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FILE REF: [Click [here](#) and type file ref.]TO: Mike Donofrio
Hartlaub Lake FileFROM: Steve Hogler
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SUBJECT: 2013 Hartlaub Lake Survey

Hartlaub Lake is located two miles southwest of the City of Manitowoc. The lake is a seepage lake that is 38 acres in size and has a maximum depth of 60 feet. Hartlaub Lake is mostly undeveloped and is located in an agricultural watershed. Past resource issues on Hartlaub Lake include poor water quality, algae blooms and an undesirable fish community that was dominated by common carp, bullhead and stunted panfish.

Fish surveys conducted in the 1950's found that black crappie, bluegill and northern pike dominated lake. However, by 1962 the fishery of the lake declined sharply and was dominated by carp and stunted panfish. A toxaphene treatment was conducted in the summer of 1962 to remove the fish population. In addition to the chemical treatment, a weir was constructed on the lake outlet to prevent the movement of carp up the stream from Lake Michigan and the lake was restocked with panfish, northern pike, walleye and largemouth bass.

Surveys conducted following the toxaphene treatment through the early 1990's found good populations of largemouth bass, northern pike and panfish, but failed to find successful walleye reproduction. A large fish kill in 1995 caused by manure runoff unbalanced the fishery once again. Mortality of gamefish was high, while moderate numbers of panfish and rough fish survived. Following the fish kill, largemouth bass and northern pike were restocked.

During the night of June 3, 2013 the entire 1.2 mile shoreline was electroshocked using a standard DNR boomshocker with two netters. The water temperature was 62F° and the water clarity was estimated at 5 feet although along the south shore heavy growth of filamentous algae was noted. During the 48 minutes of shocking, we captured 135 individual fish representing seven species (Table 1). Total catch per effort (CPE) was 112.5 mile shocked or 168.8 per hour shocked. Bluegill, largemouth bass and carp dominated our catch with the other species less frequently caught. In addition to the fish netted, we noted several northern pike and many small panfish along the shoreline.

Table 1. The abundance and CPE of fish captured during early June electroshocking on Hartlaub Lake.

Species	Number	CPE (Fish per Mile)	CPE (Fish per Hour)
Common Carp	33	27.5	41.3
Yellow Bullhead	3	2.5	3.8
Bluegill	65	54.2	81.3
Largemouth Bass	28	23.3	35.0
Black Crappie	3	2.5	3.8
Yellow Perch	1	0.8	1.3
Walleye	2	1.7	2.5
Total	135	112.5	168.8

The 28 largemouth bass that we captured ranged in length from 80 mm (3.1") to 490 mm (19.3") and had an average length of 292 mm (11.5") (Table 2). Thirteen of the 28 bass captured (46.4%) were greater in length than the 356 mm (14") minimum harvest size limit for bass on the lake, but only two were greater than 457 (18") in length.

Age was determined for a subsample of bass that we captured using scales for smaller fish (<250 mm) and spines for larger bass (>250 mm). Ages 1 through 3 and ages 6 through 9 were identified in our sample (Table 3). Ages 2, 6 and 7 were the most common. Growth of bass in Hartlaub lake as measured by length at age appears to be similar the growth of bass in other lakes around the state through age 7. We did not capture enough older fish for comparisons beyond age 7.

Several age classes most notably age 4 and age 5 were missing and age 3 was also very weak. These results is a strong indication that bass have had good years and very bad years of reproduction in the lake since the fish kill. In many cases, missing year classes are related to poor spring weather during spawning. However, missing year classes or poor reproductive success can also be indicative of poor water quality. Since multiple years are missing, it is likely that poor water quality has played a role in causing the missing year classes.

We captured two walleye during our survey and they had an average length of 562 mm (22.1"). It is likely these walleye were from the stocking that occurred in 2006. Since our walleye catch was low, it appears that survival of walleye continues to be low in this lake.

Bluegill were the most commonly captured fish in our survey (Table 1). The 65 bluegill that we netted ranged in length from 63 mm (2.5") to 144 mm (5.7") and had an average length of 107 mm (4.2") (Table 2). The age of a subsample of bluegill was determined by the use of scales. Age 1 through age 5 bluegill were found in our sample with age 4 the most common aged bluegill (Table 4). When bluegill from Hartlaub Lake are compared to other bluegill across the state, it appears that bluegill from Hartlaub Lake are growing slower than are bluegill from other lakes. It is likely that a large number of bluegill are in the lake all competing for the same resources. This competition for food has led to slow growth. It also appears that predation on bluegill may be limited based on the low number predators that we captured and the apparent lack of several year classes of bass.

Other fish in our survey included black crappie, yellow bullhead, yellow perch and common carp (Table 1). They had had average lengths of 158 mm (6.2"), 300 mm (11.8"), 145 mm (5.7") and 674 mm (26.5"), respectively (Table 2). The carp were aged with spines and were estimated to be age 12.

Many of the conditions that we noted: filamentous algae, missing bass year classes and poor bluegill growth can be related to poor water quality. It is important to continue to work with the Manitowoc County Soil and Water Department, the Manitowoc County Lakes Association, other lake associations, sportsmen and lake residents to try to improve water quality and mitigate lost habitat to improve the fishery in local lakes.

Specifically for Hartlaub Lake, additional surveys should be conducted in the future to determine if regulation changes or predator stocking is needed to reduce overabundant, slow growing bluegill. However, the successful reproduction of current predators or the successful stocking of additional predators that reduce panfish numbers will not occur if water quality remains an issue.

It should be noted that a lake resident, Gene Weyer graciously allowed us to launch our boat from his property and use his dock. Without his assistance we would not have been able to complete this survey because of low water at the county launch.

Table 2. The length frequency of fish captured during June electroshocking on Hartlaub Lake.

Length (mm)	Walleye	Largemouth Bass	Bluegill	Black Crappie	Yellow Perch	Yellow Bullhead
50						
60			3			
70			5			
80		3	11			
90			4			
100			9			
110			7			
120		1	17			
130			7			
140		1	2		1	
150		2		3		
160		1				
170		1				
180		1				
190		1				
200						
210		1				
220						
230						
240						
250						
260						
270						
280						1
290						
300						1
310						1
320		1				
330						
340		1				
350		1				
360		1				
370						
380						
390		3				
400		3				
410		1				
420		1				
430		1				
440		1				
450		1				
460						
470						
480						
490		1				
500						
510						
520	1					
530						
540						
550						
560						
570						
580						
590						
600	1					
610						
620						
Total	2	28	65	3	1	3
Average Length	562	292	107	158	145	300
S.D.	58.7	136.0	21.7	1.2	--	11.9

Table 3. The size and age distribution of captured largemouth bass collected during June electroshocking on Hartlaub Lake.

Length (mm)	Total	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9
50										
60										
70										
80	3	3								
90										
100										
110										
120	1	1								
130										
140	1		1							
150	2		2							
160	1		1							
170	1		1							
180	1		1							
190	1		1							
200										
210	1			1						
220										
230										
240										
250										
260										
270										
280										
290										
300										
310										
320	1						1			
330										
340	1						1			
350	1						1			
360	1								1	
370										
380										
390	3						2	1		
400	3							2	1	
410	1									1
420	1							1		
430	1									1
440	1							1		
450	1								1	
460										
470										
480										
490	1									1
500										
Total	27	4	7	1	0	0	5	5	3	3
Average Length	292	92	167	210	--	--	360	410	408	447
S.D.	136.0	21.2	18.4	--	--	--	28.8	20.4	44.0	39.6

Table 4. The size and age distribution of captured bluegill collected during June electroshocking on Hartlaub Lake.

Length (mm)	Total	Age 1	Age 2	Age 3	Age 4	Age 5
50						
60	3	1	2			
70	5		5			
80	11		11			
90	4		1	3		
100	9			6	2	1
110	7			5	2	
120	17			4	11	3
130	7			1	6	
140	2				2	
150						
Total	65	1	18	19	23	4
Average Length	107	66	80	110	125	119
S.D.	21.7	--	7.1	12.1	10.4	9.8