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TO: Paul Peeters

FROM: Steve Hogler
Steve Surendonk

SUBJECT: 2008 Europe Lake Survey

Europe Lake (WBIC-93100) is a 274 acre lake located in the northeast corner of the Door County peninsula (T32N, R29E, Section 9). It is a shallow, hard water seepage lake that has a maximum depth of 10 feet, an average depth of 6 feet, and a shoreline development factor of 1.38. The eastern shore of the lake borders Newport State Park, providing an undeveloped wooded wetland that is roughly one-third of the entire shoreline. The rest of the shoreline is developed with cottages and year-round residences. Public access is available in the southwest corner at the eastern end of Europe Lake Road.

The history of fisheries management for Europe Lake includes fish stocking, fish removal, water chemistry investigations and fish surveys. Various fish species have been stocked into Europe Lake, with major emphasis on smallmouth bass between 1939 to 1952 and on walleye from 1968 to the present (McKee et al 2001).

A comprehensive survey conducted in 1999 found that northern pike were the most abundant predator in the lake (McKee et al 2001). The majority of pike that were captured in fyke nets were greater than 600 mm in total length with few small fish in the sample. Walleye were also captured in comparatively high number although the majority of walleye pike were age 1 fish, originating from fingerling stocking in 1998. Few smallmouth bass were captured during this assessment because it was likely that they were not vulnerable to our gear at the times they were used. Rock bass and yellow perch dominated the panfish catch and were essentially the only panfish found in Europe Lake. Since the previous survey conducted in 1985, yellow perch abundance has decreased sharply while rock bass abundance has doubled. Comparison of state length-at-age averages to those calculated for rock bass and yellow perch based on aged scale samples collected during this survey, indicate that rock bass and yellow perch in Europe Lake are growing at a rate that is slower than state averages. Common shiners and bluntnose minnows dominated what appears to be a sizeable forage fish population.

Methods and Results:

Following state lake sampling protocols, Europe Lake was surveyed on the evening of May 5, 2008 to assess the lake's gamefish populations. During the 1.82 hours of electrofishing, the entire shoreline was surveyed and an attempt was made to net all observed fish. All landed fish were identified, measured to the nearest millimeter and scales collected from smallmouth bass before being released.

Despite sampling the entire 3.4 mile shoreline, our catch was low. A total of 116 fish were captured yielding a CPE of 34.1 fish per mile or 63.7 fish per hour shocked. Rock bass and yellow perch were the most common fish captured, with smallmouth bass and northern pike the most abundant gamefish collected (Table 1). We observed many minnows that were not netted

because of their small size. The observed mixture of minnows consisted of bluntnose minnow and common shiners. Two of the common shiner were netted with a small mesh net for identification. Additionally we observed, but could not net 14 northern pike, 2 smallmouth bass and 1 walleye. Water temperature at the time of survey was 54F.

Table 1. Abundance and CPE of fish captured during 2008 spring electrofishing on Europe Lake.

Species	Number Caught	CPE (#/mile)	CPE (#/hour shocked)
Rock Bass	46	13.5	25.3
Yellow Perch	32	9.4	17.6
Smallmouth Bass	20	5.9	11.0
Northern Pike	12	3.4	6.6
Pumpkinseed Sunfish	4	1.2	2.2
*Common Shiner	2	0.6	1.1
Total	116	34.1	63.7

* Two common shiner were netted for identification, but most minnows were too small to be netted with assessment nets.

Gamefish

Smallmouth bass were the most common gamefish captured during this survey. The twenty bass ranged in length from 276 mm to 521 mm and had an average length of 362 mm (Table 2). Eight of the twenty captured bass (40%) were longer than the 356 mm minimum size limit imposed on anglers. Scale samples were collected from all captured bass. Analysis of the scales indicated that in our sample, bass were 3, 4, 5 or 7 years of age (Table 3). Most bass were age 3, with substantially fewer bass in the other age categories. Comparison to statewide length at age information found on the state fish database indicates that all ages the bass collected during this survey were longer at each age than an average bass across Wisconsin.

Twelve northern pike were captured during this survey (Table 1). These pike ranged in length from 398 mm to 794 mm and had an average length of 662 mm (Table 2). Most captured northern pike were greater than 700 mm in length, with only one being smaller than 400 mm in length.

Panfish

Rock bass were the most abundant panfish captured during this survey (Table 1). The 46 rock bass ranged in length from 46 mm to 208 mm and had an average length of 135 mm (Table 4). Most rock bass had a length between 110 mm and 150 mm.

Yellow perch were also commonly captured during this survey (Table 1). The 32 yellow perch ranged in length from 94 mm to 217 mm and had an average length of 161 mm. Most perch were between 150 mm and 180 mm in length.

Four pumpkinseed sunfish were captured during this survey and they had an average length of 170 mm (Table 4).

Table 2. Length frequency of gamefish captured during 2008 spring electroshocking on Europe Lake.

Length (mm)	Northern Pike	Smallmouth Bass
270		1
280		
290		2
300		3
310		1
320		2
330		3
340		
350		
360		1
370		
380		1
390	1	
400		
410		1
420		
430		1
440		1
450		
460		2
470		
480		
490		
500		
510		
520	1	1
530		
540		
550		
560	1	
570		
580		
590	1	
600		
610		
620		
630		
640		
650	1	
660		
670		
680		
690		
700	1	
710	2	
720	1	
730		
740		
750		
760		
770	1	
780	1	
790	1	
800		
Total	12	20
Ave. Length	662	362
S.D.	119.2	70.1

Table 3. Age distribution of smallmouth bass captured during 2008 spring electrofishing on Europe Lake.

Length (mm)	Total Number	AGE						
		1	2	3	4	5	6	7
270	1			1				
280								
290	2			2				
300	3			3				
310	1			1				
320	2			2				
330	3			3				
340								
350								
360	1			1				
370								
380	1				1			
390								
400								
410	1				1			
420								
430	1					1		
440	1					1		
450								
460	2					2		
470								
480								
490								
500								
510								
520	1							1
530								
540								
550								
Total	20	0	0	13	2	4	0	1
Average	362			317	397	451		521
S.D.	70.1			23.4	21.9	15.4		--

Table 4. Length frequency of panfish captured during 2008 spring electrofishing on Europe Lake.

Length (mm)	Rock Bass	Pumpkin-seed	Yellow Perch
70	3		
80	4		
90	1		1
100			2
110	2		
120	10		1
130	8		1
140	4		3
150	5	2	4
160		1	7
170	2		7
180	3		2
190	3		2
200	1	1	
210			2
220			
230			
240			
250			
Total	46	4	32
Ave. Length	135	170	161
S.D.	34.5	24.3	27.6

Discussion and Conclusions:

This survey was designed as a single night survey to assess smallmouth bass and other gamefish populations in Europe Lake. Our catch on Europe Lake was low compared to similar surveys on other local lakes but this result is consistent with previous surveys (Lychwick 1988). Lack of diverse habitat and relatively low productivity of lake water are likely responsible for the limited fish populations in this lake. However, water chemistry data collected by the Lake Association in the early 2000's may indicate increasing nutrient levels in the lake. It is unknown if this trend has continued and if increased productivity of the lake will translate into improved fish populations.

Traditionally Europe Lake was managed as a smallmouth bass-panfish lake, but during the 1960's through the 1980's walleye were stocked into the lake in attempt to convert the lake into a walleye dominated water (McKee etal 2001). Results from surveys conducted between 1964 and 1985 indicate that this management strategy had shifted the lake toward a walleye-yellow perch dominated lake but at the same time caused bass and rock bass populations to decline (Lychwick 1988).

Following the 1985 survey it was decided to halt walleye stocking to see if walleye could naturally reproduce in lake. Results from the 1999 (McKee etal 2001) and 2008 surveys indicate that at best only limited natural reproduction has occurred and that to maintain walleye in the lake, stocking will be required. It is unknown if the failure of walleye to establish a self-reproducing population is due to poor spawning habitat, poor survival of fry or fingerlings due to predation or from high angler harvest of adult fish. However, as the walleye population in the lake has declined, smallmouth bass and rock bass populations have rebounded.

Any decision to once again regularly stock walleye in the lake should consider the impact of doing so on the smallmouth bass population. However, since minnows are abundant in the lake, stocking walleye once every 5 years at a low number per acre could be considered if it was deemed desirable to add a walleye fishing opportunity for anglers on Europe Lake. This strategy, if adopted, should monitor bass abundance and growth to ensure bass populations are not being negatively impacted by walleye stocking. At this time it is recommended to continue the current management strategy of managing the lake for smallmouth bass-rock bass.

Northern pike appeared to be doing well in the lake. Although we did not capture any small pike, several were observed during this survey. The undeveloped shoreline that is a forested wetland should provide ample spawning habitat for pike to maintain their population abundance in Europe Lake.

References:

Lychwick, T. 1988. Fyke net summaries for fish surveys conducted on Europe Lake from 1964 through 1985. Unpublished Wisconsin Department of Natural Resources Fish Management Summary. Madison, Wisconsin. 4 pages.

McKee, P., T. Kroeff and T. Rasman. 2001. Comprehensive Lake Survey of Europe Lake, Door County. Unpublished Wisconsin Department of Natural Resources Fish Management Report. Madison, Wisconsin. 25 pages.