

60 years ago, the U.S. and Canada teamed to stamp out sea lamprey; today, Australians kill carp

By [Dan Egan](#) of the *Journal Sentinel* Dec. 4, 2010

About This Series

For the past six years, Journal Sentinel reporter Dan Egan has been reporting on threats facing the Great Lakes. This year, his focus is on how the world's largest freshwater system could be restored and protected.

Great Lakes, Great Peril

Special Section: This series will periodically examine challenges facing the Great Lakes in what experts forecast will be the century of water.

If the Asian carp mustering in the waterways south of Chicago actually do gobble their way into Lake Michigan and topple the multibillion dollar Great Lakes fishery, it won't be a first.

Over a half-century ago, the Great Lakes collapsed in the manner many now fear.

Crippled in the 1940s by decades of overfishing and a century's worth of wanton pollution, the lakes suffered a knockout blow when sea lamprey slithered their way in from the Atlantic Ocean via man-made shipping canals.

The ancient vampires that suck the blood - and life - out of their prey found heaven in our fish-filled, glacially carved lakes that are a mere 10,000 years old - ecological babies, really. And just as vulnerable.

It was an environmental debacle that is hard to fathom. In Lake Michigan alone the annual lake trout harvest in 1946 was 6.5 million pounds; nine years later crews pulled in a scant 34 pounds of the fish.

"The lamprey was the first to really expose the people of this region to what a single invasive species is capable of," says Marc Gaden of the Great Lakes Fishery Commission.

Gone was the sweet, pink trout flesh that fed the cities that put the industrial muscle into America, and the collapse was even more dire for the little fishing communities.

"People's livelihoods evaporated before their eyes," Gaden says. "Lamprey literally changed the way of life in the region."

It was the kind of doomsday scenario that is feared with the carp today - a fear that has spawned a courtroom battle pitting Great Lakes states against one another at this most vulnerable moment.

The difference is that the ecological crisis triggered by the lamprey invasion 60 years ago didn't tear us apart.

It brought us together.

A devil of a problem in Tasmania

There are a few things you can do when you have carp invading your biggest lakes.

You can ignore it. You can fight about how to deal with it. You can call for more studies.

Or you can close ranks, marshal all the cunning, muscle and tools you have and go for the kill.

In Australia, they go for the kill.

When word broke that a handful of common carp had been plucked from two of the biggest and most popular fishing lakes on the wild and previously carp-free island of Tasmania, officials didn't fumble about for a plan that would make everyone happy.

"It was first found on a Monday or a Tuesday," says Chris Wisniewski, Tasmania's carp eradication boss, "and by the weekend, the lakes were shut down."

That was 1995.

Today the larger lake - Lake Sorell, a body of water substantially bigger than Madison's Lake Mendota - remains closed to everyone except Wisniewski. He and his carp-killing crew work around the clock and calendar chasing down the species that has already overrun much of the Australian mainland.

The carp, likely planted by rogue anglers, would surely be raging out of control across the island of Tasmania, an area more than twice the size of Massachusetts, but Wisniewski and his crew have put together an impressive quiver to beat back the invaders - poison, pheromones, radio trackers, electrodes, fish-egg-smothering lime and sophisticated computer modeling, as well as traditional tools such as nets and metal grates to keep the fish from migrating out of the lake.

With an assassin's focus, they have driven down the adult population to a handful, two of which are implanted with radio transmitters to act as "Judas fish" and lead fishery crews to the last of the other adults.

"We know them individually," a spray-drenched Wisniewski yells as he powers his seatless Jeep-of-a-boat through the pounding waves of Lake Sorell toward the radio signals of "fish 404."

"And we haunt them."

It is a sustained assault that has already eradicated the carp population in the adjacent smaller lake.

University of Minnesota biologist and carp expert Peter Sorensen was floored when he first learned of the carp battle under way Down Under.

"I thought: Oh my God, they're actually doing it," says Sorensen, who is working with the Australian crew to deploy cutting-edge pheromone-based traps that use sex hormones to lure in the last of the adults. "These guys are going out every day in boats - *every day* - and actually doing it."

Sorensen sees what's happening on Lake Sorell as a schoolroom for any government bent on getting control of an invasive species.

The key, he says, is to learn everything you can about the species, the habitat it's invaded and the tools needed to squeeze its numbers down, hopefully to zero. Then you focus on the Achilles' heel in the species' life cycle, and if you don't have tools to exploit that weakness, you invent them.

Sorensen says it would be worth the trip for U.S. biologists and decision makers to head to Tasmania to see what can be accomplished when an invasive species is attacked with what biologists call "integrated pest management."

"I think it would help reset their mind-set, just to see what it can do."

In the Great Lakes region, we should be familiar with that mind-set.

We pioneered it a half-century ago with the lamprey.

1950s Great Lakes: 'A big desert'

Louis King knew he had a hell of a job when he arrived from Missouri with his wife and two young children in the northern Michigan town of Cheboygan in the mid-1950s.

He had been hired to help save the Great Lakes, to kill lamprey.

"What I saw when I got here," the 80-year-old says of Lake Huron, "was virtually a desert. A big desert. Nothing was there. No commercial fishing. No recreational fishing."

The lamprey devastation had pushed the governments of Canada and the United States into a treaty that created the Great Lakes Fishery Commission, and they gave that commission simple marching orders: Kill the lamprey.

"They put in that treaty: You shall develop and then carry out a lamprey control program," says the Fishery Commission's Gaden. "That created accountability. It became our responsibility, and Congress could haul us in front of them to see how we were doing."

Yet when the commission was created, there were no effective tools to beat back the 18-inch lamprey, each of which could kill 40 pounds worth of fish in a single year.

King remembers a sense of hopelessness staring out at the big, wild and ailing waters of Lake Huron.

"I was overwhelmed," he says. "I thought: How in the world could they ever, ever control lamprey in this vast body of water - and there were five lakes!"

His hopelessness was not unfounded.

The U.S. Navy itself probably didn't have the fleet or firepower to obliterate the untold millions of lamprey in the lakes and their tributaries - a surface area about equal to the states of New York, Connecticut, New Jersey, Massachusetts, Vermont, New Hampshire and Rhode Island combined.

But the scientists had found the Achilles' heel in the eel-like lamprey. They had learned the lamprey spawned only in a relatively small number of streams and rivers that fed the lakes. And their offspring stayed in those streams for up to six years as night-crawler-sized vermin, burrowing into the sand-and-silt stream bottoms, filtering from the water everything they needed until they descended into the lakes as adults to kill as many fish as they could before returning to the streams the next year to spawn and die.

Once the scientists zeroed in on the tributaries that were the lampreys' prime habitat, they set out to find a lamprey-specific poison that could be applied to those relatively small water bodies.

Miles from any town in a converted Coast Guard station carved from a lonely forest on the tip of Michigan's Lower Peninsula, King and a crew of government workers started looking to create what would essentially be ecosystem-scale chemotherapy. Their boss was a whiz kid named Vernon Applegate.

Poisons from chemical companies around the globe started to show up almost daily, bearing numbers but no names - the chemical companies jealously guarded their formulas in case one turned out to be the lucrative magic bullet to save the Great Lakes.

The poison screening worked like this: workers filled big jars with water and dropped two juvenile lampreys into each along with two rainbow trout. The idea was to find a concoction that would destroy the lamprey but leave the rainbows unharmed.

"Imagine testing 40 to 50 unknown chemicals daily," King says. "You just have to keep at it."

Cliff Kortman doesn't have to imagine it; he remembers. It was his job to weigh the chemicals.

"All I got was little bottles with a skull and crossbones on it," says the 83-year-old, who was hired initially as a maintenance man.

Kortman and others were so intent on finding the right mix they worked on their own time.

"It was a mission," says King.

Kortman remembers one chemical simply evaporated before he could walk it across the room.

"I just couldn't believe it."

So he tried it again. It happened again.

Another chemical smelled so nasty it cleared out the room.

Kortman kept at it. For years.

He remembers the day he tested chemical No. 5,209.

"That one was pretty something," he says.

That one saved the Great Lakes.

On July 26, 1957, The Milwaukee Journal broke news that the "blind and desperate hunt" for the perfect lamprey poison had succeeded.

The first application in the wild of a lamprey-specific poison happened later that year, under the cover of darkness, on a tiny creek near Cheboygan with "almost the secrecy of a nuclear project," according to a local newspaper report.

Precise dosages of the chemical were pumped into the creek and in the following hours, just as the researchers hoped, thousands of the wormy lamprey surfaced lifeless from the streambed. Applegate described the scene that night as a "real purty sight." Better yet, no ill effects on the stream's fish were reported.

"By midnight, the weary crews returned to Cheboygan for hot lunches. The lid of secrecy was lifted a bit - there were hints, knowing glances," the Grand Rapids Herald reported at the time.

"The lamprey had had it."

The fight today: Who's in charge?

Lamprey numbers were eventually knocked back to 10% of their peak. Although few may be aware of it, the program continues today, with about \$20 million spent annually on lamprey control operations in streams and rivers across the Great Lakes.

After the lampreys were controlled, lake trout populations recovered in Lake Superior. But, for reasons that remain mysterious, the top native predator never made the hoped-for comeback in the other lakes.

It did not help that fishery managers opted at the time to focus in those lakes on stocking Pacific salmon, a species they figured would do a better job of controlling the pesky alewife, an invasive ocean herring whose numbers exploded after the lake trout die-off. Biologists at the time figured alewives made up 90% of the fish mass in Lake Michigan.

The salmon spawned a multibillion-dollar recreational fishery and restored to the lakes a shaky biological balance.

Today that fishery is in jeopardy because of a fresh wave of invasions led by quagga and zebra mussels, and will be followed, many fret, by Asian carp.

This new confederation of invaders is on its way to upending the lakes even more profoundly than the lamprey and alewives because they strip from the lakes the plankton that supports the food chain upon which every fish species directly or indirectly depends.

Yet many argue there has been no focused and coordinated plan of attack.

Fishery officials have known for years, for example, that the Asian carp invasion was headed toward the Great Lakes. And for years politicians did little but cobble together a largely experimental electric barrier system on the Chicago Sanitary and Ship Canal just miles from Lake Michigan - a system that was not turned up to a voltage strong enough to repel young carp until just last year, once DNA evidence revealed the carp were at the door.

Asian carp were initially imported to Arkansas and deployed in federally funded sewage treatment experiments in the 1970s. The first word that they could be trouble came 35 years ago in a memo from an Arkansas state employee to the U.S. Fish and Wildlife Service warning that four adult Asian carp pulled from the wild posed a "potential threat to native fish."

If the government had pounced then?

"A rapid response plan in place in the 1970s could very likely have eliminated this threat before it started," says Duane Chapman, a biologist with the U.S. Geological Survey, one of the nation's top Asian carp experts.

But little was done even after the fish began to overwhelm stretches of river in Illinois in the 1990s.

The Fishery Commission's spokesman Gaden says he isn't critical of efforts of individuals now scrambling to come up with a plan to beat the carp. The problem, he says, is that authority is dispersed across so many government agencies that it can paralyze their ability to respond.

"If we see things coming for the better part of a decade, and we're still not able to mount a response in time, there is something seriously wrong with the governance structure we have in place for dealing with invasive species today," Gaden says.

Much has been made about the recent appointment of President Barack Obama's Asian carp director, but his job is to basically coordinate federal agency efforts on the matter - he has no legal authority to lead a lamprey-style project.

"No one is in charge, no one is actually obligated to prevent those fish from getting into the Great Lakes, and by that I mean, actually required by law to prevent that from happening," says Joel Brammeier, president of the conservation group Alliance for the Great Lakes.

"This has been the recurring problem with invasive species management - it only succeeds when somebody is in charge."

This point was underscored several years ago when regional resource managers put together the blueprint for what helped shape Obama's Great Lakes Restoration Initiative - a multiyear Everglades-style program for the Great Lakes toward which the government has already committed \$475 million.

That blueprint called for an "Aquatic Invasive Species Integrated Management Program," citing a Government Accountability Office report that revealed some 20 federal agencies were involved in regulating invasive species management nationwide, and their efforts were woefully uncoordinated.

"One entity should be empowered to coordinate (invasive species) actions in the Great Lakes," stated the plan, which specifically cited the focus - and success - of the lamprey control program.

"A similar mandate is required for other aquatic invasive species."

It hasn't happened.

And today it is clear that there is little unity in the region over how to protect the Great Lakes from the next invasion. When a single Asian carp was plucked from Lake Michigan waters in June, Wisconsin and other states sued for immediate action to close two Chicago navigation locks as an emergency measure to wall off the carp-infested Mississippi River basin from the Great Lakes.

Federal officials declined, and lawyers on both sides spent the fall in court arguing about what the carp find means and what we should do about it.

A federal judge in Chicago ruled Thursday against closing the locks.

The U.S. Army Corps of Engineers, meanwhile, has just announced the details of a study that will look at what it would take to solve the carp problem by re-creating the natural separation between Lake Michigan and the Mississippi basin that the Chicago canals destroyed a century ago.

That study probably won't be done until 2015.

Contrast that to how Australia - a continent ravaged over the past century by invaders such as rabbits, rats, toads and foxes - has chosen to address fresh threats.

Four years after Tasmania closed the two popular lakes after carp were found, an invasive mussel similar to the zebra mussel was detected in the waters near Darwin. Three marinas were quarantined within five days, infested vessels were ordered removed from the water, and loads of mussel-killing chemicals were pumped into the marina waters.

The mussel colonies were destroyed, and they never made a comeback.

Great Lakes, great obligation

Australian invasive species experts know well the story of the Great Lakes lamprey.

"That's one of the great successes of invasive animals anywhere in the world," says Tony Peacock, past chief of Australia's Invasive Animals Cooperative Research Center, a national program built to coordinate researchers, business, government agencies and environmental groups to work on long-term solutions to invasive species like the carp. "But it did take two countries to and decide not to put barriers in the way of people." . . . come together

They are breaking down barriers in Australia today, where the can-do torch lighted by the U.S. and Canadian lamprey program burns bright in an Australian government lab on the shore of Tasmania's Hobart Harbor.

Ron Thresher is an American transplant who is trying to get inside the carp genes to figure out how to manipulate their reproductive systems so they can reproduce only male offspring - and their offspring can produce only male offspring, and so on.

The idea is that if you plant enough "daughterless carp" into a particular system, you can knock their numbers down, hopefully someday to zero.

Thresher is looking beyond the carp problem in Tasmania. He is thinking on a continent-sized scale; common carp have ravaged the mainland of Australia much in the way Asian carp have overrun the Mississippi River basin.

"We've got a real chance of doing something big in terms of controlling these miserable bastards," he says.

The "daughterless gene" has already been planted into zebrafish swimming in Thresher's high-security lab.

To prevent any potentially harmful specimens from escaping, Frankenstein-style, into the wild, the lab's windows are sledgehammer-proof. The floors near the doors are bermed so no water - or fish - can float out if a tank bursts. The walls are waterproof to a level that they can contain all the water holding the genetically manipulated fish.

Pipes from the lab don't drain to the local sewer system. They lead to a boiler for sterilization before being released. If that boiler fails, there is a twin backup.

Thresher says it won't be long before he is ready to begin experiments in controlled water bodies outside the lab - and not too long after that until actual daughterless carp could theoretically be released.

Because carp can live dozens of years, it probably could take decades for a daughterless population to make a big impact on a wild population, but Australians aren't looking at solving their national carp problem tomorrow. They're thinking about future generations.

"The technology will be widely available, I reckon, in the next 10 years," Thresher says. "It's a question of the willingness to use it."

That is a question he knows must be answered outside his high-security lab, perhaps in the chambers of Australia's parliament.

It is a question North Americans might find themselves wrestling with as well, because Thresher believes the technology being developed in his lab will lead to similar genetic controls for nuisance species across the globe - including the Great Lakes.

"The basic technology, once it's up and running, I think will be applicable to a wide range of things," he says. "Mussels included."

It's not that he has so much confidence in himself; he just has confidence in the future.

"If we fail or if we don't come up with optimal solutions, 10 years from now, someone else will have done it," he says. "It's not going to be that hard."

It may be more difficult getting Great Lakes leaders to work cooperatively once again - as they did with the lamprey - to stop the carp and try to fix the damage wrought by all the invasive species now living in our lakes.

Lamprey pioneer Louis King says the lakes, battered as they are, deserve the best we have.

"We're obligated," he says. "These are the greatest bodies of freshwater in the world."

But here is the critical question: Exactly who is obligated, and who should be held accountable?

"When it's everybody's responsibility," Alliance for the Great Lakes' Brammeier says, "it's nobody's responsibility."