

In whole-lake experiment, have invasive crayfish met their match?

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The numbers of rusty crayfish, an invasive species blamed for decimating fish, insect and plant communities in Sparkling Lake, have dropped dramatically since a UW-Madison experiment concluded. Credit: Lindsey Sargent

Four years ago, UW-Madison researchers wrapped up a multi-year effort to dramatically reduce the population of a destructive invasive species in a northern Wisconsin lake.

Now, a recent survey of the lake shows that not only have fish, insect and plant communities bounced back in Sparkling Lake, but the invasive rusty [crayfish](#) is on the ropes.

Gretchen Hansen, a former postdoctoral researcher in the UW Center for Limnology and lead author of the study published in the July issue of the *Canadian Journal of Fisheries and Aquatic Sciences*, says that when rusty crayfish invade a lake, they use their claws to snip [aquatic plants](#) right at their roots. Scientists think this lets crayfish better spot approaching predators, but it also removes critical cover for other species, leaving them nowhere to hide from predators like [smallmouth bass](#).

In the early 2000s, when UW researchers began the rusty removal experiment, Sparkling Lake was essentially deforested. There were no beds of aquatic plants, no spawning sunfish and tons of invasive crayfish. "Rusties then were crazy abundant," Hansen recalls, adding that crayfish boils were not an uncommon occurrence for the students and other scientists working on the project. "We were catching 1,000 a day and eating them all the time."

Today, researchers are more likely to have a fish fry.

By suppressing the rusty crayfish population, Hansen says, researchers enabled [plant communities](#) to grow back and, with them, the aquatic invertebrates and fish that called them home. It was an outcome researchers aspired to but weren't sure was possible.



Gretchen Hansen (left) and graduate student Ali Mikulyuk preparing to dive for a plant survey in Sparkling Lake.

Previous studies suggested that many plant species wouldn't regrow from the [lake bottom seed bank](#) and Sparkling Lake's [fish populations](#) were tenuous at best.

"We thought that pumpkinseeds might come back, but we were a little concerned that [bluegills] had been extirpated," she says, noting that from 2000 to 2004, extensive surveys of Sparkling Lake turned up only a couple dozen pumpkinseeds and no bluegills.

Today, says Hansen, now a research scientist with the Wisconsin Department of Natural Resources, rebounding populations of fish like

bluegill and pumpkinseed are helping keep rusty crayfish populations down by preying on juvenile crayfish and larvae.

But the news isn't good for all species in the lake, she says. "Sparkling Lake used to have tons of mayfly larvae, but now you can't find any," Hansen says of an invertebrate species that made up a key element of the lake's food web. "We thought they would rebound, but they haven't."

Hansen says this is possibly because fish like rock bass and smallmouth bass switched their diets from crayfish to aquatic invertebrates as the rusties were removed from the food web. The increase in other insect-loving fish like bluegill only made things worse for the mayflies.

"Things are often more complicated than you might expect," Hansen says. "But it's a transient thing, and we only know how the lake is now, four years later. That doesn't mean that's what it'll be like in another four years."

For now, Sparkling Lake's native ecosystem is healthier than it's been for decades and a pernicious invader is being kept in check naturally.

As far as fighting the invasive crayfish on other lakes, Hansen thinks that, if the right agency or lake association had the time and money to pay someone to extensively trap crayfish, it could work. But, she cautions, it's a lot of work. Her group needed eight summers of full-time trapping to finally get rusty crayfish numbers where they wanted them.

Thanks to that time and effort, though, the work seems to have paid off. At the very least, Hansen says, "it's pretty tough now to put together a crayfish boil."

Provided by University of Wisconsin-Madison

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