Loon Pit

Warrick County

Supplemental Largemouth Bass Survey

Date of Survey: April 7 and April 14, 2009

Biologist: Michelle L. Cain, Assistant Fisheries Biologist

Survey Objectives: Monitor the largemouth bass population under the 18.0-in length limit and two bass bag limit.

Methods: Largemouth bass collection effort consisted of 1.5 h on April 7 and 1.5 h on April 14, for a total of 3.0 h of pulsed DC night electrofishing with two dippers. All bass were measured to the nearest 0.1 in TL and weighed to the nearest 0.01 lb. Scale samples were taken from a subsample of bass for age and growth analysis. Proportional (PSD) and relative stock density (RSD) indices were used to assess the population (Anderson and Neumann 1996). Relative weights were calculated for bass 8.0 in and larger for 2004 and 2009 data. A Kruskal-Wallis one-way nonparametric analysis of variance was used to statistically compare catch per unit effort (CPUE) and stock index values among years. A two sample Kolomogorov-Smirnov test was used to detect statistical differences among length-frequency distributions from year to year. The years 2004 and 2005 were targeted as a point of comparison to recent years because the 18.0-in minimum size limit was enacted in 2004. This new size limit could not have had a significant impact on the population until 2006.

Summary: A total of 122 largemouth bass was collected that ranged in length from 4.2 to 17.9 in. They weighed a total of 81 lbs. The relative weights improved from 2004 to 2009. The relative weights in 2004 ranged from 80 to 84 compared to 94 to 100 in 2009. A relative weight near or above 100 indicates ad adequate food supply (Flickinger et al. 1999).

Bass growth was average with an age-4 and age-5 bass averaging 12.0 and 14.6 in and has essentially been the same since 2001. The length-frequency distributions were

significantly different between 2004 and 2009 (D = 0.41; P < 0.01) indicating more large bass within the population. In 2004, 90% of the fish collected were 11.0 in or less versus 56% in 2008.

The electrofishing catch rate decreased from 61.5/h to 40.4/h. Normal catch rate fluctuations ranging from 40 to 60/h have occurred since 2004. A significant increase in CPUE for fish 14.0 or longer was detected between the years 2004 and 2005 combined versus 2006 through 2009 (F = 9.6; df = 5; P = 0.04). The CPUE for fish 18.0 in or longer was not significantly different between 2004 and 2005 combined versus 2006 to 2008 (F = 0.07, df = 5, P = 0.81).

The PSD increased from the 2008 value of 20 to 32. A significant increase was detected in PSD values between 2004 and 2005 combined versus 2006 through 2009 (F = 8.73; df = 5; P = 0.04). The RSD-14 decreased from 8 to 5. A significant increase was detected in RSD-14 values between 2004 and 2005 versus 2006 through 2009 (F = 9.6; df = 5; P = 0.04). The RSD-15 was 5, the same as 2008. The RSD-15 value exhibited a significant increase between 2004 and 2005 versus 2006 through 2009 (F = 10.67; df = 5; P = 0.03). The RSD-18 was 0 and was not significantly different among years (F = 0.20, df = 5, P = 0.68).

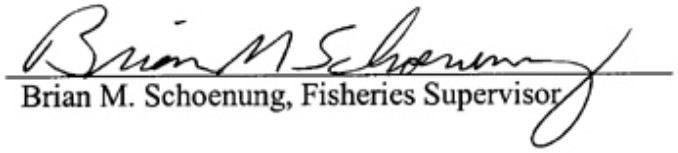
Loon Pit's bass population has improved since the implementation of the new largemouth bass regulations. More large fish are being collected. Length-frequency, PSD, RSD-14, RSD-15, and relative weights have all improved since 2004 indicating more, bigger bass. It is recommended that a supplemental bass survey be conducted in 2010 to further evaluate the effects of the 18.0 length limit and two bass bag limit.

Literature Cited:

Anderson, R. O. and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-481 *in* B. R. Murphy and D. W. Willis, editors. Fisheries Techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

Flickinger, S.A., F. J. Bulow and D. W. Willis. 1999. Small impoundments. Pages 561-588 *in* C. C. Kohler and W. A Hubert, editors. Inland Fisheries Management 2nd edition. American Fisheries Society, Bethesda, Maryland.

Submitted by: Michelle L. Cain, Assistant Fisheries Biologist
Date: June 3, 2009

Approved by: 
Brian M. Schoenung, Fisheries Supervisor

Date: October 30, 2009

Appendix 1

Loon Pit largemouth bass data.

LAKE SURVEY REPORT

Type of Survey: [ ] Initial Survey [X] Re-Survey

Lake Name	County	Date of survey (Month, day, year)
Loon Pit	Warrick	April 7 and April 14, 2008
Biologist's name		**Date of approval (Month, day, year)**
Michelle L. Cain		October 30, 2009

LOCATION

Quadrangle Name	Range	Section
Daylight	9W	7, 18
Township Name	**Nearest Town**	
5S	Daylight	

ACCESSIBILITY

State owned public access site	Privately owned public access site	Other access site
One concrete and one gravel boat ramp		

Surface acres	Maximum depth	Average depth	Acre feet	Water level	Extreme fluctuations
173	62	22	3,806	unknown	6 ft

Location of benchmark

INLETS

Name	Location	Origin
Culvert pipe from Bluegrass Pit	North end of pit	Bluegrass Pit

OUTLETS

Name	Location
Culvert pipe to Otter Pit	South end of pit

Water level control

POOL	ELEVATION (Feet MSL)	ACRES
TOP OF DAM		
TOP OF FLOOD CONTROL POOL		
TOP OF CONSERVATION POOL		173
TOP OF MINIMUM POOL		
STREAMBED		

Bottom type

- [ ] Boulder
- [ ] Gravel
- [ ] Sand
- [X] Muck
- [ ] Clay
- [ ] Marl

Watershed use

Reclaimed coal strip mine ground

Development of shoreline

County road on north and south end of pit.

Previous surveys and investigations

Largemouth bass supplemental surveys: 2000, 2004, 2005, 2006, 2007, and 2008.

General fisheries survey: 2001.

Crappie supplemental survey: 2007.

Angler creel surveys: 2004 and 2006.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0	2	1.6	0.04	1	22.0				
4.5	2	1.6	0.05	1	22.5				
5.0	2	1.6	0.06	1	23.0				
5.5	1	0.8	0.10	1	23.5				
6.0	4	3.3	0.09	1, 2	24.0				
6.5					24.5				
7.0					25.0				
7.5					25.5				
8.0	4	3.3	0.24	2, 3	26.0				
8.5	7	5.7	0.28	2	TOTAL	122			
9.0	10	8.2	0.35	2, 3					
9.5	8	6.6	0.37	3					
10.0	13	10.7	0.48	3, 4					
10.5	4	3.3	0.63	3, 4					
11.0	16	13.1	0.66	3, 4					
11.5	13	10.7	0.74	3, 4					
12.0	16	13.1	0.89	3, 4					
12.5	10	8.2	0.97	4					
13.0	2	1.6	1.17	4, 5					
13.5	2	1.6	1.18	4, 5					
14.0	1	0.8	1.50	5					
14.5									
15.0	2	1.6	1.88	6					
15.5									
16.0									
16.5	1	0.8	2.40	5					
17.0	1	0.8	2.57	7					
17.5	1	0.8	3.20	8					
18.0									
18.5									

ELECTROFISHING CATCH	40.4/h	GILL NET CATCH	N/A	TRAP NET CATCH	N/A

LARGEMOUTH BASS AGE-LENGTH KEY

Length group (in)	Total number	Sub-sample	AGE 1	2	3	4	5	6	7	8
4.0	2	2	2							
4.5	2	2	2							
5.0	2	2	2							
5.5	1	1	1							
6.0	4	4	2	2						
6.5										
7.0										
7.5										
8.0	4	4		2	2					
8.5	7	6		7						
9.0	10	5		4	6					
9.5	8	5			8					
10.0	13	6			11	2				
10.5	4	4			2	2				
11.0	16	6			11	5				
11.5	13	5			3	10				
12.0	16	6			3	13				
12.5	10	6				10				
13.0	2	2				1	1			
13.5	2	2				1	1			
14.0	1	1								
14.5										
15.0	2	2						2		
15.5										
16.0										
16.5	1	1					1			
17.0	1	1							1	
17.5	1	1								1
Totals	122	74	9	15	45	45	3	2	1	1

AGE-LENGTH KEY SUMMARY						
Age	Number	Mean TL	Var	SE	Lower 95%CI	Upper 95%CI
1	9	5.2	0.59	0.26	4.7	5.7
2	15	8.5	0.92	0.25	8.0	9.0
3	45	10.4	0.97	0.15	10.1	10.7
4	45	12.0	0.55	0.11	11.8	12.2
5	3	14.6	3.58	1.09	12.4	16.8
6	2	15.3	0	0	15.3	15.3
7	1	17.3				
8	1	17.8				

GPS LOCATION OF SAMPLING EQUIPMENT

GILL NETS			TRAP NETS			ELECTROFISHING		
1	N	W	1	N	W	1	N 38.09020	W -87.45949
	N	W	2	N	W		N 38.08657	W -87.45972
2	N	W	3	N	W	2	N 38.08636	W -87.45973
	N	W	4	N	W		N 38.08410	W -87.46152
3	N	W	5	N	W	3	N 38.08401	W -87.46135
	N	W	6	N	W		N 38.08265	W -87.45870
4	N	W	7	N	W	4	N 38.08255	W -87.45962
	N	W	8	N	W		N 38.08030	W -87.46100
5	N	W	9	N	W	5	N 38.08012	W -87.46098
	N	W	10	N	W		N 38.08085	W -87.45855
6	N	W	11	N	W	6	N 38.08077	W -87.45845
	N	W	12	N	W		N 38.07714	W -87.45900
7	N	W	13	N	W	7	N 38.08458	W -87.46147
	N	W	14	N	W		N 38.08526	W -87.45831
8	N	W	15	N	W	8	N 38.08443	W -87.46152
	N	W	16	N	W		N 38.08254	W -87.45787
9	N	W	17	N	W	9	N 38.08252	W -87.45916
	N	W	18	N	W		N 38.07967	W -87.46099
10	N	W	19	N	W	10	N 38.07939	W -87.46113
	N	W	20	N	W		N 38.07995	W -87.45830
11	N	W				11	N 38.07986	W -87.45823
	N	W					N 38.07623	W -87.45864
12	N	W				12	N 38.07606	W -87.45869
	N	W					N 38.07160	W -87.46098
13	N	W				13	N	W
	N	W					N	W
14	N	W				14	N	W
	N	W					N	W
15	N	W				15	N	W
	N	W					N	W
16	N	W				16	N	W
	N	W					N	W
17	N	W				17	N	W
	N	W					N	W
18	N	W				18	N	W
	N	W					N	W
19	N	W				19	N	W
	N	W					N	W
20	N	W				20	N	W
	N	W					N	W