

Illinois-Indiana Sea Grant

IMPACTS: Today and Tomorrow

Aquatic Invasive Species



The PROBLEM:

AIS pathways pose risks to new waters

Asian carp are the most notorious aquatic invasive species (AIS) in the Great Lakes region right now with the news that their DNA has been found in Lake Michigan. These species have the potential to devastate the Great Lakes ecosystem due to their voracious appetite for plankton, the base of the food chain.

But these fish are just the most talked about threat right now. Over 180 non-native species have been introduced into the Great Lakes region. Some of these species—such as the zebra mussel, Eurasian watermilfoil, and round goby—have flourished and negatively impacted both our environment and economy. Even more AIS such as these lurk on the horizon as threats to Lake Michigan and the inland waters of both Illinois and Indiana.

The Chicago Sanitary and Ship Canal is a pathway for Asian carp and other AIS to enter the Great Lakes. But AIS can move to new waters through a variety of human activities including those associated with recreational water users, water gardeners, aquarium hobbyists, and nursery tradespeople. For example, when an angler releases

bait fish at the end of a day's fishing or a water gardener disposes of excess plants in a local waterway, they could also be accidentally introducing AIS.

It is critical that information reach those who might provide a pathway for these species so that they can prevent AIS from entering and getting a foothold in new waters.

Photo courtesy of Jason Lindsey

ACTION and RESULTS:

Illinois-Indiana Sea Grant (IISG) is reaching key audiences—informing them about how they can help prevent the spread of Asian carp and how to help reduce existing populations. In Indiana, natural resource managers now have a risk assessment model to identify invasive plants before they are introduced to the state. Education specialists gathered information from teachers across the country about live organisms used in classrooms and are now poised to create targeted outreach materials about AIS. And, an educational AIS website is now available to museum audiences around the country.

IISG leads outreach efforts on Asian carp

The threat that Asian carp pose to the Great Lakes has become the center of much attention now that carp DNA has been detected in Lake Michigan waters. But for years, IISG—working with other programs, agencies, and organizations—has been proactively engaged in efforts to slow the spread of these species. In fact, IISG has been at the forefront of outreach efforts to address the growing concern about Asian carp.

Since 1996, IISG has provided outreach expertise on several key committees or working groups established to prevent invasive species from moving in or out of Lake Michigan, including the ANS Dispersal Barrier Panel. As part of the federal Asian Carp Working Group, IISG was on the team that developed the outreach and education component of a national plan to manage and control Asian carp species—bighead, black, grass, and silver carps.

In Illinois, ground zero in this project, IISG has led a concerted effort to inform anglers and others who might help prevent the spread of Asian carp or who might keep an eye out for and identify these species. In partnership with the U.S. Coast Guard Auxiliary, IISG distributed the program's Asian carp posters and Bighead and Silver WATCH cards, both which provide identifying characteristics and contact information, around Chicago waterways—in all, to 30 marinas, 19 bait shops, five fishing clubs, and six boating and fishing equipment stores. In 2010, as debate has heated up about whether Asian carp are in Lake Michigan, IISG's press release describing how to identify Asian carp led to news articles in several major suburban newspapers.

One way to reduce Asian carp numbers is to eat them. IISG's AIS team, Pat Charlebois and Kristin TePas have helped create fact sheets, recipes, YouTube videos (and DVD), and a cooking demonstration at Bass Pro Shop to inform anglers and others about how to catch, clean, and cook these species. The



Photo courtesy of Duane Chapman

IISG Asian carp webpage has had 5,500 hits in the past 16 months; part one (of a three part video) of the YouTube video has had 5,200 views.

From a bigger picture perspective, IISG is planning an Asian carp marketing summit in 2010, which will bring together parties from the business and science world to brainstorm ways to improve the salability of these fish, including renaming them—Asian carp species are considered much tastier than the well-known muddy-tasting common carp. Marketing Asian carp can be a big step towards reducing Asian carp populations and ideally, eradicating these species in Midwest waters.

Products:

Bighead and Silver Carp WATCH Card

Flying Fish, Great Dish DVD

Asian Carp Cuisine



Indiana takes action on invasive plants

As the invasive Brazilian elodea and hydrilla began to appear in local lakes, the Indiana Department of Natural Resources (IDNR) turned to IISG for help in developing a game plan to prevent future invasive plants from finding their way to Indiana waters.

Together, they set out to involve stakeholders in the decision process to inspire a bottom up approach for taking action. Because invasive plants are often spread through gardening activities, IISG's AIS team put together a working group from the nursery trade—retailers, wholesalers, and hobbyists—as well as scientists and representatives from related non-profit organizations.

The group has been developing solutions that include policy, best management practices, and out-

reach. The policy encompasses regulations, which, pending approval by the newly-created invasive species council, will outlaw a “black list” of plant species that pose the greatest threat to Indiana waters.

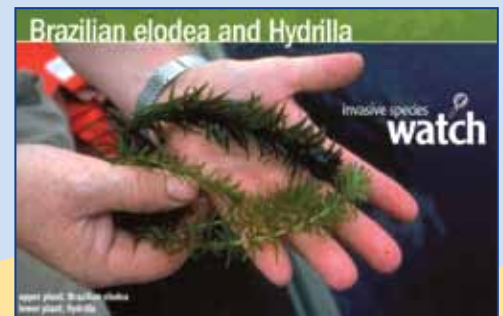
The list was created using a risk assessment model designed to predict whether species are likely to become invasive. Through funding of research projects and collaboration, IISG has developed a relationship with University of Notre Dame biologists who have developed several risk-assessment models. As part of the working group, these scientists worked closely with IISG's Pat Charlebois and Kristin TePas. Throughout the process, the entire group supplied key input that ultimately shaped the model used to assess potentially invasive plants. Now, the process is in place for

IDNR to assess the potential invasiveness of plants before they are introduced into the state.

By bringing scientists and stakeholders together in Indiana, IISG helped facilitate solutions that are science-based as well as industry-approved. This ongoing collaboration may have larger impacts. Risk assessment models are now being considered by leading organizations as a means of identifying all potentially invasive plants nationwide.

Product:

*Brazilian elodea and
Hydrilla WATCH card*



Invasive Hydroid May Strain Food Source of Young Fish

An IISG study found that the diet of an invasive freshwater hydroid includes organisms that are an important food source for young-of-the-year and bottom-dwelling fish. Biologists Nadine Folino-Rorem of Wheaton College and Martin Berg of Loyola University Chicago studied the distribution and diet of *Cordylophora caspia* in Lake Michigan.

C. caspia typically eats larval zebra and quagga mussels. However, they found that when those sources are not readily available, the hydroid feeds on other invertebrates, which potentially affects prey availability for fish.

The researchers found that the population of the freshwater hydroid is growing in Lake Michigan. *C. caspia* has been limited in its range due to its need

to colonize on hard surfaces—Lake Michigan's muddy bottom does not provide a hospitable habitat. However, the recent spread of quagga mussels, which can colonize the soft, muddy bottoms found in deeper areas, may increase the amount of available substrate for *C. caspia* attachment, and therefore increase the impact of this species.

AIS website featured at Smithsonian

Nab the Aquatic Invader!, an educational website about AIS is featured at the Smithsonian National Museum of Natural History as part of the Ocean Today Kiosk in the Sant Ocean Hall.

The website was created by IISG along with Sea Grant programs in New York, Louisiana, Connecticut, and Oregon to provide information about AIS through colorful characters and a crime-solving theme. In addition to being fun, the site



is rich with curriculum for teachers, ideas for stewardship projects, and creative educational activities for students and other online audiences.

The Ocean Today Kiosk, developed by NOAA in partnership with the Smithsonian Institution, presents news, video stories, and, in this case, interactive pages that highlight some of the most interesting, surprising, and pressing issues facing our ocean today. Through a large touch-screen interface, kiosk visitors are offered a variety of information about ocean life, current science and technology, and recent discoveries.

The *Nab the Aquatic Invader!* feature focuses on the suspects—aka the invasive species—in four regions of the country: Atlantic, Pacific, Gulf, and Great Lakes. In each region, visitors can read interrogation interviews with the 10

Most Wanted AIS and learn their origin, problems they cause, and some control methods used to slow the spread of these species.

In addition to the Sant Ocean Hall, Ocean Today Kiosks are located at a growing network of aquariums across the nation through the Coastal America's Ecosystem Learning Centers, including the John G. Shedd Aquarium in Chicago. This partnership will ultimately provide opportunities for 20 to 30 million people to engage with *Nab the Aquatic Invader!* and many more ocean resources.

Products:

Nab the Aquatic Invader!
game cards



Nab those Menacing Invaders!
poster set



AIS knowledge is key for teachers, students

The use of live organisms in classrooms is a valued tool for engaging students. However, it is not wise for a class to release organisms into the wild or for teachers to allow students to take organisms home as pets (if they are later released). Sometimes these plants and animals are documented invasive species. These organisms are often distributed to teachers through biological supply houses, frequently with widely-used science curriculum packages.

In an ongoing project, funded through NOAA-National Sea Grant, IISG is working with Sea Grant programs around the country as well as several Canadian entities to address this AIS pathway from two fronts—in classrooms and through supply houses. The goal is to quantify and define the problem and to research solutions.

IISG has developed a survey to use in discussions with biological supply house managers to learn more about this industry and to help develop

practices that can reduce the risk of AIS ending up in local waters.

IISG also helped shape questions used in eight focus groups held with educators in the U.S. and Canada, including Chicago. And the program helped develop a survey in which



Photo courtesy of Shaw Nature Reserve

nearly 2,000 teachers provided input. Investigators learned that teachers indeed see value in using live organisms in their classrooms and that pet stores are also a major source for plants and animals. It became clear that sometimes, unbeknownst to teachers, the species are invasive. While many school 'pets' remain in the classroom until their life is done

some are, in fact, released into the wild.

Through interviews with school district curriculum coordinators, Robin Goettel and Terri Hallesy, IISG's education team, learned that often schools do not have policies that guide teachers in proper disposal of live organisms. Many expressed a strong interest in instilling environmental stewardship values in their students and so were interested in learning more about integrating this information into the curriculum.

This project clearly affirmed the need for education about AIS so that both students and teachers are more aware and therefore more inclined to make responsible choices regarding selection and disposal of classroom organisms. Teachers will benefit from learning about many online resources, including several IISG sites that provide alternatives to releasing organisms. Biological supply houses can also play a key role by providing information as they supply organisms.

Documenting an invasion timeline

Typha x glauca is an invasive hybrid cattail that has become established in wetlands across the Great Lakes region. Nancy Tuchman and her team at Loyola University Chicago have developed a timeline of impacts on the wetland ecosystem due to the presence of *Typha x glauca*. This timeline of invasion can aid land managers in

assessing the status of invaded areas and in designing management strategies. By managing for *Typha x glauca* early in an invasion, the risk of negative impacts on the wetland ecosystem can be minimized.

By studying 50 years of aerial photographs, the researchers found that

within eleven years of invasion, litter mass of *Typha x glauca* more than doubled. Species diversity declined 50 percent in the first 25 years. Changes in plant communities, soil, and environmental conditions through time likely alter the structure of invaded wetlands, affecting a range of wetland ecosystem services.

The bottom line ...

- Anglers and boaters in the Chicago region have access to information to help identify and catch Asian carp, as well as to report any sightings.
- Anglers and others are learning how to clean and cook Asian carp to help reduce populations and lessen the threat to the Great Lakes.
- Indiana natural resource managers have a process in place to assess the invasive quality of aquatic plants before they are introduced to the state.
- Research has laid the groundwork to address the problem of AIS that are released in the wild through classroom-related activities.
- 20 to 30 million people will have the opportunity to learn about AIS through *Nab the Aquatic Invader!* at the Smithsonian Museum and Coastal America's Ecosystem Learning Centers nationwide.
- Natural resource managers have information that they can use to help prevent the negative impacts of *Typha x glauca* in wetland ecosystems.

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