Fisheries Research Fact Sheet

Largemouth Bass Population Monitoring in B. E. Jordan Lake: Using Over 20 Years of Surveys to Estimate Largemouth Bass Mortality

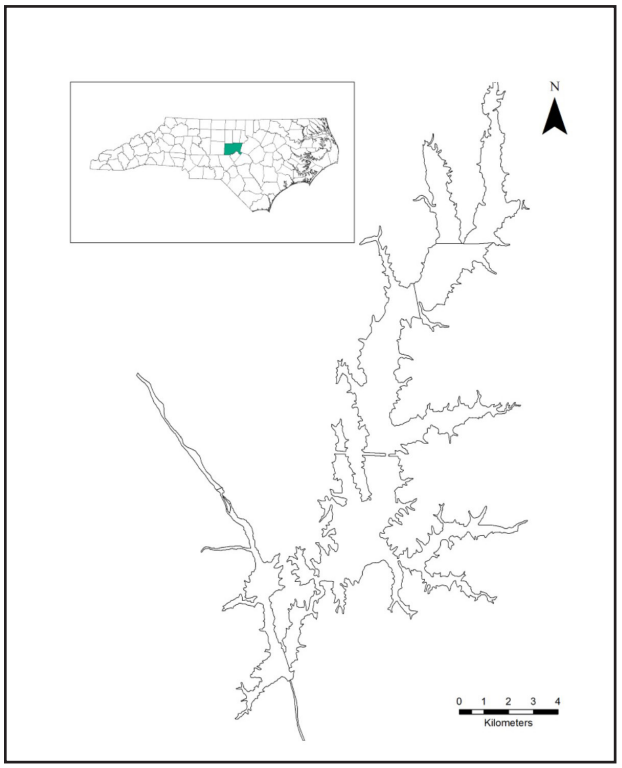
May 2020

B. Everett Jordan Reservoir (Jordan Lake) is a 13,942-acre impoundment at the confluence of the Haw River and New Hope Creek in Chatham County approximately 30 miles west of Raleigh, NC. Jordan Lake was impounded in 1982 by the United States Army Corps of Engineers. The lake provides drinking water for eight surrounding municipalities and provides flood control for the cities along the Cape Fear River downstream to Wilmington, NC. Its proximity to the Triangle region, diverse fish community, and productive fish populations make it a popular destination for numerous anglers each year. Mortality and survival of fish in a lake is very important to fish managers because it can help and is used to estimate what is known as the overall recruitment to certain size classes or life stages that are important in sustaining a good fishery.

Routine Largemouth Bass surveys have been completed by the N.C. Wildlife Resources Commission (Commission) for Jordan Lake since 1983. These routine surveys allow Commission biologists to monitor the fishery to ensure that size and creel regulations are appropriate for achieving management goals. Biologists have captured 9,426 individual bass during 21 surveys over this period of time. Shoreline electrofishing is used to collect Largemouth Bass and is performed in the spring as the water begins to warm and the fish move into the shallow areas to spawn. Biologists survey multiple sites throughout the reservoir where Largemouth Bass are collected, measured, and weighed. A subset of those fish collected are sacrificed and otoliths ("ear stones") are collected to allow biologists to determine the ages of those fish.

Commission biologists have now completed an analysis of 9,085 Largemouth Bass collected at Jordan Lake since 1989 to determine how population characteristics, such as mortality, have changed over time. The size of Largemouth Bass caught in these surveys varied widely, but for the purpose of the analyses, biologists only included fish that were at least 6 inches in length; these fish ranged in age from 0 to 16 years old.

Mortality rates, or the rate of natural- and fishing-related deaths over a given time frame, are an important component



Map of B. E. Jordan Lake

Largemouth Bass collected from Jordan Lake

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of fisheries management. Fishery biologists often look at mortality over different time scales and attempt to estimate a fish's potential for mortality at different life stages from juvenile to adulthood stages. Most bass populations exhibit a concave survival curve where the highest potential for death occurs during the earliest stages of a fish's life (Figure 1). Mortality and survival (the opposite of mortality) drive the size and age structures of fish populations and ultimately determine how many fish of a particular species are present at a given time in a waterbody. Biologists estimated mortality rates for the Jordan Lake Largemouth Bass fishery over time (Figure 2).

The annual mortality, which includes natural and fishing mortality, for the population (i.e. the population as a whole, rather than certain age classes) ranged between 29.8% and 41.7%. The overall average mortality was 32.4% over the 20 surveys. These numbers are on par with other lakes in the Southeastern U.S. and are typical of popular Largemouth Bass fisheries with ample fishing pressure and numerous bass fishing tournaments. There was no discernable trend in the estimated mortality rates, meaning mortality has not changed significantly over time despite the apparent increase in tournaments and fishing pressure. The variation among the estimates is likely due to minor changes in sampling strategies over time. The estimated mortality rates are healthy for a productive system such as Jordan Lake and are not detrimental to the population. Mortality is a routine component of a fishery that keeps a population in balance as young fish grow older and older fish are either harvested or die of natural causes.

In general, mortality rates have changed very little within the Jordan Lake Largemouth Bass population during the last 30 years. Low harvest rates coupled with the ample amounts of fishing pressure have kept the population thriving and healthy. Five fish limits in excess of 25 pounds are common during spring and fall when Largemouth Bass are active and foraging frequently and angler satisfaction appears to be satisfactory. Commission biologists will continue to monitor the population and adjust regulations as necessary.

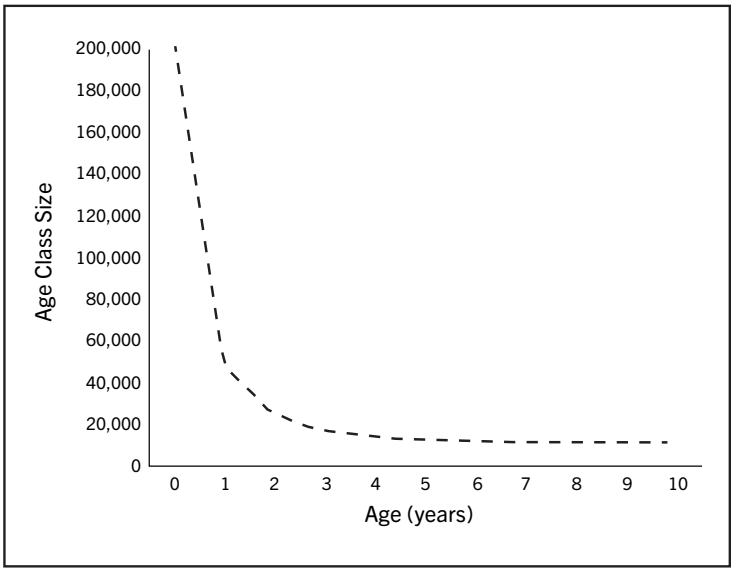

Figure 1. Hypothetical progression of mortality through time as Largemouth Bass increase in age.

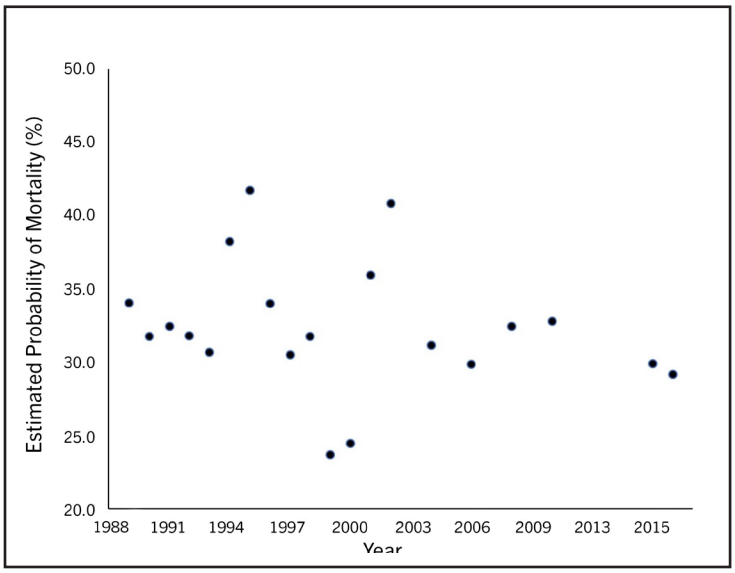

Figure 2. Estimated Annual mortality rates for the population of Largemouth Bass in B. E. Jordan Lake between 1989 and 2016. Y-axis is on a percentage scale between 0-50% chance of a fish in the population falling to mortality in a given year.

For more information, contact:

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