THE FISHERIES OF THE GREAT LAKES

The University of Wisconsin Sea Grant College Program has played a vital role in the rebirth of the Great Lakes fisheries—fisheries that were nearly destroyed by overexploitation, the invasion of alien species of fish and pollution in the first half of this century.

THE FISHERY TODAY

Virtually nonexistent just 20 years ago, the Great Lakes sport fishery in 1985 was valued at $1.4 billion. The Great Lakes also support a small but active commercial fishery with a dockside catch valued at $41 million a year. The rebirth of this fishery has been responsible for the economic revival of hundreds of Great Lakes coastal communities.

However, the fisheries of the Great Lakes could not exist without continuous control of the parasitic sea lamprey. Many native species have been lost, and the sport fishery is now largely dependent on hatchery-raised and stocked exotic species like coho and chinook salmon. The carrying capacity of the forage base is in question. Use of the resource is constrained by microcontaminants like PCBs in some of the larger fish. Balancing commercial and sport harvests remains a difficult policy issue.

Despite these problems, our understanding of the Great Lakes ecosystem, particularly the fisheries, has reached the stage where scientists are asking the right questions and management of the fisheries is entering a new and enlightened phase.

PROVIDING ANSWERS

University of Wisconsin Sea Grant researchers have taken a leadership role in establishing new directions for Great Lakes fishery management by providing:

An Ecosystem Approach to Fishery Management. The Lake Michigan ecosystem is undergoing rapid and dramatic changes. The exotic alewives, the principal forage fish for stocked salmonids, have declined sharply. Stocks of native species like the bloater chub and yellow perch are rebounding. Changes of such magnitude require precise, up-to-date information on the structure, function and interactions of the fish community for effective management.

It is now apparent that the reduced nutrient loading into the lakes and the effects stocked salmonids are having on the food web have resulted in water quality improvements. Water clarity during summer months and fishing in Lake Michigan are better than they have been in at least 60 years. Similar developments could occur in Lakes Superior, Huron, Erie and Ontario as stocking rates increase there. Sea Grant researchers continue to uncover the mechanisms by which these changes have occurred and the extent to which they can be controlled.

Fishery Management Tools. UW Sea Grant scientists have developed a prototype model of Great Lakes predator-prey interactions, which Wisconsin and Michigan fishery managers are now using to make stocking decisions based on trends in the forage base. Wisconsin scientists are also coordinating the first Great Lakes-wide survey of the diets of stocked salmon and trout to establish a baseline for monitoring the predator-prey system.

Another UW Sea Grant model is being used to guide the development of a cost-effective sea lamprey assessment program in Lake Ontario. Wisconsin researchers have also shown that fishery managers can use the early life history of fish like bloater chubs to forecast future populations and set catch limits. Sea Grant whitefish population models for Green Bay and northern Lake Michigan have also been used by management agencies to regulate the commercial whitefish fishery. Researchers are also working to restore naturally reproducing lake trout populations in the Great Lakes and are evaluating the economic returns of various lake trout management policies.

Contaminants and Fish. University of Wisconsin scientists are identifying the sources and fates of toxic chemicals in the aquatic environment and predicting how long these compounds will remain a problem in Great Lakes fish. UW scientists have identified the atmosphere as a major source of the PCBs and other toxics in the Great Lakes. Because of concern over health effects on humans who ingest contaminants in the fish, Sea Grant is conducting an epidemiological study of pregnant women and babies in the city of Green Bay. Sea Grant is also distributing information to the public on how to minimize the intake of contaminants by properly cleaning and cooking the fish. Such research has allowed industry and government to better manage and control discharges of toxic compounds.

Fishery Enhancement. UW Sea Grant Advisory Services field agents have conducted marketing workshops for the economically important charter fishing industry. Advisory agents are also working with Green Bay commercial perch fishermen to determine the best net mesh size to reduce mortality among sublegal fish. Sea Grant scientists have worked with the commercial fishing industry to develop better storage and packaging techniques.

THE FUTURE

The future of the billion-dollar fishery of the Great Lakes depends on enlightened management and continued, coordinated research on all facets of the Great Lakes ecosystem. Management agencies like the Wisconsin Department of Natural Resources, the U.S. Fish and Wildlife Service and the Great Lakes Fishery Commission, and advisory groups like the International Joint Commission, all rely on the research results and scientific expertise of the University of Wisconsin Sea Grant College Program.

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