2006 Electrofishing Survey of Cove Lake State Park

Submitted to

The Tennessee Department of Environment and Conservation

Prepared by

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INTRODUCTION

The Tennessee Wildlife Resources Agency Region IV reservoir data collection unit was asked to sample several Tennessee State Park lakes during the spring of 2006. This work was conducted under an agreement with the Tennessee Department of Environment and Conservation, Division of State Parks to follow a protocol for care of state park lakes. The goal of this management effort is to enhance the quality of fisheries for the enjoyment of park visitors and Tennessee anglers. One of the lakes sampled is contained within Cove Lake State Park located in Campbell County.

The 1991, 1999, and 2003 fishery survey reports of Cove Lake were used for historical comparison of fish assemblages (Bettoli 1991, Negus 1999, Negus 2003). The sampling methods used by Bettoli were significantly different than those employed during our 1999 - 2006 efforts so only very general inferences can be made.

STUDY AREA

The impoundment located within Cove Lake State Park is a sub-impoundment of Norris Reservoir (Figure 1) (Southeast Publications USA, inc). It was created during the late 1930's and contains approximately 85 hectares. The maximum depth is only 5.0 m and the lake bottom is gradually sloped. During high water years, Norris Reservoir can rise above the level of the Cove Lake Dam.

Cove Lake was classified by a Tennessee Technological University study in 1990 as mesotrophic based on average total N concentration (0.58 mg/l) and eutrophic based on the average total P concentration (35 ug/l) (Bettoli 1991). Low water clarity due to suspended clay particles is characteristic of the impoundment. This turbidity suppresses phytoplankton production which in turn lowers the production of fish species.

No private boats are allowed in the lake, but paddle boats are available to anglers. There is a significant area accessible to bank anglers.

METHODS

Electrofishing is the most efficient method to collect black bass and other game fish in pond and lake situations. Therefore, we used standardized electrofishing procedures outlined in our 1998 reservoir fisheries assessment guidelines to sample this lake (TWRA 1998).

A 5.5 m electrofishing boat was used to sample the fish population. The boat was equipped with a front-mounted electrode system with two independent pole mounts terminating in cable arrays. The arrays had six droppers of 9.5 mm stainless steel cable spread 45.7 cm apart. Collections were made using pulsed DC current set at 120 pulses per second and 7-8 amps.

Four, 900 second electrofishing runs were performed on May 31, 2006. All bass and crappie observed were collected, but sunfish, shad, and rough fish were only netted to determine the species composition in the lake. Fish were measured to the nearest millimeter and weighed to the nearest gram and released.

Analysis of data included calculations of proportional stock density (PSD), relative stock density (RSD), and relative weight (Wr) (Wege and Anderson 1978; Anderson 1980; Alexander and Brown 1987). National standard weights were used in the relative weight analysis.

RESULTS

Thirteen fish species were collected during the 1.0 hours of electrofishing (Table 1). Largemouth bass, gizzard shad, golden redhorse, and redear sunfish made up the majority of the sample.

The 2006 catch rate of largemouth (42.0/hr) was much less than that observed in 2003 and 1999 (94.0/hr and 86.7/hr, respectively). The size structure of the population is well balanced and there were a fair number of small largemouth present in the sample (Figure 2). These substock largemouth will help enhance the quality of the fishery for the next several years and suggests fair recruitment of the 2005 year class. There were no serious gaps in the length frequency indicating that reproduction has been fairly stable over time.

Relative weight values for largemouth bass were less than ideal though comparable to that seen in Norris Reservoir (Figure 3). These moderately low Wr values do not necessarily mean there is a problem since they are typical of East Tennessee largemouth fisheries.

Twenty-nine percent of the bass collected were spotted bass. Unlike largemouth and smallmouth bass, this species rarely reaches quality-size in any East Tennessee impoundment. They also utilize the same habitat and compete with the more desirable bass species. As a result, anglers are encouraged to keep these fish for the table. There is no size restriction and the limit is 15 spotted bass per day.

Eight of the 12 crappie collected were greater than the 254 mm minimum length limit. Electrofishing is biased towards capturing larger-sized crappie so this sample indicates a normal structured population exists.

An acceptable forage base is available to game fish. We observed a good number of gizzard shad and redear sunfish of various sizes.

MANAGEMENT RECOMMENDATIONS

Creel limits for Cove Lake are the same as those imposed by the TWRA for Norris Reservoir. Park rangers are encouraged to continue enforcing these limits and promote the catch and release of largemouth bass in particular. Limited harvest of largemouth bass will increase the predation on bluegill and redear sunfish. This will in turn increase the average size of sunfish by decreasing competition.

The creel limit for spotted bass is 15 per day with no size limit. Spotted bass do not attain quality size in our East Tennessee impoundments and their harvest is encouraged. The increased harvest of this species will help improve the quality of the more desirable largemouth and smallmouth populations through reduced competition.

It is generally accepted that crappie are poorly suited for small impoundments. They tend to over populate and few reach harvestable-size. They are not overly abundant in the lake suggesting anglers are harvesting adequate numbers to keep this species in check.

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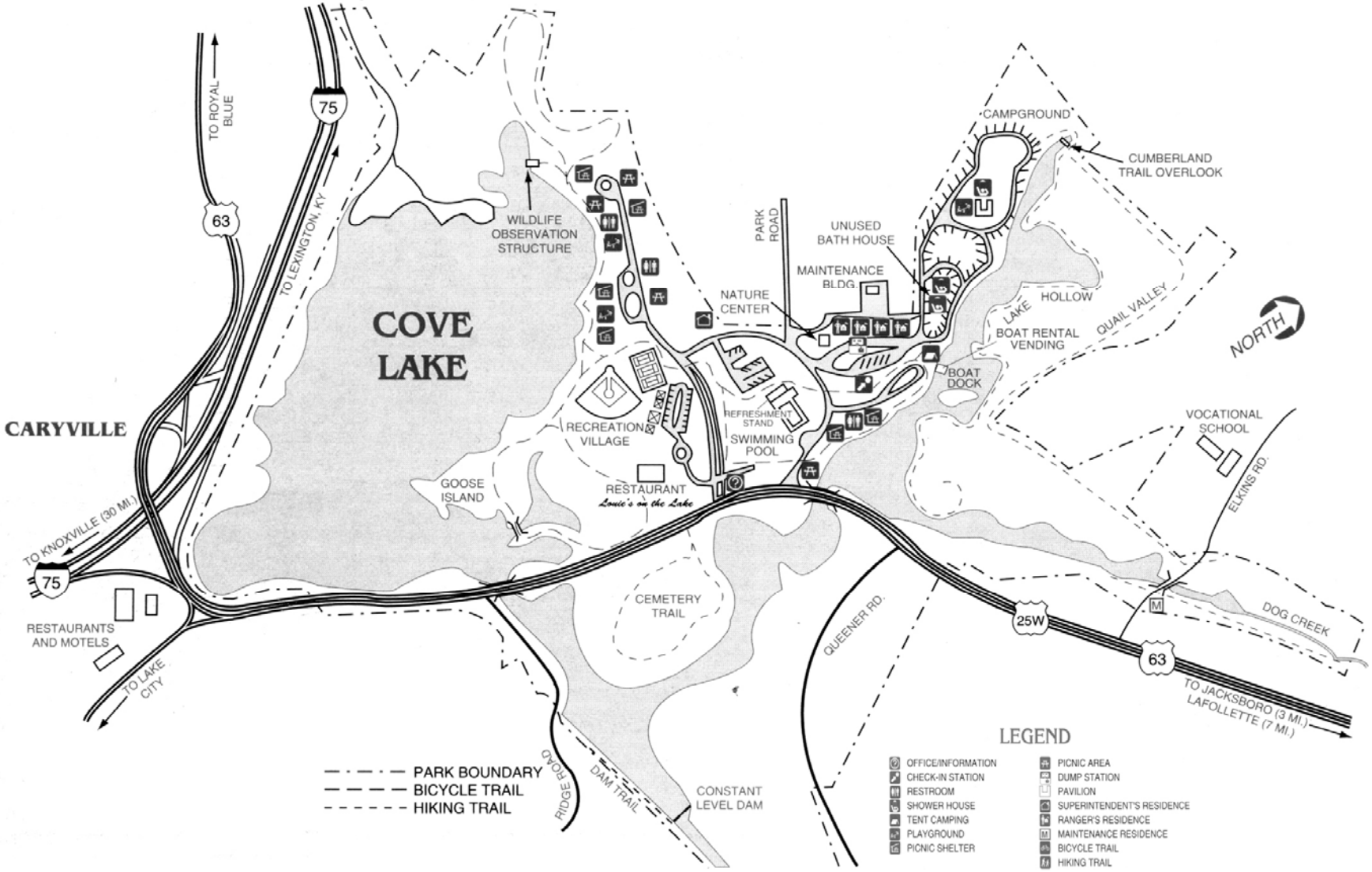

Figure 1. Illustration of the impoundment within Cove Lake State Park, a sub-impoundment of Norris Reservoir.

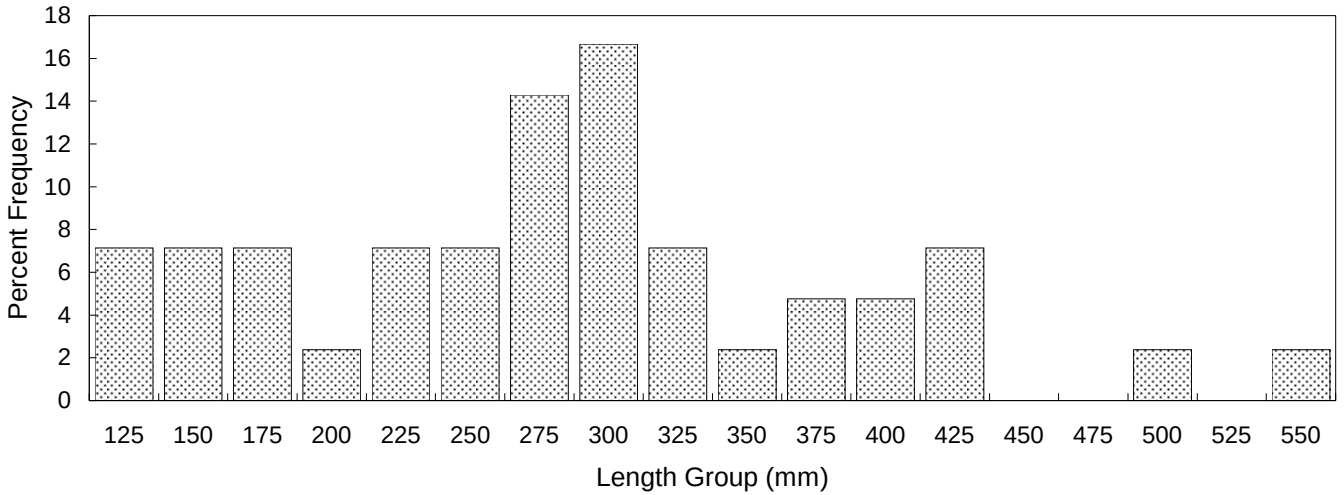

Figure 2. Cove Lake State Park largemouth bass length frequency by percent for 2006 electrofishing sample (n=42)

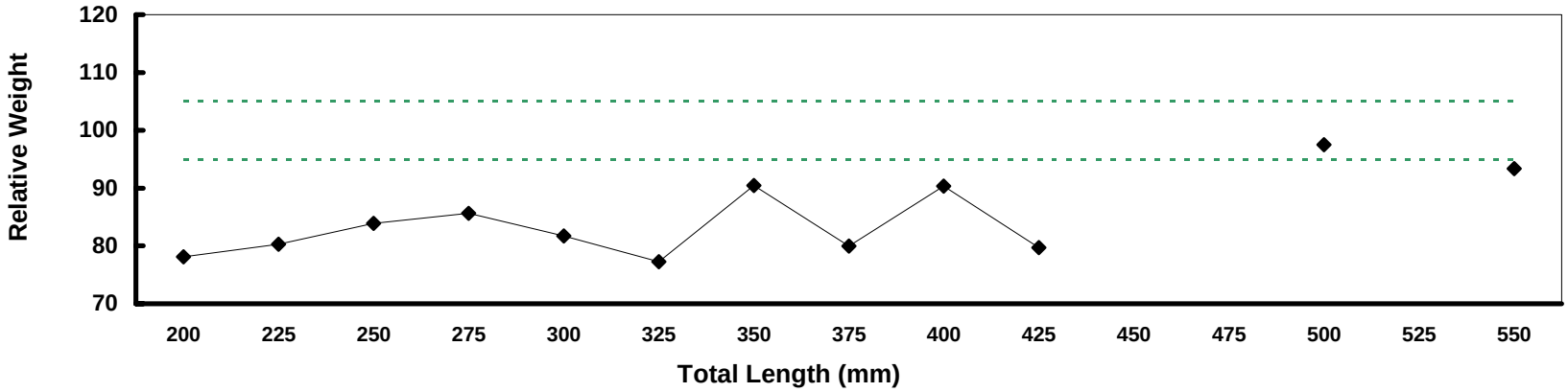

Figure 3. Cove Lake largemouth bass mean relative weight values from the 2006 electrofishing sample (n=36).

Table 1. Species collected in Cove Lake State Park impoundment during the 2006.

Species Collected
Black Crappie
Bluegill
Common Carp
Flathead Catfish
Gizzard Shad
Golden Redhorse
Largemouth Bass
Longnose Gar
Redear Sunfish
Spotted Bass
Threadfin Shad
White Crappie
White Sucker