

LARGEMOUTH BASS POPULATION CHARACTERISTICS IN HIGH ROCK LAKE, 2001

Piedmont Fisheries Investigations

Federal Aid in Fish Restoration Project F-23-S

Period Covered: 1 April 2001– 30 May 2001

Project Type: Survey

Final Report

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2001

Abstract

Largemouth bass were sampled in High Rock Lake during April of 2001. Size structure and relative weight data indicated the largemouth bass population was in good condition with a large number of harvestable fish present. A sub sample of largemouth bass collected was retained for largemouth bass virus detection. Of the fish assayed, a single fish tested positive for this virus.

Introduction

Across the United States, largemouth bass are the favorite species among anglers (USFWS 1996). The high value placed on this species by anglers necessitates thorough evaluation of population conditions and current regulations as both relate to management goals. As shoreline development continues to occur along Yadkin-Pee Dee reservoirs, it will be important to monitor the condition of largemouth bass, a species that typically uses littoral habitats.

The objectives of this study were to:

- 1) determine the current status of the largemouth bass population in High Rock Lake.
- 2) quantify the status of largemouth bass virus (LMBV) in the largemouth bass population.

Study Area

High Rock Lake is a 6374 ha mainstream impoundment located on the Yadkin River in Davidson and Rowan Counties. The reservoir is operated by Yadkin-APGI incorporated for hydropower generation but also facilitates flood control and recreational uses. The reservoir is subject to water level fluctuations as a result of operational objectives. Shoreline development is relatively heavy with homes, lawns, boathouses, piers, and other facilities occurring around most of the lake. Aquatic cover mostly consists of tree lumps and buttonbush Cephalanthus occidentalis at scattered locations, as well as riprap along railroad and highway approaches. The NC Division of Water Quality (NCDENR 1988) classifies High Rock Lake as a eutrophic reservoir.

Several species of interest to anglers are present in High Rock Lake. They include largemouth bass Micropertus salmoides, white bass Morone chrysops, striped bass Morone saxatilis, black crappie Pomoxis nigromaculatus, white crappie P. annularis, flathead catfish Pylodictus olivaris, and blue catfish Ictalurus furcatus.

Methods

Sampling for largemouth bass was conducted from April 19th –April 26th, 2001. Transects were selected based on previous studies. However, not all transects sampled during other studies were sampled during this study. Transect lengths were variable and catch per unit effort (CPUE) was computed based on pedal time.

Largemouth bass were collected during the daytime using a boat-mounted Smith Root Mark VI electrofishing system. Electrofishing was conducted at 345 Volts pulsed DC with a

pulse width of 5 and frequency of 60 pulses per second that yielded an output voltage of 3 amps. All largemouth bass collected were measured for total length (TL) and a subsample were weighed to the nearest g. All fish were released after measurements and weights were collected except those retained for LMBV screening. Largemouth bass collected for LMBV screening were placed on ice and shipped to the US Fish and Wildlife Service Fish Health Center in Warm Springs, Georgia.

Data from all transects were pooled for analysis. A length-frequency histogram was constructed and relative weights were computed using the formulas of Wege and Anderson (1978). Proportional stock density (PSD) (Gabelhouse 1984) and relative stock density-preferred (RSD-P) (Wege and Anderson 1978) values were computed for this sample.

Results

A total of 298 largemouth bass were collected during this study. Catch rates were variable among sampling sites (Table 1), yet no apparent spatial trends existed among these data. Mean CPUE was 1.3 fish per minute. Largemouth bass collected ranged in size from 111 mm to 552 mm TL (Figure 1). Over 51 percent of largemouth bass collected were harvestable size (355 mm) or larger. Mean Wr was 97.4 and relative weight values were variable across the entire size range (Figure 2). PSD value for this sample was 80 and the RSD-P value was 46.

Of the 47 largemouth bass assayed for LMBV, only 1 (2.7%) tested positive using the presumptive cell culture test. This fish was collected in Flat Swamp Creek arm of the reservoir. No fish collected in Swearing Creek were found to contain LMBV.

Discussion

The largemouth bass population in High Rock Lake again appears to be in good condition. Catch rates in this study were higher than those reported by Chapman and Chambers (2000). Relative weight values were comparable between the two studies. However, Chapman and Chambers (2000) found lower PSD and RSD- P values than were obtained in this study. It is unclear at this point whether this difference is related to natural variation or a shift in the overall size structure of the largemouth bass population.

LMBV was found in the High Rock Lake largemouth bass population. To date, there have been no LMBV related fish kills in North Carolina. There is also a great deal of uncertainty about the effect of LMBV on largemouth bass (Plumb et. al 1999). We will continue to monitor this population for the presence of this virus in the largemouth bass population.

Management Recommendations

- 1) Retain the 356 mm minimum size limit for largemouth bass in High Rock Lake
- 2) Continue monitoring the largemouth bass population in High Rock Lake including additional testing for the presence of largemouth bass virus in the reservoir

References

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- Gabelhouse, D. W. 1984. A length categorization system to assess fish stocks. *North American Journal of Fisheries Management* 4:273-285.
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- Plumb, J. A., A. D. Noyes, S. Graziano, J. Wang, J. Mao, and V. G. Chinchar. 1999. Isolation and Identification of Viruses from Adult Largemouth Bass during a 1997–1998 Survey in the Southeastern United States. *Journal of Aquatic Animal Health*: 11:391–399.
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- Wege, G.J., and R.O. Anderson. 1978. Relative weight (Wr): a new index of condition for largemouth bass. Pages 79-91 in G. D. Novinger and J. G. Dillard, editors. *New approaches to the management of small impoundments*. American Fisheries Society, North Central Division, Special Publication 5, Bethesda, Maryland.

Tables

Date	Site	Number Collected	Effort (seconds)	CPUE (fish/minute)
4/19/01	Second Creek Bridge	20	866	1.39
4/19/01	Second Creek Bridge/Cove	20	1302	0.92
4/19/01	Crane Creek/Site 15	23	1936	0.71
4/19/01	Crane Creek	28	1589	1.05
4/23/01	Flat Swamp /RR Bridge	31	1297	1.43
4/23/01	Flat Swamp /Hole in Wall	46	1303	2.11
4/24/01	Swearing Creek Bridge	21	1437	0.87
4/24/01	Swearing Creek/Back of Crk	27	1337	1.21
4/26/01	Abbott's Creek Bridge	56	1699	1.97

Table 1. Catch per unit effort (CPUE) by site of largemouth bass collected from High Rock Lake, April 19th-April 26th, 2001 using electrofishing.

Figures

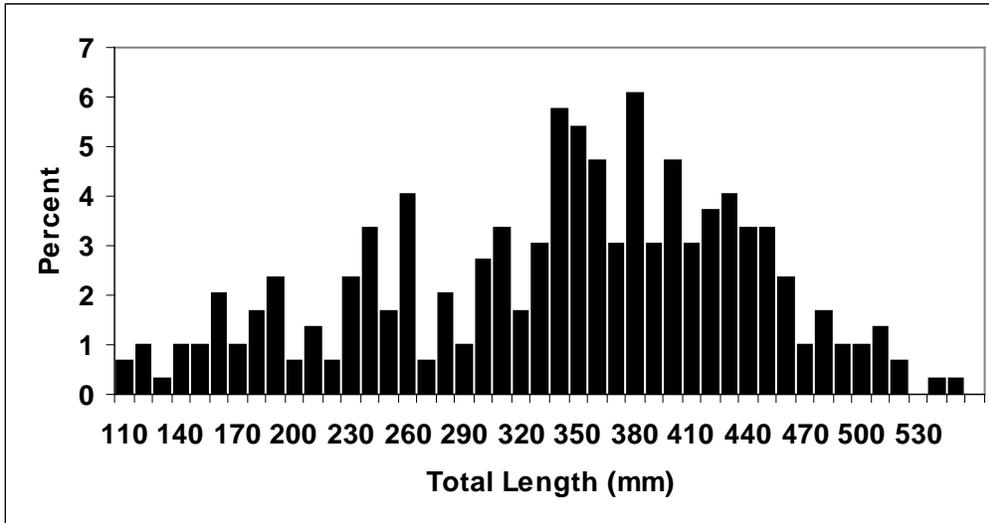


Figure 1. Length-frequency of largemouth bass collected from High Rock Lake, April 19th-26th, 2001 using electrofishing.

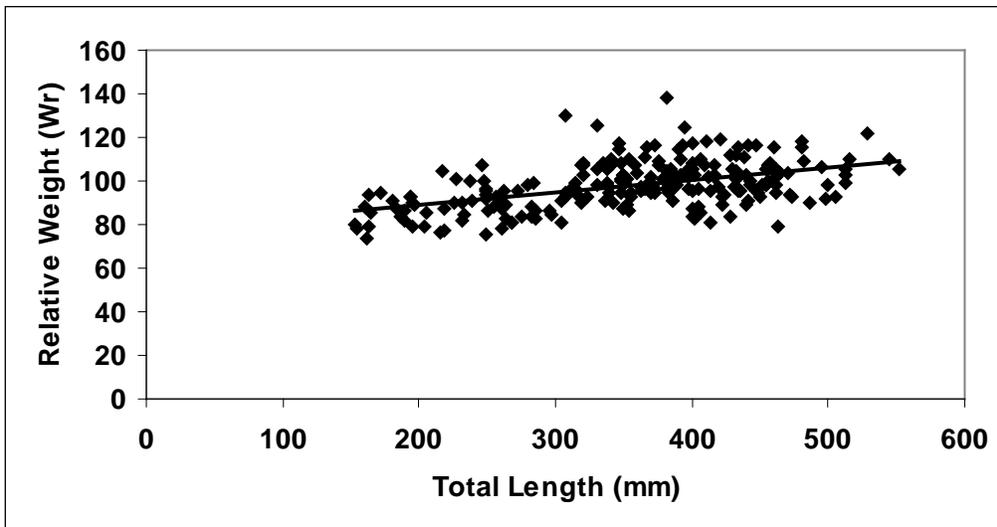


Figure 2. Relative weight (Wr) versus total length (mm) for largemouth bass collected from High Rock Lake, April 19th-26th, 2001 using electrofishing.