



High Rock Lake Black Crappie Population Dynamics 2000-2016

March 2019



The N.C. Wildlife Resources Commission (Commission) has conducted crappie surveys at High Rock Lake since 2000 to monitor population conditions and to determine if existing regulations were effective. High Rock Lake is a 15,180-acre reservoir located along the Yadkin River in Davidson and Rowan counties. It contains popular fisheries for Largemouth Bass, Black and White Crappie, and several species of catfish. The regulations for Black Crappie and White Crappie at High Rock Lake during these surveys was an 8-inch minimum size limit and a 20-fish-per-day creel limit. Although High Rock Lake contains both Black Crappie and White Crappie, Black Crappie typically outnumber White Crappie in surveys and therefore analyses for High Rock Lake are focused on Black Crappie.

In addition to continuous evaluation of agency regulations based on population surveys, staff also receive feedback periodically from anglers who fish the state's waterbodies. Beginning in 2012, anglers who fished for crappie at High Rock Lake expressed frustration that the crappie population contained a high percentage of sub-legal fish, which limited their ability to harvest crappie in this reservoir. Many crappie anglers are harvest oriented so the ability to harvest some crappie on each fishing trip is an important component for crappie fisheries.

Objectives:

- To determine the relative abundance, size structure, and growth rates of Black Crappie in High Rock Lake over a multi-year period.
- To evaluate the effectiveness of the current regulations for Black Crappie at High Rock Lake.

Methods:

- Crappie were collected during October and November of each study period using trap nets. Studies were conducted in 2000, 2003, 2006, 2010, 2013, and 2016.
- Trap nets were fished at fixed locations across several areas of the reservoir including Second Creek, Crane Creek, Swearing Creek, Flat Swamp Creek, and along the main basin of the reservoir.
- Black Crappie were collected daily from nets. Each fish was measured and weighed. A subsample of fish during each survey were sacrificed and their otoliths removed for age determination. If a fish was not kept as part of the subsample, it was returned to the reservoir after processing.
- Relative abundance was calculated by dividing the total number of fish collected in a survey by the total number of net nights (one net set in a location for one night = one net night). This is called catch per unit effort (CPUE). Size structure was determined as the percentage of Black Crappie collected that were greater than or equal to 8 inches in total length. Growth rates were measured by calculating the average length of all age-2 Black Crappie collected in each survey.

Results:

- CPUE ranged from a low of 9 fish per net night in 2010 to a high of 34 fish per net night in 2016 (Figure 1, next page). While these values fluctuated almost four-fold over the period of these surveys, CPUE in 2002 and 2010 were within the average range of relative abundance measured in Piedmont reservoirs (4–18 fish per net night). In all other years, CPUE was well above average values which indicated high densities of Black Crappie present in High Rock Lake.



0 5 10 Miles



Map of High Rock Lake located in Davidson and Rowan counties in the Piedmont, North Carolina.



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- The percentage of fish greater than or equal to 8 inches in total length ranged from 12 percent to 61 percent over these surveys (Figure 2). In all but two years, 2003 and 2013, at least 45 percent of the Black Crappie collected in surveys were at least 8 inches in total length. These shifts in size structure towards smaller average size appeared to occur after periods of balance between legal and sub-legal sizes of Black Crappie. This effect was likely the result of highly successful spawning years for Black Crappie immediately prior to our survey years.
- Average length of age-2 Black Crappie ranged from 7 inches to 9 inches over our surveys (Figure 3). The average size range for age-2 Black Crappie in Piedmont reservoirs is between 8 and 10 inches. The average length of age-2 Black Crappie was below average for Piedmont reservoirs in 2003 and 2013. In none of the years surveyed did the average length for age-2 Black Crappie equal or exceed 9 inches.
- The Black Crappie population in High Rock Lake exhibited above average densities of fish with average growth rates over most of the surveys conducted from 2000-2016. In most years, a sizeable portion of the fishery was available to harvest by anglers. However, average size of age-2 fish never exceeded 9 inches indicating that most fish in the population were just large enough to be harvested but few exceptional size fish were present in the population.

What's Next:

- As a result of survey results and angler comments, staff proposed in 2015 to eliminate the 8-inch minimum size limit and 20 fish daily creel. This regulation was adopted by the Commission and went into effect on Aug. 1, 2016. The goal of this regulation change is to increase the average size of Black Crappie while maintaining average to above average densities of Black Crappie in High Rock Lake. Initial reports from anglers and Commission Wildlife Enforcement Officers suggest that anglers are happy with this regulation change.
- Biologists will continue to survey the crappie population in High Rock Lake on a routine basis. Although they conducted a crappie survey in 2016, the survey was just after the elimination of the size and creel limits and they would not have seen any changes to the fishery at that point. The next survey is scheduled for fall 2019.

For more information, contact:

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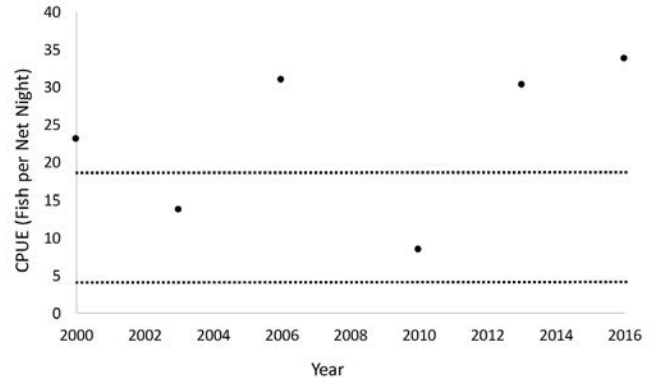


FIGURE 1 – Catch per unit effort of Black Crappie from High Rock Lake. Dotted horizontal lines indicate the Black Crappie average CPUE range for the Piedmont Region.

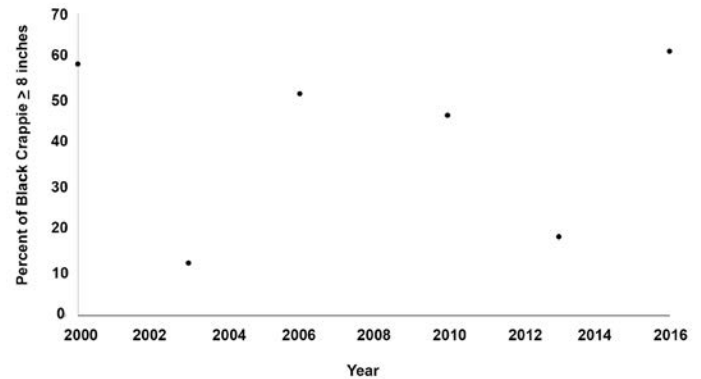


FIGURE 2 – Percentage of Black Crappie greater than or equal to 8 in. in High Rock Lake.

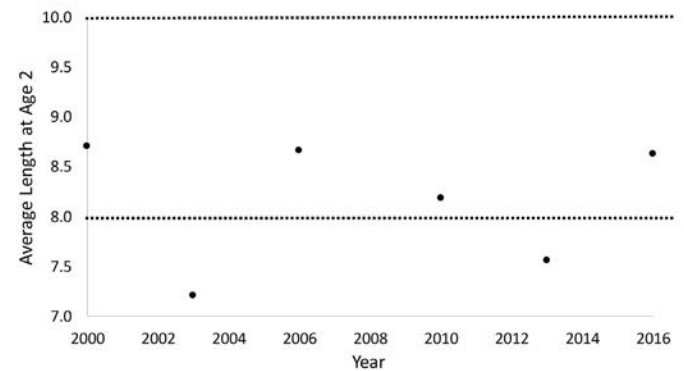


FIGURE 3 – Average length (inches) of age-2 Black Crappie in High Rock Lake. Dotted horizontal lines indicate the Black Crappie average length of age-2 fish range for the Piedmont Region.

