CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: October 28, 2010 FILE REF: [Click **here** and type file ref.]

TO: Wilke Lake File

FROM: Steve Hogler

SUBJECT: 2010 Wilke Lake Electroshocking Survey

Wilke Lake is a 97 acre lake located in the southwest corner of Manitowoc County. The lake has a maximum depth of 22 feet, is highly developed, experiences heavy recreational use and is managed as a bass-bluegill water. The lake is stocked with walleye every year to provide additional fishing opportunities for anglers. Wilke Lake has had a history of panfish problems and many attempts have been made to solve this problem by using physical removal, partial chemical removal and predator stocking to reduce numbers and increase the size of panfish. Results of these actions have been mixed with some short term gains but little long term improvement noted. Nutrient enrichment causing either excessive rooted plant growth or planktonic algae blooms and habitat loss also may negatively impact fish populations in the lake.

2010 Survey Results

Wilke Lake was surveyed on the night of May 18 following state protocols for Tier 1 bass lakes. The water temperature at the time of the survey was 65 F. During 80 minutes of electrofishing the entire shoreline was shocked and an attempt was made to net all fish although many bluegill were not netted because of their abundance. Fish were identified, measured and a subsample of largemouth bass and bluegill had scales removed to allow us to estimate age and growth. We captured 393 individual fish representing twelve species during shocking (Table 1). Overall our catch per effort (CPE) was 302.31 fish per mile shocked or 295.49 fish per hour. The dominant species in our catch were bluegill and yellow perch. Largemouth bass were the most common gamefish captured. Other species were captured in much lower abundances (Table 1).

Table 1. Catch summary of the 2005 and 2010 electroshocking surveys of Wilke Lake.

	2010				2005			
Species	Number	Size Range (mm)	CPE (Fish/Mile)	CPE (Fish/Hour)	Number	Size Range (mm)	CPE (Fish/Mile)	CPE (Fish/Hour)
Largemouth Bass	40	134-428	30.77	30.08	17	75-432	13.08	18.89
Northern Pike	6	425-570	4.62	4.51	2	432-483	1.54	2.22
Walleye	2	482-609	1.54	1.50	0		0.00	0.00
Bluegill	218	61-172	167.69	163.91	241	75-203	185.38	267.78
Yellow Perch	101	66-149	77.69	75.94	31	75-228	23.85	34.44
Pumpkinseed	10	113-169	7.69	7.52	24	50-125	18.46	26.67
Black Crappie	8	68-201	6.15	6.02	6	150-254	4.62	6.67
Yellow Bullhead	1	214	0.77	0.75	0		0.00	0.00
Brown Bullhead	1	310	0.77	0.75	0		0.00	0.00
Bluntnose Minnow	2	--	1.54	1.50	0		0.00	0.00
Golden Shiner	1	--	0.77	0.75	8		6.15	8.89
Carp	3	--	2.31	2.26	1		0.77	1.11
Total	**393**		302.31	295.49	**330**		**253.85**	**366.67**

Largemouth bass were the most abundant gamefish we captured during shocking (Table 1). The forty bass ranged in length from 134 mm to 428 mm and had an average length of 331 mm (Table 2). Ten of the 40 captured bass (25%) were greater in length than the 356 mm (14") minimum size limit. Only 2 of 40 fish were larger than 406 mm (16"). Scale samples were collected from all the bass that we captured for age estimation. From scale samples, age 1 through age 5 fish were present in our catch (Table 3). Most bass were age 3 with substantially fewer bass of other ages captured. When the average length at each age from this survey are compared to length at age data from across the state, bass in Wilke Lake are larger at all ages. This indicates that bass growth in the lake is very good.

We also captured six northern pike and two walleye during electrofishing (Table 1). The pike averaged 500 mm in length and the walleye averaged 545 mm in length (Table 2). Both walleye were greater than the 381 mm (15") size limit while none of the northern pike were greater than the 660 mm (26") size limit.

Bluegill and yellow perch dominated our panfish catch with pumpkinseed sunfish and black crappie captured in much lower numbers (Table 1). The 218 bluegill that we captured ranged in length from 61 mm to 172 mm and had an average length of 110 mm (Table 2). Most bluegill (94.5%) were less than 150 mm in length and none were greater than 173 in length. We took scales from a subsample of bluegill for age analysis. Ages 1 through 5 were present in our sample with age 3 bluegill the most common followed by age 4 (Table 5). When compared to statewide length at age data, bluegill in Wilke Lake appear to grow slower than bluegill in other lakes at most ages. (Table 4)

Table 2. The length frequency of fish captured during electroshocking in 2010 from Wilke Lake.

Length (mm)	Largemouth Bass	Northern Pike	Walleye	Bluegill	Yellow Perch	Pumpkin-seed	Black Crappie	Brown Bullhead	Yellow Bullhead
60				19	5		1		
70				23	19				
80				15	2				
90				17	3				
100				25	17				
110				42	31	2			
120				37	10	2			
130	1			11	8	2	2		
140	1			17	6	2	1		
150				9		1	1		
160						1	1		
170				3					
180									
190							1		
200							1		
210									1
220	1								
230									
240									
250									
260	1								
270	1								
280									
290	1								
300	1								
310	2							1	
320	3								
330	9								
340	5								
350	4								
360	3								
370	1								
380	3								
390	1								
400									
410	1								
420	1	1							
430									
440		1							
450									
460									
470		1							
480			1						
490									
500									
510									
520									
530		1							
540		1							
550									
560									
570		1							
580									
590									
600			1						
Total	40	6	2	218	101	10	8	1	1
Ave. Length	331	500	545	110	107	136	148	310	214
S.D.	58.36	60.25	84.85	25.82	22.33	16.63	39.91	--	--

Table 3. The age frequency of largemouth bass captured during May electroshocking on Wilke Lake.

Length (mm)	Number	Age				
		Age 1	Age 2	Age 3	Age 4	Age 5
130	1	1				
140	1	1				
150						
160						
170						
180						
190						
200						
210						
220	1		1			
230						
240						
250						
260	1		1			
270	1		1			
280						
290	1			1		
300	1		1			
310	2			2		
320	3			3		
330	9			6	3	
340	5			5		
350	4			3	1	
360	3			1	1	1
370	1				1	
380	3				3	
390	1				1	
400						
410	1					1
420	1					1
Number	40	2	4	21	10	3
Ave. Length	331	140	266	336	365	402
S.D.	58.36	7.01	31.19	16.21	23.57	32.15

Table 4. Age at length for selected species in Wilke Lake as estimated by surveys in 2005 and 2010 compared to statewide averages (WDNR 1990). All lengths are in mm and statewide averages are in ().

		Age							
Species	Year	1	2	3	4	5	6	7	8
Largemouth bass	2010	140	266	336	365	402	--	--	--
	2005	60	--	270	326	388	407	420	--
(state average)		**(97)**	**(165)**	**(229)**	**(290)**	**(338)**	**(384)**	**(414)**	**(447)**
Bluegill	2010	68	74	112	129	141	--	--	--
	2005	--	70	80	98	108	121	130	--
(state average)		**(64)**	**(97)**	**(122)**	**(147)**	**(167)**	**(183)**	**(196)**	**(208)**
Yellow Perch	2010	74	115	145	--	--	--	--	--
	2005								
(state average)		**(74)**	**(119)**	**(152)**	**(180)**	**(208)**	**(226)**	**(241)**	

Table 5. The age frequency of bluegill captured during May electroshocking on Wilke Lake. Age estimates from subsamples were expanded across the size distribution of the captured sample to estimate the age of captured bluegill.

Length (mm)	Number	Age				
		Age 1	Age 2	Age 3	Age 4	Age 5
50						
60	19	6	13			
70	23	2	17	4		
80	15		8	5	2	
90	17			14	3	
100	25			17	8	
110	42			34	5	3
120	37			25	12	
130	11			7	4	
140	17			1	13	3
150	9				7	2
160						
170	3				2	1
180						
190						
200						
Number	218	8	38	107	56	9
Ave. Length	110	68	74	112	129	141
S.D.	25.82	4.68	7.41	14.83	21.56	21.28

Yellow perch were also commonly captured during electroshocking (Table 1). The 101 perch ranged in length from 66 mm to 149 mm and had an average length of 107 mm (Table 2). Similar to bluegill, yellow perch were small in size, with all captured perch less than 150 mm in length. Age 1 through age 3 yellow perch were present in our aged sample. Age 2 perch were the most common followed by age 1 (Table 6). In Wilke Lake, yellow perch grow at average rates when compared to statewide length at age averages (Table 4).

Table 6. The age frequency of yellow perch captured during May electroshocking on Wilke Lake. Age estimates from subsamples were expanded across the size distribution of the captured sample to estimate the age of captured perch.

Length (mm)	Number	Age				
		Age 1	Age 2	Age 3	Age 4	Age 5
50						
60	5	5				
70	19	19				
80	2	2				
90	3		3			
100	17		17			
110	31		31			
120	10		10			
130	8		8			
140	6			6		
150						
Number	101	26	69	6	0	0
Ave. Length	107	74	115	145		
S.D.	22.33	5.16	10.21	--		

The other panfish species that we captured included ten pumpkinseed sunfish and eight black crappie (Table 1). They averaged 136 mm and 148 mm in length respectively (Table 2). Also captured were two species of bullhead and several minnow species including common carp (Table 1). All were captured in low abundances.

Discussion

Although a single night of survey does not provide a complete picture of a lake's fish community it does provide a snapshot of the status of the fishery. During our 80 minutes of electroshocking we captured 393 individual fish representing twelve species. Our survey indicates that Wilke Lake continues to be a bass-bluegill lake.

Largemouth bass continues to be the dominant gamefish in the lake although in 2010 we also captured walleye and northern pike during electroshocking. The number of bass that we captured in 2010 was more than twice what was captured in 2005 (Hogler 2006). The size of bass captured in 2010 was similar to what was captured in 2005 although small bass were less commonly captured in 2010. Growth of bass was better than statewide averages but since growth is good the lack of large fish suggests that anglers may be harvesting many of the legal size bass in the lake. If harvest begins to affect recruitment, more conservative bass limits may be needed to protect the largemouth bass population in the lake.

Northern pike number and size has improved since the 2005 survey. The reasons for the increase in number and size are unknown. Walleye are stocked in alternate years by DNR. Stocking continues to produce a very limited fishery with few individuals being captured in our surveys or by anglers. If stocking continues to provide a poor return to anglers, cessation of state walleye stocking should be considered.

Panfish continue to dominate the fish community of the lake, although most were small in size. Past surveys indicated that bluegill were abundant, small and somewhat slow growing (Hogler 2006). The 2010 survey also captured mostly small (under 150 mm) bluegill, and length at age analysis indicates that bluegill growth in Wilke Lake is less than average. Yellow perch are also small in size but growth appears to be average. The lack of older bluegill and perch indicates high angler harvest once reaching 150 mm. However, despite the harvest of larger individuals, harvest has not improved growth rates for bluegill. Perhaps larger gamefish minimum sizes could improve bluegill growth through additional predation, however, the over-abundant rooted plant population found in the lake during some years may inhibit the predation of gamefish on panfish.

Also of note was the lack of forage fish captured during surveys of Wilke Lake. Additional forage fish could also help to improve growth rates of gamefish and older panfish. Carp were captured in low number during this survey. The impact to the lake by carp is unknown.

References

Hogler, S. 2006. 2005 Wilke Lake Survey Report. WDNR. Unpublished. 5 pages.

WDNR 1990. Fish Management Reference Book. WDNR. Unpublished. Madison, WI.