

# How to Search for Zebra Mussels

Monitoring for adult or settling zebra mussels can be done in different ways, depending on volunteer interest and funds available. The more places in a water body that you look, the faster you may find a new population of zebra mussels. Selected sites should be checked about once a month during the summer and fall, or more frequently if time and resources allow. The Minnesota Department of Natural Resources (DNR) recommends the search methods listed here. These methods may be done together or separately.

## What do Zebra Mussels Look Like?

[Zebra mussels](#) have brown and yellow striped D-shaped shells (see Appendix A). They use byssal threads to attach to hard materials, usually in shaded areas. Zebra mussels are microscopic when they first settle, and become visible to the naked eye after a few weeks of growth. Adults can reach 1.5 inches in length, but newly settled mussels may be difficult to detect amongst naturally occurring aquatic life in lakes and rivers (algae, mineral deposits, other invertebrates). When in doubt, report it (see pg.3).



## Safety First

You are responsible for your own safety while conducting zebra mussel searches. Tips:

- Wear proper personal protective equipment like gloves and shoes to protect from sharp shells, and a life jacket for safety on the water.
- Be aware of your surroundings – watch for boat traffic and don't trespass on private property.

## 1. Settling Samplers

**Searching:** Installed objects in the water, such as bricks, cinderblocks, PVC pipe and/or plate samplers (See Appendix B for building instructions).

**Timing:** Install in May and check regularly from early June through the end of September.



**Left:** Plate sampler. Credit Minnehaha Creek Watershed District.

**Middle:** Adult zebra mussel settled on a sampler, likely after a full season of growth. Credit Comfort Lake – Forest Lake Watershed District.

**Right:** Newly settled zebra mussels – these would require further identification by an expert. Credit Minnehaha Creek Watershed District.

### Advantages:

- Simple to make and easy to deploy and use.
- Already used by many groups, which provides comparability among monitoring programs.
- Ability to place them in different areas of a lake.
- Regular examination can result in earlier detection than examining docks in the fall.

### Disadvantages:

- Zebra mussels must be reproducing, and their offspring must settle on the sampler.
- Small sampling area.

**Note:** Before installation, get permission from all property owners. For public water accesses, contact each access owner for permission. You can find ownership information for most accesses using the Recreation Compass tool in [LakeFinder](#).

### Search Procedure:

Assemble sampler and determine an easy-to-access installation location (e.g. off a dock, with permission). Place the sampler close to the lake bottom and out of direct light, if possible. For example, put them on the side of a dock or other structure that will get some shade during the day. If bricks or blocks are used, these can be set on the bottom. Visually inspect the sampler on a regular interval mid-summer through fall.

### Other Best Management Practices for Samplers:

- Label clearly with contact information.
- Place in a discreet location to avoid vandalism.
- Scatter multiple samplers around the water body.
- Use a magnifying glass or microscope to inspect.

## 2. Lake Bottom Material

**Searching:** Rocks, wood, plants, trash, etc.

**Timing:** Summer (June – August)



### Advantages:

- Covers larger areas of the lake.
- Mussels which may have settled the previous season, while not being found on docks or other gear, can be found by this active searching.
- Covers areas of the lake where recreational equipment is not available.

### Disadvantages

- Limited to fairly shallow depths.

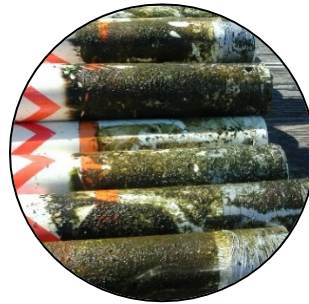
### Search Procedure:

Wade in shallow water. Snorkeling is also an option. Pick up and visually examine hard materials like rocks and woody debris. If you are limited on time or resources, it may be wise to focus searches in areas of high human activity such as water accesses, walk/carry-in accesses, fishing piers, parks, beaches, etc.

## 3. Recreational Equipment in the Water

**Searching:** Docks, lifts, boats, swim rafts, water intakes, buoys/anchors, etc.

**Timing:** Fall (September – October)



### Advantages

- Requires no money to make separate samplers.
- Short time commitment, based on individual's availability.
- Covers lots of surface area compared to various settling samplers, and are often widespread throughout the lake.

### Disadvantages

- Done late in the season, so if something is found, timing follow up surveys may be difficult.
- Large equipment can be hard to carefully examine, and may be handled by lake service providers rather than the property owner.

### Search Procedure:

Visually inspect equipment for attached mussels, especially nooks and crannies and even inside posts. This is the method used by volunteers (e.g. lakeshore property owners) in the DNR's [Volunteer Zebra Mussel Monitoring Program](#).

## If No Zebra Mussels are Detected, Record Absence Data

Absence data are important data. Record lake information, location, date and search method on the postcard or spreadsheet provided. If no detections are made for the entire season, submit the data to your program's coordinator or to the DNR's volunteer zebra mussel monitoring program at the end of the season. Coordinators should compile absence reports into one spreadsheet and submit it to the DNR at the end of the season.

## If Suspected Zebra Mussels *are* Detected

### Report immediately to the DNR

1. **Collect a specimen and/or take high quality photos**
  - **Take multiple photos of:**
    - The entire animal.
    - The animal with an object for scale (e.g. coin).
    - Close-up of its identifying features.
    - General area where it was found.
  - **Collect a sample**
    - Place in a sealed container.
    - Include in the container a piece of paper with the following report information written in pencil: water body name, county, date, your name, your DNR contact information.
    - Store on ice or refrigerate to prevent decay.
2. **Record the exact location(s) using a GPS unit or hardcopy map.**
3. **Contact your DNR Invasive Species Specialist using one of the options listed below and include these key details in your report:** Inform them that you have a sample of a suspected zebra mussel and ask for further direction on what to do with the sample. Provide them with the exact location where it was found, water body name, county, date, your name and your contact information.

**By Phone:** Call your DNR AIS Specialist (*Appendix C* or go to [www.mndnr.gov/ais](http://www.mndnr.gov/ais)).

**In Person:** Deliver a sample to your [nearest DNR office](#).

**Electronically:** Submit a report using the [EDDMapS Midwest website](#) ([www.eddmaps.org/Midwest](http://www.eddmaps.org/Midwest)) or the [GLEDN Application](#) on your mobile device.

- Once uploaded, the system will automatically send the report to the appropriate DNR AIS Specialist.
- It is strongly recommended that you contact your DNR AIS Specialist to confirm they received your report.

Remember to never make public announcements of potential new AIS findings. The DNR will work with you, your organization, local governments and other stakeholders to verify the infestation and, if needed, determine feasible next steps in a response effort.

## Resources for Volunteer Coordinators

Are you coordinating multiple volunteers around your lake, in your watershed or throughout your county? The DNR has created some resources to make it easy for you to support your wonderful volunteers.

- **How to Search for Zebra Mussels** (this document) – details search and reporting methods.
- **Zebra Mussel Search Report Postcard** – a reminder card for volunteers to perform and record their search efforts. Volunteers can send this “report card” to you at the end of the season if no zebra mussels are detected.
- **AIS Absence Report Spreadsheet** – a way to track search efforts. This could be sent to each volunteer, if they prefer to record their data electronically. Coordinators can compile volunteer data each year into this spreadsheet and share it with the DNR.

### Insert Volunteer Coordinator Information Here:

County and/or Region Covered:

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Lead Organization:

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Coordinator Name:

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Coordinator Contact:

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### Additional Resources:

- Zebra Mussel Information: <http://www.dnr.state.mn.us/invasives/aquaticanimals/zebramussel/index.html>
- Zebra Mussel Factsheet: [http://files.dnr.state.mn.us/natural\\_resources/invasives/aquaticanimals/zebramussel/fact\\_sheet-zebra\\_mussels.pdf](http://files.dnr.state.mn.us/natural_resources/invasives/aquaticanimals/zebramussel/fact_sheet-zebra_mussels.pdf)
- DNR Volunteer Zebra Mussel Monitoring Program: [http://www.dnr.state.mn.us/volunteering/zebramussel\\_monitoring/index.html](http://www.dnr.state.mn.us/volunteering/zebramussel_monitoring/index.html)
- Pilot Projects to Control Zebra Mussels: [http://www.dnr.state.mn.us/invasives/aquaticanimals/zebramussel/pilot\\_project.html](http://www.dnr.state.mn.us/invasives/aquaticanimals/zebramussel/pilot_project.html)

*All photos in this document are credited to the Minnesota Department of Natural Resources unless otherwise noted.*



## Appendix A: Photos of Zebra Mussels

Photos are credited to the Minnesota Department of Natural Resources unless otherwise noted.

### Zebra Mussels

Additional Photo Credit: Comfort Lake – Forest Lake Watershed District (far left)



### Settling Samplers with Attached Zebra Mussels

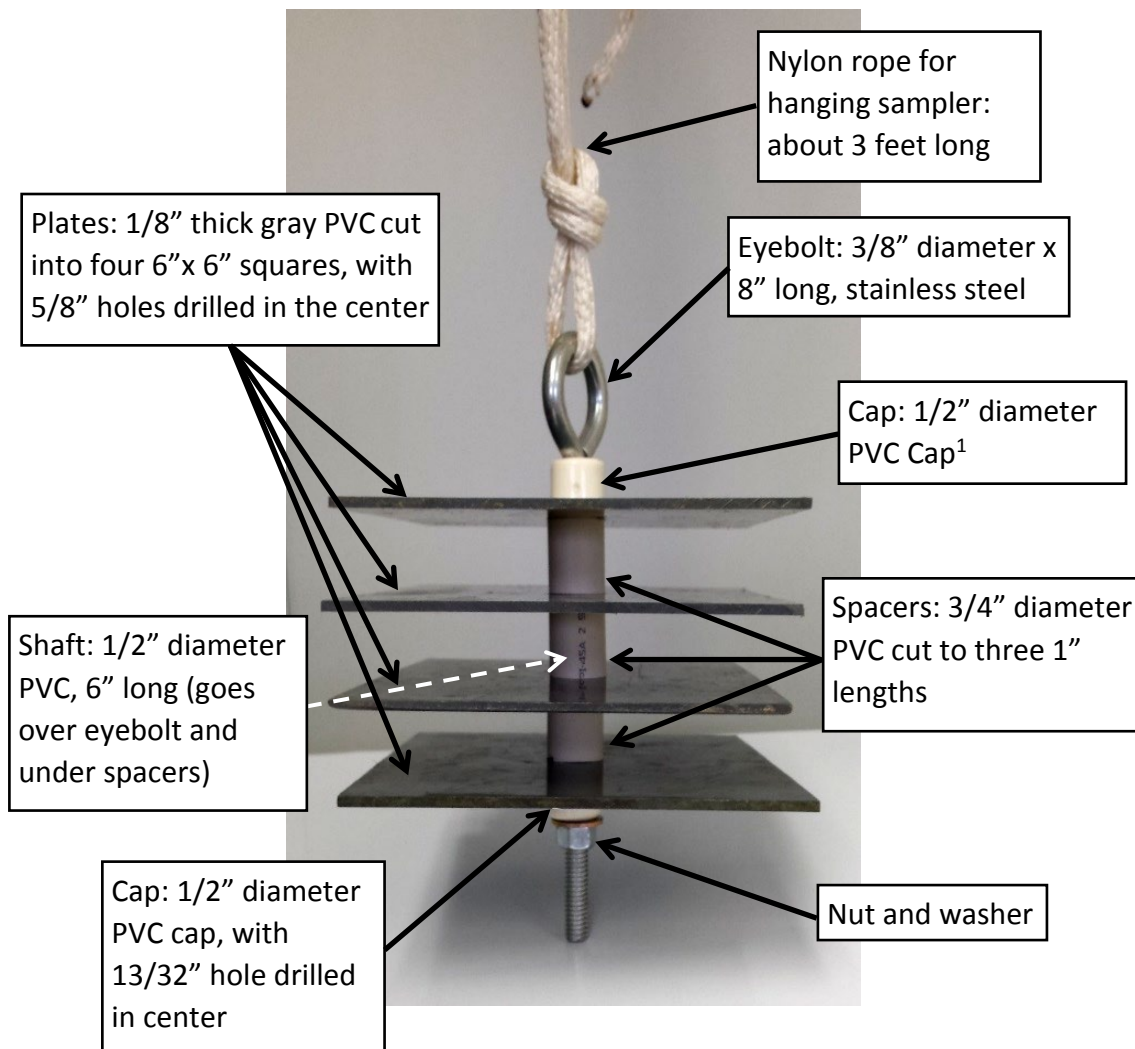
Additional Photo Credits: Minnehaha Creek Watershed District (top three); Comfort Lake – Forest Lake Watershed District (bottom two)



### Equipment with Attached Zebra Mussels



## Appendix B: Constructing a Zebra Mussel Settling Sampler



## Appendix C: Invasive Species Specialists (May 2018)

Refer to the online [AIS Contacts](http://www.mndnr.gov/ais) (found at [www.mndnr.gov/ais](http://www.mndnr.gov/ais)) for current information.

Map Color and Region Number	Region Name	District	Office Location
1	Northwest Region	North District	Park Rapids
1	Northwest Region	South District	Fergus Falls
2	Northeast Region	West District	Brainerd
2	Northeast Region	East District	Grand Rapids
3	Central Region	North District	Sauk Rapids
3	Central Region	South District	St. Paul
4	Southern Region	North District	Hutchinson
4	Southern Region	South District	Waterville



Primary contact for local AIS issues and permits. Provide technical support for invasive species management and prevention activities for their respective work areas.

Office Location	DNR Region and District	Name	Phone Number	Email
Park Rapids	1 North	Nicole Kovar	218-732-8960	<a href="mailto:nicole.kovar@state.mn.us">nicole.kovar@state.mn.us</a>
Fergus Falls	1 South	Mark Ranweiler	218-739-7576 x254	<a href="mailto:mark.ranweiler@state.mn.us">mark.ranweiler@state.mn.us</a>
Brainerd	2 West	Tim Plude	218-203-4354	<a href="mailto:timothy.plude@state.mn.us">timothy.plude@state.mn.us</a>
Grand Rapids	2 East	Richard Rezanka	218-328-8821	<a href="mailto:richard.rezanka@state.mn.us">richard.rezanka@state.mn.us</a>
Sauk Rapids	3 North	Christine Jurek	320-223-7847	<a href="mailto:christine.jurek@state.mn.us">christine.jurek@state.mn.us</a>
Sauk Rapids	3 North	Vacant (NRS)		
St. Paul	3 South	Keegan Lund	651-259-5828	<a href="mailto:keegan.lund@state.mn.us">keegan.lund@state.mn.us</a>
St. Paul	3 South	Kylie Cattoor (NRS)	651-259-5729	<a href="mailto:kylie.cattoor@state.mn.us">kylie.cattoor@state.mn.us</a>
St. Paul	3 South	April Londo (NRS)	651-259-5861	<a href="mailto:april.londo@state.mn.us">april.londo@state.mn.us</a>
Hutchinson	4 North	Eric Katzenmeyer	320-234-2550 x237	<a href="mailto:eric.katzenmeyer@state.mn.us">eric.katzenmeyer@state.mn.us</a>
Waterville	4 South	Allison Gamble	507-362-8786	<a href="mailto:allison.gamble@state.mn.us">allison.gamble@state.mn.us</a>