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TO: Pigeon Lake File

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SUBJECT: Fall 2006 Fall Electrofishing Survey of Pigeon Lake

Background on Pigeon Lake:

Pigeon Lake is a seepage lake located in south-central Manitowoc County. It has a surface area of 77 acres, a maximum depth of 67 feet and the lake water is hard and clear. It experiences heavy recreational use with over sixty dwellings and a youth camp on its shores. Public access and parking is available in the northeast corner of the lake.

Fish Survey History:

A 1945 survey was the first to investigate the fish populations of the lake. During that survey, the fyke net catch was dominated by bluegill and rock bass. Largemouth bass were the most common gamefish, with few walleyes present in the catch. Fishing and other recreational uses of the lake were described as heavy. Beginning in 1956, a mixture of rainbow and brown trout were stocked into the lake to develop a two story fishery. A 1963 electroshocking survey captured some trout, but the catch was dominated by bluegill, rock bass, yellow perch and bullhead. Largemouth bass were the most common gamefish collected with several northern pike also captured. The management recommendation at that time was to discontinue rainbow stocking.

An intensive fisheries survey was conducted on Pigeon Lake in 1973. Bluegill, white sucker, yellow perch and walleye were the most common fish captured. The fish populations of the lake were characterized as generally slow growing. At that time, it was recommended to manage the lake as a warmwater fishery and to stock walleye.

The most recent comprehensive survey of Pigeon Lake occurred in 1984. A total of 3,312 fish representing twelve species were collected, with bluegill dominating the catch. Substantially lower numbers of rock bass, bullhead, walleye, largemouth bass, northern pike and alewife were captured during the survey. Walleye and largemouth bass were the dominant gamefish, with the walleye population sustained by private and DNR stocking. In general, the growth of gamefish species was slower than state averages. The panfish community was dominated by bluegill and rock bass. Growth of all panfish species were less than state averages. Few forage species were captured in this survey. The lack of forage may have contributed to the small size of panfish that were captured.

2006 Survey Results:

The entire 1.7 mile shoreline of Pigeon Lake was electroshocked on the night of October 9th using pulsed DC current. An attempt to net all fish was made and all captured fish were measured to the nearest mm. Scales for age analysis were collected from largemouth bass and bluegill at the rate of 10 per centimeter group.

During the 51 minutes of shocking, 146 individual fish representing nine species were captured that night (Table 1). Many bluntnose minnow were observed but not netted because of their small size. Bluegill and largemouth bass dominated the catch with substantially fewer individuals of other species captured. CPE for bluegill was 104.4/hr or 51.2/ mile shocked. Largemouth bass CPE was 66/hour or 32.4/mile shocked.

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

Length (mm)	Largemouth Bass	Northern Pike	Walleye	Bluegill	Rock Bass	Pumpkin-seed	Green sunfish	White Sucker	Brown Bullhead
70				3					
80				3					
90				9					
100				35					
110	4			8					
120	2			10		1			
130	1			8					
140	2			2			1		
150				4					
160									
170				1	1				
180	3			1					
190	10			2					
200	3								
210				1					
220	1								
230	2								
240	2								
250	2				1				
260	2								
270	2								
280	2								
290	2								
300	3								
310	2								1
320									
330	5								
340									
350	3								
360									
370									
380									
390	1		1						
400									
410									
420									
430		1							
440									
450	1								
460									
470									
480									
490									
500									
510									
520									
530									
540									
550								1	
560									
570									
580									
590									
600									
610		1							
Total	55	2	1	87	2	1	1	1	1
Ave. Length	233	520	390	112	210	120	140	550	310
S.D.	74.2	127.3	--	26	56.7	--	--	--	--

Gamefish

Largemouth bass were the dominant gamefish captured. The fifty-five bass ranged in length from 110 mm to 457 mm and had an average length of 233 mm. Only 3 bass (5.5%) were greater than the 14 inch (356 mm) minimum size limit. When scales were aged, age classes from young of year to age 6 were detected (Table 2).

Table 2. Age distribution of largemouth bass in Pigeon Lake caught during electroshocking on the night of October 9, 2006.

Length (mm)	Number	Age						
		0	1	2	3	4	5	6
70								
80								
90								
100								
110	4	4						
120	2	2						
130	1	1						
140	2	2						
150								
160								
170								
180	3		3					
190	10		10					
200	3		3					
210								
220	1			1				
230	2			2				
240	2			1	1			
250	2			1	1			
260	2			2				
270	2			2				
280	2				2			
290	2				1	1		
300	3				3			
310	2				1	1		
320								
330	5					5		
340								
350	3					1	2	
360								
370								
380								
390	1						1	
400								
410								
420								
430								
440								
450	1							1
Total	55	9	16	9	9	8	3	1
Ave. Length	233	121	190	248	283	325	363	450
S.D.	74.2	12.7	6.3	18.6	24.9	17.7	23.1	

Age 1 bass were the most common age bass captured, but other ages were also common. When compared to statewide length at age averages, bass in Pigeon Lake grew at average rates through age 5 and then grew at slightly less than average rates thereafter.

Northern pike and walleye were also captured, but in low number. The two captured northern pike averaged 520 mm in length and the single walleye was 392 mm in length. No age structures were collected from northern pike and walleye.

Panfish

Bluegill were the most common panfish captured during this survey. The eighty-seven bluegill ranged in length from 75 mm to 211 mm and had an average length of 112 mm (Table 1). Most bluegill were less than 120 mm in length and only one was greater than 200 mm in length.

When scales were aged, age classes 0 through 4 were detected in the sample (Table 3). Ages 0 and 1 were the most common age bluegill. Only one bluegill was older than age 3.

Table 3. Age distribution of bluegill captured on Pigeon Lake during fall 2006 electroshocking.

Length (mm)	Number	Age				
		0	1	2	3	4
70	3	3				
80	3	2	1			
90	9	8	1			
100	35	21	14			
110	8		6	2		
120	10		9	1		
130	8		5	3		
140	2		1	1		
150	4			4		
160						
170	1				1	
180	1				1	
190	2				2	
200						
210	1					1
220						
230						
240						
250						
Total	87	34	32	11	4	1
Ave. Length	112	94	111	134	184	210
S.D.	26	9.5	13.4	15.9	9.6	

When compared to statewide length at age averages, bluegill in Pigeon Lake were longer at each age than an average bluegill from other lakes in Wisconsin.

Other captured panfish included rock bass, pumpkinseed sunfish and green sunfish. The average lengths of these fish were 210 mm, 120 mm and 140 mm, respectively.

During this survey, we also captured white sucker and brown bullhead. Many bluntnose minnow were observed but because of their small size they passed through our dip nets.

Discussion and Conclusions:

The largemouth bass population in Pigeon Lake is fair when compared similar lakes in northeast Wisconsin. In the fall of 2006, the bass were small in size. Growth, however, is greater than state averages. The lack of large, old fish may indicate substantial harvest of large fish by anglers or could be

the result of a fish kill that occurred in May 2000. That fish kill was caused by super-saturation of dissolved oxygen. Most of the 2006 captured fish were from spawning years that followed the fish kill.

Walleye and northern pike were captured in very low numbers during this survey. It is likely that spawning habitat loss caused by shoreline development and by fast boating has hurt the northern pike population by reducing critical habitat. The abundance of walleye in the lake is likely to be limited, because Pigeon Lake lacks suitable spawning substrate for walleye. Periodic stocking will be required to maintain a fishable walleye population in Pigeon Lake.

Abundance of panfish captured in 2006 was lower than measured in previous surveys. Low abundance of panfish is likely due to the 2000 fish kill, although population declines because of habitat loss should not be ignored. Angler harvest of larger bluegill may also impact the population.

Growth of bluegill captured in this survey was greater than in previous surveys and is likely due to lower competition for food resources because bluegill and other panfish were less abundant in 2006 than historic levels.

It should also be noted that during the 2006 survey, most fish were captured when aquatic vegetation was present. These plant beds were scarce and widely scattered along the shoreline. The abundance and distribution plants appeared to be much less than in previous years. An aquatic plant management permit was issued to the lake association for a chemical treatment of European water milfoil in 2006. Although there is no proof that the lack of vegetation and the herbicide treatment are linked, we are concerned about the lack of vegetation. The loss of plants when added to habitat loss caused by shoreline development and fast boating in shallow water may cause fish populations in Pigeon Lake to recover from the 2000 fish kill more slowly than usual. We recommend another electroshocking survey within five years to document the status of the fish population in Pigeon Lake. Barring any more fish kills, we hope the next survey will indicate a continued recovery of this fishery from the 2000 fish kill. The access site is adequate for this waterbody and no improvements are needed at this time.