# SPRINGS VALLEY LAKE

Orange County

2009 Fish Management Report

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# EXECUTIVE SUMMARY

- Springs Valley Lake (also referred to as Tucker Lake) is a 127-acre impoundment located about 6 mi south of the Town of French Lick in Orange County.

- A general survey was conducted on May 4 and June 1 to 2, 2009. Submersed aquatic vegetation was sampled on July 13, 2009.

- Submersed vegetation was found to a maximum depth of 11.0 ft. Six native species, American pondweed, brittle naiad, coontail, American elodea, small pondweed, and southern naiad were collected. Brittle naiad was the most frequently occurring, followed by American elodea, small pondweed, and coontail.

- A total of 551 fish, representing ten species, was collected that weighed an estimated 182 lbs. Largemouth bass ranked first by number, followed by redear sunfish, and longear sunfish. Largemouth bass ranked first by weight, followed by redear sunfish, and channel catfish.

- A total of 163 largemouth bass was sampled that weighed 70 lbs. They ranged in length from 3.9 to 14.6 in. Largemouth bass growth was normal when compared to the district average with age-3 fish averaging 10.5 and age-4 fish averaging 12.1 in.

- Springs Valley Lake provides excellent fishing for redear sunfish and bluegill. Seventy-four percent of the redear and 12% of the bluegill were 8.0 in or longer. The redear electrofishing catch rate increased by 242% and the trap net catch rate increased by 938% since 2006. The bluegill electrofishing catch rate increased by 27%.

- The largemouth bass electrofishing catch rate has substantially increased from 2006. However, the number of harvestable fish has decreased. Only one bass over 14.0 in was collected versus 9 in 2006. This may be due to increased harvest.

- The channel catfish catch rates were low indicating that these fish are being utilized and stockings should continue. Also, the proximity of camping and the abundant shoreline access makes this lake ideal for catfish anglers.

## INTRODUCTION

Springs Valley Lake (also referred to as Tucker Lake) is a 127-acre impoundment located about 6 mi south of the Town of French Lick in Orange County. The U. S. Forest Service (USFS) owns the lake and the surrounding property. However, the Indiana Department of Natural Resources (IDNR), Division of Fish and Wildlife manages the lake's fishery. Angler access includes a concrete boat ramp and shoreline fishing along USFS trails. There are no access fees and only electric motors are allowed.

The 2006 general survey revealed low numbers of largemouth bass and a decreased bluegill population. Growth was good for both species. It was recommended that channel catfish stockings continue.

## METHODS

A general survey was conducted on May 4 (electrofishing) and June 1 and 2 (netting), 2009. Some physical and chemical characteristics of the water were measured according to standard guidelines (Shipman 2001). Submersed aquatic vegetation was sampled on July 13, 2009, using guidelines written by the IDNR (2006).

Fish collection effort consisted of pulsed DC night electrofishing with two dippers for 0.75 h, two trap net lifts, and four experimental-mesh gill net lifts. All fish collected were measured to the nearest 0.1 in TL. Average weights for fish by half-inch groups for Fish Management District 7 were used to estimate weights. Fish scale samples were taken from sport fish for age and growth analysis. Proportional stock density (PSD) and relative stock density (RSD) were calculated for bluegill, largemouth bass, and redear sunfish (Anderson and Neumann 1996). The Bluegill Fishing Potential (BGFP) index was used to assess bluegill fishing quality (Ball and Tousignant 1996).

## RESULTS

Springs Valley Lake has a maximum depth of 31.0 ft. The Secchi disk depth was 8.0 ft and the conductivity was 125 μS. Dissolved oxygen concentrations were marginal for fish survival below 16.0 ft.

Submersed vegetation was found at 85% of the littoral sites to a maximum depth of 11.0 ft. Six native species, American pondweed, brittle naiad, coontail, American elodea, small

pondweed, and southern naiad were collected. Brittle naiad was the most frequently occurring (48%), followed by American elodea (26%), small pondweed (20%), and coontail (16%). No emergent plants were observed. Blue-green algae (*Oscillatoria spp.)* was collected.

A total of 551 fish, representing ten species, was collected that weighed an estimated 182 lbs. Largemouth bass ranked first by number (30%), followed by redear sunfish (23%), longear sunfish (19%), and bluegill (16%). Largemouth bass ranked first by weight (39%), followed by redear sunfish (31%), and channel catfish (7%). Other species collected were warmouth, black crappie, a notropis spp., white sucker, and brown bullhead. Species collected in past surveys include black bullhead, yellow bullhead, grass pickerel, green sunfish, common carp, golden shiner, and blackstripe topminnow.

A total of 163 largemouth bass was sampled that weighed 70 lbs. They ranged in length from 3.9 to 14.6 in. The electrofishing catch rate was 217.3/h and none were collected in trap or gill nets. The electrofishing catch rate in 2006 was 113.0/h. Largemouth reached 14.0 in during their fifth year of growth. Largemouth bass growth was normal when compared to the district average with age-3 fish averaging 10.5 in and an age-4 fish averaging 12.1 in. In 2006, bass averaged 10.9 in at age-3 and 13.6 in at age-4.

The largemouth bass PSD decreased from 27 (2006) to 14. The suggested PSD range indicating a balanced largemouth bass fishery is 40 to 70 (Anderson and Neumann 1996). The RSD-14 and RSD-15 were 1 and 0 versus 14 and 6 in 2006.

One hundred twenty-five redear sunfish were sampled that weighed 57 lbs. They ranged in length from 3.8 to 10.9 in. The catch rates were 54.7/electrofishing h, 41.5/trap net lift, and 0.3/gill net lift. The electrofishing catch rate in 2006 was 16.0/h. Redear sunfish grew fast. Redear averaged 8.8 at age 4 and 9.8 in at age 5 compared to the district average of 8.0 at age 4 and 8.9 in at age 5.

The redear PSD was 69 and the RSD-9 was 12. These indices were not calculated in 2006 due to the small sample size.

A total of 90 bluegill was sampled that weighed 13 lbs. They ranged in length from 1.4 to 8.5 in. The catch rates were 105.3/electrofishing h, 1.5/trap net lift, and 2.0/gill net lift. The 2006 electrofishing catch rate was 83.0/h. Bluegill grew fast averaging 6.9 in at age 3 and 8.0 in at age 4 compared to 6.0 in at age 3 and 7.4 in at age 4 in 2006. The district averages are 5.4 in at age 3 and 6.5 in at age 4. No bluegill age 5 or older were collected.

The bluegill PSD was 59. These indices were not calculated in 2006 due to the small sample size. The suggested PSD range indicating a balanced bluegill fishery is 20 to 60 (Anderson and Neumann 1996). The RSD-7 was 47 and RSD-8 was 18. The BGFP index was 29 classifying the bluegill fishery as "excellent".

Sixteen channel catfish were sampled that weighed 17 lbs. They ranged in length from 10.2 to 23.2 in. The catch rates were 2.6/electrofishing h, 0/trap net lift, and 3.5/gill net lift.

Six black crappie were collected that weighed 2 lbs. They ranged in length from 7.6 to 11.6 in. The catch rates were 5.3/electrofishing h, 0/trap net lift, and 0.5/gill net lift.

## DISCUSSION

Springs Valley Lake provides excellent fishing for redear sunfish and bluegill. Seventy-four percent of the redear and 12% of the bluegill were 8.0 in or longer. The redear electrofishing catch rate increased by 242% and the trap net catch rate increased by 938% since 2006. The bluegill electrofishing catch rate increased by 27%.

The largemouth bass electrofishing catch rate has substantially increased from 2006. However, the number of harvestable bass has decreased. Only one bass over 14.0 in was collected versus 9 in 2006. This may be due to increased harvest.

The channel catfish catch rates were low indicating that these fish are being utilized and stockings should continue. Also, the proximity of camping and the abundant shoreline access makes this lake ideal for catfish anglers.

This is the first time that *Oscillatoria spp.* (blue-green algae) has been identified in Springs Valley Lake. *Oscillatoria* and many other species of blue-green algae have the potential to produce toxins that are harmful to humans, fish, and other animals (Dr. L. P. Tedesco, personal communication, November 19, 2009). Blue-green algae is common in nutrient rich environments. It is recommended that the USFS investigate methods to reduce nutrient loading in the lake's watershed.

## RECOMMENDATIONS

- Channel catfish stockings should continue.
- The USFS should investigate methods to reduce nutrient loading into the lake's watershed.

LITERATURE CITED

Anderson, R. O. and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-481 *in* B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

Ball, R. L. and J. N. Tousignant. 1996. The development of an objective rating system to assess bluegill fishing in lakes and ponds. Research report. Indiana Department of Natural Resources. Indianapolis, Indiana. 18 pp.

Indiana Department of Natural Resources. 2006. Tier II aquatic vegetation survey protocol. 9 pp.

Shipman, S. T. 2001. Manual of fisheries survey methods. Fisheries Section. Indiana Division of Fish and Wildlife. Indianapolis, Indiana. 58 pp.

Submitted by: Michelle L. Cain, Assistant Fisheries Biologist
Date: November 9, 2009

Approved by: Daniel P. Carnahan, Fisheries Biologist

Approved by: Brian M. Schoenung, Fisheries Supervisor

Date: January 20, 2010

# Appendix

Fish survey data

# LAKE SURVEY REPORT

Type of Survey: [ ] Initial Survey [X] Re-Survey

| Lake Name | County | Date of survey (Month, day, year) |
|---|---|---|
| Springs Valley Lake | Orange | May 4 and June 1-2, 2009 |
| **Biologist's name** | | **Date of approval (Month, day, year)** |
| Michelle Cain | | January 20, 2010 |

## LOCATION

| Quadrangle Name | Range | Section |
|---|---|---|
| Greenbrier | 1W | 29, 30, 31, 32 |
| **Township Name** | **Nearest Town** | |
| 1N | French Lick | |

## ACCESSIBILITY

| State owned public access site | Privately owned public access site | Other access site |
|---|---|---|
| | | USFS concrete boat ramp |

| Surface acres | Maximum depth | Average depth | Acre feet | Water level | Extreme fluctuations |
|---|---|---|---|---|---|
| 127.5 | 31.0 | 10.0 | 1,275.0 | 579.0 | None |

Location of benchmark: Unknown

## INLETS

| Name | Location | Origin |
|---|---|---|
| Unnamed stream | Section 29 | Runoff |
| Unnamed stream | Section 31 | Runoff |
| Unnamed stream | Section 32 | Runoff |

## OUTLETS

| Name | Location |
|---|---|
| French Lick Creek | Below dam |

Water level control:

| POOL | ELEVATION (Feet MSL) | ACRES |
|---|---|---|
| TOP OF DAM | 602 | |
| TOP OF FLOOD CONTROL POOL | 585 | |
| TOP OF CONSERVATION POOL | 579 | 135 |
| TOP OF MINIMUM POOL | | |
| STREAMBED | 548 | |

**Bottom type**

| | |
|---|---|
| X | Boulder |
| X | Gravel |
| X | Sand |
| X | Muck |
| | Clay |
| | Marl |

Watershed use: Agriculture, Forest. Lake on 1,445 acres of National Forest Service land.

Development of shoreline: One concrete boat ramp, primitive campground near boat ramp.

Previous surveys and investigations: Fisheries surveys: 1965, 1967, 1968, 1973, 1977, 1981, 1985, 1993, 2000, and 2006.

Results of fertilization: 1970, 1971.

| SAMPLING EFFORT | | | | | |
|---|---|---|---|---|---|
| ELECTROFISHING | Day hours: 0 | | Night hours: 0.75 | | Total hours: 0.75 |
| TRAP NETS | Number of traps: 2 | | Number of Lifts: 1 | | Total effort: 2 overnight sets |
| GILL NETS | Number of nets: 4 | | Number of Lifts: 1 | | Total effort: 4 overnight sets |
| ROTENONE | Gallons | ppm | Acre Feet Treated | SHORELINE SEINING | Number of 100 Foot Seine Hauls |

| PHYSICAL AND CHEMICAL CHARACTERISTICS | |
|---|---|
| Color: Clear | Turbidity: 8 Feet 0 Inches (SECCHI DISK) |
| Alkalinity (ppm)*: Surface: 51.3 Bottom: 85.5 | pH: Surface: 7.66 Bottom: 7.42 |
| Conductivity: 125 (5/4); 128 (6/1) micromhos | Air temperature: 75 °F |
| Water chemistry GPS coordinates: N 38.481993 W -86.567687 | |

| TEMPERATURE AND DISSOLVED OXYGEN (D.O.) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | Degrees (°F) | D.O. (ppm) | DEPTH (FEET) | DEGREES (°F) | D.O. (ppm) | DEPTH (FEET) | DEGREES (°F) | D.O. (ppm) |
| SURFACE | 74.8 | 6.03 | 36 | | | 72 | | |
| 2 | 74.8 | 5.98 | 38 | | | 74 | | |
| 4 | 74.8 | 6.09 | 40 | | | 76 | | |
| 6 | 74.8 | 6.08 | 42 | | | 78 | | |
| 8 | 71.2 | 6.70 | 44 | | | 80 | | |
| 10 | 66.9 | 5.84 | 46 | | | 82 | | |
| 12 | 64.9 | 5.41 | 48 | | | 84 | | |
| 14 | 61.9 | 5.28 | 50 | | | 86 | | |
| 16 | 58.3 | 4.45 | 52 | | | 88 | | |
| 18 | 55.4 | 3.23 | 54 | | | 90 | | |
| 20 | 53.9 | 2.64 | 56 | | | 92 | | |
| 22 | 52.9 | 2.49 | 58 | | | 94 | | |
| 24 | 51.6 | 2.42 | 60 | | | 96 | | |
| 26 | 50.0 | 2.30 | 62 | | | 98 | | |
| Bottom | 48.9 | 2.18 | 64 | | | 100 | | |
| 30 | | | 66 | | | | | |
| 32 | | | 68 | | | | | |
| 34 | | | 70 | | | | | |

| COMMENTS |
|---|
| |
| |
| |

*ppm-parts per million

## Occurrence and Abundance of Submersed Aquatic Plants

| | | | | | |
|---|---|---|---|---|---|
| **Lake:** | Springs Valley | **Secchi (ft):** | 15 | **SE Mean Species / Site:** | 0.16 |
| **Date:** | 7/13/2009 | **Littoral Sites w/Plants:** | 40 | **Mean Natives / Site:** | 1.22 |
| **Littoral Depth (ft):** | 11.0 | **Number of Species:** | 8 | **SE Mean Natives / Site:** | 0.13 |
| **Littoral Sites:** | 47 | **Max. Species / Site:** | 4 | **Species Diversity:** | 0.81 |
| **Total Sites:** | 50 | **Mean Species / Site:** | 1.50 | **Native Diversity:** | 0.75 |

| | Frequency of | Score Frequency | | | | |
|---|---|---|---|---|---|---|
| **Species** | **Occurrence** | **0** | **1** | **3** | **5** | **Dominance** |
| Brittle naiad | 48 | 52 | 32 | 12 | 4 | 17.6 |
| American elodea | 26 | 74 | 16 | 2 | 8 | 12.4 |
| Coontail | 16 | 84 | 10 | 2 | 4 | 7.2 |
| Small pondweed | 20 | 80 | 18 | 2 | 0 | 4.8 |
| American pondweed | 10 | 90 | 8 | 2 | 0 | 2.8 |
| Southern naiad | 2 | 98 | 2 | 0 | 0 | 0.4 |

| SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT | | | | | |
|---|---|---|---|---|---|
| *COMMON NAME OF FISH | NUMBER | PERCENT | LENGTH RANGE (inches) | WEIGHT (pounds) | PERCENT |
| Largemouth bass | 163 | 29.6 | 3.9 - 14.6 | 70.25 | 38.6 |
| Redear sunfish | 125 | 22.7 | 3.8 - 10.9 | 56.52 | 31.0 |
| Longear sunfish | 106 | 19.2 | 1.8 - 5.9 | 5.95 | 3.3 |
| Bluegill | 90 | 16.3 | 1.4 - 8.5 | 12.81 | 7.0 |
| Warmouth | 33 | 6.0 | 2.8 - 8.2 | 5.92 | 3.2 |
| Channel catfish | 16 | 2.9 | 10.2 - 23.2 | 16.99 | 9.3 |
| Black crappie | 6 | 1.1 | 7.6 - 11.6 | 2.16 | 1.2 |
| Notropis spp. | 6 | 1.1 | 2.1 - 2.6 | 0.06 | 0.0 |
| White sucker | 4 | 0.7 | 16.9 - 19.1 | 8.17 | 4.5 |
| Brown bullhead | 2 | 0.4 | 15.6 | 3.40 | 1.9 |
| Totals | 551 | | | 182.23 | |

*Common names of fishes recognized by the American Fisheries Society.

| NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TOTAL LENGTH (inches) | NUMBER COLLECTED | PERCENT OF FISH COLLECTED | AVERAGE WEIGHT (pounds) | AGE OF FISH | TOTAL LENGTH (inches) | NUMBER COLLECTED | PERCENT OF FISH COLLECTED | AVERAGE WEIGHT (pounds) | AGE OF FISH |
| 1.0 | | | | | 19.0 | | | | |
| 1.5 | | | | | 19.5 | | | | |
| 2.0 | | | | | 20.0 | | | | |
| 2.5 | | | | | 20.5 | | | | |
| 3.0 | | | | | 21.0 | | | | |
| 3.5 | 2 | 1.2 | 0.03 | 1 | 21.5 | | | | |
| 4.0 | 2 | 1.2 | 0.03 | 1 | 22.0 | | | | |
| 4.5 | 2 | 1.2 | 0.04 | 1 | 22.5 | | | | |
| 5.0 | 3 | 1.8 | 0.06 | 1 | 23.0 | | | | |
| 5.5 | | | | | 23.5 | | | | |
| 6.0 | | | | | 24.0 | | | | |
| 6.5 | | | | | 24.5 | | | | |
| 7.0 | 9 | 5.5 | 0.16 | 2 | 25.0 | | | | |
| 7.5 | 24 | 14.7 | 0.20 | 2, 3 | 25.5 | | | | |
| 8.0 | 20 | 12.3 | 0.24 | 2 | 26.0 | | | | |
| 8.5 | 16 | 9.8 | 0.28 | 2, 3 | TOTAL | 163 | | | |
| 9.0 | 5 | 3.1 | 0.33 | 2, 3 | | | | | |
| 9.5 | 7 | 4.3 | 0.39 | 2, 3 | | | | | |
| 10.0 | 7 | 4.3 | 0.46 | 2, 3 | | | | | |
| 10.5 | 10 | 6.1 | 0.53 | 3 | | | | | |
| 11.0 | 25 | 15.3 | 0.62 | 3, 4 | | | | | |
| 11.5 | 12 | 7.4 | 0.71 | 3, 4 | | | | | |
| 12.0 | 9 | 5.5 | 0.80 | 4 | | | | | |
| 12.5 | 5 | 3.1 | 0.91 | 4 | | | | | |
| 13.0 | 3 | 1.8 | 1.02 | 4, 5 | | | | | |
| 13.5 | 1 | 0.6 | 1.15 | 5 | | | | | |
| 14.0 | | | | | | | | | |
| 14.5 | 1 | 0.6 | 1.47 | 5 | | | | | |
| 15.0 | | | | | | | | | |
| 15.5 | | | | | | | | | |
| 16.0 | | | | | | | | | |
| 16.5 | | | | | | | | | |
| 17.0 | | | | | | | | | |
| 17.5 | | | | | | | | | |
| 18.0 | | | | | | | | | |
| 18.5 | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ELECTROFISHING CATCH | 217.3/h | GILL NET CATCH | 0/lift | TRAP NET CATCH | 0/lift |

| NUMBER, PERCENTAGE, WEIGHT, AND AGE OF REDEAR SUNFISH | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TOTAL LENGTH (inches) | NUMBER COLLECTED | PERCENT OF FISH COLLECTED | AVERAGE WEIGHT (pounds) | AGE OF FISH | TOTAL LENGTH (inches) | NUMBER COLLECTED | PERCENT OF FISH COLLECTED | AVERAGE WEIGHT (pounds) | AGE OF FISH |
| 1.0 | | | | | 19.0 | | | | |
| 1.5 | | | | | 19.5 | | | | |
| 2.0 | | | | | 20.0 | | | | |
| 2.5 | | | | | 20.5 | | | | |
| 3.0 | | | | | 21.0 | | | | |
| 3.5 | 2 | 1.6 | 0.03 | 1 | 21.5 | | | | |
| 4.0 | | | | | 22.0 | | | | |
| 4.5 | | | | | 22.5 | | | | |
| 5.0 | 2 | 1.6 | 0.09 | 2 | 23.0 | | | | |
| 5.5 | 6 | 4.8 | 0.13 | 2 | 23.5 | | | | |
| 6.0 | 3 | 2.4 | 0.17 | 2 | 24.0 | | | | |
| 6.5 | 2 | 1.6 | 0.22 | 2 | 24.5 | | | | |
| 7.0 | 9 | 7.2 | 0.27 | 2, 3 | 25.0 | | | | |
| 7.5 | 9 | 7.2 | 0.33 | 3, 4 | 25.5 | | | | |
| 8.0 | 26 | 20.8 | 0.40 | 3, 4 | 26.0 | | | | |
| 8.5 | 28 | 22.4 | 0.48 | 3, 4 | TOTAL | 125 | | | |
| 9.0 | 17 | 13.6 | 0.57 | 4, 5 | | | | | |
| 9.5 | 10 | 8.0 | 0.66 | 4, 5 | | | | | |
| 10.0 | 5 | 4.0 | 0.76 | 5 | | | | | |
| 10.5 | 6 | 4.8 | 0.87 | 5, 6 | | | | | |
| 11.0 | | | | | | | | | |
| 11.5 | | | | | | | | | |
| 12.0 | | | | | | | | | |
| 12.5 | | | | | | | | | |
| 13.0 | | | | | | | | | |
| 13.5 | | | | | | | | | |
| 14.0 | | | | | | | | | |
| 14.5 | | | | | | | | | |
| 15.0 | | | | | | | | | |
| 15.5 | | | | | | | | | |
| 16.0 | | | | | | | | | |
| 16.5 | | | | | | | | | |
| 17.0 | | | | | | | | | |
| 17.5 | | | | | | | | | |
| 18.0 | | | | | | | | | |
| 18.5 | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ELECTROFISHING CATCH | 54.7/h | GILL NET CATCH | 0.3/lift | TRAP NET CATCH | 41.5/lift |

| NUMBER, PERCENTAGE, WEIGHT, AND AGE OF BLUEGILL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TOTAL LENGTH (inches) | NUMBER COLLECTED | PERCENT OF FISH COLLECTED | AVERAGE WEIGHT (pounds) | AGE OF FISH | TOTAL LENGTH (inches) | NUMBER COLLECTED | PERCENT OF FISH COLLECTED | AVERAGE WEIGHT (pounds) | AGE OF FISH |
| 1.0 | 3 | 3.3 | 0.01 | not aged | 19.0 | | | | |
| 1.5 | 7 | 7.8 | 0.01 | 0, 1 | 19.5 | | | | |
| 2.0 | 10 | 11.1 | 0.01 | 0, 1 | 20.0 | | | | |
| 2.5 | 15 | 16.7 | 0.01 | 1 | 20.5 | | | | |
| 3.0 | 2 | 2.2 | 0.02 | 1 | 21.0 | | | | |
| 3.5 | 5 | 5.6 | 0.03 | 2 | 21.5 | | | | |
| 4.0 | 3 | 3.3 | 0.05 | 2 | 22.0 | | | | |
| 4.5 | 3 | 3.3 | 0.07 | 2, 3 | 22.5 | | | | |
| 5.0 | 4 | 4.4 | 0.09 | 2, 3 | 23.0 | | | | |
| 5.5 | 1 | 1.1 | 0.13 | 2 | 23.5 | | | | |
| 6.0 | 3 | 3.3 | 0.17 | 2, 3 | 24.0 | | | | |
| 6.5 | 10 | 11.1 | 0.22 | 3, 4 | 24.5 | | | | |
| 7.0 | 5 | 5.6 | 0.28 | 3, 4 | 25.0 | | | | |
| 7.5 | 8 | 8.9 | 0.34 | 3, 4 | 25.5 | | | | |
| 8.0 | 10 | 11.1 | 0.41 | 3, 4 | 26.0 | | | | |
| 8.5 | 1 | 1.1 | 0.49 | 4 | TOTAL | 90 | | | |
| 9.0 | | | | | | | | | |
| 9.5 | | | | | | | | | |
| 10.0 | | | | | | | | | |
| 10.5 | | | | | | | | | |
| 11.0 | | | | | | | | | |
| 11.5 | | | | | | | | | |
| 12.0 | | | | | | | | | |
| 12.5 | | | | | | | | | |
| 13.0 | | | | | | | | | |
| 13.5 | | | | | | | | | |
| 14.0 | | | | | | | | | |
| 14.5 | | | | | | | | | |
| 15.0 | | | | | | | | | |
| 15.5 | | | | | | | | | |
| 16.0 | | | | | | | | | |
| 16.5 | | | | | | | | | |
| 17.0 | | | | | | | | | |
| 17.5 | | | | | | | | | |
| 18.0 | | | | | | | | | |
| 18.5 | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ELECTROFISHING CATCH | 105.3/h | GILL NET CATCH | 2.0/lift | TRAP NET CATCH | 1.5/lift |

| NUMBER, PERCENTAGE, WEIGHT, AND AGE OF BLACK CRAPPIE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TOTAL LENGTH (inches) | NUMBER COLLECTED | PERCENT OF FISH COLLECTED | AVERAGE WEIGHT (pounds) | AGE OF FISH | TOTAL LENGTH (inches) | NUMBER COLLECTED | PERCENT OF FISH COLLECTED | AVERAGE WEIGHT (pounds) | AGE OF FISH |
| 1.0 | | | | | 19.0 | | | | |
| 1.5 | | | | | 19.5 | | | | |
| 2.0 | | | | | 20.0 | | | | |
| 2.5 | | | | | 20.5 | | | | |
| 3.0 | | | | | 21.0 | | | | |
| 3.5 | | | | | 21.5 | | | | |
| 4.0 | | | | | 22.0 | | | | |
| 4.5 | | | | | 22.5 | | | | |
| 5.0 | | | | | 23.0 | | | | |
| 5.5 | | | | | 23.5 | | | | |
| 6.0 | | | | | 24.0 | | | | |
| 6.5 | | | | | 24.5 | | | | |
| 7.0 | | | | | 25.0 | | | | |
| 7.5 | 3 | 50.0 | 0.22 | 2, 3 | 25.5 | | | | |
| 8.0 | 2 | 33.3 | 0.28 | 3 | 26.0 | | | | |
| 8.5 | | | | | TOTAL | 6 | | | |
| 9.0 | | | | | | | | | |
| 9.5 | | | | | | | | | |
| 10.0 | | | | | | | | | |
| 10.5 | | | | | | | | | |
| 11.0 | | | | | | | | | |
| 11.5 | 1 | 16.7 | 0.94 | 5 | | | | | |
| 12.0 | | | | | | | | | |
| 12.5 | | | | | | | | | |
| 13.0 | | | | | | | | | |
| 13.5 | | | | | | | | | |
| 14.0 | | | | | | | | | |
| 14.5 | | | | | | | | | |
| 15.0 | | | | | | | | | |
| 15.5 | | | | | | | | | |
| 16.0 | | | | | | | | | |
| 16.5 | | | | | | | | | |
| 17.0 | | | | | | | | | |
| 17.5 | | | | | | | | | |
| 18.0 | | | | | | | | | |
| 18.5 | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ELECTROFISHING CATCH | 5.3/h | GILL NET CATCH | 0.5/lift | TRAP NET CATCH | 0/lift |

## LARGEMOUTH BASS AGE-LENGTH KEY

| Length group (in) | Total number | Sub-sample | AGE 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| 3.5 | 2 | 1 | 2 | | | | |
| 4.0 | 2 | 2 | 2 | | | | |
| 4.5 | 2 | 2 | 2 | | | | |
| 5.0 | 3 | 3 | 3 | | | | |
| 5.5 | | | | | | | |
| 6.0 | | | | | | | |
| 6.5 | | | | | | | |
| 7.0 | 9 | 5 | | 9 | | | |
| 7.5 | 24 | 7 | | 21 | 3 | | |
| 8.0 | 20 | 6 | | 20 | | | |
| 8.5 | 16 | 5 | | 13 | 3 | | |
| 9.0 | 5 | 5 | | 4 | 1 | | |
| 9.5 | 7 | 5 | | 3 | 4 | | |
| 10.0 | 7 | 4 | | 2 | 5 | | |
| 10.5 | 10 | 5 | | | 10 | | |
| 11.0 | 25 | 5 | | | 20 | 5 | |
| 11.5 | 12 | 6 | | | 4 | 8 | |
| 12.0 | 9 | 5 | | | | 9 | |
| 12.5 | 5 | 5 | | | | 5 | |
| 13.0 | 3 | 3 | | | | 1 | 2 |
| 13.5 | 1 | 1 | | | | | 1 |
| 14.0 | | | | | | | |
| 14.5 | 1 | 1 | | | | | 1 |
| Totals | 163 | 45 | 9 | 71 | 51 | 28 | 4 |

| AGE-LENGTH KEY SUMMARY | | | | | | |
|---|---|---|---|---|---|---|
| Age | Number | Mean TL | Var | SE | Lower 95%CI | Upper 95%CI |
| 1 | 9 | 4.6 | 0.38 | 0.20 | 4.2 | 5.0 |
| 2 | 71 | 8.2 | 0.50 | 0.08 | 8.1 | 8.4 |
| 3 | 51 | 10.5 | 1.16 | 0.15 | 10.2 | 10.8 |
| 4 | 28 | 12.1 | 0.30 | 0.10 | 11.8 | 12.3 |
| 5 | 4 | 13.8 | 0.50 | 0.35 | 13.0 | 14.5 |

## REDEAR SUNFISH AGE-LENGTH KEY

| Length group (in) | Total number | Sub-sample | AGE | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 |
| 3.5 | 2 | 2 | 2 | | | | | |
| 4.0 | | | | | | | | |
| 4.5 | | | | | | | | |
| 5.0 | 2 | 2 | | 2 | | | | |
| 5.5 | 6 | 6 | | 6 | | | | |
| 6.0 | 3 | 3 | | 3 | | | | |
| 6.5 | 2 | 2 | | 2 | | | | |
| 7.0 | 9 | 6 | | 5 | 5 | | | |
| 7.5 | 9 | 6 | | | 8 | 2 | | |
| 8.0 | 26 | 5 | | | 16 | 10 | | |
| 8.5 | 28 | 4 | | | 7 | 21 | | |
| 9.0 | 17 | 8 | | | | 9 | 9 | |
| 9.5 | 10 | 6 | | | | 7 | 3 | |
| 10.0 | 5 | 5 | | | | | 5 | |
| 10.5 | 6 | 6 | | | | | 2 | 4 |
| Totals | 125 | 61 | 2 | 18 | 35 | 48 | 19 | 4 |

| AGE-LENGTH KEY SUMMARY | | | | | | |
|---|---|---|---|---|---|---|
| Age | Number | Mean TL | Var | SE | Lower 95%CI | Upper 95%CI |
| 1 | 2 | 3.8 | 0 | 0 | 3.8 | 3.8 |
| 2 | 18 | 6.3 | 0.51 | 0.17 | 5.9 | 6.6 |
| 3 | 35 | 8.1 | 0.22 | 0.08 | 8.0 | 8.3 |
| 4 | 48 | 8.8 | 0.27 | 0.07 | 8.7 | 9.0 |
| 5 | 19 | 9.8 | 0.30 | 0.13 | 9.5 | 10.0 |
| 6 | 4 | 10.8 | 0 | 0 | 10.8 | 10.8 |

## BLUEGILL AGE-LENGTH KEY

| Length group (in) | Total number | Sub-sample | AGE 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| 1.0 | 3 | | | | | |
| 1.5 | 7 | 2 | 7 | | | |
| 2.0 | 10 | 4 | 10 | | | |
| 2.5 | 15 | 8 | 15 | | | |
| 3.0 | 2 | 2 | 2 | | | |
| 3.5 | 5 | 5 | | 5 | | |
| 4.0 | 3 | 3 | | 3 | | |
| 4.5 | 3 | 3 | | 2 | 1 | |
| 5.0 | 4 | 4 | | 3 | 1 | |
| 5.5 | 1 | 1 | | 1 | | |
| 6.0 | 3 | 3 | | 1 | 2 | |
| 6.5 | 10 | 7 | | | 9 | 1 |
| 7.0 | 5 | 5 | | | 4 | 1 |
| 7.5 | 8 | 4 | | | 4 | 4 |
| 8.0 | 10 | 8 | | | 1 | 9 |
| 8.5 | 1 | 1 | | | | 1 |
| Totals | 90 | 60 | 34 | 15 | 22 | 16 |

| AGE-LENGTH KEY SUMMARY | | | | | | |
|---|---|---|---|---|---|---|
| Age | Number | Mean TL | Var | SE | Lower 95%CI | Upper 95%CI |
| 1 | 34 | 2.4 | 0.20 | 0.08 | 2.3 | 2.6 |
| 2 | 15 | 4.6 | 0.67 | 0.21 | 4.2 | 5.0 |
| 3 | 22 | 6.9 | 0.67 | 0.18 | 6.6 | 7.3 |
| 4 | 16 | 8.0 | 0.27 | 0.13 | 7.7 | 8.2 |

## GPS LOCATION OF SAMPLING EQUIPMENT

| GILL NETS | | | TRAP NETS | | | ELECTROFISHING | | |
|---|---|---|---|---|---|---|---|---|
| 1 | N 38.486260 | W -86.558853 | 1 | N 38.479652 | W -86.563919 | 1 | N 38.479063 | W -86.563653 |
| | N | W | 2 | N 38.481197 | W -86.557604 | | N 38.479037 | W -86.562516 |
| 2 | N 38.483488 | W -86.558671 | 3 | N | W | 2 | N 38.479724 | W -86.564254 |
| | N | W | 4 | N | W | | N 38.480618 | W -86.568067 |
| 3 | N 38.479014 | W -86.562659 | 5 | N | W | 3 | N 38.481912 | W -86.568107 |
| | N | W | 6 | N | W | | N 38.483397 | W -86.563505 |
| 4 | N 38.481426 | W -86.568009 | 7 | N | W | 4 | N | W |
| | N | W | 8 | N | W | | N | W |
| 5 | N | W | 9 | N | W | 5 | N | W |
| | N | W | 10 | N | W | | N | W |
| 6 | N | W | 11 | N | W | 6 | N | W |
| | N | W | 12 | N | W | | N | W |
| 7 | N | W | 13 | N | W | 7 | N | W |
| | N | W | 14 | N | W | | N | W |
| 8 | N | W | 15 | N | W | 8 | N | W |
| | N | W | 16 | N | W | | N | W |
| 9 | N | W | 17 | N | W | 9 | N | W |
| | N | W | 18 | N | W | | N | W |
| 10 | N | W | 19 | N | W | 10 | N | W |
| | N | W | 20 | N | W | | N | W |
| 11 | N | W | | | | 11 | N | W |
| | N | W | | | | | N | W |
| 12 | N | W | | | | 12 | N | W |
| | N | W | | | | | N | W |
| 13 | N | W | | | | 13 | N | W |
| | N | W | | | | | N | W |
| 14 | N | W | | | | 14 | N | W |
| | N | W | | | | | N | W |
| 15 | N | W | | | | 15 | N | W |
| | N | W | | | | | N | W |
| 16 | N | W | | | | 16 | N | W |
| | N | W | | | | | N | W |
| 17 | N | W | | | | 17 | N | W |
| | N | W | | | | | N | W |
| 18 | N | W | | | | 18 | N | W |
| | N | W | | | | | N | W |
| 19 | N | W | | | | 19 | N | W |
| | N | W | | | | | N | W |
| 20 | N | W | | | | 20 | N | W |
| | N | W | | | | | N | W |