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SUBJECT: 2011 Bullhead Lake, Manitowoc County Survey Report

Bullhead Lake is a seepage lake located in western Manitowoc County. The lake has a surface area of 67 acres, a maximum depth of 40 feet and a shoreline development factor of 1.07. The lake has one basin with an adjoining cattail wetland. The lake bottom consists of muck, sand and gravel and the water is considered hard. Bullhead Lake is surrounded by agricultural land with an increasing number of year round residences being built. A public boat launch is present on the western side of the lake. Past lake management actions have included a toxaphene treatment in 1957 to remove the fish population and alum treatments in 1978 and 1988 to reduce water column phosphorus.

Traditionally, Bullhead Lake has been managed as a bass-panfish lake with additional stockings of muskellunge (1980's) and walleye (1990's- to present) to increase angling opportunities. Results from the last two surveys in 1999 (Surendonk and Hogler 2003) and 2005 (Hogler and Surendonk 2005) found that Bullhead Lake continued to be a largemouth bass and bluegill lake. Those surveys indicated that a good mix of gamefish and panfish were in the lake. Largemouth bass were found to be abundant, while northern pike and walleye numbers were low. The bluegill population was judged healthy, but other panfish species such as black crappie and yellow perch were low in abundance. Forage minnows were found to be low in number. A creel survey that was conducted with the 1999 survey found that sport anglers were using the lake at a rate of 190 hours per acre with most anglers targeting bluegill and largemouth bass. Very few individuals were found to be targeting other species.

2011 Survey

On the night of June 1, 2011, the entire 1.19 mile shoreline of Bullhead Lake was electroshocked to assess the fish community. During the survey all fish were netted, identified and measured except for common carp which were counted. A subsample of largemouth bass and bluegill had scales removed for age analysis.

Results

148 individual fish representing seven species were captured during the 67 minutes of shocking (Table 1). Overall, catch per effort (CPE) was 132.1 fish per hour or 124.4 per mile. Largemouth bass and bluegill dominated the catch with substantially fewer individuals of other species captured.

Table 1. The catch data from the electroshocking survey of Bullhead Lake on June 1, 2011. All lengths are in millimeters.

Species	Number	Average Length	Size Range	CPE (Fish/Hour)	CPE (Fish/Mile)
Largemouth Bass	113	303 mm	106-446 mm	100.9	95.0
Northern Pike	3	469 mm	293-620 mm	2.7	2.5
Bluegill	21	145 mm	65-238 mm	18.8	17.6
Yellow Perch	4	175 mm	147-241 mm	3.6	3.4
Black Crappie	2	256 mm	222-290 mm	1.8	1.7
Black Bullhead	3	298 mm	281-311 mm	2.7	2.5
Common Carp	2	--	--	1.8	1.7
Total	148			132.1	124.4

The 113 largemouth bass that we captured averaged 303 mm in length and were caught with a CPE of 100.9 bass per hour shocked (Table 1). Only 2.7% of the bass we captured had a length greater than the 356 mm (14") minimum size limit (Table 2). Most (87.6%) of the bass captured were between 254 mm and 356 mm (10" to 14").

Table 2. The length and age distribution of largemouth bass captured during the June 2011 electroshocking survey of Bullhead Lake. All lengths are in millimeters. The single 446 mm bass was not aged because of regenerated scales.

Length (mm)	Number	Age					
		1	2	3	4	5	6
100	1	1					
110							
120	1	1					
130	1	1					
140							
150							
160							
170	1		1				
180	1		1				
190							
200							
210							
220	1		1				
230	2		2				
240	1		1				
250	4		4				
260	8		8				
270	7		4	3			
280	2			2			
290	7			7			
300	17		1	15	1		
310	20				15	5	
320	15				10	4	1
330	13				9	3	1
340	8				1	5	2
350							
360	2					2	
370							
380							
390							
400							
410							
420							
430							
440	1						
450							
Total	113	3	23	27	36	19	4
Ave. Length	303	121	177	260	313	337	338
S.D.	42.9	15.5	9.9	16.9	15.5	29.4	9.9

Analyses of scales indicated that age 1 through 6 were present in our sample (Table 2). Age 4 was the most common age followed by age 3 and age 2 bass. Few young (age 2 and younger) or old (greater than age 5) were sampled. Growth as measured at average length at age for largemouth bass in Bullhead lake appears to be above state averages for age 1 through age 4 bass and at or slightly less than state averages for older fish (Table 3). Length at age for bass in Bullhead Lake across the last three surveys appears to be stable.

Table 3. Age at length for largemouth bass and bluegill for Bullhead Lake. The top line is from the 2011 survey, the second line the 2005 survey, the third line from the 1999 survey and the bottom number in () is the statewide average length. All lengths are in millimeters.

Species	Year	Age							
		1	2	3	4	5	6	7	8
Largemouth bass	2011	121	177	260	313	337	338		
	2005	94	155	228	288	329	380	--	--
	1999	79	154	217	279	323	376	406	463
	(state average)	(97)	(165)	(229)	(290)	(338)	(384)	(414)	(447)
Bluegill	2011	65	105	141	211				
	2005	50	110	139	158	193	205	--	--
	1999	43	74	100	129	155	168	182	192
	(state average)	(64)	(97)	(122)	(147)	(167)	(183)	(196)	(208)

The three northern pike that we captured ranged in length from 293 mm to 290 mm and had an average length of 469 mm (Table 1).

During electroshocking, we captured 21 bluegill that averaged 145 mm in length with a CPE of 18.8 per hour (Table 1). Bluegill were small in size with only 38.1% greater than 150 mm (6") in length and 23.8% greater than 200 mm (8") in length (Table 4). Ages 1 through 4 were present in the collected scale samples (Table 5). Ages 2 through 4 were the most common ages followed by age 1 bluegill (Table 5). Length at age was above statewide averages for all aged bluegill (Table 3). For age 1 through age 3, bluegill growth was similar to 2005 growth rates. However, the age 4 bluegill was much greater than what was measured in 2005. This result should be viewed cautiously because of the small number of bluegill aged in 2011.

Other panfish species were captured during shocking in low number and included yellow perch and black crappie. They had average lengths of 175 mm and 256 mm respectively (Table 4). The three black bullhead captured during this survey averaged 298 mm in length (Table 4).

Table 4. The length frequency of panfish and bullhead captured during electroshocking on Bullhead Lake, June 1, 2011.

Length (mm)	Bluegill	Black Crappie	Yellow Perch	Black Bullhead
60	1			
70				
80				
90	1			
100	4			
110	4			
120	1			
130	2			
140			1	
150			2	
160	1			
170				
180	1			
190	1			
200	2			
210	2			
220		1		
230	1			
240			1	
250				
260				
270				
280				1
290		1		
300				1
310				1
320				
Total	21	2	4	3
Ave. Length	145	256	175	298
S.D.	50.5	48.1	44.1	14.8

Table 5. The length and age distribution of bluegill captured during Jun 2011 electroshocking on Bullhead Lake.

Length (mm)	Number	Age			
		1	2	3	4
60	1	1			
70					
80					
90	1		1		
100	4		4		
110	4		2	2	
120	1			1	
130	2			2	
140					
150					
160	1			1	
170					
180	1				1
190	1			1	
200	2				2
210	2				2
220					
230	1				1
240					
Total	21	1	7	7	6
Ave. Length	145	65	105	141	211
S.D.	50.5	--	7.2	28.1	18.7

Discussion

When the results from the 2011 survey are compared to the results from the two previous surveys, it appears that the current fish community of Bullhead Lake is very similar to those measured in previous surveys. The fish community of Bullhead Lake continues to be dominated by largemouth bass and bluegill, although panfish numbers measured in 2011 appear to be lower than in earlier surveys.

Captured largemouth bass in 2011 were similar in abundance and size to those captured in previous surveys. Growth continues to improve for younger age bass but slows to near statewide average growth in older fish. Few bass achieve legal size in Bullhead Lake and those that do are likely quickly harvested by anglers.

Northern pike and walleye remain low in abundance. Pike reproduction appears to be very low and inconsistent with few individuals recruited to the population on a yearly basis. Survival of stocked walleye also is low. It appears that few walleye survive long enough to be legally caught by anglers fishing Bullhead Lake.

Panfish abundance, mainly bluegill abundance, was much lower than measured in 2005 and continues the trend of decreasing panfish abundance noted since 1999. The size and age distribution of bluegill in 2011 were similar to those bluegill captured in previous surveys. Similar to bluegill, yellow perch and black crappie decreased in abundance while being similar in size sizes to those captured in previous surveys.

Common carp were captured for the second consecutive survey in Bullhead Lake after many years of absence following the toxaphene treatment. In 2005, we captured a single carp and in 2011 we caught two carp. All three carp were removed from the lake.

A comprehensive fish survey of Bullhead Lake may be required to determine if (1) changes in bass regulation are needed to improve the size structure of the population, (2) walleye stocking should be halted and (3) the status of the panfish population.

REFERENCES:

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