# Wisconsin Mussel Monitoring Program Wisconsin Lakes and Rivers Convention

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# Wisconsin Mussel Monitoring Program 1) Ecology and Conservation 2) Identification 3) Monitoring

# Wisconsin Mussel Monitoring Program

## **Ecology and Conservation**

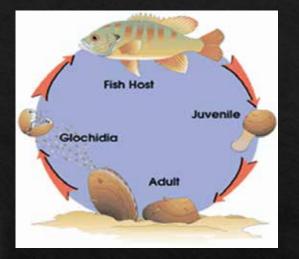
# Why Should We Care?

#### Indicators of aquatic health

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

#### **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 !





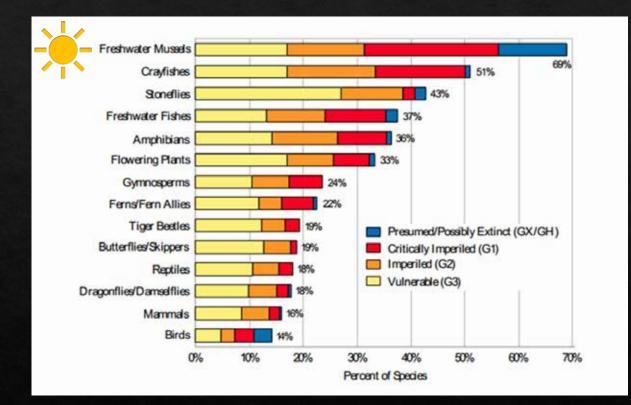




Minnow Worm Fly Crayfish

Catch & Release





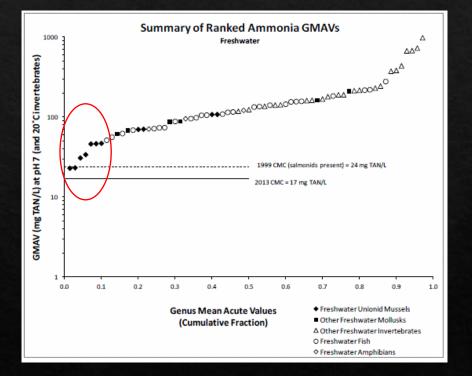
### **Mussel Status**

#### **Wisconsin**

24 of 50 species listed

#### **Threats**

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



## **Wisconsin Mussel Monitoring Program**



## **í**Naturalist.org

### **WMMP** Activities

#### NRF Field Trips



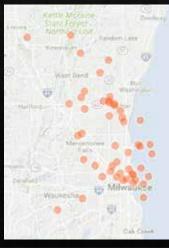
#### Reintroduction



# Salvage



#### Assessments



#### **Mussel Blitz**







# Wisconsin Mussel Monitoring Program

Identification

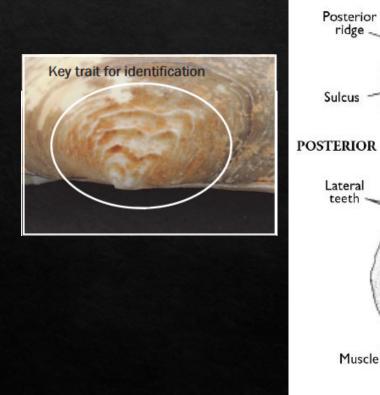
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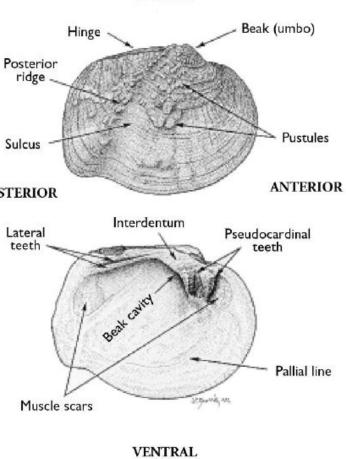
### **Resources**



## **General Structure**

DORSAL

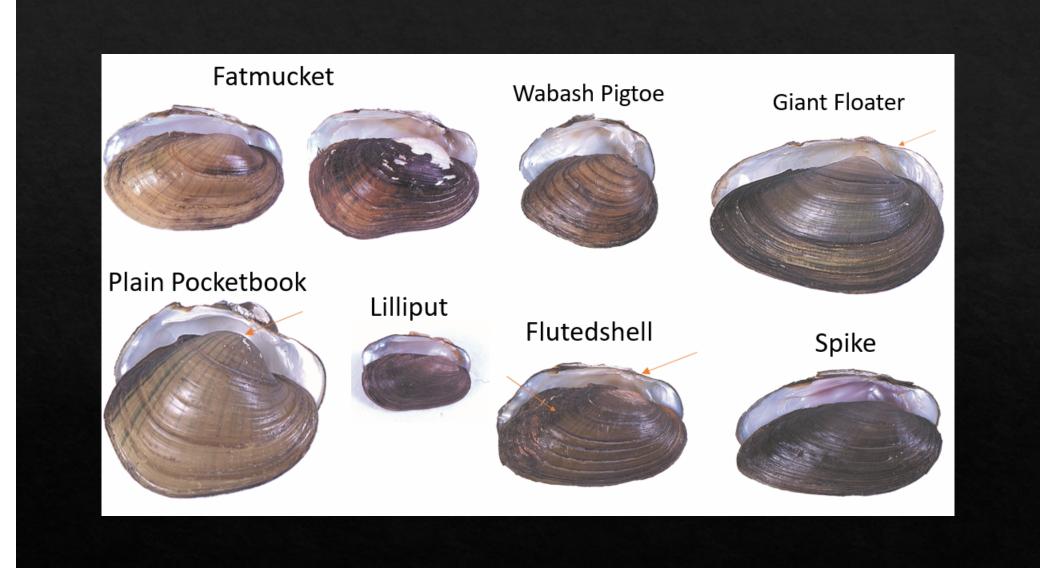




### Smile at the camera!

- ♦ 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





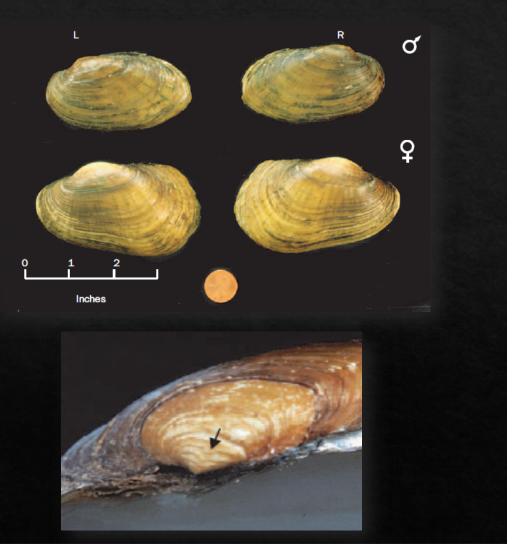
### **Fatmucket** (*Lampsilis siliquoidea*)

Habitat: Widespread but commonly found in medium-sized rivers

Host fish: basses, minnows, perches, and sunfishes

ID. Aids:

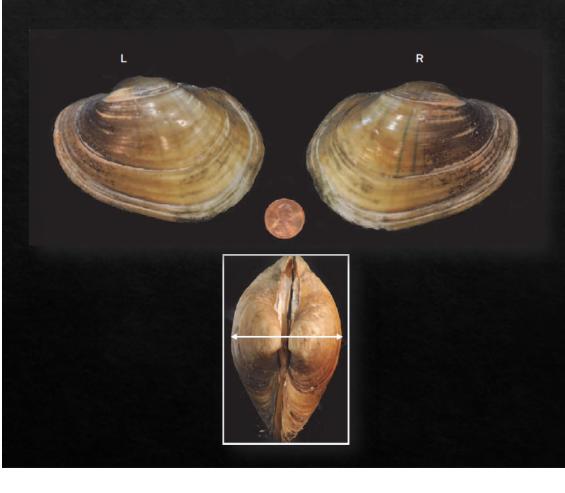
- Double-looped umbo
- Moderately elongated shell
- Green rays and Gold color



## **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, <u>sand</u>, 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"

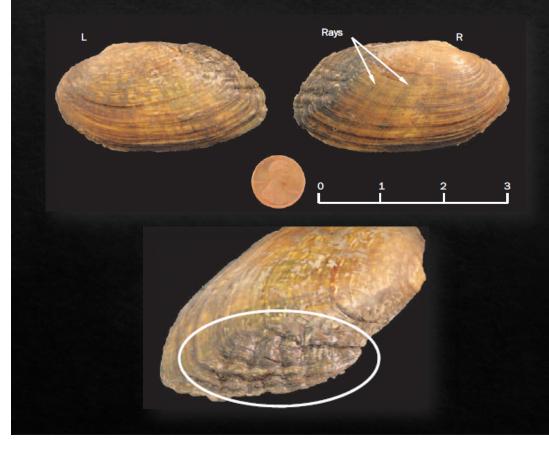




## **Giant Floater** (*Pyganodon grandis*)



### 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







The spike's nacre color can be quite variable. Most often it is purple, but it can also be pink or white.

# **Spike** (*Elliptio dilatata*)



### 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 parvus)







# Wisconsin Mussel Monitoring Program

Monitoring

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## **Wisconsin Mussel Monitoring Program**



## **í**Naturalist.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.
- 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.

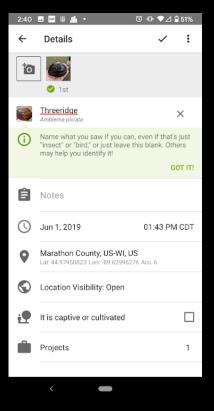


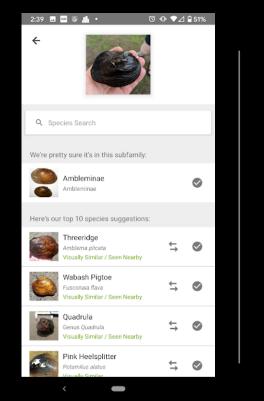
# **Naturalist.org**

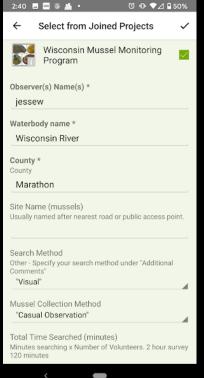
- Citizen science project and online social network of naturalists, citizen scientists, and biologists built on the concept of mapping and sharing observations of biodiversity across the globe
- ♦ Developed by California Academy of Sciences and National Geographic
- ♦ 1,200,000 users, 33,000,000 observations,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



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≡ My Obs	servations	■ <b>&lt; :</b>
163 OBSERVATIONS	79 SPECIES	685 IDENTIFICATIONS
bittersweet nightsha	Leukoma	2 Banded Mysterysnall
Marbled Orbweaver	Ektoe	Ellipse
Giant Floater Mussel	Three-horn Wartyback	Sheepnose
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### **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
 Steams <15 meters width: 1 hour for 2 searchers (2 person/hrs)</li>
 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

#### **Timed Search Methodology**

- Establish a site location. A suggested site can be provided by the a Program Coordinator.
- 2. Estimate the stream width to determine how much time is necessary for a complete sample.
- 3. Once in a starting position, start the clock for the first 15-minute search.
- 4. Stop all searches when clock reaches 15 minutes.
- 5. At the end of each 15-minute search, count and record all live and dead mussels found, noting any mussels less than 4 years old.
- 6. The survey is completed when the time limit has been reached (2 or 4 hours)

#### WISCONSIN MUSSEL MONITORING PROGRAM

#### SURVEY DATA SHEET

Date:Colle	cted by:		E-mail:		
Waterbody:		Monitoring Site			
County:	State:	Latitude:	La	ngitude:	
Area searched: Length (	m) Mean W	idth (m)			
Did you enter into iNatu	ralist? o Yes o N	io Are juvenile	mussels present?	n Yes in No	
SEARCH METHOD: ::					
COLLECTION METHO	DD: Casual O	servation of	Fined Survey		
Total Survey Time	(15 minutes per sea	rch X number of sea	rches):		
AVERAGE WATER DE	PTH:	WATER	DEPTH RANGE:		
SUBSTRATE % COVE	R: Clay: S	Silt: Sand:	Gravel:	Cobble:	Boulder:
Bedrock (Solid bottom): _	Wood:	Detritus:	Vegetation:		

Briefly describe habitat conditions:

Search	Mussel Species	# Alive	# Shells	Shell Condition (0-4)

1 = 0-25% of surface worn, light wear.
2 = 25-50% of shell surface worn, light to moderate wear some pitti

2 = 25-50% of shell surface worn, light to moderate wear 3 = 50-75% of shell surface worn, some deep pitting.

4 = 75-100% of shell surface worn, deep pitting, badly croded surface

### Survey Practice

Mill Creek, Portage County Highway 66 <15m, 1-2ft deep LATLON: 44.464735, -89.654532

Search 1: Giant floater: 1L, 2D

Search 2: Giant floater: 4L, 1D

Wabash pigtoe: 2L

Search 3: No mussels

Search 4: Fatmucket: 1D

Search 5: No mussels

Search 6: No mussels

Search 7: Wabash pigtoe: 4L

Giant floater: 1L, 3D

Search 8: Flutedshell: 1L

#### Wisconsin Mussel Monitoring Program

#### SURVEY DATA SHEET

Date:	Collected by:			E-mail:	
Waterbody:			Monitoring Site:		
County:	S	tate:	Latitude:	Longitude:	
Area searched	: Length (m)	Mean Wid	th (m)		

Did you enter into iNaturalist?	□Yes □No	Are juvenile m	ussels present? 🗆	Yes 🗆 No		
SEARCH METHOD: D Bathy:	scope 🛛 Snorke	l □ Hand or Visua	ıl ⊐ Other			
COLLECTION METHOD:	Casual Observa	tion 🛛 🗆 Timed Su	rvey			
Total Survey Time (15 mir	nutes per search 3	X number of searc	hes):			
AVERAGE WATER DEPTH:		WATER DI	EPTH RANGE: _			
SUBSTRATE % COVER: Clay	y: Silt:	Sand:	Gravel:	Cobble:	Boulder:	
Bedrock (Solid bottom):	Wood:	Detritus:	Vegetation:			

Briefly describe habitat conditions:

# Search	Mussel Species	# Alive	# Shells	Shell Condition (see definitions below)
1	Giant floater	1	2	
2	Giant floater	4	1	
	Wabash pigtoe	2		
3	No mussels			
4	Fatmucket		1	3: ~55% wear

#### **Sampling Locations**

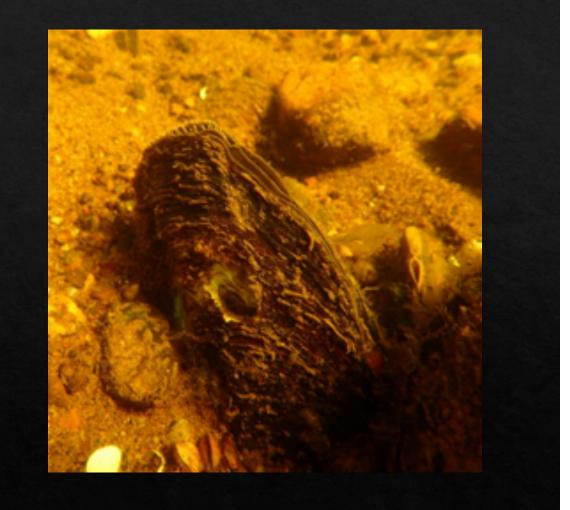
- 1. Shallow-water areas
- 2. Exposed sand and gravel bars

3. River and lake bottoms during lowwater 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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