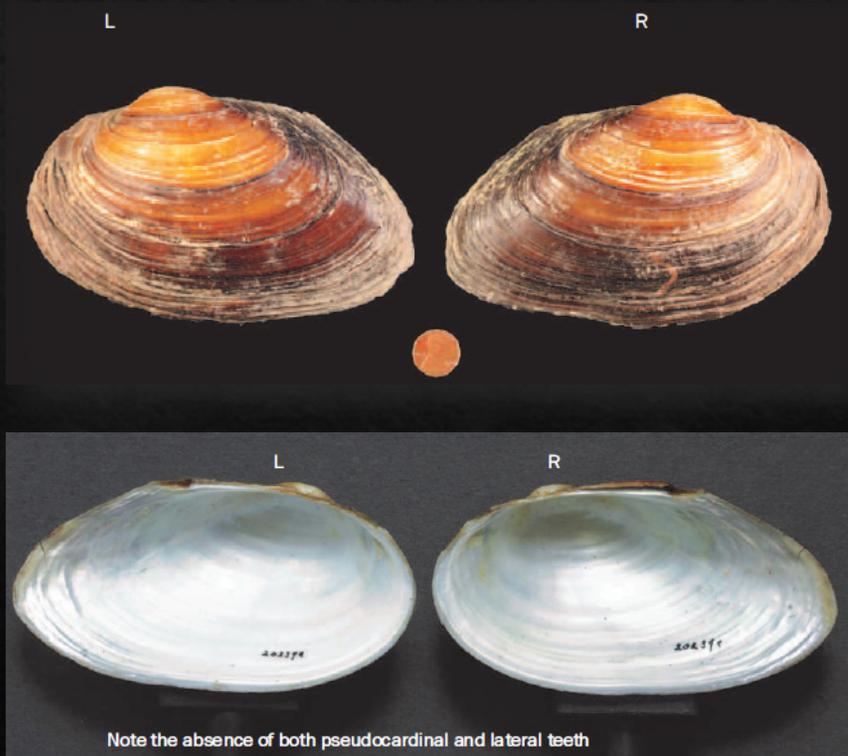
# Giant Floater (*Pyganodon grandis*)

Habitat: Widespread, abundant in lakes, flowages, and ponds

Host fish: bullhead, darter, freshwater drum, gars, gizzard shad, carp

ID. Aids:

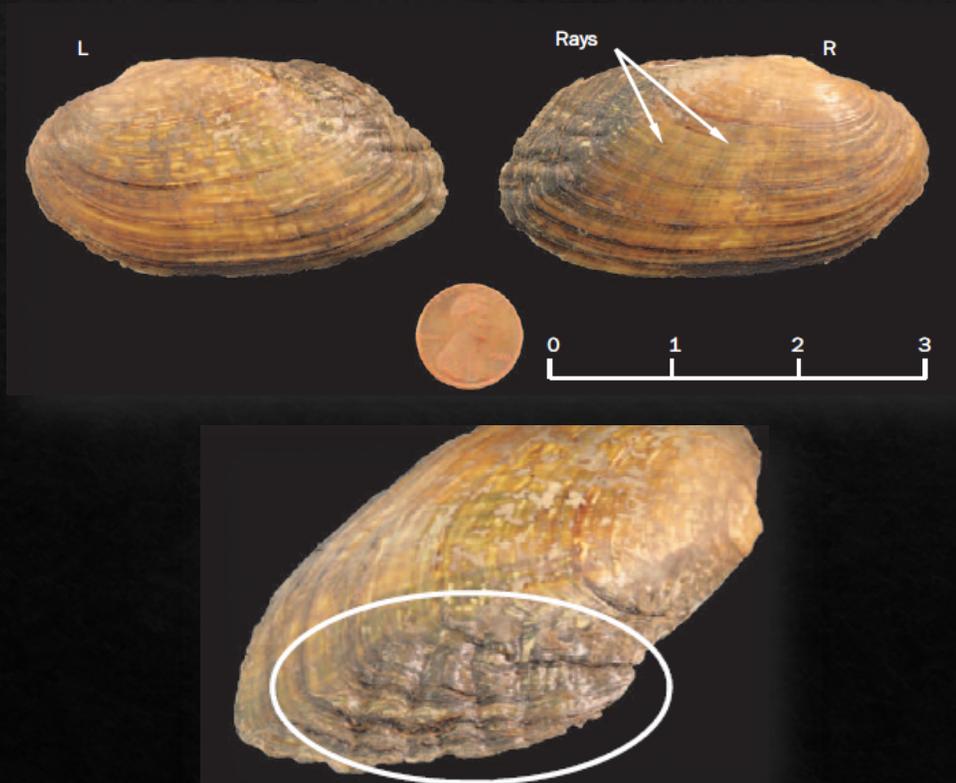
- Thin-shelled
- Prominent umbo ridges
- No “teeth”



## Giant Floater (*Pyganodon grandis*)



## Fluted-shell (*Lasmigona costata*)



Habitat: Widespread but common in medium-sized streams

Host fish: many fish, common carp

ID. Aids

- Elongated and compressed
- Flutes along posterior third

# Fluted-shell (*Lasmigona costata*)



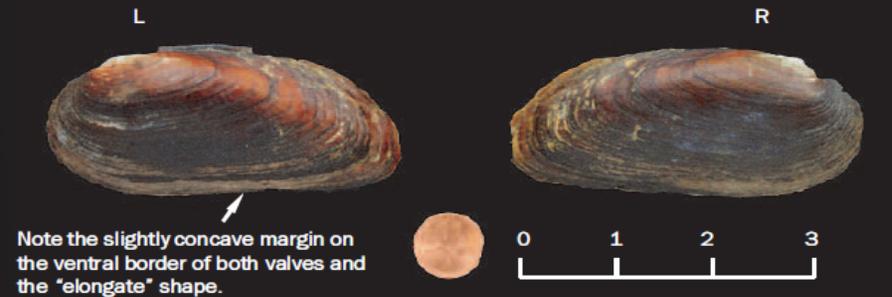
# Spike (*Elliptio dilatata*)

Habitat: widespread, tolerant of cold water streams and soft substrates

Host fish: Bass, gizzard shad, perch, sculpin, and sauger

ID. Aids:

- Elongated shell
- Low profile umbo w/ rough loops
- Nacre is colored purple



## Spike (*Elliptio dilatata*)



Z. Driscoll

# Lilliput (*Toxolasma parvus*)

Habitat: Widespread, common in flowages, lakes, ponds, and rivers

Host fish: basses, minnows, perches, and sunfishes

ID. Aids:

- Small, rarely exceeding 2in
- Distinct double-looped umbo
- Inflated for its size



# Lilliput (*Toxolasma parvum*)



B. Butterfield

# Questions?





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# Wisconsin Mussel Monitoring Program

*Monitoring*

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# Wisconsin Mussel Monitoring Program



**iNaturalist.org**

# What to Bring for Monitoring

- ◇ Mussel monitoring reporting forms. You may also report observations on the program's iNaturalist project.
- ◇ Camera (or smartphone)
- ◇ GPS unit (or smartphone)
- ◇ Bathyscope (or mask & snorkel)
- ◇ Collection bag
- ◇ Gloves
- ◇ Waders (or clothes you don't mind getting wet)
- ◇ Water, sunscreen, hat, towel, extra set of clothes



## Monitoring Strategies

1. **Casual Observation** — Determine the presence of a mussel at a particular location.
2. **Timed Search** — Establish species lists, abundance, and richness estimates for mussels present at a site.

# Casual Observation

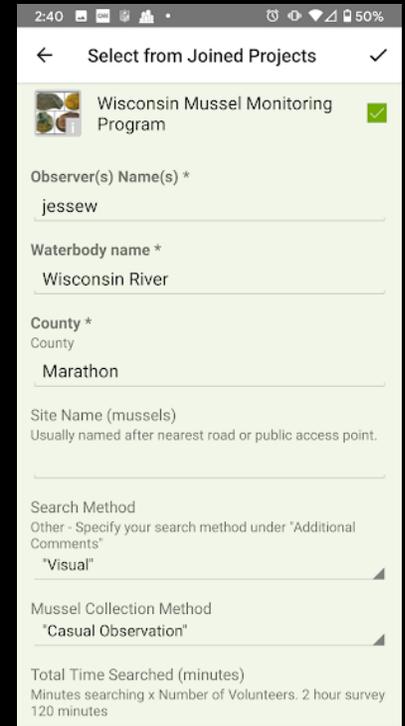
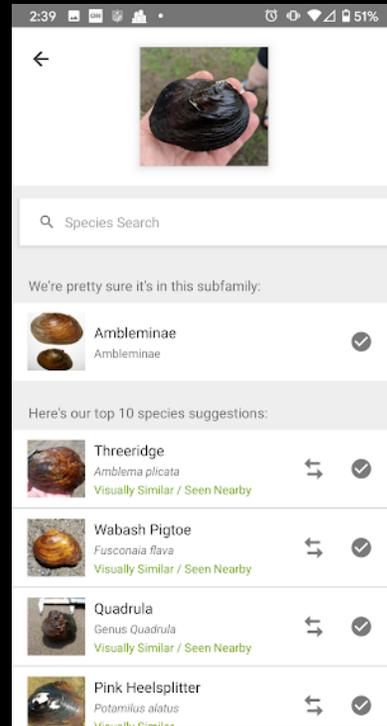
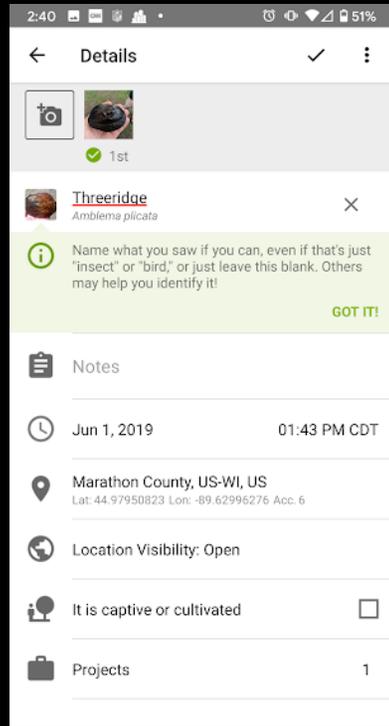
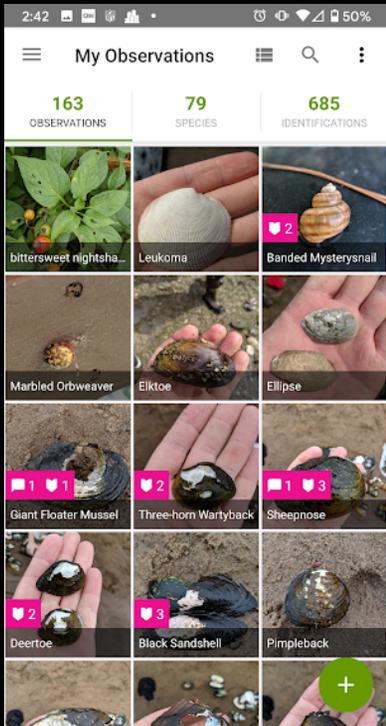
- ◆ Casual observation searches have no strategy. Instead, we ask volunteers to document any living or dead mussels at any location. Searchers may walk along shorelines looking for shells or stranded live mussels, or look in shallow waters use waders, visual, or snorkeling strategy. Streambanks may also be examined to look for dead shells or midden piles.



# iNaturalist.org

- ◆ Citizen science project and online social network of naturalists, citizen scientists, and biologists built on the concept of mapping and sharing observations of biodiversity across the globe
- ◆ Developed by California Academy of Sciences and National Geographic
- ◆ 1,200,000 users, 33,000,000 observations, and 251,000 species recorded
  
- ◆ CREATE a username
- ◆ JOIN the Wisconsin Mussel Monitoring Program project page
- ◆ SUBMIT mussel observations





## Timed Search

- ◇ Follows DNR standardized survey protocols used to establish species lists, abundance, and richness estimates the agency can then use to track population trends over time
- ◇ Increased survey effort with increasing stream size
  - ◇ Streams <15 meters width: 1 hour for 2 searchers (2 person/hrs)
  - ◇ Streams > 15 meters width: 2 hours for 2 searchers (4 person/hrs)
- ◇ Survey efforts are separated into 15-minute searches
  - ◇ Example: 2 person/hr search is divided into 8, 15 minute searches





## Sampling Locations

1. Shallow-water areas
2. Exposed sand and gravel bars
3. River and lake bottoms during low-water periods (droughts, drawdowns, etc.)
4. Islands and streambanks for middens

## General Tips

- Go slow
- “Fan” the substrate to expose buried mussels
- Develop a “Blue Mind”



*“To have a greater effect on environmental and societal issues that threaten the health and resiliency of aquatic ecosystems, an awareness and conservation support for mollusks needs to reach those outside the mollusk conservation community” FMCS*



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