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Timber Coulee Creek, a trout stream in western Wisconsin, is popular with local and visiting trout anglers.

Welcome to the good old days of trout fishing.

Lisa Gaumnitz

Dan Kohler has fished the Tomorrow River in central Wisconsin since he was a kid and marvels at the changes he finds today.

Streambanks destroyed by grazing have been repaired and fenced to keep the cows out, the silty bottom has given way to cobble, and memories of spotty fishing for small browns and brookies have been erased by glorious nights where he's hauled in 25 to 30 fish.

"I don't think the trout fishing has ever been better," says Kohler, 65.

A new UW-Stevens Point analysis of trout populations confirms what Kohler's creel suggests; these are the good old days of trout fishing.

"We see a general, overall improvement in the total number of trout, and trout in all the size ranges we looked at since 1950," says Dr. Nancy Nate, the principal investigator and a scientist at the UW-Stevens Point Fisheries Analysis Center.

Nate plumbed DNR databases for thousands of fish surveys between 1950 and 2010 from streams all over the state. It's the most comprehensive look ever at what's happening in Wisconsin's trout streams.

What she found is a higher number of trout statewide, and increased numbers in each of the size ranges she looked at: brook trout over seven, eight and nine inches, and brown trout over seven, nine and 12 inches. Not as clear, however, are the reasons why, including the role regulations played, one of the original questions she hoped to answer.

At the very least we can say that trout populations have continued to improve under Wisconsin's current regulatory structure, Nate says. Whether or not the regulations played an important role is still a

OUT TREASURY

question. "There are a lot of different things going on at the same time across the state," she says. "I want to tease apart the data more and really get at what's causing the improvement."

Kohler has no doubt about what's driving better fishing.

"It's restoring the habitat," he says. As stream improvement chairman for his local Izaak Walton chapter, he's worked on a number of trout habitat projects and seen how the trout numbers exploded. "The water quality is better and there's more food now than there was 100 years ago. Our trout fishing is so much better because of the habitat."

The secrets to salmonid success

Veteran fish biologists say the factors fueling salmonid success vary somewhat by region, but that changing land use and improved land management are among the most important factors. Habitat improvement work done by DNR and partners, anglers' embrace of catch-and-release fishing, and DNR's shift to stocking trout spawned from wild parents are also factors. Regulations, acquisition of sensitive lands along streams, and beaver control in northern Wisconsin play a role as well.

"They've (factors) been synergistic," says Larry Claggett, who guided DNR's trout program from 1982 until retiring in December 2010. "Bob Hunt thought we should combine habitat work on our better streams with regulations that allow the fish to use the habitat so you get the maximum productivity. It appears that it worked."

Not only are there more and bigger fish but the number of waters where trout have been documented has climbed by more than 300 since 1980, and total mileage has increased to 10,631 miles from 9,562.

Across Wisconsin, improvements in how farmers managed their land and foresters their timber and adjacent waters have also helped fuel the rising trout treasury.

The changes are particularly dramatic and well documented in Coon Valley, the 92,000-acre watershed south of La Crosse where the nation's first soil conservation project was launched in 1933. Teams of agricultural, natural resource and economics professionals worked with willing farmers on conservation plans that took steep slopes out of production, used contour strips of alternating crops, and installed terraces to keep the soil on the land and out of the water. They also fenced pastures to keep grazing cows from beating down the stream banks, which robbed trout of hiding places and increased erosion.

More recent practices have sought to leave more crop residue on the land to absorb the impact from falling rain, allowing the drops to soak into the soil instead of running off, and to develop nutrient management plans that will reduce the risk that manure and commercial fertilizer would run into streams.

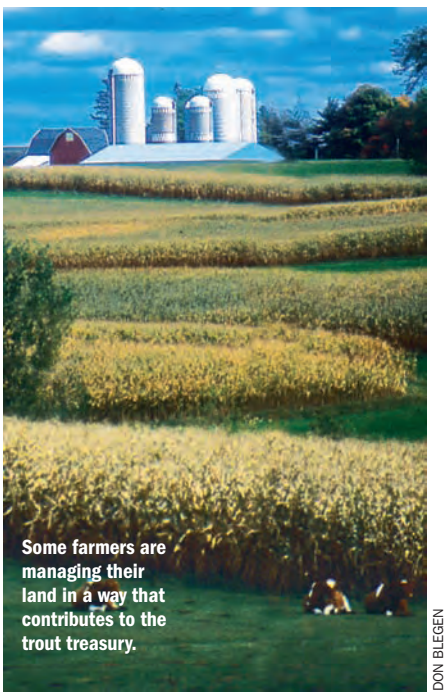
"Land use changes, conservation tillage, no-till, CRP (the federal Conservation Reserve Program that pays farmers to let sensitive lands lie fallow) and better pasture management have all allowed for better infiltration and less erosion," says Pete Segerson, an avid, life-long trout angler who leads the DNR crews that work on trout habitat improvement and trout stocking in western Wisconsin.

The U.S. Geological Survey documented that such changes in farming practices increased infiltration of water into the ground, raising groundwater levels, increasing baseflow and decreasing flooding peaks in southwestern Wisconsin. Streams in Monroe, Crawford, La Crosse and Vernon counties responded and they now boast more than 1,000 miles of trout water, up from the 654 in 1980.

Northern Wisconsin streams similarly have benefitted from improved land management resulting in more water and colder water for trout streams.

Log drives are no longer used to get timber to market, timber cutting is done when the ground is frozen, and timber companies follow best management practices for road construction and other land disturbances.

"We just take better care of our land and water resources," Segerson says. "And that comes from things like the Clean Water Act and our general water regulation and zoning laws. There's just better stewardship by landowners."



Some farmers are managing their land in a way that contributes to the trout treasury.

DON BLEGEN

Streamside vegetation can avert runoff.

DNR FILE

Better care of land brings more and colder water

A big part of taking better care of land and water resources has meant protecting them by buying crucial trout production areas and easements for access. Statewide, land acquisitions primarily of spring heads and feeder streams with money from a 1960s program to buy land for public recreation, and its successor, the Knowles-Nelson Steward-

ship program, have protected more than 107,000 acres of sensitive trout areas. These funding programs have also enabled DNR to secure permanent easements along nearly 13,000 acres, a cheap and effective way to protect critical habitat and provide fishing access because the property stays in private hands.

Those easements and acquisitions also have allowed a lot of habitat work on key stretches of trout waters to improve spawning habitat, and create cover where the fish can hide from predators and pools where fish can spend the winters and find respite during drought years.

When Larry Claggett started as "the trout guy" in 1982, Wisconsin was already 30 years into efforts to boost trout populations by improving in-stream habitat. Research done in Wisconsin by Bob Hunt suggested that Wisconsin could increase trout populations if they created more habitat in streams for adult trout, particularly overhead cover where the fish could hide during the day to escape from winged predators. Plus research from Montana was showing that stocking streams that contained already naturally reproducing trout populations actually hurt those populations and the fishing.

However, Wisconsin's habitat improvement efforts were hobbled by a lack of adequate and consistent funding, and by the practices of the times, Claggett recalls.

"Right after I got here there was real substantial flooding and all of those structures got wiped out," he says. "We didn't know enough about how those streams function to make them last and work with the floods, not against them."

But help arrived on several fronts.

Innovative fish managers at the time, like Dave Vetrano in southwestern Wisconsin and Max Johnson in northern Wisconsin, developed trout habitat structures suited to the streams they worked on.

Vetrano's LUNKERS and Johnson's skyhook cover both sought to provide overhead cover for fish to hide from predators in the air. These methods narrow and deepen channels. Streambank shaping as part of the projects seeks to reconnect the streambank to the floodplain, giving the water somewhere to go and dissipating the energy as floodwaters course through a stream.

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Dave Vetrano has seen many changes in the state's trout population during his career as a fish manager.

New technology, like excavators and dump tracks that move along tracks and could swivel and dump rock and other materials in a 360-degree radius, made the work much more efficient than previous methods of using wheelbarrows or moving one rock at a time.

And critically, Trout Unlimited led the fight to get a stable, dedicated funding source for such work. They persuaded the Legislature in 1977 to approve requiring anglers to buy a trout stamp if they were fishing inland trout waters. Proceeds from stamp sales would go solely to habitat work.

"We finally had the money to do work," Claggett says. "We were the only state to do a stamp dedicated to habitat."

DNR, working with partners, was able to significantly ramp up the number of projects. Currently, about 140,000 trout stamps are sold every year to generate $1.2 million for habitat work, and about 25 miles of stream and one spring pond are improved every year. More than 800 miles have been improved since 1978.

Marty Engel has seen the benefits of those projects over the 32 years he's worked for the DNR, the last 23 of them as the fish manager for Dunn, Pepin, Pierce and St. Croix counties. A DNR trout crew stationed in Eau Claire improves habitat along two to three miles of streams a year.

"You see a direct cause and effect," Engel says. "By creating new habitat, you're creating new fish. So we get the instant big boom in population on that particular half mile or mile of stream, going from 300 to 1,000 fish per mile to 3,000 to 8,000 fish per mile. Upstream of the projects, there is generally little change in fish population, but downstream, the new habitat projects deliver more fish."

That's because there is generally an overproduction of juveniles in the improved stretch and some of those fish migrate downstream.

Dave Seibel, DNR fish manager for Langlade and Lincoln counties, also sees a direct cause and effect from the most common kinds of habitat im-

Sediment buildup harms downstream spawning grounds.

DENNIS PRATT

Good trout habitat includes gravel substrate in which trout can bury their eggs.

DENNIS PRATT

Too much debris can decrease stream flow and lead to warmer water.

DENNIS PRATT

Beaver dam removal can restore trout migration routes.

DENNIS PRATT

LUNKERS are submerged and provide places for fish to hide.

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provement projects done in the north. Keeping beaver numbers under control has helped reduce the number of beaver dams that cause changes in temperature, habitat, and now provide access to spawning areas.

"It's our number one job in the northern part of the state. If we only had money or time to do one thing, beaver control would be it," Seibel says.

Another habitat improvement method unique to the north has been dredging spring ponds, headwater ponds that range from the size of an office cubicle to 25 acres. They are important habitat for spawning adult trout, but these ponds "age" more quickly than other waters, filling in with sediment.

In the last 30 years, more than 50 spring ponds have been dredged in Lincoln and Langlade counties.

"It's like turning back the geological clock," he says.

And the methods keep evolving. There is more focus on shaping stream channels and adding natural cover (trees, logs, root wads and rock) and on doing holistic projects that recruit a variety of conservation groups to restore streamside habitat for other wildlife as well as in-stream habitat for trout.

Born to be wild

Engel was fortunate that waters in his area held on to remnant populations of brook trout. Once infiltration increased and groundwater levels and baseflow started improving, naturally reproducing populations started moving slowly into lower reaches of the streams.

In southern Wisconsin, however, DNR used stocking to help re-establish naturally reproducing populations in improved streams. Vetrano again was an innovator. He, Roger Kerr and Gene Van Dyck started to experiment with stocking the offspring of parent fish captured from the wild. The early results were encouraging, and by the mid-1990s, Nevin and St. Croix fish hatcheries were producing wild trout for stocking in mostly Class II streams.

Studies, including a recent one by DNR fisheries researcher Matt Mitro, have found survival rates two to four times greater for stocked trout of wild versus domestic parentage, and some increases in natural reproduction. It is thought that hatchery trout of wild parentage maintain the genetic diversity and better embody the characteristics found in wild populations and may

therefore improve restoration success.

In 1990, 100 percent of the fish raised by clubs in western Wisconsin under cooperative contracts were domestic strain, Segerson says. A decade later, that number had dropped to 80 percent. Now only 16 percent of the trout stocked by clubs through cooperative rearing agreements are domestic strain. "It's wonderful hands-on conservation with the clubs and they involve the schools," he says.

A boon or a bane to anglers?

Perhaps no potential factor is as debated as the category system of regulations that took effect in 1990. Before, an angler could keep 10 trout over six inches from most streams. After 1990, there were five categories (now reduced to four) of trout regulations ranging from a 10-fish daily bag limit with no minimum length limit to catch and release only. Among the "special regulation" streams, about 3 percent of Wisconsin trout water, there were 36 different regulation types that restricted gear, bag limits, seasons and size limits.

UWSP's Nate found that this diversity of regulations and the lack of comparisons to streams with no regulations made it problematic to tease apart the effect of a regulation from other possible influences on trout populations. In general, however, Nate found that streams with a daily bag limit of three and an eight-inch minimum for brook trout had the highest total density and more fish greater than nine inches among the four regulation categories. Conversely, streams that had one of the "special regulations" had the highest density of total brown trout and of brown trout greater than 12 inches. However, these streams may have had higher densities of brook trout and brown trout before the regulation as well.

Catch and release is popular among trout anglers.

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Many anglers have made up their minds.

Kohler thinks some regulations are too restrictive. He'd like to see no minimum size limit on most streams other than those with special regulations so that anglers who hook a fish poorly can harvest the fish, instead of digging around to get the hook out and releasing the fish, only to have it die the next day. He also thinks it would make it easier to take kids and other novice anglers fishing. But he'd also like to see a reduction in the number of fish that can be harvested per day.

Mike Reiter, a wildlife and aquatic biologist by training and longtime chair of the Conservation Congress Trout Committee, notes that the regulations have been simplified several times since the 1990s and thinks they have done their job well.

"As far as I'm concerned, one of the biggest things is the invention of the category system, which is phenomenal. It treats streams according to their potential. You can't treat the Brule like some small stream and expect to produce good fishing. Nor can anglers expect that Wisconsin waters are going to produce the big hogs found in some of the western states, where the streams are much larger."

Improving water quality and colder temperatures found in Wisconsin streams that were previously marginal trout fishing waters have changed the forage base. Gone are the infrequent big brown trout that dined on minnows and crayfish, replaced by the sleeker, smaller fish that eat an insect diet.

Wisconsin offers enough trout mileage that if one stream's special regulations are not to your liking, a few miles away there will likely be one that is, he says.

Anglers' attitudes change

Angler attitudes and behaviors over the past 60 years have changed dramatically and have played a role in increased trout populations. Timber Coulee Creek, a trout stream in western Wisconsin, illustrates these changes. Catch and release has caught on in a big way, to the point where anglers on Timber Coulee Creek in a 2008 creel survey reported keeping only 119 trout during the entire season, even though half of the stream is open to harvest. That compares to 1,859 in 1984. And nearly 80 percent of anglers in 2008 said they travelled from more than 50 miles away, a reversal from 1984 when 89 percent of the anglers were local.

As such trends have emerged, a schism has opened in the trout fishing ranks. Some anglers who fish with bait and keep their catch perceive that anglers in the catch-and-release ranks look down on them for taking fish home, Reiter says.

To address those conflicts, Reiter and his group developed a mission statement and took positions on five major issues, which they discuss and address at every meeting.

"The Trout Committee feels strongly that any activity on any stream that is legally allowed is appropriate. If the angler desires to take a legal limit home for consumption then that is their prerogative."

He thinks that listening to everybody, respecting their opinion, and letting them know they have a piece of the pie, has helped defuse some of the conflict of past years. "I don't see that quite as much. People seem more willing to listen. It's the diehards on either side who are living in the past."

And as Nate's work has shown, for trout anglers at least, the present is a better place to be.

Lisa Gaumnitz is the public affairs manager for DNR's Water Division.

We Want Your Input

Wisconsin has more and bigger trout than ever. Help us decide how to continue this great fishing.

Go to - **dnr.wi.gov/fish/trout/** - to learn what 60 years of trout surveys show, to share your ideas and feedback, and to sign up for updates.

Wisconsin is reviewing its trout fishing and will be asking anglers for their input on how to make the fishing even better. Public input meetings were set for late winter. Mail surveys and online surveys are planned for coming months. Get more information and free e-mail updates on this effort at dnr.wi.gov/fish/trout/