Lake Service Provider Training

Manual for Preventing the Spread of Aquatic Invasive Species

Version 3.3

MNDNR

Lake Service Provider Training Manual developed by:

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Section 1 : Lake Service Provider Basics

What is a Lake "Service Provider"?

Minnesota's invasive species laws (Minnesota Statutes, Chapter 84D) regulate the transport of invasive species, equipment, and water to help prevent the spread of aquatic invasive species (AIS) between waters of the state.

In 2011, Minnesota passed new AIS prevention and management laws that apply to those businesses that transport water-related equipment. One section of the new laws established requirements for a service provider permit. (Minnesota Statutes, Section 84D.108)

Service providers (typically called "lake service providers") must apply for and obtain a permit from the Minnesota Department of Natural Resources (DNR) before installing, removing, renting, or decontaminating any water-related equipment from waters of the state.

Minnesota Statute 84D.01 subd. 15a defines **"Service Provider"** as an individual or entity that:

1. decontaminates, installs, or removes water-related equipment or structures from waters of the state for hire or as a service provided as a benefit of membership in a yacht club, boat club, marina, or similar organization or
2. rents or leases water-related equipment that will be used in, placed into, or removed from the waters of the state. Service provider does not include a person working under the supervision of an individual with a valid service provider permit issued under section 84D.108.

Service providers can obtain a permit by registering and paying a $50 application fee online, attending a DNR aquatic invasive species training, and passing the lake service provider test.

What are Aquatic Invasive Species (AIS)?

According to state statutes, **"Invasive Species"** means a non native species that:

1. Causes or may cause economic or environmental harm or harm to human health; or
2. Threatens or may threaten natural resources or the use of natural resources in the state.

AIS can be plants or animals. Invasive aquatic plants are introduced non native species of plants that have adapted to living in, on, or next to water, and that can grow either submerged or partially submerged in water. Invasive aquatic animals require a watery habitat, but do not necessarily have to live entirely in water. AIS plants and animals can threaten native species and aquatic ecosystems; interfere with municipal, commercial, and agricultural water supply and distribution; and impair recreational activities.

In their native environments, AIS populations are typically held in check by predators, parasites, pathogens, and competitors. However, when they are transported to a new environment that doesn't have those natural checks and the species have other strong survival attributes, these plants and animals have an advantage over native species, making them very difficult to control.

Why a training and permit?

Commonly, service providers are installing and removing water-related equipment from multiple bodies of water. The Minnesota legislature identified service provider activities as having a high risk for the transport of aquatic invasive species.

Service provider training is designed to educate service providers about how to prevent the spread of AIS. The training also includes how to understand and follow the permit, identify common AIS, inspect water-related equipment, and follow best business practices to reduce the risk of transporting AIS.

The permit requirement ensures that all service providers in Minnesota have taken the training, their employees have completed mandatory basic AIS training online, and that service providers understand and implement AIS risk reduction procedures and practices when doing business.

How do you know if you are a service provider and need a permit?

If you or your business receives payment to do any of the following work, you are legally a service provider and need a permit:

1. Install or remove water-related equipment into or from waters of the state of Minnesota for another person or another business;
2. Install or remove water-related equipment into or from waters of the state of Minnesota for another person or business as a service provided as a benefit of membership in a yacht club, boat club, marina, or similar organization;
3. Decontaminate water-related equipment from waters of the state of Minnesota for another person or another business; or
4. Rent or lease water-related equipment that will be used in, placed into, or removed from waters of the state of Minnesota.

The individuals below are not considered service providers and do not require a permit.

- Fishing guides
- Commercial bait harvesters (already trained and permitted on AIS by the DNR)
- Sheriff departments that install and remove buoys
- Local governments (counties, cities, watershed districts, etc.) installing their own equipment because they are not hired to install water-related equipment owned by someone else. If the local government hires a person or business to place or remove equipment, then that person or business must be permitted as a service provider.

How to get your service provider permit

Lake service provider owners or managers need to complete the following steps to acquire a permit for their business:

1. Register online for a service provider training at mndnr.gov/lsp;
2. Pay the $50 application and testing fee online;
3. Attend AIS training for lake service providers;
4. Complete and pass the service provider test. A score of 70% or more is passing.

When steps 1-4 above are completed, the DNR mails out the service provider permit and vehicle stickers to the permitted service provider business.

Lake service provider owners or managers can register for training, pay permit fees, get online employee training, and find more information on the DNR's lake service provider website at mndnr.gov/lsp.

Service Provider Vehicle Stickers

During online registration for the training and permit, you will be asked how many vehicle stickers you will need for vehicles hauling water-related equipment or providing services. The DNR will mail stickers along with your permit.

The stickers must be attached to the inside of the windshield in the lower left corner (driver's side) of the vehicle to identify the vehicle as having the required service provider permit.

- **Service provider permits and stickers are valid for three calendar years.**
- **Permitted service providers must have a valid permit in possession and a sticker in their vehicle window while providing services**

Online AIS Training for Your Employees

Although employees who work for a permitted service provider do not have to take the AIS training for owners or managers, they must take LSP, an online employee training at: mndnr.gov/lsp before working in waters of the state.

The online training covers a streamlined version of the same information as the training for owners and managers.

At the end of the online training, employees receive a wallet-sized lake service provider employee certificate (example shown above). Employees need to print and keep a copy of the certificate in their possession at all times when working for a service provider.

The permitted service provider is responsible for having all persons working under their permit trained and certified through the online service provider training.

Employee Training Exemption

As of July 1, 2013, lake service provider employees who are only working with water-related equipment or structures that **remain on shoreline property controlled by the permittee,** and are only installed and removed **in that same water body**, are exempt from the aquatic invasive species employee training and certification (MS 84D.108 Subd.2d).

Businesses that meet those conditions are still LSPs and not exempt from permit or online training.

Follow-up After Training

You can not legally do work until you receive your permit and vehicle stickers from the DNR.

To get your lake service provider permit:

1. Hand in your test at the end of class today. Passing grade is 70%. If you do not pass, you will be contacted and given a make-up test.
2. If you have not already registered online, then register for today's class at the lake service provider website: mndnr.gov/lsp. Click on "register for trainings" link.
3. When registering, make sure you type your business name and information in the format you want to see posted on the DNR website. If you are already registered, double-check your listing for accuracy.
4. Pay the $50 permit fee online during registration.

When all steps are completed, you will receive your permit and vehicle stickers in the mail.

Remember

1. Have your staff complete employee online training at mndnr.gov/lsp
2. When you receive your permit, sign it and put copies of it in each vehicle, along with vehicle stickers.
3. If your business address changes or you add more decontamination locations, contact us to add them to your permit.
4. If you need replacement vehicle stickers, contact the AIS Training Coordinator.

If you have Permit Questions, Contact:

April Rust
Aquatic Invasive Species Training Coordinator
Minnesota Department of Natural Resources
Division of Ecological and Water Resources
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Section 2: Aquatic Invasive Species (AIS)

Aquatic Invasive Species (AIS)

Aquatic invasive species (AIS) are species that are not native to the local ecosystem and whose introduction causes or is likely to cause economic harm, environmental harm, or harm to human health.

AIS can be plants or animals. Some of the most problematic invaders currently in Minnesota are zebra and quagga mussels, spiny waterfleas, faucet snails, Eurasian watermilfoil, and curly-leaf pondweed. These animals and plants can threaten native species and aquatic ecosystems; interfere with municipal, commercial, and agricultural water supply and distribution; and impair recreational activities. This section includes basic information on some of the most problematic AIS.

AIS species in Minnesota are regulated depending on the legal classification they are given. The two main categories relevant to AIS laws are **prohibited** and **regulated.**

Eurasian watermilfoil

According to Minnesota statute, "A person may not possess, import, purchase, sell, propagate, transport, or introduce a **prohibited** invasive species." Examples include zebra and quagga mussels, invasive carp, faucet snails, round goby, Eurasian watermilfoil, and flowering rush. Statute states, "A person may not introduce a **regulated** invasive species." Examples include rusty crayfish, banded and Chinese mystery snails, and spiny waterfleas.)

Many AIS, including zebra and quagga mussels, were first introduced into the Great Lakes via the discharged ballast water of ocean-going ships.

spiny waterflea

Photo. Jeff Gunderson, Minnesota Sea Grant

Once in North American waters and wetlands, these invasive species often "hitch" rides to other bodies of water on the boats, trailers, and equipment that people transport from place to place.

Invasive species such as zebra and quagga mussels pose a great ecological and financial threat to Minnesota. The invasion of these species can cause significant and irreversible changes to Minnesota waters.

Information about all of the invasive species in Minnesota is available at mndnr.gov/invasives.

Other AIS were introduced intentionally for gardens but unintentionally through aquarium owners. Although many are from overseas, others are form different parts of the U.S.

rusty crayfish

Zebra mussels *(Dreissena polymorpha)* Quagga mussels *(Dreissena bugensis)*

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 U.S. Quagga mussels are native to the Dnieper River Drainage in the Ukraine, and were first found in the Great Lakes in 1989.

Zebra mussel	Quagga mussel
• Sits flat on ventral side	• Topples over, will not sit on ventral side
• Triangular or D-shaped	• Rounder in shape
• Color patterns vary	• Usually have dark, concentric ring on shell
	• Paler in color near the hinge

Biology

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. Adult mussels range in size from 1/4 to about 2 inches in length. 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 byssal threads to any hard surface.

Both zebra and quagga mussels can survive cold waters, but will not tolerate freezing. They can endure temperatures between 33º - 86º F. Zebra mussels need waters above 54ºF to reproduce, while quagga mussels can reproduce in waters as cold as 48º F.

A single female mussel can produce up to one million eggs a year. The microscopic larvae, called veligers, are planktonic—free-floating. The veligers float in the water column or are carried in the current for two to three weeks. Then, the larvae develop shells and settle onto any solid surface, including the shells of native aquatic species and stems of aquatic plants.

Photo: USGS

Impacts

Zebra and quagga mussels can cause severe economic, recreational, and environmental problems.

The amount of food the mussels eat and the waste they produce can have life-altering effects on the ecosystem and can harm fisheries. As filter feeders, they remove large amounts of microscopic plants and animals that form the base of the food chain, reducing available food for native aquatic species.

As the mussels filter plankton from the surrounding water, the water clarity may increase, which can cause more aquatic vegetation to grow at greater depths and produce dense stands. If a lake has high numbers of mussels over large areas, this filter feeding can impact the food chain, reducing food for young fish.

Other common problems include:

- Clogged intakes for home irrigation systems.
- Clogged boat motors, intakes, water cooling areas.
- Clogged intake pipes, trash screens, canals, aqueducts, and dams—disrupting the water supply to homes, farms, factories, and power plants.
- Altered taste and smell of drinking water.
- Cuts to people and dogs from shells on rocks, swim rafts, ladders, or washed up on beaches.
- Lost fishing tackle from shells cutting fishing line.
- Zebra mussels can attach to native mussels, smothering and killing them.

Means of Spread

Adult mussels can spread to other bodies of water by attaching to boat hulls, lower units, trim tabs, anchors, docks, and other water-related equipment.

Depending on their size and the weather conditions, adult zebra mussels can survive out of water for up to two weeks and as a result can be transported overland to new water bodies. They prefer cool, dark areas so often will attach inside hard-to-reach areas like dock posts.

Microscopic mussel larvae can be transported in bilge water, ballast water, or live bait wells. Larvae can also be present in mud and on plants which are then spread by equipment. Larvae also disperse naturally, and can be carried by water currents to other lakes or reservoirs downstream or through water diversions.

Where to look

Trim Tab

Examine boat hulls, swimming platforms, docks, the inside of pipes, on aquatic plants, wood and other objects along the shorelines of lakes and rivers.

Intake to the Lower Unit

Regulatory Classification

Zebra and Quagga mussels are prohibited invasive species, which means it is illegal to import, possess, transport, or introduce them into the wild.

Zebra and quagga mussels are very difficult to kill.

In only one instance have managers been able to eradicate zebra mussels, and that was an isolated 12-acre quarry in Virginia. A large volume of 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 may not be possible, so prevention is very important. If watercraft are cleaned, drained, and dried before being placed in another water body, any attached mussels or other AIS will be removed or killed.

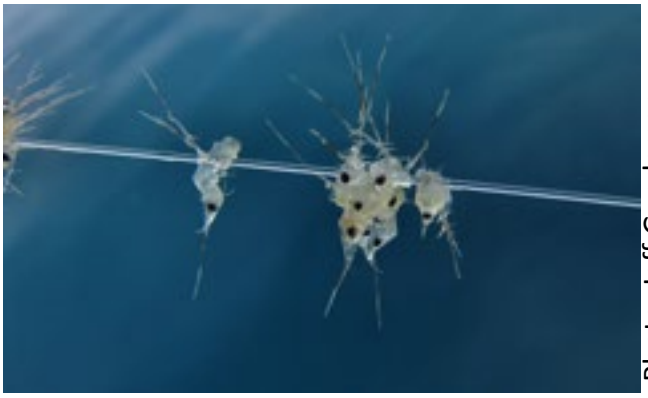


Photo. Jeff Gunderson, Minnesota Sea Grant

Spiny waterflea *(Bythotrephes longimanus)* and Fishhook waterflea *(Cercopagis pengoi)*

Spiny and fishhook waterfleas are very small creatures known as zooplankton (microscopic animals). Native to Europe and Asia, they were introduced into the Great Lakes by ballast water discharged from ocean-going ships. They were first discovered in Lake Ontario in 1982 and spread to Lake Superior in 1987.

Biology
Adults range from 1/4- to 5/8- inch long. Spiny waterflea have a single, long tail with small spines along its length.

Even though these waterfleas can be eaten by fish, their spines make it difficult for most small fish to swallow them.

Impacts
Waterfleas threaten aquatic ecosystems and fishing by out-competing native fish for food. Spiny waterfleas eat smaller zooplankton including Daphnia, which are an important food for young native fish. In some lakes, they caused the decline or elimination of some species of native zooplankton.

With fewer zooplankton eating algae, algal blooms can occur, making lake water less clear.

Waterfleas collect in masses on fishing lines and downrigger cables. They can clog eyelets of fishing rods and prevent fish from being landed.

Means of Spread
Waterfleas can spread to new waters when egg-laden females attach to fishing lines, downriggers, anchor ropes, and other water-related equipment. They can also be unintentionally transported in bilge water, bait buckets, or livewells. While females die out of water, at the end of the season they produce special "resting" eggs that resist drying and freezing, remain viable, and can establish a new infestation.

Where to look

They collect in gelatinous globs on fishing lines and downrigger cables. They prefer deep lakes, but can be found in shallow lakes and rivers.

Regulatory Classification
Spiny waterfleas are a regulated invasive species in Minnesota, which means introduction into another water body is prohibited.

Photo. Jeff Gunderson, Minnesota Sea Grant

Faucet snail *(Bithynia tentaculata)*

The faucet snail is a small aquatic snail native to Europe. It was introduced to the Great Lakes in the 1870s. It was probably brought to North America unintentionally with the solid ballast of large timber transport ships, or perhaps with vegetation used in packing crates.

Biology
Faucet snails have spread beyond the Great Lakes to surrounding inland waters in Midwest states including Minnesota. They are very difficult for the non-specialist to identify. Adults can grow up to 1/2-inch in length, but are generally smaller. They are light brown to black, with four to five whorls and a cover on the shell opening. The shell opening is on the right when the shell is pointed up.

Impacts
The faucet snail is an intermediate host for three intestinal parasites that cause mortality in ducks and coots. When waterfowl consume the infected snails, the adult parasites attack the internal organs and cause lesions and hemorrhage. Infected birds appear lethargic and have difficulty diving and flying before eventually dying. The parasites have contributed to the deaths of about 9,000 scaup and coots in 2007 and 2008 on Lake Winnibigoshish and tens of thousands of waterfowl since 2002 in the whole state.

There is no evidence that other wildlife besides waterfowl, including any fish species, are adversely affected by the parasites 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 parasite.

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

Means of Spread
They can spread by attaching to aquatic plants, boats, anchors, decoy anchors, other water-related equipment and then come off in the next body of water where the equipment is used. Faucet snails are able to close their openings to withstand dry conditions and a variety of temperatures.

Where to look
It is found on rocky shorelines, river and lake bottoms, aquatic plants, docks, and other objects placed in the water.

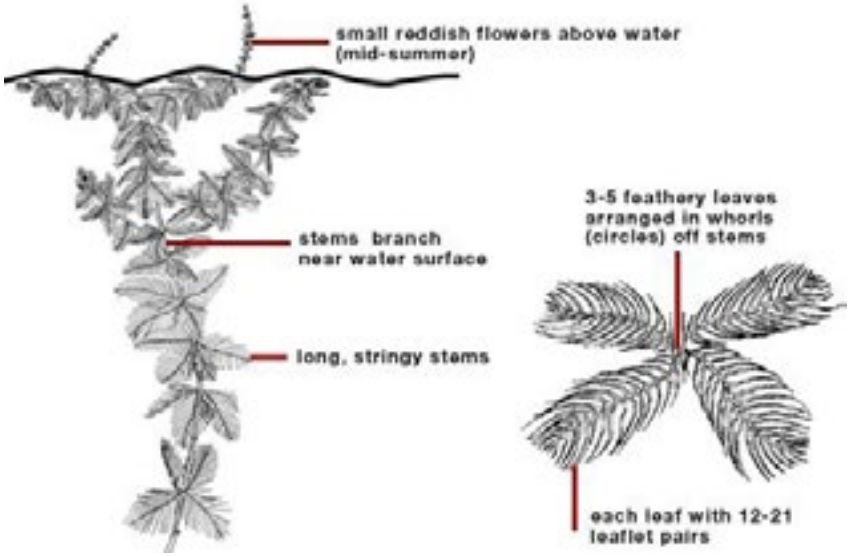
Regulatory Classification
Faucet snails are prohibited invasive species, which means that importation, possession, transportation, and introduction into the wild is prohibited.

Photo: USGS National Wildlife Health Center

Eurasian watermilfoil *(Myriophyllum spicatum)*

Eurasian watermilfoil is a submerged aquatic plant that was accidentally introduced to North America from Europe in the 1940s. It spread westward into inland lakes primarily by boats and reached the Midwest between the 1950s and 1980s. This highly aggressive species colonizes a variety of habitats, including both moving and standing waters.

Biology
The feathery dark green leaves of Eurasian watermilfoil are finely divided and occur in whorls of three or four along the stem, with 12–21 pairs of fine, thin leaflets. These leaflets give milfoil a feathery appearance that is a distinguishing feature. It grows rapidly—about one foot per week. Pink or olive green stems grow to the water surface, usually extending three to ten feet in length and frequently forming dense mats.



A key factor in the plant's success is its ability to reproduce through stem fragmentation and runners. A single segment of stem and leaves can take root and form a new colony.

It can be difficult to tell Eurasian watermilfoil apart from some native aquatic plants like Northern watermilfoil (Myriophyllym sibiricum) and hybrids between the native and invasive milfoil species.

Impacts
In nutrient-rich lakes, it can form thick underwater stands of tangled stems and vast mats of vegetation at the water's surface. In shallow areas, the plant can interfere with water recreation such as boating, fishing, and swimming. The plant's floating canopy can also crowd out important native water plants, disrupting the food chain, displacing wildlife habitat, and clogging waterways and flow of water.

It is difficult for Eurasian watermilfoil to take hold in lakes with well-established populations of native plants. In some lakes, the plant appears to coexist with native flora and has little impact on fish and other aquatic animals.

Means of Spread
Fragments clinging to boats and trailers can spread the plant from lake to lake. Mechanically clearing aquatic plants from beaches, docks, and landings creates thousands of new stem fragments. Removing native vegetation creates perfect habitat for invading Eurasian watermilfoil.

Where to look
Milfoil can easily get stuck in boat propellers, or may attach to keels and rudders of sailboats. Stems can become lodged among any watercraft apparatus or sports equipment that moves through the water, especially boat trailers.

Regulatory Classification
It is a prohibited invasive species, which means import, possession, transport, and introduction into the wild is prohibited.

Curly-leaf pondweed *(Potamogeton crispus)*

Native to Eurasia, Africa, and Australia, it was likely brought to North America from Europe as a garden plant. It was first noted in Minnesota about 1910. It probably was accidentally introduced to the state when common carp were intentionally brought to the area. It has been in Minnesota so long that most people do not realize it is a non native species.

Biology
A submersed aquatic plant, it generally grows in three to ten feet of water. Leaves are somewhat stiff and crinkled, approximately 1/2-inch wide and two to three inches long; leaves are arranged alternately around the stem, and become more dense toward the end of branches. It tolerates low water clarity and will readily invade disturbed areas. It is similar in appearance to many native pondweed plants commonly found in Minnesota lakes and streams, but can be distinguished from them by its unique life cycle. It is generally the first to come up in spring, then dies back in mid-summer. The flower stalks, when present, stick up above the water surface in June. It appears reddish-brown in the water, but is actually green when pulled out of the water.

Impacts
In spring, curly-leaf pondweed can form dense mats that may interfere with boating and other recreation on lakes. It also can cause ecological problems by displacing native plants. In mid-summer, it usually dies back, resulting in rafts of dying plants piling up on shorelines, and often is followed by an increase of the nutrient phosphorus in the water, creating undesirable algal blooms.

Means of Spread
It is believed to spread from one body of water to another primarily by the unintentional transfer of turions, which are hardened stem tips, on plant fragments carried on watercraft and trailers.

Where to look
Curly-leaf pondweed can easily get stuck in boat propellers, or may attach to keels and rudders of sailboats. Stems can become lodged among any watercraft apparatus or sports equipment that moves through the water, especially boat trailers.

Regulatory Classification
It is a prohibited invasive species, which means import, possession, transport, and introduction into the wild is prohibited.

Flowering rush *(Butomus umbellatus)*

Native to Africa, Europe and Asia, the Flowering Rush was likely brought to North America as a garden plant.

Biology
A perennial aquatic plant, it grows one to four feet high on an erect stem along shores in shallow water. In deeper water it grows submerged without producing flowers. It is very difficult to identify when not in flower. It closely resembles many native shoreland plants, such as the common bulrush. Its leaves are sword-shaped, triangular in cross section. It has umbrella-shaped pink or white flowers that bloom from June to August.

Impacts
Once established, populations of flowering rush increase and may continue to persist. It can spread slowly into nearby wetlands, and can tolerate water 6-1/2 feet deep or deeper. Flowering rush can outcompete and displace native shoreline vegetation, disrupting the local habitat. It also can be an obstacle to boat traffic. Boaters can transport flowering rush on their equipment. Its wide range of hardiness (zones 3-10) makes it capable of being invasive throughout much of the United States.

Means of Spread

Flowering rush is a Eurasian plant that was sold commercially for use in garden pools. It is now illegal to buy, sell, or possess the plant. It reproduces by vegetative spread from its roots in the form of bulblets. Both seeds and bulblets are dispersed by water currents. It is actively expanding and has spread from a limited area around the Great Lakes and the St. Lawrence River to sporadically appear in the northern U.S. and southern Canada.

Where to look
Flowering rush can easily get stuck in boat propellers and can become lodged among any watercraft apparatus or sports equipment that moves through the water.

Regulatory Classification
It is a prohibited invasive species, which means import, possession, transport, and introduction into the wild is prohibited.

Invasive Fish Diseases

Viral Hemorrhagic Septicemia Virus ***(VHS)***

Viral hemorrhagic septicemia virus is a serious pathogen of fresh and saltwater fish. VHS is a rhabdovirus (rod shaped virus) that affects fish of all size and age ranges. It does not pose any threat to human health, but can cause bleeding of fish tissue, including internal organs, and potentially the death of infected fish. Once a fish is infected, there is no known cure.

The clinical signs of VHS may include tissue hemorrhaging, unusual behavior, anemia, bulging eyes, bloated abdomens, and 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. The only way to confirm VHS is to test the fish in a lab.

Other Aquatic Invasive Species

There are many other AIS that pose a significant threat to Minnesota waters. See pictures and descriptions of these common invaders of concern at mndnr.gov/invasives.

Aquatic Invasive Plants

- Brazilian elodea (Brazilian waterweed)
- Brittle naiad
- Hydrilla
- Purple loosestrife
- Reed canary grass
- Water hyacinth
- Yellow iris

Aquatic Invasive Animals:

- Bighead and silver carp
- Chinese and banded mystery snails
- New Zealand mud snail
- Ruffe
- Sea lamprey
- White perch
- Grass carp
- Round goby
- Rusty crayfish

Bighead Carp

Section 3: Minnesota Aquatic Invasive Species Laws

General Minnesota AIS Laws

Sections 1 and 4 cover AIS laws related specifically to the lake service provider permit, but there are other invasive species laws that all users must follow.

Those laws include:

- **A person may not possess, import, purchase, sell, propagate, transport, or introduce a prohibited invasive species.** Those prohibited species include curly-leaf pondweed, Eurasian watermilfoil, bighead and silver carp, New Zealand mudsnails, zebra or quagga mussels, and several other species listed under Minnesota Rules 6216.0250 Prohibited Invasive Species in Appendix A.
- **A person may not introduce a regulated invasive species without a permit issued by the commissioner.** Regulated species include rusty crayfish, spiny waterfleas, and other regulated species listed under Minnesota Rules 6216.0250 Regulated Invasive Species in Appendix A.

- **A person may not transport aquatic macrophytes (aquatic plants).**
- **A person may not place or attempt to place into waters of the state water-related equipment that has aquatic macrophytes, zebra mussels, or prohibited invasive species attached.**

- **When leaving waters of the state and transporting water-related equipment a person must drain all 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.** Drain plugs must be removed and bailers, valves, or other devices used to control the draining of water from ballast tanks, bilges, and livewells must be left open while transporting water-related equipment.
- **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.

Introduce and Transport Definitions

In state laws **"introduce"** means to place, release, or allow the escape of a non native species into a free-living state.

Introduce does not include:

1. The immediate return of a non native species to waters of the state from which the non native species was removed; or

2. The seasonal return of non native 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.

In state laws **"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 non native 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 non native 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.

The second exception under both "introduce" and "transport" allows individuals and service providers to return water-related equipment such as docks and lifts that may have aquatic invasive species such as zebra or quagga mussels attached back into the water from which they came as long as they only came off that same riparian (shoreline) property.

These exceptions DO NOT allow you to transport water-related equipment with aquatic plants or prohibited invasive species attached to an access and down the road to a person's riparian property.

We strongly encourage service providers to review Appendix A: Selected Minnesota Laws Related to Service Providers, Water-related Equipment, Watercraft Inspections, and Decontamination for additional information on AIS laws.

Penalties for Violating Minnesota AIS Laws

Penalties for violating AIS laws vary depending on the offense, severity, subsequent offenses, and civil or criminal violation.

Civil Citation	Penalty
Transport aquatic plants on public road	**$100**
Launch with plants attached	**$200**
Transport or possess prohibited species	**$500**
Launch into non-infested waters with AIS attached	**$500**
Failure to drain water/have drain plug out	**$100**
Transport infested water without a permit	**$200**
Subsequent offenses	**Amounts double**
Refuse inspection	**Lose boat license for up to 1 year**

Criminal Citation	Penalty
Misdemeanor	**Up to $1,000 and/ or 90 days**
Gross Misdemeanor	**Up to $3,000 and/ or 1 year**

Penalties for Violating Service Provider Laws

Civil Citation	Penalty
Install or remove water related equipment for hire without a permit	**$175**
Fail to display LSP vehicle sticker on driver's windshield	**$175**
Service provider or employees working without completing training	**$175**

Authorization Forms for Citizens to Transport Prohibited Invasive Species and Aquatic Plants

The DNR offers several authorization forms to allow boat owners and shoreland owners to transport prohibited invasive species, such as zebra mussels and aquatic plants, in these situations:

- Transport of boat lifts, docks, swim rafts, and related equipment with prohibited invasive species attached to a repair or storage location and removal of the prohibited invasive species.
- Transport of watercraft with prohibited invasive species attached to a repair or storage location and removal of the prohibited invasive species.
- Transport of aquatic plants or aquatic plants with prohibited invasive species attached to a disposal location.
- Transport of construction-related equipment with zebra mussels or other prohibited invasive species attached to a maintenance, storage, or disposal facility for removal and disposal of the invasive species.

Authorization forms are not permits and it is not necessary to apply to the DNR to use them. To use authorization forms, citizens must:

1. Download and print the appropriate form from mndnr.gov/invasives/ais_transport.html
2. Fill in the required information and sign the form
3. Carry it during transport

Some LSP businesses may want to direct customers to these forms if customers are transporting contaminated equipment to the LSP for decontamination. Keep in mind that these forms are not for LSP business use - you have transport authority in your permit that allows you to transport equipment with zebra mussels and faucet snails for decontaminating at your site.

All of these forms are a one-way pass to allow either the transport of prohibited species attached to boats or water-related equipment to a location where the prohibited invasive species must be removed, or to transport aquatic plants to a disposal location.

Boats and equipment must have visible prohibited species removed before transporting equipment to another location or back to the water body where the watercraft or equipment originated.

Section 4: Your Lake Service Provider Permit

Sample Cover Letter and Permit Checklist (will be mailed with permit)

Minnesota Department of Natural Resources

500 Lafayette Rd • St. Paul, MN • 55155-4025

Dear [insert name from online registration],

Congratulations on completing the service provider training and passing your test. Your Service Provider Permit valid for the years of 2014, 2015, and 2016 is enclosed. Please follow the steps below to legally validate your permit.

- ☐ *Read and sign the permit to have it become effective;*
- ☐ *Make copies of the permit for all employees working under the permit;*
- ☐ *Keep copies of the permit in your possession while providing services;*
- ☐ *Place a service provider vehicle sticker (enclosed) on the lower left side (driver's side) of windshield of each motor vehicle (it is not necessary on boats);*
- ☐ *Have each employee working under the permit take the required online training and keep a copy of their training certificate and this permit in their possession while working;*
- ☐ *Ensure that permits and certificates are made available upon request by a licensed peace officer.*

If you have questions about this permit, please contact the DNR Invasive Species Specialist in your area (www.dnr.state.mn.us/invasives/contacts.html#aquatic).

Sincerely,

Ann Pierce, Manager

Ecosystem Management and Protection Section

Sample Permit

Service Provider Permit

State of Minnesota
Division of Ecological and Water Resources
Department of Natural Resources
500 Lafayette Road, St. Paul Minnesota 55155

2016
2017
2018

Permittees: (owner or agents): [insert from online registration]
Company Name: [insert from online registration]
Company Address: [insert from online registration]
Additional Decontamination Location(s) (if different from above address):
Phone Number: [insert from online registration] **Number of Vehicle Stickers:** [insert]

Permit Scope:

- The permittee has completed invasive species training provided by the commissioner and passed an examination as required by Minnesota Statutes, Section 84D.108. This permit allows the permittee to provide services installing or placing water-related equipment in waters of the state, removing water-related equipment from waters of the state, renting water-related equipment or decontaminating water-related equipment according to the conditions in this permit and the applicable state laws.

- **Water-related equipment** is defined as 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 those with a Minnesota Pollution Control Agency permit), bilge areas, and water-hauling equipment that is capable of containing or transporting aquatic invasive species, aquatic macrophytes (plants), or water. (Minnesota Statutes, Chapter 84D.01, Subdivision 18a)

- **Transporting Prohibited Invasive Species** – The permittee is authorized to possess and transport zebra mussels and faucet snails that are attached to water-related equipment being removed and transported from waters to the permittee's decontamination site for the purpose of decontamination and disposal. The permittee is authorized to transport zebra mussels and faucet snails from the decontamination location to a disposal site in accordance with the conditions in this permit and the applicable state laws. (Minnesota Statutes, Chapter 84D.11, Subdivision 1)

- **Transporting Contaminated Bilge Water –** The permittee is authorized to transport inboard and inboard-outboard power boats from a waterbody to the service provider's designated decontamination location(s) without draining bilge water or removing the drain plugs, **when necessary**. This authorization is only to minimize discharge of oil and other liquids that may be in the bilges at the water accesses and into waters of the state. Outboard boats and sailboats must be drained at the water access and drain plugs removed as required by Minnesota law. (Minnesota Statutes, Chapter 84D.10, Subdivision 4)

Sample Permit

Permit Conditions:

Section 1: Permit Possession and Vehicle Sticker Placement
(Minnesota Statutes, Chapter 84D.108, Subdivision 1)

A. The permittee must provide a copy of this permit to all employees providing services.
B. The permittee shall display a service provider vehicle sticker on the lower left (driver's) side of the windshield of each motor vehicle working under this permit.
C. Stickers are not required on service providers' watercraft.
D. Permits must be made available upon request by a licensed peace officer or authorized watercraft inspector.

Section 2: Employee Training, Certification, and Exemption
(Minnesota Statutes, Chapter 84D.108, Subdivision 2)

A. All persons that the permittee employs to provide services are required by law to complete aquatic invasive species online employee training. While conducting service provider work, the employee must possess aquatic invasive species training certificates issued by the Department of Natural Resources that shows the required employee training has been completed.
B. Employee aquatic invasive species training certificates must be made available upon request by a licensed peace officer.
C. Exemption – Employees, working under the supervision of a service provider, who are only working with water-related equipment or structures that remain on property controlled by the permittee and remain in the same water body are exempt from the aquatic invasive species employee training and certification.

Section 3: Decontamination Requirements at Water Access
The permittee must take the following decontamination measures **at all waters** to prevent the spread of aquatic invasive species to other waters when providing services under this permit. Before transporting from a water access or riparian property:

A. All water-related equipment being transported must have all aquatic plants (excluding duckweed) removed before transport; (Minnesota Statutes, Chapter 84D.09)
B. water must be drained from any water-related equipment components that hold water prior to transporting unless authorized by this permit (Minnesota Statutes, Chapter 84D.10, Subdivision 4); and
C. accessible sediment must be removed from anchors, dock components, boat lifts, and other water-related equipment.

Section 4: Decontamination Requirements at Service Provider Site for Zebra Mussel and Faucet Snail Infested Waters (after completing section 3: A-C)

The permittee is authorized to transport equipment to the service provider's business address or additional designated decontamination sites (addresses must be listed with the DNR) for the purpose of removing aquatic invasive species and sediment. This is a one-way authorization from the water body to the decontamination location and all zebra mussels and faucet snails must be removed before the water-related equipment is transported to another location.

Sample Permit

When decontaminating water-related equipment, service providers must follow the decontamination requirements at the water access (permit section 3: A-C) **AND** the applicable requirements from the list below (permit section 4: A-D).

A. Watercraft transported to an non-riparian long-term storage location:

1. Thoroughly scrape and/or high-pressure wash the hull and motor parts exposed to the water to remove all zebra mussels and faucet snails, including portions of the hull that may have grates covering them; and
2. drain contaminated (oily) water from bilge, livewells, motor, and other boat components capable of holding water that was not completed at the water access.

B. Moored watercraft that have been in a zebra mussel or faucet snail infested waterbody for more than 24 hours and transported to, or re-launched into, another waterbody the same boating season:

1. Thoroughly scrape and/or hot-water (140 degrees F unless limited by model of watercraft), high-pressure wash the hull and motor parts exposed to the water to remove and kill all zebra mussels and faucet snails, including portions of the hull that may have grates covering them;
2. drain contaminated (oily) water from bilge, livewells, motor, and other boat components capable of holding water that was not completed at the water access and flush with hot water (140 degrees F unless limited by model of watercraft); and
3. following power washing and/or scraping, it is also recommended that the watercraft be kept out of water and allowed to dry for at least 5 days.

C. Watercraft and water-related equipment being removed from zebra mussel or faucet snail infested waterbody for repair, maintenance, or other temporary purpose and returned to the same waterbody where it was removed:

1. Thoroughly scrape and/or hot-water, high pressure wash the hull and motor parts exposed to the water to remove all zebra mussels and faucet snails, including portions of the hull that may have grates covering them; and
2. drain contaminated (oily) water from bilge, livewells, motor, and other boat components capable of holding water that was not completed at the water access before transporting back to the waterbody.

D. Day-use watercraft (those launched and removed from the water each day) transported to, or re-launched into, another waterbody the same boating season:

1. Drain contaminated (oily) water from bilge, livewells, motor, and other boat components capable of holding water that was not completed at the water access and flush with hot water (140 degrees F unless limited by model of watercraft).

Section 5: Decontamination Requirements for Boat Lifts, Docks, Swim Rafts, or Associated Equipment

A. **Boat lifts, docks, swim rafts, or associated equipment placed in off-lake long-term storage (transported to non-riparian/non-shoreline property):**

1. Thoroughly scrape and/or power spray the areas of water-related equipment exposed to the water to remove all zebra mussels, faucet snails, other nonnative aquatic species (e.g., spiny waterfleas, mystery snails); and

Sample Permit

2. dry the water-related equipment for at least 21 days. (MN Statute 84D.10, Subd.4f).

B. **Boat lifts, docks, swim rafts, or associated equipment placed in another water or sale to person off the lake during the same boating season**
   1. Thoroughly scrape and/or 140 degree hot-water power spray the water-related equipment exposed to the water to remove all zebra mussels, faucet snails, other nonnative aquatic species (e.g., spiny waterfleas, mystery snails) and sediment;
   2. drain water from equipment components holding water; and
   3. dry the water-related equipment for at least 21 days.

Section 6: Disposal of Aquatic Invasive Species and Water Used in Decontamination

All water transported to the permittee's decontamination location due to contamination (from oil, gasoline, etc.) in boats that were removed shall be properly disposed of so that it does not enter the storm sewer system or another waterbody. All plants, zebra mussels, and associated material removed from boats and equipment shall be either;

A. Disposed of at the cleaning location provided it is at least 300 feet from any waterbody; or
B. transported to a disposal location in closed containers or covered trailers or trucks, and disposed of at sites at least 300 feet from any waterbody.

Section 7: Inspections

The commissioner may inspect any facilities used by the permittee for holding prohibited invasive species of wild animals and aquatic plants for control or disposal purposes.

Section 8: Disclaimer of Liability

This permit is permissive only. No liability is assumed by the State or any of its officers, agents, or employees by issuance of this permit, or any damage to persons or property resulting from any act or omission of the permittee, or by any prohibited species in possession of the permittee. This permit shall not be construed as stopping or limiting any legal claims or right of action of any person other than the State against the permittee, for any damage or injury resulting from any such act or omission, or as estopping or limiting any legal claim or right of action of the State against the permittee, for violation of or failure to comply with the provisions of the permit or applicable provisions of law.

This permit shall not release the permittee from any other permit requirements or liability or obligation imposed by Minnesota statutes or rules, federal law, or local ordinances relating thereto and shall remain in force subject to all conditions and limitations now or hereafter imposed by law.

Section 9: Penalties

Violations of this permit can result in civil and criminal penalties established in Minnesota Statutes, chapter 84D.13.

Section 10: Revocation

The commissioner may modify or revoke this permit in accordance with applicable laws and rules for any cause as necessary for the protection of public interests, or for violation of the provisions of this permit.

Section 11: Transferability

This permit is not transferable.

Sample Permit

Section 12: Expiration date
This permit is valid from the date of issuance through December 31, 2015.

Issued by:

Ann Pierce, Manager, Ecosystem Management and Protection Section

I hereby certify that I have read and understand the provisions of this permit and understand that this permit is not valid unless it is signed by the permittee.

Permittee Signature	Date

Section 5: Inspection and Decontamination 101

Best Business Practices and Protocols for Service Providers

There are a number of practices that a business can implement to stop the spread of AIS. Some activities such as cleaning off plants and animals, draining boats and other water-related equipment, and drying water-related equipment are required by law and service provider permits. Others, for example tagging a customer's equipment to identify the date it was brought to the facility, date it was decontaminated, and date it began drying, are recommended practices that add an extra measure of safety to avoid transporting any unwanted aquatic hitchhikers and help ensure lake service providers follow AIS laws.

Service providers should be continually evaluating the risk level of spreading AIS for each situation and job site. Some situations are higher risk for spreading invasive species than others and may require more actions to prevent the spread. For example, removing and transporting a boat lift that has been in zebra mussel infested waters for several months is much riskier than removing and transporting a boat that has been in non-infested waters for a few hours.

Watercraft Inspectors

Service providers will often communicate with both authorized watercraft inspectors and AIS volunteers inspecting boats and water-related equipment at water access points. Watercraft inspectors interact with boaters arriving at and leaving lakes and rivers in the state to:

- Inspect watercraft for aquatic invasive species and aquatic plants.
- Educate boaters about invasive species and how they can prevent the spread of invasive species, including teaching boaters how to inspect and clean their own watercraft.
- Provide informational materials regarding invasive species.
- Ask boaters questions regarding their invasive species knowledge and boating activity.
- Document and record research activities.
- Provide decontaminations of watercraft.

Protocols: Inspection

Before transporting water-related equipment, a thorough and complete visual and physical inspection should be completed. Remember that all parts of trailers, docks, boat lifts, swim platforms, boats, barges, irrigation pumps, and all equipment removed from the water, including boots and waders should be systematically inspected. Be on the lookout for aquatic plants, snails, water, mud, and zebra or quagga mussels.

Invasive species and invasive plant seeds can easily be spread in mud on waders, boots, and other water-related equipment.

The time it will take to complete an inspection can vary greatly depending on the type and complexity of the equipment and could range from three minutes to 30 minutes or more.

Exterior Inspection

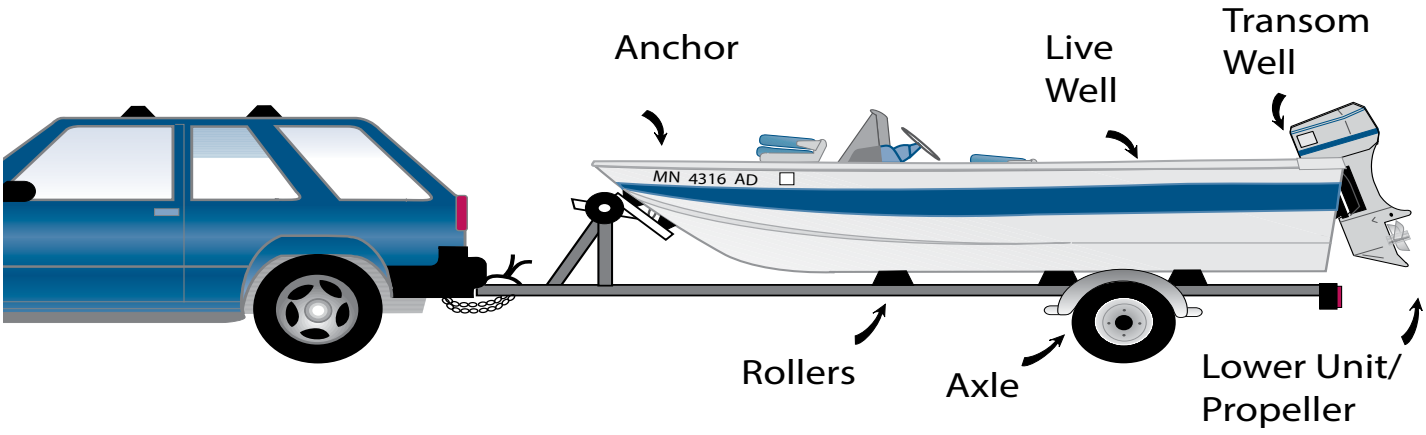
Start and end the inspection at the same place on each piece of water-related equipment. Some common places to inspect are:

- External components of dock posts and ladders, boat lift frame, and swim rafts;
- Trailers hauling water-related equipment;
- Hull of boats;
- Boat motors including propeller and motor mount;
- Back of boats including trim tabs, transducer, intakes, and boat plugs.

Examine each piece of equipment and feel for sandpapery bumps that may indicate the presence of tiny young zebra or quagga mussels. Carefully check the rear of boats, including intakes, upper and lower motor areas, and the propeller. Trailers also can pose a high risk, so carefully check trailer rails, lights, and electrical wires, as well as the license plate and trailer pads for aquatic plants.

Extendable mirror for inspecting hard-to-see areas

Zebra or quagga mussels do not like to be located in direct sunlight, so pay particular attention to the undersides of lifts and docks where zebra or quagga mussels are commonly found. A mirror can help by allowing you to see in locations you may otherwise miss. In addition, portions of boat lifts and docks that contact the sediment should receive additional attention as these areas commonly pick up bottom material from the lake or river while the equipment is in the water.



Interior Inspection

The interior of all water-related equipment needs to be inspected for the presence of invasive species and standing water before transporting. Below is a list of common equipment to inspect:

- Internal components of dock posts/parts and lift legs and frame (if possible)
- Livewells and baitwells
- Bilge area near back of the boat
- Ballast tanks
- Ropes and anchors
- Buoys
- Miscellaneous fishing equipment

Service providers working with boats must inspect bait and livewells to ensure the plug is removed and they are drained of all water before transport. The bilge area near the back of the boat also must be inspected for standing water and to ensure the plug is removed.

Your permit allows an **exception for service providers to transport inboard and inboard-outboard power boats from a designated infested water body to the service provider's address and/or the decontamination location without draining bilge water or removing the drain plugs** to minimize the discharge of oil and other liquids that may be in the bilges at the water accesses and into waters of the state.

This only pertains when you leave the access – drain plugs need to be out when you return to the water access just like anyone else.

Outboard boats and sailboats must be drained at the water access and drain plugs removed as required by Minnesota Statutes 84D.

Other equipment such as ropes and anchors that may be stored inside the boat, also should be inspected. If possible, search the inside of the dock/boat lift frame by removing the white rubber caps that cover the end of the framing. A flashlight may be needed to effectively see inside the framing and other dark crevices.

Ensure all equipment is inspected!

Protocols: Removing and Disposal

If plants are found attached to the exterior or interior of equipment, they need to be removed by hand and disposed of before transporting the equipment.

The permit requires that all plants, zebra mussels, and associated material removed from boats and equipment that were in infested waters be dried for at least five days and either:

1. Disposed of at the cleaning location if it is at least 300 feet from any water body; or
2. Transported to a disposal location in closed containers or covered trailers or trucks, and disposed of at sites at least 300 feet from any water body.

After inspection and removal, you may need to decontaminate and dry the piece of equipment. If it has been:

1. Located in infested waters; or
2. Any aquatic invasive species are found; or
3. Sandpapery bumps are felt; or
4. Mud or standing water is found.

Refer to the decontamination protocols and the drying recommendations in this section.

Ensure all equipment is cleaned!

Protocols: Draining

Water must be drained from all water-related equipment holding any water before leaving a water access. Drain plugs must be removed and bailers, valves, or other devices used to control the draining of water from ballast tanks, bilges, and live/baitwells must be opened while transporting water-related equipment. Because pontoons are air holding

compartments and not intended to hold water, plugs do not need to be removed from them when they are transported, unless they are damaged and contain water.

Water should be drained at a location that is far enough away from the lake to ensure water, which may contain oil or other contaminants, does not flow back into the lake.

The permit requires that all water transported to the decontamination location in boats that were removed from infested waters shall be disposed of on a permeable surface (e.g., gravel, sand, or grass) or sludge/holding tank, so that it does not enter the storm sewer system or another water body.

An interior inspection should reveal any areas of standing water. This water must be drained prior to transporting the equipment. If the bilge area of a boat cannot be visually inspected, bilge pumps should be activated to determine if there is any water present. Similarly, if the boat has a ballast tank (such as on wakeboard boats), staff should remove the plug and drain all water or activate the ballast tank pump until no water is expelled. If these situations are encountered, staff should perform additional decontamination as outlined in this section.

Boat motors should be trimmed down as much as possible until water is observed draining from the motor. Remember to trim the motor into the up position before transporting. For docks and boat lifts, consider drilling holes in the frame at strategic locations to help drain water. If standing water is found in any areas that cannot be drained, refer to the decontamination protocols in this section.

Remember, the permit does allow an exception to service providers to transport inboard and inboard-outboard power boats from a designated infested water body to the service provider's address and/or the decontamination location without draining bilge water or removing the drain plugs (to minimize the discharge of oil and other liquids that may be in the bilges at the water accesses and into waters of the state).

Outboard boats and sailboats must be drained at the water access and drain plugs removed as required by Minnesota Statutes 84D. This only pertains when you leave the access – plugs need to be out when you return to the access just like anyone else.

Ensure all equipment is drained!

Protocols: Drying

Any 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 has passed.

It is extremely difficult, if not impossible, to fully decontaminate some parts of water-related equipment, thus drying is the only option to ensure aquatic invasive species that could not be removed are not alive. It is recommended that all other equipment from infested waters should be dried a minimum of five days prior to entering another body of water. The best practice is to allow the equipment to overwinter prior to being placed in another water body.

Ensure all equipment is dry!

Decontamination Protocols

Decontamination should be done on equipment removed from infested waters whenever it has plants, animals, or mud on it; or when it may have other high-risk factors.

Decontamination can be completed by inspecting and manually removing, washing, or scraping AIS off of equipment with simple tools like scrapers. However, recommended decontamination often consists of a very hot (140º F), high- or low-pressure spraying. There are no soaps, bleaches, or chemicals needed or recommended. Prolonged exposure to hot water kills zebra or quagga mussels and other invasive species, and the high pressure removes them from the water-related equipment.

Aquatic plants and invasive species must be removed from all water-related equipment before moving the equipment to a different water body. If you decontaminate at the access, be sure you are located far enough away from the water, so waste water will not flow back into the water body.

When is decontamination recommended?

Decontamination of water-related equipment needs to occur by law in the following situations:

1. The water-related equipment was located in infested waters;
2. Aquatic invasive species (such as zebra or quagga mussels) are found or suspected to be on a piece of water-related equipment;
3. Unidentifiable bumps are detected on water-related equipment;
4. The water-related equipment contains a large amount of water that cannot be drained;
5. Mud, sand, or other substrate is attached to water-related equipment; or
6. An authorized DNR inspector deems decontamination is necessary.

Each service provider should evaluate the circumstances of the activity being performed and determine whether it must be done to comply with state laws or the risk warrants decontamination. When in doubt, decontamination and extended drying is recommended.

Transport Authority to Your Work Site

Service providers are allowed to transport zebra mussel- and faucet snail- contaminated water-related equipment to complete decontamination at their place of business, but they still must remove visible and accessible aquatic plants at the access.

All equipment must be fully decontaminated before transporting it away from the service provider address.

Decontamination Training

Service providers that offer decontamination services to their customers need to be trained in hot-water, high-pressure decontamination protocols and verify that their equipment meets DNR specifications if they want to be listed as offering decontamination on the DNR website. The DNR offers limited decontamination trainings in the summer to interested service providers.

Hot-Water High-Pressure Decon Equipment

Specialized equipment is needed to decontaminate any boat, lift, dock, trailer, or other water-related equipment. Below are examples of equipment that will make decontamination more efficient and reliable for staff to ensure they are not spreading AIS.

- Hot-Water and High-Pressure Sprayer Unit – portable with attachments
- High-pressure wand and low-pressure diffuser
- Motor muffs for outboard motors
- Fake-a-Lake for ballast tanks
- Scraping equipment (to scrape off snails and zebra or quagga mussels)
- Personal protection equipment (face shield or eye glasses, rubber boots and clothing, gloves, ear plugs, etc.)

Hot-Water Power Pressure Sprayers – there are a number of units that will work just fine to assist in decontamination. Fully contained portable units like the large blue one below (right) are used by the DNR, but smaller units like the red one below (left) will work just as well, as long as they meet the pressure and heat specifications (see table on the following page.)

High-Pressure Wand and Low-Pressure Diffuser – both attachments are essential when decontaminating any water-related equipment. The high-pressure wand is used to apply hot water and scrape away any attached AIS, and the low-pressure

diffuser allows you to soak sensitive areas and water holding areas with hot water to kill AIS.

Outboard Motor Muffs and Fake-a-Lake attachment – both attachments are essential if decontaminating motors and onboard ballast tanks and bags. The outboard motor muffs are attached to the lower units as seen in the picture below. The Fake-a-Lake attachment is positioned under one of the through hull fittings and the ballast tank or bag is then turned on to circulate hot water through the system long enough to kill all AIS.

Boat Decontamination Protocol

The general water temperature and pressure recommendations for decontamination of a boat are:

Boat Area	Water Temp	Pressure Level
For non-sensitive areas (e.g., boat hulls and trailers)	140º F	high pressure at point of contact (approx. 2,500 psi) with a 40-degree nozzle
For interior compartments without pumps	140º F	low pressure
For interior compartments with pumps and gimbal areas	120º F	low pressure to avoid damaging the pump areas

If you determine a boat is in need of decontamination, follow these steps:

1. Use extreme caution while operating the hot-water, high-pressure sprayer. Wear proper personal protective equipment and ensure that the area surrounding the boat is clear of other staff.
2. Remove all mud, plants, and large material as much as possible prior to beginning the decontamination.
3. Spray the entire exterior of the boat and trailer using 140°F water at high pressure with a 40 degree nozzle. Begin and end at the same location. Take small sections at a time by locating the water line on the hull, and spray crosswise from stern to bow, starting at the top of the water line and working down. Hold the spray nozzle 12 inches away from the surface at a 45-degree angle, so the water is "chiseling" the unwanted material off the boat/trailer. DO NOT shoot the high-pressure, hot-water at a 90-degree angle to the object.
4. Use caution in gimbal areas. DO NOT use high pressure as it may cause damage. Rinse to kill mussels inside gimbal and prop area.
5. All compartments that may hold water and have a pump such as live/baitwells, ballast, or bilge areas and intakes must be flushed with 120°F water at low pressure. Flush these areas until the exit water temperature is 120°F. If a bilge pump is present, it should be operated until the bilge appears empty. Also flush all discharge ports for one minute.
6. Boat engines should be flushed with 140°F water at low pressure. For outboard motors, make sure the motor is completely lowered. Place the muffs so that the intake openings are completely covered. Start the water flowing and start the motor in neutral. Flush the engine until the exit water temperature is 120°F, then for 2 minutes.
7. Note: Following the decontamination, the boat should be inspected again to ensure proper decontamination was completed.

Locate decontamination where the discharge water will be disposed of on a permeable surface (e.g., gravel, sand, or grass) or sludge/holding tank, so that it does not enter the storm sewer system or another water body.

Boat Lift and Dock Decontamination Protocol

Water-related equipment such as boat docks and lifts pose unique challenges to decontamination. This type of equipment is commonly in the water for longer periods of time than boats and, therefore, may have adult zebra or quagga mussels or other AIS attached. In addition, the framework on many docks and lifts make it almost impossible to properly decontaminate with a hot-water, high-pressure sprayer. For docks, lifts, and associated equipment, it is required by law to allow at least a 21 day drying period before moving the equipment to a new water- body even if the piece of equipment has been decontaminated as outlined here.

If you determine that a boat dock or lift is in need of decontamination, follow these steps:

1. Use extreme caution while operating the hot-water, high-pressure sprayer. Wear proper personal protective equipment and ensure that

   the area surrounding the boat is clear of other staff.
2. Remove all mud, plants, and large material as much as possible prior to beginning the decontamination.
3. Spray the entire exterior of the dock/lift using 140^{o} F water at high pressure with a 40-degree nozzle. Begin and end at the same location.
4. Hold the spray nozzle 12 inches away from the surface at a 45-degree angle so the water is “chiseling” the unwanted material off the boat/trailer. DO NOT shoot the high-pressure, hot-water at a 90-degree angle to the object.
5. Use 140°F water at low pressure to rinse the inside of the framing and other components as much as possible. Continue to rinse the framing until the exit water is 140°F.
6. Following the hot water decontamination, the equipment should again be inspected to ensure proper decontamination was completed. Allow the piece of equipment to dry for at least 21 days or over the winter before moving it to another body of water.

What if a hot-water, high-pressure sprayer is not available?

If your company does not have access to a hot-water, high-pressure sprayer, you have the following options to ensure you are not transporting invasive species:

- Dedicate equipment for use only in infested waters
- Dry for the recommended amount of time and hand clean before moving equipment to another body of water.
- Don’t transport equipment—leave it on property owner’s shoreline.

Section 6: Best Practices for Lake Service Provider Businesses

Best Practice Examples from LSP Businesses

During lake service provider trainings held over the past several years, LSP business owners have shared their recommendations on AIS prevention measures. Below are several practices that other businesses have incorporated to prevent AIS spread.

- Track all equipment you are moving/cleaning with a logbook or spreadsheet (see example on next page).
- Decontaminate/dry all rental returns.
- Tag all equipment that comes into your facility—note things such as date of arrival, date of decontamination, and where the equipment came from.
- Dedicate separate equipment for infested waters.
- Drill extra holes in frames of equipment for better drainage.
- Schedule work on infested waters at the end of the day or week.
- Restrict usage/work in infested waters.

Transfer and sale of used water-related equipment from infested water

If you are asked to transport used equipment from infested waters, consider setting basic standards for your business.

- All equipment must be cleaned, drained, and dry before transporting.
- For boat lifts and docks, decontaminate and dry for at least 21 days before moving it to another water body as they are high risk for transporting AIS.
- When possible, delay transfer of any equipment over winter.

Reporting New Infestations

As service providers, you not only serve an important role as leaders in preventing the spread of AIS, but also are often the first to see new infestations of AIS in your area. Because you and your staff are regularly working out on the water, you have a good chance of seeing new infestations. So, how do you report any suspected AIS that you see?

- Know Your Infested Waters – Infested waters are marked with signs at public accesses. You also can find the latest infested waters list at the DNR website: files.dnr.state.mn.us/eco/invasives/infested_waters.pdf
- Contact your local Invasive Species Specialist – To find your local specialist, go to the DNR website: mndnr.gov/invasives/ais/contacts

To help your local DNR Invasive Species Program field staff confirm a potential new AIS infestation, it is helpful to have a few pieces of information at hand:

- A digital photograph of the organism with some way of suggesting scale. It is helpful for the AIS staff to have an idea of the size of the plant or animal;
- Location of potential AIS; a GPS coordinate is great, but if that is not possible, then a detailed description with landmarks is helpful; and
- If you think you have found a new infestation, especially zebra or quagga mussels, you can collect a sample for transport to a DNR office. Place the specimen in a sealed container with a label stating the name of the water body where it was collected, and your contact information. A digital photograph with GPS location are also helpful.

AIS resources for You and Your Customers

We hope you realize the key role you play in protecting the lakes and rivers of our state. You have an opportunity to share what you have learned today with your employees, customers, neighbors, and family. Below are some resources that you can share with others to increase their knowledge of aquatic invasive species.

Stop Aquatic Hitchhikers!

"Stop Aquatic Hitchhikers!" is a national campaign that helps recreational users become part of the solution in stopping the transport and spread of aquatic invasive species. Brochures and additional information are available from the Protect Your Waters website at: www.protectyourwaters.net/

You can download a brochure from the DNR website to hand out to your customers (files.dnr.state.mn.us/natural_resources/invasives/protect_waters.pdf) **or request copies by calling 1-888-646-6367**

Use Training, Permit, and Employee Certificates to Promote Your Business

The DNR has made a commitment to stop the spread of invasive species, and it hopes you have also made the commitment to use practices that will protect our water resources for generations to come. That is a great accomplishment and one that should be shared with others.

Across the state, customers are calling to request the contact information of businesses that have been trained on AIS awareness, inspection, and decontamination protocols, and have obtained the required permit. Take some steps to make sure that your customers know that you care about their lakes and rivers!

- Make your lake service provider permit and certification part of your advertising. When you receive your permit, your business is also listed on the DNR website on the list of all permitted service providers. Use this and your employee's certifications in your advertising.
- Ask lake associations to share in their newsletters and websites that your business is permitted.

DNR Invasive Species Program

The purpose of the DNR's Invasive Species Program is to curb the spread and minimize the harmful effects of invasive plants and animals on our state's ecology and economy.

Goals of the program:

- Prevent the introduction of new invasive species into Minnesota.
- Prevent the spread of invasive species within Minnesota.
- Reduce the impacts caused by invasive species to Minnesota's ecology, society, and economy.

For more information on Aquatic Invasive Species and the Program, visit the website at: mndnr.gov/AIS.

SAMPLE TRACKING SHEET - WINTER BOAT PICK UP

DATE:	INSPECTOR:
CUSTOMER NAME:	**Batt Switch off**
BOAT MAKE, MODEL, YEAR:	IBS Trlr #
	CUSTOMER TRAILER EXPIRATION

MN#:		
EXPIRE DATE:		
HOURS:		
FUEL LEVEL:		
WIDE OPEN THROTTLE RPMS:		
DRAIN WATERTANK:		
CARPET # OF PIECES:		
CANVAS IN BOAT?:	YES	NO
CANVAS # OF PIECES:		
Inventory of Canvas:		
BIMINI		
BIMINI BOOT		
BOW		
COCKPIT		
ISENGLASS		
MOORING COVER		
TRANSOM COVER		

SLIP INFO:		
BOAT WET:	YES	NO
STEREO FACE ON:	YES	NO
FUEL STABILIZER ADDED:	YES	NO
ZEBRA MUSSEL VISIBLE:	YES	NO
DRAIN PLUG OUT CENTER	YES	NO
DRAIN PLUG OUT BACK	YES	NO

CHANGE FLUIDS/FILTERS	*YES*	*NO*
BOTTOM CLEAN	*YES*	*NO*
TAB/DRIVE CLEAN	*YES*	*NO*
PRESSURE WASH	*YES*	*NO*

Appendix A
Selected Minnesota Laws Related to Service Providers

MINNESOTA STATUTES 84D.01 DEFINITIONS.

Subd. 8d. 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. 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.

MINNESOTA STATUTES 84D.05 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 as specified 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.

MINNESOTA STATUTES 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.

MINNESOTA STATUTES 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. [Effective 8-1-2013]

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. [Effective 8-1-2013]

MINNESOTA STATUTES 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. [Effective 8-1-2013]

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 equipment 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. [Effective 5-28-2011]
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 a noninfested surface water bodies and that is transported by a commercial vehicle, excluding watercraft, or commercial trailer, which vehicle or trailer is specifically 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). [Effective 8-1-2013]

MINNESOTA STATUTES 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.

MINNESOTA STATUTES 84D.108 SERVICE PROVIDER PERMIT.

Subd. 1. Service provider permit required.

a. Service providers must apply for and obtain a permit from the commissioner before providing any services described in section 84D.01, subd. 15a.
b. Service providers must have a valid permit in possession while providing services described in section 84D.01, subd. 15a.
c. Service providers must display the service provider permit decal issued with their permit. The decal must be completely affixed by its own adhesive on the inside of the extreme lower corner of the driver's windshield of the vehicle being operated while providing services described in section 84D.01, subdivision 15a.

Subd. 2. Permit requirements.

a. Service providers must complete invasive species training provided by the commissioner and pass an examination to qualify for a permit. Service provider permits are valid for three calendar

years.

b. A $50 application and testing fee is required for service provider permit applications.
c. Persons working for a permittee must satisfactorily complete aquatic invasive species-related training provided by the commissioner.
d. A person working for and supervised by a permitee is not required to complete the training under paragraph (c) if the water-related equipment or other water-related structures remain on the riparian property owned or controlled by the permittee and are only removed from and placed into the same water of the state. [Effective 7-1-2013]

Subd. 3. Standard for issuing.

The commissioner may issue, deny, modify, or revoke a permit as provided in section 84D.11, subd. 3.

Subd. 4. Appeal of permit decision.

Permit decisions may be appealed as provided in section 84D.11, subd. 4.

MINNESOTA STATUTES 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. [Effective 8-1-2013]

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. [Effective 5-28-2011]

Subd. 5.Civil penalties.

a. 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;

5. For intentionally damaging, moving, removing, or sinking a buoy marking, as prescribed by rule, Eurasian water milfoil, $100;

6. For failing to have drain plugs or similar devices removed or opened while transporting water-related equipment or 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.

b. A civil citation that is issued to a person who has one or more prior convictions or final orders for violations of this chapter is subject to twice the penalty amounts listed in paragraph a. [Effective 7-1-2012]

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. [Effective 5-28-2011]

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. [Effective 5-28-2011]

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.

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);
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) Linneaus;
b. New Zealand mud snail (Potamopyrgus antipodarum) Gray;
c. quagga mussel (Dreissena bugensis) Andrusov;
d. red swamp crayfish (Procambarus clarkii) Girard; and
e. zebra mussel (Dreissena spp.).

MINNESOTA RULES 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. The following fish are designated as regulated invasive species:

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. 4.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.

Appendix B
Aquatic Invasive Species Identification Sheets

Zebra Mussel *Dreissena Polymorpha*

Regulatory Classification: Prohibited Invasive Species

Origin: Native to Black and Caspian Seas in Eastern Europe and Western Russia

Biology

They are small, fingernail-sized animals that attach to solid surfaces in water. Adults are 1/4 to 1 1/2 inches long and have D-shaped shells with alternating yellow and brownish colored stripes. Females can produce 100,000- 500,000 eggs per year. These develop into microscopic, free-living larvae (called veligers) that begin to form shells. After two-three weeks, the microscopic veligers start to settle and attach to any firm surface using "byssal threads". A related species that is also invasive is the slightly larger and more round-shelled Quagga mussel. These two are the only freshwater mussels that can attach to objects.

Means of Spread

They were brought over to the Great Lakes in ballast water of freighters and discovered in the Great Lakes in 1988. They attach to boats, nets, docks, swim platforms, boat lifts, and can be moved on any of these objects. They also can attach to aquatic plants, making it critical to remove all aquatic vegetation before leaving a lake. Microscopic larvae may be carried in water contained in bait buckets, bilges or any other water moved from an infested lake or river.

Impacts

They clog intakes for irrigation equipment on lakeshore properties with irrigation. They attach to motors and sometimes clog cooling water areas on watercraft. When in large groupings on rocks, beaches, swim rafts and ladders, their shells cause cuts and scrapes. Anglers may lose tackle as the shells can cut fishing line. They attach to native mussels, killing them. They filter plankton from the surrounding water which can increase water clarity, causing more aquatic vegetation to grow at deeper depths and more dense stands. If a lake has high numbers of them over large areas, this filter feeding could impact the food chain, reducing food for larval fish.

Spiny Waterflea *Bythotrephes longimanus*

Regulatory Classification: Regulated Invasive Species

Origin: Native to Europe and Asia

Biology

A type of zooplankton (microscopic animals) with adults ranging in size from 1/4 to 5/8 inches long. They have a single long tail with small spines along its length. They prefer deep lakes, but can be found in shallow lakes and rivers. The ability to swim, as opposed to merely drifting with the current, helps them to encounter prey and to move between shallow and deeper lake waters. Their long, barbed tail makes them difficult for most small fish to swallowing.

Means of Spread

First discovered in Lake Ontario in 1982 and spread to Lake Superior in 1987, they were introduced into the Great Lakes by ballast water discharged from ocean-going ships. They can spread by attaching to fishing lines, downriggers, anchor ropes, and fishing nets. While females die out of water, under certain conditions they produce eggs that resist drying and freezing, and can establish a new infestation. They also can be unintentionally transported in bilge water, bait buckets, or livewells. They collect in gelatinous globs on fishing lines and downrigger cables.

Impacts

They eat small animals (zooplankton), including Daphnia, which are an important food for native fishes. In some lakes, they caused the decline or elimination of some species of native zooplankton. They can clog eyelets of fishing rods and prevent fish from being landed.

Faucet Snail *Bithynia tentaculata*

Regulatory Classification: Prohibited Invasive Species

Origin: Native to Europe

Biology

A type of small snail that grows up to 1/2 inch in length, but is generally smaller. They are light brown to black, with 4 to 5 whorls and a cover on the shell opening. Found on rocky shorelines, river and lake bottoms, aquatic vegetation, and docks. The shell opening is on the right when the shell pointed up. They are difficult to distinguish from native snails or immature invasive mystery snails.

Means of Spread

They were introduced to the Great Lakes in the 1870s. It was probably brought to North America unintentionally with the solid ballast of large timber transport ships or perhaps with vegetation used in packing crates. 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.

Impacts

They are an intermediate host for three intestinal trematodes, or flukes, that cause mortality in ducks and coots. These parasites have a complex life history and require two intermediate hosts, such as this snail to develop. When waterfowl consume the infected snails, the adult trematodes attack the internal organs and cause lesions and hemorrhage. Infected birds appear lethargic and have difficulty diving and flying before eventually dying. The trematodes have contributed to the deaths of about 9,000 scaup and coots in 2007 and 2008 on Lake Winnibigoshish. These snails also compete with native snails, and may clog water intake pipes and other submerged equipment.

Curly-leaf Pondweed *Potamogeton crispus*

Regulatory Classification: Prohibited Invasive Species

Origin: Native to Eurasia, Africa, and Australia

Biology

A submersed aquatic plant, it generally grows in 3-10 feet of water. Leaves are somewhat stiff and crinkled, approximately 1/2-inch wide and 2 to 3 inches long; leaves are arranged alternately around the stem, and become more dense toward the end of branches. It tolerates low water clarity and will readily invade disturbed areas. It is similar in appearance to many native pondweeds commonly found in Minnesota lakes and streams but can be distinguished from them by its unique life cycle. It is generally the first to come up in spring then dies back in mid-summer. The flower stalks, when present, stick up above the water surface in June. It appears reddish-brown in the water, but is actually green when pulled out of the water.

Means of Spread

It was first noted in Minnesota about 1910. It probably was accidentally introduced to the state when common carp were intentionally brought to Minnesota. It has been in Minnesota so long that most people do not realize that it is a nonnative species. It is believed to spread from one body of water to another primarily by the unintentional transfer of turions, which are hardened stem tips, on plant fragments carried on watercraft and trailers.

Impacts

In spring, it can form dense mats that may interfere with boating and other recreation on lakes. It also can cause ecological problems by displacing native plants. In midsummer, it usually dies back, resulting in rafts of dying plants piling up on shorelines, and often is followed by an increase of the nutrient phosphorus in the water, creating undesirable algal blooms.

Flowering Rush *Butomus umbellatus*

Regulatory Classification: Prohibited Invasive Species

Origin: Native to Africa, Europe and Asia

Biology

A perennial aquatic herbaceous plant, it grows 1-4' high on an erect stem along shores in shallow water. In deeper water it grows submerged without producing flowers. It is very difficult to identify when not in flower. It closely resembles many native shoreland plants, such as the common bulrush. Its leaves are sword-shaped, triangular in cross section. It has umbrella-shaped pink or white flowers that bloom from June to August.

Means of Spread

It is a Eurasian plant that was sold commercially for use in garden pools. It is now illegal to buy, sell or possess the plant. It reproduces by vegetative spread from its roots in form of bulb-lets. Both seeds and bulb-lets are dispersed by water current. It is actively expanding and has spread from a limited area around the Great Lakes and the St. Lawrence river to sporadically appear in the northern U.S. and southern Canada.

Impacts

It competes with native shoreland vegetation. There is documentation from a site in Idaho, between 1956 and 1973, where it appeared to be out-competing willows and cattails. It can displace native riparian vegetation, disrupting the local habitat. It can also be an obstacle to boat traffic.

Eurasian Watermilfoil

Myriophyllum spicatum

Regulatory Classification: Prohibited Invasive Species

Origin: Native to Europe

Biology

Found in water less than 20 feet deep, it is a submerged aquatic plant that has 3-5 feathery leaves arranges in circles off the stems. Each leaf typically has 12-21 leaflet pairs. It can form mats in waters less than 15 feet deep. It has long stringy stems that branch out near the water surface and small reddish flowers above the waterline in mid summer. A native look-alike, northern watermilfoil, has fewer (5-10) leaflet pairs.

Means of Spread

It is believed to have been introduced as an aquarium plant and spread westward into inland lakes primarily by boats. It reached midwestern states between the 1950s and 1980s. A key factor in the plant's success is its ability to reproduce through stem fragmentation and runners. A single segment of stem and leaves can take root and form a new colony. Small fragments clinging to boats and trailers can easily spread the plant from lake to lake. The mechanical clearing of aquatic plants for beaches, docks, and landings creates thousands of new stem fragments. Removing native vegetation creates perfect habitat for it to invade but it has difficulty becoming established in lakes with well established populations of native plants.

Impacts

In nutrient-rich lakes it can form thick underwater stands of tangled stems and vast mats of vegetation at the water's surface. These mats can interfere with swimming and entangle propellers, which hinders boating, fishing, and waterfowl hunting. Heavy infestations may reduce property values. It can displace native aquatic plants, impacting fish and wildlife.