Deam Lake

Sequential Fish Sampling and Submersed Plant Survey

Clark County

Dates: (1) Fish sample on May 24, 2005; (2) Submersed plant survey on August 11, 2005

Biologists: Larry L. Lehman and Clinton R. Kowalik

Survey Objectives: (1) Conduct a sequential sampling of bluegill and largemouth bass at Deam Lake (a 192-acre impoundment) to determine reliable estimates of PSD and the need for a largemouth bass slot limit.

(2) Conduct a submersed aquatic plant survey.

Methods: On May 24, fish collection effort consisted of pulsed DC night electrofishing with two dippers for bluegill (0.25 h) and largemouth bass (0.50 h). Fish were measured to the nearest 0.1 in TL. Average weights for fish by half-inch groups for Fish Management District 8 were used to estimate the weight of bluegill and largemouth bass within the sample. Scales were collected for age and growth determination. Proportional stock density (PSD) was calculated for bluegill and largemouth bass (Anderson and Neumann 1996). The Bluegill Fishing Potential (BGFP) index was used to assess bluegill fishing quality (Ball and Tousignant 1996). On August 11, submersed aquatic vegetation was sampled using guidelines written by Pearson (2004). A GARMIN GPSmap 76 was used to record the location of the fish collection sites and aquatic vegetation sample sites.

Summary: A total of 70 bluegill was sampled that weighed nearly 7 lbs. They ranged in length from 1.2 to 8.1 in TL, averaging 4.3 in TL. The electrofishing catch rate was 280.0/h, which is a 17% increase from the last survey in 2000 (Lehman 2001). A reliable estimate of the bluegill PSD was determined after 0.25 h (Anderson and Neumann 1996). Bluegill represented a balanced population; the bluegill PSD was 36, which is a 17% increase from 2000. Twenty-four percent of the bluegill in this sample were quality size (≥ 6.0 in), which is a 212% increase from 2000. The BGFP index was 20, which is in the fair category; the BGFP index in 2000 was 22,

which is also in the fair category. Bluegill 8 in and longer continue to be collected. Back-calculated lengths indicated bluegill reached 6 in during their 5th year of growth, which is below average for southeastern Indiana (Figure 1). Bluegill at all ages grew slower than in 2000.

A total of 94 largemouth bass was sampled that weighed 61 lbs. They ranged in length from 3.4 to 14.4 in TL, averaging 10.5 in TL. The electrofishing catch rate was 188.0/h, which is a 6% increase from 2000 (Lehman 2001). A reliable estimate of PSD was determined after 0.5 h. Although largemouth did not represent a balanced population, the PSD of 36 represents a 37% increase compared to 2000. It was not determined when largemouth reached 14 in, but they most likely reached legal size during their 6th or 7th year of growth, which is below average for southeastern Indiana (Figure 2). Largemouth grew slower than in 2000.

Submersed vegetation was found to a depth of 19.5 ft. Southern naiad dominated the population, but Eurasian watermilfoil, coontail, and chara were also found frequently throughout the lake. Arrowhead rosettes, brittle naiad, leafy pondweed, and nitella were also collected.

The objectives for Deam Lake were a success. Reliable estimates of PSD were determined after 0.25 h for bluegill and 0.5 h for largemouth. The bluegill PSD was in the recommended range of values for a balanced fishery, but the largemouth PSD was slightly below (Anderson and Neumann 1996). For both species, catch rates increased from 2000, while growth generally decreased at all ages. At this time, the Division of Fish and Wildllife should maintain a 14-in minimum size limit on largemouth bass. We will continue to monitor the Deam Lake fishery and control vegetation as needed. Submersed aquatic vegetation is scheduled to be treated in 2006.

Literature Cited:

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Submitted by: Clinton R. Kowalik, Assistant Fisheries Biologist
Date: March 31, 2006

Approved by: Larry L. Lehman, Fisheries Biologist

Approved by: _____
Brian Schoenung, Fisheries Supervisor
Date: November 6, 2006

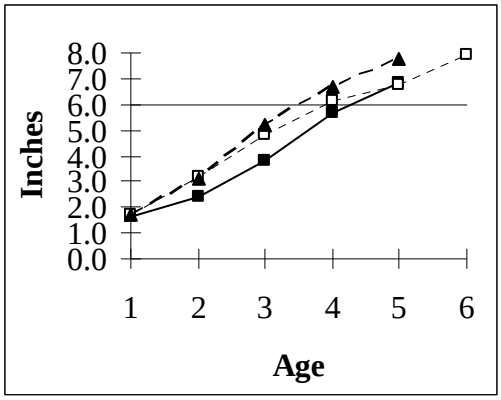

Figure 1. Deam bluegill from 2005 survey (solid line) compared to 2000 survey (dashed line) and to average bluegill growth observed in Fish Management District 8 impoundments (dotted line).

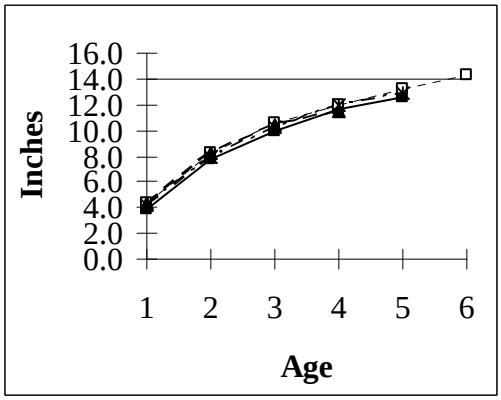

Figure 2. Deam largemouth bass growth from 2005 survey (solid line) compared to 2000 survey (dashed line) and to average largemouth bass growth observed in Fish Management District 8 impoundments (dotted line).

SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT					
*COMMON NAME OF FISH	NUMBER	PERCENT	LENGTH RANGE (inches)	WEIGHT** (pounds)	PERCENT
Bluegill (Effort = 0.25 h)	70	42.7	1.2-8.1	6.57	9.7
Largemouth bass (Effort = 0.50 h)	94	57.3	3.4-14.4	60.93	90.3
Totals (2 species)	164	100.0		67.50	100.0
**does not include weight of 12 bluegill < 2.3 inches					

*Common names of fishes recognized by the American Fisheries Society.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF: Bluegill Deam Lake 5/24/05									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	EST. AVE. WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0	1	1.4	<0.01	—	19.0				
1.5	3	4.3	<0.01	1	19.5				
2.0	8	11.4	<0.01	1	20.0				
2.5	10	14.3	0.01	1, 2	20.5				
3.0	4	5.7	0.02	2, 3	21.0				
3.5	5	7.1	0.03	2, 3	21.5				
4.0	6	8.6	0.04	2, 3	22.0				
4.5	6	8.6	0.06	3, 4	22.5				
5.0	4	5.7	0.08	3, 4	23.0				
5.5	3	4.3	0.11	4, 5	23.5				
6.0	5	7.1	0.15	4	24.0				
6.5	4	5.7	0.19	4, 5	24.5				
7.0	1	1.4	0.24	5	25.0				
7.5	7	10.0	0.30	4, 5	25.5				
8.0	3	4.3	0.38	5, 6	26.0				
8.5					TOTAL	70			
9.0									
9.5						PSD = 17/47(100) = 36.2			
10.0									
10.5						%≥ 6.0 inches = 17/70(100) = 24.3			
11.0									
11.5						Bluegill Fishing Potential Index = 20 (good)			
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	280.0/hr	GILL NET CATCH	N/A	TRAP NET CATCH	N/A

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF: Largemouth bass Deam Lake 5/24/05									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	EST. AVE. 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	1	1.1	0.02	1	21.5				
4.0	2	2.1	0.03	1	22.0				
4.5	1	1.1	0.04	1	22.5				
5.0	2	2.1	0.05	1	23.0				
5.5					23.5				
6.0					24.0				
6.5					24.5				
7.0					25.0				
7.5	1	1.1	0.19	2	25.5				
8.0	8	8.5	0.24	2	26.0				
8.5	2	2.1	0.28	2	TOTAL	94			
9.0	10	10.6	0.34	2, 3					
9.5	3	3.2	0.41	2, 3		PSD = 30/84(100) = 35.7			
10.0	13	13.8	0.48	3, 4					
10.5	6	6.4	0.57	3, 4		%≥ 14.0 inches = 3/94(100) = 3.2			
11.0	7	7.4	0.64	3, 4					
11.5	5	5.3	0.74	4					
12.0	6	6.4	0.84	4, 5					
12.5	10	10.6	0.97	4, 5					
13.0	7	7.4	1.09	4, 5					
13.5	6	6.4	1.24	4, 5, 6					
14.0	3	3.2	1.39	5, 6					
14.5	1	1.1	1.59	5					
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	188.0/hr	GILL NET CATCH	N/A	TRAP NET CATCH	N/A

Species Bluegill	YEAR CLASS	Number of fish aged	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE							
				1	2	3	4	5	6	7	8
Intercept= 0.8"	2004	8	1.6-2.4	1.6							
	2003	9	2.5-4.0	1.7	2.5						
	2002	11	3.2-5.0	1.6	2.4	3.6					
	2001	16	4.4-7.5	1.5	2.3	3.4	5.5				
	2000	9	5.5-8.1	1.5	2.6	4.3	5.8	6.8			
	1999	1*	8.1	1.4	1.9	3.5	6.4	7.2	7.9		
	AVERAGE LENGTH			1.6	2.4	3.8	5.7	6.8			
	NUMBER AGED			53	45	36	25	9			

Species Largemouth bass	YEAR CLASS	Number of fish aged	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE							
				1	2	3	4	5	6	7	8
Intercept= 0.8"	2004	6	3.4-4.8	4.1							
	2003	9	7.6-9.4	3.4	7.9						
	2002	16	8.9-11.0	4.1	7.0	9.7					
	2001	19	10.0-13.7	4.2	8.3	10.2	11.6				
	2000	17	11.9-14.4	3.9	7.4	10.0	11.6	12.6			
	1999	2*	13.4-14.2	4.7	7.6	9.9	11.9	12.8	13.6		
	AVERAGE LENGTH			3.9	7.7	10.0	11.6	12.6			
	NUMBER AGED			67	61	52	36	17			

Species	YEAR CLASS	Number of fish aged	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE							
				1	2	3	4	5	6	7	8
Intercept=											
	AVERAGE LENGTH										
	NUMBER AGED										

Species Black crappie	YEAR CLASS	Number of fish aged	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE							
				1	2	3	4	5	6	7	8
Intercept=											
	AVERAGE LENGTH										
	NUMBER AGED										

*Not included in average length calculations.

GPS LOCATION OF SAMPLING EQUIPMENT, DEAM LAKE MAY 24, 2005

GILL NETS			TRAP NETS			ELECTROFISHING		
1	N	W	1	N	W	1	N 38.46888	W -85.86499
	N	W	2	N	W		N 38.47101	W -85.85881
2	N	W	3	N	W	2	N 38.47211	W -85.86153
	N	W	4	N	W		N 38.47087	W -85.86221
3	N	W	5	N	W	3	N	W
	N	W	6	N	W		N	W
4	N	W	7	N	W	4	N	W
	N	W	8	N	W		N	W
5	N	W	9	N	W	5	N	W
	N	W	10	N	W		N	W
6	N	W	11	N	W	6	N	W
	N	W	12	N	W		N	W
7	N	W	13	N	W	7	N	W
	N	W	14	N	W		N	W
8	N	W	15	N	W	8	N	W
	N	W	16	N	W		N	W
9	N	W	17	N	W	9	N	W
	N	W	18	N	W		N	W
10	N	W	19	N	W	10	N	W
	N	W	20	N	W		N	W
11	N	W				11	N	W
	N	W					N	W
12	N	W				12	N	W
	N	W					N	W
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

Occurrence and Abundance of Submersed Aquatic Plants in Deam Lake

Date:	8/11/05	Littoral sites with plants:	42	Species diversity:	0.81
Littoral depth (ft):	19.5	Number of species:	8	Native diversity:	0.76
Littoral sites:	47	Maximum species/site:	5	Rake diversity:	0.76
Total sites:	51	Mean number species/site:	1.98	Native rake diversity:	0.69
Secchi (ft.):	14.3	Mean native species/site:	1.53	Mean rake score:	1.77

Common Name	**Site frequency**	**Relative density**	**Mean density**	**Dominance**
Southern naiad	55.3	1.66	3.00	33.2
Eurasian watermilfoil *	44.7	1.09	2.43	21.7
Coontail	34.0	0.66	1.94	13.2
Chara	31.9	1.02	3.20	20.4
Arrowhead sp. rosette	12.8	0.13	1.00	2.6
Brittle naiad	10.6	0.17	1.60	3.4
Leafy pondweed	6.4	0.06	1.00	1.3
Nitella	2.1	0.02	1.00	0.4
Other Observed Vegetation				
SUBMERSED: Filamentous algae				
EMERGENT: Arrowhead sp., Broadleaf cattail, Bulrush sp., Creeping water primrose, Spikerush sp.				
* Exotic plant				