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TO: Shea Lake File

FROM: Steve Hogler

SUBJECT: Shea Lake- Kewaunee County May 2009 Electrofishing Survey Report

Shea Lake is a thirty-one acre, twenty-four foot deep lake located in southwestern Kewaunee County. The shoreline of the lake is moderately developed along three shores while the north shore is wetland. The lake is eutrophic because of non-point source pollution and low dissolved oxygen levels are common. Shea Lake has had a history of winterkill, with kills noted in the 1960's, 70's and 80's. Restocking attempts have focused on northern pike and largemouth bass but because of continuing poor water quality they have met with only limited success.

Surveys conducted by Probst (1953), Kernen (1973), Welch (1982) and Peeters (1986) have documented the changes in fish population that have occurred over the past fifty years in Shea Lake. Probst (1953) using a seine to survey the lake, found that the lake was dominated by black crappie, yellow perch and largemouth bass. An electroshocking survey in the 1970's found that the lake was dominated by bullhead with only a low number of panfish and only one northern pike captured despite heavy largemouth bass stockings the previous two years (Kernen 1973). The two electroshocking surveys in the 1980's conducted by Welch (1982) and Peeters (1986) found a lake that was dominated by panfish with few gamefish. Yellow perch were less abundant than in the past surveys and bluegill were more common. Largemouth bass and northern pike abundance was low.

On the night of May 20, 2009 Shea Lake was electroshocked as part of baseline lake monitoring. A single circuit of the lake was shocked using 150 volts pulsed DC at 4 amps of current. Total electrofishing time was 33 minutes to cover the 0.9 miles of shoreline. All fish were netted, identified and either measured to the nearest millimeter or counted. All captured largemouth bass and subsample of bluegill had scales removed for aging.

In total, 216 individual fish representing eight species of fish were captured with a total CPE of 240.0 fish per mile or 392.7 fish hour shocked (Table 1). Bluegill dominated the catch followed by largemouth bass. Other captured species were netted in much lower numbers.

**Table 1. The abundance and CPE of fish captured by electroshocking on East Alaska lake during May, 2009.**

Species	Number	Fish/Mile	Fish/Hour
Largemouth Bass	43	47.8	78.3
Northern Pike	3	3.3	5.5
Golden Shiner	6	6.7	10.9
Brown Bullhead	4	4.4	7.3
Pumpkinseed Sunfish	2	2.2	3.6
Bluegill	143	158.9	260.3
Black Crappie	13	14.4	23.7
Yellow Perch	2	2.2	3.6
Total	216	240.0	392.7

## **Largemouth Bass**

A total of forty-three largemouth bass were captured during the survey (Table 1). Bass CPE was 78.3 fish per hour or 47.8 per mile of shoreline shocked. The bass ranged in length from 217 mm to 455 mm and averaged 308 mm in length (Table 2). Twelve of the captured bass (27.9%) were greater than the size limit (356 mm or 14"). When compared to state averages for length at age, bass in Shea Lake appear to be growing at near State averages (Table 3).

Based on scale samples, seven age classes of bass were noted, with age 4 bass the most common age class (Table 4). Very few bass were older than age 8 and no age 1 or age 2 bass were captured.

## **Northern Pike**

Three northern pike were captured during electrofishing (Table 1). They ranged in length from 235 mm to 749 mm and had an average length of 532 mm. The smallest northern pike was likely a yearling. Pike CPE was 3.3 per mile or 5.5 per hour shocked.

## **Bluegill**

Bluegill dominated our catch with a CPE of 158.9 per mile or 260.3 per hour shocked (Table 1). The 143 captured bluegill ranged in length from 65 mm to 185 mm and had an average length of 121 mm (Table 2). Fifteen bluegill (10.5%) were greater than 150 mm but few were greater than 175 mm in length. Growth (length at age) was slightly above state averages (Table 3).

Ages 1 through 5 were present in the scale samples that were collected and analyzed (Table 5). Age 2 bluegill were the most common followed by age 1 and age 3 fish. Only a single age 5 bluegill was captured.

## **Other Panfish**

We also captured thirteen black crappie, two yellow perch and two pumpkinseed sunfish (Table 1). The crappie, perch and pumpkinseed had average lengths of 191 mm, 154 mm and 129 mm respectively (Table 2).

## **Other Species**

Additionally we captured six golden shiner and four brown bullhead (Table 1). We did not observe any carp.

## **Summary**

From this limited late spring survey it appears that largemouth bass and bluegill are doing well in the lake. We noted an improvement in largemouth bass number as compared to the previous three surveys but the lack of young bass was also noted. This could indicate several years of poor reproduction (2007 and 2008) or that young bass (ages 1 and 2) were not onshore when we were shocking. Growth appears to be good and the distribution of bass sizes indicates that bass can do well in the lake. Future surveys should continue to take age samples to determine the strength of succeeding year classes.

Few northern pike were captured although the lake appears to be suited for pike. The single yearling pike we captured indicates that reproduction is occurring but it appears to be limited.

Bluegill appear to be doing well although few large (older) bluegill were captured. Bluegill have become much more numerous in the lake than documented during past surveys. Conversely, yellow perch and black crappie numbers have declined sharply from levels measured during previous surveys. Current environmental conditions appear to favor bluegill over open water species such as yellow perch and black crappie. It is likely that angler harvest has selectively reduced large (size) bluegill abundance since bluegill appear to grow at the state average rate. Predation pressure from large predators appears to be low on small bluegill.

It is likely that poor water quality continues to be a problem on Shea Lake although water quality parameters were not measured during this survey. However it does appear that winterkill has not been a recent problem as shown by the age distribution of bass although missing year classes of bass could indicate a problem that should be watched in the future.

### **References**

Kernen, L.T. 1973. Shea Lake Boomshocker Survey- July 14, 1972. Unpublished survey report. WDNR. Madison, WI. 3 pages.

Peeters, P. 1986. Shea Lake Electrofishing Survey, May 22, 1986. Unpublished survey report. WDNR. Madison, WI 1 page.

Probst, R.T. 1953. Shea Lake Seine Survey Report. Unpublished survey report. Wisconsin Conservation Department. Madison, WI 2 pages.

Welch, D. 1986. 1982 Shea Lake Survey Report. Unpublished survey report. WDNR. Madison, WI. 4 pages.

**Table 2. The length frequency of fish captured by electroshocking on Shea Lake on the night of May 20, 2009.**

Length (mm)	Largemouth Bass	Golden Shiner	Brown Bullhead	Pumpkinseed Sunfish	Bluegill	Black Crappie	Yellow Perch
60					1		
70					7		
80		2			9		
90					13		
100		1			15		
110					24		
120				1	27	1	1
130				1	17		
140					11		
150					9	1	
160					5	1	
170		2			3	2	
180		1			2	1	1
190						1	
200						2	
210	1						
220	5					3	
230	2		1			1	
240	1		1				
250							
260	5		1				
270	3						
280	3						
290	2						
300	1						
310	1		1				
320	1						
330	4						
340	2						
350	1						
360	3						
370	2						
380	2						
390							
400	1						
410	2						
420							
430							
440							
450	1						
Number	43	6	4	2	143	13	2
Ave. Length	308	135	265	129	121	191	154
S.D.	62	47.6	39.4	6.4	25.4	31.5	36.9

**Table 3. Average length (mm) at age as determined by scales for fish captured on Shea Lake during the May 2009 survey and statewide length at age information.**

Species	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8	AGE 9
Largemouth Bass	--	--	221	271	347	370	385	355	430
(State Average)	97	165	229	290	338	384	414	447	454
Bluegill	78	112	141	161	180	--	--	--	--
(State Average)	64	97	122	147	167	183	196	--	--

**Table 4. Largemouth bass length and age distribution as determined by scales collected during electroshocking on May 20, 2009.**

Length (mm)	Age							
	2	3	4	5	6	7	8	9
200								
210		1						
220		4	1					
230		2						
240								
250			1					
260			5					
270			3					
280			3					
290			2					
300			1					
310			1					
320			1					
330			1	2			1	
340				1	1			
350				1				
360				1	1	1		
370				1	1			
380					1		1	
390								
400					1			
410						1		1
420								
430								
440								
450								1
Number		7	19	6	5	2	2	2
Ave. Length		221	271	347	370	385	355	430
S.D.		6.9	26.1	16.3	22.4	35.4	35.4	28.3

**Table 5. Bluegill length and age distribution as determined by scales collected during electroshocking on May 20, 2009.**

Length (mm)	Age				
	1	2	3	4	5
60	1				
70	7				
80	7	2			
90	5	8			
100		15			
110		24			
120		27			
130		14	3		
140			11		
150			5	4	
160				5	
170				3	
180				1	1
190					
200					
Number	20	90	19	13	1
Ave. Length	78	112	141	161	180
S.D.	8.9	12.7	6.6	9.5	--