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TO: English Lake File

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SUBJECT: Spring 2014 Electrofishing Survey of English Lake

Background of English Lake:

English Lake is a 51 acre lake located seven miles southwest of the City of Manitowoc that experiences heavy boating and moderate angling activity. It is a seepage lake with a maximum depth of 80 feet. Its water is clear and hard, and the lake bed is mostly muck with scattered gravel deposits. Much of the English Lake shoreline is developed with cottages and year-round residences.

Fish Survey History:

The fishery of English Lake has undergone substantial changes in the past sixty years as documented by past surveys (Hogler and Surendonk 2006). Surveys in the 1940's found that Bluegill were the dominant panfish species and that they exhibited excellent growth. Walleye were the dominant gamefish, and they grew at near the statewide average rate. Surveys conducted in the late 1950's found fair to good numbers of Northern Pike and Largemouth Bass, but fair to poor numbers of Walleye. Electrofishing surveys in the 1960's found good numbers of Walleye, but low numbers of bass, Bluegill and crappie. By the 1970's small, slow growing Black Crappie dominated the fishery. During 1977, fyke nets were used to thin the populations of Black Crappie and Black Bullhead found in the lake. Surveys conducted in the 1980's found that Largemouth Bass and Walleye were the most common gamefish and despite removal efforts, Black Crappie once dominated the panfish catch. In 1995, a comprehensive fish survey was conducted to assess the fish populations of the lake. Largemouth Bass were found to be the dominant predator. Northern Pike and Walleye were also captured during surveys but in low numbers. Black Crappie were the dominant panfish caught during this survey and they were small in size. Bluegill and Yellow Perch were also captured but in substantially lower numbers. The last survey of the lake was a spring electroshocking survey in 2006 during which Largemouth Bass and Bluegill dominated the catch.

2014 Survey Results:

The entire 1.13 mile shoreline of English Lake was electroshocked in 45 minutes on the night of June 3 using pulsed DC current. An attempt to net all fish was made and all captured fish were measured to the nearest 1 mm. Scales were collected from bluegill and a dorsal spine was collected from Largemouth Bass at the rate of 10 per centimeter group for age analysis.

During the 45 minutes of shocking, 235 individual fish representing seven species were captured (Table 1). Total CPE was 312.6 fish per hour shocked or 207.9 per mile shocked. Largemouth Bass and Bluegill dominated the catch with substantially fewer individuals of other species captured. CPE for Largemouth Bass CPE was 143.2/hour or 94.7/mile shocked. Bluegill, the second most abundant species, had a CPE of 139.7 per hour or 92.9 per mile shocked.

Table 1. The species captured and Catch per Effort (CPE) for fish captured by electroshocking on June 2, 2014 from English Lake.

Species	Number Caught	CPE (Fish/Hr)	CPE (Fish/Mile)
Northern Pike	2	2.7	1.8
Rock Bass	2	2.7	1.8
Green Sunfish	1	1.3	0.9
Bluegill	105	139.7	92.9
Largemouth Bass	107	142.3	94.7
Black Crappie	10	13.3	8.8
Yellow Perch	8	10.6	7.1
Total	235	312.6	207.9

Gamefish

Largemouth Bass were the dominant gamefish captured. The 107 captured Largemouth Bass ranged in length from 120 mm to 521 mm and had an average length of 284 mm (Table 2). Seventeen bass (16.0%) were greater than the 356 mm (14") minimum size limit and two bass (1.9%) were greater than 457 mm (18") in length.

When spine samples were examined to estimate age, age classes from age 1 through age 11 were detected in our collected sample (Table 3). Age 3 were the most common age class in our aged sample followed by age 2 and age 4 Largemouth Bass. In English Lake based on our age sample, it takes a Largemouth Bass seven years to reach the 356 mm (14") minimum size limit at which an angler could harvest a bass.

The growth of Largemouth Bass in English Lake appears to be average. Based on our sample, bass show above average length at each age through age 5 but growth does appear to slow after age 5 possibly because of forage limitations (Table 4) However, length at age for bass greater than age 6 should be viewed cautiously because of small sample sizes.

During this survey we also caught two Northern Pike that ranged in size from 462 mm to 477 mm. No Walleye were captured or observed during the 45 minutes of electroshocking.

Table 2. Length frequency of captured fish from English Lake caught during electroshocking on the night of June 2, 2014.

Length (mm)	Northern Pike	Largemouth Bass	Bluegill	Black Crappie	Yellow Perch	Green Sunfish	Rock Bass
50							
60			2				
70			8				
80			25			1	
90			16				
100			19	2	1		
110			9		2		
120		3	3	2	3		
130		1	3				
140		1	2				
150		1	1				
160		2	5	1	1		
170		1	4	2			
180			3	2			
190				1	1		1
200		3	3				
210		5	2				1
220		4					
230		9					
240		8					
250		11					
260		5					
270		2					
280							
290		3					
300		2					
310		8					
320		5					
330		6					
340		8					
350		2					
360		6					
370		3					
380		2					
390		1					
400							
410		2					
420		1					
430							
440							
450							
460	1						
470	1	1					
480							
490							
500							
510							
520		1					
530							
540							
550							
Total	2	107	105	10	8	1	2
Average	470	284	111	152	132	83	200
S.D.	10.6	74.2	36.9	34.9	28.9	--	14.1

Table 3. The age distribution of Largemouth Bass captured from English Lake in 2014 during June electroshocking.

Length (mm)	Number	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11
120	3	3										
130	1	1										
140	1	1										
150	1		1									
160	2		2									
170	1		1									
180												
190												
200	3		2	1								
210	5		2	3								
220	4		3	1								
230	9		1	7		1						
240	8		1	7								
250	11			11								
260	5			5								
270	2			2								
280												
290	3				2		1					
300	2				2							
310	8				6	1	1					
320	5				3	1	1	1				
330	6					3	1		1			
340	8					2	3	1		1		1
350	2						1					1
360	6						2	1		2	1	
370	3								2	1		
380	2									1	1	
390	1							1				
400												
410	2								2			
420	1								1			
430												
440												
450												
460												
470	1									1		
480												
490												
500												
510												
520	1									1		
Total	107	5	13	37	13	8	10	4	6	7	2	2
Average	284	130	204	246	311	321	339	357	388	403	372	348
S.D.	74.2	10.6	25.9	16.1	10.2	37.9	21.8	30.2	32.9	66.3	11.3	4.9

Table 4. The average length at age for Largemouth Bass and Bluegill captured in English Lake during spring electroshocking in 2014 and 2006 as compared to statewide average length at age for each species.

Species	Survey Year	Age							
		1	2	3	4	5	6	7	8
Largemouth Bass	2014	130	204	246	311	321	339	357	388
	2006	91	147	195	269	323	380	400	400
	State Average	97	165	229	290	338	383	414	447
Bluegill	2014	72	102	120	171	196	207	172	
	2006	87	128	160	180	--	--	--	
	State Average	64	97	122	147	167	183	196	

Panfish

Bluegill were the most common panfish captured during this survey. The 105 captured Bluegill ranged in length from 65 mm to 218 mm and had an average length of 111 mm (Table 2). Seventeen (16.2 %) of the captured Bluegill were greater than 150 mm in length and five (4.8%) were greater than 200 mm in length.

When collected scale samples were aged, age 1 through age 7 were detected in the sample (Table 5). Age 2 was the most common age class followed by age 4 and age 3 Bluegill. Few Bluegill older than age 4 were identified in our sample.

When compared to statewide length at age averages, Bluegill in English Lake were longer at each age than an average bluegill from other lakes in Wisconsin (Table 4).

Table 5. The age distribution of Bluegill captured from English Lake during June electroshocking.

Length (mm)	Number	Age 1	Age 2	Age3	Age 4	Age 5	Age 6	Age 7
50								
60	2	2						
70	8	8						
80	25		19	6				
90	16		11	5				
100	19		19					
110	9		6	3				
120	3		1	2				
130	3			2	1			
140	2			1	1			
150	1				1			
160	5			1	4			
170	4				3			1
180	3				1	2		
190								
200	3				1		2	
210	2				1	1		
220								
230								
240								
250								
Total	105	10	18	12	13	3	2	1
Average	111	72	102	120	171	196	207	172
S.D.	36.9	3.4	12.7	21.9	20.9	16.3	3.5	--

Other captured panfish included Black Crappie, Yellow Perch, Rock Bass and Green Sunfish in decreasing abundance. The average lengths of these fish were 152 mm, 132 mm, 200 mm and 83 mm, respectively.

Discussion and Conclusions:

Gamefish

Since the 1995-1996 survey, Largemouth Bass have been the dominant gamefish captured during surveys. It appears that over the past twenty years, Largemouth Bass have established dominance over other gamefish in lake through stable recruitment and possibly decreasing fishing mortality. We have noted that in surveys conducted in 2006 and 2014, the number of bass greater than 357 mm (14") minimum size limit has been increasing. It is likely catch and release and the 14" minimum size limit have increased the average size of bass in English Lake.

Average lengths at age of bass in 2014 were greater than those noted in the 2006 and state averages through age 4, but from age 5 and older, lengths were less than measured in 2006 and state averages (Table 4). With more bass protected by the 14" size limit, the increased predation pressure on limited forage may be causing growth to slow. The Largemouth Bass population should be monitored to see if current population trends continue.

Northern Pike continue to be present in the lake but in low numbers. This trend is similar to what was seen in 2006. Despite alternate year Walleye stocking, no Walleye were seen or captured in 2014. Poor survival of stocked Walleye and limited spawning habitat will always limit their population in English Lake. If future walleye stocking occurs then larger fingerlings should be planted in an attempt to improve survival.

Panfish

Overall panfish numbers were down from the previous two surveys based the numbers caught. In 2014, Bluegill dominated the panfish catch. Other panfish captured in this survey included Black Crappie, Rock Bass, Yellow Perch but in numbers lower than observed in previous surveys. Most captured Bluegill in were small in size, less than 5 years of age and exhibited better than average growth. It is likely that predation by gamefish has reduced small Bluegill abundance and anglers have harvested larger Bluegill reducing the number of Bluegill in the lake. Declining panfish numbers have resulted in improved growth rates in Bluegill and likely other panfish as well because of reduced competition for food resources. Because English Lake has a small littoral area that limits the reproduction of Bluegill and other panfish, DNR should monitor panfish numbers to determine if predation or harvest is too great to maintain a healthy panfish population.

Clearly, there is marked difference between surveys conducted in the 1970's and the present. Earlier surveys found a lake that was dominated by slow growing overabundant panfish, chiefly black crappie. Major predators in the lake were Walleye and Northern Pike with Largemouth bass infrequently collected. Black Bullhead were also abundant in the system. This survey and the two previous surveys have documented a shift in the primary predator from Walleye to Largemouth Bass and panfish which were overabundant and slow growing are now much lower in number and exhibiting good growth.

Hogler, S.R. and S. Surendonk. 2007. The Fall 2006 English Lake Survey. WDNR. Unpublished. Green Bay, WI. 5 pages.