



Black Bass Population Characteristics in Lake Norman, North Carolina After the Introduction of Alabama Bass

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Since 1993, Duke Energy Corporation has conducted annual surveys to monitor fish populations at Lake Norman as part of its overall compliance monitoring program. During this time, Duke Energy biologists have shared these data with N.C. Wildlife Resources Commission (NCWRC) fisheries biologists, who have used them to track trends in the Largemouth Bass population in the reservoir. In 2002, Alabama Bass were first detected while conducting Duke Energy's annual survey. In 2010 and 2013, NCWRC fisheries biologists conducted additional sampling to bolster the work of Duke Energy. The native range of Alabama Bass is the Mobile River basin, which includes portions of Alabama, Mississippi and Georgia. Until 2008, Alabama Bass were thought to be a subspecies of Spotted Bass. However, fisheries scientists determined Alabama Bass were, in fact, a separate species. Anglers had requested the NCWRC to stock Spotted Bass in Lake Norman as early as the mid-1980s. Many had requested the Alabama Bass because Alabama Bass have higher growth potential than Spotted Bass in their native range. The NCWRC consistently declined to stock Spotted Bass and Alabama Bass but ultimately, these species were introduced despite objections from NCWRC staff. However, since both species are indistinguishable, NCWRC staff were unsure of the exact species that had been stocked in the reservoir. The goals of this study were to determine the impacts the introduced black bass had on native Largemouth Bass and to confirm the species of black bass introduced into the lake.

Project Objectives:

- To determine the changes in the black bass population since the introduction of Alabama Bass.
- To confirm that the introduced black bass species were Alabama Bass and not Spotted Bass.

Methods:

- Black bass were collected annually from 1994–2013 by Duke Energy and NCWRC except for 1998 using standard boat electrofishing techniques.
- Electrofishing was conducted at 10 fixed sites in each of three zones Marshall Steam Station (Lower Lake), Upper Forebay, and McGuire Nuclear

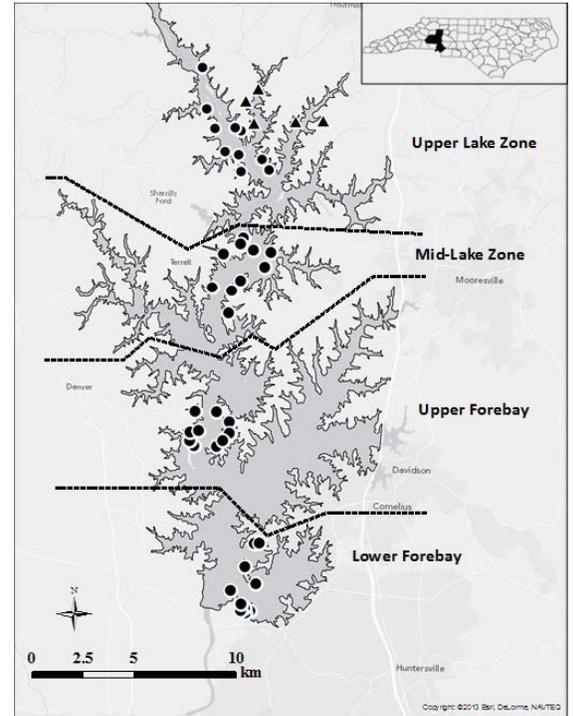


Figure 1. Map of Lake Norman illustrating sampling zones within the reservoir. Circles indicate Duke Energy electrofishing stations and triangles indicate stations sampled by the NCWRC.



Angler John Velte holds an Alabama Bass from Lake Norman. (Photo by B. Kim Baker)



Methods (continued):

Station (Lower Forebay). Additional samples were also taken in 1999, 2005, 2010 and 2013 in the Upper Lake zone (Figure 1).

- Lengths and weights were taken for each individual fish collected and catch per unit effort (CPUE; number of fish/300 meters) was calculated for each species by site and year.
- In 2014, a sample of suspected Alabama Bass was sent to Auburn University for genetic analysis and compared with Spotted Bass collected from Kentucky Lake, TN and Alabama Bass from the Tallapoosa River, AL.

Results:

- Alabama Bass were first collected in Duke Energy Surveys in 2002. By 2010, they were almost five times more abundant than Largemouth Bass in surveys. Alabama Bass were first collected in the Lower Forebay zone in 2002, and by 2004, they had spread to the Lower Lake zone. They were not collected in the Upper Lake zone in 2005 but they were detected in the 2010 survey. Alabama Bass were likely established throughout the entire reservoir within 10 years of the initial introduction.
- From 1993–2013, Largemouth Bass CPUE ranged from a high of 22 fish/300 meters in 1996 to 1 fish/300 meters in 2013. After 2002 when the first Alabama Bass was collected, CPUE of Largemouth Bass declined from 14 fish/300 meters to 1 fish per 300 meters by 2013 (Figure 2).
- Mean total length of both species increased over the study period but for different reasons. For Largemouth Bass, the increase was likely due to decreased numbers of fish competing for food resources, which yielded higher individual lengths on average. For Alabama Bass, the increase was due to the establishment of the fishery where few year classes were present initially but as the overall population expanded in age structure, average lengths increased concurrently (Figure 3).
- Results of genetic analysis clearly indicated the introduced black bass species in Lake Norman are Alabama Bass and not Spotted Bass as once previously thought.
- This introduction serves as a clear case of the long-term negative effects that unauthorized fish stockings can have on existing populations.

What's next?:

- Biologists will continue to monitor this fishery in conjunction with Duke Energy's standard survey program and make management changes as necessary.
- Biologists will use this as an educational tool to demonstrate to anglers the long-term effects of introducing nonnative species on established fish populations.

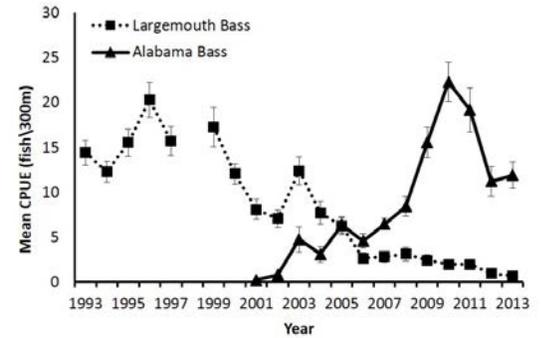


Figure 2. Mean catch per unit effort (CPUE) of Largemouth Bass and Alabama Bass from Lake Norman, North Carolina, 1993–2013.

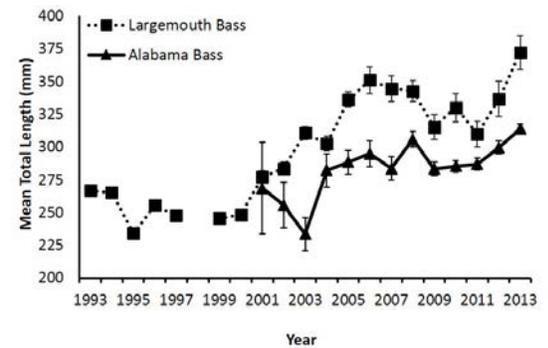


Figure 3. Mean total length of Largemouth Bass and Alabama Bass from Lake Norman, North Carolina, 1993–2013.



Fisheries Biologists Lawrence Dorsey (left) and Troy Thompson conduct an electrofishing survey for black bass on Lake Norman. (Photo by Keith Hendrickson)

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