Populations of stunted bluegill account for the majority of fish in many Illinois lakes. Can research unlock the secret to bigger bluegill?

The Big Bluegill Experiment

Story By Joe McFarland

(Photo by Joe McFarland.)

Hefty bluegill such as this large adult female from a Jackson County farm pond are a favorite among anglers. Unfortunately, many Illinois lakes struggle with stunted bluegill populations.

Some of us dream of hauling ashore a monster bass, or a giant muskie, or maybe a 40-pound catfish. Big fish make for big stories. For researchers at the Illinois Natural History Survey, a 7-inch bluegill—lots of them—would have been a huge story.

After nearly a decade of trying to coax populations of stunted bluegill into producing quality fish, researchers say a statewide investigation found out how complex the problem is and offered some future directions to look for management solutions. The multi-approach study, made possible by Federal Aid in Sportfish Restoration, gathered plenty of potentially useful data. But the ultimate prize of demonstrating methods to fix stunted bluegill populations in Illinois is proving elusive.

(Photo by Illinois Natural History Survey.)

According to the INHS project summary released in June, researchers tested everything from size and creel limits to the introduction of more predators to increase bluegill size. Unfortunately, none of the techniques tested at 32 study lakes between 1996-2005 produced one, perfect bluegill management plan. On important outcome was that lakes that already enjoyed quality bluegill populations remained so with the regulation, but lakes with populations of stunted fish showed no statistically significant improvement.

But the study wasn't a total washout. Like all optimistic fishermen, researchers point out the lessons learned on the water today could have big payoffs tomorrow.

"We've come up with some ideas," said INHS Research Biologists Matt Diana and Dave Wahl, who helped monitor the team's lengthy quest for a bluegill bonanza. "We have a lot of data and a lot of interesting bluegill research can be based on what we learned."

That mountain of data includes some surprising contradictions to commonly held beliefs about stunted bluegill. When largemouth bass were stocked in 16 of the study lakes, thereby increasing the existing bass population, common wisdom held that the additional predators would trim some of the bluegill population. Fewer bluegill would translate into less competition for food, and the remaining well-fed bluegill could grow. It didn't happen because largemouth bass stocking success was low.

The social structure of bluegill populations seems to influence how large bluegill might grow in any Illinois lake.

Another disappointing strategy: When creel and size limits for bluegill were established at 16 lakes, limiting the size of legal fish to 8 inches or longer (plus a 10-fish limit), the results were scarcely noticeable in spring and fall lake samples. Anglers themselves might be to blame on that front. Diana and Wahl said too many anglers seemed to ignore the posted size and creel limit for the study, which left researchers without reliable evidence for or against bluegill creel and size limits.

(Photo by Joe McFarland.)

Some lakes—such as Devil's Kitchen Lake on Crab Orchard National Wildlife Refuge—consistently produce great bluegill measuring up to 10 inches.

Prior to the study, four basic approaches were developed for the 32 lakes which contained either quality or stunted bluegill populations. A few lakes were left alone as control examples. Some lakes received a stocking of bass without the size or creel limit, and other lakes were stocked with extra bass but had size and creel limits.

"A lot of these management studies are done on just one lake," Diana observed. "This was done on a large scale, at dozens of different lakes with different conditions."

Another approach examined something totally different: Prior to the study, researchers discovered certain small but sexually mature males would sneak into a larger competitor's spawning bed and fertilize female eggs. Their secret: Small males can alter their colors to mimic the appearance of females, thereby sneaking past the watchful security of dominant males.

Was it possible too many small males were performing this gender-switching trick, thereby increasing populations of genetically stunted bluegill? Or did stunted fish simply fall into repeated cycles of being stunted due to overcrowding? Researchers also noted that bluegill growth rates drop significantly once the fish becomes sexually mature. If too many bluegill were becoming sexually mature before growing to their full potential, none of the fish would reach whopper size.

Under ideal conditions, a 4-year-old bluegill might measure 9 inches or more. If the same bluegill became sexually mature while younger, that 4-year-old fish might measure a mere 5 inches or less. In the absence of larger males, smaller males have no competitive reason to continue growing.

"What causes early sexual maturity in bluegill is pretty complicated," Diana explained. "The social structure of a population appears to influence when it happens—and the environment. Water clarity, possibly affected by the presence of gizzard shad, also seemed to make a difference in other aspects of the study."

In the end, unlocking the secret to preventing early sexual maturity in bluegill appears to be a key factor in controlling stunted bluegill. And while bluegill anglers seeking bigger fish to fry might have to wait for subsequent breakthroughs to arise from the groundwork study, researchers say they're glad to have this much on the books.

(Photo by Illinois Natural History Survey.)

Two bluegill of similar ages might be noticeably different in size, depending on the quality of the bluegill population.