Research on Stocking Hatchery Reared Largemouth Bass
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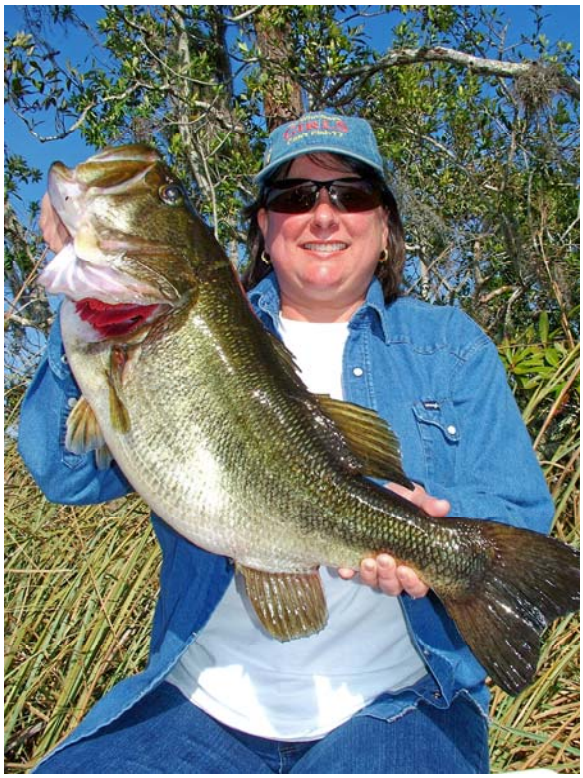
We hear it all the time, "bass management is easy, just stock more fish." Truth is – it isn't that simple. Florida Fish and Wildlife Conservation Commission (FWC) biologists, as well as other fishery research experts, have understood for years that stocking fingerling bass (1-inch to 1.5 inches long) rarely improves fishing. However, the FWC now appears to be on the brink of a breakthrough.



Beth Higginbotham caught and released this bass from Lake Wildcat.

When Richloam Hatchery, in Sumter County, was renovated it took on a number of new roles and challenges and was reborn as the Florida Bass Conservation Center (FBCC). Among those challenges was to expand on pioneering research done by FWC biologists that enable scientists to produce larger advanced fingerling bass (approximately 4 inches long).

There were always occasions when stocking fingerling bass worked, and the FBCC continues to provide fish for those situations. For example, stocking fingerling bass into a new reservoir or community pond built for that

fishing, or into a lake following a drought, a fish kill, or habitat restoration program can restore a population more quickly than natural reproduction alone.

Advanced fingerlings have a greater chance for survival, improving the benefits to anglers.

However, making bass stocking a more effective management tool in other circumstances requires larger hatchery fish, so they can eat a greater variety of prey. Being bigger is also an advantage because fewer predators can eat them.

Sounds simple, but the problems have been significant. First, largemouth bass are typically spawned naturally in hatchery ponds, because they don't respond well to hormones, such as used to spawn striped bass. In addition, small bass are cannibals, and they don't like artificial foods, such as those fed to catfish and trout. Therefore, bass were historically grown in fertilized outdoor ponds with lots of zooplankton (tiny floating animals such as insect larvae). Predators, including minnows, insects and frogs, ate the eggs and baby fish. As they grew larger, other predators such as birds began feasting on the young bass where they concentrated in outdoor ponds.

Consequently, the FBCC was designed to intensively culture largemouth bass indoors using state-of-the-art technology. The FBCC has the

potential to produce more than 1,000,000 advanced fingerling largemouth annually.

Through research, scientists found a way to trick bass fry into eating artificial food. It was discovered that by crowding fry together and feeding them live brine shrimp (the size of a gnat) they'd go into a feeding frenzy and be less choosy in what they ate. That allowed researchers to mix in artificial food that was about the size and color of the brine shrimp. Once the bass fry began eating the artificial food, it was easier to progressively train them to take bigger pellets as the bass grew in size.

FWC scientists check angler's catches with a magnetic wand to determine if they are tagged hatchery bass. Photo by Mark Conlin.

Unfortunately, during the 1990s, survival of pellet-reared bass was low once stocked into Florida lakes. Liver disease and other health problems were linked to poor nutrition. FWC personnel worked with a university nutritionist to develop an artificial diet similar to a bass' natural diet. The custom feed has more digestible fats and appropriate vitamins that have virtually eliminated liver disease in hatchery bass.

Although vigorous, healthy hatchery fish should survive better in the wild, resolving the diet problems led to another concern – domestication. Research showed that pellet-reared largemouth had difficulty capturing prey

in the wild. To reduce this problem, largemouth bass are now fed live fish for a week at the hatchery before stocking. A lack of experience avoiding predators may also reduce survival, so researchers are attempting to teach hatchery bass to stay away from things that might eat them.

Other research has improved culture conditions, fish health management, handling and hauling protocols. Now scientists are comparing survival rates between hatchery fish that are simply stocked at a boat ramp in the traditional manner, versus those distributed into vegetated habitats around the lake, so they are more dispersed and avoid predators more easily.

Time of year when fish are stocked is also important. Bass and other fishes, invertebrates and amphibians typically reproduce at a relatively specific time, often triggered by seasonal factors such as water temperature, day length, lunar cycle and water levels. In this way, nature provides bass with the correct size prey for the young to get a fast start on life. If hatchery fish are stocked too early, prey may not be available, and if stocked too late prey may be too big—and even turn the table eating bass fingerlings.

This occurs earlier in the southern end of the state compared to the Panhandle. Moreover, there is evidence that bass, like other naturally evolved animals, have adapted genetically to these subtle differences, so it is important fisheries managers deal with these unique “stocks” differently so we don’t adversely affect the gene pool of these wonderful sport fish. That’s where the ability to adjust water temperatures in the spawning areas at the

FBCC come into play, by allowing offspring from parental fish from different areas to be ready for stocking at the most opportune moment.

For example, advanced fingerling largemouth reared in ponds on live aquatic organisms and stocked into Lake Talquin fed on fishes more successfully and grew faster than their wild counterparts during their first year of life in the reservoir. At the end of the first year, hatchery fish composed 40 percent of the bass that survived from that year's spawn during a year when 25 fish were stocked per acre. Five years after supplemental bass stocking, hatchery fish accounted for 20-27 percent of bass caught in tournaments. Research is being conducted in Lake Talquin to determine whether pellet-reared hatchery bass will survive as well as hatchery fish reared on live feed.

The Lake Talquin study has provided optimism that stocking advanced sizes of largemouth bass at the appropriate time will become a more widespread and successful management tool. Information gained from research and adaptive management is critical to long-term success of bass stock-enhancement programs. Specific spawning strategies are being used to protect the genetic integrity of Florida bass populations in the state.

In summary, researchers are collaborating to improve diets of hatchery bass to ensure fish behavior suitable for survival in the wild, to determine the time of year that is optimum for stocking, and to refine stocking protocols.

Fishery scientists have few options to manage multi-million dollar recreational fisheries, which justifies the efforts to study and refine largemouth bass culture and stocking protocols. However, to be completely successful, we have to make certain there are healthy habitats available to stock the fish and that anglers follow the necessary rules to share the bounty and ensure safe, sustainable, quality recreational fishing for everyone.

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