

PROTECT NEW JERSEY'S WATERS

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Invasive fish species such as the snakehead, flathead catfish, and Asian swamp eel can outcompete other fish for food and available habitat, including rarely encountered native species and prized recreational fisheries. Zebra mussels choke intake pipes and cover critical spawning substrate.

Many of the same mechanisms which transport invasive plants and animals also transmit diseases such as Viral Hemorrhagic Septicemia (VHS), Infectious Pancreatic Necrosis Virus (IPN) and Largemouth Bass Virus (LMBV) threaten fish populations.

Why are invasive species a problem?

Invasive species are defined as "a species that is non-native to an ecosystem and whose introduction causes or is likely to cause economic or environmental harm or harm to human health."

- **Predation:** Large snakeheads and flatheads indiscriminately consume any fish species small enough to fit into their enormous mouths.
- **Competition:** Food, spawning areas and habitat are sought by invasive fish, leaving less available for desirable species.
- **Habitat Loss:** Plants like purple loosestrife or common reed (phragmites) can take over a wetland making it less suitable for native wildlife.
- **Loss of Recreation:** Bighead and silver carp threaten recreational boating as these large fish, when startled, leap out of the water high enough to intercept passing boaters.
- **Decreased Property Value:** Beautiful lakefront property can be transformed into a weed-choked monoculture once Eurasian water milfoil or water chestnut become established.
- **Economic Impact:** Zebra mussels cause millions of dollars of damage each year in the Great Lakes alone.

Anglers and recreational boaters play an important role in minimizing the spread of aquatic invasive species and fish disease. Boat trailers, live wells, bait buckets and even our favorite pair of waders are mechanisms for the transfer of aquatic invasives and disease. Anglers who regularly fish out-of-state on vacation or at tournaments must be especially careful. Trailers and boat livewells can harbor unwanted hitchhikers for weeks in their damp interiors. Our favorite pair of felt-soled waders—which may help with slippery rocks—can have felt that remains damp inside for up to two weeks, transferring disease from one waterway to another. Boots, boats and trailers alone can easily transfer unwanted vegetation.

At first it would seem almost impossible to prevent the spread of invasives, but by following some smart guidelines, anglers and boaters can greatly minimize the potential of spreading problematic species. Share this information with your friends and family. The more people aware of the dangers of spreading invasive species and disease along with the proper techniques for minimizing risk, the safer New Jersey waters will be.

Ready or not, here they come! Several unwelcome aquatic invasive species have made their way into our waters and many more are knocking at the door.

Aquatic invasive plants like Eurasian water milfoil, hydrilla, didymo (rock snot) and water chestnut choke thriving waterways.

Invasive Plants

The introduction of invasive aquatic plants not only affects the waterbody ecology but negatively affects the local economy of a lake community. Remove all aquatic plants from boats, motors and trailers before leaving the body of water where you've been boating or fishing.



- ▶ **WATER CHESTNUT**
Triangular shaped, strongly toothed leaves. Nut-like fruit with four sharp spines.

- ▶ **DIDYMO (ROCK SNOT)**
Algae that looks slimy but feels gritty. Resembles toilet paper.



- ▶ **HYDRILLA**
Leaves normally with whorls of five around the stem.

- ▶ **EURASIAN WATER MILFOIL**
Feather-like leaves in whorls of three to five around the stem and 12 or more pairs of leaflets per leaf.



The future of New Jersey's waters is in your hands!

Invasive Fish

Fish identification can be easy for species that you catch often, however this may not be the case for species new to New Jersey waters. An untrained eye can easily mistake species that look similar.

Bowfin are native species, actually dating back 250 million years and should be released unharmed. However, **snakeheads** are invasive and should be destroyed and submitted to the Division of Fish and Wildlife for verification. Snakeheads have recently been found in the lower Delaware River and some of its tributaries.

BOWFIN—NATIVE



Short anal fin.

▶ SNAKEHEAD—INVASIVE



Long anal fin.

Painting: Susan Trammell
www.susantrammell.com

American eels are a diadromous native species, using both fresh and marine waters during their lifecycle. These eels are found in nearly every waterbody in New Jersey. **American brook lamprey** are a harmless native species that serves as an indicator of clean substrate. The **Asian swamp eel** is an invasive species with documented presence in Silver Lake, a 10-acre waterbody located in Gibbsboro.

AMERICAN EEL—NATIVE



Pectoral fins present; no gill slits.

AMERICAN BROOK LAMPREY—NATIVE



No pectoral fins; gill slits present.

▶ ASIAN SWAMP EEL—INVASIVE



No pectoral fins; no gill slits.

Although not a native species, **channel catfish** are stocked by Fish and Wildlife in select locations as it is a desirable recreational and food species. They do not reproduce in most waters, and in the few where they do, populations do not reach problematic proportions. The **flathead catfish** is considered an invasive species capable of causing ecological damage by out-competing other recreationally important species for food and habitat. Flatheads have been confirmed in the middle section of the Delaware River.

CHANNEL CATFISH—STOCKED



Upper jaw protrudes past lower jaw; tail deeply forked.

▶ FLATHEAD CATFISH—INVASIVE



Lower jaw protrudes past upper jaw; tail not deeply forked.

Anglers must destroy these species if encountered while fishing and are directed to submit specimen(s) to the Bureau of Freshwater Fisheries personnel for verification. Fish and Wildlife's fishery biologists with can be reached at (908) 236-2118 for northern New Jersey, and at (856) 629-4950 for southern New Jersey.

Invasive Mussels—Zebra Mussels

How to Identify Zebra Mussels

- Look like small clams with a yellowish or brownish "D"-shaped shell, usually with alternating dark and light colored stripes.
- Up to two inches long, but most are under an inch.
- Usually grow in clusters
- Zebra mussels are the **ONLY** freshwater mollusk that can firmly attach itself to solid objects—rocks, dock pilings, boat hulls, water intake pipes, etc.



What to Do If You Find a Zebra Mussel

- Note the date and precise location where the mussel or its shell was found.
- Take the mussel (several if possible) with you and store in rubbing alcohol. **Do not throw it back in the water.**
- **Immediately** call Dr. Peter Rowe, New Jersey Sea Grant Headquarters, (732) 872-1300 extension 31, or write prowe@njmsc.org.

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Be a Responsible Angler

Angler and boater cooperation is critical to minimize the spread of aquatic invasives species and disease. Follow these guidelines for every fishing trip:

- **Never, ever move fish from one waterbody to another.** Relocating fish transfers disease and parasites between waterbodies. The practice also undermines Fish and Wildlife's stocking and management programs, wasting valuable time and money. Fish from an aquarium also must never be released into a local pond, lake or stream.
- Handle fish as gently as possible if they are to be released. Less stress equates to better disease resistance.
- Refrain from hauling fish for long period in livewells if fish are to be released.
- If interested in stocking fish, an application for a Fish Stocking Permit may be obtained at: NJFishandWildlife.com/pdf/fshstkapp.pdf
- Do not release live bait into any body of water.
- Stage weigh-in tournaments during cooler weather so fish caught will be stressed less. Utilize "paper" tournaments during hot weather, with anglers measuring and immediately releasing the fish.
- Switch to wearing rubber-soled boots instead of felt.
- Drain your livewell, bilge and bait tanks *before* leaving the body of water where you've been boating or fishing.
- Remove all mud, aquatic plants and animals from all gear, boats, motors and trailers *before* leaving the body of water where you've been boating or fishing.
- Thoroughly clean and dry livewells, boats, trailers and other equipment between fishing trips. A light bleach solution is an excellent disinfectant for cleaning equipment (1 cup bleach for 10 gallons of water). For livewells, use ¼ cup bleach per gallon of water. The contact time with bleach should be at least five minutes. (In a waterbody known to contain VHS, clean and disinfect livewells and bait wells with a 10 percent chlorine/water solution). Rinse well to remove all residual chlorine.
- After cleaning, allow boats, trailers and other equipment to dry fully in the sun for four to six hours.



Chris Smith/NJDFW

Tournament Organizers: Are You Traveling Out of State?

With the increasing popularity of tournament angling and growing potential for spreading invasive species and diseases, organizers are encouraged to follow proper procedures for disinfecting boats, trailers and equipment after each fishing trip. Popular fishing destinations such as Lake Champlain, the Hudson River and Oneida Lake are infested with zebra mussels and water chestnut. Hydrilla is found in the Potomac River and Susquehanna Flats. Eurasian milfoil is found in many waters throughout the northeast and mid-Atlantic region. Taking proper precautions like disinfecting equipment and educating fellow anglers will ensure the protection of New Jersey's waterbodies from these invaders. For more information on how your organization can help stop the spread of invasive species and to assist the Division of Fish and Wildlife visit NJFishandWildlife.com.

For additional information on proper tournament procedures plus fish care recommendations, visit bassmaster.com/conservation. 



Chris Smith/NJDFW