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The Carp Must Die

Asian carp are destroying the rivers of the Midwest and preparing to invade the Great Lakes. Can they be stopped?

By Ben Paynter

The Asian carp is a skittish fish, averaging about two feet long and 10 pounds apiece. When startled by something, say a boat's motor, it's prone to jump up to 10 feet in the air. So when Blake Ruebush, Levi Solomon, and Chase Holtman, an ecology team with the Illinois Natural History Survey, head out on an early October carp-hunting mission, they do so with caution, and armor.

Ruebush's steering console has been modified with a carp-proof Plexiglas windshield and a side wall of mesh netting to guard the throttle and steering wheel from aerial impact. The team considered wearing helmets but dismissed the idea as too dorky. Instead, despite the humidity, Ruebush and Solomon wear waders to repel the slime. Holtman, a burly-looking guy, has gone the other way, opting for a T-shirt, shorts, and Crocs. "I'll shower afterwards," he says. "People look at you funny when you reek of blood and fish."

As they head out from Havana, Ill., and up a side channel of the lower Illinois River, the water starts to churn with agitated fish, and the boat's hull thumps from underwater collisions. Then the fish start flying—dozens of them, rising like a storm cloud. One ricochets off the boat's guardrail; another leaps in from behind the boat, getting tangled in the motor's steering cords. The air is so thick with fish that some bash together mid-flight, showering everyone with a snot-like splatter.

The fish come in at close to 30 miles per hour. That's enough to cause bruises and broken noses—even concussions have been recorded—but Ruebush and his crew seem unworried. "This is Ground Zero for Asian carp," Ruebush says, steering forward as his buddies stand at the front of the boat. They won't have to endure the barrage much longer, though. They're about to electrocute all the fish.

Solomon and Holtman lower two 10-foot booms attached to a generator capable of producing

5,000 watts. Ruebush starts the generator's engine. It's like a giant underwater Taser. As Ruebush motors ahead, fish that swim into the field will be stunned, then scooped off the surface by Solomon and Holtman with dip nets and dumped in a tub in the center of the boat, where they are identified, measured, weighed, and counted.

As the generator goes hot, they jump even higher. A fish hurdles the guardrail, skittering to a stop at Ruebush's feet. "Hey! There's a volunteer. We count those, too," he adds, chuckling. Within a minute the water quiets and unconscious fish begin rising to the surface.

The electrocution, one of four that will occur in the area today, will last 15 minutes and cover about 200 yards of shoreline. INHS runs thousands of these "fish community assessment" collections a year—a mix of shock fishing and other techniques such as netting—to track changes occurring in the river. The group is looking for two different species of Asian carp. The jumpers surrounding the boat are Asian silver carp. The Asian bighead swims closer to the bottom of the river and is harder to zap. Both are filter feeders and thrive on plankton, a flotsam of algae and other microorganisms.

In the 1970s, fish farmers in mostly Southern states began importing Asian carp from China to help clean their commercial ponds. Some escaped in floods, making their way into the Missouri River, the Mississippi River, and the Illinois and Ohio River basins. They breed fast, grow fast, and eat piggishly. Females can spawn up to three times a year, releasing millions of eggs per drop. Young fish easily eat their weight in food daily, while adults can consume up to 20 percent of their body weight. That yields silver carp as big as 50 pounds and bigheads up to 100 pounds. After their first few months, the fish outgrow their natural predators in the river system. And they pick it clean.

Thanks to the interconnectedness of America's waterways, Asian carp now infest more than 23 states, mostly in the Midwest. But they are not yet in the Great Lakes, home to a \$7 billion fishing and \$9 billion boating industry, according to the Great Lakes Boating Federation. Havana and the 210 river miles north to Chicago represent the last stand in the battle against the carp.

The Illinois Natural Resources Dept. estimates that adult silver carp account for nine out of 10 fish in some places along the Illinois River. That's 4,300 fish per river mile. "It is probably an underestimate," says Kevin Irons, the state's aquatic nuisance species program manager, who adds that it doesn't include baby fish or bigheads.

The carp are scaring people away. According to a University of Illinois survey, 47 percent of

recreational boaters from Havana and the nearby towns of Pekin and Beardstown were hit by an Asian carp in 2010 and 2011; one-third of those suffered watercraft damage. "It's cut down on our business considerably," says Betty DeFord, manager of the Boat Tavern, a bar made out of an old riverboat on cinder blocks that sits alongside a boat ramp in the nearby town of Bath. "People who used to go out on the water won't anymore because they are sick and tired of getting beat to death by the damn things."

Ross Harano, director of international marketing at Big River Fish, a processor in Pearl, Ill., estimates there are more than 100 million pounds of Asian carp in the Illinois River and more than 500 million pounds in the Mississippi basin, all of it growing at a rate of at least 10 percent a year.

Fish, of course, must follow water to spread, and local and national authorities are attempting to find out which rivers they're in and how to kill them. In 2009 the U.S. Army Corps of Engineers and David Lodge, director of the Center of Aquatic Conservation at the University of Notre Dame, began taking samples of environmental DNA, or "eDNA," from the water, looking for genetic markers in leftover scales, mucus, and feces. In November 2009, samples suggested that carp had made it upstream, as close as six miles from Lake Michigan.

The primary gateway to the lake, the Chicago Harbor Lock, is a system near Navy Pier in downtown Chicago. It handles about 1,800 tons of barge traffic per week and is a cornerstone of the country's \$380 billion domestic shipping industry, a transit point for commodities such as coal, steel, and petroleum fuels from as far south as Louisiana.

A closure would reroute those commodities overland, costing the region anywhere from an estimated \$1.4 billion to \$4.7 billion over the next two decades. It would also plug a pathway used by as many as 8,000 recreational boaters annually. The other two access points are the Wilmette Pumping Station, a passage the city uses to discharge runoff, and the Thomas J. O'Brien Lock and Dam, near Lake Calumet.

In 2010 the Supreme Court denied a request by the Michigan Attorney General to close the Chicago lock. Michigan officials have since pressed the issue with a series of bills now being heard in Congress. The Army Corps of Engineers has also launched its own \$25.5 million study to identify all nuisance species in the region, figure out how they might travel between bodies of water, and measure the costs and impacts of two types of longer-term solutions. The first, hydrological separation, would be a total quarantine with no access via waterways. The second, ecological separation, would divide habitats less strictly, possibly using nets, filters, pumps, and lifts to hoist boats over the locks. The report is due in 2015.

In many cases the fight against an invasive species ends in such protracted analysis. Asian carp have received more attention than usual because their presence immediately drives off business. As Lodge puts it: "When you've got a 40-pound fish jumping into a boat and breaking jaws and knocking out teeth, people tend to stop boating and fishing. That has a demonstrable economic effect."

In September 2010, President Barack Obama tapped John Goss, a former head of the Indiana Natural Resources Dept., to become the country's first Asian carp czar, though the term is not official. Goss runs a multistate, 20-agency task force, the Asian Carp Regional Coordinating Committee, which includes officials from the Army Corps of Engineers, U.S. Fish and Wildlife Service, and U.S. Geological Survey, among numerous partners. Goss has greenlighted \$106 million in projects aimed to reshape the way in which species are managed and maintained.

On a Wednesday afternoon in late September, Goss stands on the rear deck of an Illinois Conservation Police boat. He has arrived to check out part of his new fighting armada, a fleet of six vessels outfitted with nets, electroshocking units, and eDNA sampling bottles. The boats are pattering around about 10 miles downstream from Navy Pier in an area called Bubbly Creek, so named because it used to be a dumping ground for stockyards; air bubbles from cattle carcasses still burble up when the bottom is disturbed. That makes for nutrient-rich water, perfect for Asian carp. Not that Goss expects to find any. "If we do, I'll be surprised," he says, peering into the nets in various boats as they drift past.

Goss hopes to meld traditional and genetic sampling. An eDNA hit implies fish, but not how many, so Goss is trying to match results with fished samples. "When we find DNA, it just says there's DNA there," he says. "Is it from one fish, multiple fish, or just fish scales brought in by barges from farther downriver?"

Containment starts another 20 miles downstream in Romeoville, Ill. There, near a railroad track lined with shanty houses, sit three electric barrier stations. These are like mega-electrofishing units, paralyzing fish across the width of a river. Anything shocked will simply float back downriver. The river here is also flanked by 13 miles of ultrafine chain-link fence, meant to keep fish from other rivers from dumping into the channel above the fail-safe during floods.

When a barrier was taken down for service in December 2009, state and federal officials launched Operation Silverstream, a 450-person effort to poison six miles of river with Rotenone, an industrial fish toxin. The attack used boats and pumps on the shore to inject

Rotenone into the water. Its spread was tracked with a dye, and caged fish acted like underwater canaries. A neutralizer was applied downstream. The effort killed thousands of fish but found only one bighead carp near the barrier. After numerous eDNA hits around the Little Calumet River just a few miles from Lake Michigan in May of the following year, officials mounted Operation Pelican, poisoning a three-mile stretch of river, again without finding any Asian carp. When a bighead carp was netted above the quarantine zone in Lake Calumet in June 2010, officials tried a less noxious tactic. A large-scale fishing expedition lasted for days, but their nets came up empty.

Despite such results, the Fish and Wildlife Service has purchased 2,000 gallons of Rotenone, now housed in an undisclosed wilderness location. It's a communal pool that any state can tap to protect still-virgin waters, but the committee wants to be prudent about using it again in Illinois. Upstream from the barrier, dozens of sites are fished and sampled weekly. Officials onboard with Goss carry a playbook adorned with the Asian Carp Regional Coordinating Committee logo—a shield-like crest featuring a carp in a net—that outlines their rapid response plan. Three eDNA hits in a row, for instance, or a reported carp sighting, leads to exploratory fishing. Catching one Asian carp leads to more intensive fishing. Two or more fish in hand, and the poison can be released.

Two days later, at a town hall-style committee meeting in Saginaw, Mich., Goss introduces the audience to Dr. Leon Carl, director of the U.S. Geological Survey's Great Lakes Science Center, who describes new weapons he is working on. The list includes an underwater "carp cannon" that blasts high-pressure sound waves to scare off the fish; a carp-specific toxin, or "carpicide"; and a perfume of pheromones that might lure males or females into some specific area, where they will find not love but death. The carp cannon has already been used to clear out the area around the barriers so they can be powered down for maintenance. More prototypes should roll out within the next two years, after which both Carl and Goss hope they can be applied more widely.

Locally, states and towns are doing what they can to kill the fish by more traditional means, such as catching them and eating them. Directly below the electric barrier, Illinois Natural Resources has hired fisherman to pull as many carp as possible from the water. They netted 62 tons in 2010 and caught roughly 400 tons in 2011. The department is also promoting a new sport: aerial bow fishing, in which guys in motorboats with modified bows shoot and then reel in the jumpers. At the second annual Director's Shoot, 54 teams shot more than 48,000 pounds of fish 120 miles upstream from Havana. At the Boat Tavern, owner DeFord also hosts the annual Redneck Fishing Tournament. She describes it as a "carp rodeo" where boaters with nets try to snag as many fish out of the air as they can in an hour, as if they were

netting 30-pound butterflies. This year about 200 people, some wearing helmets and baseball caps, caught 8,977 carp.

Asian carp have been harder to sell to consumers. In March 2011 the Illinois Public Health Dept. approved Asian carp for human consumption. A series of videos posted to the USGS website titled "Flying Fish, Great Dish" hasn't really caught on. Officials promote carp as a cheap, protein-rich food source that's lower in mercury than tuna, but in general the fish is considered bony and dirty. "A lot of people call them sewer bass," says Steve McNitt, the sales manager at Schafer Fisheries in Thomson, Ill. Currently, Schafer turns all the state's donated catch into an organic fish emulsion fertilizer, but the company is prototyping carp hot dogs, carp burgers, and carp jerky.

Illinois has also hired a chef to conduct taste tests. On a Thursday afternoon in September, Chef Philippe Parola and his business partner, chef Tim Creehan, shuffle around the stainless steel kitchen of Christ the King Jesuit College Preparatory High School on Chicago's west side, checking on a series of buffet-size trays that will be dished out to more than 300 underprivileged kids in a gymnasium. The menu will be carp cakes—a fish version of crab cakes—with a béarnaise sauce and sides of green beans and sweet potatoes. They are also working on a bit of rebranding. During his presentation, Parola calls the fish by a more inventive and polished name: silverfin. It worked for Patagonian toothfish, also known as Chilean sea bass.

There's one place, however, where carp is both in short supply and welcome on the menu: China. Since 2010, Illinois has spent \$6 million training fisherman to catch carp and helping processors develop ways to better store and ship bulk orders to China. In the homeland of carp, there are hardly any wild-caught specimens available; canal systems are too polluted to support the species. American processors can buy carp for 13¢ per pound on the docks and get up to 92¢ per pound from mainland importers. "In China, we tell everybody that this fish is so fresh and has so much energy that it dances on the water," says Harano, the marketer at Big River Fish, which recently received a \$2 million state grant to expand its packing plant to handle an annual 30-million-pound contract for Beijing. "We market it a lot like you might Angus beef." Their logo is a bald eagle clutching a fish in its talons while flying over the Mississippi River.

Above the barrier at Romeoville, eDNA testing suggests carp are getting through, but in small numbers. In 2010 there were 21 hits out of 1,270 samples. In 2011 there were 34 hits out of 2,548 samples. That isn't enough for a big intervention. That there are fish still in the region, though, argues against hydrological separation as a permanent solution; it doesn't account for

human interference. There is currently a federal ban on transporting live Asian carp anywhere, as well as state bans on using carp as bait. That doesn't mean fishermen, especially those who are selling live catches at ethnic markets or out catching their own bait, are following the guidelines.

Back near Havana, the INHS crew completes another electroshocking and spots a type of species thought to have been driven off: the human. Dan Belden, a lean, tan, 23-year-old with a ponytail, paddles up to the boat in his canoe, spooked by the carp flying around everywhere. Belden has been on the river for weeks. In September he loaded his canoe with camping gear and trail mix and put in hundreds of miles upstream on the Fox River in Wisconsin, planning to paddle south until he hit New Orleans.

He knew there would be danger along the way, but he wasn't expecting it to be in the water. Belden got blasted in the head with a super-size Asian carp a few days ago. "I never thought I'd be afraid of a fish, but those things had me scared within a day," he tells Ruebush. When he nears a shoreline, he has learned to tuck his paddle into the boat and drift in gently, hoping not to launch the bottom-dwellers. Belden looks over at the stunned fish in the tub. "Do you think there are any lakes out there where these things can't live?" he asks. Says Ruebush: "I wouldn't bet against them."

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