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TO: English Lake File

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SUBJECT: Fall 2006 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. Surveys in the 1940's found that bluegill were the dominant panfish and that they exhibited excellent growth. Walleye were the dominant gamefish, and grew near statewide averages. Few northern pike and no largemouth bass were collected. It was recommended to discontinue stocking bass into this lake. Surveys conducted in the late 1950's found fair to good numbers of northern pike and bass, but fair to poor numbers of walleye. It was felt the walleye population was maintained by stocking because of the lack of suitable spawning habitat. Yellow perch was the dominant panfish. Electrofishing surveys in the 1960's found good numbers of walleye, but low numbers of bass, bluegill and crappie. A large number of yellow perch were collected, but were small in size.

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. A total of 57,049 black crappie, and 5,609 black bullhead were removed during this effort. Following the removal effort, yellow perch, largemouth bass and walleye were stocked to add predation pressure on young of the year crappie. Surveys conducted in the 1980's found that largemouth bass and walleye were the most common gamefish. Black crappie were numerous and dominated the panfish catch. Bluegill, yellow perch and black bullhead were also captured but in much lower number.

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 catch in this survey and were small in size. Bluegill and yellow perch were also captured but in substantially lower numbers.

**2006 Survey Results:**

The entire 1.13 mile shoreline of English Lake was electroshocked on the night of October 9<sup>th</sup> using pulsed DC current. An attempt to net all fish was made and all captured fish were measured to the nearest 1 mm. Scales for age analysis were collected from largemouth bass and bluegill at the rate of 10 per centimeter group.

During the 31 minutes of shocking, 181 individual fish representing nine species were captured (Table 1). Total CPE was 362 fish per hour or 160.2 per mile shocked. Largemouth bass dominated the catch with substantially fewer individuals of other species captured. CPE for largemouth bass CPE was 280/hour or 123.9/mile shocked. Bluegill, the second most abundant species, had a CPE of 66 per hour or 29.2 per mile shocked.

**Table 1. Length frequency of captured fish from English Lake caught during electroshocking on the night of October 9, 2006.**

Length (mm)	Largemouth Bass	Northern Pike	Walleye	Bluegill	Rock Bass	Yellow Perch	Green sunfish
70	1			1			
80	3						
90	4			1			
100	1			1			
110	1						
120	1			2			
130	2			1	1		
140	1			5			
150	4			5			
160	7			6			
170	6			5			
180	13			3			1
190	7			1			
200	8			1			
210	8			1			
220	3						
230	5						
240	2						
250	1						
260	4						
270	1						
280	3					1	
290	3						
300	5						
310	4						
320	14						
330	4						
340	8						
350	2						
360	3						
370	3						
380	1						
390							
400	4						
410	1						
420	1						
430	1		1				
440							
450			1				
460							
470							
480							
490							
500			1				
510							
520		1					
530							
540							
550							
560							
570							
580							
590			1				
600							
Total	140	1	4	33	1	1	1
Ave. Length	243	520	493	152	130	280	180
S.D.	87.5	--	71.4	29.6	--	--	--

## Gamefish

Largemouth bass were the dominant gamefish captured. The 140 bass ranged in length from 77 mm to 437 mm and had an average length of 243 mm. Fourteen bass (10.0%) of captured bass were greater than the 14 inch minimum size limit. When scales were aged, age classes from young of year to age 8 and age 10 were detected (Table 2).

**Table 2. Age distribution of largemouth bass in English Lake.**

Length (mm)	Total	0+	1+	2+	3+	4+	5+	6+	7+	8+	9+	10+
70	1	1										
80	3	3										
90	4	4										
100	1	1										
110	1	1										
120	1	1										
130	2		1	1								
140	1		1									
150	4		3	1								
160	7		1	6								
170	6			6								
180	13			11	2							
190	7			2	5							
200	8			8								
210	8			5	2	1						
220	3			3								
230	5			1	3	1						
240	2			1	1							
250	1				1							
260	4			3	1							
270	1			1								
280	3			1	2							
290	3				3							
300	5				5							
310	4				4							
320	14				6	7		1				
330	4					3	1					
340	8				2	6						
350	2					1	1					
360	3					1	1	1				
370	3					1	1	1				
380	1							1				
390												
400	4							1	2	1		
410	1							1				
420	1							1				
430	1											1
440												
450												
Total	140	11	6	50	37	21	4	7	2	1	0	1
Ave. Length	243	91	147	195	269	323	353	380	400	400		430
S.D.	87.5	14.5	10.3	32.5	52.3	27.3	17.1	34.1	--	--	--	--

Age 2 fish were the most common age bass captured, but age 3 and age 4 were also common. When compared to statewide length at age averages, bass in English Lake grew at less than average rates at all ages (Table 3). Younger aged fish showed the largest departure from average length, while older fish were closer to an average largemouth bass of equal age.

**Table 3. Average length at age for largemouth bass and bluegill captured in English Lake during fall electroshocking. Statewide average lengths at age for largemouth bass and bluegill are in (). Since little growth will occur until January 1, fall fish are placed into the next whole age category (1+ fish are placed into the age 2 category) for comparative purposes.**

	Age							
	1	2	3	4	5	6	7	8
Largemouth Bass	91 (97)	147 (165)	195 (229)	269 (290)	323 (338)	380 (383)	400 (414)	400 (447)
Bluegill	87 (64)	128 (97)	160 (122)	180 (147)				

Northern pike and walleye were also captured, but in low number. Captured walleye averaged 493 mm in length and the single northern pike was 520 mm in length.

**Panfish**

Bluegill were the most common panfish captured during this survey. The thirty-three bluegill ranged in length from 75 mm to 210 mm and had an average length of 152 mm (Table 1).

When scales were aged, age classes 0+ through 3+ were detected in the sample (Table 4). Age 2+ was the most common age bluegill and these fish had an average length of 160 mm. Only five bluegill were older than age 2+.

**Table 4. Age distribution of bluegill captured on English Lake during fall electroshocking.**

Length (mm)	Total	0+	1+	2+	3+
70	1	1			
80					
90	1	1			
100	1	1			
110					
120	2		2		
130	1		1		
140	5		1	3	1
150	5			5	
160	6			6	
170	5			4	1
180	3			2	1
190	1			1	
200	1				1
210	1				1
220					
230					
240					
250					
Total	33	3	4	21	5
Ave. Length	152	87	128	160	180
S.D.	29.6	15.3	9.6	13.8	22.4

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.

Other captured panfish included rock bass, yellow perch and green sunfish. The lengths of these fish were 130 mm, 280 mm and 180 mm respectively.

## **Discussion and Conclusions:**

### Gamefish

Largemouth bass were the dominant gamefish captured during electrofishing in 2006. This was similar to the 1995-96 comprehensive survey when during fall electroshocking bass dominated the gamefish catch. Unlike the previous survey in which YOY bass dominated the catch, in 2006 ages 2, 3 and 4 were the most common ages. In addition, average length and the number of fish greater than 14" increased in 2006 from what was measured in 1995-96. It is likely catch and release and 9 more years of the 14" minimum size limit increased average size and the age of bass in English Lake.

Length at age of bass in 2006 was less than in previous surveys. With more bass protected by the 14" size limit, increased predation pressure on limited forage may be causing growth to slow. The bass population should be monitored to see if current population trends continue.

Walleye and northern pike continue to be present in the lake but in low numbers. This is similar to what was seen in 1995-96. Limited spawning habitat will always limit their populations in English Lake.

### Panfish

Bluegill dominated the panfish catch in 2006. Bluegill in 2006 were young in age, but were fast growing. It is likely that predation by gamefish has reduced bluegill number thus reducing competition for food resources. Because English Lake has a small littoral area that limits the reproduction of bluegill and other panfish, we should monitor panfish numbers to determine if predation is too great to maintain a healthy bluegill 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. Largemouth bass were infrequently collected. Black bullhead were also abundant in the system. This survey and the comprehensive survey of 1995-96 have documented a shift in the primary predator from walleye to largemouth bass. Panfish which were overabundant and slow growing are now much lower in number and exhibiting good growth.