MINNESOTA DEPARTMENT OF NATURAL RESOURCES

Aquatic Invasive Species (AIS) Ambassador & Volunteer Handbook

April 2014

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What are Aquatic Invasive Species (AIS)?

"Aquatic invasive species" are plants and animals that do not naturally occur in Minnesota waters and they are species that cause or may cause economic or environmental harm or harm to human health; or threaten or may threaten natural resources or the use of natural resources in the state.

The recreational and commercial use of Minnesota waters, and the health of native plants and animals that live within them, are threatened by aquatic invasive species. A small percentage of nonnative species, such as curly-leaf pondweed, Eurasian watermilfoil, faucet snails, and zebra mussels, introduced to the state can cause significant changes and problems. Other invasive species that have not arrived in Minnesota yet, such as black carp, hydrilla, snakehead fish, and water chestnut, are also potential threats to our aquatic resources.

Invasive species usually have competitive advantages over native species: they multiply rapidly, are free from natural predators found in their native areas, and some may grow or spread very quickly. Once introduced into our waters, they are nearly impossible to eliminate.

What is the purpose of this Aquatic Invasive Species (AIS) Volunteer Handbook?

This handbook outlines procedures to educate citizens on how to prevent the spread of aquatic nuisance species in Minnesota. While this handbook puts special emphasis on zebra and quagga mussels—the procedures apply to all aquatic invasive species, both plant and animal. A comprehensive list and description of nonnative species that could negatively impact native species, water recreation, or water resources in our state is provided at the end of this handbook.

Overview of the AIS Ambassador and Volunteer Program

The purpose of the AIS Ambassador and Volunteer Programs is to educate the public about invasive species at the public access. These interactions at the access serve to teach people about invasive species such as Eurasian watermilfoil, zebra mussels, ruffe, spiny waterflea, and others that can invade our water bodies. You will talk to boaters about how to comply with Minnesota laws regarding invasive species and help people understand the necessary steps and places to look on their boat and trailer for invasive species. Please remember that your role is as an AIS ambassador or volunteer and that you are not authorized to require watercraft inspections. Watercraft users are not required to speak with you and the process is completely voluntary and educational.

Additional Information:

- We recommend that you organize your group and if possible have a coordinator or committee to assist volunteers with scheduling. This person or group can send the schedules in to the Regional Watercraft Inspection Supervisor.
- Educational materials are available; please contact your local Watercraft Inspection Supervisor or Program Assistant for these materials.
- If during your conversation with a watercraft user you observe a possible violation please inform them about the issue and how they can fix it so they are complying with state laws. If they refuse or if you observe a violation by someone you haven't contacted you can report the violation to a conservation officer. Please see your AIS volunteer trainer for contact information.

Introduction to Self Watercraft Inspection by Boaters

As an AIS ambassador or volunteer, you need to do the following:

Ensure personal and public safety

Your safety and the safety of the public is your top priority at all times. Many vehicles and boats will be moving around the access area. People will be looking under trailers and all around watercraft. You will need to make sure every effort is made to ensure the safety of all involved.

Educate boaters

Every contact you make with boaters must educate them about the importance of controlling zebra and quagga mussels, Eurasian watermilfoil, and other AIS. As an ambassador or volunteer, your most important task is educating the public since many lakes and rivers in the state will not have inspections.

You need to emphasize the primary education message to **Clean-Drain-Dry** and explain why boaters need to do it ***each time*** they use their craft regardless of what waters they are leaving. Boaters must realize that AIS are spread by their actions (or inaction). Impress upon them that they have a lot to lose if they do not assist in this effort, both in terms of recreation opportunities (damage to boats, fishing, and swimming) and penalties for violating state laws.

PHOTO: BRAD HENLEY

The education message is: Clean-Drain-Dry:

Clean—inspect closely and remove all plants, animals, and mud (it is the law)

Drain—drain spaces or items that can hold water; remove the drain plugs and open other water-draining devices (it is the law)

Dry—their boat for five days or more before launching in other waters (recommended)

Where should ambassadors and volunteers contact boaters?

Ideally, ambassadors and volunteer educators should contact boaters before they launch (in the prep area) and/or before they leave the water access (in the tie down area). The location should be far enough from the water or boat ramp that drained bilge/ballast/well water cannot flow into the water body. Prevention actions taken by the boater should be conducted "high and dry"—away from the water.

Differences Between AIS Ambassadors and Volunteers

Ambassador Requirements:

1. ALL people who wish to be AIS ambassadors must attend training, submit a completed background check form, and register during the training session.
2. You must submit a schedule for each access that you or your group will be volunteering at, in writing, to the Regional Watercraft Inspection Program Supervisor at least 24 hours before the volunteering is to take place. The schedule can be for the whole summer or a shorter period of time and may be sent via email. Schedules may be sent by an individual or a group coordinator.
3. If the access is owned by the MN DNR you may do AIS education there after you have attended training, submitted a grant DNR application, and submitted a written schedule to the Watercraft Inspection Regional Supervisor.
4. If the access is not owned by the DNR you must contact the access owner and obtain written permission to perform AIS education there. Please be aware that public accesses may belong to the City, County, Township or others and that you will need to contact those entities for permission prior to being at the access.
5. AIS ambassadors should identify themselves as a part of the group they are with. For example groups can use signage that clearly states "Invasive Species Awareness sponsored by (name of group)". AIS volunteers can also wear vests or shirts with their group's name or you can purchase Stop Aquatic Hitchhiker hats from the MN DNR.

Volunteer Requirements:

1. ALL people who wish to be AIS volunteers must attend training, submit a completed background check form, and register as DNR volunteers during the training session.
2. You must submit a schedule for each access that you or your group will be volunteering at, in writing, to the Regional Watercraft Inspection Program Supervisor at least 7 days before the volunteering is to take place. The schedule can be for the whole summer or a shorter period of time and may be sent via email. Schedules may be sent by an individual or a group coordinator.
3. If the access is owned by the MN DNR you may do AIS education there after you have attended training, become a DNR volunteer and submitted a written schedule to the Watercraft Inspection Regional Supervisor.
4. If the access is not owned by the DNR you must contact the access owner and obtain written permission to perform AIS education there. Please be aware that public accesses may belong to the City, County, Township or others and that you will need to contact those entities for permission prior to being at the access.
5. AIS volunteers should identify themselves as a part of the group who they are with. For example groups can use signage that clearly states "Invasive Species Awareness sponsored by (name of group)". AIS volunteers can also wear vests or shirts with their group's name or you can purchase Stop Aquatic Hitchhiker hats from the MN DNR.

Set-up at Access:

The volunteer posts identifying signage showing who is conducting volunteer AIS education and chooses a location near the access to set up. If possible, set the chair so you are on the driver's side of approaching vehicles, this way you won't have to walk around the vehicle. You will also want to set up the chair in the shade when it is available. AIS volunteer education sites should be set up to avoid traffic congestion.

Directing Vehicles to Education Site and Initiating Contact:

As the vehicle approaches, greet them and explain that you are educating people about AIS and how to conduct their own self inspection. If they haven't done so already, you must ask the driver to turn off the engine, put on the parking brake, and step out of the vehicle. It is critical to prevent boats or trailers from rolling as the boater will be looking under and behind them.

The importance of education cannot be overemphasized! Inspectors can not be at all accesses so it is essential to show boaters how to inspect their own boats and explain why we are doing this and what laws are in effect. Impress on the boater how mussels and AIS harm boats, gear, fisheries, and water infrastructure. Provide brochures or other information. Share the primary education message, Clean/Drain/Dry, and explain why it is important to always arrive and leave with their watercraft and gear cleaned and drained. Emphasize to boaters that they will need to empty all their water (bilge, ballast, live well, and bait well) from their boat before transporting.

Approach the boater and introduce yourself. Example: *"Hi, I'm _____ with the _____ volunteer group and I'm out here today educating boaters and teaching them to perform inspections for aqautic invasive species, plants, and water. Our purpose for being out here is to keep Eurasian milfoil (EWM), zebra mussels (ZM), and other aquatic invasive species from spreading to other lakes."*

Explain what AIS are and their impacts such as: aquatic invasive species are plants or animals that come from other places and cause problems for Minnesota's waters, recreation, and economy. If the water body is infested, let them know what it is infested with."Zebra mussels/EWM/SWF are in this lake/river." Point out the orange infested waters sign and remind them there is a complete list in the fishing regulations

Self Inspection of Watercraft and Trailer:

- Start your demonstration of the self inspection process at the trailer winch post on the driver's side. Work your way completely around the boat using the next steps and end at the passenger side winch post after showing the boater where to look at every step.
- Teach the boater to look closely for zebra mussels, snails, spiny water fleas, and other species that may be attached to the hull. Have them look into the boat and check the equipment for plants, snails, mussels, waterfleas, and mud. Remind them that spiny water fleas are likely to collect on anchor lines, fishing lines, and downriggers.
- Help them to check rollers and trailer bunks for attached plants; talk about EWM and what the problems associated with it are, remind they must remove all vegetation before transporting the boat – Eurasian watermilfoil grows in dense surface mats that interfere with many types of water recreation. It out-competes native vegetation needed by fish and wildlife as it grows very quickly; up to 2" per day (see also Eurasian watermilfoil on page 13).
- When you get to the trailer fender, teach them to look at the axle, use your flashlight and mirror (if you have one) to check hard to see places, including the opposite side of axle for plants. Aquatic plants are likely to attach to trailer, lower unit and prop, and waterfowl decoy lines and fishing lures. Also have them check license plates and taillight wires.

Remind them that under state law, it is illegal to transport any type of aquatic plants on boat or trailer - they need to remove all vegetation before leaving any access and before entering any water body. Removing all plants eliminates need to identify specific species. A small fragment of milfoil a few inches long can survive several days out of water and infest another lake. Also, zebra mussels and other invasive species can attach to aquatic plants.

- Help them look closely for zebra mussels, snails, spiny water fleas, and other species that may be attached to the hull of the boat and equipment. The boat owner should feel the ridges, seams, and recessed bolts of the craft. The young mussels may feel like bumps or sandpaper on the craft. If the owner feels a rough spot, help them to look for attached mussels. Use your flashlight to see under the boat and into the shadows. Have the boater run their hand over the boat below the waterline and touch the transom to ensure there are no tiny zebra mussels attached. As they do this, explain the problems associated with zebra mussels- they can reduce food that is needed by fish and other organisms, clog intake pipes for industry, litter beaches with sharp shells, can foul boat hulls, and cause boat engines to overheat. They reproduce quickly - one female can produce up to one million eggs per summer (see also "Zebra Mussels" on pages 3-7).

Under state law, it is illegal to transport zebra mussels on a road. Adult mussels can live out of water, attached to a boat many days.

It is important to educate the boater by explaining why you are recommending each action and what they should be looking for so that they can inspect their own boats. Teach them to carefully check the rear of the boat, including intakes, upper and lower motor areas, trim tabs, transducers, and the propeller. They should look especially closely at the lower unit and motor parts that would be below the waterline, and use your mirror (if you have them) to look at hard to view places. Trailers can pose as high of a risk as boats, so they should carefully check trailer rails, lights, and electrical wires, as well as the license plate and trailer pads for aquatic plants.

If plants or mussels are found on either the boat or the trailer, tell the boater that they should remove any invasive species. **Ask the boater to make sure their watercraft is drained:**

Explain to them that it is very important that they drain the boat so they don't transport water that could contain young zebra mussels or spiny waterfleas.

Under state law, you must drain water-related equipment holding water and live wells and bilges by removing the drain plug before transporting the watercraft and associated equipment on public roads; this includes bait containers, drain plugs, bailers, valves, or other devices used to control the draining of water from ballast tanks, bilges, and live wells must be removed or opened while transporting watercraft (marine sanitary systems are excluded from this requirement)

PHOTO BY MN DNR

- **Entering boats:** The drain plug should be out on arrival. If it is not, suggest they go away from the access and drain it (they need to go far enough away that the water they drain out won't run into the waterbody). If it is out, remind them to put it in before launching
- **Exiting boats:** Remind them to remove the drain plug, drain all water from bilge, livewell, bait containers, and to leave the plug out until they relaunch. Suggest they lower the motor so it drains completely. Help tell the boater when to stop lowering the motor to prevent it hitting the ground.
- Explain why it is important to drain all water and talk about ZM veligers. Explain how they are microscopic and could be transported in water because they are free-floating in the water column for 10 days before settling, attaching to a hard surface, and growing shells.

Remind the boater to check their livewell and other compartments within their boat including their bait bucket. Then continue around the boat until you reach the passenger side of the winch post.

If at any time a boater is attempting to launch their watercraft with attached invasive species or aquatic plants, please contact the local conservation officer or other trained peace officer.

Close with "*Thank you for your attention and helping protect Minnesota's lakes.*"

Keeping safety of all staff and boaters in mind, clear the area of all volunteers and boaters and only after you have made sure the area is clear, have them proceed.

PHOTO BY ELIZABETH BROWN, CDOW

Suggested Equipment List for AIS Ambassadors and Volunteers

Safety Equipment

- ☐ Traffic safety vests
- ☐ First Aid Kit

Volunteer Equipment

- ☐ Crescent wrench or needlenose pliers to take out bilge plugs (9/16" socket also handy)
- ☐ Paper towels
- ☐ Extension mirrors
- ☐ Flashlights
- ☐ Magnifying glass
- ☐ Extension arm
- ☐ Topsider water pump
- ☐ Sponge
- ☐ Identification: shirts, badges, name tags, hats, inspection vest, etc.
- ☐ Trash bags
- ☐ Copies of the Authorization Form for Transport of Prohibited Invasive Species and Aquatic Plants found at: http://www.dnr.state.mn.us/invasives/ais_transport.html

Personal Items

- ☐ Hand Wipes
- ☐ Hand sanitizer
- ☐ Chairs
- ☐ Sunblock
- ☐ Bug spray
- ☐ Cell phone

Educational Materials

- ☐ *Stop Aquatic Hitchhikers* brochures, ID cards and Laws.

Signage

- ☐ Volunteer group identification sign.
  Example: *"Aquatic Invasive Species Education Provided by Great Lake Association"*

Watercraft Inspection Staff Directory

Northwest Region

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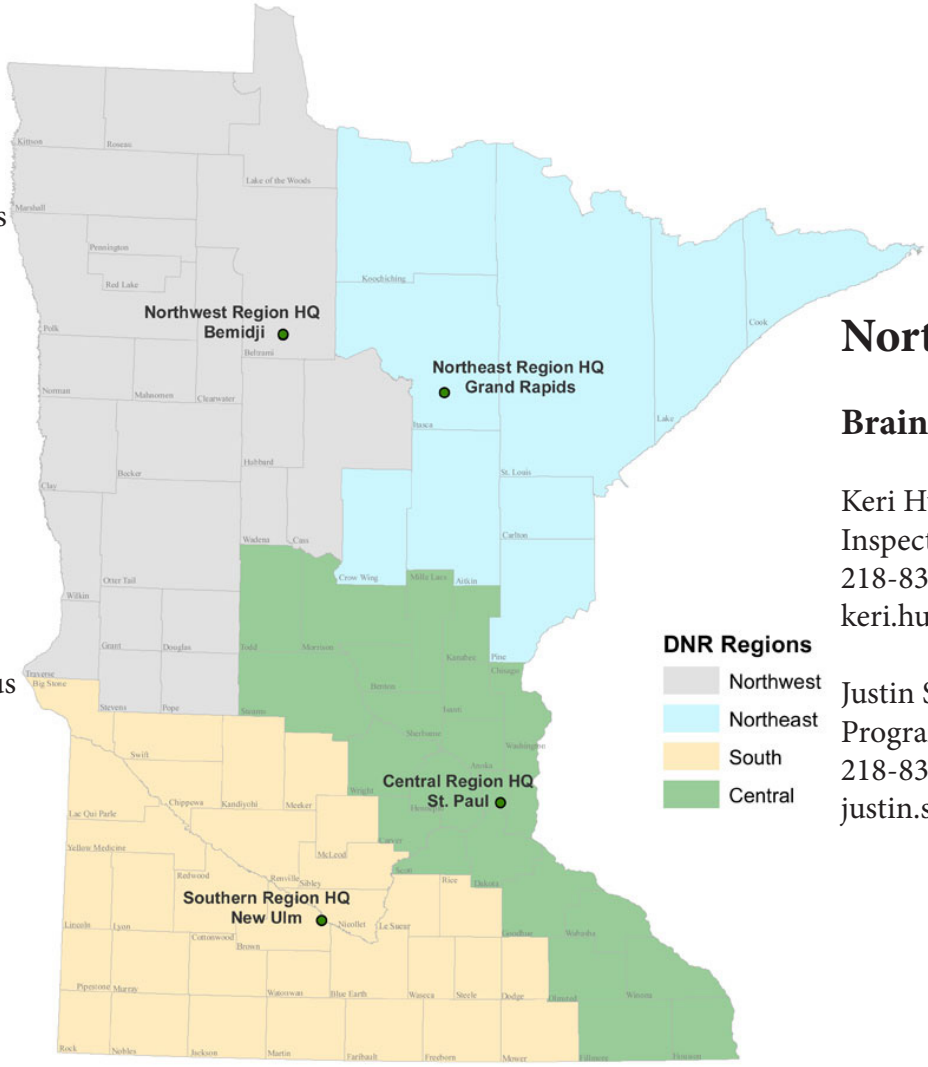

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What are zebra and quagga mussels?

Zebra and quagga mussels are freshwater bivalve mollusks—animals with two shells. They are relatives of clams and oysters. It is very difficult for a non-expert to tell the two species apart. The shell color of both mussels alternates between a yellowish and darker brown, often forming stripes. They range in size from microscopic up to about two inches long. The zebra mussel is nearly triangular in shape and the quagga mussel is more rounded. Unlike native North American freshwater mussels, which burrow in soft sediment, adult zebra and quagga mussels can attach via tiny threads—byssal threads—to hard surfaces.

Both zebra and quagga mussels can survive cold waters, but cannot tolerate being frozen. They can endure temperatures between 1°–30°C (33°–86°F). Zebra mussels need waters above 12°C (54°F) to reproduce while quagga mussels can reproduce in waters as cold as 9°C (48°F). The embryos are microscopic. The larvae, called **veligers**, are planktonic—free-floating. The veligers float in the water column or are carried in the current for about 10 days. The larvae then develop shells and settle onto any solid surface, including the skin or shells of native aquatic species.

Zebra mussels are native to the Black and Caspian Seas. They were discovered in the Great Lakes in 1988, and have since spread to over half of the states in the United States. Quagga mussels are native to the Dnieper River Drainage in the Ukraine, and were first found in the Great Lakes in 1989.

PHOTO BY LAUREN LIVO AND STEVE WILCOX

PHOTO BY U.S. GEOLOGICAL SURVEY

ILLUSTRATION BY
LEIGH ANNE MCCONNAUGHEY

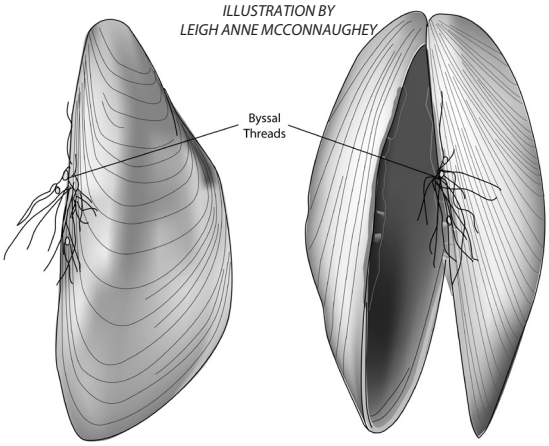
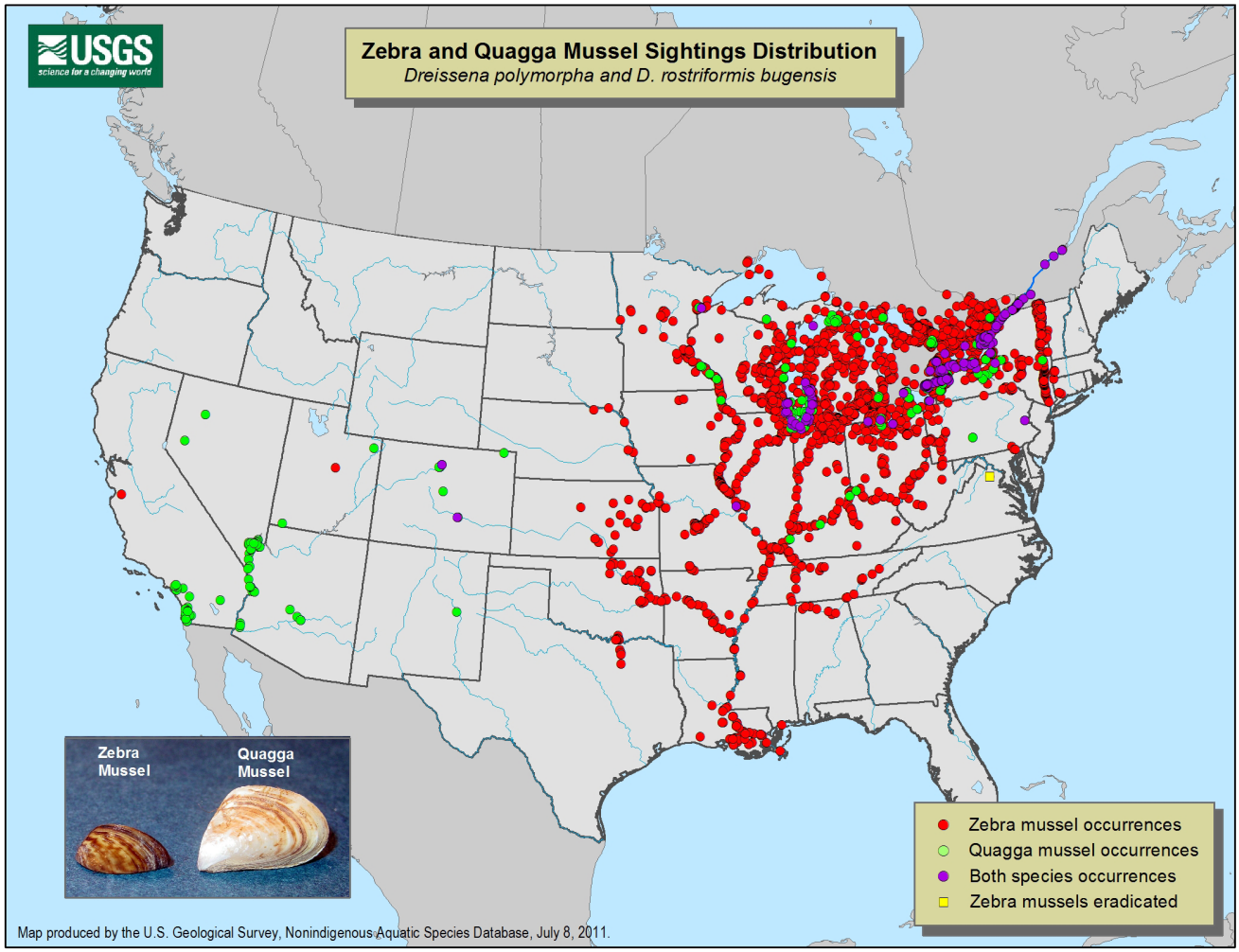


PHOTO BY DAVID K. BRITTON, PHD, U.S. FISH AND WILDLIFE SERVICE

Actual size

How did the mussels get to Minnesota?

Many aquatic nuisance species, including zebra and quagga mussels, were first introduced into the Great Lakes via the discharged ballast water of ocean-going ships. They were first found in Minnesota in the Duluth/Superior Harbor in 1989. Once in North American waters and wetlands, aquatic nuisance species often hitch rides to other bodies of water on the boats, trailers, and equipment that people transport from place to place. Boaters and anglers inadvertently transport AIS on water-realated equipment, including boats, boatlifts, waders, and in water contained in bait buckets and live wells.



The U.S. Geological Survey (USGS) updates a sightings map for both species daily at http://nas.er.usgs.gov/taxgroup/mollusks/zebramussel/.

Why should we be concerned about zebra and quagga mussels?

Zebra and quagga mussels pose a great ecological and financial threat to the state. The invasion of these mussels can affect all Minnesotans in some way. The impacts could be significant and irreversible.

PHOTO BY MN DNR

PHOTO BY BRAD HENLEY

They grow and reproduce quickly

Zebra and quagga mussels reproduce *exponentially*. A single female mussel can produce up to one million eggs a year! As the mussel population explodes, they cover many areas of the bottom and sides of the waterway.

PHOTO BY PETER YATES

They clog water infrastructure, impacting water supply and quality

As mentioned before, zebra and quagga mussels can attach via byssal threads to hard surfaces. They attach to most underwater structures and can form dense clusters that impair facilities and impede the flow of water. They clog intake pipes and trash screens, canals, aqueducts, and dams—disrupting water supply to homes, farms, factories, and power plants. Zebra and quagga mussels also degrade water quality and can alter the taste and smell of drinking water.

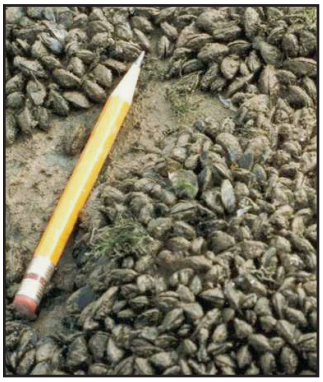


PHOTO BY RON DERMOTT

They have significant ecological impacts

Invasive species have the ability to change aquatic ecosystems including native plant and animal populations. The amount of food the mussels eat and the waste they produce has negative effects on the ecosystem and can harm fisheries. As filter feeders, these species remove large amounts of microscopic plants and animals that form the base of the food chain, reducing available food for native aquatic species. Zebra mussels attach to and encrust native organisms, essentially smothering them and removing more animals from the food chain.

PHOTO BY BRAD HENLEY

PHOTO BY GREAT LAKES ENVIRONMENTAL RESEARCH LABORATORY

They have water recreation impacts

These mussels encrust docks and boats and attached mussels can increase drag on boats. Small mussels can get into engine cooling systems causing overheating and damage. Increased hull and motor fouling will result in increased maintenance costs on vessels moored for long periods of time. The weight of attached mussels can sink navigational buoys. Zebra and quagga mussels also impact fish populations and reduce sport-fishing opportunities. Their sharp shells can cut the feet of swimmers, beach goers, and dogs.

PHOTO BY MNDNR

They have significant economic impacts

As maintenance costs for power plants, water treatment facilities, and water delivery infrastructures increase, so does the cost of food and utilities. In the Great Lakes area, maintenance costs in water treatment plants, power plant intakes, and dams have been in the billions of dollars. The damage to native fisheries also has a wider economic impact in terms of tourism and recreation dollars not spent. Marinas and watercraft dealers could suffer business declines.

PHOTO BY GREAT LAKES ENVIRONMENTAL RESEARCH LABORATORY

PHOTO BY MN DNR

They are very difficult to kill

In only one instance have managers been able to eradicate zebra mussels from a water body, and that was an isolated 12-acre quarry in Virginia. A large volume of a chemical was used to treat the water and kill the adults and larvae. Eradicating or treating zebra or quagga mussels in large water bodies and/or connected waterways is currently not possible, making prevention very important.

If watercraft are cleaned, drained, and dried in between water bodies, any attached mussels or other AIS will be removed or killed.

They spread quickly to other water bodies

Mussels can spread to other bodies of water by attaching to boat hulls, lower units, trim tabs (see photo below), anchors, and aquatic plants on trailers. Veligers can be transported in bilge water, ballast water or live bait wells. Veligers also disperse naturally by being carried downstream on water currents to other lakes, reservoirs, or through water diversions.

PHOTO BY BRAD HENLEY

What are the other AIS to be concerned about?

There are many other AIS that pose a significant threat to the aquatic resources or water infrastructure of the state, including, but not limited to, the following:

Animals:

Common Name	Scientific Name
Rusty Crayfish	*Orconectes rusticus*
Faucet Snail	
Zebra Mussel/Quagga	*Dreissena polymorpha & bugensis*
New Zealand mudsnail	*Potamopyrgus antipodarum*
Water flea, fishhook	*Cercopagis pengoi*
Spiny Water flea	*Bythotrephes longimanus* (also known as *Bythotrephes cederstroemi*)

Plants:

Common Name	Scientific Name
Brazilian water weed	*Egeria densa*
Curly-leaf pondweed	*Potamogeton crispus*
Eurasian watermilfoil	*Myriophyllum spicatum*
Flowering rush	*Butomus umbellatus*
Hydrilla	*Nymphoides peltata*
Purple loosestrife	*Lythrum salicaria*

Pathogens:

Common Name	Scientific Name
Viral Hemorrhagic Septicemia	*Viral Hemorrhagic Septicemia Virus*

Species Descriptions—Animals

Rusty Crayfish (*Orconectes rusticus*)

This species, which is native to the Ohio River basin, can often be identified by two rust colored marks on its mid-back area, near the area where one would place a thumb and finger to pick the animal up. Adults reach a maximum length of four inches. Original spread was by anglers using rusty crayfish as bait, but the crayfish were also harvested for regional bait markets and for biological supply companies, activities which probably helped spread the species further.

Rusty crayfish can inhabit lakes, ponds, and both pool and fast-water areas of streams. They are opportunistic feeders and will eat a variety of aquatic plants, benthic invertebrates (like aquatic worms, snails, leeches, clams, and aquatic insects), decaying plants and animals, bacteria and fungi, fish eggs, and small fish. Rusty crayfish cause a variety of negative impacts when introduced to new waters, including displacing native animals and plants.

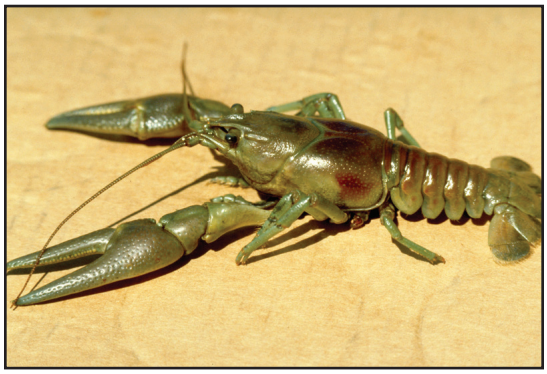


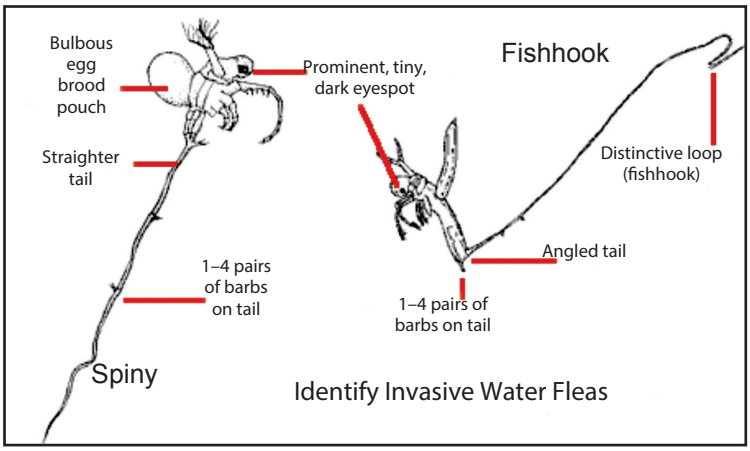
PHOTO BY U.S. ENVIRONMENTAL PROTECTION AGENCY

PHOTO BY MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

New Zealand mudsnail (*Potamopyrgus antipodarum*)

This small aquatic snail is native to freshwater lakes and streams of New Zealand. In the United States, this snail was first detected in the mid-1980s in the Snake River region of Idaho. Since then, it has spread to waters of Montana, Wyoming, Minnesota, California, Arizona, Oregon, and Utah. Mature New Zealand mudsnails average ⅛ inch in length and have brown or black cone-shaped shells with five whorls. One way to identify this species is hold the point of the shell upward. When the point of the shell is facing up, the shell's opening is on the right.

The mudsnail attaches to fishing gear, boats, trailers, or even fish and bait, then comes off in the next stream or river where these things are used or discarded. Mudsnails are able to close their openings to withstand dry conditions and a variety of temperatures. They can survive out of water for several days, so it's easy to see how they can move about and survive on recreational gear. Mudsnails consume aquatic vegetation, upsetting the balance of the aquatic environment. They reproduce asexually; it only takes **one** to start a whole new population! Eradicating established infestations is impossible.



Spiny Water flea (*Daphnia longimanus*) and Fishhook Water flea (*Cercopagis pengoi*)

Spiny and fishhook water fleas are small, predacious crustaceans—a group of animals that includes crabs, shrimp, crayfish, and lobsters. Unlike these other crustaceans, the spiny and fishhook water fleas are very small creatures known as zooplankton. Both arrived in ship's ballast water from Eurasia.

Water fleas threaten aquatic ecosystems and fishing by competing with native fish for food and fouling gear. Both water fleas eat smaller zooplankton that is important food for juvenile fish. With less zooplankton to feed on algae, algal populations can bloom, making lake water less clear. Even though these waterfleas can be eaten by fish, their spine deters most small fish, which experience great difficulty swallowing the water fleas.

Water fleas collect in masses on fishing lines and downrigger cables. The buildup is so heavy that it can become diffucult to fish with any degree of enjoyment.

Water fleas can spread to inland waters when recreational gear is contaminated with egg-laden females. While females die out of water, under certain conditions they produce eggs that resist drying, remain viable, and can establish a new population. Eradicating established infestations is impossible.

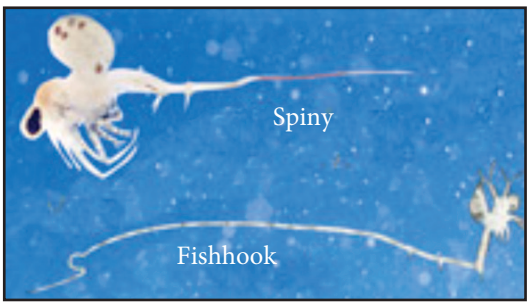


PHOTO BY MINNESOTA SEA GRANT

PHOTO BY MN DNR

PHOTO BY MN DNR

Bighead and Silver Carp *(Hypophthalmichthys nobilis & H. molitrix)*

They are large filter feeding fish that can weigh up to 110 pounds for bighead carp and 60 pounds for silver carp. Imported from China in the 1970s for use in aquaculture ponds to control plankton. By the early 1980s, both species had escaped into open waters in southern states.

They eat huge amounts of plankton and detritus. Because they feed on plankton, these fish compete for food with native organisms including mussels, larval fishes, and some adult fish such as paddlefish. This competition for food could result in fewer and smaller sport fish. Silver carp can jump up to 10 feet out of the water when disturbed by sounds of watercraft. They often jump into boats and can injure boaters, and damage personal watercraft.

Both species are spreading within the Mississippi River basin through connected waters. The juveniles are difficult to distinguish from gizzard shad and other native baitfish, so they could be spread through use or release of live bait.

Bighead and silver carp are all designated as prohibited invasive species, which means import, possession, transport, and introduction into the wild is prohibited. It is required to report these fish if caught in the state. They can be legally transported to the DNR to report a suspected finding.

Faucet Snail *(Bithynia tentaculata)*

The faucet snail is an aquatic snail native to Europe and was introduced to the Great Lakes in the 1870s. It was probably brought to North America unintentionally with the solid ballast used in large timber transport ships or perhaps with vegetation used in packing crates. Faucet snails are hosts to three parasitic trematodes or flukes (*Sphaeridiotrema globulus, Cyathocotyle bushiensis, Leyogonimus polyoon*), that have contributed to the deaths of thousands of ducks and coots in the past several years on Lake Winnibigoshish.

Since 2002, they have had the same impacts along the Mississippi River at Lake Onalaska near Lacrosse, WI. These parasites have a complex life history and require two intermediate hosts, such as the faucet snail to develop. When waterfowl consume the infected snails, the adult trematodes attack the internal organs and cause lesions and hemorrhaging. Infected birds appear lethargic and have difficulty diving and flying before eventually dying.

Faucet snails also compete with native snails, and may clog water intake pipes and other submerged equipment.

There is no evidence that other wildlife besides waterfowl, including any fish species, are adversely affected by the trematodes present in faucet snails. Anglers can eat fish from Lake Winnibigoshish without worry of the parasite. Faucet snails are not known to be co-hosts for the swimmers itch fluke.

Faucet snails are difficult for non-specialists to conclusively identify. Native snail species and young nonnative mystery snails could look similar to faucet snails.

Adult faucet snails can grow up to 1/2 inch in length, but are generally smaller. They are light

brown to black, with 4 to 5 whorls and a cover on the shell opening The shell opening is on the right when the shell is pointed up.
They can spread by attaching to aquatic plants, boats, anchors, decoy anchors, other recreational gear and equipment placed in the water. Some movement by waterbirds may also spread this invasive to new waters. Faucet snails can survive out of water for several days so precautions should be taken when transporting boats and equipment from infested waters.

PHOTO BY DAVE JUDE

Round Goby *(Neogobius melanostomus)*

The round goby is an aggressive bottom-dwelling fish that lives in lakes and rivers. They resemble sculpins, which are native, bottom-dwelling fishes. They can spawn several times per year. Adult fish are 3-10 inches long and mostly slate gray in color. There is a single scallop-shaped pelvic fin and a black spot on the dorsal fin. It is native to the freshwater region of the Black and Caspian Seas. They were introduced into the Great Lakes within ballast water discharged from ocean-going ships.
Round gobies have been found at densities up to 20 per square meter. They compete with native fish for food and habitat, and eat the eggs and young of native fish.
It is a prohibited invasive species, which means import, possession, transport, and introduction into the wild is prohibited. They could be spread through the illegal harvest and improper disposal of live bait.

Species Descriptions—Plants

Curly-leaf Pondweed *(Potamogeton crispus)*

Curly-leaf pondweed is a rooted, submersed aquatic plant that is not native to North America. It generally grows in 3-10 feet of water. Curly-leaf tolerates low water clarity and will readily invade disturbed areas. Curly-leaf is similar in appearance to many native pondweeds commonly found in Minnesota lakes and streams. It can be distinguished from other pondweeds by its unique life cycle. It is generally the first pondweed to come up in spring and dies back in mid summer. Leaves have undulating and finely serrated edges (see photo).

In spring, curly-leaf pondweed can form dense mats that may interfere with boating and other recreation on lakes. Curly-leaf also can cause ecological problems because it can displace native aquatic plants. In mid-summer, curly-leaf plants usually die back, which results in rafts of dying plants piling up on shorelines, and often is followed by an increase in phosphorus (a nutrient), and undesirable algal blooms.
Curly-leaf is believed to spread from one body of water to another primarily by the unintentional transfer of turions (hardened stem tips) and plant fragments carried on trailered boats, personal watercraft, etc. The most important action that you can take to limit the spread of curly-leaf and other non-native aquatic plants is to remove all aquatic plants from your watercraft before you move it from one body of water to another. It is a prohibited invasive species and is illegal to transport on a road.

PHOTO BY WASHINGTON STATE NOXIOUS WEED CONTROL BOARD

Brazilian Waterweed (*Egeria densa*)

Native to Brazil and Argentina, Brazilian elodea is a popular aquarium plant often sold in pet stores and available in school science kits under the name *Anacharis*. When it is introduced into freshwater, it forms dense beds that reduce water quality, disrupt wildlife habitat, slow the flow of water, and impede recreational activities.

This aquatic weed is a submerged, freshwater perennial plant found in both still and flowing waters including lakes, ponds, and quiet streams. It prefers low light and tolerates variable water quality (turbidity, pollution, etc.). It can survive under ice for short periods—but not prolonged freezing. The plant grows mostly underwater but forms dense mats along the surface that can cover hundreds of acres. Leaves grow in whorls of three to six around the stem making a cylindrical shape, and the stems are very leafy compared to the native elodea. The leaf edges appear smooth to the naked eye but the margins are minutely toothed, visible with low magnification. A distinguishing characteristic is the smooth midvein on the underside of the leaf. Small, white flowers appear from June through October. They have three glossy petals that appear wrinkled, and float on or rise above the water's surface on thread-like stems.

Brazilian waterweed is commonly mistaken for the native elodea (*Elodea canadensis*), or common waterweed, as well as the nonnative, invasive hydrilla (*Hydrilla verticillata*). Use the table below to distinguish among the species or contact the DNR for assistance with identification.

Hydrilla (*Hydrilla verticillata*)

PHOTO BY MONTANA DEPARTMENT OF AGRICULTURE

Hydrilla is native to India, Korea, and central Africa. It was first introduced in Florida in 1958 for use in the aquarium industry. Hydrilla is a submerged, rooted, perennial plant that forms dense colonies. Leaves are blade-like, about ⅛ inch to ⅜ inch long with small tooth margins. The underside of the leaf has a red midrib with one to four spines or conical bumps, making them feel rough. Leaves are usually four to eight in a whorl. Hydrilla produces tiny, translucent, white to reddish flowers on long stalks. Plants flower from June through October.

Hydrilla is able to establish itself in low-light waters over 20 feet deep and then grow towards the shallow banks. It branches profusely after reaching the surface and forms thick mats that hinder recreation, navigation, and water intakes. It grows quickly and outcompetes and eliminates native species. Hydrilla can grow in almost any freshwater—in variable conditions with either low or high nutrient amounts, and has a wide temperature tolerance (68–86°F).

Hydrilla reproduces rapidly—by fragmentation, from seeds, and it also produces ¼ inch turions at the leaf axils and potato-like tubers attached to the roots in the mud.

Plant Characteristics:	Brazilian waterweed (nonnative)	Common elodea (native)	Hydrilla (nonnative)
Leaves in whorl:	3–6	3–5	5–8
Leaf margins toothed:	Minutely, need magnification	No teeth	Coarse visible teeth
Midvein:	Smooth	Smooth	1–4 conical bumps, midvein red
Flowers:	Glossy white	White	Petals translucent, white to reddish
Reproduction:	Stolons, fragments	Seeds, fragments, stolons	Turions, stolons, fragments

PHOTO BY ELIZABETH BROWN, CDOW

Eurasian Watermilfoil (*Myriophyllum spicatum*)

Eurasian watermilfoil is a submerged, herbaceous aquatic plant. Native to Europe, Asia, and Northern Africa, it was introduced into the USA in the 1940s and is one of the most destructive aquatic plants known. This highly aggressive species colonizes a variety of habitats, including both moving and standing waters. It grows rapidly—about one foot per week—and forms extremely dense mats. The mats crowd out native species, disrupt the food chain, displace wildlife habitat, and clog waterways, stopping or slowing the flow of water.
Its infestations alter aquatic ecosystems by shading out native species and providing choice mosquito larvae habitat. Dense mats impair all forms of water based recreation.

Pink or olive green stems grow to the water surface, usually extending 3 to 10, but as much as 33, feet in length and frequently forming dense mats. Stems of Eurasian watermilfoil are long, slender, branching, hairless, and become leafless toward the base. New plants may emerge from each node (joint) on a stem, and root upon contact with mud. The feathery dark green leaves of Eurasian watermilfoil are finely divided and occur in whorls of three or four along the stem, with 12–20 pairs of fine, thin leaflets about ½ to 2 inches long. These leaflets give milfoil a feathery appearance that is a distinguishing feature of the genus. Eurasian watermilfoil produces small, yellow, four parted flowers on a spike that projects 2 to 4 inches above the water surface from June to September. The fruit is a hard, segmented capsule containing four seeds.

Native watermilfoil, Northern watermilfoil (*Myriophyllym sibiricum*) and Parrotfeather (*Myriophyllum aquaticum*) are very difficult to distinguish from Eurasian watermilfoil. There are also hybrids that can complicate identification.Use the table on page 39 to help tell the difference between the two species or contact the Minnesota DNR for assistance with identification.

PHOTO MN DNR

Flowering Rush *(Butomus umbellatus L.)*

Flowering rush is a perennial aquatic plant, native to Europe and Asia. It grows along lake and river shores as an emergent plant. Emergent plants are rooted in the lake bottom with stems and leaves that grow above the surface of the water. A familiar emergent plant is cattail. Flowering rush may also grow as a non-flowering, submersed plant, growing below the surface of the water, with limp, ribbon-like leaves.

Identification of flowering rush can be difficult, especially when the plants do not have flowers. It closely resembles many native emergent plants, such as bulrush. The emergent form of flowering rush has three-angled fleshy leaves and may produce a cluster of pink flowers (see photo).

Flowering rush has been sold as an ornamental garden plant and is most likely introduced into new waterbodies by humans. Flowering rush is classified as a prohibited invasive species in Minnesota. It is illegal to possess, buy, sell, transport, and plant.

The plant spreads primarily by vegetative means, usually not by seed. Vegetative reproduction can result from growth of thick rhizomes, which are underground stems. Rhizomes also may produce small tubers or buds, which can disperse and grow into new plants. Also, small buds or "bulblets" that form in the clusters of flowers also can disperse and grow into new plants. Water currents, ice movement, muskrats, and geese can easily move these reproductive structures to new locations within a water body.

Dense stands of flowering rush may interfere with swimming and other use of lakes. Resource managers are concerned that flowering rush may become an aggressive competitor and displace native emergent vegetation, such as hardstem bulrush.

Plant Characteristics:	Eurasian watermilfoil (exotic)	Northern watermilfoil (native)	Parrotfeather (exotic)
Number of pairs of leaflets:	Pairs of 12–20	Pairs of 10 or less	Pairs of 20–30
Submerged leaves	Submerged leaves 0.5 to 2.0 inches long (longer than wide)	Leaves .4–.9 incheslong, .5–1.3 mm wide (wider than long)	Submerged leaves 0.6 to 1.4 inches long (longer than wide)
Emergent leaves	None	None	Emergent leaves 0.8 to 2 inches long with 16 to 18 leaflets per leaf
Leaf whorls	3–5 leaves per whorl (typically 4)	3–5 leaves per whorl (typically 4)	5–6 leaves per whorl
Leaf stiffness	Leaves limp out of water	Leaves stiff out of water	Leaves stiff out of water
Leaf color	Olive green	Green	Blue green
Stem color	Pink, peach, light green	White, light green	Green
Flower spike	Emerged	Emerged	Emerged
Flowering times	June through September	July through September	April through July
Fruits	Hard, segmented capsule	Hard, segmented capsule	Not known to fruit outside native range
Turions	No	Yes	

Purple Loosestrife (*Lythrum salicaria*)

PHOTO ©BARRY A. RICE, THE NATURE CONSERVANCY

Purple loosestrife is native to Europe and Asia, and was initially introduced to the northeastern seaboard of the United States in the ballast of ships in the 1800s. It has been repeatedly and continually introduced as a garden plant. Purple loosestrife invades marshes and lakeshores, replacing cattails and other wetland plants. In some locations, natural cattail marshes have been completely overtaken by loosestrife. The plant forms dense, impenetrable stands that are unsuitable as cover, food, or nesting sites for a wide range of native wetland animals. Loosestrife tolerates a wide range of environmental conditions. It favors fluctuating water levels and other conditions often associated with disturbed sites. It is shade intolerant and is apparently unable to invade saline wetlands.

Purple loosestrife is a perennial with long, showy spikes of magenta flowers and a square stem. Usually under 4 feet in height, the plant may reach up to 10 feet tall in nutrient-rich habitats. The flowers have five to seven petals and bloom from June to September. The leaves are usually opposite, usually in pairs, or in whorls of three. Leaves are lance-shaped, without teeth, and the venation has a peripheral margin which distinguishes it from other square stem mint species prior to flowering. Purple loosestrife is a List A noxious weed and eradication is mandatory.

Species Descriptions—Pathogens

Viral Hemorrhagic Septicemia Virus (*VHSV*)

Viral hemorrhagic septicemia virus is a serious pathogen of fresh and saltwater fish. VHSV virus is a rhabdovirus (rod shaped virus) that affects fish of all size and age ranges. It does not pose any threat to human health. VHSV can cause hemorrhaging of fish tissue, including internal organs, and can cause the death of infected fish. Once a fish is infected with VHSV, there is no known cure. The clinical signs of VHSV may include tissue hemorrhaging (bleeding), unusual behavior, anemia, bulging eyes, bloated abdomens, and the rapid onset of death; however, these symptoms could apply to many different fish diseases. There is no clear visual diagnostic to confirm VHS. Not all infected fish show signs and may become carriers of the disease. (See DNR VHS brochure for list of species) The only way to confirm VHSV is to test the fish in a lab.

VHSV can be spread from one waterbody to the next through a variety of means, not all of which

PHOTOS BY VERMONT FISH AND WILDLIFE

are known at this time. One known method of spreading VHSV is moving fish from one waterbody to another. This could occur by importation, stocking, or the use of bait fish. Other potential sources of VHSV spreading are natural fish movements, recreational boating/angling, bird assistance, water discharge, and sampling activities.

Working with the public—Frequently Asked Questions

Most boaters have heard something about zebra mussels or AIS and may be concerned about the inspection process. The boating public is more likely to comply with and be supportive of the inspection program if they understand how important it is to control these species. That is why **education is a key component of your efforts** as a volunteer. When boaters realize that the inspection takes little time and protects Minnesota's waters, they usually are more than happy to comply. You may be asked many questions during the short time you are interacting with boaters during the inspection. Here are some of the most frequently asked questions:

Q: Isn't the spread of zebra and quagga mussels inevitable anyway?

A: No, states that have implemented education and inspection programs have significantly slowed or even stopped the spread of these species. Even if we only slow the spread of mussels, each year they are contained could save us tens to hundreds of millions of dollars of taxpayer money. Also, preventing the spread of zebra and quagga mussels will protect our waters, native wildlife, and fish for that many more years while ongoing research develops tools to control these species.

Q: Aren't zebra and quagga mussels actually good for fishing?

A: No. They may impact many fish species by removing most of the nutrient base. Zebra and quagga mussels are filter feeders that strain small planktonic organisms, which are the basis of the aquatic food web, from the water column. Impacts on fish populations have not been studied in enough detail to know exactly what will happen to a particular species in any lake, but zebra mussels have the potential to reduce fish numbers.

Q: Don't zebra and quagga mussels improve water quality?

A: They do clear the water significantly, but that is not necessarily a good thing. These mussels eat the good algae and leave behind problematic algae. Clear water also can enable aquatic plant species to grow in more areas of a water body which along with problem algae, impacts water quality, causing taste and odor problems in drinking water.

Q: Isn't there anything that eats these mussels?

A: These mussels are controlled by natural predators in their native environment, but so far no biological controls have been effective on this continent. Some ducks and fish, such as sunfish, common carp and freshwater drum, do eat zebra mussels, but not in quantities that reduce zebra mussel populations.

Q: Can zebra and quagga mussels be spread by birds?

A: Research studies have shown that birds are not a significant factor in transferring these species to new watersheds. Most of the new locations where zebra and quagga mussels have been found are high-use boating areas, not wildlife refuges. Moving watercraft and water-related equipment is the primarily method of spreading these species in the U.S., and it is the one factor we can control.

Q: Is this an over-reaction to the discovery of a few mussels? Shouldn't officials wait and see what will happen in the next few years?

A: No, states that have waited to act have found that zebra mussels and AIS have spread significantly while they waited. Zebra mussels and AIS in general are nearly impossible to get rid of once they are in a water system (see next question).

Q: Can we get rid of the zebra and quagga mussels that have been found in Minnesota lakes and rivers?

A: It's not very likely. Only one water body in the entire country got rid of them. That was a 12 acre isolated quarry where a huge amount of potassium chloride was used to eradicate them. No larger bodies of water have been able to get rid of them, even with a drawdown.

Q: Should I stop boating in Minnesota lakes and reservoirs infested with zebra or quagga mussels?

A: No, you just need to take extra precautions to **Clean, Drain,** and **Dry** your watercraft completely between infested waters and other places where you like to boat. If you properly **Clean, Drain,** and **Dry** your boat, you can safely move your boat between waters.

Q: Are zebra and quagga mussels harmful to humans?

A: Not directly. They do not represent any direct health risks to humans when they are in a waterway. If there is a large population of mussels in a lake, then the shoreline can be littered with sharp shells that can cut people's feet.

Q: Can you eat zebra and quagga mussels?

A: No, you shouldn't. As the mussels filter in food and water, they accumulate various contaminants in their bodies. Because these contaminants may be toxic, we can't harvest these mussels for human consumption in order to get rid of them. They aren't the kind of mussels one would steam and eat with butter.

Q: How do you know what lakes and rivers are designated as infested waters?

A: Each year, the DNR designates waters that contain populations of Eurasian watermilfoil, faucet snail, New Zealand mudsnail, ruffe, round goby, spiny water flea, VHS fish disease, white perch, and zebra mussel as infested waters.
There are several ways to know if a waterbody is a designated infested water:

- There is a list in the annual Fishing Regulations booklet;
- The most up to date list is posted on the DNR Web site at - http://files.dnr.state.mn.us/eco/invasives/infested_waters.pdf
- The list is published annually in the State Register and as more waters are designated; and
- There are signs posted at the public water accesses.

Appendix A:
Selected Minnesota Laws Related to Water-related Equipment, Watercraft Inspections, and Decontamination

Selected Minnesota Laws Related to Water-related Equipment, Watercraft Inspections, and Decontamination

August 1, 2013

M.S. 84D.01 DEFINITIONS.
Subdivision 1. Terms. For the purposes of this chapter, the following terms have the meanings given them.

Subd. 2. Aquatic macrophyte. "Aquatic macrophyte" means a macroscopic nonwoody plant, either a submerged, floating leafed, floating, or emergent plant that naturally grows in water.

Subd. 3a. Decontaminate.
"Decontaminate" means to wash, drain, dry, or thermally or otherwise treat water-related equipment in order to remove or destroy aquatic invasive species using the "Recommended Uniform Minimum Protocols and Standards for Watercraft Interception Programs for Dreissenid Mussels in the Western United States" (September 2009) prepared for the Western Regional Panel on Aquatic Nuisance Species, or other protocols developed by the commissioner.
Subd. 8a. Introduce.
"Introduce" means to place, release, or allow the escape of a nonnative species into a free-living state. Introduce does not include:

(1) the immediate return of a nonnative species to waters of the state from which the nonnative species was removed; or
(2) the seasonal return of nonnative species attached to water-related equipment, such as a dock or boat lift, that has been stored on riparian property and directly returned to the same waters of the state from which the water-related equipment was removed.

Subd. 8b. Inspect.
"Inspect" means to examine water-related equipment to determine whether aquatic invasive species, aquatic macrophytes, or water is present and includes removal, drainage, decontamination, or treatment to prevent the transportation and spread of aquatic invasive species, aquatic macrophytes, and water.

Subd. 8c. Inspector.
"Inspector" means: (1) an individual trained and authorized by the commissioner to inspect water-related equipment under section 84D.105, subdivision 2, paragraph (a); or (2) a conservation officer or a licensed peace officer.

Subd. 16. Transport.
"Transport" means to cause or attempt to cause a species to be carried or moved into or within the state, and includes accepting or receiving the species for transportation or shipment. Transport does not include:

(1) the movement of infested water or a nonnative species within a water of the state or to a connected water of the state where the species being transported is already present; or
(2) the movement of a nonnative species attached to water-related equipment or other water-related structures from a water of the state to the shore of riparian property on that water or the return of water-related equipment or structures from the shore into the same water of the state.

Subd. 18a. Water-related equipment.
"Water-related equipment" means a motor vehicle, boat, watercraft, dock, boat lift, raft, vessel, trailer, tool, implement, device, or any other associated equipment or container, including but not limited to portable bait containers, live wells, ballast tanks except for those vessels permitted under the Pollution Control Agency vessel discharge program, bilge areas, and water-hauling equipment that is capable of containing or transporting aquatic invasive species, aquatic macrophytes, or water.

M.S. 84D.02 INVASIVE SPECIES MANAGEMENT PROGRAM FOR AQUATIC PLANTS AND WILD ANIMALS.

Subdivision 1. Establishment.

The commissioner shall establish a statewide program to prevent and curb the spread of invasive species of aquatic plants and wild animals. The program must provide for coordination among governmental entities and private organizations to the extent practicable. The commissioner shall seek available federal funding and grants for the program.

M.S. 84D.O5 PROHIBITED INVASIVE SPECIES.

Subdivision 1. Prohibited activities.

A person may not possess, import, purchase, sell, propagate, transport, or introduce a prohibited invasive species, except:

(1) under a permit issued by the commissioner under section 84D.11;
(2) in the case of purple loosestrife, as provided by sections 18.75 to 18.88;
(3) under a restricted species permit issued under section 17.457;
(4) when being transported to the department, or another destination as the commissioner may direct, in a sealed container for purposes of identifying the species or reporting the presence of the species;
(5) when being transported for disposal as part of a harvest or control activity under a permit issued by the commissioner according to section 103G.615, when being transported for disposal when specifically authorized under a commercial fishing license issued by the commissioner according to section 97A.418, 97C.801, 97C.811, 97C.825, 97C.831, or 97C.835, or when being transported as specified by the commissioner;
(6) when the specimen has been lawfully acquired dead and, in the case of plant species, all seeds are removed or are otherwise secured in a sealed container;
(7) in the form of herbaria or other preserved specimens;
(8) when being removed from watercraft and equipment, or caught while angling, and immediately returned to the water from which they came; or
(9) as the commissioner may otherwise prescribe by rule.

Subd. 2. Seizure.

Under section 97A.221, the commissioner may seize or dispose of all specimens of prohibited invasive species unlawfully possessed, imported, purchased, sold, propagated, transported, or introduced in the state.

M.S. 84D.07 REGULATED INVASIVE SPECIES.

Except as provided in rules adopted under section 84D.12, subdivision 2, clause (1), a person may not introduce a regulated invasive species without a permit issued by the commissioner.

M.S. 84D.09 AQUATIC MACROPHYTES.

Subdivision 1. Transportation prohibited.

Unless specifically authorized under a license or permit issued by the commissioner, a person may not transport aquatic macrophytes except as provided in this section.

Subd. 2. Exceptions.

Unless otherwise prohibited by law, a person may transport aquatic macrophytes:

(1) that are duckweeds in the family Lemnaceae;
(2) for purposes of constructing shooting or observation blinds in amounts sufficient for that purpose, provided that the aquatic macrophytes are emergent and cut above the waterline;
(3) when legally purchased or traded by or from commercial or hobbyist sources for aquarium, wetland or lakeshore restoration, or ornamental purposes;
(4) when harvested for personal or commercial use if in a motor vehicle;
(5) to the department, or another destination as the commissioner may direct, in a sealed container for purposes of identifying a species or reporting the presence of a species;
(6) that are wild rice harvested under section 84.091;
(7) in the form of fragments of emergent aquatic macrophytes incidentally transported in or on watercraft or decoys

used for waterfowl hunting during the waterfowl season; or
(8) when removing water-related equipment from waters of the state for purposes of cleaning off aquatic macrophytes before leaving a water access site.

M.S. 84D.10 WATERCRAFT REQUIREMENTS AND PROHIBITIONS.
Subdivision 1. Launching prohibited.
A person may not place or attempt to place into waters of the state a watercraft, a trailer, or aquatic plant harvesting or control equipment that has aquatic macrophytes or prohibited invasive species attached except as provided in this section.

Subd. 3. Removal and confinement.
(a) A conservation officer or other licensed peace officer may order:
(1) the removal of aquatic macrophytes or prohibited invasive species from water-related equipment before it is placed into waters of the state;
(2) confinement of the water-related equipment at a mooring, dock, or other location until the water-related equip ment is removed from the water;
(3) removal of water-related equipment from waters of the state to remove prohibited invasive species if the water has not been designated by the commissioner as being infested with that species.; and
(4) a prohibition on placing water-related equipment into waters of the state when the water-related equipment has aquatic macrophytes or prohibited invasive species attached in violation of subdivision 1 or when water has not been drained or the drain plug has not been removed in violation of subdivision 4.
(b) An inspector who is not a licensed peace officer may issue orders under paragraph (a), clauses (1), (3), and (4).

Subd. 4. Persons transporting water-related equipment.
(a) When leaving waters of the state a person must drain water-related equipment holding water and live wells and bilges by removing the drain plug before transporting the water-related equipment off the water access site or riparian property.
(b) Drain plugs, bailers, valves, or other devices used to control the draining of water from ballast tanks, bilges, and live wells must be removed or opened while transporting water-related equipment.
(c) Emergency response vehicles and equipment may be transported on a public road with the drain plug or other similar device replaced only after all water has been drained from the equipment upon leaving the water body.
(d) Portable bait containers used by licensed aquatic farms, portable bait containers when fishing through the ice except on waters designated infested for viral hemorrhagic septicemia, and marine sanitary systems are exempt from this subdivision.
(e) A person must not dispose of bait in waters of the state.
(f) A boat lift, dock, swim raft, or associated equipment that has been removed from any water body may not be placed in another water body until a minimum of 21 days have passed.
(g) A person who transports water that is appropriated from noninfested surface water bodies and that is transported by a commercial vehicle, excluding watercraft, or commercial trailer, which vehicle or trailer is specfically designed and used for water hauling, is exempt from paragraphs (a) and (b), provided that the person does not discharge the transported water to other surface waters or within 100 feet of a surface water body.
(h) A person transporting water from noninfested surface water bodies for firefighting or emergencies that threaten human safety or property is exempt from paragraphs (a) and (b).

M.S. 84D.105 INSPECTION OF WATER-RELATED EQUIPMENT.
Subdivision 1. Compliance inspections.
Compliance with aquatic invasive species inspection requirements is an express condition of operating or transporting water-related equipment. An inspector may prohibit an individual from placing or operating water-related equipment in waters of the state if the individual refuses to allow an inspection of the individual's water-related equipment or refuses to remove and dispose of aquatic invasive species, aquatic macrophytes, and water.

Subd. 2. Inspector authority.

(a) The commissioner shall train and authorize individuals to inspect water-related equipment for aquatic macrophytes aquatic invasive species, and water.
The commissioner may enter into a delegation agreement with a tribal or local government where inspection authority as provided under paragraphs (b), (g), and (h) is delegated to tribal and local governments that assume all legal, financial, and administrative responsibilities for inspection programs on some or all public waters within their jurisdiction.

(b) Inspectors may visually and tactilely inspect watercraft and water-related equipment to determine whether aquatic invasive species, aquatic macrophytes, or water is present. If a person transporting watercraft or water-related equipment refuses to take required corrective actions or fails to comply with an order under section 84D.10, subdi vision 3, an inspector who is not a licensed peace officer shall refer the violation to a conservation officer or other licensed peace officer.

(c) In addition to paragraph (b), a conservation officer or other licensed peace officer may inspect any watercraft or water-related equipment that is stopped at a water access site, any other public location in the state, or a private location where the watercraft or water-related equipment is in plain view, if the officer determines there is reason to believe that aquatic invasive species, aquatic macrophytes, or water is present on the watercraft or water-related equipment.

(d) Conservation officers or other licensed peace officers may utilize check stations in locations, or in proximity to locations, where watercraft or other water-related equipment is placed into or removed from waters of the state. Any check stations shall be operated in a manner that minimizes delays to vehicles, equipment, and their occupants.

M.S. 84D.13 ENFORCEMENT; PENALTIES.

Subdivision 1. Enforcement.

Unless otherwise provided, this chapter and rules adopted under section 84D.12 may be enforced by conservation officers under sections 97A.205, 97A.211, and 97A.221 and by other licensed peace officers.

Subd. 2. Cumulative remedy.

The authority of conservation officers and other licensed peace officers to issue civil citations is in addition to other remedies available under law, except that the state may not seek penalties under any other provision of law for the incident subject to the citation.

Subd. 3. Criminal penalties.

(a) A person who violates a provision of sections 84D.03 or 84D.06 to 84D.11, or a rule adopted under section 84D.12, is guilty of a misdemeanor.

(b) A person who possesses, transports, or introduces a prohibited invasive species in violation of section 84D.05 is guilty of a misdemeanor. A person who imports, purchases, sells, or propagates a prohibited invasive species in violation of section 84D.05 is guilty of a gross misdemeanor.

(c) A person who refuses to obey an order of a peace officer or conservation officer to remove prohibited invasive species or aquatic macrophytes from any water-related equipment is guilty of a gross misdemeanor.

Subd. 4. Warnings; civil citations.

After appropriate training, conservation officers, other licensed peace officers, and other department personnel designated by the commissioner may issue warnings or citations to a person who:

(1) unlawfully transports prohibited invasive species or aquatic macrophytes;

(2) unlawfully places or attempts to place into waters of the state water-related equipment that has aquatic macrophytes or prohibited invasive species attached;

(3) intentionally damages, moves, removes, or sinks a buoy marking, as prescribed by rule, Eurasian water milfoil;

(4) fails to remove plugs, open valves, and drain water water-related equipment before leaving waters of the state or when transporting water-related equipment as provided in section 84D.10, subdivision 4; or

(5) transports infested water, in violation of rule, off riparian property.

Subd. 5. Civil penalties.
A civil citation issued under this section must impose the following penalty amounts:
(1) for transporting aquatic macrophytes in violation of section 84D.09, $100;
(2) for placing or attempting to place into waters of the state water-related equipment that has aquatic macrophytes attached, $200;
(3) for unlawfully possessing or transporting a prohibited invasive species other than an aquatic macrophyte, $500;
(4) for placing or attempting to place into waters of the state water-related equipment that has prohibited invasive species attached when the waters are not designated by the commissioner as being infested with that invasive species, $500 for the first offense;
(5) for intentionally damaging, moving, removing, or sinking a buoy marking, as prescribed by rule, Eurasian water milfoil, $100;
(6) for failing to remove plugs, open valves, and drain water from water-related equipment, other than marine sanitary systems, before leaving waters of the state, $100; and
(7) for transporting infested water off riparian property without a permit as required by rule, $200.

Subd. 6. Watercraft license suspension.
A civil citation may be issued to suspend, for up to a year, the watercraft license of an owner or person in control of a watercraft or trailer who refuses to submit to an inspection under section 84D.105 or who refuses to comply with a removal order given under this section.

Subd. 7. Satisfaction of civil penalties.
A civil penalty is due and a watercraft license suspension is effective 30 days after issuance of the civil citation. A civil penalty collected under this section must be paid to either: (1) the commissioner if the citation was issued by a conservation officer and must be credited to the invasive species account; or (2) the treasury of the unit of government employing the officer who issued the civil citation.

M.S. 86B.811 CRIMINAL PENALTIES.
Subd. 1a. Petty misdemeanor.
A watercraft owner who fails to obtain or display an aquatic invasive species rules decal or a person who operates a watercraft that does not display an aquatic invasive species rule decal in violation of section 86B.508 is guilty of a petty misdemeanor.

MINNESOTA RULES 6216.0250 PROHIBITED INVASIVE SPECIES.
Subpart 1. Designation. The species in subparts 2 to 5 and any hybrids, cultivars, or varieties of the species are designated as prohibited invasive species.

Subp. 2. Aquatic plants. The following aquatic plants are designated as prohibited invasive species:
A. African oxygen weed (*Lagarosiphon major*) (Ridley) Moss ex Wagner;
B. aquarium watermoss or giant salvinia (*Salvinia molesta*) Mitchell;
C. Australian stonecrop (*Crassula helmsii*) (Kirk) Cockayne;
D. brittle naiad (*Najas minor*) Allioni;
E. curly-leaf pondweed (*Potamogeton crispus*) Linnaeus;
F. Eurasian water milfoil (*Myriophyllum spicatum*) Linnaeus;
G. European frog-bit (*Hydrocharis morsus-ranae*) Linnaeus;
H. flowering rush (*Butomus umbellatus*) Linnaeus;
I. hydrilla (*Hydrilla verticillata*) (Carl von Linnaeus) Royle; J.
J. Indian swampweed (*Hygrophila polysperma*) (Roxburgh) T. Anders;
K. purple loosestrife (*Lythrum salicaria, Lythrum virgatum*, or any variety, hybrid, or cultivar thereof) Linnaeus;
L. water aloe or water soldiers (*Stratiotes aloides*) Linnaeus; and
M. water chestnut (*Trapa natans*) Linnaeus.
N. the aquatic plants listed in Code of Federal Regulations, title 7, section 360.200, are also designated as prohibited invasive species except for Chinese water spinach (*Ipomoea aquatica*)

Subp. 3. Fish. The following fish are designated as prohibited invasive species:
A. bighead carp (*Hypophthalmichthys nobilis*) Richardson;
B. black carp (*Mylopharyngodon piceus*) (Richardson) Peters;
C. grass carp (*Ctenopharyngodon idella*) Valenciennes;
D. largescale silver carp *(Hypophthalmichthys harmandi)* Sauvage;
E. northern snakehead fish (*Channa argus*);
F. round goby (*Neogobius melanostomus*);
G. rudd (*Scardinius erythrophthalmus*) Linnaeus;
H. ruffe (*Gymnocephalus cernuus*) Linnaeus;
I. sea lamprey (*Petromyzon marinus*) Linnaeus;
J. silver carp (*Hypophthalmichthys molitrix*) Valenciennes;
K. tubenose goby (*Proterorhinus marmoratus*) Pallas;
L. western mosquitofish *(Gambusia affinis)* Baird & Girard;
M. white perch (*Morone americana*) Gmelin; and
N. zander (*Stizostedion lucioperca*) Linnaeus.

Subp. 4. Invertebrates. The following invertebrates are designated as prohibited invasive species:
A. faucet snail (*Bithynia tentaculata*);
B. New Zealand mud snail (*Potamopyrgus antipodarum*);
C. quagga mussel (*Dreissena bugensis*);
D. red swamp crayfish (*Procambarus clarkii*); and
E. zebra mussel (*Dreissena spp.*).

6216.0260 REGULATED INVASIVE SPECIES.
Subpart 1. Designation. The species in subparts 2 to 5 are designated as regulated invasive species.

Subp. 2. Aquatic plants. The following aquatic plants are designated as regulated invasive species:
A. Brazilian waterweed (*Egeria densa*) Planchon;
B. Carolina fanwort or fanwort (*Cabomba caroliniana*) A. Gray;
C. Chinese water spinach (*Ipomoea aquatica*) Forsskal;
D. parrot's feather (*Myriophyllum aquaticum*) (da Conceicao Vellozo) Verdcourt;
E. nonnative waterlilies (*Nymphaea spp.*) Linnaeus, or any variety, hybrid, or cultivar thereof
Native Minnesota waterlilies are: *Nymphaea odorata Aiton subsp. odorata Aiton, N. leibergii Morong,* and *N. odorata Aiton subsp. tuberosa* (Paine) Wiersema & Hellquist; and
F. yellow iris or yellow flag (*Iris pseudacorus*) Linnaeus.

Subp. 3. Fish.
A. alewife (*Alosa pseudoharengus*) Wilson;
B. common carp, koi (*Cyprinus carpio*) Linnaeus;
C. goldfish (*Carassius auratus*) Linnaeus;
D. rainbow smelt (*Osmerus mordax*) Mitchell; and
E. tilapia (*Tilapia, Oneochromis, Sartheradon spp.*).

Subp. 5. Invertebrates. The following invertebrates are designated as regulated invasive species:
A. banded mystery snail *(Viviparus georgianus)* I. Lea;
B. Chinese mystery snail, Japanese trap door snail (*Cipangopaludina spp.*) Hannibal;
C. rusty crayfish (*Orconectes rusticus*) Girard; and
D. spiny waterflea (*Bythotrephes longimanus*) Leydig.

Notes:

Notes:

This handbook was adapted with permission from a publication originally produced by the Colorado Division of Wildlife and State Parks with input from many other partners in Colorado and other states.

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