

A New York Boaters Guide to Cleaning, Drying and Disinfecting Boating Equipment

Procedures To Prevent the Spread of Aquatic Invasive Species While Boating



New York State Department of Environmental Conservation
www.dec.ny.gov

Introduction

The following procedures are designed to advise boaters on how they can best ensure that the watercraft that they own or use do not spread aquatic invasive species (AIS). Plant and animal species such as Eurasian watermilfoil, zebra mussel and spiny waterflea are some of the more common AIS in this country and are all found in New York State. Many of these species were first introduced into this country in the Great Lakes via the ballast water in large ocean going vessels. Recreational boaters have since assisted in the spread of these species from these locations of initial introduction. Although boats are not the only way that AIS are spread from water to water, they are a significant vector that must be addressed. AIS can range from easy to detect aquatic plants to plankton and larval mussels that can only be spotted with a microscope. These microscopic species can survive in any standing water that remains in your boat or trailer. The only way to ensure that these species are not introduced into a new waterbody is to carefully CHECK, CLEAN and DRY any boat, trailer or boating equipment that comes into contact with water. If drying is not possible, anything coming into contact with water must be adequately disinfected.

Why should I be concerned about AIS?

When invasive species are introduced into this country, they rarely come along with the diseases and predators that keep them in check in their native land. Without these checks, they can easily become overabundant, often outcompeting native plants and animals. Zebra mussel, one of the best known AIS, can expand their population to such an extent that they can cover any hard surface in a body of water. This is a major concern with waters used for industry, irrigation or to supply drinking water since these mussels can clog supply pipes. Similarly, Eurasian watermilfoil, a common aquatic invasive plant species, can grow to such a level that boating is virtually impossible in a body of water.

How do I know if a water I boat on has AIS?

AIS found in waters that the Department of Environmental Conservation maintains public access facilities on can be found on the DEC boating access webpages at www.dec.ny.gov/outdoor/7832.html. Although other AIS may also be found in these waters, the listed species have been documented by either DEC staff or other AIS experts. This list is designed to make boaters aware of the known presence of an AIS in a waterbody. It is by no means inclusive, nor should the assumption be made that the absence of AIS in the table for a particular waterbody indicates that no AIS exist in it. AIS may not have been present or detected at the time the survey was made. Information on private waters can often be found on-line via a lake association or regional invasive species control program. A good source of information for waters within the Adirondack park can be found at the Adirondack Park Invasive Plant Program website at www.adkinvasives.com/Aquatic/Maps/Maps.asp. Although boaters should still take appropriate procedures to dry or clean their boats even if a waterbody does not currently have AIS listed, it is paramount that boaters take the appropriate actions after boating on listed waters. If you believe that you have identified a new AIS, it should be reported to iMap-Invasives at http://imapinvasives.org/nyimi/report_invasives.

How do I clean my boat to avoid spreading AIS?

Drying is the most effective way to ensure that all invasive species that may have accumulated on or in a boat or associated equipment are dead prior to use in a new waterbody. Drying times vary according to the time of year and associated weather conditions. During hot, dry conditions, most equipment should dry in 5 to 7 days. During cooler or more humid periods it may take a month or more to dry equipment. Drying times for various times of the year can be calculated at www.100thmeridian.org/Emersion.asp. If in doubt whether boats or boating equipment have had sufficient time to dry, you should disinfect it prior to use in a new waterbody.

The use of hot water in excess of 140° F, or steam is the most effective means of disinfecting boating and fishing equipment. While many of the invasive clam and mussel species can detect other disinfection agents and avoid them by tightly closing their shells, they cannot protect themselves from the effects of high temperature. A temperature of at least 140° must be maintained for at least 10 seconds to ensure that all AIS are destroyed. Although hot water pressure washers are expensive and self serve car washes do not normally provide water hot enough for effective disinfection, household steam cleaners can usually be purchased for under \$100 and can be used to effectively disinfect boating equipment. They are particularly effective for bilge, live wells and other small confined spaces, but can also be used to disinfect small boat hulls. Be sure to avoid decals, as the heat may remove or damage them.



Hot water is the most effective disinfectant for all aquatic invasive species. Household steam cleaners are a relatively inexpensive, yet effective disinfection option for boat owners.

Unfortunately, there currently are no chemical disinfectants readily available to boaters that are specifically designed to disinfect boating and fishing equipment. However, a number of household products have proven to be effective cleaners, depending upon the AIS of concern. These include:

Bleach: Bleach is a very effective disinfectant agent, but it is a caustic substance that can be corrosive to aluminum and other sensitive fishing and boating equipment. Soak or spray equipment for at least one minute with a 2% bleach solution (3 ounces of household bleach mixed with 1 gallon of water). If whirling disease is suspected, a 10% solution should be used (13 ounces of household bleach mixed with 1 gallon of water). If cleaning water holding areas in boats previously used in zebra or quagga mussel waters, a contact time of at least 10 minutes is recommended.



Potassium Chloride: Commonly used as a substitute for calcium chloride in home water softeners, potassium chloride (KCL) is a very effective cleanser for boats and equipment used in waters containing zebra or quagga mussels. It also does not have the corrosive side effects of some other cleaning agents. KCL salt crystals can be purchased at any home improvement or hardware store selling water conditioning products. Use a 200 ppm solution created by mixing one teaspoon of dry KCL salt crystals in 2 gallons of waters. Given the non-corrosive attributes of KCL, it is particularly useful in cleaning zebra and quagga mussels from engine cooling systems and other corrosion-prone areas.



Cleaning Agents: Of the materials traditionally used to disinfect for human or animal health purposes, quaternary ammonium compounds have been found to be effective in controlling fish viruses and pathogens, including whirling disease. Commercial formulations, such as Parvasol® and Kennelsoil®, are available through laboratory or veterinary supply companies. Although not as effective as these stronger industrial disinfectants, household cleansers/disinfectants, such as Formula 409® and Fantastik®, that contain the quaternary ammonium compound alkyl dimethyl benzyl ammonium chloride can also be used to disinfect equipment. These solutions should be used full strength. For all materials, follow label instructions and soak equipment for a minimum of 10 minutes. Be sure to dispose of materials away from surface waters in accordance with label restrictions.

ACTIVE INGREDIENTS:	
Alkyl (C12 40%; C14 50%; C16 10%)	
dimethyl benzyl ammonium chloride	0.3%
OTHER INGREDIENTS.....	99.7%

BEFORE YOU LAUNCH

1. If your boat was last used on a different waterbody, it must either be clean, completely dry or disinfected prior to launching. Follow procedures listed under **WHEN YOU GET HOME**.
2. Be aware of any documented invasive species present in the body of water you are boating on. AIS presence for waters with DEC boating access sites can be found at www.dec.ny.gov/outdoor/7832.html. Information on private waters can often be found on-line via a lake association or regional invasive species control program. A good source of information for waters within the Adirondack Park is the Adirondack Park Invasive Plant Program website at www.adkinvasives.com/Aquatic/Maps/Maps.asp. Boaters noting a species not previously detected in a body of water should report it to iMapInvasives at http://imapinvasives.org/nyimi/report_invasives.

AS YOU BOAT

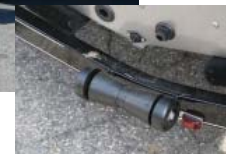
1. If your boat was recently used on another waterbody, avoid discharging water from your bilge, bait well or live well when you are on the water. All of these areas are best drained on dry land, in an area of the boat launch that does not drain directly into the water.
2. Avoid boating through matted aquatic plants that could collect on your boat or motor. This increases the likelihood of AIS attaching to your equipment and can also assist in the spread of AIS in a waterbody. Many aquatic plants can grow from very small fragments.

BEFORE YOU LEAVE

1. Immediately upon securing the boat to the trailer, drive away from the ramp to the boat tie-down area.
2. Drain ALL water from the boat including the live well, bait well, bilge, motor well and other water holding compartments. Drain ballast tanks and bladders that are installed in some water ski/wakeboard boats.
3. Thoroughly inspect the boat, motor, trailer and attached equipment for mud, plants and mussels. Remove all materials found. In addition to looking – inspect by running your hand along the entire surface of the equipment. Juvenile zebra mussels will feel like sandpaper. Be particularly watchful of areas that might accumulate materials, including ladders, depth finder transducers, trim tabs and anything else attached to the boat. Similarly, check the bunks, rollers, license plates, hanging wires, lights and other possible collection points on boat trailers.



Check all possible attachment points on your boat and trailer for clinging plants and debris.



4. Wipe the exterior of your boat with a damp towel to remove any small plant pieces or microscopic AIS. Dampen towel with a bleach solution or quaternary ammonia compound (see recommended disinfectants).
5. Inspect any equipment used during the boating trip, including nets, oars, water skis and ropes, personal floatation devices, floatation cushions and waterfowl decoys. Remove any clinging material. Wipe clean.



WHEN YOU GET HOME

1. Continue draining all water holding compartments and allow to completely dry in warm, dry conditions. Drying time can be estimated at www.100thmeridian.org/Emersion.asp.
2. Drain motor and if practical, flush with garden hose.
3. If all components of the boat cannot be completely and thoroughly dried, the boat must be disinfected. Suitable disinfectants are hot water (minimum 140° F), steam, bleach solution, or quarternary ammonia compounds. Maintain a contact time of at least 10 seconds when using hot water or steam. With other disinfectants, soak all areas for at least 10 minutes. Drain and discharge materials consistent with label restrictions. Rinse all areas completely after draining.
4. Wash boat hull with high pressure hot water (at least 140° F), steam clean, or wipe down hull with disinfection solution. Rinse hull thoroughly after wiping it down.
5. If boat was last used in a water body containing Asian clam, zebra mussel or quagga mussel, follow the additional procedures below. **Not necessary if disinfected with hot water or steam.**
6. Disinfect all equipment used during your boating trip.

Additional procedures for boats previously used in waters containing zebra/quagga mussels:

1. Fill bilge area, bait wells, live wells and other water holding compartments with potassium chloride solution and allow to sit for 12 hrs before draining. Rinse thoroughly after draining.
2. Wash hull with potassium chloride solution and rinse thoroughly with high pressure water (140° F hot water, if available).
3. Flush motor with potassium chloride solution or hot water (minimum 140° F), if possible. **Be sure to check equipment operating manuals before flushing with hot water to ensure it will not damage cooling systems.**
4. Check boat hull for juvenile mussel infestation by running hand along it. If the hull feels rough or sandpaper-like it likely has attached mussels. In such circumstances, mussels must be removed via pressure washer or scrub brush. Mussels are much easier to remove if allowed to dry first.



5. Dry boat completely. Drying times can be estimated at www.100thmeridian.org/Emersion.asp.
6. If boat is being stored for an extended period that will result in its extended drying and/or freezing, steps 1-3 are not necessary. Be sure to remove dead mussels/shells from boat before reuse, to avoid violating AIS transport laws.

Additional procedures for boats previously used in waters containing Asian clam

1. If all components of the boat cannot be completely and thoroughly dried, the boat must be disinfected. Asian clam are very resistant to chemical disinfectants. The most effective disinfectant is hot water (minimum 140° F) or steam which will actually cook the clam in its shell. Clams must be exposed to hot water or steam for at least 30 seconds. Soak times of at least 10 minutes are recommended for live wells and other water holding compartments.



Once affixed to a boat hull, zebra mussels can be difficult to remove, often requiring the use of a pressure washer.

WARNING

If using a pressure washer to clean your boat, use the 40° fan (white) tip to ensure that you don't damage your boat while cleaning.

Additional Instructions for Selected Water Craft

Water Ski Boats containing Ballast Tanks

Ballast tanks of large ocean-going vessels have brought a number of invasives to this country, including zebra mussels, quagga mussels and waterfleas. Similarly, ballast tanks in waterski boats provide one of the greatest risks for transporting AIS from water to water. These tanks must be disinfected prior to use in a new water body. Use 2 gallons of potassium chloride solution in each tank and leave it in each tank for at least 12 hrs.



Disinfectants should be added to ballast tanks via the same access points used to add anti-freeze at the end of the season.

Personal Watercraft*

1. Do not run your craft through aquatic plants. This could damage the craft, plug water intakes and increase mussel contamination.
2. After finishing activities, push or winch your craft onto the trailer without running the engine.
3. Secure the craft to the trailer and remove it from the water.
4. Start and run the motor for five to ten seconds to blow out water and contaminants from the underbody jet drive system.
5. Stop the engine and remove all plants, mud, and other contaminants from the steering nozzle.

6. Look under the craft and remove all contaminants. Check the water intake area, including the edges of the intake grate.

7. Inspect and clean the craft and trailer as described previously.

* *Guidelines courtesy of Utah Division of Wildlife Resources*

Canoes, Kayaks and Inflatable Boats, Rafts and Towables

Often ignored as a possible mechanism for the spread of AIS, these small, portable craft are more likely to be used in multiple waters in a short period of time than larger boats. The same check, clean, dry/disinfection procedures described previously should be followed before use in a new waterbody. Users of inflatable boats, rafts, tubes and other towables, should be certain to dry them thoroughly prior to rolling them up for storage.



Anything that comes into contact with water is a potential carrier of AIS and must be properly dried or disinfected.

Selected Aquatic Invasive Plant Species of Concern in New York State



Eurasian Watermilfoil

Stems are usually 3 to 10 feet in length and can range from pale pink to reddish brown in color. Bright green feathery leaves are finely divided and occur in whorls (circles) around the stem. Each leaf has 12-21 leaflet pairs. Native northern watermilfoil which it can commonly be confused with has 5-10 leaflet pairs.



Fanwort

Stems are long and appear tubular. Leaves are fan-like with a short stem and are arranged opposite each other on the stem. Plants have white to light pink flowers that float on the surface.



Variable-leaf Watermilfoil

Leaves are similar to Eurasian watermilfoil except each leaf has 5-14 leaflets. As the stem reaches the surface it changes its growth pattern to become a stout emergent flower-spike carrying an entirely different type of leaf. These emergent leaves are stalkless, wedge-shaped, stiff, and pointed, with variably-toothed margins.



Hydrilla

Plants look very similar to Brazilian elodea and other native Elodeas. Northern plants often lack the spiny underleaf and finely toothed leaves may be difficult to see. Best distinguishing characteristic is the turion or bulb connected to its roots that the other plants lack.



Curly-leaf Pondweed

Stems are branched and somewhat flattened. Leaves are reddish-brown in color, oblong and about 3 inches long. Leaves are usually stiff and crinkled and unlike other pondweeds have finely toothed edges.



Water Chestnut

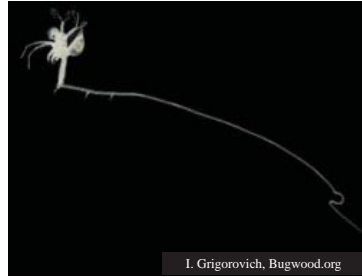
Stems are very flexible and can reach 12 to 15 ft. in length. On the water surface the plant contains a circular cluster of saw-toothed edged, triangular floating leaves that are connected to an inflated petiole (bladder) that provides added floatation. Feather-like leaves can be found along the submerged stem. Fruit is a nut with four 1/2 inch barbed spines.

Selected Aquatic Invasive Animal Species of Concern in New York State



Asian Clam

Triangular or rounded triangular shell usually around 1 inch. Light brown in color with numerous rings on outside of shell. Inside of shell light blue or light purple in color.



Fishhook Waterflea

Body size 1-3 mm without tail, 6-13 mm with tail. Tail has 3 pairs of barbs and a characteristic loop (fish hook) near the end.



Zebra Mussel

Shell "D" shaped usually with dark and light colored stripes. Usually under 1 inch in size at maturity.



Spiny Waterflea

Can reach 15mm in length, with the tail making up 70% of more of total length. Tail has numerous spines along its length.



Quagga Mussel

Similar to the zebra mussel, but more round in shape and has a pale color near the hinge. Average size is similar to the zebra mussel, although some can grow slightly larger.



When they collect on fishing line, waterfleas look like bristly gobs of jelly with black spots.

Minnesota Sea Grant

Thanks to the Utah Division of Wildlife Resources for photos and disinfection guidance included in this document.