

Fisheries Extension Enhancement

AQUATIC INVASIVE SPECIES

Theme Scope: This theme is limited to the interactions of aquatic invasive species (AIS) with the fisheries. It includes invasive fishes and fish diseases, direct and indirect impacts of AIS on the fishery and fisheries-dependent enterprises, and fisheries-related vectors of introduction and spread.

Regional Issues Addressed by this Theme

The fisheries of the Great Lakes have been strongly influenced by ecological changes brought about by deliberate as well as unintentional introductions of invasive species. Sea lampreys contributed to the collapse of native fish populations in the 1950s and 60s. Alewife and smelt have largely replaced the native forage fishes. Thriving recreational fisheries have developed around introduced Pacific salmon species. Invertebrate invaders led by the zebra mussel have dramatically altered



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the base of the food web supporting the fishery and the physical habitat of the lake bottom and coastal zone. New fish invaders—such as round goby, ruffe and white perch—pose different and equally significant challenges.

Invasive invertebrates, fish, and plant species enter the system through a variety of vectors. While ballast water is widely considered to be the leading vector of unintentional introduction, intentional introduction of fishes was historically a leading source for many of the invasive species thriving in the system today. Fisheries-related enterprises such as stocking and baitfish are also considered a significant potential vector for unintentional introductions today. Recreational fishing and boating are also considered to be a significant potential vector for the spread of invasive species from the Great Lakes to inland lakes.

Preventing the introduction and controlling the spread of AIS, as well as mitigating their negative impacts costs the region hundreds of millions of dollars annually. Accurately quantifying and communicating these impacts is an essential step in motivating action toward prevention of new introductions and control of those species already established.

Current Great Lakes Sea Grant Network Activities

Aquatic Invasive Species Hazard Analysis and Critical Control Point (AIS-HACCP)

One approach to preventing or slowing the spread of AIS is to apply the Hazard Analysis and Critical Control Point (HACCP) concept similar to



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that used by the seafood industry to minimize seafood consumption health risks. The goal of the AIS-HACCP approach is to prevent the spread of AIS while maintaining viable baitfish and aquaculture industries and supporting natural resource management agencies. The advantages of this system are that it can effectively deal with diverse processes, and it has proven to be a good partnership between industry and government regulators, and, if properly applied, it is effective. The HACCP approach concentrates on the points in the process that are critical to the safety of the product, minimizes risks, and stresses communication between regulators and the industry. The AIS-HACCP concept, when adopted by industry and resource management agencies, can be used to focus attention on the segments of the baitfish and aquaculture processes and resource management activities that are most likely to pose a risk of spreading AIS. The AIS-HACCP approach allows regulators to assess what happens in these operations and evaluate how potential hazards are being handled. The initial hazards were identified as AIS fish, invertebrates, and plants. We added parasites and diseases as a fourth hazard at the recommendation of program participants. The target audience has increased from the initial focus on baitfish producers and public/private aquaculture operations to include natural resource managers, researchers, and enforcement officers. More than 425 private, state, federal, and tribal representatives from more than 25 states, and the Province of Ontario have been trained through workshops held in 18 states. Many AIS-HACCP plans have been

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developed and are being used by many of the workshop participants. The USFWS has adopted the HACCP approach as a result of our Sea Grant funded efforts. They now have implemented 82 HACCP plans covering 18 different states.

Habitattitude™ Campaign

Habitattitude™ is the name for a new national public education campaign that is designed to help aquarium and water garden owners help prevent the release of fish and aquatic plants into the environment. The campaign's logo and "don't release" message will appear on fish bags, new aquaria, brochures and other print media, and ads in hobbyist magazines across the country. Habitattitude™ prompts hobbyists to adopt beneficial actions – alternatives that consumers should consider when dealing with unwanted aquatic plant and animals. The Great Lakes Sea Grant Network partnered with the Pet Industry Joint Advisory Council (PIJAC) and the U.S. Fish and Wildlife Service (USFWS) on behalf of the national ANS Task Force to create the campaign. A two-year \$300,000 grant from NOAA's National Sea Grant College program to five Great Lakes Sea Grant programs leverages \$100,000 from the USFWS, and over \$1.1 million from PIJAC. PIJAC and its members represent 90 percent of the aquarium industry in the U.S. This high-profile campaign serves as a model partnership among industry, government, and academia.

Aquatic Invasive Species WATCH Cards

The Great Lakes Sea Grant Network has developed a project to design and produce wallet-sized WATCH ID cards on 7 AIS aimed at raising awareness among water recreationalists, and business and agency professionals across the Great Lakes region. More than 3.8 million cards were produced and distributed. The project was a successful collaboration among 31 state, federal, and provincial entities.

Integration with National Goals

This theme supports national Sea Grant goals in the areas of Invasive Species, Coastal Communities, Fisheries, and Aquatic Science Literacy.

Fisheries extension enhancements within this theme will support national efforts to:

- Understand the ecological changes effected by invasive aquatic species
- Develop a quantitative understanding of the structure and function of critical near-shore habitats and coastal ecosystems
- Develop an ecosystem perspective in renewable resource management
- Identify and respond to special Great Lakes education needs
- Contribute to community and economic development by building leadership
- Support the development of science-based Great Lakes policies
- Revitalize economically depressed coastal communities

Priorities for Regional Action

Foster understanding of the significance of AIS to the Great Lakes including:

- habitat impacts,
- food web impacts, and
- economic impacts.

Facilitate stakeholder involvement in AIS prevention by:

- Fostering understanding of how stakeholder actions can reduce the risk of AIS spread

- Develop protocols by which specific potential vectors can act to reduce the risk of AIS spread

Assist stakeholders and management agencies in mitigating or managing the impacts of established AIS

Facilitate formulation of AIS policies and management strategies.

Additional Information

Great Lakes Fisheries Leadership Institute: AIS Effects on Sustainability
www.glerl.noaa.gov/seagrant/GLFLI/PublicNotebook/Curriculum/Modules.html



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