



## GLPRN Policy Brief Series: Invasive Species in the Great Lakes Basin

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### Overview

The Great Lakes Basin has been subject to invasion by non-native aquatic species – including plants, fish, algae, mollusks and oligochaeta – since early settlement. As of 2009, over 186 aquatic nuisance species (ANS) had entered into the Basin (Aquatic Invasive Species, 2013). Some 30% of invasive species have been introduced into the Basin through untreated ballast water (Invasive Species 2011).

As the Basin experiences higher levels of use due to commercial shipping, as well as industrial and recreational activity, the significance of this issue is likely to increase.

There are considerable ecological and economic costs associated with the continued existence of these species. In 2009, the tri-national Commission for Environmental Cooperation estimated that the economic losses and environmental impacts due to invasive species – including such problems as the zebra mussel and Asian carp – cost the United States \$100 billion (Ontario Invasive Species Strategic Plan 2012). In Ontario, the cost of dealing with zebra mussels, one of the most ubiquitous ANS, is estimated to be over \$75 million per year (Ontario Invasive Species Strategic Plan 2012). Invasive species also have a significant impact on biodiversity in the Basin, second only to habitat loss (State of Ontario's Biodiversity 2010, 2010). For example, the introduction of the quagga mussel has altered weed growth patterns and forced certain fish species to find new habitats. Further, Zebra mussels have been shown to colonize the shells of endangered freshwater mussels, smothering them (Ontario Invasive Species Strategic Plan 2012). The policy challenge thus involves both preventing the introduction of invasives (since, once the spread starts, it becomes very hard to control) but also mitigating the effects of currently existing ANS.

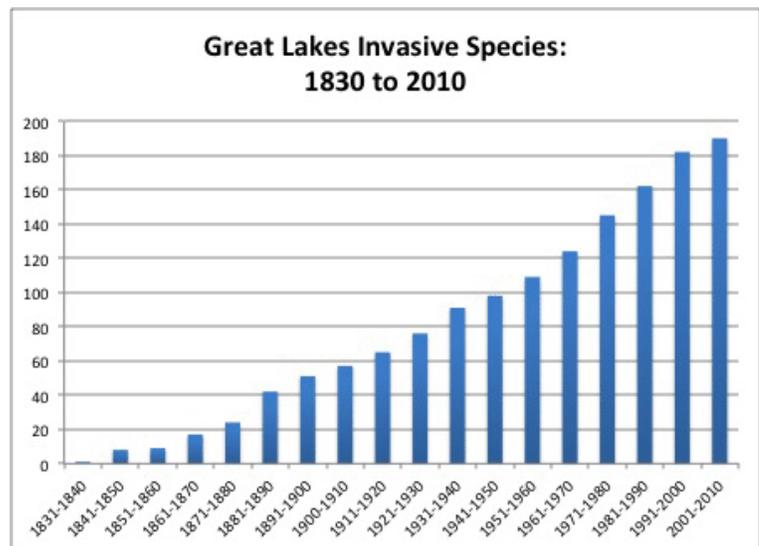


Figure 1 – Great Lakes Invasive Species: 1830-2010 (Graphic by Greta Johnsen/Data from NOAA)

## Existing Policies and Legislation

Combating invasive species, by halting their spread or restoring damaged ecosystems and infrastructure, involves efforts by all levels of government and by stakeholders outside of the government.

### *Transboundary*

- Great Lakes Water Quality Agreement Annex 6 establishes a binational strategy to prevent the introduction of invasive species, to control and reduce the spread of existing AIS, and to eradicate current existing AIS within the Basin

### *Canada*

- Canada Shipping Act protects the marine environment from damage due to navigation and shipping activities
- Wild Animal and Plant Protection and Regulation on International and Interprovincial Trade Act forbids the import, export, interprovincial transport of certain species
- Canadian Action Plan to Address the Threat of Aquatic Invasive Species

### *Ontario*

- Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA) establishes goals and objectives related to implementation of the GLWQA
- Ontario Fisheries Regulations (SOR/2007-237) prohibit the possession of invasive fish without a license
- Fish and Wildlife Conservation Act, 1997 (S.O. 1997, Chap 41) regulates the introduction and transport of wildlife into Ontario
- Ontario Invasive Species Strategic Plan

### *United States – Federal*

- National Invasive Species Act, whose prime focus is to prevent invasive species from entering the Great Lakes through ballast water
- Aquatic Nuisance Prevention and Control (16 USC Chapter 67) which focuses on ballast water management, coordination of federal research, developing and undertaking environmentally sound control methods, and provision of research and technology program to benefit states
- Ballast Water Management for Control of Nonindigenous Species in the Great Lakes and Hudson River (33 C.F.R. – 151)

### *United States – States*

- All Great Lakes states have instituted cross-departmental management plans for invasive species. New York, in particular, has instituted a very broad range of measures to combat invasives; the state sets out clearly which species are native to the state and establishes a range of measures to halt the movement of nonnative species.

## Stakeholders

Invasive species have a far reaching impact on many different stakeholder groups, individuals and organizations. Government officials and policymakers must determine the right policies to put in place to prevent the introduction of invasive species, as well as policies regarding dealing with invasive species already in the Great Lakes Basin. The shipping industry is forced to manage the release of ballast water, a key conduit for invasives, in appropriate ways; this can be costly as technical assistance is required from both biologists and ship engineers. In addition, ecologists are concerned with the overall health and biodiversity of the Great Lakes Basin and the impact invasive species have on native species. For their part, fishermen are

concerned with the possibility of invasive species wiping out populations of native fish which decrease the available catches. Public and recreational users need to be mindful of their boating practices, as transporting boats from location to location increases the likelihood of invasive species being brought into the area. Many invasive species also impact recreational beaches which causes a decrease in beach use.

There are a number of organizations involved in a variety of efforts to control invasive species:

- Aquatic Nuisance Species Task Force, which coordinates efforts between governmental and private actors related to nonindigenous aquatic species in the US
- The EPA, the Interagency Task Force, Environment Canada, the Province of Ontario and states bordering the Great Lakes are all responsible for upholding the agreement under the GLWQA
- Great Lakes Panel on Aquatic Nuisance Species works under the umbrella of the Great Lakes Commission to prevent and control the occurrence of aquatic nuisance species in the Great Lakes
- National Oceanic and Atmospheric Administration Sea Grants in the US universities in all Great Lake states which support scientific research, education, training
- US National Invasive Species Information Center was created to manage the information available on invasive species
- National Invasive Species Council is an inter-departmental council that helps to coordinate US federal activities regarding invasive species
- New York Invasive Species Council was created to coordinate multiple state entities and partners in addressing the environmental and economic threats of invasive species
- Canadian Cooperative Wildlife Health Center (CCWHC) coordinates Canada's national wildlife health surveillance program and provides educational programs, information, and consultation to both government and non-governmental agencies as well as the public

## Policy Challenges

Generally there are four main goals which should be considered when dealing with the problem of invasive species: prevention, detection, response, and management/adaption (Ontario Invasive Species Plan 2012). To date, the biggest challenge has been prevention. Increased efforts need to be directed toward ensuring that new ANS do not enter into the Great Lakes Basin. The most immediate issue is improving ballast water regulation and management, although there is still some debate as to the best way to implement controls and regulations.

The GLWQA has provided a strategy for dealing with AIS, although there are gaps within the agreement itself which need to be addressed. Canada has implemented a policy which is vastly different from individual state policies, particularly those of New York, which Canada claims to be too stringent (Ballast water and the Great Lakes-St. Lawrence Seaway System, 2012). The complexity of the issue demands effective coordination, communication and cooperation amongst neighboring states and provinces, the federal government, municipalities, NGOs, aboriginal communities and other stakeholders.

The International Association for Great Lakes Research (IAGLR) has stated that current levels of funding from both the Canadian and American governments are insufficient to adequately address this problem and has concluded that without increased government leadership and

funding, as well as greater engagement from the scientific community, current ballast tank treatment technologies will remain inefficient and costly (Research and Management Priorities for Aquatic Invasive Species in the Great Lakes, 2002).

## Policy Alternatives and Policy Futures

New legislation is currently being proposed, by both Canada and the United States, to better regulate ballast water intake and treatment. In 2006 Canada added new measures, such as mid-ocean ballast water exchange and new regulations that require empty tanks to be flushed in mid-ocean. The ballast water requirements pioneered in the Great Lakes have become regarded as best practices that are being incorporated into other international ballast water guidelines (Ballast Water Management in the Great Lakes, 2013).

Another short-term concern is preventing and controlling additional invasions in the Great Lakes Basin with particular emphasis on the Asian carp. Over the medium and longer term, there needs to be an increased emphasis on compiling and maintaining information which would track trade and ships coming into the Great Lakes Basin, increasing resources granted for scientific research to improve our understanding of the cause of invasion, the creation of risk assessment models, and the improved ability to evaluate potential future invaders.

In addition to the focus on ballast water regulation and management, there must also be an increased focus on aquaculture, the bait industry, and the aquarium industry and improving the barrier between the Great Lakes and the Mississippi River to prevent ANS movement.

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