

# Walleyes

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and harvest restrictions, walleye continue to struggle in the Oneida County fishery where warmer-water species like bass and bluegill have taken over. And the problem isn't unique to those lakes, or walleye.

It's not entirely clear why. Habitat degradation and overfishing are factors, but scientists increasingly believe warming temperatures are making many lakes unsuitable for cold and cool-water species like trout, walleye and whitefish.

The problem is expected to get worse in the coming decades as temperatures continue to climb.

And that may require a different approach to wildlife management, according to a new report published in the journal Fisheries Management and Ecology.

Wisconsin spends millions of dollars each year on efforts to maintain populations of popular species like walleye, trout and whitefish. But those efforts to resist change are often ineffective, said Zach Feiner, a research scientist with UW-Madison's Center for Limnology and lead author of the report.



Feiner

"In many lakes it doesn't seem to be working very well," Feiner said. "What we're doing now is maybe stocking lakes that are becoming too warm to really be able to sustain walleye populations into the future."

Instead, researchers say it may be time to accept that change and think about other strategies for managing a resource that supports some 14,000 jobs, generates about \$1.9 billion in annual economic activity and produces more than 4,600 tons of food each year.

As an angler, Feiner said he wants to maintain as many opportunities as possible, whether that means catching walleye and trout or bass and bluegills.

"The science is pretty clear that Wisconsin fish communities are facing pretty rapid change in the next half-century to century due to climate change," Feiner said. "You'd rather be proactive than reactive when it comes to management."

## Disappearing habitat

Between 1990 and 2017, adult walleye populations declined by more than a third in the northern third of Wisconsin, and reproduction rates have slowed as well, meaning the fish can't keep up with current harvest levels, according to a study by UW-Madison



Embke

researcher Holly Embke.

And based on current climate models, the conditions for cool and cold-water species will only get worse in the coming decades, according to a report released last year by the Wisconsin Initiative on Climate Change Impact (WICCI).

The Department of Natural Resources estimates Wisconsin has more than 420 lakes with the cool, dark waters where walleye thrive. By 2089, the WICCI report predicts, there will be just four.

The outlook for trout is almost as grim.

By 2065, climate change is expected to claim nearly 70% of Wisconsin's native brook trout habitat and almost a third of the streams that currently support brown trout, according to a 2019 study by DNR scientist Matthew Mitro.

"The outlook isn't brilliant," said Duke Welter, a volunteer with Trout Unlimited who's been trout fishing since the early 1980s and worked for about 30 years on habitat restoration efforts in the Driftless Region.

Welter said he's already noticed bass outnumbering trout on some bigger streams.

"Really, they're becoming smallmouth fisheries," Welter said.

That doesn't mean Wisconsin won't still have walleye and trout.

"We're not talking about the demise of walleye in Wisconsin," he said. "There are places where walleye are doing great. In rivers, walleye are doing pretty well."

In fact, Feiner and other researchers are turning their attention to those "bright spots" where walleye and other threatened species are thriving "to understand what are the things that are allowing them to do well."

## A new framework

Feiner suggests resource managers consider a new framework of strategies known as RAD — or resist-accept-direct.

"When you're faced with a massive ecological change, like climate change, your options are to do things to resist that



Supervisor Mike Aquino surveys a pool of brook, brown and rainbow trout raised at the Nevin Fish Hatchery in Fitchburg. By 2065, Wisconsin is projected to lose more than two-thirds of its native brook trout habitat due to climate change.

change and kind of keep the status quo, you can accept that change ... or you can direct that change ... where you're taking a more active role in shepherding that system to a new state that might have better services for your stakeholders," he said.

The RAD framework has been evolving for years, said Abigail Lynch, a fish biologist with the U.S. Geological Service's Climate Adaptation Science Centers.

"These concepts are not necessarily novel," Lynch said. "But the framing around RAD has resonated with a lot of people."

Lynch said resource managers are most comfortable with resistance — which can take the form of stocking, harvest restrictions or landscape restorations in an effort to maintain the status quo or return ecosystems to a prior state.

But that approach may not work in the face of widespread ecological change.

"There's no stable state to return to," Lynch said. "Our landscapes are changing. Our fish communities are changing. If we keep our heads in the sand and continue to resist beyond when resist options are effective it's going to be very costly and we're going



Wisconsin Department of Natural Resources fisheries technician Chad Leanna with a walleye caught during spring sampling on Lake Tomahawk in 2021. Despite a five-year harvest ban and intensive stocking efforts, walleye have failed to reach self-sustaining reproduction levels on the Minocqua Chain of Lakes, once a premier walleye fishery.

to have more extreme consequences to our natural resources."

## Testing the waters

In 2015, as part of a 10-year rehabilitation plan, the DNR — along with private and tribal partners — increased stocking efforts and implemented a catch-and-release policy for the Minocqua chain.

The results have not been promising.

While the walleye population has rebounded, the fish aren't reproducing at a sustainable rate, and recent studies have shown the ratio of males to females is out of balance.

Last year, the DNR extended the ban on keeping fish for another five years as researchers try to figure out exactly why the fish have failed to thrive.

In another test of the resistance strategy, a team led by UW researcher Embke recently wrapped up a five-year experiment to rid one northern Wisconsin lake of bass, bluegill and other warm-water species to see if the walleye population would rebound without the competition.

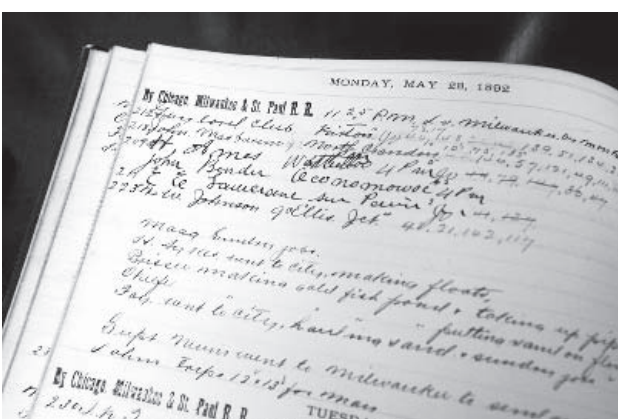
It didn't help. Using nets, traps and electric shocks, Embke's team pulled nearly 300,000 sunfish from McDermott Lake in Iron County. The yellow perch population exploded, but walleye didn't respond.

Embke said while yellow perch and walleye prefer similar habitats, walleye seem to be less able to adapt to warmer and clearer waters, even in the absence of competition.

"We threw tons and tons of effort out there — much more than would be feasible for a management agency — and we didn't get a response," she said. "We may need to accept that walleye are not going to thrive in all systems, specifically in these warming systems, and start to direct those systems toward alternative fisheries."

DNR spokesperson Sarah Hoyer said the department recognizes climate change is a major influence on the state's fisheries and deploys a combination of resistance and acceptance strategies.

That includes stocking and habitat restoration ef-



Fish deliveries from 1892 are recorded in a log book at the Nevin Fish Hatchery in Fitchburg. Started in 1876, Nevin is the oldest of Wisconsin's 11 hatcheries, which last year raised about 7.5 million fish at a cost of roughly \$3.9 million.

orts where feasible while accepting the expansion of popular sportfish like bass and bluegill.

Hoyer said the department has not employed ecological direction strategies, which are inherently difficult and involve relocating species that could have negative impacts. However, the agency promotes the state's growing bass and panfish fisheries.

"We hope that directing angler attention to them increases their popularity so that future anglers who may have preferred a meal of walleye will be just as satisfied with a meal of bluegill, at least in those places where resisting walleye declines was no longer feasible," Hoyer said.

## Shifting attitudes

Feiner said he's not advocating any single approach.

"The hope for these documents is really to start a conversation," he said. "See what's working, what isn't working, what may become less effective in the future."

That could mean changing how fisheries are managed, or convincing anglers to eat bass, which have typically been associated with "catch and release" fishing. "It's an attitude that can shift," Feiner said. "Bass are perfectly good to eat."

The shift will be especially challenging for Wisconsin's native Ojibwe people, who have relied for centuries on walleye — or ogaa — to meet subsistence, cultural and spiritual needs.

"It's probably going to be a hodgepodge of approaches," said Aaron Shultz, a fisheries biologist with the Great Lakes Indian Fish and Wildlife Commis-

sion, a natural resources agency representing 11 Ojibwe tribes who retain hunting and fishing rights in the ceded territories of Minnesota, Wisconsin and Michigan.

"We'll have some lakes where we can resist and be successful and other lakes where we can accept these changes and have an outstanding bass fishery."

Given the Wisconsin landscape will likely support fewer walleye in the future, Shultz said tribes may be forced to turn to other animals for subsistence.

"I don't know what the angling community is going to accept and I don't know what the tribes are going to accept," Shultz said. "Right now it's been resist at all costs, for walleye anyway."

As a volunteer with Walleyes for Tomorrow, Justice is working to understand and reverse the decline of walleye on the Minocqua chain, but as a businessman, he's also adjusting.

His shop, Kurt's Island Sports, is now stocked with bass gear, and he acknowledges the notoriously hard fighters are more fun to reel in, though he still prefers the challenge and taste of walleye.

"There's just something about the whole mystique," he said.

Yet he can also envision a future without them.

"The future of walleye worries me," Justice said. "I wouldn't be shocked. I'd be sad."

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