# SCALES LAKE FISHERIES SURVEY AND ANGLER SURVEY RESULTS

2001 Fish Management Report

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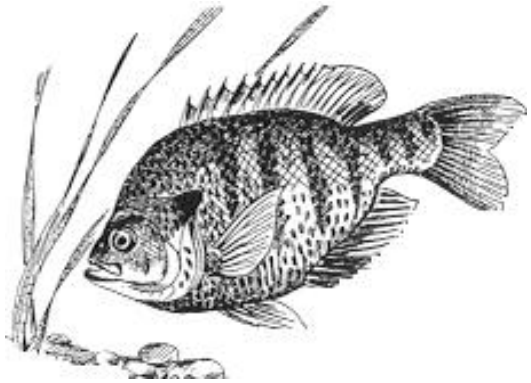

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# SCALES LAKE FISHERIES SURVEY AND ANGLER SURVEY RESULTS
Warrick County

Fish Management Report
2001

## INTRODUCTION

Scales Lake is a 66 acre impoundment located in Boonville (Figure 1). 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 good around most of the lake. 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.

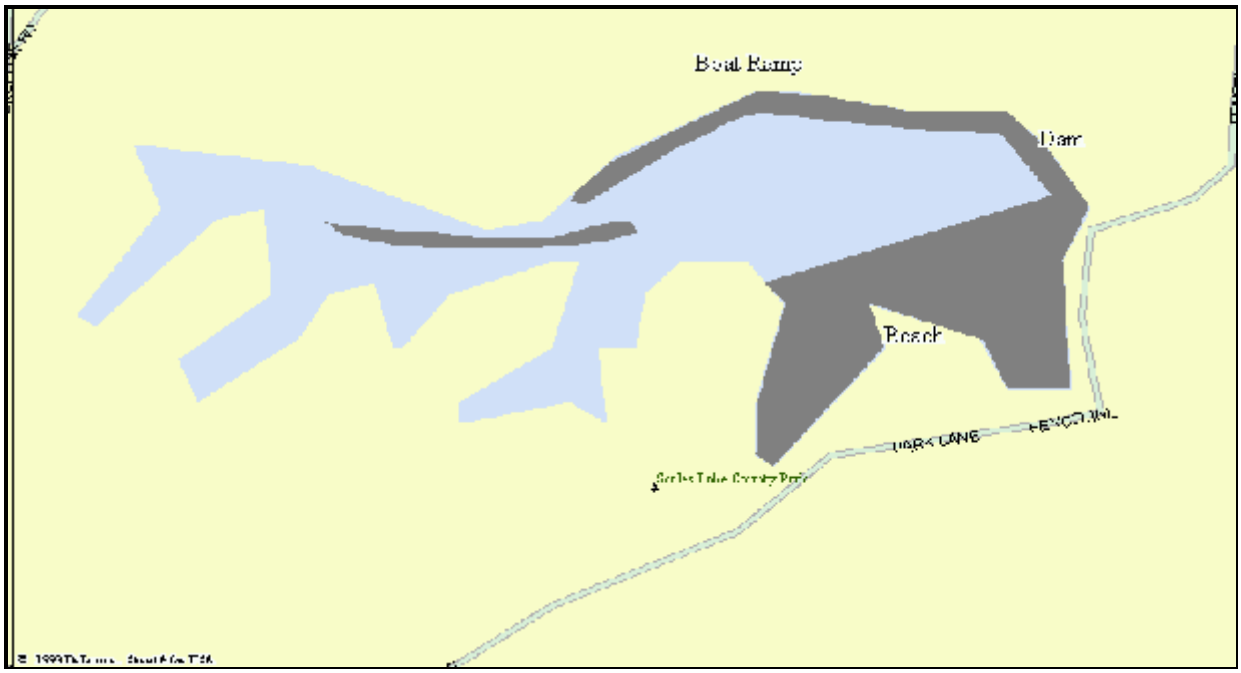


Figure 1. Map of Scales Lake. Aquatic vegetation control areas are shaded.

The area that is now Scales Lake and most of its watershed was strip-mined for coal 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, 1997 and 1999. The 1999 survey indicated that the lake contained great fishing for panfish and bass less than 14 inches long (Carnahan 2000). Many bluegill and redear sunfish greater than 8 inches were sampled in 1999. The largest bluegill sampled was 9.4 inches while the largest redear measured 10.7 inches. It was assumed that the bass slot size limit was not having a major impact on the bass population since bass electrofishing catch rates have either increased or remained the same since 1993.

Additional fish management activities consisted of channel catfish stockings in 1978, 1985, 1988, 1991, 1993, 1994, 1996, 1998, and 2000. Since 1994, 1,056 channel catfish have been stocked biannually. 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.

## METHODS

### FISHERIES SURVEY

The standard fish management survey was conducted on May 14 and 15, 2001 to evaluate panfish recruitment, bass growth rates, and impacts of the bass slot limit. An aquatic vegetation survey was conducted on July 3. 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 two trap net lifts. Two dippers collected fish stunned by the electrofishing boat. All fish were processed according to standard lake survey guidelines.

### ANGLER SURVEY

The survey was conducted by a single clerk from April 2 through October 31, 2001. Ten days were sampled out of every 14 day period. The clerk worked two different shifts in the summer, a morning (6 a.m. to 1:30 p.m.) and afternoon (1:00 p.m. to 8:30 p.m.). Since fishing pressure is typically higher in the afternoon, 75% of the sampling was conducted during the afternoon period. In the spring and fall, the park's gate hours were approximately 7 A.M. to 7 P.M. or sunset. The clerk's shifts were adjusted accordingly to correspond with the times the

park opened and closed. The creel clerk worked a total of 153 days. Count data was taken five times a shift from the boat ramp to determine fishing pressure. The clerk was stationed at the boat ramp.

Boat and shore anglers were interviewed at the end of their fishing trip. Typical information obtained from an angler interview included the number of anglers in a fishing party, fishing trip length, species sought by anglers, numbers and lengths of fish harvested by species and number of largemouth bass caught and released. Largemouth bass catch and release totals were categorized into less than 12, 12 to 15, and greater than 15 inches length ranges. All anglers interviewed were asked; "Were you satisfied with your fishing trip?". The creel clerk measured each harvested fish to the nearest 0.5 inch.

Yield by weight estimates were determined from the weight data from the Scales Lake 1997 Fish Management Report (Carnahan 1998). Harvest estimates were obtained using the Division of Fish and Wildlife's standard small lake angler survey program developed by Stuart Shipman and modified by Larry Koza.

## RESULTS

### FISHERIES SURVEY

Water chemistry results resembled that of a southwestern Indiana coal mine strip pit. Low turbidity and a conductivity of 674 microsiemens 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.

The predominant aquatic vegetation type was brittle naiad. Additional species observed were curlyleaf pondweed, eurasion watermilfoil, chara, slender naiad, creeping water primrose, american pondweed, and common cattail. Aquatic vegetation coverage was optimal for fishing access and to support a balanced fish community. During the fisheries survey, curlyleaf pondweed covered most of the lake. Hence, the lake's vegetation is treated by a professional herbicide applicator in May every year according to guidelines set by the district 7 fisheries biologist.

A total of 668 fish was collected which weighed 270.86 pounds. Bluegill dominated the collection by number followed by redear sunfish and largemouth bass. Redear ranked first by weight followed by bass, channel catfish, and bluegill. Other fish species collected were warmouth, yellow bullhead, black crappie, and bowfin.

Proportional stock density (PSD) is an index used to characterize fish populations (Anderson 1976, Gabelhouse 1984). Proportional stock density is the percent of stock size fish, which are also quality size. Bluegill and largemouth bass stock sizes are 3 and 8 inches, respectively. Bluegill and largemouth bass quality sizes are 6 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 7 inches and larger divided by the total number of bluegill which are greater than 3 inches). Bass RSDs used were RSD14 and RSD15.

A total of 225 bluegill was sampled which weighed 37.24 pounds. The bluegill ranged in length from 0.9 to 9.2 inches (Appendix). Bluegill accounted for 34% of the collection by number and 14% by weight. Relative abundances in 1997 and 1999 were 64% and 40% by number and 22% and 26% by weight respectively. Bluegill electrofishing catch rates were 216 per hour in 2001, 159 (1999), 851 (1997), 375 (1995), 213 (1993), and 25 (1992). Bluegill trap net catch rates were 12 per lift in 2001, 40 (1999), and less than 1 (1997). Bluegill growth rates increased by nearly an inch for ages 3 and 4 since 1999. Overall growth rates were above average when compared to district averages.

Bluegill fishing was rated as excellent with a Bluegill Fishing Potential Index (BGFP) score of 28 (Ball and Tousignant 1996). The BGFP increased from the 1999 score of 25. A score of 25 rated the bluegill fishing at the high end of the good range.

The bluegill PSD was 35 and the RSD7 was 14. In 1999, the PSD value was 48 and the RSD7 was 37. The PSD values for both years were within the recommended range which indicated the bluegill size distribution was well balanced. A RSD7 of 14 was low compared to previous surveys, but is still high when compared to other lakes in the fisheries district.

A total of 216 redear sunfish was collected that weighed 98.87 pounds. Redear accounted for 32% of the sample by number and 37% by weight and ranged in length from 4.4 to 10.8 inches. Relative abundances in 1999 were 26% by number and 35% by weight. Nearly 29% of the redear sampled were greater than 9 inches and 10% exceeded 10 inches. The redear electrofishing catch rate remained about the same from 1999 at 27 per hour. Redear trap net catch rates increased from 42 per lift in 1999 to 95 in 2001. Growth rates were above average and approximately a half inch better per age class when compared to 1999 growth rates.

The 141 largemouth bass sampled weighed 64.25 pounds and ranged in length from 4.7 to 16.2 inches. Bass relative abundance by number decreased from 24% in 1999 to 21% in 2001. Relative abundance by weight decreased from 30% in 1999 to 24% in 2001. The bass electrofishing catch rate was 183 per hour in 2001. Previous electrofishing catch rates were 232 per hour (1999), 234 (1997), 167 (1995), 112 (1993), and 122 (1992). Bass growth rates were

average when compared to district averages and similar to 1999 results.

The percentage of bass in the 12 to 15 inch protected slot limit range has been on an increasing trend since 1995 until 2001 (Table 1). In 2001, 14% of the bass sampled ranged in length from 12 to 15 inches, compared to 27% in 1999. The percentage of bass between 8 to 12 inches increased from 37% to 58% in 2001. The percentage of bass greater than 15 inches did not change since 1999.

Table 1. Percent of bass by selected length groups, Scales Lake, 1995 - 2001.

| Year | Percent Between 3 - 8 inches | Percent Between 8 - 12 inches | Percent Between 12 - 15 inches | Percent Greater Than 15 inches |
|---|---|---|---|---|
| 1995 | 12 | 68 | 19 | <1 |
| 1997 | 37 | 39 | 22 | 2 |
| 1999 | 35 | 37 | 27 | <1 |
| 2001 | 27 | 58 | 14 | <1 |

The bass PSD index value was 26 in 2001. Previous PSD values were 44 (1999), 46 (1997), and 26 (1995). A PSD of 26 indicates that the majority of the bass sampled were less than 12 inches in length. The RSD14 and 15 values remained the same from 1999 figures of 2 and 1 respectively.

Forty-one warmouth were sampled that weighed 9.06 pounds. They accounted for 6% of the collection by number and 3% by weight. Warmouth ranged in length from 2.8 to 7.9 inches.

Twenty-two channel catfish were sampled that weighed 41.48 pounds. They accounted for 3% of the sample by number and 15% by weight. Channel catfish ranged in length from 8.7 to 23.9 inches. The gill net catch rate was nearly 6 per overnight lift.

The remainder of the collection included yellow bullhead, black crappie, and bowfin. They combined for 3% of the collection by number and 7% by weight.

## ANGLER SURVEY

### Fishing Pressure and Harvest Rates

An estimated 1,881 anglers fished approximately 16,032 hours (243 hours per acre) from April 2 through October 31, 2001 (Table 2). The highest fishing pressure occurred in May followed by June and July. The lowest fishing pressure occurred in October followed closely by August.

Table 2. Estimated number of anglers, hours of fishing pressure, and overall harvest rates by month at Scales Lake, 2001.

| Month | Number of Anglers | Fishing pressure (hours) | Harvest Rate (fish/hour) |
|---|---|---|---|
| April | 378 | 1,839 | 0.78 |
| May | 539 | 4,537 | 0.73 |
| June | 332 | 2,887 | 0.42 |
| July | 230 | 2,546 | 0.49 |
| August | 93 | 1,334 | 0.52 |
| September | 173 | 1,572 | 0.38 |
| October | 136 | 1,318 | 1.05 |
| Totals | 1,881 | 16,032 | 0.62 |

The overall harvest rate was 0.62 fish per hour. The highest harvest rate was in October (1.05 fish per hour), followed by April (0.78), and May (0.73). The lowest harvest rate was in September (0.38). The overall catch rate (harvested fish plus caught and released fish) was 0.72 fish per hour.

## Estimated Harvest

The total estimated harvest was 9,917 fish that weighed 4,649.04 pounds (Table 3). Bluegill comprised 64% of the harvest by number followed by redear sunfish (21%), channel catfish (5%), black crappie (5%), largemouth bass (4%), and warmouth (1%). Bluegill accounted for 54% of the harvest by weight followed by redear sunfish, and channel catfish.

Table 3. Estimated numbers and pounds of fish harvested at Scales Lake from April 2 - October 31, 2001.

| Species | Harvest by Number | Percent of Total | Harvest by Weight (lbs) | Percent of Total | Average Length (in) |
|---|---|---|---|---|---|
| Bluegill | 6,298 | 63.5 | 2,519.20 | 54.2 | 7.8 |
| Redear sunfish | 2,149 | 21.7 | 1,095.99 | 23.6 | 8.5 |
| Channel catfish | 540 | 5.4 | 610.20 | 13.1 | 15.5 |
| Black crappie | 448 | 4.5 | 210.56 | 4.5 | 9.5 |
| Largemouth bass | 361 | 3.6 | 194.94 | 4.2 | 11.1 |
| Warmouth | 121 | 1.2 | 18.15 | 0.4 | 7.3 |
| Totals | 9,917 | | 4,649.04 | | |

A total of 6,298 bluegill was harvested that weighed 2,519.20 pounds. They ranged in length from 5 to 9.5 inches and averaged 7.8 inches. Sixty percent of the bluegill were at least 8 inches long (Table 4).

Table 4. Length frequency distribution of fish observed harvested from Scales Lake, April 2 - October 31, 2001.

| Length | Bluegill | | Redear Sunfish | | Channel Catfish | | Black Crappie | | Largemouth Bass | |
|---|---|---|---|---|---|---|---|---|---|---|
| (inches) | Number | % | Number | % | Number | % | Number | % | Number | % |
| 5 | 2 | 0.1 | | | | | | | | |
| 6 | 7 | 0.3 | 3 | 0.3 | | | | | | |
| 6.5 | 44 | 1.7 | 11 | 1.2 | | | 1 | 0.4 | 1 | 0.5 |
| 7 | 241 | 9.3 | 35 | 3.8 | | | 11 | 4.2 | | |
| 7.5 | 738 | 28.5 | 91 | 9.9 | | | 15 | 5.7 | | |
| 8 | 1,081 | 41.8 | 204 | 22.2 | | | 38 | 14.5 | | |
| 8.5 | 419 | 16.2 | 282 | 30.7 | | | 15 | 5.7 | | |
| 9 | 47 | 1.8 | 184 | 20.0 | 1 | 0.7 | 48 | 18.3 | 3 | 1.6 |
| 9.5 | 7 | 0.3 | 45 | 4.9 | 3 | 2.0 | 21 | 8.0 | 9 | 4.9 |
| 10 | | | 48 | 5.2 | 6 | 4.0 | 33 | 12.6 | 15 | 8.2 |
| 10.5 | | | 14 | 1.5 | 5 | 3.4 | 27 | 10.3 | 32 | 17.5 |
| 11 | | | 1 | 0.1 | 6 | 4.0 | 28 | 10.7 | 54 | 29.5 |
| 11.5 | | | | | 8 | 5.4 | 12 | 4.6 | 55 | 30.1 |
| 12 | | | | | 8 | 5.4 | 7 | 2.7 | 4 | 2.2 |
| 12.5 | | | | | 8 | 5.4 | | | | |
| 13 | | | | | 5 | 3.4 | 2 | 0.8 | | |
| 13.5 | | | | | 2 | 1.3 | 1 | 0.4 | | |
| 14 | | | | | 8 | 5.4 | 1 | 0.4 | | |
| 14.5 | | | | | 2 | 1.3 | 1 | 0.4 | | |
| 15 | | | | | 5 | 3.4 | | | | |
| 15.5 | | | | | 2 | 1.3 | 1 | 0.4 | 6 | 3.3 |
| 16 | | | | | 15 | 10.1 | | | 1 | 0.5 |
| 16.5 | | | | | 8 | 5.4 | | | 2 | 1.1 |
| 17 | | | | | 8 | 5.4 | | | | |
| 17.5 | | | | | 7 | 4.7 | | | | |
| 18 | | | | | 7 | 4.7 | | | 1 | 0.5 |
| 18.5 | | | | | 5 | 3.4 | | | | |
| 19 | | | | | 12 | 8.1 | | | | |
| 19.5 | | | | | 4 | 2.7 | | | | |
| 20 | | | | | 4 | 2.7 | | | | |
| 20.5 | | | | | 2 | 1.3 | | | | |
| 21 | | | | | 1 | 0.7 | | | | |
| 22 | | | | | 2 | 1.3 | | | | |
| 22.5 | | | | | 2 | 1.3 | | | | |
| 25.5 | | | | | 2 | 1.3 | | | | |
| 26 | | | | | 1 | 0.7 | | | | |
| Totals | 2,586 | | 918 | | 149 | | 262 | | 183 | |

A total of 2,149 redear sunfish was harvested that weighed 1,095.99 pounds. They ranged in length from 6 to 11 inches and averaged 8.5 inches. Thirty-two percent of the harvested redear were at least 9 inches long.

Five hundred-forty channel catfish were harvested that weighed 610.20 pounds. They ranged in length from 9 to 26 inches and averaged 15.5 inches. Nearly 10% of the channel catfish were at least 20 inches long.

A total of 448 black crappie was harvested that weighed 210.56 pounds. They ranged in

length from 6.5 to 15.5 inches and averaged 9.5 inches. Twenty percent of the black crappie were at least 11 inches long.

Three hundred-sixty-one largemouth bass were harvested that weighed 194.94 pounds. They ranged in length from 6.5 to 18 inches and averaged 11.1 inches. No harvest of slot size bass was observed. Five percent of the bass harvested were greater than 15 inches.

One hundred-twenty-one warmouth were harvested that weighed 18.15 pounds. The average length of a harvested warmouth was 7.3 inches.

## Catch and Release

An estimated 1,630 largemouth bass were caught and released. Bass less than 12 inches accounted for 62% of the total followed by 12 to 15 inch bass (44%), and bass greater than 15 inches (4%) (Figure 2). These percentages were similar to Indian, Celina, and Patoka Lakes while these lakes possessed the same bass slot size limit (Carnahan 2001, Stefanavage and Carnahan 1995).

## Species Sought by Anglers

Bluegill was the most sought after fish species at Scales Lake during the angler survey. Approximately 60% of the anglers targeted bluegill followed by largemouth bass (20%), channel catfish (16%), and black crappie (4%) (Figure 3). Less than 1% of the anglers listed fishing for "anything" or redear sunfish as species that they were targeting.

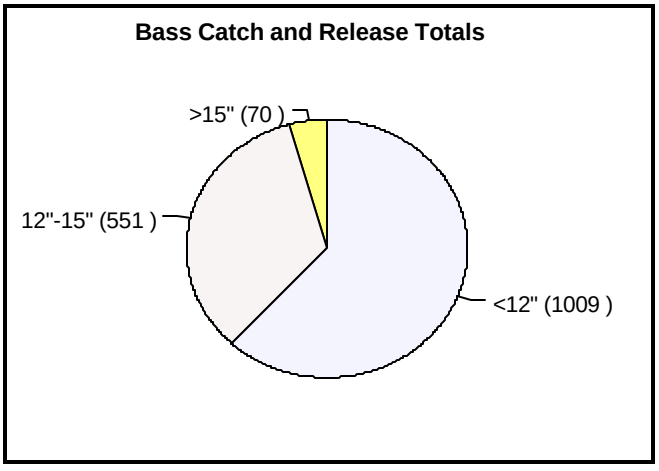


Figure 2. Largemouth bass catch and release totals by size category, Scales Lake, 2001.

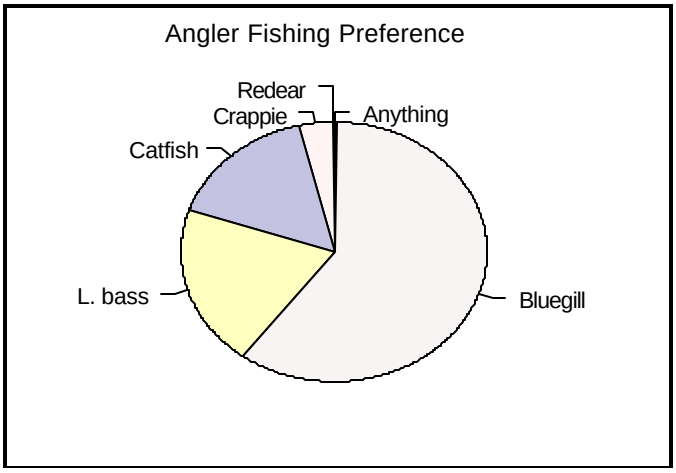


Figure 3. Fish species preferred by Scales Lake anglers, 2001.

## Angler Satisfaction

The clerk asked each party at the end of their fishing trip if they were satisfied with their fishing trip. Seventy-one percent of the anglers were satisfied with their fishing trip, 3% were not satisfied, and 26% did not respond to the question.

## Angler County of Residency

Residents from 16 of Indiana's 92 counties fished at Scales Lake during the creel period (Table 5). The majority of the anglers resided in Warrick (54%) and Vanderburgh (34%) Counties. Less than 4% of the other anglers resided in each of the other 14 counties.

Table 5. Origin of anglers interviewed at Scales Lake, April 2 - October 31, 2001.

| County | Number | Percent |
|---|---|---|
| Warrick | 557 | 54.0 |
| Vanderburgh | 350 | 33.9 |
| Morgan | 37 | 3.6 |
| Spencer | 37 | 3.6 |
| Gibson | 9 | 0.9 |
| Marion | 8 | 0.8 |
| Posey | 6 | 0.6 |
| Perry | 5 | 0.5 |
| Whitley | 4 | 0.4 |
| Lawrence | 3 | 0.3 |
| Pike | 3 | 0.3 |
| Dearborn | 3 | 0.3 |
| Sullivan | 2 | 0.2 |
| Lake | 1 | 0.1 |
| Carroll | 1 | 0.1 |
| Hendricks | 1 | 0.1 |
| Non-residents | 4 | 0.4 |

## Economic Value of the Fishery

Fishing related expenditures such as, bait, tackle, food, license fee's, lodging, and transportation represent a monetary value for the Scales Lake fishery. The average cost for a fresh water fishing trip in Indiana was $52.29 per angler day in 1996 (U.S. Department of Interior, Fish and Wildlife Service and U.S. Department of Commerce, Bureau of the Census, 1997). The $52.29 average was used for determining the economic value of Scales Lake's fishery. The estimated 1,881 anglers that fished the lake during the creel period represented an economic value of $98,357.49 for the fishery.

## CONCLUSIONS

Scales Lake is a great fishing lake for panfish and bass under 15 inches long. The lake possesses large numbers of 8 inch plus bluegill and 9.0 inch plus redear sunfish. The largest bluegill sampled was 9.2 inches long and the largest redear was 10.8 inches. Black crappie and channel catfish are also present in the lake which adds to the anglers creel. The average lengths of the bluegill, redear sunfish, and black crappie harvested were exceptional. Largemouth bass fishing opportunities are good for bass less than 15 inches due to the large number of small bass present in the lake.

Fishing pressure at Scales Lake is considered high compared to other similar lakes in the area (Table 6). The fishing pressure at Scales was 243 hours per acre, while other area lakes have, at most, half that pressure. Scales lake was also one of the best lakes for the number of fish harvested per acre, and pounds of fish harvested per acre. Scales Lake harvest rate of 0.62 fish per hour was good. Scales Lake, when compared to other similar lakes where angler surveys have been conducted, possessed the third highest harvest rate in the fisheries district.

Table 6. Comparisons of fishing pressure, fish harvest, yield, and harvest rates from angler creel surveys conducted at Scales Lake and other Indiana reservoirs.

| Lake and Year | Fishing Pressure (hours/acre) | Fish Harvest (number/acre) | Yield (lbs./acre) | Harvest Rate (fish/hour) |
|---|---|---|---|---|
| Scales (66 acres) | | | | |
| 2001 | 243 | 150 | 70.4 | 0.62 |
| Saddle (41 acres) | | | | |
| 1993 | 76 | 28 | 10.8 | 0.37 |
| Indian (154 acres) | | | | |
| 1993 | 169 | 140 | 55.0 | 0.83 |
| 1990 | 141 | 154 | 57.1 | 1.09 |
| 1988 | 119 | 108 | 43.9 | 0.91 |
| 1987 | 183 | 153 | 64.8 | 0.84 |
| 1986 | 69 | 37 | 14.2 | 0.54 |
| Celina (164 acres) | | | | |
| 1993 | 125 | 33 | 16.6 | 0.27 |
| 1990 | 111 | 64 | 26.6 | 0.57 |
| 1988 | 93 | 39 | 16.7 | 0.42 |
| 1987 | 149 | 38 | 15.8 | 0.25 |
| 1986 | 92 | 17 | 8.9 | 0.18 |
| Tipsaw (131 acres) | | | | |
| 1993 | 103 | 89 | 36.2 | 0.86 |
| 1990 | 121 | 94 | 37.4 | 0.77 |
| 1988 | 97 | 76 | 35.1 | 0.79 |
| 1987 | 110 | 102 | 40.2 | 0.93 |
| 1986 | 48 | 29 | 11.0 | 0.61 |

Since September, 1994 a largemouth bass slot size limit has been in effect. This regulation was enacted to help improve the bass population's size structure and growth rates, and to increase panfish recruitment. This regulation has been successful in creating a quality panfish fishery, which is the primary management emphasis at this lake. There were 361 bass harvested during the creel period. It is assumed that this harvest was similar to the bass harvest in previous years since the bass electrofishing catch rates have not drastically changed between the past standard fisheries surveys. It is recommended that the slot size limit remain in effect to help reduce, or at least, maintain the current size of the bass population and to maintain panfish recruitment.

Channel catfish ranked third in the harvest with 540 being harvested. Also, 16% of the anglers were targeting channel catfish. The channel catfish stocking program should continue as planned due to high angler interest.

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 in the southeast two fingered basin, beach and boat rental areas, and a narrow boat passage channel into the west basin (Figure 1). The proper management of aquatic vegetation at Scales Lake is one of the major factors that helps maintain the lake's good fishing.

The fishery at Scales Lake has not changed much since 1995. It appears that the fishery has stabilized since the elimination of all the aquatic vegetation in 1992.

## LITERATURE CITED

Anderson, R.O. 1976. Management of small warm water impoundments. Fisheries (Bethesda) 1(6):5-7, 26-28.

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.

Carnahan, D.P. 1998. 1997 Scales Lake fish management report. Indiana Department of Natural Resources, Indianapolis. 13 pp.

Carnahan, D.P. 2000. 1999 Scales Lake fish management report. Indiana Department of Natural Resources, Indianapolis. 14 pp.

Carnahan, D.P. 2001. Patoka Lake fish management report. 2000 fish management report. Indiana Department of Natural Resources, Indianapolis. 40 pp.

Gabelhouse, D.W., Jr. 1984. A length-categorization system to assess fish stocks. North American Journal of Fisheries Management. 4:273-285.

Stefanavage, T.C. and D.P. Carnahan. 1995. Largemouth bass slot size limit evaluation at Indian, Celina, Tipsaw, and Saddle Lakes. 1993 fish management report. 49 pp.

U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, Bureau of the Census. 1996 National Survey of Fishing, Hunting, ans Wildlife-Associated Recreation. 114 pp.

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# APPENDIX

## Fish Management Survey Data