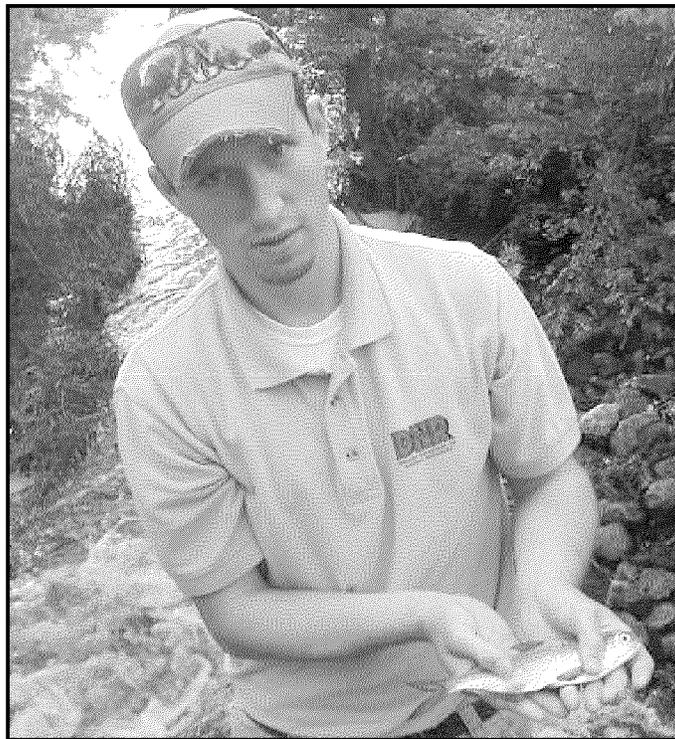


**Everett Lake**  
**Allen County**  
**Fish Management Report– 2010**

Jed Pearson, fisheries biologist



*Photo above: Matt Horsley, fisheries aide, displays one of many gizzard shad present at the outlet of Lake Everett in spring 2010.*

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

## EXECUTIVE SUMMARY

Fishing quality deteriorated at Everett Lake, a 43-acre natural lake in northwest Allen County, following an influx of gizzard shad in the late 1990s. By 2004 gizzard shad became the most abundant fish. Follow-up surveys conducted in 2005, 2007, and 2008 indicated shad abundance remained high. To reduce the number of gizzard shad, rotenone was applied to the lake in 2008. About 4,300 largemouth bass fingerlings were subsequently stocked. In late May 2010, numerous gizzard shad were observed in the ditch on the downstream side of the control structure. Many shad, presumably, swam into the lake.

To assess the change in shad abundance and the impact of the rotenone treatment, the Division of Fish and Wildlife conducted follow-up surveys in June 2009 and 2010. Everett Lake was also sampled in 2010 as part of the Division's Glacial Lakes Status and Trends Project (#F10D642) and will be used to monitor long-term changes in habitat and fish communities. Fish sampling included 0.5 hour of pulsed DC electrofishing (504V) with two dip-netters, two gill net lifts, and two trap net lifts.

During the survey, 234 fish representing 12 species were collected. Total weight was 159 pounds. Gizzard shad were most abundant by number (40%) and weight (46%). Bluegills accounted for 31% of the number and 5% of the weight. Largemouth bass ranked third by number (11%) and comprised 17% of the weight. Altogether, sport fish comprised 56% of the number but only 30 % of the weight.

Ninety-three shad were caught, ranging in length from 8.9 to 16.0 inches. The size distribution had two distinct peaks at 11.5 inches and 14.5 inches. Most (84%) were captured during electrofishing at a catch rate of 39 per 15 minutes of sampling. Seventy-two bluegills from 2.0 to 9.0 inches long were caught. Of all 3-inch and larger bluegills, 34% were 7-inch or larger, and 6% were 8-inch or larger. The number of bluegills captured by electrofishing (19/15-min) was very low compared to other lakes in the area (average 100/15-min). Their growth rate was average through age-3 and above average at age-4. Only 25 largemouth bass were collected, despite stocking 4,300 fingerlings (age-0) after the rotenone treatment in 2008. Bass collected in 2010 were 10.7 to 17.5 inches long, but only one was age-2. Ten (40%) were legal-size ( $\geq 14$ -in). The electrofishing catch rate (12/15-min) was also low. Bass growth up to age-4 was average.

Water clarity varied from 4.5 feet to 9.0 feet. Ample amounts of oxygen were present for fish ( $\geq 5$  ppm) only down to 5 feet on both occasions, although adequate amounts ( $\geq 3$  ppm) extended to 12 feet in June but only 6 feet in August. Only three submersed aquatic plant species were detected: coontail, Eurasian water milfoil, and sago pondweed.

The rotenone project apparently reduced gizzard shad abundance in Everett Lake by more than 90%, but the reduction was short-lived. Given the number of shad now present in the lake and the likelihood that more shad will enter from downstream sources, shad are expected to return to their pre-treatment level. However, in lieu of abandoning all shad management options, it is recommended that muskies be stocked for the purpose of using shad as their forage source and providing muskie fishing.

## CONTENTS

	Page
LIST OF TABLES AND FIGURES	4
INTRODUCTION	5
METHODS	5
RESULTS	6
DISCUSSION	7
RECOMMENDATION	7
APPENDICES	11

## TABLES

Table	Page
1. Number and weight of fish collected during fish population surveys at Everett Lake from 1985 through 2010. EF represents electrofishing hours, GN equals gill net lifts, and TN equals trap net lifts.	8
2. Size of largemouth bass, bluegills, and gizzard shad collected by electrofishing at Everett Lake from 1985 through 2010.	9
3. Historic oxygen levels (ppm) and water clarity (secchi depth) at Everett Lake from 1985 through 2010 (source - Division of Fish and Wildlife files).	10

## INTRODUCTION

Fishing quality deteriorated at Everett Lake, a 43-acre natural lake near Arcola in northwest Allen County, following an influx of gizzard shad in the late 1990s. Although small shad provide forage for predator fish, many shad grew too large and competed for food with bluegills and other sport fish. Shad eventually became the most abundant fish collected in fish surveys. Because shad are susceptible to a low concentration of rotenone, 21 gallons were applied to Everett Lake on September 18, 2008. About 4,300 bass fingerlings were subsequently stocked on November 6, 2008. To assess the change in shad abundance, the Division of Fish and Wildlife conducted follow-up surveys in June 2009 and 2010. Everett Lake was also sampled in 2010 as part of the Division's Glacial Lakes Status and Trends Project (#F10D642) and will be used to monitor long-term changes in habitat and fish communities. The results of the 2010 survey, along with data from previous surveys, are presented in this report.

Everett Lake lies in the Eel River watershed and drains 685 acres. The surrounding area is mostly farmed. A tile enters the southwest corner and the outlet, Johnson Ditch, leaves the east end. Retention time is about 405 days. Much of the shoreline is residential, although alterations have been minimal. A public boat ramp is available on the north side at a site leased by the Division. Maximum depth is 44 feet and average depth is 18 feet. The bottom is sand and muck. Water level is controlled by a concrete structure installed in 2002. It replaced a metal culvert. In May 2010 numerous shad (estimated to be thousands) were observed in the ditch during high flow at the control structure. Many of the shad, presumably, were able to swim into the lake.

## METHODS

Fish sampling was conducted on June 1-2 and included 0.5 hour of pulsed DC electrofishing (504V) with two dip-netters, two gill net lifts, and two trap net lifts. All captured fish were measured to the nearest 0.1-inch and released when possible. Weights were estimated from standard length-weight formulas generated from data on file from natural lake surveys. Scales were taken from bluegills and bass for age and growth determinations. Water clarity and oxygen profiles were measured on June 1 and August 4. Zooplankton was also sampled in both months and submersed aquatic plants were sampled in August according to standard procedures. To compare bluegill, bass, and shad size with previous data from Everett Lake, fish lengths were grouped into five categories (Table 3). Half-inch length distributions for each species (see Appendices) were also compiled according to previous categories (e.g. 2.8-3.2=3.0).

## RESULTS

During the survey, 234 fish representing 12 species were collected. Total weight was 159 pounds. Gizzard shad were most abundant by number (40%) and weight (46%). Bluegills accounted for 31% of the number and 5% of the weight. Largemouth bass ranked third by number (11%) and comprised 17% of the weight. Altogether, sport fish comprised 56% of the number but only 30 % of the weight.

Ninety-three gizzard shad were caught, ranging in length from 8.9 to 16.0 inches. The size distribution had two distinct peaks at 11.5 inches and 14.5 inches. Most (84%) were captured during electrofishing at a catch rate of 39 per 15 minutes of sampling. Eleven were caught in gill nets and four were caught in traps.

Seventy-two bluegills from 2.0 to 9.0 inches long were caught. Of all 3-inch and larger bluegills, 48% were 6-inch or larger, 34% were 7-inch or larger, and 6% were 8-inch or larger. The number of bluegills captured by electrofishing (19/15-min) was very low compared to other lakes in the area (average 100/15-min). Their growth rate was average through age-3 and above average at age-4.

Only 25 largemouth bass were collected, despite stocking 4,300 fingerlings (age-0) after the rotenone treatment in 2008. Bass collected in 2010 were 10.7 to 17.5 inches long, but only one was age-2. Most were 13.0 to 15.0 inches. Ten (40%) were legal-size ( $\geq 14$ -in). The electrofishing catch rate (12/15-min) was also low compared to other Indiana natural lakes. Bass growth up to age-4 was average.

Five other sport species and four non-sport species were collected. Sport fish included 20 black crappies up to 10.1 inches long, five yellow bullheads, three redear sunfish, three warmouth, and two brown bullheads. Other non-sport fish included three large carp ranging from 24.9 to 31.7 inches long, three white suckers, three spotted gar, and two spotted suckers.

Habitat conditions were generally poor, although clarity varied from 4.5 feet in June to 9.0 feet in August. Adequate oxygen was present for fish ( $\geq 5$  ppm) only down to 5 feet on both occasions. Marginal amounts ( $\geq 3$  ppm) extended to 12 feet in June but only 6 feet in August. Only three submersed aquatic plant species were detected. Coontail was present at 77% of 30 sample sites. Eurasian water milfoil was present at 13% and sago pondweed was present at 3%. Filamentous algae were sampled at 30% of the sites. Floating mats of algae covered much of the nearshore area on the north shore and reduced the effectiveness of shallow-water electrofishing.

## DISCUSSION

The rotenone project apparently reduced gizzard shad abundance in Everett Lake by more than 90%, but the reduction was short-lived (Table 1). Shad again now rank as the most abundant fish in the lake and account for nearly half of the weight (46%). Where present in Indiana natural lakes, shad typically make up 18% of the survey catch by weight (*Division of Fish and Wildlife dataset*). Fewer than 4% of natural lakes with shad contain shad populations in excess of 46% of the survey weight. Although the electrofishing catch rate of shad in 2010 (39/15-min) was below catch rates on four occasions prior to the rotenone application (Table 2), it was 40 times greater than the catch rate after the treatment in 2009 and 50% greater than the lowest catch rate (2006) prior to the treatment.

Meanwhile, fewer largemouth bass were caught in 2010 than previously (Table 1), despite the supplemental stocking of bass fingerlings in 2008. Why few stocked bass apparently survived is not known. Likewise, bluegill numbers were no greater in 2010. The bass electrofishing catch rate in 2010 was the lowest on record (Table 2), although probably not significantly less than catch rates since 2006. The bluegill catch rate (19/15-min) was identical to the average of all earlier surveys. However, spring sampling for bass and bluegills prior to development of dense algae mats could provide a better assessment of their overall abundance and size. No other major changes in the fish community were detected in 2010, although spotted gar decreased from 2009 and white suckers remained scarce. A few more crappies were caught in 2010 than previously.

## RECOMMENDATION

Given the number of gizzard shad in Everett Lake, as well as the number observed in the outlet with no option of blocking them due to flooding and barrier maintenance concerns, no additional attempt should be made to chemically reduce the shad population. However, in lieu of abandoning all shad management options it is recommended that muskies be stocked to utilize shad as their forage source. Muskies routinely eat shad and unlike other predator fish can grow large enough to feed on some of the largest shad. Interest in muskie fishing has developed following successful stockings at other Indiana lakes that contain shad.

Submitted by: Jed Pearson, fisheries biologist

Approved by: Stu Shipman, fisheries supervisor  
November 10, 2010

Table 1. *Number and weight of fish collected during fish population surveys at Everett Lake from 1985 through 2010. EF represents electrofishing hours, GN equals gill net lifts, and TN equals trap net lifts.*

Species	Number per year							Pounds per year						
	'85	'95	'04	'05	'08	'09	'10	'85	'95	'04	'05	'08	'09	'10
Black crappie	5	4	8	0	6	0	20	0.9	2.3	2.1	0	1.0	0	5.1
Bluegill	312	81	248	53	226	82	72	37.1	17.0	34.5	8.5	24.5	7.4	8.14
Brown bullhead	1	3	1	1	0	2	2	1.5	3.1	0.9	0.7	0	1.5	2.4
Channel catfish	1	0	0	0	0	0	0	1.7	0	0	0	0	0	0
Green sunfish	1	2	0	0	0	0	0	0.1	0.3	0	0	0	0	0
Hybrid sunfish	0	0	22	0	0	0	0	0	0	6.4	0	0	0	0
Largemouth bass	100	214	45	49	35	38	25	32.0	110.0	34.5	43.9	34.5	39.8	27.4
Pumpkinseed	10	1	1	0	0	1	0	1.2	0.2	0.2	0	0	0.2	0
Redear	21	4	23	1	31	13	3	4.6	1.1	5.8	0.4	6.9	3.1	0.7
Warmouth	41	19	0	1	15	5	3	4.5	2.6	0	0.4	2.9	0.7	0.5
Yellow bullhead	15	3	15	12	12	0	5	7.6	1.6	7.6	6.5	7.4	0	2.7
Yellow perch	6	1	2	0	1	0	0	2.7	0.8	1.6	0	0.1	0	0
Bowfin	0	0	0	0	1	0	0	0	0	0	0	2.6	0	0
Carp	1	4	3	4	0	0	3	6.0	42.0	31.8	34.2	0	0	28.8
Carp sucker	0	0	0	1	0	0	0	0	0	0	1.7	0	0	0
Gizzard shad	0	0	329	283	234	14	93	0	0	249.5	252.5	203.5	13.1	72.5
Lake chubsucker	2	0	0	0	1	0	0	0.8	0	0	0	0.5	0	0
Spotted gar	0	0	1	1	2	12	3	0	0	2.6	0.4	3.0	19.0	3.7
Spotted sucker	0	0	35	26	4	1	2	0	0	47.4	42.1	7.1	1.9	3.0
White sucker	1	0	39	37	30	2	3	1.8	0	39.0	47.9	31.1	2.6	4.3
TOTAL	517	336	772	469	598	170	234	102.3	180.9	463.8	439.0	325.0	89.3	159.2
Sampling Effort														
EF hours	1ac	¾dc	½dc	½dc	½dc	½dc	½dc							
GN lifts	6	4	2	2	2	2	2							
TN lifts	8	6	2	2	2	2	2							

Table 2. *Size of largemouth bass, bluegills, and gizzard shad collected by electro-fishing at Everett Lake from 1985 through 2010.*

Largemouth bass

Inches	8/5/85*	6/12/95	6/28/04	6/20/05	6/5/06	6/12/07	6/9/08	6/8/09	6/1/10
<7.8	23	18	2	2	1	0	1	3	3
7.8-11.7	70	181	23	17	19	8	9	6	6
11.8-13.7	5	11	16	25	31	11	9	18	5
13.8-17.7	2	0	4	5	25	15	11	9	9
≥ 17.8	0	4	0	0	0	0	0	1	0
Total	100	214	45	49	76	34	30	37	23
Effort (minutes)	60	45	30	30	30	45	30	30	30
Catch/15-minutes	25	71	23	25	38	17	15	19	12

Bluegills

Inches	8/5/85*	6/12/95	6/28/04	6/20/05	6/5/06	6/12/07	6/9/08	6/8/09	6/1/10
<2.8	19	4	56	1	3	0	9	3	2
2.8-5.7	101	17	24	10	4	8	4	7	17
5.8-6.7	22	8	11	3	3	1	3	1	7
6.8-7.7	13	18	7	8	2	3	7	3	10
≥ 7.8	0	12	0	4	0	0	1	4	2
Total	155	59	98	26	12	12	24	18	38
Effort (minutes)	60	45	30	30	30	45	30	30	30
Catch/15-minutes	38	20	49	13	6	4	12	9	19

Gizzard shad

Inches	8/5/85*	6/12/95	6/28/04	6/20/05	6/5/06	6/12/07	6/9/08	6/8/09	6/1/10
<1.7	0	0	2	0	0	0	0	0	0
1.8-5.7	0	0	0	0	0	0	0	0	0
5.8-9.7	0	0	3	0	1	15	11	0	7
9.8-13.7	0	0	201	142	22	239	86	2	39
≥ 13.8	0	0	80	94	26	187	40	2	32
Total	0	0	286	236	49	441	137	4	78
Effort (minutes)	60	45	30	30	30	45	30	30	30
Catch/15-minutes	0	0	143	118	25	147	69	2	39

\*denotes AC electro-fishing gear used in 1985.

Table 3. *Historic oxygen levels (ppm) and water clarity (secchi depth) at Everett Lake from 1985 through 2010 (source - Division of Fish and Wildlife files).*

Depth (ft)	8/5/85	6/12/95	6/28/04	6/20/05	6/9/08	6/8/09	6/1/10
0	7.0	10.0	9.6	11.6	9.0	6.8	8.2
5	8.0	10.0	8.5	11.4	9.0	6.0	7.7
10	7.0	4.5	1.4	2.9	5.0	0.6	3.7
15	1.0	0.2	0.7	0.6	0.4	0.2	0.0
20	0.5	0.4	0.5	0.5	0.4	0.1	0.0
25	0.0	0.6	0.3	0.4	0.0	0.1	0.0
30	0.0	0.6	0.3	0.4	0.0	0.1	0.0
35	0.0	0.6	0.3	0.4	0.0	0.0	0.0
40	0.0	0.6	0.2	0.3	0.0	0.0	0.0
Secchi (feet)	9.0	5.0	2.5	3.5	6.0	11.0	4.5

SAMPLING EFFORT							
ELECTROFISHING			Day hours	Night hours	Total hours		
<b>LAKE EVERETT</b>				0.50	0.5		
TRAPS			Number of traps	Days	Total lifts		
			2	1	2		
GILL NETS			Number of nets	Days	Total lifts		
			2	1	2		
PHYSICAL AND CHEMICAL CHARACTERISTICS							
Color			Turbidity				
tea			4 Feet		6 Inches (Secchi disk)		
TEMPERATURE, DISSOLVED OXYGEN (ppm), TOTAL ALKALINITY (ppm), pH							
Depth (ft)	Degrees °F	Oxygen*		Depth (ft)	Degrees °F	Oxygen*	
0	75.7	8.2		55			
2	75.7	7.9		56			
4	72.8	8.0		58			
5	70.8	7.7		60			
6	64.2	4.0		62			
8	62.0	3.9		64			
10	60.0	3.7		65			
12	57.4	3.4		66			
14	54.3	0.7		68			
15	52.8	0.0		70			
16				72			
18				74			
20	43.7	0.0		75			
22				76			
24				78			
25	41.6	0.0		80			
26				82			
28				84			
30				85			
32				86			
34				88			
35				90			
36				92			
38				94			
40				95			
42				96			
44				98			
45				100			
46				Sampling date: 6/1/10			
48					Surface	Bottom	
50				pH	8.1	6.6	
52				Alkalinity*			
54				Conductivity		0.378	
*ppm = parts per million							

SAMPLING EFFORT									
ELECTROFISHING			Day hours		Night hours		Total hours		
<b>LAKE EVERETT</b>									
TRAPS			Number of traps		Days		Total lifts		
GILL NETS			Number of nets		Days		Total lifts		
PHYSICAL AND CHEMICAL CHARACTERISTICS									
Color			Turbidity		9 Feet		0 Inches (Secchi disk)		
TEMPERATURE, DISSOLVED OXYGEN (ppm), TOTAL ALKALINITY (ppm), pH									
Depth (ft)	Degrees °F	Oxygen*			Depth (ft)	Degrees °F	Oxygen*		
0	81.8	6.3			55				
2	81.8	5.8			56				
4	81.8	5.8			58				
5	81.6	5.4			60				
6	80.5	4.5			62				
8	77.7	2.4			64				
10	72.4	0.8			65				
12					66				
14					68				
15	53.7	0.0			70				
16					72				
18					74				
20	46.0	0.0			75				
22					76				
24					78				
25	43.0	0.0			80				
26					82				
28					84				
30	42.4	0.00			85				
32					86				
34					88				
35	41.8	0.00			90				
36					92				
38					94				
40	41.6	0.00			95				
42					96				
44					98				
45					100				
46					Sampling date: 8/4/10				
48						Surface	Bottom		
50					pH	8.9	7.2		
52					Alkalinity*				
54					Conductivity	0.391	548		

\*ppm = parts per million

## Occurrence and abundance of submersed aquatic plants in Everett Lake

County:	Allen	Sites with plants:	23	Mean species/site:	0.93
Date:	8/4/10	Sites with native plants:	23	Standard error (ms/s):	0.12
Secchi (ft):	9.0	Vegetated sites (%)	76.7	Mean native species/site:	0.80
Maximum plant depth (ft):	13.0	Number of species:	3	Standard error (mns/s):	0.09
Trophic status:	eutro	Number of native species:	2	Species diversity:	0.30
Total sites:	30	Maximum species/site:	2	Native species diversity:	0.08

Depth ( 0 to 15 ft ) Common Name	Occurrence		Rake score observations (N,% ) per species				Plant
	Frequency (%)		0 %	1 %	3 %	5 %	Dominance
Coontail	23	76.7	7 23.3	7 23.3	8 26.7	8 26.7	47.3
Eurasian water milfoil	4	13.3	26 86.7	3 10.0	1 3.3	0.0	4.0
Sago pondweed	1	3.3	29 96.7	1 3.3	0.0	0.0	0.7
Filamentous algae	9	30.0					

<b>Relative Abundance, Size and Estimated Weight of Fish Collected at Everett Lake</b>						
			Minimum	Maximum		
Common Name*	Number	Percent	Length (in)	Length (in)	Weight (lb)**	Percent
Gizzard shad	93	39.7	8.9	16.0	72.53	45.6
Bluegill	72	30.8	2.0	9.0	8.14	5.1
Largemouth bass	25	10.7	4.4	17.5	27.37	17.2
Black crappie	20	8.5	3.2	10.1	5.05	3.2
Yellow bullhead	5	2.1	2.7	13.0	2.66	1.7
Carp	3	1.3	24.9	31.7	28.78	18.1
White sucker	3	1.3	11.3	16.6	4.28	2.7
Spotted gar	3	1.3	18.8	23.1	3.70	2.3
Redear	3	1.3	6.0	8.1	0.73	0.5
Warmouth	3	1.3	2.5	7.6	0.51	0.3
Spotted sucker	2	0.9	13.0	16.8	2.99	1.9
Brown bullhead	2	0.9	13.2	13.6	2.44	1.5
<b>TOTAL</b>	<b>234</b>				<b>159.18</b>	

Number, catch by gear, percentage, estimated weight and age of bluegills																		
Length (in)	Catch by gear			Total Number	%	Estimated Weight (lb)	Age analysis (scales/half-inch)						Age Composition (number/age)					
	EF	GN	TN				1	2	3	4	5	6+	1	2	3	4	5	6+
0.5																		
1.0																		
1.5																		
2.0	1		6	7	9.7	0.01	3						7	0	0	0	0	0
2.5	1		14	15	20.8	0.01	5						15	0	0	0	0	0
3.0	4		6	10	13.9	0.02	5						10	0	0	0	0	0
3.5			1	1	1.4	0.03	1						1	0	0	0	0	0
4.0																		
4.5	2			2	2.8	0.07		2					0	2	0	0	0	0
5.0	7		1	8	11.1	0.09		5					0	8	0	0	0	0
5.5	4		1	5	6.9	0.12		4					0	5	0	0	0	0
6.0	5			5	6.9	0.16		3					0	5	0	0	0	0
6.5	2			2	2.8	0.20		2					0	2	0	0	0	0
7.0	8	1	3	12	16.7	0.26			4	2			0	0	8	4	0	0
7.5	2			2	2.8	0.32				2			0	0	0	2	0	0
8.0	2			2	2.8	0.39				1		1	0	0	0	1	0	1
8.5																		
9.0			1	1	1.4	0.55												
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																		
Totals:	38	1	33	72		8.14	14	16	4	5	0	1	33	22	8	7	0	1
													Mean length (in):	2.6	5.4	7.0	7.3	8.0
													Variance:	0.16	0.34	0.00	0.15	

Number, catch by gear, percentage, estimated weight and age of largemouth bass																				
Length (in)	Catch by gear			Total Number	%	Estimated Weight (lb)	Age analysis (scales/half-inch)						Age Composition (number/age)							
	EF	GN	TN				1	2	3	4	5	6+	1	2	3	4	5	6+		
0.5																				
1.0																				
1.5																				
2.0																				
2.5																				
3.0																				
3.5																				
4.0																				
4.5	1			1	4.0	0.04	1						1	0	0	0	0	0		
5.0	1			1	4.0	0.06	1						1	0	0	0	0	0		
5.5																				
6.0																				
6.5																				
7.0	1			1	4.0	0.16		1					0	1	0	0	0	0		
7.5																				
8.0																				
8.5																				
9.0	1			1	4.0	0.35			1				0	0	1	0	0	0		
9.5	2	1		3	12.0	0.42			3				0	0	3	0	0	0		
10.0																				
10.5																				
11.0																				
11.5	3			3	12.0	0.75			3				0	0	0	3	0	0		
12.0																				
12.5																				
13.0	1			1	4.0	1.09														
13.5	4			4	16.0	1.23														
14.0	3			3	12.0	1.37														
14.5	1	1		2	8.0	1.53														
15.0	3			3	12.0	1.70														
15.5																				
16.0																				
16.5	1			1	4.0	2.28														
17.0																				
17.5	1			1	4.0	2.73														
18.0				0	0.0															
Totals:	23	2	0	25		27.37	2	1	4	3	0	0	2	1	4	3	0	0		
													Mean length (in):				4.8	7.0	9.4	11.5
													Variance:		0.13		0.06	0.00		



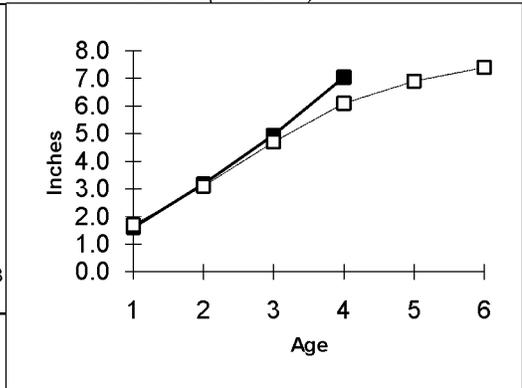
Bluegill

Intercept: 0.8 inch

**BACK-CALCULATED LENGTHS (inches) AT EACH AGE**

Year	Class	Count	Mean L	I	II	III	IV	V	VI
2009		14	2.6	2.0					
	stdev		0.41	0.25					
2008		16	5.4	1.5	4.3				
	stdev		0.65	0.21	0.61				
2007		4	7.0	1.4	2.5	6.4			
	stdev		0.17	0.23	0.18	0.23			
2006		5	7.5	1.6	2.7	3.5	7.0		
	stdev		0.31	0.17	0.40	0.53	0.40		
2005									
2004		1	8.0	2.3	2.9	5.1	6.2	7.2	7.8
Mean*				1.6	3.2	5.0	7.0		
SD				0.26	0.98	2.02			
Count				39	25	9	5		

Bluegill growth (solid line) compared to other Indiana natural lakes (dotted line).



\*Does not include age groups with less than three samples.

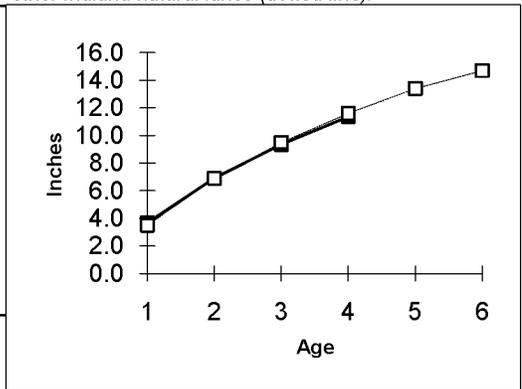
Largemouth bass

Intercept: 0.8 inch

**BACK-CALCULATED LENGTHS (inches) AT EACH AGE**

Year	Class	Count	Mean L	I	II	III	IV	V	VI
2009		2	4.8	4.1					
	stdev		0.49	0.50					
2008		1	6.8	4.0	6.3				
	stdev								
2007		4	9.2	3.5	7.0	8.8			
	stdev		0.10	0.19	0.36	0.30			
2006		3	11.7	3.8	6.9	9.9	11.4		
	stdev		0.06	0.75	1.03	0.52	0.05		
2005									
2004									
Mean*				3.7	6.9	9.4	11.4		
SD				0.22	0.09	0.75			
Count				7	7	7	3		

Largemouth bass growth (solid line) compared to other Indiana natural lakes (dotted line).



\*Does not include age groups with less than three samples.