



Asian arowana



Freshwater Invasives

AZA-ACCREDITED FACILITIES TAKE ON THE INVADERS

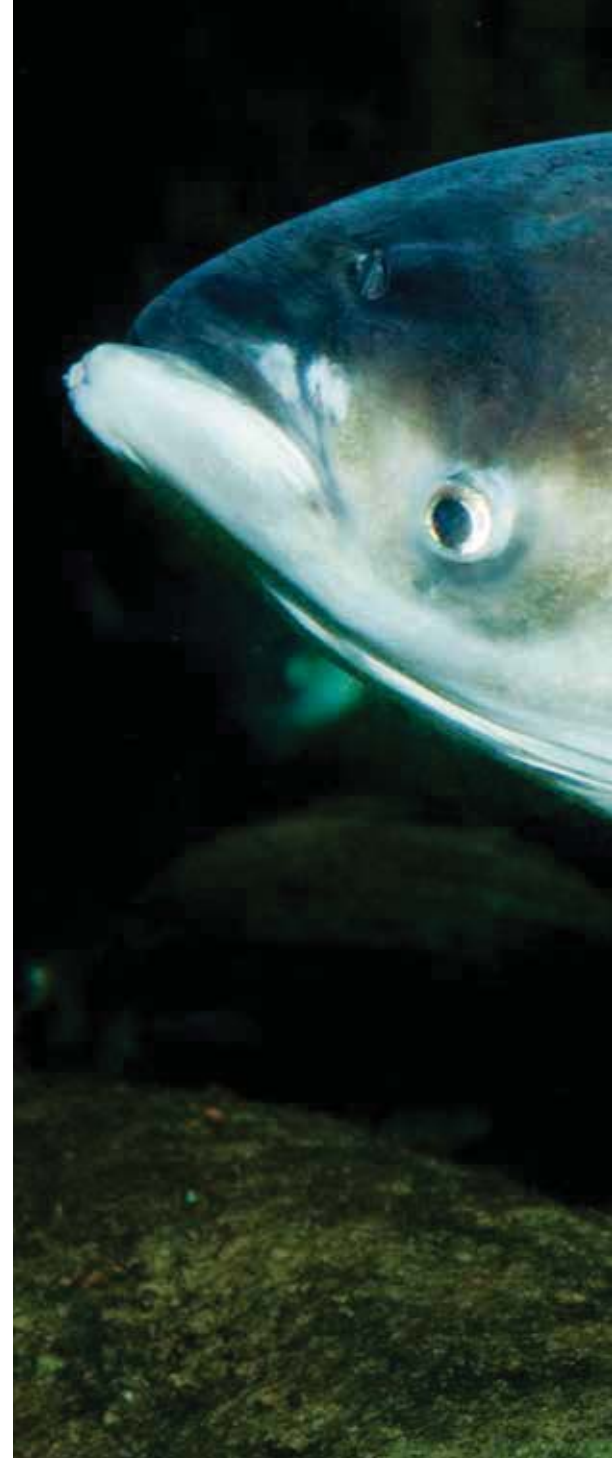
BY ALINA TUGEND

Freshwater habitats are under attack from plants and fish that have traveled across the country or across the globe, driving out or killing native species. And increasingly, Association of Zoos and Aquariums (AZA)-accredited facilities are joining in the battle against these non-natives—from the notorious Asian carp to the water chestnut—through research, breeding, education and direct removal.

The John G. Shedd Aquarium in Chicago, Ill., has one of the largest and most active programs focusing on invasive species in freshwater habitats.

“We’re filling a gap that other research organizations aren’t addressing,” said Dr. Chuck Knapp, vice president of conservation and research at the Shedd Aquarium. “For example, the Asian carp is receiving a lot of attention, as it should, but where we feel we can play a role is addressing non-native species that aren’t as conspicuous.”

For Shedd, that means conducting research, in collaboration with Western Illinois University and Loyola University Chicago, on the Oriental weatherfish, which was introduced into Illinois waters in the 1980s. It was a popular food fish in Asian



markets, as well as a common pet, Knapp said, and spread when people dumped the fish in ponds and lakes.

It is a bottom-feeding fish, and “little is known about how it interacts with other benthic fish,” he said. So Aquarium staff and volunteers trap the fish and are collecting data to find out what it is doing to the native species.

“Does its diet overlap with other native species?” Knapp asked. “Is it aggressive enough to outcompete native fish for the food?” The project, which costs about \$10,000 annually, will continue for the next two years, he added, and The Shedd is underwriting the cost.



Bighead carp

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In addition, citizen scientists go out with Aquarium staff about twice a month to remove non-native species.

“We also have a robust and extensive exhibit on non-native species because it’s such a critical issue in our region,” he added, noting that The Shedd is the only public aquarium that has the Asian carp on exhibit.

The U.S. Fish and Wildlife Service (USFWS) has partnered with The Shedd in developing some portions of its Great Lakes Gallery exhibits, which feature many invasive species from around the Great Lakes.

Michael Hoff, aquatic nuisance species coordinator with the Midwest region of

the USFWS, said working with The Shedd and other places—including the Mall of America—to educate people about the growing problem of invasives, “is exactly the sort of thing we need to do much more of.”

Having a voice—and understanding what is happening—regionally is another role for AZA-accredited zoos and aquariums. Pete Mohan, director of animal operations at the Akron Zoo in Akron, Ohio, said he has served for 18 years on Ohio’s Aquatic Invasive Species Committee, which is coordinated by the Ohio Division of Wildlife within the state’s Department of Natural Resources.



Water chestnut

She said there is a window of approximately two months—July and August—when the water chestnuts can be hand-pulled. They need to be plucked before they're mature and set seeds. Zoo staff and volunteers help with the pulls, going out in canoes and kayaks.

There are additional mechanical and chemical means to control water chestnut, Mosher said, but often the water is too shallow to use a harvester, and “we are cautious about using herbicides around aquatic ecosystems.”

In addition to removing the plant themselves, the Zoo engages its community in the fight against invasive species in other ways. “We train citizen scientists to recognize

Committee meetings typically involve approximately 20 to 30 stakeholders, including representatives from the Coast Guard, local and federal wildlife agencies, universities, non-profits and others, with “the goal to share information and educate those entities potentially impacted by invasives,” Mohan said.

Seneca Park Zoo in Rochester, N.Y., decided it “wanted to be a leader in the community in terms of education about non-native species,” said Tom Snyder, the Zoo’s director of programming and conservation action. “So we looked for partners already working on community-type actions.”

The Zoo is now collaborating with the Finger Lakes Partnerships for Regional Invasive Species (PRISM), one of eight such partnerships in New York State.

The focus of that collaboration has been on water chestnut, an ornamental water garden plant that came from Europe. It grows extremely rapidly to form a dense, floating mat.

The plant can completely dominate a waterbody and impedes light from penetrating the surface, which inhibits photosynthesis and reduces oxygen concentrations, said Hilary Mosher, coordinator of the Finger Lakes PRISM. “This degrades fish and wildlife spawning habitat and reduces biodiversity.”



and map invasive species,” she added, noting that the Zoo and the Finger Lakes PRISM teamed up to teach interested community members how to use an app, iMapInvasives, which allows citizens to report when and where they spot a high priority invasive species such as water chestnut.

Of course, the problem of invasive species is a global one, both because it affects freshwater habitats around the world and because non-native plants and fish are often transported through boats and ships from one waterway to another.

“We’re focusing on the global connections between all these areas,” said Andrew Allison, director of living collections at the National Mississippi River Museum & Aquarium in Dubuque, Iowa.

“We’ve got shipping coming in from all over the world.”

The Mississippi River Watershed encompasses 31 states and two Canadian provinces; one of the invasive species that encroaches on this immense waterway is the zebra mussel. The zebra mussels arrived in the area in the 1980s, probably hiding in the ballast water of boats traveling internationally.

Zebra mussels can lay up to one million eggs a year, making them very difficult to control—they plug up sewer and waterway systems and crowd out endangered mussel species native to the Mississippi River, including the endangered Higgins eye pearly mussel.

The Higgins mussel and others were “harvested intensely for the button and

Zebra mussel





About six years ago, the National Mississippi River Museum & Aquarium began working with the USFWS to cultivate Higgins mussels. It is using citizen scientists to collect the mussels with buckets hanging from ropes off the Museum & Aquarium's dock ...



© Jared McGovern, Mississippi River Museum

Zebra mussel

cultivated pearl industry,” said Mark Wagner, the facility’s director of education. The zebra mussel smothers the endangered mussel, preventing it from growing or getting enough food.

About six years ago, the National Mississippi River Museum & Aquarium began working with the USFWS to cultivate Higgins mussels. It is using citizen scientists to collect the mussels with buckets hanging from ropes off the Museum & Aquarium’s dock and will expand this program with a 2016 grant from AZA’s Conservation Grant Fund. The mussels are then grown to a size large enough to maximize their chances of survival and returned to the river.

The Museum & Aquarium also partners with programs educating individuals about how they can make sure they don’t unintentionally move species from one waterway to another.

Such tips include making sure your boat is clean and not transporting water from one lake to another, which is something most people don’t realize is illegal, Wagner said.

“All it takes is one cup of water to start a population in a new area,” he said. Don’t dump pets—such as fish from koi ponds—or plants in rivers, ponds and lakes and don’t pour leftover minnows used for bait into the water after fishing. That minnow may be a non-native, he added.

AZA-accredited zoos and aquariums also work with the state and federal law enforcement by holding plants and animals that are confiscated at customs. George Brandy, aquarium curator at the Houston Zoo, in Houston, Texas, said most recently the Zoo received a shipment of Asian arowana, also known as Asian bonytongues, which are popular pets from southeast Asia but are an endangered in

Asian arowana

their native range and an invasive species in the United States—and therefore illegal to own.

The Zoo holds the shipments until litigation is over, Brandy said, and then either keeps the animals or plants if it has room, or contacts other AZA-accredited facilities to see if they can take them.

In addition, Brandy said, the Houston Zoo has regular “keeper talks,” during which Zoo staff inform guests about invasive species and explain what to do when, say a fish, gets too big to keep in an aquarium.

“We tell them not to release any animal into the watersheds,” he said. Instead, it is best to go back, if possible, to the pet store and ask if there is anything the store can do regarding an oversized fish. If that doesn’t meet with success, pet owners can call the Zoo, which will see if it can take it or find another facility that is able to do so.

Brandy said the Houston Zoo is in the process of setting up a permanent kiosk—which should be up and running in the spring—that provides information about the impact of non-native species.

Just as invasives species can create havoc in freshwater habitats in a myriad of ways, AZA-accredited aquariums and zoos are becoming increasingly active in addressing the issue from a variety of creative angles. As Snyder of the Seneca Park Zoo said, “We try to tie everything we do into action, whether through boots on the ground in Borneo or in our own backyard.”

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