

# Scales Lake

## **Fish and Wildlife Research and Management Notes**

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## **INTRODUCTION**

Scales Lake is a 66-acre impoundment located in Boonville. The impoundment is part of Scales Lake Park (formerly Scales Lake State Park), operated by the Warrick County Parks and Recreation Department. Park facilities include a petting zoo, swimming beach, boat rental, camping and picnic areas. A handicap accessible boat ramp and fishing pier were constructed with Indiana Waters grant funding. Bank fishing accessibility is present on the north shore, along the dam on the east shore, and near the boat rental area and campgrounds along the southeast shore. Daily and annual entrance permits cost \$1.50 and \$15.00 while daily and annual boat launch permits cost \$1.00 and \$20.00. Both entrance and launch permits are required for boat launching.

The area that is now Scales Lake, and most of its watershed, were strip-mined and much of the area remains as spoil banks. The lake was formed by constructing a dam and flooding a mined area. Consequently, the lake resembles many strip pits in southwestern Indiana.

Due to uncertain ownership, the Division of Fish and Wildlife (DFW) was not involved with fish management at Scales Lake between 1977 and 1987. In January 1987, an Indiana court settlement gave 70 undeveloped acres to the Hemenway Presbyterian Church and left the remaining 380-400 acres under county control, as long as the park was maintained as a recreation area.

Fisheries surveys were conducted in 1963, 1964, 1965, 1967, 1977, 1987, 1992, 1993, 1995 and 1997. The 1987 results showed that bass growth was poor and that numbers of age one and two panfish were low. In 1992, the fishery was dominated by small, slow growing largemouth bass, most of which were probably dying of old age before they reached a length of 13 inches. Due to an overabundance of bass, panfish numbers were extremely low. In 1993, the bass fishery was basically the same as in 1992, but bluegill relative abundance increased due to a strong year class produced in 1992. In 1995, the panfish populations increased and bass growth improved. This was due to an increase in aquatic vegetation, since the slot limit was not in effect long enough to impact the fishery.

Additional fish management activities consisted of channel catfish stockings in 1978, 1985, 1988, 1991, 1993, 1994, 1996 and 1998. A total of 1,056 channel catfish are presently being stocked once every two years. Approximately 7,300 redear sunfish fingerlings were stocked in 1988. A largemouth bass 14 inch minimum length limit was in effect from 1990 to 1994. In September 1994, a bass 12 to 15 inch slot length limit was enacted. The slot limit allows anglers to keep bass less than 12 and greater than 15 inches, while bass measuring 12 to 15 inches have

to be released. This was necessary to reduce the dense population of small bass and to increase panfish production.

The current fisheries survey was conducted on May 17 and 18, 1999 to evaluate panfish recruitment, bass growth rates, impacts of the bass slot limit, and submerged vascular plant abundance. Water temperature, dissolved oxygen, conductivity, pH, total alkalinity, and secchi disk data were collected as per standard lake survey guidelines. Fish collection effort consisted of 0.75 hour of pulsed D.C. night electrofishing, four gill net lifts, and four trap net lifts. Two dippers collected fish stunned by the electrofishing boat.

## **RESULTS AND DISCUSSION**

Water chemistry results resembled that of a southwestern Indiana coal mine strip pit. Low turbidity and a conductivity of 674 micromhos/cm<sup>3</sup> were crude indicators that Scales Lake, like many strip pits, may be less productive than other types of lakes in the area. Dissolved oxygen was suitable for fish to a depth of 10 feet.

Aquatic vegetation covered approximately 26 percent of the lake bottom. The predominant aquatic vegetation type was Eurasian watermilfoil. Additional species observed were curlyleaf pondweed, sago pondweed, chara, and common cattail. Currently, the aquatic vegetation is being controlled by a professional herbicide applicator.

A total of 746 fish was collected which weighed 276.58 pounds. Bluegill dominated the collection by number followed by redear sunfish and largemouth bass. Redear ranked first by weight followed by bass and bluegill. Other fish species collected were warmouth, yellow bullhead, black crappie, channel catfish, and brown bullhead.

Proportional stock density (PSD) is an index used to characterize fish populations (Anderson 1976, Gabelhouse 1984). PSD is the percent of fish stock size or larger, which are quality size or larger. Bluegill and largemouth bass stock sizes are three and eight inches, respectively. Bluegill and largemouth bass quality sizes are six and 12 inches, respectively. Populations dominated by small fish have a low PSD value, while populations with large fish have a high PSD value. Anderson suggests that a balanced bluegill population should have a PSD value between 20 and 60. A balanced largemouth bass population should have a PSD value between 40 and 70.

Relative stock density (RSD) is the percentage of fish of any designated length group which are also stock size. Relative stock density used for bluegill was RSD7 (number of bluegill which are seven inches and larger divided by the total number of bluegill which are greater than three inches). Bass RSDs used were RSD14 and RSD15.

A total of 301 bluegill was sampled which weighed 71.41 pounds and ranged in length from 1.6 to 9.4 inches. Bluegill accounted for 40 percent of the collection by number and 26 percent by weight. Relative abundance by number decreased from 64 percent in 1997, while a small increase was shown by weight. Bluegill electrofishing catch rates were 159/hour in 1999, 851/hour (1997), 375/hour (1995), 213/hour (1993), and 25/hour (1992). Bluegill trap net catch rates substantially increased from 1997 results. Trap net catches in 1999 were 40 per lift while

they were less than one per lift in 1997. Bluegill growth rates increased from 1997. Growth rates were average for ages one and two bluegill, at the high end of the normal range for age three, and above average for ages four, five, and six when compared to district growth averages. Bluegill average weights were within the normal range for southwest Indiana.

The bluegill PSD was 48 and the RSD7 was 37 in 1999. PSD values from 1997 and 1995 were 31 and 45 respectively. The PSD values for both years were within the recommended range that indicates a balanced bluegill population. A RSD7 of 37 is a substantial increase from the 28 recorded in 1997. This increase indicates a larger proportion of the bluegill population is greater than seven inches.

A total of 190 redear sunfish was collected that weighed 95.97 pounds. Redear accounted for 26 percent of the collection by number and 35 percent by weight and ranged in length from 3.2 to 10.7 inches. Relative abundances in 1997 were much lower. In 1997, they accounted for nine percent of the collection by number and 22 percent by weight. All but four of the redear sampled were greater than 6 inches in length. Nearly 50 percent of the redear sampled were greater than nine inches and 21 percent exceeded 10 inches. Redear electrofishing catch rates decreased from 84 per hour in 1997 to 24 per hour in 1999. Previous electrofishing catch rates were 78/hour (1995), 13/hour (1993), and 14/hour (1992). Redear trap net catch rates increased from 9 per lift in 1997 to 42 per lift in 1999. Growth rates were average for ages one and two, above average for ages three and four, and at the high end of the average range for age five. Growth rates in 1999 were higher than 1997 figures. Redear average weights were normal.

The 178 largemouth bass sampled weighed 83.98 pounds and ranged in length from 4.9 to 17.5 inches. Bass relative abundance by number increased from 17 percent in 1997 to 24 percent in 1999. Relative abundance by weight decreased from 44 percent in 1997 to 30 percent in 1999. The increase by number and decrease by weight indicated that there were more smaller bass in the lake than in 1997. The bass electrofishing catch rate was 232 per hour in 1999. Previous electrofishing catch rates were 234/hour in 1997, 167/hour (1995), 112/hour (1993), and 122/hour (1992). Bass growth rates were above average for ages one and two, and at the high end of the normal range for ages three and four. Bass growth improved for the second straight survey. However, fewer larger bass were sampled in 1999 versus 1997. The percentage of bass in the 12 to 15 inch protected slot limit range has been on an increasing trend since 1995 ([Table 1](#)). However, the percentages of bass greater than 15 inches has not increased which is not normal for a lake that has had a slot size limit in effect for five years. Factors affecting the abundance of bass greater than 15 inches could be angler harvest, or the ineffectiveness of the survey equipment to sample large bass.

Bass PSD's appear to be leveling off. There was a big jump from 1995 (26) to 1997 (46) and then a slight decline to 44 in 1999. These figures indicate the bass population was composed of primarily small bass in 1995 and then shifted to a more balanced population of small and larger fish in 1997 and 1999. However, the RSD14 and 15 values, which account for fish greater than 14 and 15 inches, have both decreased from 1997 levels to two and one, respectively. This shows that the PSD increases have primarily been due to bass ranging in length from 12 to 13.9 inches.

The 55 warmouth sampled weighed 12.16 pounds. They accounted for seven percent of the collection by number and four percent by weight. Warmouth ranged in length from 2.5 to 8.1 inches.

The remainder of the collection included yellow bullhead, black crappie, channel catfish, and brown bullhead. They combined for three percent of the collection by number and five percent by weight.

## **CONCLUSION AND RECOMMENDATIONS**

Scales Lake is a great fishing lake for panfish and bass under 14 inches long. The lake possesses large numbers of 8-inch plus bluegill and 9.5 inch plus redear sunfish. The largest bluegill sampled was 9.4 inches long and the largest redear was 10.7 inches and weighed over a pound. Black crappie are also present in the lake which should add to the anglers creel. Largemouth bass fishing opportunities are good for bass less than 14 inches due to the large number of small bass present in the lake.

The 1997 Scales Lake Fish Management Report (Carnahan 1998) indicated the resurgence in aquatic vegetation was the primary “fix” for improvements in the fishery and not the bass slot limit. This was based on the increased bass electrofishing catch rates. The 1999 fisheries survey further substantiates this theory with the bass electrofishing catch rate remaining about the same as in 1997, the increased bass relative abundance, and the large decrease in bluegill numbers (as indicated by relative abundance and electrofishing catch rates). In a normal slot limit lake, bass numbers will decrease, while bluegill numbers increase. Some bass need to be harvested to ensure that the panfishing remains excellent. The harvest of more bass will also further improve bass growth rates which should produce larger bass in the population. The angler creel survey planned in 2001 at Scales Lake will help further evaluate the effects of the slot size limit by determining how many bass are harvested.

Channel catfish stockings should continue. Only four channel catfish were collected in the survey. This indicates that the stocked catfish are being utilized by anglers.

As recommended in previous fish management reports, the only areas that should be treated with registered aquatic herbicides are the north bank from the fishing platform to the dam, the east shore (the dam), 15 acres southeast that includes the two fingered basin, beach and boat rental areas, and a narrow boat passage channel into the west basin. Any future fish management activities by the DFW would be counter productive if the past practice of annually eliminating all submerged aquatic vegetation is continued.

Scales Lake should be resurveyed in 2001. The objectives of the survey should be to monitor bluegill and bass growth, relative abundances, and aquatic vegetation abundances.

## Tables

**Table 1. Percent of bass in various length groups, Scales Lake, 1995, 1997, 1999.**

<b>Year</b>	<b>Percent between 3 - 8 inches</b>	<b>Percent between 8 - 12 inches</b>	<b>Percent between 12 - 15 inches</b>	<b>Percent greater than 15 inches</b>
<b>1995</b>	12	68	19	less than 1
<b>1997</b>	37	39	22	2
<b>1999</b>	35	37	27	less than 1

## Literature Cited

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