

Fisheries Research Summary

Division of Inland Fisheries

N.C. Wildlife Resources Commission



Trophy Largemouth Bass Management at Lake Phelps

The N.C. Wildlife Resources Commission often establishes fishing regulations, such as length limits, to enhance sport fisheries in the public waters of North Carolina.

Since July 1, 2002, a special trophy regulation has been in place at Lake Phelps that is designed to increase the number of largemouth bass greater than 20 inches in the lake. The minimum length limit of 14 inches protects the bass from harvest until they can spawn at least once. The second part of the regulation establishes a protected "slot limit" for largemouth bass between 16 inches and 20 inches. Only largemouth bass between 14 and 16 inches in length, as well as those greater than 20 inches, can be possessed legally.



Prior to implementation of the regulation, largemouth bass anglers at Lake Phelps voiced concerns that their catch rates of largemouth bass greater than 20 inches were low compared to previous years. Data from Commission largemouth bass electrofishing boat sampling collected prior to the trophy regulation revealed an abundance of largemouth bass between 15 inches and 17 inches, but there were few fish greater than 20 inches. Out of 138 adult largemouth bass collected in samples during 2001 and 113 collected in 2002, only two were greater than 20 inches in length (see Figure 1).

In deciding on an appropriate management strategy for Lake Phelps largemouth bass, Commission staff also examined largemouth bass body condition to see if forage availability, low lake productivity, or competition for food among themselves was playing a role in the lengths of the fish. Prior to the trophy regulation, body condition of largemouth bass greater than 16 inches was relatively poor compared to other largemouth bass populations in the Southeast – they were not as plump. But, staff found that the body condition of adult largemouth bass less than 16 inches

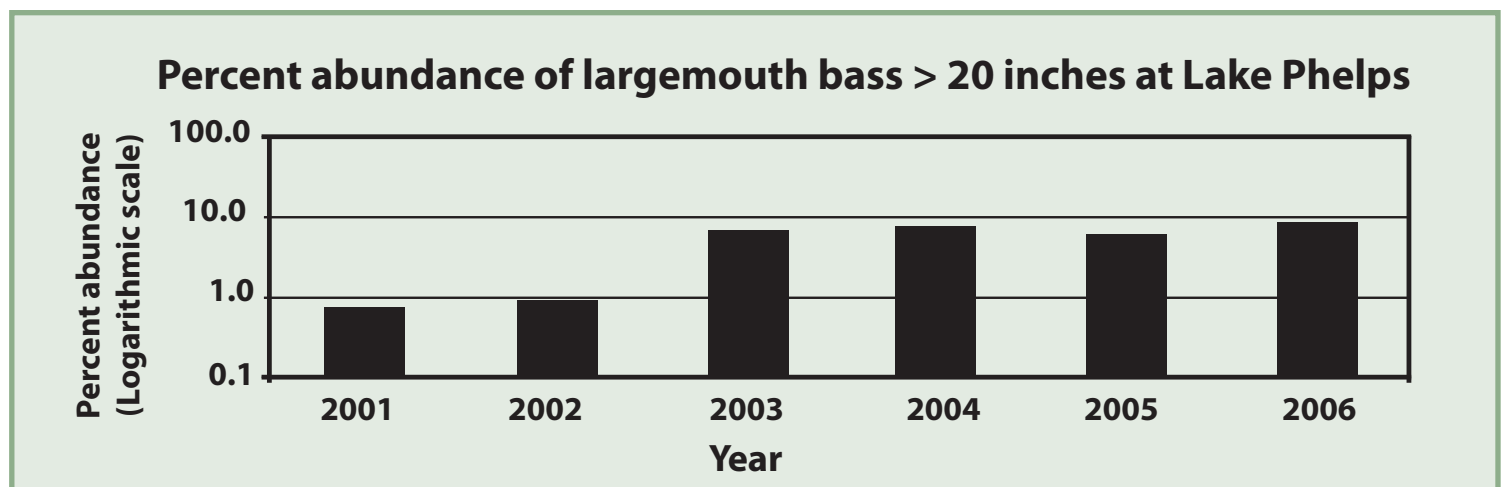


Figure 1. Percent abundance of largemouth bass greater than 20 inches at Lake Phelps from spring electrofishing samples during 2001 (Sample size, $n = 138$), 2002 ($n = 113$), 2003 ($n = 332$), 2004 ($n = 220$), 2005 ($n = 297$) and 2006 ($n = 199$). Note the y-axis is in a logarithmic scale.



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was better than those greater than 16 inches. Because lake conditions (low productivity) are the same for all sizes of largemouth bass, relative differences in weight among different size classes of largemouth bass were more likely related to a combination of forage abundance and competition for the forage. This scenario usually results when there are “too many mouths to feed” with a given level of lake productivity. In other words, the amount of food available at Lake Phelps may not be able to support multiple size groups of fish.

Staff decided that to increase the number of largemouth bass greater than 20 inches, a reduction in the number of largemouth bass of smaller sizes might be needed. A regulation crafted to help influence the sizes of largemouth bass in the lake would need to allow for and maybe even encourage the harvest of largemouth bass in the 14-to-16 inch range.

Based on the information from Commission studies, staff proposed a regulation that would protect largemouth bass from harvest until they reached spawning size; that would also allow harvest of some mid-sized fish; and that, ultimately, would protect the remaining fish from harvest until they grew into the 20-inch “trophy” category. After a series of public meetings, the trophy regulation was implemented and protocols were developed to annually monitor the fish community at Lake Phelps.

Staff is currently evaluating the trophy bass regulation by comparing pre-regulation largemouth bass data to the post-regulation largemouth bass data. Initial results indicate a general increase in the number of largemouth bass greater than 20 inches at Lake Phelps. During the past four springtime samples, staff collected at least 15 largemouth bass greater than 20 inches. These large fish made up between 5.7 percent and 8.0 percent of samples (See Figure 1 on page 1).

Similarly, anglers have reported catching more largemouth bass greater than 20 inches since the regulation was implemented. Although catch rates of largemouth bass by both anglers and biologists are relatively higher than pre-regulation catch rates, condition of largemouth bass greater than 20 inches still appears to be less than optimal. For the current regulation to be effective and condition of largemouth bass to improve, an increase in angler harvest of largemouth bass between 14 inches and 16 inches is necessary, although anglers may not harvest more than five largemouth bass per day.



More largemouth bass anglers are practicing catch and release. In addition, anglers may not be harvesting largemouth bass because of fish consumption advisories related to mercury contamination across North Carolina.

Ongoing management activities to enhance forage fish abundance at Lake Phelps may also boost body condition in Lake Phelps largemouth bass. Staff developed a management option to stock bluegill sunfish at Lake Phelps because fish community sampling data revealed that bluegill abundances were much lower than had been seen historically. After three years of stocking bluegill fingerlings however, abundance of adult bluegill did not change significantly. Thus, fingerling bluegill stocking to improve forage availability may not be a viable option for the future.



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Another management option being examined is the reintroduction of river herring (blueback herring and alewife) to Lake Phelps. Historically, during springtime migrations, anadromous river herring swam upstream from the Scuppernong River to Lake Phelps through large drainage canals, including Bee Tree Canal. In 1984, an experimental fish ladder was installed by the Commission in Bee Tree Canal to enhance herring migration to Lake Phelps.

Although water levels were sufficient to operate the fish ladder in 1984 and part of 1985, use of the fish ladder by river herring was not documented, and adult river herring were not collected in Lake Phelps in those years. After three consecutive years of drought, the fish ladder was removed. In May 2006, a new fish ladder was installed in Bee Tree Canal by the U.S. Fish and Wildlife Service in another attempt to attract river herring to available spawning habitat in Lake Phelps.

In a concurrent effort, East Carolina University researchers will attempt to jump-start the reintroduction of herring by collecting pre-spawn adult river herring from the Scuppernong River and stocking them into Lake Phelps in spring 2007. If these programs are successful, juvenile river herring in Lake Phelps could serve as a major boost in the forage fish availability for largemouth bass, and a reestablished spawning run of river herring may also help revitalize severely diminished river herring populations.

The effectiveness of the trophy largemouth bass regulation at Lake Phelps continues to be evaluated. The numbers of largemouth bass that fall within the slot limit continue to be very abundant in the lake, and provide an outstanding catch-and-release fishing opportunity.

The Commission's initial regulation assessment indicates abundance of largemouth bass greater than 20 inches also appears to be increasing at Lake Phelps. Condition of these largemouth bass, however, is less than optimal. Forage fish enhancement projects are under way that may increase the condition of these trophy-size largemouth bass.

Commission staff plans to maintain the current regulation during the next four years and further evaluate its effectiveness in light of progress in forage fish enhancement.



An example of a largemouth bass in poor condition.



Chad Thomas, fisheries supervisor for the Coastal Region, holds a largemouth bass in excellent condition.

