

BISCHOFF RESERVOIR  
Ripley County  
2008 Fish Management Report

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## EXECUTIVE SUMMARY

- Bischoff Reservoir (also known locally as Batesville Reservoir or Morris Reservoir) is a 190-acre impoundment located approximately 1 mi southwest of the small town of Morris in southeastern Indiana. It is owned by the City of Batesville and managed by the Batesville Water and Gas Utility as a water supply reservoir. An Indiana Department of Natural Resources public access site with a parking lot and concrete boat ramp is present. Electric trolling motors and gasoline outboards (up to 6 horsepower) can be used on the lake.
- A survey of largemouth bass, bluegill, and gizzard shad was conducted on Bischoff Reservoir on June 11 and 17, 2008, as part of a Division of Fish and Wildlife (DFW) work plan, which is titled, "Gizzard shad experimental management strategies." Bischoff will be used as an experimental control to determine natural fluctuations in shad populations and is scheduled to be surveyed annually in early June from 2005 through 2009.
- A total of 2,096 fish, representing three species, was collected during this survey. By number, bluegill ranked first, followed by gizzard shad and then largemouth bass. By weight, gizzard shad ranked first, followed by bluegill and then largemouth bass. The DC electrofishing catch rate for bluegill and gizzard shad increased from 2007.
- Bluegill ranged from 1.7 to 7.2 in TL, averaging 5.5 in TL. Bluegill represented a balanced population; the bluegill proportional stock density (PSD) of 39 is in the middle of the desired range (20 to 60) for a balanced bluegill fishery. In the subsample, 38% of bluegill were quality-size (6.0 in and longer), an increase from 19% in 2007. Growth was similar to 2007 and bluegill reached 6.0 in at the end of their 4<sup>th</sup> year of growth, which is average for southeastern Indiana.
- The DC electrofishing catch rate for gizzard shad was 335.5/h, which is an increase from 139.0/h in 2007 and greater also than in 2006 (188.0/h), but less than in 2005 (404.5/h).
- Largemouth bass ranged from 5.0 to 21.5 in TL, averaging 9.5 in TL. Largemouth bass did not represent a balanced population: their PSD of 23 was below the desired range (40 to 70) for a balanced bass fishery. In the sample, 9% of bass were legal size (14.0 in or longer) similar to the 8% of 2007. Growth was slower than 2007, but largemouth most likely reached 14.0 in during their 6<sup>th</sup> year of growth, which is average for southeastern Indiana. Many of the sublegal bass appeared thin, which was supported by a calculated condition factor.
- In Bischoff Reservoir, the DFW should maintain a 14.0-in minimum size limit on largemouth bass, continue to stock 3,040 (16/acre) channel catfish every two years, and continue to monitor the fishery.

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## INTRODUCTION

Bischoff Reservoir (also known locally as Batesville Reservoir or Morris Reservoir) is a 190-acre impoundment located approximately 1 mi southwest of the small town of Morris in southeastern Indiana. It is owned by the City of Batesville and managed by the Batesville Water and Gas Utility as a water supply reservoir. Construction was completed in 1960. An Indiana Department of Natural Resources (IDNR) public access site with a parking lot and concrete boat ramp is present. Electric trolling motors and gasoline outboards (up to 6 horsepower) can be used on the lake.

Bischoff Reservoir is one of the few lakes in southern Indiana where the standing crop of fish has been measured. The lake was drained by the utility in the fall of 1966 to improve water quality by removal of rough fish. As the lake drained, IDNR personnel measured and weighed all the fish. Results revealed the standing crop of fish in Bischoff Reservoir was 300 lbs per acre (Barry 1967).

Bischoff Reservoir was restocked early in 1967 with largemouth bass, redear sunfish, channel catfish, and white catfish (Ameiurus catus). Regular stockings of channel catfish were started in 1977 to maintain the channel catfish population, which was not expected to sustain itself through natural reproduction. Prior to this survey, 49,337 catfish had been supplementally stocked by the IDNR's Division of Fish and Wildlife (DFW) from 1977 through 2007.

Gizzard shad, a species that has the potential to ruin sport fisheries in impoundments, had not been collected during any surveys at Bischoff before 1993. In the 1993 survey, however, gizzard shad was found to be the dominant species by number and by weight (Lehman 1995).

Bischoff Reservoir is scheduled to be surveyed from 2005 through 2009 under a DFW work plan which is titled, "Gizzard shad experimental management strategies." The work plan objectives are:

1. Report on how the illegal introductions of gizzard shad have negatively impacted sport fish populations and reduced fishing opportunities.
2. Determine the most effective way(s) to control excessive gizzard shad populations.
3. Determine how sport fish populations respond to various gizzard shad management techniques.

According to the work plan, Bischoff will be surveyed in early to mid-June each year. Only largemouth bass, bluegill, and gizzard shad will be collected. Bischoff will be used as an experimental control to determine natural fluctuations in shad populations.

## METHODS

A survey of largemouth bass, bluegill, and gizzard shad was conducted June 11 and 17, 2008. Fish were collected by pulsed DC electrofishing along the shoreline on two nights with two dippers for 2.0 h. Four 15-min electrofishing stations in the southeast arm of the lake were sampled the first night. Three 15-min electrofishing stations in the north arm of the lake and one 15-min station along the dam were sampled the second night. A GARMIN GPSmap 76 was used to record the location of the fish collection sites.

All largemouth bass collected and subsamples of 217 bluegill and 232 gizzard shad were measured to the nearest 0.1 in TL. The remaining bluegill and shad were counted but not measured. The length-frequency distributions for 1,239 bluegill and 671 gizzard shad were created based on the proportion by number of each half-inch group of the bluegill and shad subsamples.

Average weights for fish by half-inch groups for Fish Management District 8 were used to estimate the weight of the entire fish sample. A subsample of 130 largemouth bass was weighed in the field to the nearest 0.01 lb. These field weights were not included in the weight of the total sample, but were used only to calculate Fulton condition factor (C) (Anderson and Neumann 1996).

Fish scale samples were taken from largemouth bass, bluegill, and gizzard shad for age and growth analysis. The proportional stock density (PSD) was calculated for largemouth bass and bluegill (Anderson and Neumann 1996). The bluegill PSD was calculated using only the bluegill electrofishing subsample. The Bluegill Fishing Potential (BGFP) index was used to assess bluegill fishing quality (Ball and Tousignant 1996).

## RESULTS

A total of 2,096 fish, representing three species, was collected during this survey. Total weight of the fish sample was approximately 435 lbs. By number, bluegill ranked first, followed

by gizzard shad and then largemouth bass. By weight, gizzard shad ranked first, followed by bluegill and then largemouth bass.

A total of 1,239 bluegill was sampled that weighed 156 lbs. They ranged from 1.7 to 7.2 in TL, averaging 5.5 in TL. Relative abundance was 59% by number and 36% by weight. The electrofishing catch rate was 619.5/h, increasing from 476.0/h in 2006 (Kowalik and Lehman 2008).

Bluegill represented a balanced population; the bluegill PSD was 39, increasing from 21 in 2007 (Figure 1). In the subsample, 38% of the bluegill were 6.0 in or longer (i.e. quality size), increasing from 19% in 2007. The 2008 BGFP index was 20, which is in the *good* category, compared to 13 (i.e. *fair*) in 2007. Growth was similar to 2007 and back-calculated lengths indicate bluegill reached 6.0 in at the end of their 4<sup>th</sup> year of growth, which is average for southeastern Indiana (Figure 2).

A total of 671 gizzard shad was sampled that weighed 172 lbs. They ranged from 5.8 to 11.6 in TL, averaging 9.1 in TL. Relative abundance was 32% by number and 40% by weight. The electrofishing catch rate was 335.5/h, which is an increase from 139.0/h in 2007 and greater than in 2006 (188.0/h), but less than in 2005 (404.5/h) (Kowalik and Lehman 2008) (Figure 3). Gizzard shad were not aged.

A total of 186 largemouth bass was sampled that weighed 107 lbs. They ranged from 5.0 to 21.5 in TL, averaging 9.5 in TL. Relative abundance was 9% by number and 25% by weight. The electrofishing catch rate was 93.0/h, decreasing from 115.5/h in 2007 (Kowalik and Lehman 2008).

Largemouth did not represent a balanced population; the largemouth PSD was 23, a decrease from 26 in 2007 (Figure 4). In the sample, 9% of bass were legal size (14.0 in or longer), which is similar to 2007 (8%). Growth was slower than 2007, but largemouth most likely reached 14.0 in during their 6<sup>th</sup> year of growth, which is average for southeastern Indiana. (Figure 5).

Many largemouth bass under 15 in appeared thin. Of the 130 bass that were weighed, 122 bass ranged from 5.0 to 14.3 in. The mean C of these bass was 3.8 (range = 2.4 to 5.5), which is considered *poor* condition (Anderson and Neumann 1996). The remaining 8 weighed bass ranged from 15.1 to 21.5 in. The mean C of these larger bass was 5.4 (range = 5.0 to 6.2),

which is considered *average* condition. Only two weighed bass were considered *very fat* (C of 6.0 and 6.2).

## DISCUSSION

Bischoff Reservoir was 4 to 5 ft below normal pool in late 2007 due to dry weather in the summer and fall of 2007. Submersed vegetation was much less abundant during the 2008 survey than in previous surveys. The 2008 catch rates for bluegill and gizzard shad increased from 2007, which can be partly attributed to more efficient sampling. In the 2007 survey, the electrofishing catch rate for all three species decreased from 2006. The abundance and density of submersed vegetation in certain stations in 2007 made sampling conditions difficult.

Bluegill remained the most abundant species in the sample as in 2006 and 2007. The bluegill PSD in 2008 increased (to middle of the desired range) from 2007 and was greater than 2006 and similar to 2005. The percentage of quality-size bluegill followed a similar trend as the PSD. The BGFP index returned to the *good* category (as it was in 2006). According to the index, this positive effect was due to a *good* density and *good* PSD. No bluegill 8.0 in or longer have been collected in the last five surveys. The lack of large bluegill may be the result of angler harvest and/or correlated with the presence of gizzard shad. Bluegill growth remains average for southeastern Indiana.

Gizzard shad ranked second in relative abundance by number in 2008 (as in 2006 and 2007); however, shad ranked first by weight. In 2005, gizzard shad ranked first by number and weight in the sample as in 1993 when the species first appeared in a DFW survey at Bischoff (Lehman 1995). The 2008 length range of shad was wider than 2007, but the average length was similar to 2005, 2006, and 2007. Gizzard shad directly compete with bluegill and young bass for zooplankton, which can lead to a decline in fishing.

Largemouth bass catch rate and PSD continued to decline from 2006. The 2008 catch rate was not as low as 2005, which was the last survey in which the bass PSD was in the desired range. The percentage of legal largemouth collected in 2008 was similar to 2007, but less than in 2004, 2005, and 2006. The longest bass in the past four surveys have been near 21.5 in and the majority of legal bass collected appeared to be healthy. In 2008, many of the sublegal bass appeared thin, which was supported by the calculated condition factor.

Largemouth bass growth also continued to decline; however, bass most likely reached 14.0 in during their 6<sup>th</sup> year of growth, which is average for southeastern Indiana. Largemouth do not have a shortage of prey at Bischoff and should have been able to take advantage of the prey with lower lake levels in fall of 2007 and less submersed vegetation in 2008. Submersed vegetation will most likely reach levels as observed in past surveys, but bass growth and condition is expected to improve. Bass condition should continue to be monitored. The 14.0-in minimum size limit should remain in effect to prevent over-harvest of largemouth bass, the primary source of predation on Bischoff's small panfish and gizzard shad population.

According to the work plan, Bischoff will be surveyed in early to mid-June each year. Only largemouth bass, bluegill, and gizzard shad will be collected. Bischoff will be used as an experimental control to determine natural fluctuations in shad populations.

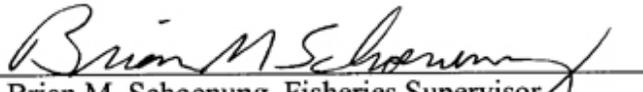
#### RECOMMENDATIONS

- The DFW should maintain the 14.0-in minimum size limit on largemouth bass at Bischoff Reservoir.
- The DFW should continue to stock 3,040 (16/acre) channel catfish fingerlings every two years as long as it is felt channel catfish should be managed in this manner. These channel catfish should average at least 8 in long to reduce mortality from bass predation.

#### LITERATURE CITED

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Date: April 3, 2009

Approved by:   
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Date: September 25, 2009

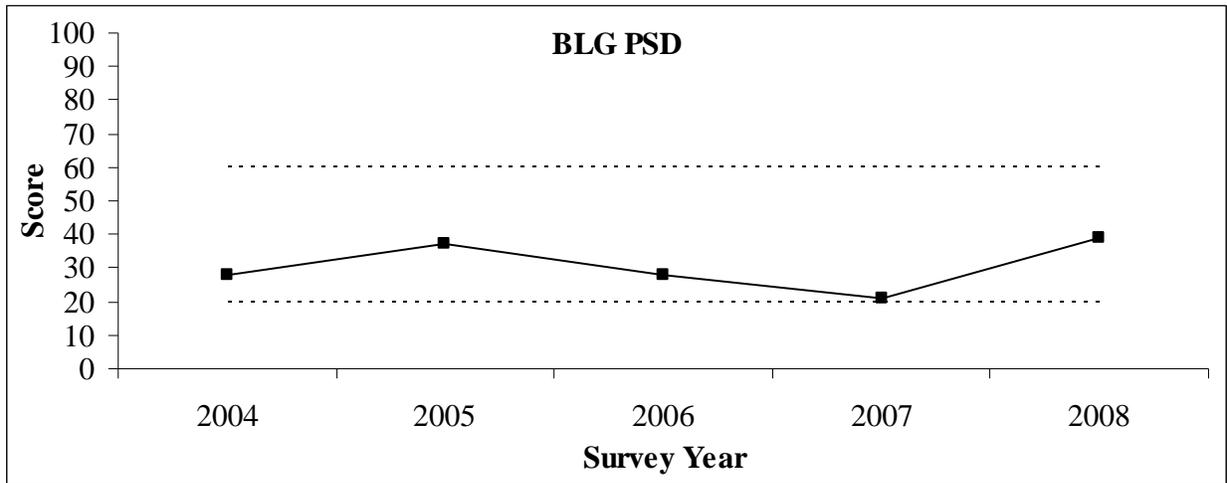


Figure 1. Bischoff Reservoir bluegill PSD scores from 2004 to 2008 in relation to the desired range of a balanced bluegill population (20 to 60).

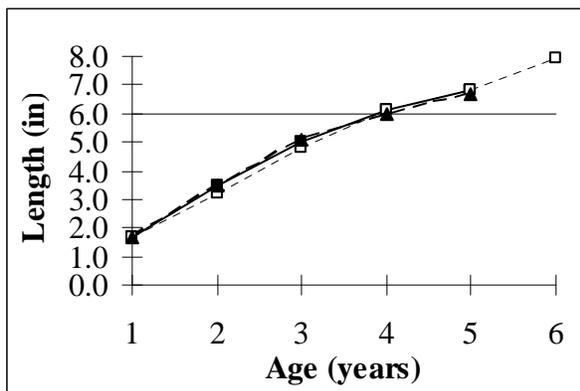


Figure 2. Bischoff Reservoir bluegill growth from 2008 survey (solid line) compared to 2007 survey (dashed line) and to average bluegill growth observed in Fish Management District 8 impoundments (dotted line).

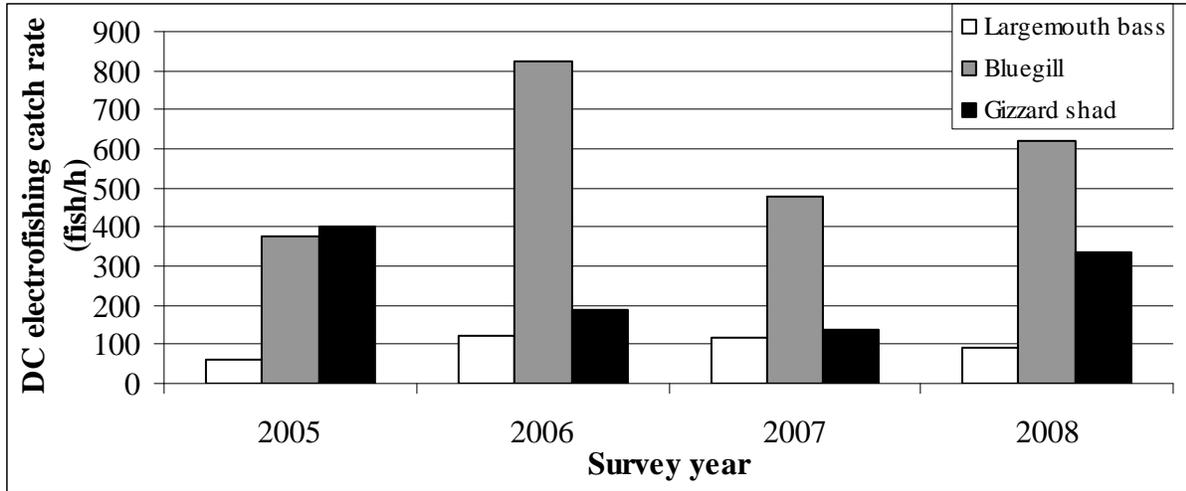


Figure 3. DC electrofishing catch rates for largemouth bass, bluegill, and gizzard shad in Bischoff Reservoir in June 2005 to 2008.

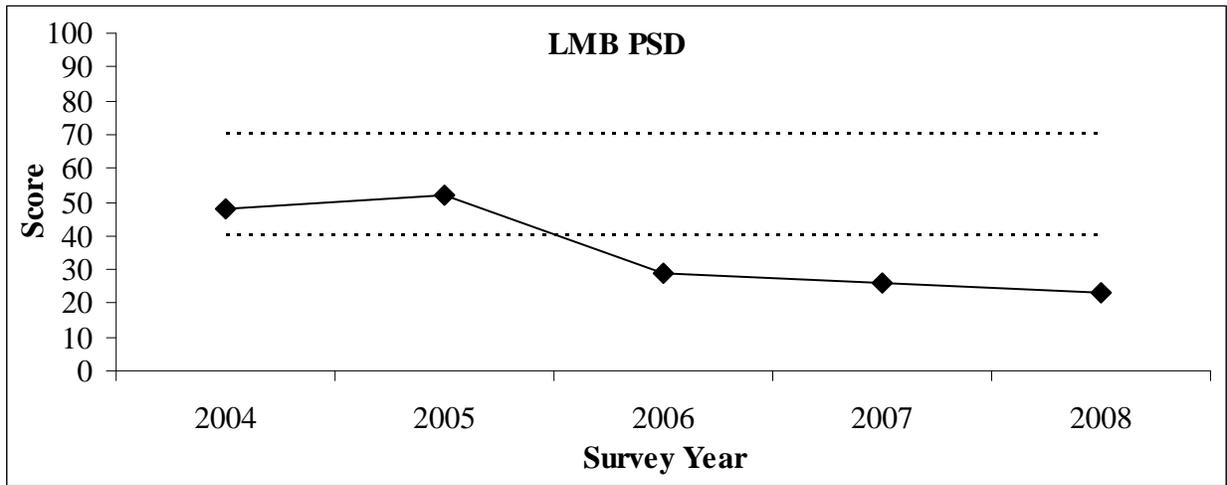


Figure 4. Bischoff Reservoir largemouth bass PSD scores from 2004 to 2008 in relation to the desired range of a balanced bass population (40 to 70). *Note:* The 2004 PSD is unreliable due to an insufficient sample size.

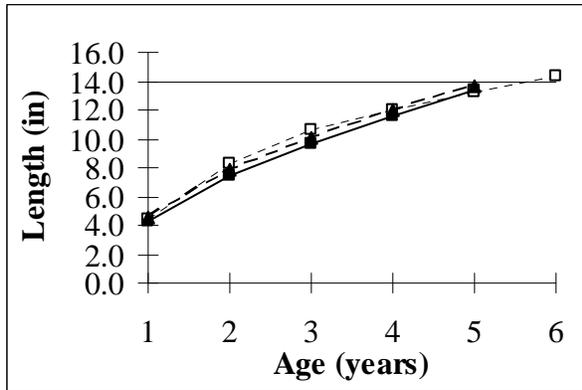


Figure 5. Bischoff Reservoir largemouth bass from 2008 survey (solid line) compared to 2007 survey (dashed line) and to average largemouth bass growth observed in Fish Management District 8 impoundments (dotted line).

# LAKE SURVEY REPORT

Type of Survey	<input type="checkbox"/> Initial Survey	<input checked="" type="checkbox"/> Re-Survey
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Lake Name Bischoff Reservoir	County Ripley	Date of survey (Month, day, year) June 11 and 17, 2008
Biologist's name Larry L. Lehman		Date of Approval (Month, day, year) September 25, 2009

LOCATION		
Quadrangle Name Batesville, IND. 1961. Photorevised 1980	Range 12E	Sections 27, 28, 33, and 34
Township 10N	Nearest Town Morris	

ACCESSIBILITY					
State owned public access site Two-lane IDNR concrete boat ramp with parking		Privately owned public access site One private boat ramp is present		Other access site City of Batesville owns impoundment	
Surface acres 190*	Maximum depth (ft) 27**	Average depth (ft) 8.1*	Volume (acre ft) 1,541*	Water level (ft MSL) 959	Extreme fluctuations 953.0-959.5 ft MSL
Location of benchmark Along State Road 46 in town of Morris					

INLETS		
Name	Location	Origin
Several unnamed intermittent inlets enter impoundment along its shoreline		

OUTLETS			
Name Bobs Creek		Location Below principal spillway in dam	
Water level control Grass emergency spillway around south end of dam. Principal spillway is 5-ft square concrete drop inlet. Ten-inch drawdown tube is present.			
POOL	ELEVATION (ft MSL)	ACRES	Bottom type
TOP OF DAM			<input type="checkbox"/> Boulder
TOP OF FLOOD CONTROL POOL			<input checked="" type="checkbox"/> Gravel
NORMAL POOL	959	190	<input checked="" type="checkbox"/> Sand
TOP OF MINIMUM POOL			<input type="checkbox"/> Silt loam
STREAMBED			<input type="checkbox"/> Clay loam
			<input type="checkbox"/> Marl

Watershed use: Watershed covers approximately 3,000 acres. Approximately 1% is commercial and 4% is residential. The remainder is forest (~10%), agriculture (~38%), and grass/pasture (~41%). (source is <http://pasture.ecn.purdue.edu>)

Development of shoreline  
Public access site with a concrete boat ramp, a courtesy dock, and parking lot is present. Twenty-six residences and some private docks sit along the shoreline. Housing development (Hillindale Commons) with a private boat ramp is located on the north arm of the lake.

Previous surveys and investigations  
Hydrographic survey 1963. Fishery survey 1963. Creel census 1965, 1966. Evaluation of survey methods 1966.

Drained 1966. Restocked 1967. Fishery survey 1970. Research project 1973-1977. Fishery survey 1984.

Lake enhancement feasibility study 1989-1991. Fishery surveys 1993, 2004. Gizzard shad study 2005, 2006, 2007.

\*According to lake enhancement feasibility study (1989-1991). \*\*According to hydrographic survey 1963.

SAMPLING EFFORT					
ELECTROFISHING	Day hours		Night hours		Total hours
	0		2.00**		2.00**
TRAP NETS	Number of traps		Number of Lifts		Total effort
	0				
GILL NETS	Number of nets		Number of Lifts		Total effort
	0				
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100-Foot Seine Hauls
	0				

PHYSICAL AND CHEMICAL CHARACTERISTICS					
Color			Turbidity		
			Feet		Inches (SECCHI DISK)
Alkalinity (ppm)*			pH		
Surface:		Bottom:	Surface:		Bottom:
Conductivity (6/11/08): 162 micromhos/cm			Air temperature		°F
Conductivity (6/17/08): 170 micromhos/cm					
Water chemistry GPS coordinates:					
N			W		

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	***		36			72		
2			38			74		
4			40			76		
6			42			78		
8			44			80		
10			46			82		
12			48			84		
14			50			86		
16			52			88		
18			54			90		
20			56			92		
22			58			94		
24			60			96		
26			62			98		
28			64			100		
30			66					
32			68					
34			70					

COMMENTS
**6/11/08 electrofisher settings: 530 volts DC, output mode 60 pps DC, pulse width 3-4 ms (3-4 amps)
**6/17/08 electrofisher settings: 530 volts DC, output mode 60 pps DC, pulse width 4 ms (4-5 amps)
***Surface water temperatures: 82°F on 6/11/08 and 79°F on 6/17/08

\*ppm-parts per million



NUMBER, PERCENTAGE, WEIGHT, AND AGE OF: Bluegill Bischoff Reservoir 6/11/08 and 6/17/08

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	5	0.4	<0.01	1	19.5				
2.0	5	0.4	<0.01	1	20.0				
2.5					20.5				
3.0	17	1.4	0.02	1	21.0				
3.5	23	1.9	0.03	2	21.5				
4.0	97	7.8	0.04	2	22.0				
4.5	69	5.6	0.06	2, 3	22.5				
5.0	137	11.1	0.08	3	23.0				
5.5	303	24.5	0.11	3, 4	23.5				
6.0	297	24.0	0.15	3, 4	24.0				
6.5	217	17.5	0.19	3, 4	24.5				
7.0	69	5.6	0.24	5, 6	25.0				
7.5					25.5				
8.0					26.0				
8.5					TOTAL	1,239			
9.0									
9.5					Subsample: PSD = 83/214(100) = 38.8				
10.0									
10.5					Subsample: % $\geq$ 6.0 inches = 83/217(100) = 38.2				
11.0									
11.5					Bluegill Fishing Potential Index = 20 (good)				
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	619.5/h	GILL NET CATCH	N/A	TRAP NET CATCH	N/A
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NUMBER, PERCENTAGE, WEIGHT, AND AGE OF: Gizzard shad      Bischoff Reservoir      6/11/08 and 6/17/08

TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5					22.5				
5.0					23.0				
5.5					23.5				
6.0	14	2.1	0.07	Not aged	24.0				
6.5	9	1.3	0.09		24.5				
7.0	6	0.9	0.12		25.0				
7.5	12	1.8	0.14		25.5				
8.0	43	6.4	0.17		26.0				
8.5	168	25.0	0.20		TOTAL	671			
9.0	136	20.3	0.25						
9.5	133	19.8	0.28						
10.0	87	13.0	0.34						
10.5	46	6.9	0.40						
11.0	14	2.1	0.46						
11.5	3	0.4	0.51						
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	335.5/h	GILL NET CATCH	N/A	TRAP NET CATCH	N/A
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NUMBER, PERCENTAGE, WEIGHT, AND AGE OF: Largemouth bass Bischoff Reservoir 6/11/08 and 6/17/08

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	1	0.5	4.52	—
2.5					20.5				
3.0					21.0				
3.5					21.5	1	0.5	5.76	—
4.0					22.0				
4.5					22.5				
5.0	7	3.8	0.05	1	23.0				
5.5	15	8.1	0.07	1	23.5				
6.0	9	4.8	0.10	1, 2	24.0				
6.5	3	1.6	0.12	1, 2	24.5				
7.0	6	3.2	0.16	2	25.0				
7.5	5	2.7	0.19	2	25.5				
8.0	13	7.0	0.24	2	26.0				
8.5	16	8.6	0.28	2	TOTAL	186			
9.0	21	11.3	0.34	2, 3					
9.5	20	10.8	0.41	3, 4					PSD = 32/139(100) = 23.0
10.0	18	9.7	0.48	3, 4					
10.5	11	5.9	0.57	3					% <sub>≥</sub> 14.0 inches = 17/186(100) = 9.1
11.0	4	2.2	0.64	3					
11.5	5	2.7	0.74	3, 4					
12.0	7	3.8	0.84	3, 4					
12.5	4	2.2	0.97	3, 4, 6					
13.0	2	1.1	1.09	4, 5					
13.5	3	1.6	1.24	4, 5					
14.0	3	1.6	1.39	4, 5					
14.5	2	1.1	1.59	5					
15.0	1	0.5	1.72	6					
15.5		0.0							
16.0	3	1.6	2.06	---					
16.5	2		2.29	---					
17.0		0.0							
17.5	1	0.5	2.90	---					
18.0									
18.5	3	1.6	3.52	---					

ELECTROFISHING CATCH	93.0/h	GILL NET CATCH	N/A	TRAP NET CATCH	N/A
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Species Bluegill	YEAR CLASS	Number of fish aged	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE								
				1	2	3	4	5	6	7	8	
Intercept= 0.8"	2007	5	1.7-3.1	1.9								
	2006	11	3.4-4.7	1.6	3.3							
	2005	17	4.5-6.3	1.8	3.7	5.1						
	2004	7	5.6-6.7	1.6	3.4	4.9	5.9					
	2003	4	6.8-7.2	1.7	3.6	5.0	6.2	6.8				
	2002	1*	6.9	1.3	3.3	5.4	6.0	6.6	6.8			
			AVERAGE LENGTH	1.7	3.5	5.0	6.1	6.8				
			NUMBER AGED	44	39	28	11	4				

Species Largemouth bass	YEAR CLASS	Number of fish aged	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE								
				1	2	3	4	5	6	7	8	
Intercept= 0.8"	2007	19	5.0-6.3	4.3								
	2006	28	6.1-9.1	4.7	7.2							
	2005	32	8.8-12.7	4.7	8.0	9.9						
	2004	10	9.5-14.2	4.4	7.5	9.9	11.5					
	2003	6	12.9-14.3	3.7	7.3	9.4	11.6	13.4				
	2002	2*	12.6-15.1	3.4	7.2	8.9	10.4	12.1	13.6			
			AVERAGE LENGTH	4.3	7.5	9.7	11.6	13.4				
			NUMBER AGED	95	76	48	16	6				

\*Not included in average length calculations.

**GPS LOCATION OF SAMPLING EQUIPMENT**

**Bischoff Reservoir 6/11/08 and 6/17/08**

GILL NETS			TRAP NETS			ELECTROFISHING		
1	N	W	1	N	W	1	N 39.27228	W -85.17967
	N	W	2	N	W		N 39.27424	W -85.18172
2	N	W	3	N	W	2	N 39.27066	W -85.18527
	N	W	4	N	W		N 39.26798	W -85.18408
3	N	W	5	N	W	3	N 39.27195	W -85.18649
	N	W	6	N	W		N 39.27217	W -85.18924
4	N	W	7	N	W	4	N 39.27065	W -85.18987
	N	W	8	N	W		N 39.26967	W -85.18719
5	N	W	9	N	W	5	N 39.28053	W -85.19268
	N	W	10	N	W		N 39.27881	W -85.19534
6	N	W	11	N	W	6	N 39.28254	W -85.18791
	N	W	12	N	W		N 39.28325	W -85.18737
7	N	W	13	N	W	7	N 39.27540	W -85.19947
	N	W	14	N	W		N 39.27467	W -85.19642
8	N	W	15	N	W	8	N 39.27598	W -85.19405
	N	W	16	N	W		N 39.27731	W -85.19057
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					N	W
	N	W					N	W
13	N	W					N	W
	N	W					N	W
14	N	W					N	W
	N	W					N	W
15	N	W					N	W
	N	W					N	W
16	N	W					N	W
	N	W					N	W
17	N	W					N	W
	N	W					N	W
18	N	W					N	W
	N	W					N	W
19	N	W					N	W
	N	W					N	W
20	N	W					N	W
	N	W					N	W