

**Williams Lake**

**Noble County**

**Fish Management Report**

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## EXECUTIVE SUMMARY

Williams Lake is a 46-acre natural lake located in south-central Noble County near Wolf Lake, Indiana. A public boat ramp is now available on the lake's west side off County Road 250W and was constructed in 2010. To provide current information on the status of the fishery to anglers who may now be interested in fishing the lake, a fish population survey was conducted in June 2010. Fish sampling was conducted on June 28-30, 2010. Submersed aquatic plants were sampled on August 5.

During the survey, 437 fish weighing 244 pounds and representing 14 species were collected. Sport fish accounted for 84% of the total number but only 37% of the total weight. Bluegills ranked first numerically (68%) but second in weight (18%) behind carp (30%). The catch rate of bluegills captured during electrofishing was typical for lakes in the area. Their growth rate, however, was rapid. The electrofishing catch rate of bass was somewhat lower than average but growth rate was within the average range.

Water clarity declined from 3.5 feet in June to 2.0 feet in August. Adequate amounts of oxygen for fish (>3 ppm) were present only in the top 5 feet of water. Coontail and Eurasian water milfoil were the only two species of submersed aquatic plants. Overall, submersed plants covered only 33% of the littoral area.

Results of the 2010 survey were generally similar to results of a 1977 survey. Although similar numbers and weights of bluegills were caught both years, fewer black crappies and redear sunfish were caught and more carp were caught in 2010. Bluegill and largemouth bass size structure may have increased over the years.

In general, adequate numbers and size of bluegills and largemouth bass are present. Several other sport fish, although not abundant, add diversity to fishing opportunities. The most troubling aspect of the survey is the relatively high number and weight of non-sport fish. Suckers and carp made up 51% of the total weight.

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## INTRODUCTION

Williams Lake is a 46-acre natural lake located in south-central Noble County near Wolf Lake, Indiana. It is one of several small lakes located in the upper reaches of the Elkhart River South Branch (Lake Michigan watershed). Maximum depth is 44 feet and average depth is 23 feet. Because of its large watershed size (19,677 acres), its hydraulic retention time is estimated to be only 20 days. Water level can vary several feet depending on runoff. More than half of the shoreline is residentially-developed. Sections of natural shoreline and palustrine wetland are located along the west and south sides of the lake. A public boat ramp is now available on the lake's west side off County Road 250W and was constructed in 2010.

Williams Lake has little fish management history because of prior limited access. A previous fish survey was conducted in August 1997 (Pearson 1977). Gill-netting was also conducted in August 1981 to determine whether northern pike stocked upstream at Bear and Miller lakes had moved down into Williams Lake (Pearson 1982). Like other lakes in the area, a 12-inch minimum size limit was imposed on largemouth bass in 1990 and increased to 14 inches in 1998. To provide current information on the status of the fishery to anglers who may now be interested in fishing the lake, another fish population survey was conducted in June 2010. The results of the survey are presented in this report.

## METHODS

Fish sampling was conducted on June 28-30, 2010 according to survey guidelines and included 0.5 hour of pulsed DC electrofishing (504V) with two dip-netters, two gill net lifts, and two trap net lifts. This amount of effort now also corresponds to the standard effort being used to detect status and trends in fish communities (Workplan F10D642). All captured fish were measured to the nearest tenth-inch (total length, TL) and released when possible. Weights were estimated from standard length-weight formulas generated from data on file from Indiana natural lakes fish population surveys. Fish scales were taken from largemouth bass and bluegills for age and growth analyses using standard body-length: scale-length relationships. Temperature and oxygen profiles were measured on June 29. Water clarity was also measured on June 29 and again on August 5 when submersed aquatic plants were sampled according to standard procedures.

## RESULTS

During the survey, 437 fish weighing 244 pounds and representing 14 species were collected (see appendices). Altogether, sport fish accounted for 84% of the total number but only 37% of the total weight. Bluegills ranked first numerically (68%) but second in weight (18%) behind carp (30%). Largemouth bass comprised 11% of the number and 16% of the weight. Although spotted suckers made up only 6% of the number, they comprised 15% of the weight.

Of the 297 bluegills caught during the survey, most were 4.0 to 7.5 inches. Those that were 7-inch and larger made up 21% of all 3-inch and larger bluegills. The largest was 9 inches. The catch rate of bluegills captured during electrofishing (119/15-min) was typical for lakes in the area (100/15-min). Their growth rate, however, was rapid with age-4 bluegills averaging 6.9 inches long. Age-4 bluegills in most area lakes average 6.1 inches.

Forty-seven largemouth bass were captured, ranging in length from 1.8 to 20.8 inches. Most bass were 8.0 to 11.5 inches. Nine were legal size ( $\geq 14$  in). The electrofishing catch rate of bass (19/15-min) was somewhat lower than average compared to other lakes (30/15-min). Their growth rate was average, however.

Few other sport fish were collected. Only seven black crappies ranging up to 10 inches long and six redear up to 9 inches long were caught. Six warmouth, two yellow perch, two pumpkinseeds, and one brown bullhead were also caught. Non-sport fish included 26 spotted suckers up to 18.8 inches long, 15 carp ranging from 16.5 to 23.6 inches 15 spotted gar, eight white suckers, four bowfin, and one golden shiner.

Water clarity declined from 3.5 feet in June to 2.0 feet in August. Adequate amounts of oxygen for fish ( $>3$  ppm) were present only in the top 5 feet of water and no oxygen was present in water 8 feet deep or deeper. Only two species of submersed aquatic plants were collected during the August sampling. None were detected in water deeper than 9 feet. Coontail was found at eight of 30 sites (27%) and Eurasian water milfoil, a non-native species, was found at four sites (13%). Even where present, neither species was abundant. Dominance scores of both species, a measure that combines plant coverage with density, were low ( $<10$ ). Overall, submersed plants covered only 33% of the littoral area.

## DISCUSSION

Results of the 2010 fish survey were generally similar to results of the 1977 survey (Table 1). Many of the differences, including fewer fish and fewer species, were likely due to variations in the date of sampling and changes in sampling gear and effort. Twenty-five species were found in 1977, compared to 14 species in 2010. Notably absent from the 2010 catch were white crappies and yellow bullheads. Although similar numbers and weights of bluegills were caught in 2010 compared to 1977, substantially fewer black crappies and redear sunfish were caught and many more carp were caught.

Bluegill and largemouth bass size structure may have increased over the years (Tables 2 and 3). Only 4% of all 3-inch and larger bluegills captured in 1977 were 7-inch or larger compared to 22% in 2010. Ten 8-inch and larger bluegills were also caught in 2010, compared to only one in 1977. Likewise, only three 14-inch and larger bass were caught in 1977 compared to nine in 2010. Of all 8-inch and larger bass, only 15% were 14-inch and larger in 1977, while 31% were 14-inch and larger in 2010. Even though slightly fewer bass were caught in 2010 because of less sampling effort, the pounds of bass collected in 2010 was twice as great as 1977 (Table 1). Increased numbers of larger bass may be the result of the 14-inch size limit. It is not known, however, whether more large bass may also be indirectly contributing to the increase in bluegill size.

In general, adequate numbers and size of bluegills and largemouth bass are present. Crappie numbers are apparently down compared to 1977 but can be more cyclic than other species. The most troubling aspect of the survey, however, is the relatively high number and weight of non-sport fish. Suckers and carp made up 51% of the total weight. Their abundance may be adversely impacting the aquatic habitat (low clarity, little vegetation). Because of the lake's connection to the Elkhart River South Branch, there is little opportunity to directly reduce their abundance or block their movement into the lake. Although suckers can provide forage for large predator, fish such as northern pike, the pike fingerlings stocked in upstream lakes years ago (Pearson 1982) apparently did not increase pike abundance in Williams Lake. Only two pike, 20.5 and 29.5 inches long, were netted in 1977 (0.33/lift). One 16.7-inch pike was netted in 1981 (0.50/lift) and none in 2010.

## RECOMMENDATIONS

Long-term fish management efforts at Williams Lake should focus on protecting and enhancing the natural character of the lake, reducing nutrient inputs and habitat alterations, restoring native plant diversity and abundance, and using the abundant sucker population as forage for additional predator fish. In the short-term, information on the current status of the fish community should be provided to interested anglers.

## REFERENCES

Pearson, J. 1977. Williams Lake, Noble County, fish management report. Indiana Division of Fish and Wildlife.

Pearson, J. 1982. Northern pike stockings in the upper reaches of the Elkhart River, South Branch. Indiana Division of Fish and Wildlife.

Submitted by: Jed Pearson, Fisheries Biologist

Approved by: Stu Shipman, Fisheries Supervisor  
November 4, 2010

Table 1. *Number and weight of fish collected in surveys at Williams Lake in 1977, 1981 and 2010.*

Species	Number			Pounds		
	1977	1981	2010	1977	1981	2010
Black crappie*	162	7	7	16.58	1.22	2.88
Bluegill*	280	18	297	39.78	3.47	44.54
Bowfin	5		4	12.24		7.10
Brook silverside	present			na		
Brown bullhead*	3	1	1	1.69	0.67	0.82
Carp	2		15	3.82		73.24
Channel catfish*	1	7		0.88	12.87	
Golden shiner	21	1	1	3.01	0.08	0.01
Green sunfish*	5			0.22		
Iowa darter	1			na		
Johnny darter	14			0.05		
Lake chubsucker	3			0.71		
Largemouth bass*	54	1	47	19.40	0.14	38.76
Logperch	4			0.02		
Pumpkinseed*	8		2	0.61		0.19
Northern pike*	2	1		13.33	0.98	
Redear sunfish*	24		6	2.73		2.18
Redfin pickerel	1			0.21		
Spotted gar	3	2	15	5.02	2.16	21.19
Spotted sucker	34	10	26	17.80	7.84	35.54
Warmouth*	22		6	2.26		0.51
White crappie*	24	1		5.58	0.35	
White sucker	23	5	8	24.86	7.87	16.60
Yellow bullhead*	10	5		3.66	2.01	
Yellow perch*	13	1	2	1.39	0.38	0.50
<b>TOTAL</b>	<b>719</b>	<b>60</b>	<b>437</b>	<b>175.85</b>	<b>40.04</b>	<b>244.06</b>
Sampling effort:						
Electrofishing minutes	60 AC	0	30 DC			
Gill net lifts	6	2	2			
Trap net lifts	6	0	2			

\* considered to be sport fish

Table 2. *Bluegill size\* at Williams Lake in 1977 and 2010.*

Inches	1977	2010
1-1½	14	0
2-2½	21	7
3-3½	108	8
4-4½	39	64
5-5½	62	87
6-6½	27	68
7-7½	8	53
8-8½	1	9
9-9½	0	1
Total	280	297
RSD ≥7**	3.7	21.7

\*Sizes represent historical length classes. For example: 6-6½ represents 5.8 to 6.7 inches.

\*\* Relative Stock Density: percentage of 7-inch and larger bluegills of all 3-inch and larger bluegills.

Table 3. *Largemouth bass size at Williams Lake in 1977 and 2010.*

Inches	1977	2010
< 4	17	3
4-7½	17	15
8-11½	13	17
12-13½	4	3
14-17½	2	4
≥ 18	1	5
Total	54	47
RSD ≥14**	15.0	31.0

\*Sizes represent historical length classes. For example: 12-13½ represents 11.8 to 13.7 inches.

\*\* Relative Stock Density: percentage of 14-inch and larger bass of all 8-inch and larger bass.

**APPENDIX  
Lake Pages**

**FISH SURVEY REPORT**  
*Indiana Division of Fish and Wildlife*

Type of survey
Initial:      Re-survey: <input checked="" type="checkbox"/>

Lake name	County	Date of survey (Month, day, year)
Williams Lake	Noble	6/28 - 6/30/10
Biologist's name	Date of approval (Month, day, year)	
Jed Pearson		

LOCATION		
Quadrangle name	Range	Section
Merriam	9E	10,11
Township	Nearest town	
33N	Wolf Lake	

**ACCESSIBILITY**

State owned public access site	Privately owned public access site	Other access site			
Constructed in 2010 on west side of lake					
Surface acres	Maximum depth (ft)	Average depth (ft)	Acre feet	Water level (msl)	Extreme fluctuations (ft)
46	44	23	1,073	882.81	1-3 feet

INLETS		
Name	Location	Origin
Thumma Ditch	South end of lake	Muncie Lake
Unnamed ditch	east side of lake	Petty Lake

**OUTLET**

Name	Location
Thumma Ditch (Elkhart S Branch)	Northwest corner of lake
Water level control	
None	

POOL	ELEVATION (Feet MSL)	ACRES	Bottom type
TOP OF DAM			Boulder _____
TOP OF FLOOD CONTROL POOL			Gravel _____
TOP OF CONSERVATION POOL			Sand _____
TOP OF MINIMUM POOL			Muck <input checked="" type="checkbox"/>
			Clay <input checked="" type="checkbox"/>
			Marl <input checked="" type="checkbox"/>
STREAMBED			

Watershed use
General farming, woodlots and wetlands
Development of shoreline
Most of the northwest, north, east and southeast shorelines are residentially-developed

Previous surveys and investigations
Fish survey, DNR 1977



**Occurrence and abundance of submersed aquatic plants in Williams Lake**

County: Noble	Sites with plants: 10	Mean species/site: 0.40
Date: 8/5/10	Sites with native plants: 8	Standard error (ms/s): 0.12
Secchi (ft): 2.0	Vegetated sites (%): 33.3	Mean native species/site: 0.27
Maximum plant depth (ft): 9.0	Number of species: 2	Standard error (mns/s): 0.08
Trophic status: eutro	Number of native species: 1	Species diversity: 0.44
Total sites: 30	Maximum species/site: 2	Native species diversity: 0.00

Depth ( 0 to 15 ft ) Common Name	Occurrence		Rake score observations (N,% ) per species								Plant Dominance
	Frequency (%)		0 %	1 %	3 %	5 %	0 %	1 %	3 %	5 %	
Coontail	8	26.7	22	73.3	6	20.0	2	6.7	0	0.0	8.0
Eurasian water milfoil	4	13.3	26	86.7	4	13.3	0	0.0	0	0.0	2.7



Number, catch by gear, percentage, estimated weight and age of bluegill																			
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			1	0.3	0.01	1						1	0	0	0	0	0	
2.5	5		1	6	2.0	0.01	5						6	0	0	0	0	0	
3.0	3		3	6	2.0	0.02	4						6	0	0	0	0	0	
3.5	2			2	0.7	0.03	2						2	0	0	0	0	0	
4.0	22		1	23	7.7	0.05		5					0	23	0	0	0	0	
4.5	39		2	41	13.8	0.07		5					0	41	0	0	0	0	
5.0	29		4	33	11.1	0.09		4	1				0	26	7	0	0	0	
5.5	44	1	9	54	18.2	0.12		6					0	54	0	0	0	0	
6.0	36	1	4	41	13.8	0.16		4					0	41	0	0	0	0	
6.5	23		4	27	9.1	0.20		5	2				0	19	8	0	0	0	
7.0	26		11	37	12.5	0.26		1	3	2			0	6	19	12	0	0	
7.5	8		8	16	5.4	0.32				3	2		0	0	0	10	6	0	
8.0		1	5	6	2.0	0.39				2	1		0	0	0	4	2	0	
8.5			3	3	1.0	0.47							2	0	0	0	0	3	
9.0		1		1	0.3	0.55							1	0	0	0	0	1	
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:	238	4	55	297		44.54	12	30	6	7	3	3	15	211	33	26	8	4	
													Mean length (in):	2.8	5.3	6.5	7.3	7.6	8.6
													Variance:	0.17	0.64	0.61	0.14	0.05	0.06

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	1		2	3	6.4	0.00															
2.5																					
3.0																					
3.5																					
4.0																					
4.5	2			2	4.3	0.04	2					2	0	0	0	0					
5.0	3			3	6.4	0.06	3					3	0	0	0	0					
5.5	2			2	4.3	0.08	2					2	0	0	0	0					
6.0																					
6.5																					
7.0	1	1		2	4.3	0.16		2				0	2	0	0	0					
7.5	5	1		6	12.8	0.20		3				0	6	0	0	0					
8.0	2	2		4	8.5	0.25		4				0	4	0	0	0					
8.5	1			1	2.1	0.30															
9.0	2	1		3	6.4	0.35			3			0	0	3	0	0					
9.5	4			4	8.5	0.42			4			0	0	4	0	0					
10.0	2			2	4.3	0.49			2			0	0	2	0	0					
10.5	1	1		2	4.3	0.57				1		0	0	0	2	0					
11.0	1			1	2.1	0.65				1		0	0	0	1	0					
11.5																					
12.0	1			1	2.1	0.85			1			0	0	1	0	0					
12.5																					
13.0		1		1	2.1	1.09				1		0	0	0	1	0					
13.5	1			1	2.1	1.23					1	0	0	0	0	1					
14.0																					
14.5	1			1	2.1	1.53															
15.0																					
15.5	1			1	2.1	1.88					1	0	0	0	0	1					
17.5	2			2	4.3	2.73															
18.0	1			1	2.1	2.97															
18.5	1			1	2.1	3.24															
19.0	2			2	4.3	3.51															
21.0	1			1	2.1	4.78															
Totals:	38	7	2	47		38.76	7	9	10	3	2	0	7	12	10	4	2				
													Mean length (in):				5.0	7.6	9.7	11.3	14.5
													Variance:				0.17	0.13	0.79	1.42	2.00

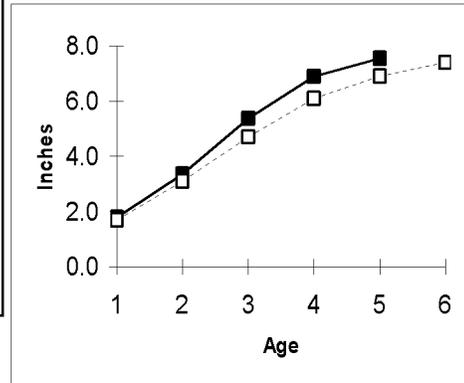
Bluegill

Intercept: 0.8 inch

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

Year	Class	Count	Mean L	I	II	III	IV	V	VI
2009		12	2.8	1.8					
	stdev		0.39	0.26					
2008		30	5.3	1.9	3.2				
	stdev		0.91	0.32	0.49				
2007		6	6.4	1.9	3.4	5.8			
	stdev		0.78	0.33	0.60	1.16			
2006		7	7.5	1.8	3.6	5.1	6.9		
	stdev		0.33	0.10	0.18	0.46	0.30		
2005		3	7.8	1.6	3.3	5.3	6.9	7.5	
	stdev		0.21	0.22	0.66	0.15	0.22	0.18	
2004		2	8.4	5.0	2.8	4.7	6.6	7.4	8.1
	stdev		0.07	4.61	1.06	1.36	0.10	0.08	0.09
Mean*				1.8	3.4	5.4	6.9	7.5	
SD				0.11	0.18	0.36	0.04		
Count				58	46	16	10	3	

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



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

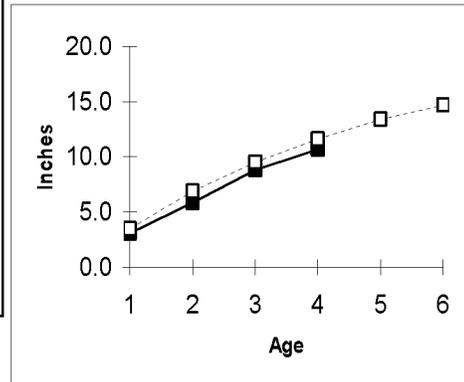
Largemouth bass

Intercept: 0.8 inch

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

Year	Class	Count	Mean L	I	II	III	IV	V	VI
2009		7	5.0	2.9					
	stdev		0.37	0.24					
2008		9	7.7	3.1	5.8				
	stdev		0.35	0.35	0.65				
2007		10	9.7	3.0	6.0	8.7			
	stdev		0.96	0.47	1.12	0.87			
2006		3	11.5	3.3	5.7	8.9	10.7		
	stdev		1.27	0.32	1.29	1.30	1.13		
2005		2	14.6	3.1	6.2	10.6	11.8	13.8	
	stdev		1.27	0.19	0.11	0.65	1.22	1.31	
2004									
Mean*				3.1	5.8	8.8	10.7		
SD				0.15	0.15	0.14			
Count				29	22	13	3		

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



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