

A SURVEY OF THE BIG LONG LAKE FISH COMMUNITY, LARGEMOUTH BASS
POPULATION AND FISH HARVEST

LaGrange County

2005

Larry A. Koza

Assistant Fisheries Biologist



Fisheries Section
Indiana Department of Natural Resources
Division of Fish and Wildlife
I.G.C.-South, Room W273
402 W. Washington Street
Indianapolis, IN 46204

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ABSTRACT

Three fisheries surveys were conducted at Big Long Lake by Division of Fish and Wildlife (DFW) fisheries biologists in 2005, a fish population survey, an angler creel survey and a largemouth bass population estimate.

The fish population survey was conducted from June 13 through 17, 2005. A total of 657 fish weighing 344 pounds were collected during this survey. Fifteen species were represented in the sample. Largemouth bass dominated the sample by number (36%) followed by bluegill (20%), yellow bullhead (14%) and yellow perch (11%). Largemouth bass also dominated the sample by weight (28%), followed by northern pike (21%) and yellow bullhead (17%).

The creel survey was conducted from April 19 through October 31, 2005. Big Long Lake anglers fished a total of 9,799 hours, with boat anglers accounting for 9,308 (95%) of those hours. Boat anglers exerted a fishing pressure of 25.5 hours per acre and harvested 10,484 fish or 1.13 fish per hour. Nine species were represented in the harvest. The number one species harvested numerically was bluegill (68%) followed by yellow perch (19%) and redear (11%). Bluegill also dominated the harvest by weight (69%), followed by yellow perch (17%) and redear (12%). In addition to the species harvested, anglers caught and released 12,994 largemouth bass.

Bluegill was by far the most sought after species at Big Long Lake, as 67% of all angler parties interviewed indicated they were fishing specifically for bluegill. An additional 5% indicated they were fishing for panfish, a group that would include bluegill. Bass fisherman comprised the second most popular category with 22%. Other responses included yellow perch (3%), anything (1%) and crappie (less than 1%).

Residents from 18 counties other than LaGrange County fished at Big Long Lake during this survey. An additional 3% of the angling parties came from Ohio while 1% came from Michigan and 1% indicated they were from other states. The Indiana County with the most visitors from outside of LaGrange County was Allen County (14%). The next highest number of parties came from Noble County (10%) followed by DeKalb County (8%). Lake residents accounted for 35% of all Big Long Lake angling parties interviewed during this survey.

The total largemouth bass population estimate for Big Long Lake was 17,656 fish, or 48.4 per acre. A total of 3,729 bass, or 21% of the population, were handled during this survey. Estimates indicated a total of 14,707 (83%) stock size bass (eight-in TL or larger) were present

in Big Long Lake. Bass 12 in TL or larger numbered 2,841 (7.8 per acre) while only 71 bass (0.2 per acre) were legal size. These fish comprised 16% and 0.4% of the population respectively. Bass 8.0 to 12.0 in TL comprised 81% of the sample while 59% were 10.0 to 12.0 in TL. The largest bass collected during the Big Long Lake population estimate study measured 19.9 in TL.

Big Long Lake supports a good sport fish population comprised primarily of largemouth bass, bluegill, yellow perch and redear. Together these species represented 72% of the general survey sample by number and 43% by weight. Bluegill, perch and redear provide very good fishing opportunities as approximately 78% of these three species were harvestable size. The majority of the age classes for these three species grew at an above average rate for northern Indiana natural lakes. While a plentiful largemouth bass fishery is present at Big Long Lake, the number of legal size fish is a low. Largemouth bass are only moderately attractive to anglers as 22% of anglers were fishing exclusively for bass. Despite the fact that 13,038 bass were caught by Big Long Lake anglers during the creel survey, only 20 legal size fish were kept.

An extremely diverse community of aquatic vegetation is present at Big Long Lake. Vegetation is especially abundant in the northwest basin and along portions of the north and south shores at the lower end of the lake, but is not considered detrimental to the fishery at this point. Eurasian watermilfoil, an exotic species, has been chemically controlled in certain areas for a number of years, as well as a limited number of native plants.

Big Long Lake presently supports an abundant, slow growing largemouth bass population. While this population could impact bluegill recruitment in the future, 2005 and historic general survey data suggests that this is not occurring at the present time. Changing bass regulations or implementing any other measures to reduce the bass population at this time is not warranted considering the high quality bluegill fishery that exists.

To monitor this unique situation, it is recommended that general surveys be periodically conducted beginning in 2008. It is also recommended that the lake association, with LARE support, continue their efforts to keep Eurasian watermilfoil under control.

INTRODUCTION

Big Long Lake is a 365-acre natural lake located north of Kendallville, Indiana in LaGrange County. It has an average depth of 30 feet and the maximum depth is 82 feet. There are three small inlets to Big Long Lake. Two are located on the northwest basin of the lake and a third is located on the south shore. The lone outlet of Big Long Lake is located on the north shore and drains into Mud Lake. There is a state owned public access site located on the north shore off of County Road 500 South with a concrete boat ramp. Approximately 95% of the shoreline is developed with summer cottages or permanent homes.

Fisheries biologists from the Indiana Department of Natural Resources, Division of Fish and Wildlife (DFW) initially surveyed Big Long Lake in 1975 to evaluate the condition of the sport fishery. The results of this survey indicated the presence of a satisfactory sport fishery and no fisheries management was recommended. Additional general fisheries surveys were conducted in 1984 and 1993 (Table 1). Sampling methods consisted of gill netting, trap netting and electrofishing. Over the course of these surveys, the most notable change detected in the fish community was in the abundance and growth of largemouth bass (Table 2).

Walleye were stocked in Big Long Lake by the DFW in 1990. This release was preceded by a stocking conducted by the Big Long Lake Association in 1986. Based on fall electrofishing evaluations conducted by the DFW, neither of these stockings was successful.

METHODS

The general fisheries survey was conducted on June 13 through 17, 2005 as part of DFW Work Plan 204755 that covers management of fish populations in natural lakes. Several physical and chemical characteristics of the water were measured in the deepest area of the lake according to the Manual of Fisheries Survey Methods (2001) standard lake survey guidelines. Submersed aquatic vegetation was sampled on August 30, 2005 using guidelines written by Pearson (2004). A global positioning system (GPS) device was used to record the location of the limnological data collection site, aquatic vegetation sample sites, and fish collection sites.

Fish were collected by pulsed D.C. electrofishing the shoreline at night with two dippers for 1.25 hours. One trap net and two experimental-mesh gill nets were fished overnight for four nights. All fish collected were measured to the nearest 0.1 in TL. Length-weight regression equations for Fish Management District 2 were used to estimate the weight of all fish within the

sample. Five scale samples per half-inch group were collected from game species for age and growth analysis. Average length-at-age for these species was estimated using the Fraser-Lee method of back calculation and standard intercepts (DeVries and Frie 1996, Carlander 1982).

The Big Long Lake creel survey was conducted from April 19 through October 31, 2005. The main parameters measured during the survey included fishing pressure, fish harvest and species preference of anglers. Two fishing periods were used for this survey, a morning period and an afternoon period. The morning period began at 6:00 am and ended at 1:30 pm while the afternoon period began at 1:30 pm and ended at 9:00 pm. Angler counts were conducted four times a day and anglers were interviewed as they completed their trip. In addition, any anglers still fishing when the clerk finished his shift were interviewed and noted as partial trips. Information collected from anglers included number of hours fished, number of fish harvested by species and length of fish harvested. The number of largemouth bass caught and released by anglers was also recorded. Additional information collected included species preference, county of residence, opinion regarding the quality of the Big Long Lake fishery and satisfaction with that days fishing trip. The data was expanded separately by month, weekend or weekday, and boat and shore fisherman. Holidays were included with the weekend periods. Fish weights were calculated using regional length-weight regression equations.

A largemouth bass population estimate was conducted at Big Long Lake in the spring of 2005. Sampling effort consisted of four nights of pulsed D.C. electrofishing using two dippers per boat and totaling ten hours over a four week period. The first three nights consisted of one crew sampling for two hours each night. Two crews were on the lake for the fourth night with each crew sampling for two hours, which enabled the entire shoreline to be covered that night. Only largemouth bass were collected and all of these fish were measured to the nearest 0.1 in TL and marked by removing a fin. The number of bass that were re-captured on subsequent nights was recorded and a population estimate was made using the Schnabel method. Analysis of largemouth bass abundance concentrated on stock size fish which is the main size group used for comparative purposes in scientific literature. In addition, fish smaller than stock size are often times collected in low numbers, making recapture difficult which in turn results in unreliable estimates of abundance. The stock size for largemouth bass is any fish 8.0 in TL or larger.

RESULTS

The Secchi disk reading at Big Long Lake on June 13 was 20 ft. Dissolved oxygen concentrations were adequate for fish survival all the way to the bottom. A total of 61 sites were randomly sampled during the plant survey, all of which fell within the littoral zone in water 25 ft in depth or less. A total of 16 native and 2 exotic species were identified. Aquatic plants were observed at 56 of the 61 littoral sites sampled. The maximum number of plant species found at one site was nine and the mean was three. Coontail dominated the plant population, followed by Eurasian watermilfoil, large-leaf pondweed and variable pondweed. Five emergent, floating or floating leaf plants associated with wetlands including, arrow arum, cattails, pickerelweed, spatterdock and white water lily, were also observed.

A total of 657 fish weighing 344 pounds were collected during the general survey. Fifteen species were represented in the sample. Largemouth bass dominated the sample by number (36%) followed by bluegills (20%), yellow bullhead (14%) and yellow perch (11%). Largemouth bass also dominated the sample by weight (28%), followed by northern pike (21%) and yellow bullhead (17%).

Largemouth bass ranked first by both number (36%) and weight (28%) among all species collected. A total of 234 largemouth bass weighing 95 pounds were collected. They ranged in length from 3.3 (age 1) to 13.6 (age 6) in TL and averaged 9.6 in TL. There were no bass fourteen in TL or larger (legal size) collected during this survey. Only 10% of the bass in the sample were 12 in TL or larger. The vast majority of the bass (76%) were 8.5 in TL to 12.0 in TL inclusive. The electrofishing catch rate for largemouth bass was 168.0 fish per hour. Gill netting yielded 2.4 bass/lift and trap netting 1.3 bass/lift. Age-1 through Age-8 bass were collected during this survey. Of these age groups, only age-1 largemouth bass grew at an average rate for northern Indiana natural lakes. All other ages of bass grew at a below average rate. There also were no 14 in TL or larger bass collected during the 1993 survey, while four were collected in both 1975 and 1984. Approximately 32% of the bass collected in 1975 were 12 in TL or larger along with 7% in 1984 and 2% in 1993. It should be noted that only 25 bass total were collected in 1975.

A total of 134 bluegills weighing 25 pounds were collected during the survey. Bluegills ranked second among all species collected by number (20%) and fourth by weight (7%). They ranged in length from 2.7 (age 2) to 10.0 (age 8) in TL and averaged 6.2 in TL. The

electrofishing catch rate for bluegills was 32.0 fish/hour. Gill netting yielded 1.8 bluegills/lift and trap nets caught 20.0 bluegills/lift. Harvestable size bluegills (6 in TL or larger) comprised 60% of the sample. Approximately 47% were 7.0 in TL or larger, 27% were 8.0 in TL or larger and 9% were 9 in TL or larger. Age-1 and age-2 bluegills grew at an average rate for northern Indiana natural lakes while older ages of fish grew at an above average rate. Sixty-four percent of the bluegills collected in 1993 were harvestable, as well as 43% in 1984 and 88% in 1975. Eight-in TL or larger bluegill comprised 39% of the sample in 1993, 10% in 1984 and 42% in 1975.

Seventy-three yellow perch ranging in length from 4.1 (age 1) to 11.7 (age 4) in TL and averaging 8.8 in TL were captured. Yellow perch ranked fourth numerically (11%) and seventh by weight (5%). Yellow perch 8.0 in TL and larger (harvestable size), comprised 80% of the sample by number. In addition, 34% of the perch were 10.0 in TL or larger. The electrofishing catch rate for yellow perch was 8.8 fish/hour. Gill netting yielded 7.6 yellow perch/lift and trap netting 0.3 yellow perch/lift. All age groups of yellow perch grew at an above average rate for northern Indiana natural lakes.

Redear comprised 4% of the sample by number and 3% by weight, ranking sixth and ninth respectively. A total of 29 redeer weighing nine pounds were collected during this survey. They ranged in length from 4.5 (age 2) to 11.8 (age 6) in TL and averaging 7.2 in TL. Harvestable size redeer (6-in TL or larger) comprised 93% of the sample. The electrofishing catch rate for redeer was 3.2 fish/hour. Gill netting yielded 0.8 redeer/lift and trap netting 4.8 redeer/lift. Age-1 redeer grew at an average rate for northern Indiana natural lakes while all other ages grew at an above average rate. The 1975 and 1984 surveys yielded 17 and 29 redeer respectively, while in 1993, 151 redeer were captured. Over 97% of these were harvestable size.

Nine northern pike were also collected during the survey. Despite the small number of pike in the sample, they ranked second by weight (21%) at 71 pounds, which calculates to an average weight of approximately eight pounds per fish. The largest pike captured measured 42.2 in TL. Northern pike first appeared in the Big Long Lake sample in 1993 when five were collected. The largest pike that year measured 36.1 in TL. All pike collected during the current survey were captured in gill nets. The catch rate for pike was just over one fish/lift.

During the angler creel survey at Big Long Lake a total of 500 angling parties consisting of 908 anglers were interviewed. Of these, 482 parties, or 96% of those interviewed, were

fishing from a boat. Due to the small number of shore anglers that were interviewed, the resultant estimates for the fish harvest by these anglers were extremely high. Therefore, only the results from boat fisherman will be used in the discussion of the survey results. In addition, it should be noted that the survey did not begin until April 19. Thus any harvest and effort data for April only reflects a 12 day period, not a full month.

A total of 10,484 fish weighing 4,157 pounds were harvested during the Big Long Lake creel survey (Table 3). Nine species were represented in the harvest. The number one species harvested numerically was bluegill (68%) followed by yellow perch (19%) and redear (11%). Bluegills also dominated the harvest by weight (69%), followed by yellow perch (17%) and redear (12%) (Table 4). Boat anglers harvested 1.13 fish per hour and 11.39 pounds of fish per acre. In addition to the species harvested, anglers caught and released 12,994 largemouth bass.

Anglers at Big Long Lake harvested the highest number of fish in June (26%), followed by August (22%) and May (20%). The highest number of fish harvested per hour, however, occurred in April (2.77), followed by August (1.72) and June (1.32). For the entire survey, fish were harvested at an average rate of 1.13 per hour. Despite being the month with the highest harvest rate, fewer fish were taken in April than any other month (523). However, only 12 of a possible 30 days were included in the April data due to the creel beginning on April 19th. October had the second fewest fish harvested of any month (704). This was followed by July (904), which also had the lowest harvest rate of only 0.51 fish per hour.

Total fishing pressure by boat anglers for the Big Long Lake survey was 9,308 hours. A total of 2,080 of these hours occurred during June, which experienced the highest monthly fishing pressure during this survey (22%). The next highest fishing pressure was exerted during May (1,866 hrs), followed closely by July (1,782 hrs). Together, these three months comprised 61% of the total fishing pressure for this survey. Not surprisingly, 55% of the total fish harvest also occurred during these three months. The fewest hours of fishing pressure occurred during April (189 hrs) followed by October (685 hrs). Again, only 12 of a possible 30 days were included in the April data due to the creel beginning on April 19th. The hours fished during these two months comprised only 2% and 7% of the total fishing pressure for the survey respectively. The average trip length for boat anglers at Big Long Lake was 3.4 hours.

Bluegill was the dominant species harvested during the creel survey, both by number (68%) and weight (69%), ranking first in both categories. A total of 7,122 bluegills were

harvested by Big Long Lake anglers, weighing 2,854 pounds and ranging in length from 6.0 to 10.5 in TL (Table 5). The average length of bluegills taken was 8.0 in TL while the average weight was 0.40 pounds. None of the bluegills in the harvest measured less than 6.0 in TL, which is considered harvestable size. Eight-in TL and larger bluegill comprised 62% of the harvest. An additional 16% of the harvest was comprised of 9.0 in TL and larger fish while 3% of the bluegill were 10.0 in TL or larger. Bluegills were harvested at a rate of 0.77 fish/hour and 19.5/acre. On average, medium size natural lakes in Indiana have yielded 0.51 bluegill/hour and 23/acre during the past 15 years. This is based on the results of 10 medium sized natural lakes creel surveys conducted since 1995. Only 8% of the bluegills harvested during that time period were less than 6.0 in TL while 21% were 8.0 in TL or larger.

More bluegills were harvested from Big Long Lake in May than in any other month (25%). June trailed closely behind with 24% of the bluegill harvest having occurred during this month. The lowest bluegill harvest occurred in April (6%) but October had the lowest full month of bluegill harvest at 8%.

A total of 1,986 yellow perch weighing 691 pounds were harvested during the survey. Perch ranked second numerically (19%) and by weight (17%) among species in the harvest. They ranged in length from 6.5 in TL to 13.0 in TL and averaged 8.6 in TL (Table 6). Eighty percent of the perch taken were harvestable size (8.0 in TL or larger) while 15% were 10.0 in TL or larger. Perch harvest was highest in August, when approximately 50% of the fish were taken, followed by June (23%). The lowest perch harvest occurred in April (1%) but the lowest harvest for a full month was in October (2%). Perch were harvested at a rate of 0.21 fish/hour and 5.4 per acre.

Redear ranked third by both weight (12%) and number (11%) among species harvested. A total of 1,110 redear ranging in length from 6.5 in TL to 12.0 in TL and weighing 489 pounds were taken by anglers (Table 7). Redear 8.0 in TL or larger comprised 76% of the harvest. Fish 9.0 in TL or larger comprised 26% of the catch while 10.0 in TL or larger fish accounted for 5%. The average length of redear harvested was 8.3 in TL while the average weight was 0.44 pounds. Redear harvest was highest in the month of June (45%) and September ranked second at 25%. The lowest redear harvest over a full month occurred in July, when only 55 were taken.

A total of 133 rock bass weighing 45 pounds were harvested by Big Long Lake anglers during this survey. They ranked fourth by number and by weight, comprising 1% of the harvest

in both categories. They ranged in length from 7.0 in TL to 8.5 in TL (Table 8). Rock bass harvest was highest in July and June, 40% and 22% respectively. There were two months when no rock bass were harvested, April and October.

The harvest of largemouth bass was very low at Big Long Lake, as only 44 were kept by anglers. Bass comprised only 0.4% of the harvest by number and 1.0% by weight. They ranged in length from 9.0 in TL to 15.5 in TL and averaged 12.0 TL (Table 9). Twenty of the bass harvested were legal size, which is 14 in TL or larger. Bass harvest occurred at a rate of 0.12 fish/acre and less than 0.01/ hour. The catch and release of bass totaled 12,994 fish or 35.6/acre. Combined with bass harvest, this resulted in an overall catch of 13,038 bass at Big Long Lake, or 1.4 bass/hour. The average bass catch from seven medium sized Indiana natural lakes (100 to 499 acres) since the imposition of a 14 in TL minimum size limit in 1998 was 23 fish/acre and 0.42 fish/hour.

The majority of largemouth bass were harvested in August (59%), followed by July (23%) and June (18%). All of the bass harvest during this survey occurred during these three months. The largest catch of largemouth bass was in July, when 3,266 fish (25%) were caught. The June bass catch was second highest (19%) followed closely by the May catch (18%). The lowest bass catch for a full month occurred in October (5%). Largemouth bass catch/hour ranged from a high of 1.84 fish/hour in July to a low of 0.90/hour in October and averaged 1.40 bass/hour. October was the only month during which a catch rate of less than one bass/ hour occurred. Bass catch/ hour was second highest in August (1.50) followed by September (1.48).

There were four other species in the harvest for the Big Long Lake Creel. These were pumpkinseed, black crappie, warmouth and bullhead. Together these species comprised just under 1% of the total harvest by both number and weight (Table 10). Of these species, black crappie would be the one most likely to be specifically sought by anglers. A total of 18 crappie weighing 13 pounds were harvested, the largest measuring 13.5 in TL.

Bluegill was by far the most sought after species at Big Long Lake, as 67% of all angler parties interviewed indicated they were fishing specifically for bluegill (Table 11). An additional 5% indicated they were fishing for panfish, a group that would include bluegill. Bass fisherman comprised the second most popular category with 22%. Other responses included yellow perch (3%), anything (1%) and crappie (less than 1%).

Residents from 18 counties other than LaGrange County fished at Big Long Lake during this survey (Table 12). An additional 3% of the angling parties came from Ohio while 1% came from Michigan and 1% indicated they were from other states. The Indiana County with the most visitors from outside of LaGrange County was Allen County (14%). The next highest number of parties came from Noble County (10%) followed by DeKalb County (8%). Lake residents accounted for 35% of all Big Long Lake angling parties interviewed during this survey.

Big Long Lake anglers were asked to answer several questions regarding fishing at the lake. When asked if they thought the overall quality of fishing at Big Long Lake was improving, declining or staying the same, the vast majority (79%) thought it was improving. Only four parties thought fishing was declining. Anglers were also asked to rate their fishing experience for the day. All but one party interviewed indicated they were satisfied with their fishing experience at Big Long Lake that day.

The total largemouth bass population estimate for Big Long Lake was 17,656 fish, or 48.4/acre. Of these, 14,707 or 83% were stock size (8 in TL or larger). A total of 3,729 bass, or 21% of the population, were handled during this survey. Bass 8.0 to 12.0 in TL comprised 81% of the sample while 59% were 10.0 to 12.0 in TL. Bass 12 in TL or larger numbered 2,841 (7.8/acre) while only 71 bass (0.2/acre) were legal size (Table 13). These fish comprised 16% and 0.4% of the population respectively. The largest bass collected during the Big Long Lake population estimate study measured 19.9 in TL.

DISCUSSION

Big Long Lake supports a good sport fish population comprised primarily of largemouth bass, bluegill, yellow perch and redear. Together these species represented 72% of the general survey sample by number and 43% by weight. Bluegills, perch and redear provide very good fishing opportunities as approximately 78% of these three species were harvestable size. The majority of the age groups for these three species grew at above average rates for northern Indiana natural lakes.

A total of 500 fishing parties fished for 9,308 hours and harvested 10,484 fish weighing 4,157 pounds during the creel survey. Anglers averaged 25.5 hours of fishing pressure per acre while harvesting 1.13 fish per hour. Averages from eight previous District 2 creel surveys are 36.3 hours of fishing pressure per acre and a harvest rate of 0.53 fish per hour. Bluegill, yellow

perch and redear were the dominant species harvested, combining to represent 97% of the total harvest numerically.

The bluegill harvest was especially remarkable in regards to the size of fish taken. Eight-in TL and larger bluegill comprised 62% of the harvest which is nearly three times the number of fish in this size range normally observed in medium size natural lake creel surveys in Indiana. In addition, good numbers of 9 and 10-in fish were also taken. The 2005 Big Long Lake bluegill harvest rate of 0.77 fish per hour was above average for medium size natural lakes while the number harvested per acre was average.

Anglers who like to catch and release largemouth bass regardless of size would enjoy the Big Long Lake bass fishery since the bass catch per hour was nearly three times greater than what is typically observed at similar size lakes. In addition, largemouth bass catch per acre was approximately 55% higher than average. While a plentiful largemouth bass fishery is present, the number of legal size fish is low. Based on historic general survey information dating back to 1975, Big Long Lake has never produced many 14-in TL or larger largemouth bass. In fact, there were no legal size bass collected during the current general survey. Largemouth bass were only moderately attractive to anglers, as witnessed by the fact that only 22% of anglers were fishing exclusively for bass. On average, approximately 41% of the anglers interviewed during natural lakes creel surveys mentioned previously were fishing exclusively for bass. Despite the fact that 13,038 bass were caught by Big Long Lake anglers during the creel survey, only 20 legal size fish were kept. While it is not known how many of the 12,994 bass that were caught and released were legal size, it is highly probable few were, based on the results of the general survey and the bass population estimate.

The bass population estimate revealed the presence of only 71 legal size bass in the entire lake, which is approximately 0.4% of the bass population. This was despite the presence of 14,707 stock size bass, or 40 per acre, which is approximately twice the average number found in similar sized natural lakes. A 12-in TL minimum size limit was imposed on largemouth bass harvest in Indiana in 1990. This was increased to 14 in TL in the fall of 1998. Stock size bass averaged 11.4 per acre in pre-size limit medium size lakes (100 to 499 acres) and increased to 20.8 per acre following the imposition of the size limits. Likewise, bass 12.0 in TL and larger as well as those 14 in TL or larger also increased from 3.1 to 8.8 per acre and 1.7 to 3.5 per acre

respectively. Bass 12 in TL and larger at Big Long Lake approach this average at 7.8 per acre but the number of 14 in TL or larger bass fall woefully short at only 0.2 per acre.

An examination of the age and growth data collected for the bass population shows average growth for bass during their first year. In fact, many of the older year classes of bass exhibited average growth through their early to mid years but in later years growth slowed to below average. Currently all age groups with the exception of age-1 fish are below average in size for their age.

One concern at Big Long Lake is whether the substantial largemouth bass population could have a negative impact on bluegill recruitment. In previous studies conducted at 16 medium size natural lakes in northeast Indiana, the average DC electrofishing catch rate for bluegill was 164 fish/hour. In 1993 and 2005 the bluegill electrofishing catch rate at Big Long Lake was 203 and 32 fish/hour respectively. Although the 2005 catch rate was low, 6-in TL and larger bluegills comprised 60% of the sample compared to the natural lakes average of 35%. Overall, almost twice as many bluegills in the 3 to 5.5 in TL size range were collected in 1993 than in 2005. However, the number of bluegills in that size range collected in 1984 was similar to 2005. Additional sampling will be necessary to monitor bluegill recruitment in an attempt to maintain the quality of the present bluegill fishery.

An extremely diverse community of aquatic vegetation is present at Big Long Lake. Vegetation is especially abundant in the northwest basin and along portions of the north and south shores at the lower end of the lake, but is not considered detrimental to the fishery at this point. Eurasian watermilfoil, an exotic species, has been chemically controlled in certain areas for a number of years, as well as a limited number of native plants. During the last several years, up to 70 acres of milfoil and 20 acres of native plants have been treated. The lake association recently received funding through Lake and River Enhancement (LARE) for the treatment of 26 acres of milfoil for 2006.

No fish diseases or parasites were observed during this survey. Shoreline erosion is minimal.

RECOMMENDATIONS

- Big Long Lake presently supports an abundant, slow growing largemouth bass population. While this population could impact bluegill recruitment in the future, 2005 and historic general survey data suggests that this is not occurring at the present time. Changing bass regulations or implementing any other measures to reduce the bass population at this time is not warranted considering the high quality bluegill fishery that exists.
- To monitor this unique situation, it is recommended that general surveys be periodically conducted at Big Long Lake beginning in 2008. It is also recommended that the lake association with LARE support continue their efforts to keep Eurasian watermilfoil under control.

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Submitted by: Larry A. Koza, Assistant Fisheries Biologist
Date: 3/8/07

Approved by: Stuart Shipman
North Region Fisheries Supervisor
Date:

Table 1. Sampling effort, species composition and relative abundance of fish collected during 1975, 1984, 1993 and 2005 fisheries surveys of Big Long Lake.

Species	1975	1984	1993	2005
Black bullhead	12	-	-	-
Black crappie	7	-	2	-
Bluegill	106	103	296	134
Bowfin	8	19	13	6
Brown bullhead	37	106	28	3
Golden shiner	2	135	6	-
Green sunfish	17	31	6	2
Hybrid sunfish	-	2	3	1
Lake chubsucker	20	229	20	3
Largemouth bass	25*	156 (104/hr)	243 (243/hr)	234 (168/hr)
Northern pike	-	-	5	9
Pumpkinseed	12	112	22	10
Redear	17	29	151	29
Redfin pickerel	5	31	3	1
Rock bass	-	1	-	-
Spotted gar	5	9	45	19
Warmouth	92	98	48	44
Yellow bullhead	75	153	28	89
Yellow perch	25	344	225	73
Total	465	1,558	1,144	657
Sampling Effort				
Electrofishing Effort	1.5 h AC	1.5 h AC	1.0 h DC	1.25 h DC
Gill Net Effort	9 lifts	9 lifts	12 lifts	8 lifts
Trap Net Effort	0	9 lifts	12 lifts	4 lifts

Table 2. Catch by select size ranges for bluegill, largemouth bass and yellow perch collected during 1975, 1984, 1993 and 2005 fisheries surveys of Big Long Lake.

Species	Length Range (TL)	1975	1984	1993	2005
Bluegill	3.0-5.5 in	13	51	102	52
	6.0-6.5 in	14	19	34	17
	7.0-7.5 in	34	16	39	27
	≥ 8.0 in	45	10	116	36
Largemouth bass	8.0-9.5 in	7	61	105	64
	10.0-11.5 in	7	28	57	102
	12.0-13.5 in	4	7	6	23
	14.0-17.5 in	3	3	0	0
	≥ 18.0 in	1	1	0	0
Yellow perch	8.0-9.5 in	5	31	71	33
	10.0-11.5 in	0	8	59	25
	≥ 12.0 in	1	0	0	0

Table 3. Monthly fishing pressure and harvest from Big Long Lake, April – October, 2005.

Species	April	May	June	July	August	September	October	Total
Bluegill	434	1,798	1,721	742	1,149	691	587	7,122
Yellow perch	15	215	461	29	988	239	39	1,986
Redear	37	91	499	55	71	279	78	1,110
Rock bass	0	9	29	53	19	23	0	133
Pumpkinseed	37	0	16	10	0	0	0	63
Largemouth bass	0	0	8	10	26	0	0	44
Black crappie	0	11	7	0	0	0	0	18
Warmouth	0	0	0	5	0	0	0	5
Bullhead	0	0	0	0	0	3	0	3
Total	523	2,124	2,741	904	2,253	1,235	704	10,484
Angler hours	188.57	1,855.76	2,080.00	1,782.22	1,313.23	1,403.07	685.19	9,308.04
Hours per acre	0.52	5.08	5.70	4.88	3.60	3.84	1.88	25.50
Fish per hour	2.77	1.14	1.32	0.51	1.72	0.88	1.03	1.13

Table 4. Fishing pressure, harvest and yield from Big Long Lake, April – October, 2005.

Species	Number Harvested	Percent	Total Weight (lbs.)	Percent
Bluegill	7,122	70.8	2,854.09	68.7
Yellow perch	1,986	16.6	690.99	16.6
Redear	1,110	10.3	489.31	11.8
Rock bass	133	1.1	44.70	1.1
Pumpkinseed	63	0.5	17.29	0.4
Largemouth bass	44	0.4	43.56	1.0
Black crappie	18	0.2	12.76	0.3
Warmouth	5	*	1.90	*
Bullhead	3	*	2.10	0.1
Total	10,484		4,156.70	

Total angler hours 9,799.10

Total angler hours per acre 26.85

Total pounds harvested per acre 13.01

Fish harvested per hour 1.22

*less than 0.1%

Table 5. Length-frequency distribution for bluegills harvested from Big Long Lake, 2005.

Total Length (in.)	Number Harvested	Percent	Total Weight (lbs.)	Percent
6.0	54	0.8	8.63	0.3
6.5	169	2.4	35.53	1.2
7.0	724	10.2	185.67	6.5
7.5	1,777	25.0	563.14	19.7
8.0	1,985	27.9	766.79	26.9
8.5	1,296	18.2	602.96	21.1
9.0	623	8.7	345.40	12.1
9.5	374	4.4	206.15	7.2
10.0	149	2.1	114.13	4.0
10.5	30	0.4	26.69	0.9
Total	7,122		2,854.09	

Table 6. Length-frequency distribution for yellow perch harvested from Big Long Lake, 2005.

Total Length (in.)	Number Harvested	Percent	Total Weight (lbs.)	Percent
6.5	4	0.2	0.52	0.1
7.0	73	3.7	12.08	1.7
7.5	324	16.3	66.94	9.7
8.0	478	24.1	121.57	17.6
8.5	365	18.4	112.85	16.3
9.0	259	13.0	96.25	13.9
9.5	186	9.4	82.26	11.9
10.0	126	6.3	65.73	9.5
10.5	49	2.5	29.91	4.3
11.0	41	2.1	29.07	4.2
11.5	45	2.3	36.82	5.3
12.0	16	0.8	15.01	2.2
12.5	16	0.8	17.12	2.5
13.0	4	0.2	4.86	0.7
Total	1,986		690.99	

Table 7. Length-frequency distribution for redear harvested from Big Long Lake, 2005.

Total Length (in.)	Number Harvested	Percent	Total Weight (lbs.)	Percent
6.5	25	2.3	5.08	1.0
7.0	55	4.9	13.96	2.9
7.5	186	16.8	58.07	11.9
8.0	299	26.9	113.31	23.2
8.5	258	23.2	117.30	24.0
9.0	131	11.8	70.72	14.5
9.5	98	8.8	62.23	12.7
10.0	36	3.2	26.67	5.5
10.5	7	0.6	6.00	1.2
11.0	11	1.0	10.85	2.2
12.0	4	0.4	5.12	1.0
Total	1,235		543.96	

Table 8. Length-frequency distribution for rock bass harvested from Big Long Lake, 2005.

Total Length (in.)	Number Harvested	Percent	Total Weight (lbs.)	Percent
7.0	9	6.8	2.28	5.1
7.5	73	54.9	22.79	51.0
8.0	47	35.3	17.81	39.8
8.5	258	3.0	1.82	4.1
Total	133		44.70	

Table 9. Length-frequency distribution for largemouth bass harvested from Big Long Lake, 2005.

Total Length (in.)	Number Harvested	Percent	Total Weight (lbs.)	Percent
9.0	5	11.4	1.78	4.1
9.5	9	20.5	3.78	8.7
10.0	5	11.4	2.45	5.6
11.0	5	11.4	3.28	7.5
14.0	5	11.4	6.85	15.7
14.5	5	11.4	7.62	17.5
15.0	5	11.4	8.45	19.4
15.5	5	11.4	9.34	21.4
Total	44		43.56	

Table 10. Species, number and weight of additional fish harvested from Big Long Lake, 2005.

Species	Number Harvested	Total Weight (lbs.)
Pumpkinseed	63	17.29
Black crappie	18	12.76
Warmouth	5	1.90
Bullhead	3	2.10
Total	89	34.05

Table 11. Species preference of angling parties interviewed at Big Long Lake, 2005.

Species	Number of Parties	Percent
Bluegill	337	67.4
Bass	112	22.4
Panfish	26	5.2
Yellow perch	17	3.4
Anything	6	1.2
Crappie	2	0.4
Total	500	

Table 12. County of residence of angling parties interviewed at Big Long Lake, 2005.

County	Number of Parties	Percent
Lake Resident	173	34.7
Lagrange	90	18.0
Allen	70	14.0
Noble	50	10.0
Dekalb	42	8.4
Steuben	18	3.6
Ohio	14	2.8
Elkhart	10	2.0
Adams	4	0.8
Wells	4	0.8
Whitley	4	0.8
Michigan	4	0.8
Other State	4	0.8
Grant	2	0.4
Lake	2	0.4
Huntington	1	0.2
Jefferson	1	0.2
Kosciusko	1	0.2
Madison	1	0.2
Marion	1	0.2
Marshall	1	0.2
St. Joseph	1	0.2
Warren	1	0.2
Total	499	

Table 13. Average number of largemouth bass per acre in medium size natural lakes (199-499 acres) in Indiana prior to and following the imposition of a 14" minimum size limit. Number of lake populations included in the average in ().

Size range (inches)	Average pre-size limit (21)	Average post-size limit (7)	Big Long Lake 2005
≥ 8.0 in	11.4	20.8	40.3
≥ 12.0 in	3.1	8.8	7.8
≥ 14.0 in	1.7	3.5	0.2



▲ Trap Net

●—● Gill Net

Figure 1. Aerial photo of Big Long Lake with sample locations.

APPENDIX 1. General survey data page

LAKE SURVEY REPORT

Type of Survey	<input type="checkbox"/> Initial Survey	<input checked="" type="checkbox"/> Re-Survey
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Lake Name Big Long Lake	County LaGrange	Date of survey (Month, day, year) 6/13-17/2005
Biologist's name Neil D. Ledet and Larry A. Koza		Date of approval (Month, day, year)

LOCATION		
Quadrangle Name Stroh	Range 11E	Section 22,26 & 27
Township Name 36N	Nearest Town Kendallville, IN	

ACCESSIBILITY					
State owned public access site Off of C.R. 500 South		Privately owned public access site		Other access site	
Surface acres 365	Maximum depth 82 feet	Average depth 30 feet	Acre feet 10,974	Water level 941.24 MSL	Extreme fluctuations None
Location of benchmark On the Southwest side of lake and at outlet water control structure.					

INLETS		
Name Unnamed	Location Northwest basin	Origin Drainage
Unnamed	Northwest basin	Drainage
Unnamed	South	Drainage

OUTLETS			
Name Unnamed	Location North-flows east to Mud Lake		
Water level control Concrete			
POOL	ELEVATION (Feet MSL)	ACRES	Bottom type <input type="checkbox"/> Boulder <input checked="" type="checkbox"/> Gravel <input checked="" type="checkbox"/> Sand <input checked="" type="checkbox"/> Muck <input type="checkbox"/> Clay <input type="checkbox"/> Marl
TOP OF DAM			
TOP OF FLOOD CONTROL POOL			
TOP OF CONSERVATION POOL			
TOP OF MINIMUM POOL			
STREAMBED			

Watershed use General farming and residential
Development of shoreline 90% of the shoreline is developed with summer and year-round residences

Previous surveys and investigations Hydrographic survey; Purdue University, 1925. IDNR Fisheries surveys: General surveys; Peterson, 1975; Ledet, 1984. Cisco survey; Gulish, 1974. Walleye surveys; Ledet, 1986, 1990.

SAMPLING EFFORT

ELECTROFISHING	Day hours		Night hours		Total hours
	N/A		1.25		1.25
TRAP NETS	Number of traps		Number of Lifts		Total effort
	1		4		4 lifts
GILL NETS	Number of nets		Number of Lifts		Total effort
	2		4		8 lifts
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

PHYSICAL AND CHEMICAL CHARACTERISTICS

Color		Turbidity	
Light Green		20 Feet	0 Inches (SECCHI DISK)
Alkalinity (ppm)*		pH	
Surface: 137.3	Bottom: 120.1	Surface: 9.2	Bottom: 8.5
Conductivity: 320 micromhos		Air temperature: 86 °F	
Water chemistry GPS coordinates: N 41.5521 W 85.23331			

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	78.4	6.3	36	47.1	8.3	72	45.0	7.7
2	78.4	6.0	38	46.9	8.2	74	45.0	7.6
4	78.4	4.6	40	46.6	8.1	76	45.0	7.1
6	78.4	4.2	42	46.2	8.0	78	45.0	6.0
8	78.3	4.2	44	45.9	7.8	80	45.0	5.9
10	77.5	4.1	46	45.7	7.9	82	44.8	5.5
12	73.8	4.2	48	45.3	7.6	84		
14	69.1	4.4	50	45.3	7.5	86		
16	66.9	6.9	52	45.5	6.9	88		
18	63.7	7.2	54	45.5	6.9	90		
20	60.3	7.5	56	45.3	6.8	92		
22	55.0	8.2	58	45.3	6.8	94		
24	51.8	8.6	60	45.3	6.7	96		
26	50.7	8.6	62	45.1	6.6	98		
28	49.1	8.7	64	45.1	6.5	100		
30	48.6	8.7	66	45.1	6.5			
32	48.0	8.5	68	45.0	6.4			
34	47.7	8.5	70	45.0	6.3			

COMMENTS

*ppm-parts per million

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	0.9	0.02	1	21.5				
4.0					22.0				
4.5	1	0.4	0.04	2	22.5				
5.0	2	0.9	0.06	2	23.0				
5.5	5	2.1	0.08	2	23.5				
6.0	10	4.3	0.10	2	24.0				
6.5	15	6.4	0.13	2	24.5				
7.0	4	1.7	0.16	2	25.0				
7.5	6	2.6	0.20	2,3	25.5				
8.0	3	1.3	0.24	3	26.0				
8.5	20	8.5	0.28	2,3	TOTAL	234			
9.0	19	8.1	0.34	2,3					
9.5	22	9.4	0.40	3					
10.0	20	8.5	0.46	3,4					
10.5	27	11.5	0.54	3,4					
11.0	24	10.3	0.62	4,5					
11.5	31	13.2	0.71	4,5					
12.0	14	6.0	0.80	4,5,6					
12.5	6	2.6	0.91	5,6					
13.0	2	0.9	1.02	5,6					
13.5	1	0.4	1.14	5					
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	168.0/hr	GILL NET CATCH	2.4/lift	TRAP NET CATCH	1.3/lift
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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					19.0				
1.5					19.5				
2.0					20.0				
2.5	2	1.5	0.01	2	20.5				
3.0	8	6.0	0.02	2	21.0				
3.5	8	6.0	0.03	2	21.5				
4.0	11	8.2	0.05	2	22.0				
4.5	9	6.7	0.06	2,3	22.5				
5.0	9	6.7	0.08	2,3	23.0				
5.5	7	5.2	0.11	2,3	23.5				
6.0	9	6.7	0.14	3	24.0				
6.5	8	6.0	0.17	3	24.5				
7.0	15	11.2	0.21	3,4	25.0				
7.5	12	9.0	0.25	3,4	25.5				
8.0	14	10.4	0.30	4,5	26.0				
8.5	10	7.5	0.36	4,5	TOTAL	134			
9.0	6	4.5	0.41	4,5,6					
9.5	2	1.5	0.48	6					
10.0	4	3.0	0.55	6,7,8					
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	32.0/hr	GILL NET CATCH	1.8/lift	TRAP NET CATCH	20.0/lift
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NUMBER, PERCENTAGE, WEIGHT, AND AGE OF YELLOW PERCH

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	2	2.7	0.03	1	22.0				
4.5					22.5				
5.0					23.0				
5.5					23.5				
6.0	1	1.4	0.09	1	24.0				
6.5					24.5				
7.0	1	1.4	0.13	2	25.0				
7.5	11	15.1	0.16	2	25.5				
8.0	14	19.2	0.19	2	26.0				
8.5	11	15.1	0.22	2	TOTAL	73			
9.0	4	5.5	0.26	2,3,4					
9.5	4	5.5	0.30	4					
10.0	16	21.9	0.34	3,4					
10.5	5	6.8	0.39	3,4					
11.0	3	4.1	0.44	4					
11.5	1	1.4	0.50	4					
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	8.8/hr	GILL NET CATCH	7.6/lift	TRAP NET CATCH	0.3/lift
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NUMBER, PERCENTAGE, WEIGHT, AND AGE OF REDEAR

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	1	3.4	0.06	2	22.5				
5.0					23.0				
5.5	1	3.4	0.11	2	23.5				
6.0	3	10.3	0.14	2	24.0				
6.5	5	17.2	0.19	2	24.5				
7.0	10	34.5	0.23	2,3	25.0				
7.5	3	10.3	0.29	2,3	25.5				
8.0					26.0				
8.5	2	6.9	0.43	3,4	TOTAL	29			
9.0	2	6.9	0.51	4					
9.5									
10.0									
10.5									
11.0									
11.5	1	3.4	1.09	5					
12.0	1	3.4	1.25	6					
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	3.2/hr	GILL NET CATCH	0.8/lift	TRAP NET CATCH	4.8/lift
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NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS, SPRING 2005

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	3	0.1		8
2.0					20.0	1	0.1		9
2.5					20.5				
3.0					21.0				
3.5	4	0.1		1	21.5				
4.0	3	0.1		1	22.0				
4.5	3	0.1		2	22.5				
5.0	17	0.5		2	23.0				
5.5	94	2.5		2	23.5				
6.0	142	3.8		2	24.0				
6.5	123	3.3		2	24.5				
7.0	50	1.3		2	25.0				
7.5	32	0.9		2,3	25.5				
8.0	72	1.9		3	26.0				
8.5	198	5.3		2,3	TOTAL	3,729			
9.0	259	6.9		2,3					
9.5	279	7.5		3					
10.0	379	10.2		3,4					
10.5	413	11.1		3,4					
11.0	495	13.3		4,5					
11.5	566	15.2		4,5					
12.0	362	9.7		4,5,6					
12.5	154	4.1		5,6					
13.0	43	1.2		4,5,6					
13.5	26	0.7		5,6					
14.0	2	0.1		5					
14.5	4	0.1		7,8					
15.0	3	0.1		7					
15.5	1	0.1		7					
16.0									
16.5	1	0.1		7					
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	466.1 /hr	GILL NET CATCH	/lift	TRAP NET CATCH	/lift
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Species Largemouth bass	YEAR CLASS	NUMBER OF FISH AGED	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE								
				I	II	III	IV	V	VI	VII	VIII	
Intercept = 0.8	2004	2	3.8 - 3.9	3.7								
	2003	55	4.7 - 8.8	2.9	6.0							
	2002	48	7.5 - 10.3	3.6	6.6	8.7						
	2001	18	10.2 - 13.1	3.9	6.8	9.4	10.9					
	2000	31	10.9 - 13.9	3.7	6.8	9.2	11.0	12.1				
	1999	13	11.9 - 13.7	3.8	6.7	8.9	10.8	11.9	12.9			
	1998	6	14.5 - 16.4	4.0	7.0	9.8	11.8	13.1	114.2	15.0		
	1997	3	14.3 - 19.7	3.7	6.4	9.1	11.2	13.1	14.2	15.2	15.9	
	AVERAGE LENGTH			3.6	6.6	9.2	11.1	12.6	13.8	15.1	15.9	
	NUMBER AGED			176	174	119	71	53	22	9	3	

Species Bluegill	YEAR CLASS	NUMBER OF FISH AGED	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE								
				I	II	III	IV	V	VI	VII	VIII	
Intercept = 0.8												
	2003	16	2.7 - 5.4	1.5	3.0							
	2002	30	4.3 - 7.4	1.3	2.7	5.4						
	2001	14	6.9 - 8.8	1.4	2.8	5.2	7.4					
	2000	8	7.9 - 9.0	1.3	2.5	4.5	6.8	8.1				
	1999	4	9.1 - 9.9	1.3	2.8	5.8	8.1	8.9	9.4			
	AVERAGE LENGTH			1.4	2.8	5.2	7.5	8.5	9.4			
	NUMBER AGED			72	72	56	26	12	4			

Species Yellow perch	YEAR CLASS	NUMBER OF FISH AGED	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE								
				I	II	III	IV	V	VI	VII	VIII	
Intercept = 1.2	2004	2*	4.1 - 5.9	3.7								
	2003	19	7.2 - 8.9	3.1	7.0							
	2002	3	9.1 - 10.3	2.8	6.6	9.4						
	2001	13	9.0 - 10.8	2.8	5.6	8.5	9.7					
	AVERAGE LENGTH			2.9	6.4	8.9	9.7					
	NUMBER AGED			37	35	16	13					

Species Redear	YEAR CLASS	NUMBER OF FISH AGED	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE								
				I	II	III	IV	V	VI	VII	VIII	
Intercept = 0.6												
	2003	13	4.5 - 7.6	1.9	5.6							
	2002	3	7.2 - 8.5	1.4	4.1	7.4						
	2001	3	8.4 - 9.0	1.9	6.1	7.4	8.4					
	AVERAGE LENGTH			1.7	5.3	7.4	8.4					
	NUMBER AGED			19	19	6	3					

*Not included in average length calculations.

GILL NETS				TRAP NETS				ELECTROFISHING			
1	N	41.54683	W 85.22124	1	N	41.56150	W 85.24474	1	N		W
	N		W	2	N	41.55317	W 85.22801		N		W
2	N	41.56379	W 85.23930	3	N	41.54973	W 85.22889	2	N		W
	N		W	4	N	41.55761	W 85.23878		N		W
3	N	41.54815	W 85.22092	5	N		W	3	N		W
	N		W	6	N		W		N		W
4	N	41.56033	W 85.24010	7	N		W	4	N		W
	N		W	8	N		W		N		W
5	N	41.55984	W 85.24013	9	N		W	5	N		W
	N		W	10	N		W		N		W
6	N	41.54889	W 85.22346	11	N		W	6	N		W
	N		W	12	N		W		N		W
7	N	41.56273	W 85.23910	13	N		W	7	N		W
	N		W	14	N		W		N		W
8	N	41.56491	W 85.24279	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

