

7~ RECOMMENDATIONS FOR ACTION



Sault Ste. Marie

Our options for recovery once a nuisance species invasion has occurred in the Great Lakes are limited. The lakes will not clean themselves of invasive species as they can to some extent of chemical pollution; so stopping new inputs is not enough. Nor can we restore the food web simply by stocking high-profile species like trout and salmon or limiting their harvest. We must develop and implement new management tools designed specifically to protect the entire ecosystem and not just individual species. We must investigate and better understand food web dynamics and how these systems are being disrupted. Above all, it is absolutely imperative that we stop new, even more damaging invasive species from entering the Great Lakes. To accomplish this difficult but vital objective, we must attack the problem on multiple fronts: policy, research, funding, and public education. A number of initiatives have been taken to combat the threat of invasive species in the Great Lakes through containment, control and prevention. Efforts have achieved varying degrees of success.



Duluth, MN

POLICY ACTIONS

The invasion of the sea lamprey and ensuing crash of several commercial fish species led to the establishment of one of the most successful invasive species control programs – the sea lamprey control program – which has reduced lamprey populations by 90%, according to the Great Lakes Fisheries Commission, which manages the program in conjunction with the U.S. Fish and Wildlife Service, Army Corps of Engineers, and Fisheries and Oceans Canada. The program costs between \$10 million and \$15 million annually, and, its success notwithstanding, has underscored the challenge of mitigating the effects of invasive species in an environment in which they have already established themselves.

Great Lakes states have also enacted statutes to prevent the introduction and spread of invasive species. Through a patchwork of legislative initiatives, states have attempted to monitor and regulate the importation, transportation, stocking, possession, sale and release of non-native species such as fish and bait.

Recent efforts to combat invasive species have focused on preventing new non-native organisms from entering the

Great Lakes through the primary pathway of entry – the release of ballast water from ocean-going vessels originating in foreign ports.

Under the Non-Indigenous Aquatic Nuisance Species Prevention and Control Act of 1990, ships entering the Great Lakes from the oceans are required to either carry no ballast water when entering the Great Lakes (“No Ballast On Board” vessels, or NOBOBs), or to exchange their ballast water at sea, in theory dumping any invaders into the ocean before they reach the Great Lakes.

But after extensive study, scientists have concluded that NOBOBs and ballast water exchange are not effective at stopping the introduction of new invasive species into the Great Lakes. Salt water may kill freshwater organisms. However, brackish water species such as crustaceans and algae may survive the exchange treatment.¹⁴⁰ Furthermore, despite their name, NOBOBs do contain residual ballast water and sludge that the pumps cannot remove. NOBOB vessels entering the Great Lakes typically carry between one to two hundred metric tons of unpumpable slop and sediment in the bottom of their tanks.¹⁴¹ As the ships unload their cargo and take in Great Lakes ballast, the residual ballast mixes with the new water, resuspending non-native organisms and then releasing them when they take on and discharge ballast during their voyage through the lakes. Ballast water exchange at sea fares no better, for the same reason. Such exchanges cannot remove all organisms from ships’ ballasts; so even after an exchange at sea, ships entering the Great Lakes can carry harmful organisms that they discharge as they travel through the lakes. And of course, ballast water exchange cannot address invasive species that attach to the hulls of ships.

Far more protection is needed. There are a number of immediate and important actions the federal government and regional leaders should take to address invasive species

to prevent further damage to the Great Lakes food web and fishery. These include:

National Legislation: Congress is considering comprehensive national legislation – the National Aquatic Invasive Species Act (S.525), or NAISA – that would regulate the most common routes of nuisance species introduction in the United States, including the nation’s first implementation of standards for ballast water discharges. NAISA’s enactment is a top priority; but it is also part of a long-term solution. The Great Lakes need even more rapid action than the bill would provide.

Voluntary action: The shipping industry has recognized its role in the introduction of aquatic invasive species. Recently, the International Maritime Organization (IMO) issued international ballast water standards for vessels. The IMO standards are weak and do not go far enough in protecting the Great Lakes. Those standards have also not been ratified by the necessary 30 nations representing 35 percent of world shipping tonnage. Nevertheless, the shipping industry does not have to wait for government action; it can take measures now to prevent the introduction of new harmful species. Over the past several years, ballast water treatment technologies have been tested to reduce the probability of invasive species introductions. Great Lakes carriers, ports and shippers can

commit to developing and installing innovative and effective treatment technologies, rather than waiting for the public outcry and legal liability that could accompany a new infestation by a harmful invasive species.

Great Lakes Restoration: Congress also is considering pending legislation that would provide \$4 billion-\$6 billion to restore the Great Lakes. These funds would be spent in a number of areas, including invasive species control, clean up of contaminated sediments, prevention of additional water pollution, and habitat restoration. The funds may also be spent on research projects (including the research discussed below) that are critical to understanding and addressing the massive disruption of the Great Lakes food web.

RESEARCH ACTIONS

Scientists have made strides in determining the extent of the disruption of the Great Lakes food web, the causes of that disruption, and its consequences. However, there are critical knowledge gaps that must be filled before we know how to restore the food web or at least minimize the damage done to it. More research is urgently needed to determine:

- The scope and severity of changes to the food web throughout the Great Lakes.
- The causes of the changes to the food web, including a better understanding of multiple interacting factors where identified.
- The impacts that food web disruptions have already had on other aquatic species, and the likely future impacts given current trends. Current impacts need to be measured directly to the greatest extent possible. Additional data gathering and computer modeling on food web interactions is necessary to identify potential



Great Lakes marina

Box 7

GETTING A HANDLE ON INVASIVE SPECIES: THE CHALLENGES OF A COORDINATED, EFFECTIVE RESPONSE

Jurisdictional management of resources in the Great Lakes drainage basin is complex – involving the federal governments of the United States and Canada, bureaucracies from two provinces and eight states, and Native American tribes.¹⁴² Further, policy and management guidance is provided by the International Joint Commission and the Great Lakes Fisheries Commission.

U.S. government agencies at all levels have adopted programs to restore and protect the environmental quality in the Great Lakes region. In a 2003 report, the U.S. General Accounting Office (GAO), the investigative arm of Congress, found that within seven federal agencies there were 33 programs that were specifically designed to address environmental conditions in the Great Lakes through activities such as research, cleanup, or pollution prevention. The federal government spent \$387 million in fiscal years 1992 through 2001 on these programs. During this same time, the Army Corps of Engineers spent \$358 million on projects in the Great Lakes basin, as directed by Congress. And, according to the GAO, officials from seven states

reported 17 Great Lakes specific programs that expended about \$956 million in 1992 through 2001. In its assessment of these Great Lakes restoration efforts, the U.S. General Accounting Office found that there is no single agency in charge of the Great Lakes to coordinate various programs, resulting in a menu of Great Lakes programs that are often fragmented, uncoordinated and underfunded.

The GAO found that similar problems plagued national efforts to combat invasive species. In 1999 President Clinton signed an executive order to ramp up the government's response to invasive species and curtail the damage caused by non-native organisms to the environment, economy and health of the country. The executive order established the National Invasive Species Council (NISC) to provide leadership on invasive species initiatives – including responsibilities to ensure federal initiatives are coordinated and effective.

As part of this charge, the NISC crafted a federal management plan, issued in 2001, to coordinate the national effort to control invasive species among the 20 or so federal agencies that currently have jurisdiction in that area. In a study released in June 2003, the GAO found that the federal management plan for addressing invasive species included actions that would lead to the control of, monitoring and response to invasive species – though it lacked clear

outcomes and measures of success. Further, the GAO found that implementation of the plan was slow due in part to lack of funding and staff to carry out the work. The 2003 study also identified other obstacles in combating invasive species, including gaps in existing legislation and lack of an effective ballast water standard. The report detailed major concerns by state officials, including a lack of federal funding, public education and outreach, and cost-effective management programs.¹⁴³



future impacts of food web disruptions in the Great Lakes.

- The design of new management tools to address the damage to the food web and its ripple effects throughout the lakes. Existing tools are inadequate.

In addition, since all potential invaders may not be prevented from entering the Great Lakes, research should be aimed at prioritizing threats, through means such as:

- Identifying potential donor regions and dispersal pathways of future invaders;
- Selecting potential invaders using biological criteria;
- Using invasion history as a predictive criterion;¹⁴⁴
- Examining instances of failed invasions to identify limiting factors.¹⁴⁵

While researchers have been addressing various aspects of these issues, it is clear that current research capacity and activity must increase to address these potentially serious changes to food webs. Significant additional funding is urgently needed, and state and federal fisheries agencies need to establish this research area as a top priority within their budgets and staffs.

PUBLIC EDUCATION

State funding will not be enough. According to the U.S. General Accounting Office, federal funds – especially new federal funding through Great Lakes restoration financing legislation currently pending in Congress – are essential.

Policymakers and the public for years have heard about toxic pollution, water diversions and habitat destruction in the Great Lakes, and the general level of public understanding of these issues is relatively high. In the past few years, invasive species also have gained considerable notoriety. But few outside the Great Lakes scientific community understand the radical and harmful changes these problems have caused for the Great Lakes food web, fishery, and overall ecosystem. That limited awareness must change. The Great Lakes are in the midst of what may be an ecological meltdown – and the public and many policymakers do not yet know. The Great



Lakes will not receive the attention they need in the time frame they need it unless public awareness of the problem changes dramatically.

A great number of mechanisms are available to bring about this change. A few include:

- Organized hearings, in Washington D.C. and in the region, to explore and highlight the problem.
- The convening of panels of knowledgeable scientists by conservation and business associations at regional and national meetings.
- State legislative and agency hearings.
- Priority-setting by regional organizations, such as the International Joint Commission, the Council of Great Lakes Governors, and the Great Lakes Cities Initiative.
- Continued education and outreach through state Sea Grant programs, and increased efforts by state extension programs.