

**Hurshstown Reservoir**

**Allen County**

**Fish Management Report 2008**

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## EXECUTIVE SUMMARY

- Hurshtown Reservoir is a 260-acre impoundment north of Grabill and was built in 1969 to provide an emergency water supply for Fort Wayne.
- The water level in Hurshtown Reservoir is maintained by pumping water from the St. Joseph River. Maximum depth is 31 ft and average depth is 21 ft. Water clarity ranges from 5.0 ft to 11.0 ft. Although a temperature gradient exists, there was no distinct thermocline. In 2008, sufficient oxygen was available down to 18 ft.
- To assess the current fish population, a fish survey was conducted June 16-18, 2008. Sampling effort consisted of 0.75 h of electrofishing, four trap net lifts and six gill net lifts.
- During the survey, 302 fish weighing 137 pounds were collected. Fourteen species were noted. Green sunfish were first by number (35%) and gizzard shad were first by weight (29%). Smallmouth bass were second by number (11%) and weight (19%).
- Fewer smallmouth bass were captured in 2008 when compared to previous surveys, with the electrofishing catch rate decreasing by 66%. Despite this, overall contribution to the total catch by number only decreased from 14% in 2002 to 11% in 2008.
- Due to the physical characteristics, natural, but not sustainable, reproduction of walleye may be occurring at Hurshtown Reservoir. As many as 14 age-2 walleyes were captured in 2008, despite the ending of walleye stockings in 2000. If the Fort Wayne Parks and Recreation Department wishes to develop a successful walleye fishery at Hurshtown Reservoir, it is recommended that they resume annual fingerling stockings.
- Due to relaxations in boating restrictions, and the construction of a new boat ramp, it is recommended that the Division of Fish and Wildlife continue to participate in fish management activities at Hurshtown Reservoir as necessary.

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## INTRODUCTION

Hurshtown Reservoir is a 260-acre impoundment north of Grabill and was built in 1969 to provide an emergency water supply for Fort Wayne. It was closed to the public until 1986. The Fort Wayne Parks and Recreation Department (FWPRD) manages the recreational use at the reservoir and installed a boat ramp, boat livery, and fishing piers. Daily entrance and launch fees are charged to fund staff and general maintenance of the facility. The reservoir is open Thursday through Monday, 7 a.m. to 9 p.m., from May 1<sup>st</sup> to September 30<sup>th</sup>. Boaters must use electric motors while on the reservoir.

The water level in Hurshtown Reservoir is maintained by pumping water from the St. Joseph River. Maximum depth is 31 ft and average depth is 21 ft. Water clarity ranges from 5.0 ft to 11.0 ft. Although a temperature gradient exists, there was no distinct thermocline. Historically, enough oxygen for fish survival (5 ppm) has been present to the bottom. In 2008, sufficient oxygen was available down to 18 feet (Table 1). The shoreline is lined with rock and devoid of trees or emergent vegetation. Submerged vegetation is not present either.

The fish management history of the reservoir dates back to 1987 when an initial survey was conducted. At the time, green sunfish were abundant and predator fish were scarce. As a result, 52,000 smallmouth bass fingerlings and 23 adults were stocked from 1989 to 1992. As many as 38,000 fingerlings were 3-4 in long. Total cost of the stocking program was \$46,000. Follow up sampling in 1990, 1992, and 1994 indicated smallmouth bass were successfully established and naturally reproducing at levels of largemouth bass in Indiana natural lakes. In 2002, an additional general fish population survey was conducted to further assess the long-term success of the stocking program. Results indicated that significantly fewer green sunfish were present, but only 4 individuals were greater than 6 in and growth remained slow. In addition, fewer smallmouth bass were collected, but electrofishing rates remained steady and numbers were thought to rival those of largemouth bass in nearby natural lakes.

From 1998 to 2000 the FWPRD stocked approximately 13,500 3-inch walleye fingerlings to increase predators in the reservoir and increase fishing diversity. However, due to limited funding, stocking was terminated. To assess the current fish population, a

fish survey was conducted June 16-18, 2008. Sampling effort consisted of 0.75 h of electrofishing, four trap net lifts and six gill net lifts.

## METHODS

Fish sampling effort was conducted according to current Division of Fish and Wildlife (DFW) guidelines and included 0.75 h of pulsed DC electrofishing (504V) with two dip-netters, six gill net lifts, and four trap net lifts. 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 green sunfish, smallmouth bass, and walleye for age and growth analyses using standard body-length: scale-length relationships.

## RESULTS

During the survey, 302 fish weighing 137 pounds were collected. Fourteen species were noted. Green sunfish were first by number (35%) and gizzard shad were first by weight (29%). Smallmouth bass were second by number (11%) and weight (19%). Other sportfish collected included bluegill, white crappie, channel catfish, walleye, rock bass, yellow bullhead and yellow perch. Overall, sportfish accounted for 83% of the number and comprised 54% of the total weight.

A total of 106 green sunfish was collected, ranging in length from 2.2 to 6.7 in. The majority (66%) were between 2.5 and 3.5 in and only five were larger than 6.0 in. Nearly all (93%) were captured while electrofishing (36/15-min), while eight were caught with trap nets and none were captured with gill nets. Although age-7 fish were present, growth was slow with age-4 fish averaging 4.4 in.

Thirty-three smallmouth bass were collected, ranging in length from 2.6 to 16.1 in. Seven were legal size (>14 in), 15 were between 8.0 and 13.9 in and 11 were less than 8 in. Twenty-one were captured during electrofishing (7/15 min) and 12 were captured in gillnets (2/lift). Fish were up to seven years old and growth was good with fish averaging nearly 14 in by age-5.

Fourteen walleyes were captured, ranging in length from 10.4 to 12.4 in. All were age-2 and all but one were captured in gillnets (2/lift). No adults were captured during the survey.

Other sportfish included 27 bluegills up to 7.6 in long, 25 white crappies up to 11.6 in, 20 channel catfish up to 25.0 in, 11 rock bass, nine yellow bullheads, and four yellow perch. Other fish included carp, logperch, a freshwater drum, and a bluntnose minnow.

## DISCUSSION

Fewer fish were caught in 2008 than any previous survey, but total weight of fish was similar to past surveys (Table 2). Decreased catches of smallmouth bass, carp, and green sunfish contributed to the overall decline in catch by number, though numbers of channel catfish, walleye and white crappie have increased since 2002.

Fewer smallmouth bass were captured in 2008 when compared to previous surveys, with the electrofishing catch rate decreasing by 66% (Table 3). Despite this, overall contribution to the total catch by number only decreased from 14% in 2002 to 11% in 2008. Given the observed size distribution of smallmouth bass in the survey catch, Hurshtown Reservoir contains many harvestable size bass and continues to support an adequate smallmouth bass fishery.

With the exception of smallmouth bass, white crappie, and channel catfish, Hurshtown Reservoir continues to provide little sport fishing opportunities. Nearly 64% of the total catch was contributed by less desirable species such as carp, bullhead, gizzard shad and green sunfish. Upon completing the last fish management survey, it was suggested that stocking additional predators in Hurshtown Reservoir may improve fishing quality and diversity. Smallmouth bass stockings ceased in 1992 after it was determined that a successful population had been established. As stated previously, walleye stockings ended in 2000; however, 14 age-2 walleyes were captured in 2008. It is plausible that the reservoir may suitable habitat for walleye spawning, and because the reservoir is devoid of vegetation, prevailing winds may provide enough water movement necessary for fry survival. Nevertheless, because walleye spawning is highly dependent on environmental factors, future recruitment of walleye may be poor and result in erratic year-class

fluctuations. If the FWPRD wishes to develop a successful walleye fishery at Hurshtown Reservoir, it is recommended that they resume annual fingerling stockings.

Prior to 2004, the FWPRD drastically limited public use by requiring all gas powered motors be removed from boats. However, in 2004, they removed the restriction, but the reservoir remains under an electric-motor only regulation. Though this requirement still limits public use to a degree, the change in the boating restriction, in conjunction with the installation of a new boat ramp in 2006, demonstrates that the FWPRD recognizes Hurshtown Reservoir's potential as a popular fishing destination for citizens of Fort Wayne and the surrounding area. Consequently, it is recommended that the Division of Fish and Wildlife continue to participate in future fish management activities as necessary.

#### RECOMMENDATIONS

- To develop a successful walleye fishery, the FWPRD should continue annual walleye stockings.
- Because the FWPRD has increased its efforts to promote Hurshtown Reservoir as a public-use fishery, the DFW should continue to remain active in monitoring Hurshtown Reservoir's fish population.

Submitted by: Nathan D. Thomas, Assistant Fisheries Biologist

Date: Oct. 27, 2008

Approved by: Jed Pearson, Fisheries Biologist

Approved by: Stu Shipman, Fisheries Supervisor

Date: Feb. 3, 2009

Table 1. Temperature, oxygen levels, and water clarity (secchi depth) at Hurshtown Reservoir during fish community surveys from 1987-2008.

Depth (ft)	Temperature (F)				Oxygen (ppm)			
	1987	1994	2002	2008	1987	1994	2002	2008
0	75	69	75	74	8.0	11.0	9.1	8.0
5	77	69	71	74	8.0	11.0	9.8	8.0
10	77	69	69	74	8.0	10.0	10.0	8.0
15	76	67	68	74	8.0	10.0	9.8	8.0
20	73	66	65	68	5.0	10.0	9.3	1.5
25	65	62	63	65	3.0	9.0	7.6	0.3
30	60	59	57	60	1.0	7.0	5.6	0.3
Secchi (ft)	7.5	11	9	5				

Table 2. Number and weight of fish collected in surveys at Hurshtown Reservoir.

Species	Number				Pounds			
	1987	1994	2002	2008	1987	1994	2002*	2008*
Black crappie	0	0	9	0	0	0	3.5	0
Bluegill	59	1	18	27	2.3	0	0.2	3.5
Bluntnose minnow	26	4	3	1	0.3	0.1	0	0.1
Brook silverside	1	0	0	0	0	0	0	0
Carp	72	47	129	13	50.8	33.8	155	18.3
Channel catfish	6	4	6	20	11.5	13.1	36.8	19.7
Freshwater drum	0	0	0	1	0	0	0	5.2
Gizzard shad	4	1	26	30	5.3	1.7	22.5	39.8
Green sunfish	1,462	674	152	106	64.4	29.4	8.9	4.2
Hybrid sunfish	86	2	0	0	2.9	0.1	0	0
Logperch	22	3	9	8	0.3	0	0.1	0.1
Pumpkinseed	25	0	0	0	2.1	0	0	0
Rock bass	0	0	7	11	0	0	0.8	1.8
Smallmouth bass	0	106	64	33	0	35.6	32	25.9
Walleye	0	0	1	14	0	0	1.1	7
White crappie	9	4	16	25	2.9	1.1	10.5	6.7
Yellow bullhead	106	40	21	9	14.4	12.4	12.3	3.1
Yellow perch	0	0	11	4	0	0	6.8	1.5
TOTAL	1,878	886	472	302	157.1	127.3	290.6	136.9
EFFORT								
Electrofishing (hrs)	1	0.75	0.75	0.75				
Gill nets	6	6	5	6				
Trap nets	8	8	4	4				

\*estimated from standard length-weight equations.

Table 3. Number, size, and catch per effort (N/15-min) of smallmouth bass collected by electrofishing at Hurshtown Reservoir, 1990-2008.

Inches	1990*	1992*	1994*	2002*	2008
2-3½	0	1	2	8	9
4-5½	10	18	63	12	2
6-7½	91	15	13	16	0
8-9½	32	12	3	4	0
10-11½	0	71	6	10	4
12-13½	0	21	8	5	4
14-15½	0	1	7	6	2
16-17½	0	0	4	3	0
Total	133	139	106	64	21
Effort (min)**	90	90	60	45	45
N/15-min	22.2	23.2	26.5	21.3	7.0

\*Half-inch increments represented by individuals from 0.7 to 0.2 nearest to whole inch (e.g. 2.7 was represented in 3.0 inch group)

\*\*Includes effort conducted during fish survey and targeted sampling

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)
Hurshstown Reservoir	Allen	6/16-6/18/08
Biologist's name	Date of approval (Month, day, year)	
Nate Thomas		

LOCATION		
Quadrangle name	Range	Section
Grabill	13E	13
Township	Nearest town	
32N	Grabill	

### ACCESSIBILITY

State owned public access site	Pprivately owned public access site	Other access site			
		Fort Wayne parks Dept.			
Surface acres	Maximum depth (ft)	Average depth (ft)	Acre feet	Water level (msl)	Extreme fluctuations (ft)
260	30	21	5,524	835	Minimal

### INLETS

Name	Location	Origin
Unnamed	NE Corner	Pumped from St. Joseph River

### OUTLET

Name	Location
Unnamed	SW Corner
Water level control	
Gravity outflow to St Joseph River	

POOL	ELEVATION (Feet MSL)	ACRES	Bottom type
TOP OF DAM	7 to 40 ft high		Boulder <input checked="" type="checkbox"/>
TOP OF FLOOD CONTROL POOL			Gravel <input type="checkbox"/>
TOP OF CONSERVATION POOL			Sand <input type="checkbox"/>
TOP OF MINIMUM POOL			Muck <input type="checkbox"/>
			Clay <input checked="" type="checkbox"/>
			Marl <input type="checkbox"/>
STREAMBED	805 ft		

Watershed use
Emergency reserve water supply for city of Fort Wayne

Development of shoreline
Boat rental, fishing dock, and boat launching ramp are located on the reservoir's east shore along Roth Rd.

Previous surveys and investigations
Fishery surveys, DNR, 1987, 1994 and 2002; Smallmouth bass sampling, DNR, 1990 and 1991.

SAMPLING EFFORT			
ELECTROFISHING	Day hours	Night hours	Total hours
		0.75	0.75
TRAPS	Number of traps	Days	Total lifts
	2	2	4
GILL NETS	Number of nets	Days	Total lifts
	3	2	6

PHYSICAL AND CHEMICAL CHARACTERISTICS	
Color	Turbidity
Murky, blue-green	5 Feet 0 Inches (Secchi disk)

TEMPERATURE, DISSOLVED OXYGEN (ppm), TOTAL ALKALINITY (ppm), pH							
Depth (ft)	Degrees F	Oxygen*		Depth (ft)	Degrees F	Oxygen*	
Surface	74.3	8.0		50			
2	74.3	8.0		52			
4	74.3	8.0		54			
5	74.3	8.0		55			
6	74.3	8.0		56			
8	74.3	7.9		58			
10	74.3	8.0		60			
12	74.3	8.0		62			
14	74.3	8.0		64			
15	74.1	8.0		65			
16	74.1	8.0		66			
18	68.4	6.2		68			
20	68.2	1.5		70			
22				72			
24				74			
25				75			
26				76			
28				78			
30				80			
32				82			
34				84			
35				Sampling date:			
36					Surface	Bottom	
38				pH	8.5	8.5	
40				Alkalinity*	136.8	136.8	
42				Conductivity			
44				TDS			
45							
46							
48							

\*ppm = parts per million

COMMON SPECIES OF AQUATIC PLANTS			
COMMON NAME	SCIENTIFIC NAME	DEPTH (ft)	ABUNDANCE
EMERGENTS			
SUBMERGENTS			
Comments There is virtually no emergent or submergent vegetation in Hurshtown Reservoir.			

<b>Relative Abundance, Size and Estimated Weight of Fish Collected at Hurshtown Reservoir</b>						
Common Name*	Number	Percent	Minimum Length (in)	Maximum Length (in)	Weight (lb)**	Percent
Green sunfish	106	35.1	2.2	6.7	4.2	3.0
Smallmouth bass	33	10.9	2.6	16.1	25.9	18.9
Gizzard shad	30	9.9	14.8	16.9	39.8	29.1
Bluegill	27	8.9	2.0	7.3	3.5	2.5
White crappie	25	8.3	6.4	11.8	6.7	4.9
Channel catfish	20	6.6	10.1	25.0	19.7	14.4
Walleye	14	4.6	10.4	12.4	7.0	5.1
Carp	13	4.3	11.7	19.0	18.3	13.4
Rock bass	11	3.6	2.0	7.4	1.8	1.3
Yellow bullhead	9	3.0	7.1	12.4	3.1	2.3
Logperch	8	2.6	3.7	4.9	0.1	0.1
Yellow perch	4	1.3	3.3	11.4	1.5	1.1
Freshwater drum	1	0.3	21.8	21.8	5.2	3.8
Bluntnose minnow	1	0.3	3.3	3.3	0.1	0.1
Total (14 species)	302				136.9	

\*Common names of fishes recognized by the American Fisheries Society.

\*\*Weights estimated from standard length-weight regression models.

**Number, catch by gear, percentage, estimated weight and age of green sunfish**

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+	
2.0	8			8	7.5	0.01	1							8					
2.5	22			22	20.8	0.01	1	5						4	18				
3.0	22		1	23	21.7	0.02		2	4					8	15				
3.5	24		1	25	23.6	0.03			2	2					13	13			
4.0	9			9	8.5	0.05				4							9		
4.5	7			7	6.6	0.07					4							7	
5.0	4			4	3.8	0.10					2	1						3	1
5.5	2		1	3	2.8	0.13					2	1						2	1
6.0			3	3	2.8	0.18							2						3
6.5			2	2	1.9	0.23							2						2
Totals:	98	0	8	106		4.16	2	7	6	6	8	6	6	12	26	28	22	12	7

Mean length (in): 2.2 2.6 3.2 3.7 4.8 5.9  
 Variance: 0.06 0.05 0.06 0.06 0.16 0.31

**Number, catch by gear, percentage, estimated weight and age of smallmouth 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+			
2.5	3			3	9.1	0.01	3									3					
3.0	5			5	15.2	0.01	5									5					
3.5	1			1	3.0	0.02	1									1					
4.0	1			1	3.0	0.03	1									1					
4.5	1			1	3.0	0.04	1									1					
5.0																					
5.5																					
6.0																					
6.5																					
7.0																					
7.5																					
8.0																					
8.5																					
9.0																					
9.5		1		1	3.0	0.43			1							1					
10.0																					
10.5	1			1	3.0	0.60															
11.0		2		2	6.1	0.69				2							2				
11.5	3			3	9.1	0.80				3							3				
12.0	2	1		3	9.1	0.92				3							3				
12.5		2		2	6.1	1.04				2							2				
13.0	1	1		2	6.1	1.18				2									2		
13.5	1			1	3.0	1.34							1								1
14.0	2	1		3	9.1	1.50				1	2							1	2		
14.5		1		1	3.0	1.68				1								1			
15.0		2		2	6.1	1.87				1	1							1	1		
15.5																					
16.0		1		1	3.0	2.30							1								1
16.5																					
Totals:	21	12	0	33		25.79	11	0	1	10	5	5				11	0	1	10	5	5

Mean length (in): 3.1 --- 9.5 11.8 13.9 14.5

Variance: 0.40 --- --- 0.29 0.80 1.00

Number, catch by gear, percentage, estimated weight and age of walleye																		
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+
10.0			1	1	7.1	0.36		1							1			
10.5		4		4	28.6	0.41		4							4			
11.0		2		2	14.3	0.47		2							2			
11.5		2		2	14.3	0.53		2							2			
12.0		5		5	35.7	0.60		5							5			
Totals:	0	13	1	14		7.03	0	14	0	0	0	0		14				

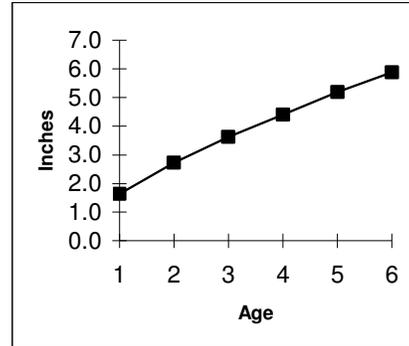
Mean length (in): --- 11.2 --- --- --- ---  
Variance: --- 0.53 --- --- --- ---

Green Sunfish  
Intercept: 0.4 inch

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

Year	Class	Count	I	II	III	IV	V	VI	VII
2007		2	2.0						
	stdev		0.1						
2006		7	1.7	2.6					
	stdev		0.4	0.2					
2005		6	1.7	2.8	3.3				
	stdev		0.2	0.1	0.1				
2004		7	1.6	2.8	3.4	3.9			
	stdev		0.2	0.3	0.2	0.2			
2003		8	1.7	2.8	3.6	4.3	4.9		
	stdev		0.3	0.4	0.5	0.4	0.4		
2002		3	1.4	2.9	4.3	4.9	5.5	5.9	
	stdev		0.2	0.0	0.5	0.5	0.6	0.7	
2001		3	1.6	2.4	3.6	4.5	5.3	5.9	6.4
	stdev		0.1	0.3	0.4	0.2	0.1	0.1	0.3
Mean*			1.6	2.7	3.6	4.4	5.2	5.9	6.4
SD			0.2	0.2	0.3	0.3	0.4	0.4	0.3
Count			36.0	34.0	27.0	21.0	14.0	6.0	3

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

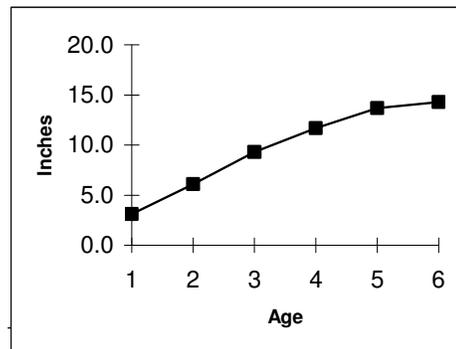


Smallmouth bass  
Intercept: 0.8 inch

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

Year	Class	Count	I	II	III	IV	V	VI
2007		11	3.0					
	stdev		0.6					
2006		0						
	stdev		--	--	--			
2005		1	3.4	6.6	9.7			
	stdev		--	--	--			
2004		10	3.1	5.7	9.0	11.6		
	stdev		0.4	0.4	0.9	0.6		
2003		5	3.1	5.9	9.3	12.2	13.8	
	stdev		0.4	1.1	1.6	1.2	0.8	
2002		4	3.4	6.8	9.6	11.4	13.5	14.3
	stdev		0.9	0.9	1.0	1.5	0.8	0.6
Mean*			3.1	6.1	9.3	11.7	13.7	14.3
SD			0.6	0.8	1.2	1.1	0.8	0.6
Count			30	19	19	14	9	4

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



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