

SUMMIT LAKE WALLEYE STOCKING EVALUATION

Henry County

2004, 2005, and 2007 Fish Management Report

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## EXECUTIVE SUMMARY

- Summit Lake is located within Summit Lake State Park about 4 miles north of New Castle, Indiana. Summit Lake covers approximately 835 acres when at full pool. However, due to the small watershed of the lake, it typically is closer to around 700 acres.
- Summit Lake was initially stocked with nearly 2 million walleye fry in 1999 in an attempt to reduce an overabundant yellow perch population.
- A fall evaluation of walleye stocking success was conducted October 12 to 14, 2004. A total of 45 walleye was collected that weighed 43.54 lbs. The electrofishing CPUE of YOY walleye was 2.0/h. The catch rates for age-1 walleye were 3.3/h of electrofishing and 1.4/gill net lift.
- A fall evaluation of walleye stocking success was conducted October 4 to 11, 2005. Twenty-six walleye weighing 11.56 lbs were collected. Walleye up to 16.8 in were collected and the average length was 10.8 in. The electrofishing CPUE of YOY walleye was 5.3/h.
- A fall evaluation of walleye stocking success was conducted October 15 to 17, 2007. There were 55 walleye collected that weighed 49.54 lbs. They ranged in length from 9.2 to 19.0 in and averaged 14.2 in. The electrofishing CPUE of YOY walleye was 1.7/h. Age-1 walleye catch rates were 1.0/h of electrofishing and 4.7/gill net lift.
- The annual stocking of 100 walleye fingerlings/acre (70,000) should continue in order to help sustain a balance between predators and prey.
- A fall evaluation should be conducted in 2010 to assess the stocking success and survival and growth of older walleye.

## TABLE OF CONTENTS

	Page
INTRODUCTION .....	1
METHODS .....	1
2004 Fall Walleye Evaluation.....	1
2005 Fall Walleye Evaluation.....	1
2007 Fall Walleye Evaluation.....	1
RESULTS .....	2
2004 Fall Walleye Evaluation.....	2
2005 Fall Walleye Evaluation.....	2
2007 Fall Walleye Evaluation.....	2
DISCUSSION .....	3
RECOMMENDATIONS .....	4
LITERATURE CITED .....	4
APPENDIX.....	5

## INTRODUCTION

Summit Lake is located within Summit Lake State Park about 4 miles north of New Castle, Indiana. Summit Lake covers approximately 835 acres when at full pool. However, due to the small watershed of the lake, it typically is closer to around 700 acres. The surrounding vegetated park property helps maintain good water quality and clarity.

Summit Lake was initially stocked with nearly 2 million walleye fry in 1999 in an attempt to reduce an overabundant yellow perch population. The initial stocking appeared to be unsuccessful as no YOY walleye were collected. Since 2000, fingerling walleye have been stocked instead of fry. The Division of Fish and Wildlife's (DFW) stocking goal of 70,000 fingerling walleye has been reached in most years since 2000 (Table 1). Fall evaluations were conducted in 2004, 2005, and 2007 to assess the success of the stockings.

## METHODS

### 2004 Fall Walleye Evaluation

A fall evaluation was conducted October 12 to 14, 2004. Fish collection effort consisted of 3 h of DC night electrofishing and 10 standard gill net lifts. Walleye were measured to the nearest 0.1 in TL and weighed to the nearest 0.01 lb. Scale samples were collected for age and growth determination.

### 2005 Fall Walleye Evaluation

A fall evaluation was conducted October 4 to 11, 2005. Fish collection effort was 3 h of night DC electrofishing. No gill nets were used for the 2005 evaluation. Walleye were measured to the nearest 0.1 in TL and weighed to the nearest 0.01 lb. Scale samples were collected for age and growth determination.

### 2007 Fall Walleye Evaluation

A fall evaluation was conducted October 15 to 17, 2007. Fish collection effort was 3 h of night DC electrofishing and 10 standard gill net lifts. Walleye were measured to the nearest 0.1 in TL and weighed to the nearest 0.01 lb. Scale samples and otoliths were collected for age and growth determination.

## RESULTS

### 2004 Fall Walleye Evaluation

A total of 45 walleye was collected that weighed 43.54 lbs. Walleye ranged in length from 9.0 to 23.9 in and averaged 13.8 in. Walleye CPUE was 6.3/h of electrofishing and 2.6/gill net lift. Overall, 33% of the walleye were 14 in or larger.

There were 6 YOY walleye collected via electrofishing and 2 YOY collected via gill net. YOY walleye ranged in length from 9.0 to 10.3 in and averaged 9.7 in. The electrofishing CPUE of YOY walleye was 2.0/h.

Twenty-four age-1 walleye were collected that averaged 13.0 in. The catch rates for age-1 walleye were 3.3/h of electrofishing and 1.4/gill net lift. Only three age-2 walleye were collected with the largest being 16.5 in. There were seven age-3 walleye collected that ranged in length from 15.6 to 18.7 in. Three walleye were age-4, of which the largest was 23.9 in.

### 2005 Fall Walleye Evaluation

Twenty-six walleye weighing 11.56 lbs were collected. Walleye up to 16.8 in were collected and the average length was 10.8 in. Walleye electrofishing CPUE was 8.7/h.

There were 16 YOY walleye collected that ranged in length from 7.8 to 9.6 in and averaged 8.6 in. The electrofishing CPUE of YOY walleye was 5.3/h. There were five age-1 walleye collected that averaged 13.0 in, of which the largest was 13.8 in. The remaining five walleye collected were age-2 and were found up to 16.8 in.

### 2007 Fall Walleye Evaluation

There were 55 walleye collected that weighed 49.54 lbs. They ranged in length from 9.2 to 19.0 in and averaged 14.2 in. Walleye CPUE was 8.7/h of electrofishing and 2.9/gill net lift. Overall, 62% of walleye collected were 14 in or larger.

Seven YOY walleye were collected. YOY walleye ranged in length from 9.2 to 10.4 in and averaged 9.9 in. The electrofishing CPUE of YOY walleye was 1.7/h.

There were 15 age-1 walleye collected that ranged in length from 12.4 to 14.3 in and averaged 13.3 in. Age-1 walleye catch rates were 1.0/h of electrofishing and 4.7/gill net lift. Seventeen age-2 walleye were collected, of which the largest was 16.0 in. The remaining 15 walleye collected were age-3 and were found up to 19.0 in.

## DISCUSSION

The DFW criteria for walleye stocking success is the collection of at least seven YOY walleye/h of electrofishing. The 2004, 2005, and 2007 walleye stockings were all unsuccessful with YOY catch rates of 2.0, 5.3, and 1.7/h, respectively. The success criteria has been met only once (10.0/h in 2003) since walleye were introduced at Summit Lake.

Age-1 and older walleye were well represented in the 2004 and 2007 walleye evaluations. No gill nets were deployed in 2005 which likely led to the low catch rate of age-1 and older walleye.

Cagle's Mill Reservoir, an established walleye fishery, had an average age-1 gill net catch rate from 1990 to 2006 of 3.3/lift (Smyth 2008). The 2007 Summit Lake age-1 walleye gill net catch rate was 4.7/lift, surpassing the Cagle's Mill age-1 catch rate, an established walleye fishery within the district. Also, an angler creel survey conducted in 2003 indicated the walleye fishery had developed better than expected and nearly met two of the three DFW success criteria for a successful walleye fishery (Wisener 2004).

The walleye fishery at Summit Lake continues to be a mystery. Fall evaluations indicate poor YOY walleye survival, yet age-1 catch rates, creel surveys, and reports from anglers indicate otherwise. The predatory pressure on yellow perch and panfish has certainly increased since walleye were introduced. A 2005 standard survey found nearly a third of the yellow perch collected were at least 8 in and growth had improved from the 2002 survey (Wisener In press). Quality size redear sunfish and bluegill were also found in 2005, indicating predators were keeping their numbers in balance.

Unfortunately, production of walleye fingerlings at DFW hatcheries was low and no walleye were stocked at Summit Lake in 2008. Since indications are there to suggest a successful walleye fishery has nearly been established and the predator/prey balance has improved, walleye fingerlings should continue to be stocked at Summit Lake on an annual basis. The next stocking of 70,000 (100/acre) fingerlings is slated for the spring of 2009. A fall evaluation should be conducted in 2010 to assess the stocking success and survival and growth of older walleye.

## RECOMMENDATIONS

- The annual stocking of 100 walleye fingerlings/acre (70,000) should continue in order to help sustain a balance between predators and prey.
- A fall evaluation should be conducted in 2010 to assess the stocking success and survival and growth of older walleye.

## LITERATURE CITED

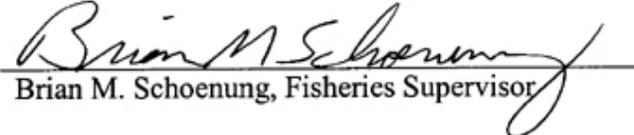
Smyth, J.L. 2008. Cagle's Mill Reservoir 2006 Supplemental Walleye Stocking Evaluation. Indiana Department of Natural Resources. Indianapolis, Indiana. 6pp.

Wisener, J.R. 2004. Evaluation of Angler Harvest and Walleye Stockings at Summit Lake, 2003 Fish Management Report. Indiana Department of Natural Resources. Indianapolis, Indiana. 18pp.

Wisener, J.R. In press. Evaluation of the Fish Community and Angler Harvest at Summit Lake, 2005 Fish Management Report. Indiana Department of Natural Resources. Indianapolis, Indiana.

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Date: December 31, 2008

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Date: March 16, 2009

**NUMBER, PERCENTAGE, WEIGHT, AND AGE OF WALLEYE (2004)**

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	1	2.2	2.56	4
3.0					21.0				
3.5					21.5	1	2.2	3.27	4
4.0					22.0				
4.5					22.5				
5.0					23.0				
5.5					23.5	1	2.2	4.45	4
6.0					24.0				
6.5					24.5				
7.0					25.0				
7.5					25.5				
8.0					26.0				
8.5					TOTAL	45			
9.0	2	4.4	0.24	0					
9.5	5	11.1	0.31	0					
10.0	1	2.2	0.37	0					
10.5									
11.0									
11.5	2	4.4	0.50	1					
12.0	2	4.4	0.58	1					
12.5	9	20.0	0.63	1					
13.0	7	15.6	0.68	1					
13.5	2	4.4	0.77	1					
14.0	1	2.2	0.85	1					
14.5	1	2.2	1.03	1					
15.0	1	2.2	1.02	2					
15.5	2	4.4	1.17	3					
16.0	1	2.2	1.33	2					
16.5	3	6.7	1.54	2,3					
17.0									
17.5	2	4.4	1.75	3					
18.0									
18.5	1	2.2	2.08	3					

ELECTROFISHING CATCH	6.3 / h	GILL NET CATCH	2.6 / lift	TRAP NET CATCH	NA
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**NUMBER, PERCENTAGE, WEIGHT, AND AGE OF WALLEYE (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				
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					24.0				
6.5					24.5				
7.0					25.0				
7.5	3	11.5	0.13	0	25.5				
8.0	4	15.4	0.16	0	26.0				
8.5	4	15.4	0.19	0	TOTAL	26			
9.0	4	15.4	0.23	0					
9.5	1	3.8	0.27	0					
10.0									
10.5									
11.0									
11.5									
12.0	1	3.8	0.54	1					
12.5	2	7.7	0.53	1					
13.0									
13.5	3	11.5	0.74	1,2					
14.0									
14.5	1	3.8	0.95	2					
15.0									
15.5									
16.0									
16.5	3	11.5	1.26	2					
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	8.7 / h	GILL NET CATCH	NA	TRAP NET CATCH	NA
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**NUMBER, PERCENTAGE, WEIGHT, AND AGE OF WALLEYE (2007)**

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	1.8	1.95	3
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					24.0				
6.5					24.5				
7.0					25.0				
7.5					25.5				
8.0					26.0				
8.5					TOTAL	55			
9.0	1	1.8	0.24	0					
9.5	3	5.5	0.25	0					
10.0	3	5.5	0.31	0					
10.5									
11.0									
11.5									
12.0	1	1.8	0.54	1					
12.5	4	7.3	0.65	1					
13.0	4	7.3	0.70	1					
13.5	5	9.1	0.75	1,2					
14.0	4	7.3	0.88	1,2					
14.5	8	14.5	0.95	2					
15.0	8	14.5	1.05	2,3					
15.5	6	10.9	1.11	2,3					
16.0	4	7.3	1.18	2,3					
16.5									
17.0	1	1.8	1.64	3					
17.5	1	1.8	1.72	3					
18.0	1	1.8	1.71	Not Aged					
18.5									

ELECTROFISHING CATCH	8.7 / h	GILL NET CATCH	2.9 / lift	TRAP NET CATCH	NA
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Walleye Age-length Key (2004)

Length group (in)	Total #	Sub-sample	Age														
			1	2	3	4	5	6	7	8	9	10	11	12	13		
1.0																	
1.5																	
2.0																	
2.5																	
3.0																	
3.5																	
4.0																	
4.5																	
5.0																	
5.5																	
6.0																	
6.5																	
7.0																	
7.5																	
8.0																	
8.5																	
9.0	2	0															
9.5	5	1															
10.0	1	1															
10.5																	
11.0																	
11.5	2	2	2														
12.0	2	2	2														
12.5	9	7	9														
13.0	7	4	7														
13.5	2	2	2														
14.0	1	1	1														
14.5	1	1	1														
15.0	1	1		1													
15.5	2	2			2												
16.0	1	1		1													
16.5	3	3		1	2												
17.0																	
17.5	2	2			2												
18.0																	
18.5	1	1			1												
19.0																	
19.5																	
20.0																	
20.5	1	1				1											
21.0																	
21.5	1	1				1											
22.0																	
22.5																	
23.0																	
23.5	1	1				1											
24.0																	
<b>Total</b>	<b>45</b>	<b>34</b>	<b>24</b>	<b>3</b>	<b>7</b>	<b>3</b>	<b>0</b>										

Walleye Age-length Key (2005)

Length group (in)	Total #	Sub-sample	Age													
			1	2	3	4	5	6	7	8	9	10	11	12	13	
1.0																
1.5																
2.0																
2.5																
3.0																
3.5																
4.0																
4.5																
5.0																
5.5																
6.0																
6.5																
7.0																
7.5	3	0														
8.0	4	0														
8.5	4	0														
9.0	4	0														
9.5	1	0														
10.0																
10.5																
11.0																
11.5																
12.0	1	1	1													
12.5	2	2	2													
13.0																
13.5	3	2	2	1												
14.0																
14.5	1	1		1												
15.0																
15.5																
16.0																
16.5	3	3		3												
17.0																
Total	26	9	5	5	0	0	0	0	0	0	0	0	0	0	0	0

Walleye Age-length Key (2007)

Length group (in)	Total #	Sub-sample	Age														
			1	2	3	4	5	6	7	8	9	10	11	12	13		
1.0																	
1.5																	
2.0																	
2.5																	
3.0																	
3.5																	
4.0																	
4.5																	
5.0																	
5.5																	
6.0																	
6.5																	
7.0																	
7.5																	
8.0																	
8.5																	
9.0	1	0															
9.5	3	0															
10.0	3	0															
10.5																	
11.0																	
11.5																	
12.0	1	1	1														
12.5	4	4	4														
13.0	4	4	4														
13.5	5	5	4	1													
14.0	4	4	2	2													
14.5	8	7		8													
15.0	8	7		3	5												
15.5	6	6		2	4												
16.0	4	4		1	3												
16.5																	
17.0	1	1			1												
17.5	1	1			1												
18.0	1	0															
18.5																	
19.0	1	1			1												
19.5																	
Total	55	45	15	17	15	0	0	0	0	0	0	0	0	0	0	0	0

Mean length at Capture

**Walleye (2004)**

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	24	13.0	0.48	0.14	12.7	13.3
2	3	16.1	0.58	0.44	15.2	17.0
3	7	17.0	1.24	0.42	16.2	17.9
4	3	22.1	2.33	0.88	20.3	23.8

**Walleye (2005)**

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	5	13.0	0.44	0.31	12.3	13.6
2	5	15.7	2.18	0.63	14.3	16.8

**Walleye (2007)**

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	15	13.3	0.35	0.15	13.0	13.6
2	17	14.9	0.37	0.14	14.6	15.2
3	15	16.2	1.31	0.30	15.6	16.8

Table 1. Walleye stockings at Summit Lake from 1999 to 2008.

Year	Number	Size	% of recommended stocking	YOY CPUE
1999	1,963,425	Fry	93	0.0
2000	70,000	Fingerling	100	1.8
2001	70,000	Fingerling	100	2.3
	382	13.5 in average	N/A	N/A
	50	8.0 in average	N/A	N/A
2002	57,274	Fingerling	82	1.7
2003	67,805	Fingerling	97	10.0
2004	70,000	Fingerling	100	2.0
2005	70,428	Fingerling	101	5.3
2006	55,811	Fingerling	80	No fall evaluation
2007	70,000	Fingerling	100	1.7
2008	***** No Stocking *****			