

Protecting NYS's Waterways from Harmful Species



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New York's Wonderful Waters

With more than 7,000 lakes and ponds and some 70,000 miles of rivers and streams, New York State is home to exceptional freshwater ecosystems. These waters support a diversity of wildlife, figure prominently within the region's history, and enrich the lives of residents and visitors. They are key for the state's economic development. Protecting them benefits all of us.

Among these important freshwater resources is the expansive New York State Canal System (NYSCS). The NYSCS helped usher in an era of economic growth during the Industrial Revolution and was responsible for the livelihoods of some 50,000 New Yorkers at its economic height. While the NYSCS is still utilized for commercial transport, its primary use today is for recreation and tourism. Millions of visitors enjoy boating, fishing, sightseeing, hiking, biking and many other activities on the Canals and adjacent trails each year.¹

Canals are engineered passageways comprised of built and natural waterways, which over time can become part of the landscape and support habitats for native species. Some of these species are recreationally important, threatened, endangered and/or invasive. Anglers enjoy leisure fishing for warm waters species, like panfish, throughout the NYSCS and there are sections that support world-class fishing opportunities. In addition to recreationally important fishes, the NYSCS contains species that need careful management and conservation, such as imperiled freshwater mussels, blueback herring, and American eel. Harmful invasive species are also present within the NYSCS due to its connectivity to other waterbodies and introductions directly into the canals by human activity.

Aquatic Invasive Species

Effects of AIS on Natural Waterbodies & Canals

Aquatic Invasive Species (AIS) are non-native plants and animals introduced into new habitats from other ecosystems. They can multiply and spread so rapidly that they change the way the invaded ecosystem functions to the detriment of native species. AIS can damage water quality and harm local economies by interfering with recreational activities like fishing and boating. Once introduced, AIS are difficult to control and often cost local communities millions of dollars to manage the ecological and economic fallout. AIS threaten native species and recreational opportunities in New York's waterways, potentially causing a significant loss of ecosystem services



Red swamp crayfish (*Procambarus clarkii*) is a freshwater species that can invade lakes, ponds, rivers and wetlands.

for Canal communities and visitors. Species such as the red swamp crayfish (*Procambarus clarkii*), whose burrowing activities may destabilize embankments,² can threaten the integrity of Canal infrastructure. This damage could require costly repairs to preserve historically important infrastructure and maintain critical operations.

Unintended Consequences of Connected Waterways

The spread of AIS into the NYSCS has serious implications that extend far beyond the canal system itself. The canal system creates a connection between five major watersheds and several large waterbodies, including two Great Lakes (Erie and Ontario), the Finger Lakes, Oneida Lake, Lake Champlain and the Atlantic Ocean. These connections inadvertently create dispersal pathways for AIS to travel between once naturally separated waterbodies.

The Great Lakes currently host about 65 non-native species that are not yet found in the Hudson or Mohawk rivers. These rivers are at risk of new AIS introductions from the Great Lakes due to their connection to the Erie Canal. The New York State Canal Corporation (NYSCC), New York Power Authority (NYPA) and New York State

Department of Environmental Conservation (NYSDEC) are working together to address these AIS spread risks while maintaining public access to and through the NYSCS.

Irreversible Impacts

AIS can be introduced to new water bodies in many ways. Species may hitch a ride on boats, be dumped from unwanted household aquariums or bait buckets and/or spread unassisted through natural population growth. Several AIS are known to have spread from the Great Lakes to other regions of New York by way of the Erie Canal.³ Here are some examples:

- **Zebra mussel (*Dreissena polymorpha*).** This invasive mussel caused plankton populations to plummet by 70 to 80 percent in the Hudson River, reducing food supply for fish and other wildlife.⁴
- **Faucet snail (*Bithynia tentaculata*).** The faucet snail is a small aquatic snail that infests municipal water systems. It also harbors a variety of parasites that are deadly to migratory waterfowl. At least 60,000 birds across 15 species have been killed by these parasitic assemblages nationwide, with thousands of birds continuing to die each year.⁵
- **Round goby (*Neogobius melanostomus*).** The newest arrival to the Mohawk and Hudson rivers is the round goby,⁶ an aggressive, voracious predator that disrupts fisheries.⁷

Taking Action to Prevent Harmful Species Spread - Round Goby

The recent spread of round goby through the Mohawk and Hudson rivers highlights the importance of preventing AIS from using the NYSCS to move into new waterways. The NYSCC, NYPA, NYSDEC, Lake Champlain Basin Program (LCBP) and other stakeholders are implementing a comprehensive effort to combat the potential spread of the round goby through the Champlain Canal to Lake Champlain. This strategy is based on the experience of subject matter experts involved in AIS at local, state and regional levels. Although this strategy focuses on the Champlain Canal as a specific pathway for round goby migration, it details a series of rapid responses that could be used to guide action throughout the NYSCS to deter future AIS introductions.

Rapid Response Plan for the Champlain Canal

The Rapid Response Plan (RRP) uses surveys conducted by our partners to detect the presence of round goby in the



*Round goby (*Neogobius melanostomus*) is a highly invasive bottom-dwelling fish from the freshwater region of Europe's Black and Caspian Seas. They are voracious feeders that outcompete native species for food, shelter and spawning areas.*

Champlain Canal and proposes adaptive actions to contain round goby using a Trigger Action Response Plan (TARP). The TARP includes a series of escalating actions, such as limiting vessel traffic or temporary lock closures, to contain round goby if it advances within the Champlain Canal. View the RRP and TARP at <https://bit.ly/3V3uVi5>.

Here are some of the actions the NYSCC and its collaborating agencies are taking to mitigate the spread of round goby in the Champlain Canal:

- **Round Goby Monitoring.** The LCBP, USGS and NYSDEC are using electrofishing and eDNA surveys to monitor round goby populations in the Hudson River and Champlain Canal. View survey results at <https://bit.ly/3wEzvcx>.
- **Operational Changes.** The NYSCC is continuing to implement operational modifications to reduce the risk of round goby spreading within the Champlain Canal. These modifications include scheduled lock openings, double draining at locks C1 and C2, and using data on round goby presence to time floodgate operation. View info on scheduled lockings and double draining at <https://bit.ly/3SUrCHm>.
- **Community Education and Outreach.** Preventing the spread of AIS is the most impactful and cost-effective management strategy available. The NYSCC has produced educational materials to alert boaters to the presence of round goby, explain operational changes and highlight ways the community can help stop the spread of round goby. The NYSDEC encourages better boat cleaning habits to help prevent AIS spread. See examples of these materials in Learn More, below.

Champlain Canal Facility Plan

The facility plan is a preliminary design study that describes and evaluates potential technological interventions that could be implemented to mitigate the spread of round goby in the Champlain Canal and into Lake Champlain. The proposed technologies may include a bubble curtain and electric deterrent within the Champlain Canal, and an inlet screen system to deter round goby from entering the Glens Falls Feeder Canal. These measures may also mitigate the spread of other AIS and will be evaluated based on their efficacy.

Future AIS Planning

While progress has been made by the NYSCC on developing rapid response plans and evaluating deterrent technologies to fight the spread of round goby in the Champlain Canal, additional threats lay on the horizon. For example, invasive carp, a significant threat to native fisheries and the health of boaters and anglers, may soon enter the Great Lakes and spread through the Canal System into the Mohawk and Hudson Rivers. The NYSCC is using lessons learned from work in the Champlain Canal to develop additional strategies that prioritize early detection of new AIS and rapid responses in other NYSCS locations.

Management strategies for the NYSCS will continue to seek balance between preserving recreational opportunities and mitigating AIS impacts. The response to AIS will evolve through ongoing collaboration with other agencies and stakeholders on early detection and rapid response plans, deterrent technology planning and implementation and public education initiatives.

Acknowledgements

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References

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Learn More

Community Education and Outreach Materials for Boaters



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https://www.canals.ny.gov/community/environmental/Invasive_Species.html



Department of
Environmental Conservation

<https://dec.ny.gov/nature/animals-fish-plants/invasive-species/aquatic/prevent-spread-of-aquatic-invasive-species>