



Fisheries Research Fact Sheet

High Rock Lake Black Crappie Population Assessment - 2019

January 2021



Black (top) & White Crappie illustrations by Duane Raver

The N.C. Wildlife Resources Commission (NCWRC) recently conducted a trap net survey at High Rock Lake to determine the status of the crappie population and to evaluate the management of the fishery. The 15,180-acre impoundment of the Yadkin River is located in Rowan and Davidson counties and is one of the more productive lakes in the Piedmont. High Rock Lake is a popular destination for North Carolina anglers with several species of interest including Largemouth Bass, Striped Bass, White Bass, Black Crappie, White Crappie, Flathead Catfish, and Blue Catfish.



High Rock Lake is located in Rowan and Davidson counties in the Piedmont region of North Carolina

Historically, High Rock Lake has produced large numbers of smaller, slower growing (stunted) crappies. Although lack of adequate forage plays a role, slow growth at High Rock Lake is likely due primarily to an excessive amount of recruitment, which is the number of fish that survive to catchable size. Poor growth, condition (plumpness), and size distribution led fisheries biologists to remove the 8-inch minimum length limit and 20-fish daily creel limit on crappies at High Rock Lake in 2015. Although anglers generally prefer to harvest larger crappies, a significant increase in the harvest of 6–8 inch crappies can lead to improvements in growth, condition, and average size. Evaluating population responses to regulation changes is critical for proper sportfish management.

Project Objectives:

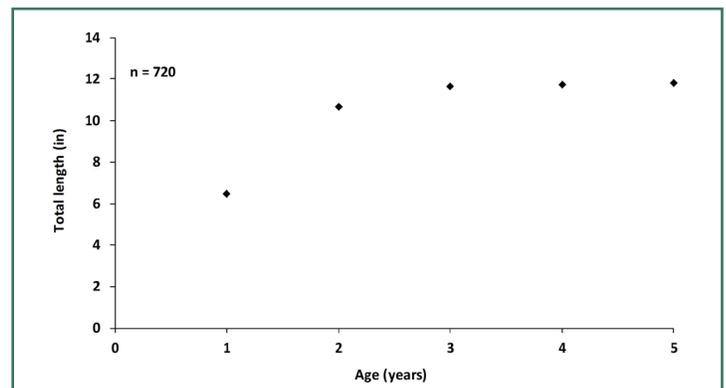
- Determine the status of the crappie population by analyzing relative abundance, length distribution, age distribution, and growth.
- Compare these parameters with those from previous surveys to determine the effects, if any, of the regulation removal on the crappie population.

Methods:

- In November 2019 twelve trap nets were set perpendicular to the shore with the leading panel tied to a shoreline tree, usually on or near a point. The trap nets were checked daily for two days to remove any fish collected.
- Crappies were identified to species, weighed, and measured. Otoliths (ear stones) were removed from a subsample of the catch to determine age and the rest of the fish were released back into the lake unharmed.

Results:

- A total of 894 crappies were collected, of which 81% were Black Crappies and 19% were White Crappies. This is typical for High Rock Lake where White Crappies normally constitute 20–30% of the total population. Although their life histories are similar, White Crappies tend to have more variable recruitment, faster growth, and shorter lifespans compared with Black Crappies.
- Growth was exceptional for crappies older than age 1 (Figure 1). Age-2 Black Crappies exhibited a mean length



Mean total length at age at time of capture of Black Crappies collected from High Rock Lake with trap nets, November 2019



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more typical of age-3 fish in an average Piedmont reservoir. Additionally, the mean length values of age-2 and age-3 Black Crappies are the highest that have been recorded at High Rock Lake in at least twenty years (Table 1).

- Over 20% of the total crappie population was greater than 10 inches in length (Figure 2). This indicates that many larger fish are available for angler harvest.
- The removal of harvest regulations is a factor that may have influenced improvements in growth and length distribution. However, annual recruitment is likely the most significant driver of these positive changes. Strong year classes were not produced from 2015–2017 and this likely reduced crowding and competition for resources during this time.
- Data analysis indicates that a very strong year class was produced in 2018, however age-1 fish comprised 79% of the Black Crappie sample (Figure 3) and 99% of the White Crappie sample in 2019 and growth was slow for these fish. Since age-1 and age-2 crappies typically support this fishery, stunting conditions are likely to return when consecutive strong year classes are formed.

What's Next:

- Although the crappie population was in better shape overall in 2019, stunting conditions are likely to return when consecutive strong year classes are formed. Because of this propensity, anglers are strongly encouraged to harvest smaller crappies at High Rock Lake.
- Future trap net surveys will be important to fully determine the effects of the regulation removal and to help guide future management actions. Currently the reservoir is sampled every three years and the next survey is planned for fall 2022.

For more information, contact:

Troy Thompson, District 6 Fisheries Biologist I
 (910) 439-2006; troy.thompson@ncwildlife.org

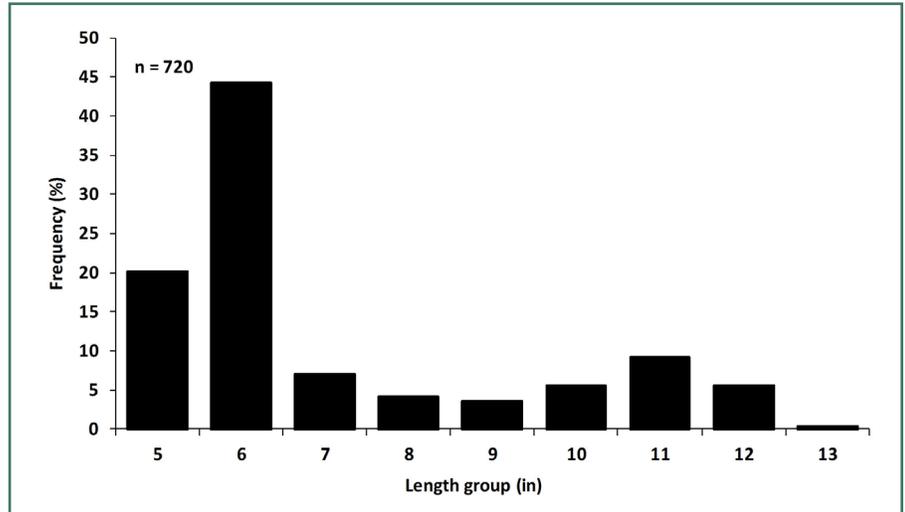


Figure 2. Length frequency distribution of Black Crappies collected from High Rock Lake with trap nets, November 2019

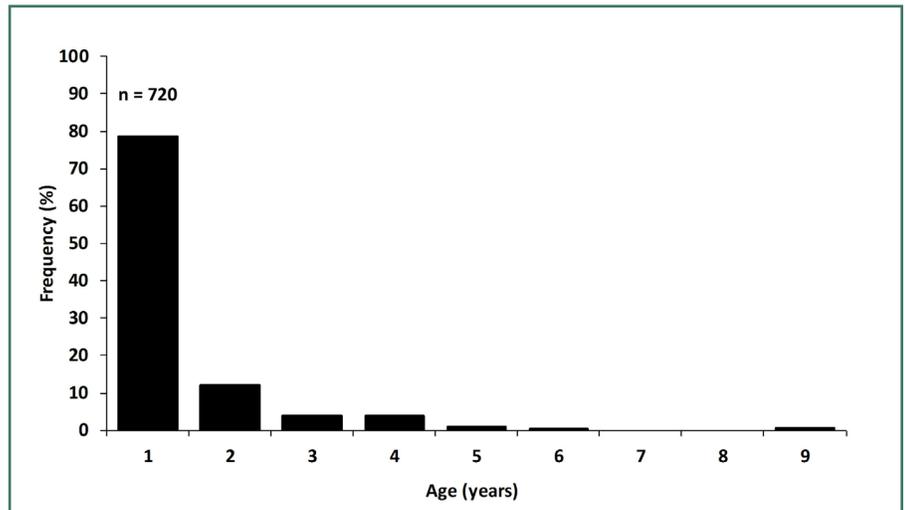


Figure 3. Age frequency distribution of Black Crappies collected from High Rock Lake with trap nets, November 2019

Year	Fish per net night	% 10 in and larger	% Age 3 and older	Mean length at age 2 (in)	Mean length at age 3 (in)	% 1 lb and larger
2003	14	4	9	7.2	8.9	1.5
2006	31	10	25	8.7	9.4	1.3
2010	9	22	22	8.2	10.0	3.7
2013	30	7	27	7.6	8.1	1
2016	34	4	13	8.6	9.3	0.7
2019	30	20	9	10.7	11.7	5.7

Table 1. Mean number of fish caught per net night, percent of fish that were 10 inches and larger, percent of fish that were age 3 and older, mean total length of age-2 fish at time of capture, mean total length of age-3 fish at time of capture, and percent of fish that were greater than one pound. Black Crappies collected from High Rock Lake with trap nets, November 2003, 2006, 2010, 2013, 2016, and 2019.

