

## EXECUTIVE SUMMARY

# Aquatic Invasive Species

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**A**quatic Invasive Species (AIS) are one of the leading causes of biodiversity loss in freshwater systems globally. With more than 180 introduced species, the Laurentian Great Lakes are one of the most invaded environments in the world and they act as a beach head of invasion for North America freshwater systems.

The primary pathways of invasion are maritime shipping (ballast water discharge, hull fouling), accidental introductions from either the trade in live organisms or recreational boaters, and colonization through canals that artificially connect the Great Lakes to other watersheds. The Chicago and Erie canals artificially connect over 40% of continental US land area and are a major pathway of secondary spread of introduced species from the Great Lakes into the Mississippi and Hudson River systems. Recreational boats and the sale of live organisms captured in the Great Lakes region are also important vectors of spread of AIS.

Our efforts to combat the threat of AIS are focused on preventing new invasions by promoting federal and state legislation to control discharges from maritime shipping and the importation of known invasive species in the live trade pathways. We are also working with science leaders to develop and disseminate tools to inform management of the most cost effective risk assessment, surveillance, early detection & rapid response (EDRR), slow-the-spread, and control strategies for invasive species.

Aquatic invasions are a global issue and the Great Lakes share many of the same problem species and vectors with other watersheds in the US and internationally. Species such as: common carp, rusty crayfish, brown trout, and Eurasian milfoil are impacting biodiversity around the world and a variety of groups (e.g. Australasian Invasive Animal Cooperative Research Centre) are developing management solutions that will benefit conservation and AIS control in the Great Lakes. Working with national and international groups we can collectively develop and share solutions and turn the tide on aquatic invasions.

### **Desired Outcomes**

- Halt introductions of AIS via maritime shipping (ballast water discharge, hull fouling, and sediment).
- Re-establish biological separation between Great Lakes basin and other North American watersheds artificially connected by canals.
- Prevent new introductions of AIS into and secondary spread from the Great Lakes basin arising from the trade in live organisms.
- Halt new introductions and secondary spread of AIS into and from the Great Lakes basin as a consequence of recreational boating activities.
- Reduce the dominance and environmental impacts of established AIS.

### **Key Strategies**

- Support research to identify high risk ports, alien species and shipping to inform treatment and compliance priorities.
- Develop defensible risk assessment protocols to identify invasive species in the live trade in organism. Use results to develop consistent regional regulations that prohibit known AIS and exert pressure for improved federal regulations by promoting science and regional policy efforts.
- Provide guidance to local and regional partners to improve the effectiveness of intervention strategies to halt the spread of AIS by recreational boaters.
- Find a permanent solution to achieve biological separation between Great Lakes Watersheds and Mississippi and Hudson River catchments.
- Develop a range of control and eradication tools as part of an integrated pest management program designed to reduce or eliminate impacts of priority invasive species.
- Establish an international network of AIS manager's and researchers to develop and share integrated pest management solutions.

## Challenges

- The problem is large with 10,000+ inland lakes, and a third of all US boaters using the Great Lakes region.
- We must build capacity within the organization and among external partners and agencies.
- Integrating AIS management into the Conservancy's state conservation planning and the Global Freshwater Program.

## Questions

1. Can effective ballast water and hull fouling treatment systems be developed and rapidly deployed on all maritime vessels?
2. How can we achieve biological separation between the Great Lakes and Mississippi watersheds and prevent further transit of AIS, while not adversely impacting the functions of the Chicago City waste and stormwater treatment systems, or recreational and commercial use?
3. Can we improve detection of new invasions to enable more effective Early Detection and Rapid Response?
4. How do we identify potential invasive species in the trade in live organisms, and what are the most cost effective methods for pre-import risk assessment or screening?
5. Can we develop an integrated set of control and/or eradicate methods for priority invasive species to restore Great Lakes ecosystems that are environmentally and socially acceptable?
6. What is the current distribution of invasive species in the Great Lakes basin (including inland waters) and what are the most effective survey and monitoring methods for a comprehensive inventory?

## Critical Resource Needs

- Research investment in risk assessment protocols to enable federal pre-import screening on live organisms in trade.
- Long term research investment in the development of an integrated set of control and eradication tools for crayfish and mollusk and other priority AIS.
- Comprehensive AIS inventory to fill gaps in distribution data around all Great Lakes States and provinces.
- Determining the feasibility, options and costs of biological separation of the Chicago Sanitary and Ship Canal and to develop mitigation strategies to prevent impacts on commercial and recreational users of the canal system.

## Opportunities

- AIS are a problem with solutions.”
- The Great Lakes region is a center of science excellence in invasion ecology, containing a number of the worlds leading invasion scientists.
- Great Lakes states and provinces work well together and have demonstrated their collective ability to affect policy or legislative change at federal levels.
- The Great Lakes Regional Panel of the Aquatic Nuisance Species Task Force (GLP-ANSTF) provides a formal venue for partnership and collaboration. The ANSTF was established under the Non-indigenous Aquatic Nuisance Prevention and Control Act. Membership on GLP-ANSTF includes each of the eight GL state aquatic nuisance species coordinators, US (e.g. Coast Guard, Environmental Protection Agency, Army Corp of Engineers, Fish and Wildlife Service) and Canadian federal and provincial agencies from Ontario and Québec, user groups, local communities, tribal authorities, commercial interests, and the university/research community.
- Comprehensive ballast water legislation will likely to be passed by US government. This legislation requires ballast water treatment and adoption of best management practices to limit or prevent introductions by maritime shipping. The bill also authorizes a new “national rapid response plan” to stop the introduction and spread of all AIS.
- The introduction and spread of VHS, a fish disease that is impacting Great Lakes biodiversity, has been the catalyst for change in boating behaviour and led to regulations that restrict the use and movement of live bait, and water (in live wells).
- Fishing, hunting and wildlife watching generates about \$18 billion annually in the Great Lakes region. Strong community support for AIS management and a number of states levy licenses and registrations to successfully fund and develop capacity in AIS management at agency and community levels (e.g. Wisconsin AIS funding for aquatic species grants has increased by 250% from \$1.5 million annually [2003] to \$4.3 in 2008-2009 budget). Promulgation of such funding approaches across the basin would greatly enhance capacity.
- The basin shares many of the same problem species with other US or international groups (e.g. carp, rusty crayfish) that are also actively investing in research to develop management solutions.