

## THE LIVE FOOD FISH INDUSTRY: NEW CHALLENGES IN PREVENTING THE INTRODUCTION AND SPREAD OF AQUATIC INVASIVE SPECIES

Co-authored by: Erin Higbee, Sussman Fellow, Great Lakes Commission and  
Katherine Glassner-Shwayder, Senior Project Manager, Great Lakes Commission

This edition of the ANS Update feature is based on the research of Great Lakes Commission's 2004 Sussman intern Erin Higbee. Due to the length of the feature article, the state updates are not included in this issue. The standard ANS Update format will be continued in the next issue.

The species posing the greatest risk to the ecological and economic health of the Great Lakes may not be the zebra mussel, sea lamprey, Asian carp, or most recently, northern snakehead, but rather humans. Many of the pathways by which aquatic invasive species (AIS) are introduced and spread are the result of human behavior. An emerging issue of concern is the risk posed by practices associated with cultural, religious and dietary preferences.

### The Case of the Asian Carp

One relevant scenario is the looming invasion of two Asian carp species, the bighead carp (*Hypophthalmichthys nobilis*) and silver carp (*H. molitrix*) into the Great Lakes. These fish, native to southeast Asia, were initially introduced into U.S. waterways through their unintentional escape from southern aquaculture facilities. Accidental release of bighead and silver carp from these facilities resulted from 1990 floods in the Mississippi River system. They are now found in the Illinois Waterway, connecting the Mississippi River to the Great Lakes basin. In response to this threat, various Great Lakes stakeholders are investing significant effort to fortify an electric barrier between the two watersheds. However, introduction by other pathways, such as the live food fish industry, has the potential to undermine barrier efforts. Resource managers are concerned that if the bighead and silver carp enter the Great Lakes ecosystem, their extremely aggressive feeding and behavioral patterns could result in enormous negative impacts.

### Live Food Fish Industry

It is suspected that the live food fish industry could be a potential pathway for introducing Asian carp into Great Lakes waters. Live food fish species are being sold

to a predominantly Asian-American market primarily in the larger cities of the Great Lakes region, such as Chicago and Toronto, as well as New York City. A 1999 Ontario risk analysis estimated there were over 200 retail markets in Ontario that sold live fish. As part of a Sea Grant-funded study examining invasive pathways into Lake Michigan, researchers at the University of Notre Dame were able to purchase two live bighead carp (16" long), as well as a number of other live aquatic invasive species such as *Xenopus* frogs, *Tilapia*, eels and soft-shell turtles in food markets prior to a Chicago ban on the sale of live fish. In another part of the study, *Tilapia* and soft-shell turtles were found in some Detroit, Michigan stores.<sup>1</sup> The growing concern over this pathway is driven by documentation of nonindigenous aquatic species introductions traced to species sold as live food fish, including Chinese mystery snail (*Cipangopaludina chinensis malleata*), Japanese mystery snail (*C. japonica*), and Asian clam (*Corbicula fluminea*).<sup>2</sup>

### Regulatory Challenges

Inconsistency in rules and bans implemented throughout the Great Lakes states has raised challenges in regulating species believed to be introduced through the live food fish industry. For example, most of the Great Lakes states have adopted regulations to ban possession and transportation of live Asian carp, yet regulations are not consistent on a regional basis. In the city of Chicago, the sale of live Asian carp was banned in 2002, yet it is still legal to possess them throughout the rest of the state. In New York, due to concern over the economic repercussions of a bighead carp ban on the Asian seafood markets, customers may still purchase this fish as long as it is killed before it leaves the market.

Canadians face similar challenges on this issue. David Ramsey, Ontario Minister of Natural Resources (MNR), recently announced an amendment to an existing regulation to prohibit the buying and selling of live bighead, black, silver and grass carp; all species of snakeheads; and two species of gobies. These regulations still allow these fish to be sold in food markets, but similar to New York and Chicago's bans, they must be killed before leaving the markets. Ramsay has also urged the Canadian federal government to expedite the approval of a regulation amendment through the *Ontario Fisheries Regulations* (under the federal *Fisheries Act*) that would prohibit live possession of these species in Ontario. MNR introductions biologist Beth MacKay explains, "Ontario's recent regulatory amendment reflects the province's interest in protecting the Great Lakes ecosystem and supporting the efforts of other jurisdictions in the Great Lakes basin to prevent the introduction and spread of invasive species of fish."

Federal Aquatic Invasive Species regulations in the United States remain a step behind the states. The National Aquatic Invasive Species Act, introduced in Congress in the spring of 2002, outlines a screening process for planned importations of live organisms to prevent the introduction or establishment of aquatic invasive species, but is still awaiting passage. The Lacey Act, another tool for regulating invasive species, lists those that are determined to be "injurious" and prohibits their import, export, sale, acquisition and purchase. However, the Lacey Act is inherently reactive, as species are often listed as "injurious" after they escape into the environment, often too late to halt the spread. There is concern that this reactive

approach compromises opportunities for feasible prevention and control efforts. Several Great Lakes organizations are petitioning for the inclusion of Asian carp on the Lacey Act list.

While regulations involving species-specific bans on a state, provincial or federal level provide one strategy for curbing new introductions, stricter regulation of pathways should also be considered. The 1999 risk analysis of the live food fish industry in Ontario identified many operational factors contributing to the risk of AIS introductions through this pathway. Some of these problems include the lack of requirements for the use of sterile fish, dumping shipments of fish and gray water into Ontario waters when excessive mortality occurs, and improperly disposing of gray water despite compliance regulations under the provincial Environmental Protection Act, Ontario Water Resources Act and the federal Fisheries Act. Overall, the report warns that the pathway risk associated with live food fish industry is high.<sup>3</sup>

Many think that a regulatory approach – identifying legal responsibility and developing consistent regulations – will be needed on a regional basis to prevent intentional or unintentional AIS release. Managers, however, also contend with the reality that the absence of adequate enforcement mechanisms compromises the effectiveness of these regulations.

### Cultural and Religious Traditions

To confound the situation, it has been discovered that an increasing population within the Great Lakes region uses live invasive fish for religious and cultural purposes. Asian carp have been discovered in public ponds and lagoons in the Great Lakes region, and media stories indicate that these fish are being intentionally released as part of a religious ceremony. The *hojo-e* ceremony of releasing living beings into the wild is a ritual performed in a number of Buddhist countries, particularly in Eastern Asia. The ritual, developed in Japan, is based on the principle of compassionate action toward animals to accrue merit for the afterlife. Followers of this tradition believe that performing good deeds such as releasing captive animals will lengthen their own life span.<sup>4</sup> Although this practice occurs in the United States (where it is common to release goldfish, turtles, and birds), this ritual is usually performed in a pond at a Buddhist temple under the guidance of a monk.<sup>5</sup> In the Czech Republic, it is tradition to keep a live carp in the bathtub for a few days before a Christmas feast. It has been found that some people buy two; one to eat, and one to release into a river.

### Education and Outreach

Since the Chicago ban passed, the Chicago Department of Environment has visited every bait shop and food market in the Chicago area to make sure that people understand the reasons for the ban. Press releases and educational materials have been

translated for Chinese and Vietnamese communities in north and south Chicago. According to the Dept. of the Environment, the response to the ban has been overwhelmingly positive. It was generally found that once people understood the consequences of introducing invasive species into the Great Lakes, most customers were supportive and willing to comply with the ban, even if it meant taking home a freshly killed fish rather than a live one.<sup>6</sup> The need for awareness of unique cultural rituals and uses is critical as efforts continue to prevent the introduction and spread of high-risk aquatic invasive species into the Great Lakes through the live food fish industry.

In developing effective AIS prevention education programs on this issue, it is important to integrate sensitivities to the role of cultural and religious rituals, taking into consideration a diverse audience. While laws and regulations are part of the strategy to prevent new AIS introductions into the Great Lakes, educating communities about the collective repercussions of individual actions is also important as a viable prevention strategy. In the case of the bighead and silver carp, there is particular concern for the sale or purchase of live invasive fish in such proximity to the Great Lakes. In this scenario and others, there is a need to recognize the significance of cultural differences in efforts to educate consumers in regard to compliance with regulatory bans. For many people in the United States and Canada, preserving traditions, such as food preparation, is an important way to stay connected to their native culture. Effective education must address the importance of preserving cultural differences with an understanding of protecting natural resources for future generations. In support of this goal, information must be accessible to diverse audiences, respecting the particular needs, cultural practices and ethics of these particular groups. **Contact:** Katherine Glassner-Shwayder, Great Lakes Commission, [shwayder@glc.org](mailto:shwayder@glc.org), 734-971-9135.

### References

- <sup>1</sup> Keller, Reuben, Ph.D. candidate: freshwater invasive species in the Great Lakes region, College of Science, Department of Biological Sciences, Notre Dame. 2003 Phone Interview, 6 June.
- <sup>2</sup> Benson, A.J. 1999. Documenting Over a Century of Aquatic Introductions in the United States, in *Nonindigenous Fresh Water Organisms: Vectors, Biology, and Impacts*, Claudi, R. & Leach, J., CRC Press.
- <sup>3</sup> Goodchild, C.D. 1999. A risk analysis of the live food fish industry in Ontario. Ontario Ministry of Natural Resources.
- <sup>4</sup> Williams, Duncan Ryuken. 1997. "Animal Liberation, Death, and the State: Rites to Release Animals in Medieval Japan." In: Mary Evelyn Tucker and Duncan Ryuken Williams. *Buddhism and Ecology: The Interconnection of Dharma and Deeds*. Harvard University Press, Cambridge, Mass.

<sup>5</sup> Hubert, H. 1999. The ceremony of setting live creatures free. *Journal of the Order of Buddhist Contemplatives*. 1999. Accessed on 21 May 2003. <http://www.Obcon.org/journal/jobc5.html>

<sup>6</sup> Lee, Gene, Community Relations, Chicago Mayors Office, 2003 Phone Interview, 28 May.

---

## Washington Watch

Congress passed language in a conference report on October 18 authorizing an increase in the amount of money that the U.S. Army Corps of Engineers can spend on the construction of Barrier II in efforts to block the invasion of Asian carp into the Great Lakes. The bill increases spending to \$6.825 million, with the Great Lakes states agreeing to contribute the remaining funds to the \$9.1 million barrier. This authorization had broad support in Congress, the federal government, the states, and the environmental community. **Contact:** Joy Mulinex, Senate Great Lakes Task Force, Northeast-Midwest Institute, 202-224-1211, [joy\\_mulinex@levin.senate.gov](mailto:joy_mulinex@levin.senate.gov).

---

## Great Lakes Panel Update

A process to formalize guidance for Great Lakes Panel operations has been initiated by Panel officers and staff. A draft is being prepared for discussion at the upcoming mid-winter Panel meeting. Further details regarding date and location will be announced in mid-December. Outcomes resulting from the spring Panel meeting are available online at Great Lakes ANS website: [www.glc.org/ans/initiatives.html](http://www.glc.org/ans/initiatives.html). Roger Eberhardt, Panel Chair, attended the national ANS Task Force meeting held in conjunction with the Mississippi River Basin ANS Panel meeting May 25-27, 2004 in Missouri. Tom Crane attended the fall ANS Task Force meeting held in Nov. 16-17 in Crystal City, Va. Staff continues to work with officers from U.S. FWS and NOAA on grants supporting Panel operations. **Contact:** Katherine Glassner-Shwayder, 734-971-9135, [shwayder@glc.org](mailto:shwayder@glc.org).

---

## Upcoming Events

- *Regional Aquatic Nuisance Species (ANS) Regulation and Enforcement Workshop*, Dec. 12, 2004 at the Westin Hotel in Indianapolis, Ind. The workshop, sponsored by the International Association of Fish & Wildlife Agencies (IAFWA), is held in association with the 65<sup>th</sup> *Midwest Fish & Wildlife Conference*, Dec. 12-15, 2004 ([www.in.gov/dnr/midwest2004](http://www.in.gov/dnr/midwest2004)). **Contact:** Gwen White, D.J. Case & Associates, [gwen@djcase.com](mailto:gwen@djcase.com).