

High Rock Lake Striped Bass Survey, 2006

SUMMARY REPORT

PIEDMONT FISHERIES INVESTIGATIONS

Federal Aid in Fish Restoration
Project F-23

Project Type: Survey

Period Covered: December 2006

Troy Thompson

Fisheries Biologist

North Carolina Wildlife Resources Commission
Division of Inland Fisheries
Raleigh

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Funds from the Sport Fish Restoration Program are used for fisheries management and research, aquatic education, and boating access facilities. The program is administered cooperatively by the N.C. Wildlife Resources Commission and the U.S. Fish and Wildlife Service.

Background

High Rock Lake is a 6,374-ha mainstream impoundment located on the Yadkin River located in Davidson and Rowan counties. The reservoir is operated by Yadkin-APGI for hydropower generation but also facilitates recreational uses. As a result of operational objectives, the lake is subject to a fall drawdown of approximately three meters. Shoreline development is relatively heavy with private developments along most of the lake. Shoreline habitat primarily consists of piers, riprap, tree laps and emergent vegetation. The reservoir is classified as eutrophic by the North Carolina Division of Water Quality (NCDWQ 2007). Species of interest to anglers include largemouth bass *Micropterus salmoides*, white bass *Morone chrysops*, striped bass *M. saxatilis*, black crappie *Pomoxis nigromaculatus*, white crappie *P. annularis*, flathead catfish *Pylodictus olivaris*, and blue catfish *Ictalurus furcatus*. The North Carolina Wildlife Resources Commission stocks approximately 79,000 (12.4/ha) fingerling striped bass into High Rock Lake each year. The daily creel limit is eight fish, two of which may be less than 406 mm.

The objective of this survey was to obtain stock assessment data needed to evaluate and manage striped bass in High Rock Lake.

Methods

Field Collections

Striped bass were collected from December 12-18, 2006 using 51- and 76-mm-bar-mesh gill nets set perpendicular to the shoreline. Total length (mm) and weight (g) were measured and sagittal otoliths were collected from all fish.

Data Assessment

The status of the striped bass population was determined by evaluating growth and body condition. Data were compared with surveys from previous years to monitor population trends and develop management recommendations to maintain and improve the fishery.

Growth

Growth was evaluated by examining mean length at age at time of capture and by modeling the von Bertalanffy growth curve:

$$L_t = L_{inf} (1 - e^{-k(t-t_0)})$$

where L_t = length at time t , L_{inf} = maximum length, k = growth coefficient, and t_0 = the theoretical age at which the fish would have zero length (Ricker 1975). In fitting the growth curve, fractional ages were used to account for growth between an assumed May 1 hatch date and the date of capture. Fast growth may be due to high harvest rates or abundant forage. Slow growth may indicate overcrowding or an insufficient food supply.

Body Condition

Relative weight provides an indication of body condition compared to a national average and a value of 100 is considered ideal. Relative weight can fluctuate with season. Low relative

weight values mean fish are skinnier than average and high values indicate that fish are heavier than average.

Results

Catch Data

A total of 80 striped bass were collected from High Rock Lake over 40 net-nights. Approximately 91% were over the minimum length limit of 406 mm (Figure 1). Striped bass up to age 8 were sampled and 49% were age 3 or older (Figure 2).

Growth

Mean length of age-3 fish at the time of capture was 649 mm. This is above the Yadkin-Pee Dee River reservoir average of 636 mm (NCWRC, unpublished data). The growth rate was fairly rapid before slowing after age 6 (Figure 3).

Body Condition

The mean relative weight for striped bass was 108 and is above the Yadkin-Pee Dee River reservoir average of 101 (NCWRC, unpublished data). Relative weights increased slightly with increasing length (Figure 4). Striped bass less than 500 mm (mostly age 1) had a mean relative weight of 107 versus 109 for those over 500 mm.

Summary

In 2006, the striped bass population in High Rock Lake exhibited excellent body condition and fast growth by reaching the minimum size limit before age 2. Growth rates remained high as modeled by the von Bertalanffy growth curve before slowing after age 6. Unlike striped bass in many Piedmont reservoirs, body condition did not decrease with age in High Rock Lake. This indicates that adequate forage is available for larger fish. However, few fish over age 3 were captured in 2006. This situation may improve in future samples with the deployment of larger 89-mm-bar-mesh gill nets.

Recommendations

1. Stock 79,000 striped bass fingerlings into High Rock Lake in 2008.
2. Maintain current minimum size and creel limits on striped bass at High Rock Lake.
3. Continue to sample High Rock Lake every 2-3 years during fall with gill nets to examine temporal trends in the population and evaluate current regulation.

References

NCDWQ (North Carolina Division of Water Quality). 2007. Lake and reservoir assessments – Yadkin-Pee Dee River Basin. Final Report, Raleigh.

Ricker, W. E. 1975. Computation and interpretation of biological statistics of fish populations. Bulletin of the Fisheries Research Board of Canada 191.

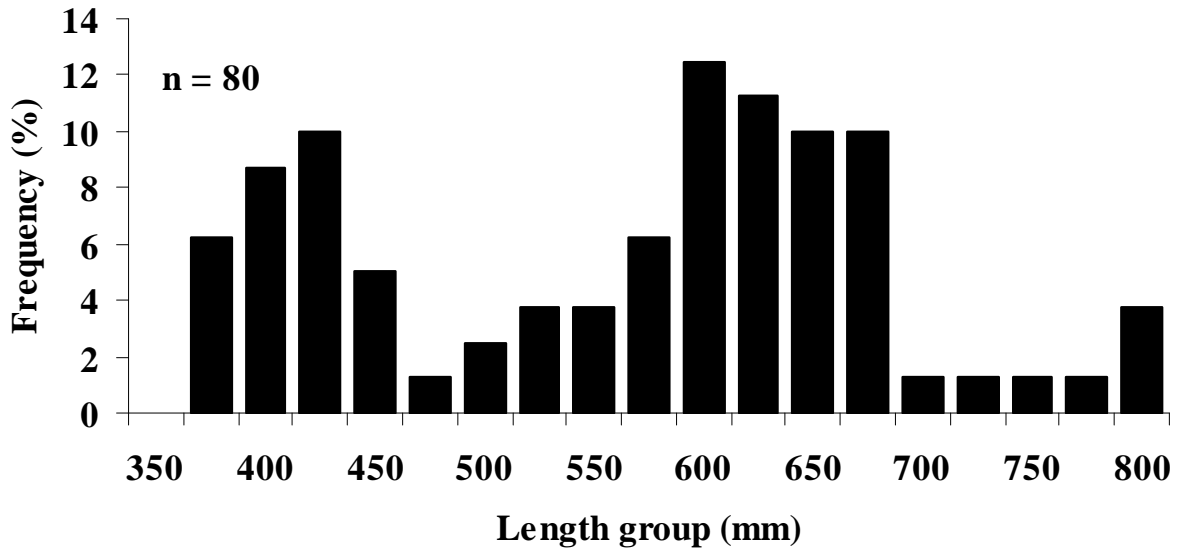


FIGURE 1.—Length frequency distribution of striped bass collected from High Rock Lake with gill nets, December 2006.

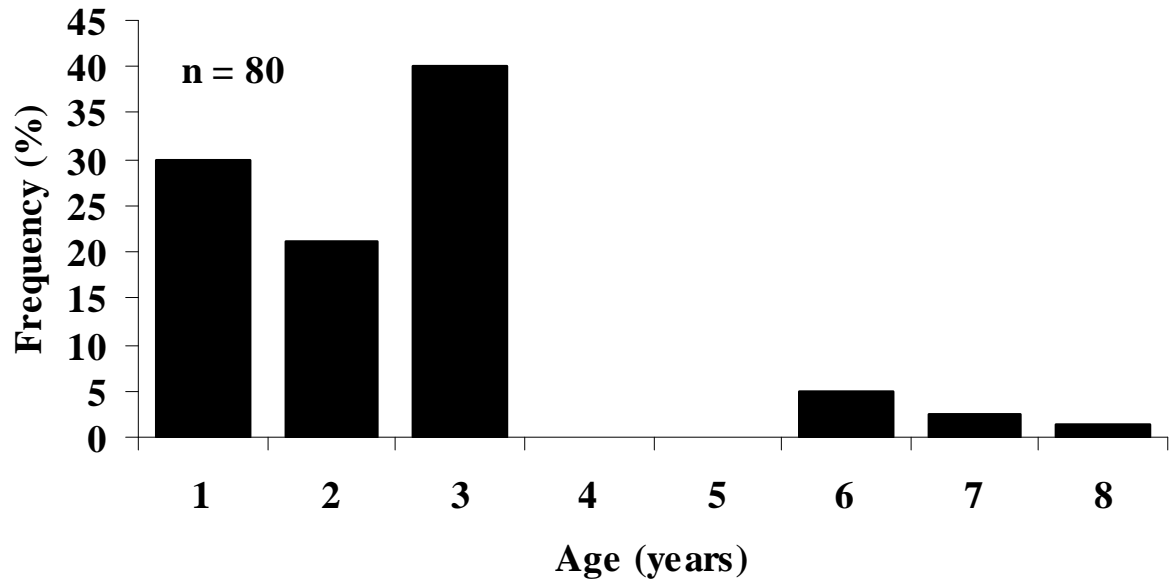


FIGURE 2.—Age frequency distribution of striped bass collected from High Rock Lake with gill nets, December 2006.

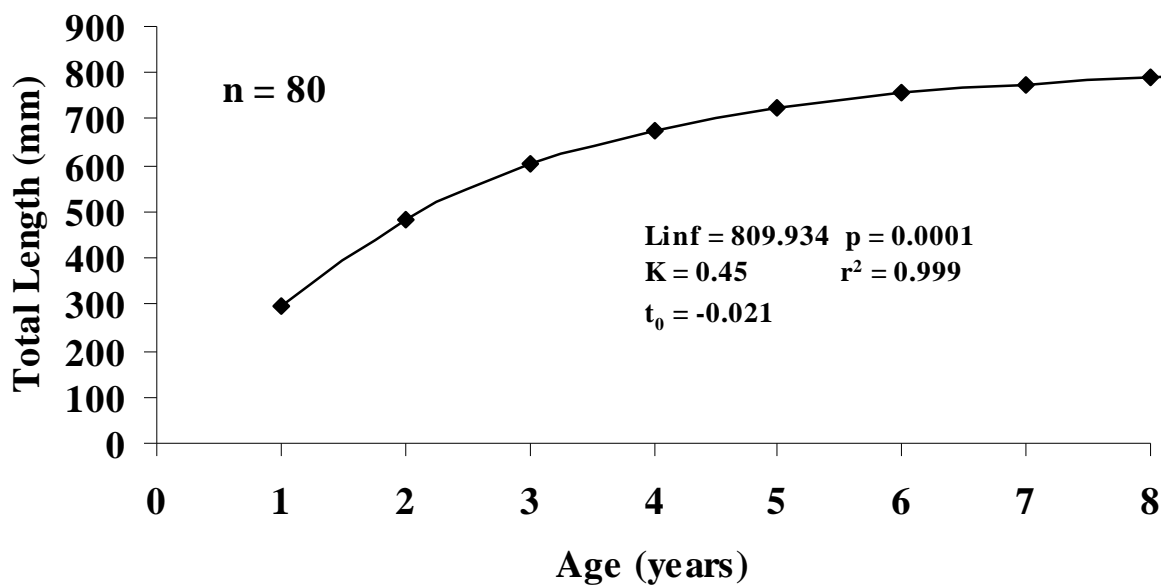


FIGURE 3.—Von Bertalanffy growth curve for striped bass collected from High Rock Lake with gill nets, December 2006.

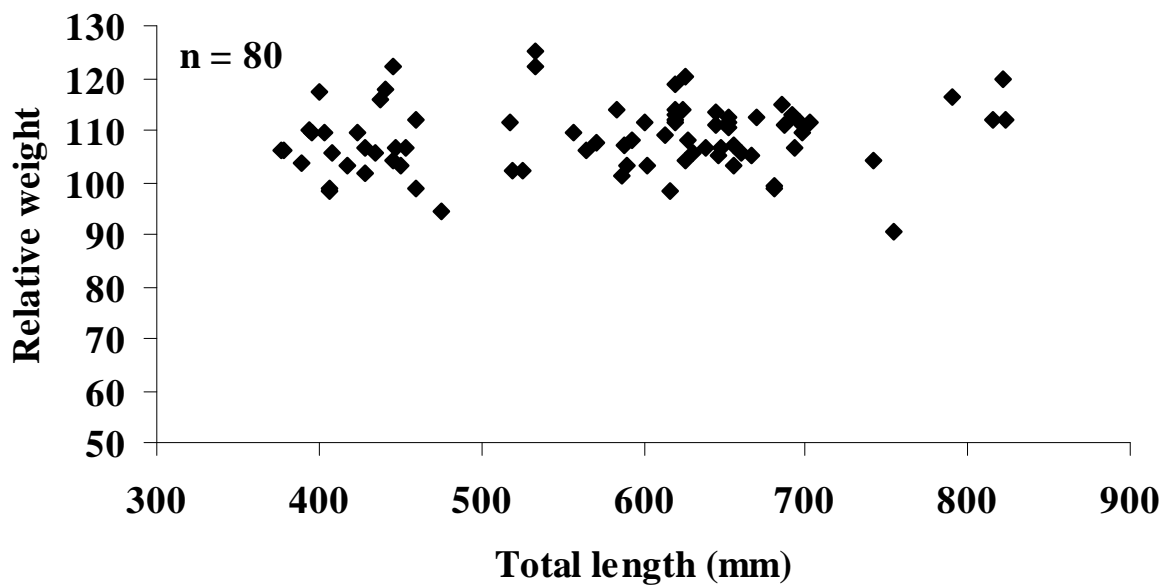


FIGURE 4.—Relationship between length and relative weight of striped bass collected from High Rock Lake with gill nets, December 2006.