

A Fisheries Survey of Palestine Lake, Kosciusko County, Indiana, July 2003

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## INTRODUCTION

Palestine Lake, located in Kosciusko County, Indiana, is a shallow lake where maximum depth is 30 feet and average depth is only 4 feet (Figure 1). This lake suffered a winterkill in 1978, which allowed undesirable fish, such as carp and gizzard shad, to become the dominant species (Braun 1991). By 1982, these fish had also migrated into Caldwell Lake and, consequently, dominated both lake populations (Kittaka 2000). Once these species were abundant, the game fish populations were unable to recover in number, and as a result, rotenone was applied in 1988 to the lake, its tributaries, and Caldwell Lake to remove fish. Restocking of largemouth bass, bluegill, redear sunfish, and channel catfish occurred in the fall of 1988 and length limits were imposed on both lakes in order to protect the fish from harvest and enable the establishment of a sizable population (Table 1). In addition, northern pike were stocked into Palestine Lake in 1991, 1993, 1994, and 1995, and muskellunge were stocked in 1997, 1998, 1999, 2002, and 2003.



Figure 1. East and west basins of Palestine Lake located in Kosciusko County, Indiana.

A general fish population survey was last conducted in Palestine Lake in 1999 and showed a population structure that was different from the one expected based on previous stocking efforts (Kittaka 2000). During the 1999 survey, gizzard shad were second in abundance to bluegill. In addition, the largemouth bass only accounted for 4% of the catch, but age-1 fish were captured which did indicate some recruitment.

Table 1. Species, number, and sizes of fish stocked into Palestine Lake, Kosciusko County.

Year	Species	Number	Size Range (in)
1988	Largemouth bass	12,627	2.5-16.0
1988	Bluegill	220,000	0.2-1.7
1988	Redear sunfish	92,300	0.6-1.4
1988	Channel catfish	7,252	1.0-11.3
1990	Channel catfish	7,242	5.0-11.8
1991	Northern pike	1,500	8.3-10.9
1993	Northern pike	1,500	7.6-10.0
1994	Northern pike	1,500	8.2-11.9
1995	Northern pike	1,500	8.2-11.8
1997	Muskellunge	1,727	6.6-10.1
1998	Muskellunge	1,450	8.9-13.3
1999	Muskellunge	1,450	9.0-13.2
2002	Muskellunge	1,450	8.5-11.0
2003	Muskellunge	580	8.5-11.0

In contrast, age-0 and age-1 redear sunfish were not captured, indicating poor recruitment of this population. No muskellunge or channel catfish and only six northern pike were collected during the 1999 survey. This general survey of the population of fish in Palestine Lake is necessary to evaluate changes in the population that may have occurred in the past few years and determine management strategies that may be necessary to improve the game fish populations within the lake.

## RESULTS

A total of 930 fish consisting of 15 species and one hybrid were captured from gill nets, trap nets, and night boat electrofishing in the east and west basins of Palestine Lake (Table 2). The total weight of all captured fish was 347.81 lbs. The most abundant fish species in the lake were bluegill, largemouth bass, black crappie, gizzard shad, and golden shiner. The least abundant fish in this lake were pumpkinseed, yellow perch,

redeer sunfish, white sucker, brown bullhead, yellow bullhead, hybrid bluegill, channel catfish, and green sunfish. Of the six species of fish stocked into Palestine Lake (bluegill, largemouth bass, redear sunfish, channel catfish, muskellunge, and northern pike), only four of these were captured during the survey. The other species collected were not stocked by the Department of Natural Resources.

Table 2. Amount of effort and relative abundance of fish species collected from Palestine Lake, Kosciusko County, Indiana, in 2003, 1999, 1997, and 1995.

<b>Species</b>	<b>2003</b>	<b>1999</b>	<b>1997</b>	<b>1995</b>
Bluegill	509	1209	1484	928
Largemouth bass	109	102	59	108
Black crappie	106	143	205	212
Gizzard shad	74	508	15	79
Golden shiner	73	216	29	2
Black bullhead	18	70	30	104
Warmouth	11	149	16	13
Pumpkinseed	7	256	42	60
Yellow perch	6	-	-	1
Redear sunfish	5	78	45	128
White sucker	5	2	9	1
Brown bullhead	2	-	3	-
Yellow bullhead	2	-	8	1
Hybrid bluegill	1	10	4	-
Channel catfish	1	-	-	20
Green sunfish	1	2	-	-
Northern pike	-	6	4	10
Grass pickerel	-	3	-	-
Carp	-	1	1	1
<b>Total</b>	<b>930</b>	<b>2755</b>	<b>1954</b>	<b>1668</b>
<b>Effort</b>	<b>2003</b>	<b>1999</b>	<b>1997</b>	<b>1995</b>
Electrofishing hrs	2.0	1.0	1.5	1.5
Gill net lifts	6	3	3	6
Trap net lifts	6	5	3	6

Bluegill was the most abundant species captured and comprised 54.7% of the total catch (N = 509). These fish ranged in size from 2.1 to 8.7 in and had a batch weight of

87.91 lbs (25.3% of total weight). Captured bluegills were ages 1+ through 8+ and growth for these fish was average. The PSD for bluegill in this lake was 55.4 and the RSD-8 was 16.7.

Largemouth bass (length range, 5.7 to 18.3 in) were second in abundance based on total catch (N = 109; 11.7%). However, this species comprised the largest percentage by weight (91.06 lbs; 26.2%) overall. Largemouth bass in this lake were ages 1+ through 9+. No age-7 largemouth bass (year-class 1996) were captured during this survey. Growth of these fish was slightly above average. The PSD for largemouth bass in this lake was 33.0. The RSD-14 was 28.6 and the RSD-18 was 1.1.

Black crappie were the third most abundant species by catch (N = 106) despite not being stocked into the lake, and represented 11.4% of the total number of fish captured during the survey (length range, 5.9 to 12.6 in). However, this species comprised only 7.4% of the total weight of captured fish (25.68 lbs). The black crappie ranged in age from 2+ through 6+. No age-1 or age-5 fish were collected. Growth of these fish was slightly below average.

Gizzard shad (N = 74) were the fourth most abundant species based on total catch (8.0%). In contrast, this species was the third most abundant based on percent weight and comprised 23.2% of the total weight captured from the lake (80.60 lbs) even though they were not stocked. These fish ranged in length from 12.7 to 15.7 in.

Golden shiners made up 7.8% of the total catch (N = 73). These fish weighed only 1.6% of the total weight of fish (5.48 lbs) captured during the survey. Eleven other species were collected including two stocked and nine unstocked species.

Water quality was determined for both the east and west basins of Palestine Lake. In the east basin, surface dissolved oxygen (DO) was 8.8 ppm (parts per million), whereas in the west basin, surface DO was 12.0. Adequate oxygen levels for fish were not present below 8 ft in either the east or west basin. The color of the water was greenish-brown and the secchi disk readings were 3 ft, 4 in for both basins. Low secchi readings may indicate water that is too turbid to allow efficient feeding for sight-feeding species such as largemouth bass.

Vegetation sampling resulted in the identification of 8 different species of submerged, emergent, floating, and shoreline vegetation, including coontail, spatterdock,



arrowhead, duckweed, water meal, cattails, purple loosestrife, and water willow (Table 3). The dominant algae found during this survey was pithophora. Coontail was the dominant submerged vegetation, and water meal and duckweed covered most of the sampled area.

## DISCUSSION

The population structure of fish in Palestine Lake has only slightly changed since this lake was last surveyed in 1999. The total number of fish captured in 2003 was less than half of what was captured during the same amount of sampling effort in 1999 (Kittaka 2000). Three game species, bluegill, largemouth bass, and black crappie, dominated the fishery, unlike 1999 when bluegill, gizzard shad, and pumpkinseed were the most abundant species in the lake. Although bluegill were the most abundant species collected during both the 1999 and 2003 surveys, the PSD and RSD-8 of those fish were higher in 2003. In addition, the largemouth bass population in 2003 had a higher PSD and comprised a larger percentage of the total number of fish captured than in 1999, indicating that this fishery may be steadily improving each year. The RSD-14 and RSD-18 values for largemouth bass were similar between the 1999 and 2003 surveys. Fewer gizzard shad were collected during this survey and all fish ranged in size between 12.7 and 15.7 in, so predators such as largemouth bass may be utilizing small gizzard shad as a prey resource. Black, brown, and yellow bullhead, as well as channel catfish are still found in Palestine Lake, however, their numbers remain low and they comprise less than 3% of the total number of fish found in this lake. In addition, no carp were collected during the 2003 survey, whereas in both 1997 and 1999, carp were captured from the lake (Braun 1997; Kittaka 2000). Therefore, it appears that carp are not an important component of the fishery in Palestine Lake at this time.

Although muskellunge were last stocked in Palestine Lake in 2003, and northern pike in 1995, none of these fish were captured during the 2003 survey. This is an indication that stocking efforts in this lake were unsuccessful in establishing naturally reproducing populations. In addition, muskellunge in this lake do not appear to survive for long after stocking has taken place, either migrating over the dam or dying at high water temperatures in the summer. Based on these data and previous surveys, continued

stocking of this lake will not produce a naturally reproducing population, possibly due to a limitation in suitable habitat necessary for their survival (i.e., high water temperatures and low DO at depths less than 8 ft) and the muskellunge fishery in this lake will continue to be hatchery-based (Kittaka 1999).

#### RECOMMENDATIONS

General fisheries surveys should continue to be conducted periodically in this lake in order to evaluate changes that occur in the game fish populations and monitor the gizzard shad abundance. In addition, the heavy vegetation and low DO levels in this lake should be addressed and investigated with the assistance of the lake association in order to further improve water quality and consequently, the game fish fishery. Further, muskellunge should continue to be stocked into this lake in order to maintain a productive fishery for this species.

#### LITERATURE CITED

- Braun, E. R. 1991. Palestine Lake Kosciusko County fish management report. Indiana Department of Natural Resources, Indianapolis, Indiana.
- Braun, E. R. 1991. Palestine Lake Kosciusko County fish management report. Indiana Department of Natural Resources, Indianapolis, Indiana.
- Kittaka, D. S. 2000. Palestine Lake Kosciusko County fish management report. Indiana Department of Natural Resources, Indianapolis, Indiana.

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APPENDIX 1

Lake Survey Report and Relative Abundance of Fish Species by Number and Weight

**LAKE SURVEY REPORT**

Type of Survey
<input type="checkbox"/> Initial Survey <input checked="" type="checkbox"/> Re-Survey

Lake Name	County	Date of survey (Month, day, year)
Palestine Lake	Kosciusko	07/14-15/2003
Biologist's name	Date of approval (Month, day, year)	
Edward R. Braun		

LOCATION		
Quadrangle Name	Range	Section
Burket	5E	1, 2, 33, 34
Township Name	Nearest Town	
31N, 32N	Palestine, Indiana	

ACCESSIBILITY					
State owned public access site		Privately owned public access site		Other access site	
Northwest corner of lake					
Surface acres	Maximum depth	Average depth	Acre feet	Water level	Extreme fluctuations
290	30 Feet	4 Feet	1,170	816.75 MSL	None
Location of benchmark					
At public access site on northwest corner of lake					

INLETS		
Name	Location	Origin
Williamson Ditch	NW edge	farmland
Sloan Ditch	South corner	farmland
Magee Ditch	NE corner	farmland

OUTLETS			
Name	Location		
Trimble Creek	NW corner		
Water level control			
Concrete dam and mill race			
<b>POOL</b>	<b>ELEVATION (Feet MSL)</b>	<b>ACRES</b>	<b>Bottom type</b>
TOP OF DAM			<input type="checkbox"/> Bolder
TOP OF FLOOD CONTROL POOL			<input checked="" type="checkbox"/> Gravel
TOP OF CONSERVATION POOL			<input checked="" type="checkbox"/> Sand
TOP OF MINIMUM POOL			<input checked="" type="checkbox"/> Muck
STREAMBED			<input checked="" type="checkbox"/> Clay
			<input type="checkbox"/> Marl
Watershed use			
General farming and residential			
Development of shoreline			
Previous surveys and investigations			
Lake mapping (U.S.G.S.) Fisheries surveys IDNR 1975, 1977, 1978, 1988, 1989, 1990, 1991, 1993, 1995, 1997, 1999. Winterkill 1977, Renovation and dam repair 1988.			

Date: 7/14-15/2003

SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT					
*COMMON NAME OF FISH	NUMBER	PERCENT	LENGTH RANGE (inches)	WEIGHT (pounds)	PERCENT
Bluegill	509	54.7	2.1-8.7	87.91	25.3
Largemouth bass	109	11.7	5.7-18.3	91.06	26.2
Black crappie	106	11.4	5.9-12.6	25.68	7.4
Gizzard shad	74	8.0	12.7-15.7	80.60	23.2
Golden shiner	73	7.8	5.5-8.1	5.48	1.6
Black bullhead	18	1.9	6.7-14.4	18.52	5.3
Warmouth	11	1.2	4.2-9.2	4.33	1.2
Pumpkinseed	7	0.8	3.5-7.1	1.14	0.3
Yellow perch	6	0.6	7.8-12.9	2.33	0.7
Redear sunfish	5	0.5	9.1-10.5	3.64	1.0
White sucker	5	0.5	13.4-20.4	11.83	3.4
Brown bullhead	2	0.2	12.1-13.6	3.02	0.9
Yellow bullhead	2	0.2	11.6-14.7	2.72	0.8
Hybrid bluegill	1	0.1	9.7	0.69	0.2
Channel catfish	1	0.1	28.5	8.81	2.5
Green sunfish	1	0.1	4.4	0.05	0.0
Total (15 Species/1 Hybrid)	930	100.0		347.81	100.0

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

APPENDIX 2

Sampling Effort, Water Quality Parameters, and Vegetation Sampling

SAMPLING EFFORT					
ELECTROFISHING	Day hours		Night hours		Total hours
	0		1		1
TRAP NETS	Number of traps		Number of Lifts		Total effort
	3		1		3
GILL NETS	Number of nets		Number of Lifts		Total effort
	3		1		3
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

**Palestine Lake East Basin**

PHYSICAL AND CHEMICAL CHARACTERISTICS			
Color	Turbidity		Air temperature: F
Greenish brown	3 Feet	4 Inches (SECCHI DISK)	
Water chemistry GPS coordinates:		N	W

WATER QUALITY PARAMETERS															
DEPTH (Feet)	Degrees (F)	D.O.	SpC	pH	TDS	D.O.%	Turb.	DEPTH	Degrees (F)	D.O.	SpC	pH	TDS	D.O.%	Turb.
SURFACE	75.4	8.8	0.62	8.5	0.4	107.8	8.0	52							
2	75.1	8.3	0.62	8.5	0.4	100.8	6.6	54							
4	73.6	5.6	0.61	8.2	0.4	67.9	4.6	56							
6	72.1	1.1	0.62	7.9	0.4	13.5	3.9	58							
8	71.7	0.0	0.63	7.8	0.4	0.1	7.0	60							
10	71.0	0.0	0.64	7.8	0.4	0.0	4.3	62							
12	70.5	0.0	0.64	7.8	0.4	0.0	3.2	64							
14	67.0	0.0	0.65	7.7	0.4	0.0	71.3	66							
16	61.8	0.0	0.71	7.6	0.5	0.0	30.0	68							
18	59.7	0.0	0.76	7.4	0.5	0.0	0.0	70							
20								72							
22								74							
24								76							
26								78							
28								80							
30								82							
32								84							
34								86							
36								88							
38								90							
40								92							



SAMPLING EFFORT					
ELECTROFISHING	Day hours		Night hours		Total hours
	0		1		1
TRAP NETS	Number of traps		Number of Lifts		Total effort
	3		1		3
GILL NETS	Number of nets		Number of Lifts		Total effort
	3		1		3
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

**Palestine Lake West Basin**

PHYSICAL AND CHEMICAL CHARACTERISTICS			
Color	Turbidity		Air temperature: F
Greenish brown	3 Feet	4 Inches (SECCHI DISK)	
Water chemistry GPS coordinates:		N	W

WATER QUALITY PARAMETERS															
DEPTH (Feet)	Degrees (F)	D.O.	SpC	pH	TDS	D.O.%	Turb.	DEPTH	Degrees (F)	D.O.	SpC	pH	TDS	D.O.%	Turb.
SURFACE	76.4	12.0	0.56	9.0	0.4	148.2	16.9	52							
2	75.5	10.9	0.56	8.9	0.4	133.4	17.6	54							
4	74.6	8.5	0.58	8.6	0.4	103.7	14.9	56							
6	73.1	2.3	0.58	8.0	0.4	28.0	8.2	58							
8	72.4	0.0	0.58	7.9	0.4	0.0	5.1	60							
10	72.0	0.0	0.58	7.9	0.4	0.0	5.0	62							
12	71.2	0.0	0.59	8.0	0.4	0.0	5.8	64							
14	69.3	0.0	0.58	8.0	0.4	0.0	7.3	66							
16	65.7	0.0	0.59	8.0	0.4	0.0	9.0	68							
18	62.5	0.0	0.60	8.0	0.4	0.0	12.9	70							
20	60.4	0.0	0.62	7.9	0.4	0.0	13.7	72							
22	59.0	0.0	0.64	7.8	0.4	0.0	13.0	74							
24	58.0	0.0	0.66	7.6	0.4	0.0	12.8	76							
26	56.8	0.0	0.68	7.5	0.4	0.0	25.8	78							
28								80							
30								82							
32								84							
34								86							
36								88							
38								90							
40								92							

Dominant vegetation distribution and abundance in Palestine Lake, Kosciusko County, Indiana, July 2003. The amount of area covered by submersed aquatic plants was estimated using values of 1 to 5, where 1 was the lowest rating and 5 was the highest. A rating of 0 indicates the absence of a species at a particular location. Percentages indicate percent of surface cover, whereas the value "P" indicates their submersed presence.

<b>Lake</b>	Palestine	<b>Secchi (ft)</b>	4.5
<b>County</b>	Kosciusko	<b>Max Plant Depth (ft)</b>	
<b>Lake ID</b>		<b>Weather</b>	Sunny
<b>Date</b>	7/29/2003	<b>Comments</b>	
<b>Biologist</b>	Kittaka & Sweeten		

<b>Site</b>	<b>Lat</b>	<b>Lon</b>	<b>Depth</b>	<b>All</b>	<b>Coontail</b>	<b>Algae</b>	<b>Duckweed</b>	<b>Spatter Dock</b>	<b>Water Meal</b>
450	41.179698	-85.948373	4	1	0	P	P	0	0
451	41.179408	-85.947729	5.5	1	0	P	P	0	P
452	41.178716	-85.947011	5	1	0	P	0	0	0
453	41.177895	-85.945991	4	1	0	25%	50%	0	0
454	41.17826	-85.945283	3	1	0	P	0	0	0
455	41.177246	-85.945203	4	2	0	P	P	0	0
456	41.176409	-85.944972	3	4	0	95%	25%	0	0
457	41.17664	-85.942837	4.5	4	0	65%	25%	0	0
458	41.174939	-85.941378	6	1	0	P	0	0	0
459	41.173931	-85.941593	7.5	0	0	0	0	0	P
460	41.172858	-85.942907	4.5	1	0	P	0	0	0
461	41.171994	-85.943438	2.25	1	1	95%	25%	0	10%
462	41.170986	-85.942456	4.5	5	1	P	0	0	0
463	41.170455	-85.942413	3.5	1	1	25%	50%	50%	50%
464	41.169999	-85.941614	4	2	1	P	P	0	P
465	41.168196	-85.941281	2.75	1	0	0	0	0	0
466	41.167638	-85.940707	2	1	1	0	0	0	0
467	41.168743	-85.940713	3.25	3	2	P	0	0	0
468	41.168212	-85.93927	1.75	1	1	0	0	0	0
469	41.16928	-85.939849	3	2	1	P	P	0	0
470	41.170192	-85.939366	4	3	1	P	0	0	0
471	41.170921	-85.938808	4.75	2	0	P	0%	0	0
472	41.170632	-85.937521	3.5	1	0	100%	100%	0	100%
473	41.171249	-85.936298	2.5	3	3	80%	100%	0	100%
474	41.170793	-85.935407	2.25	1	1	P	100%	0	100%
475	41.171651	-85.935767	3	1	0	10%	100%	0	100%
476	41.171806	-85.936995	3.25	1	1	0	100%	40%	100%
477	41.172091	-85.937049	4	5	1	P	10%	0	100%
478	41.172675	-85.937011	1.75	5	0	40%	100%	100%	100%
479	41.173207	-85.937907	4.5	3	0	P	0	0	0
488	41.175642	-85.937006	4	3	1	P	50%	0	50%
489	41.175728	-85.936389	3	4	2	75%	100%	0	100%
490	41.176055	-85.936287	4	1	0	P	P	0	P
491	41.175959	-85.935649	3.5	1	1	P	P	0	P
492	41.175154	-85.935702	3	2	0	90%	100%	0	100%
493	41.175063	-85.935134	3	1	1	P	P	0	P
494	41.174617	-85.933707	3	1	1	P	P	0	P
495	41.173947	-85.93316	3	4	4	0	100%	10%	100%
496	41.174929	-85.932655	3.25	3	1	P	P	0	P
497	41.175744	-85.933514	4.25	1	1	P	0	0	0
498	41.176533	-85.93501	4	5	1	20%	50%	P	50%
499	41.176806	-85.934394	6	2	1	P	0	0	0
500	41.178238	-85.933653	3.5	1	0	P	P	0	P
501	41.178786	-85.934935	7.5	1	0	P	0	0	0
502	41.1787	-85.936378	3	5	5	40%	50%	50%	50%

503	41.178056	-85.936813	3.75	3	0	P	0	0	0
504	41.179606	-85.938347	3	1	0	50%	100%	0	100%
505	41.179231	-85.939372	2.25	1	0	P	P	0	P
506	41.177954	-85.93787	3.5	1	0	P	0	0	0
507	41.176811	-85.937226	3	5	5	50%	100%	25%	100%
508	41.177289	-85.939393	3.25	1	0	P	50%	0	50%
509	41.17606	-85.938326	4	4	0	80%	100%	0	100%
510	41.175106	-85.938948	4.75	1	0	P	0%	0	0
511	41.175814	-85.939935	3	5	1	90%	50%	0	50%
512	41.176473	-85.941737	5.5	1	0	P	0	0	0%
513	41.178474	-85.942429	4.5	2	0	P	0	0	0%
514	41.179746	-85.943277	4	5	0	100%	P	0	P
516	41.178442	-85.943738	4.5	3	1	P	P	0	P
517	41.179821	-85.945128	3	1	0	80%	75%	P	75%
518	41.178845	-85.945643	3.5	1	0	P	P	P	P
519	41.180529	-85.947735	5.5	1	0	P	P	0	P
520	41.181377	-85.947091	6	1	0	P	P	0	P
521	41.181945	-85.947638	7	1	1	P	P	0	P
522	41.180084	-85.948352	4.5	1	1	P	P	P	P
523	41.179917	-85.948314	5.5	0	0	0	P	0	P

### APPENDIX 3

Length Ranges for Bluegill, Largemouth Bass, and Black Crappie for Each Gear Type:

Gill Nets (GN), Electrofishing (EF), and Trap Nets (TN)

Back-Calculated Lengths at Each Age for Bluegill, Largemouth Bass, and Black Crappie

Body of water: Palestine Lake  
 Date: 7/14-15/2003  
 Species: Bluegill  
 PSD: 55.4

CPUE:  
 Gill nets: 3 fish/lift  
 Electrofishing: 209 fish/h  
 Trap nets: 97 fish/lift

	GN	EF	TN	Total
SS <sup>a</sup>	9	204	262	475
QS <sup>b</sup>	6	113	97	216
PS <sup>c</sup>	1	22	33	56
MS <sup>d</sup>	0	0	0	0
TS <sup>e</sup>	0	0	0	0
HS <sup>f</sup>	6	120	108	234
Total	9	209	291	509

<sup>a</sup>SS = stock size  
<sup>b</sup>QS = quality size  
<sup>c</sup>PS = preferred size  
<sup>d</sup>MS = memorable size  
<sup>e</sup>TS = trophy size  
<sup>f</sup>HS = harvest size

Length	GN	EF	TN	Total	Avg. Wt.	Age
2.0	0	3	2	5	0.01	1+
2.5	0	0	17	17	0.01	1+
3.0	0	2	24	26	0.02	1+
3.5	0	0	12	12	0.02	1+, 2+
4.0	0	8	16	24	0.04	2+
4.5	1	24	50	75	0.06	2+
5.0	1	30	31	62	0.08	2+, 3+
5.5	1	22	31	54	0.12	3+
6.0	0	19	15	34	0.15	3+, 4+
6.5	1	19	18	38	0.21	4+
7.0	2	21	17	40	0.27	4+, 5+
7.5	0	27	17	44	0.33	5+
8.0	2	20	27	49	0.39	5+, 6+
8.5	1	14	14	29	0.44	6+, 7+, 8+

Body of water: Palestine Lake  
 Date: 7/14-15/2003  
 Species: Largemouth bass  
 PSD: 33

CPUE:  
 Gill nets: 1.3 fish/lift  
 Electrofishing: 105 fish/h  
 Trap nets: 0 fish/lift

	GN	EF	TN	Total	
SS <sup>a</sup>	2	91	0	93	<sup>a</sup> SS = stock size
QS <sup>b</sup>	2	30	0	32	<sup>b</sup> QS = quality size
PS <sup>c</sup>	2	23	0	25	<sup>c</sup> PS = preferred size
MS <sup>d</sup>	0	0	0	0	<sup>d</sup> MS = memorable size
TS <sup>e</sup>	0	0	0	0	<sup>e</sup> TS = trophy size
HS <sup>f</sup>	2	26	0	28	<sup>f</sup> HS = harvest size
Total	4	105	0	109	

Length	GN	EF	TN	Total	Avg. Wt. (lbs)	Age
5.5	0	2	0	2	0.08	1+
6.0	2	6	0	8	0.10	1+
6.5	0	2	0	2	0.12	1+
7.0	0	2	0	2	0.15	1+
7.5	0	1	0	1	0.22	1+
8.0	0	2	0	2	0.23	2+
8.5	0	7	0	7	0.28	2+
9.0	0	15	0	15	0.33	2+
9.5	0	9	0	9	0.39	2+
10.0	0	7	0	7	0.46	2+
10.5	0	11	0	11	0.55	2+
11.0	0	5	0	5	0.64	2+
11.5	0	6	0	6	0.74	2+, 3+
12.0	0	1	0	1	0.94	2+, 3+
13.5	0	3	0	3	1.16	3+, 4+
14.0	0	1	0	1	1.49	3+, 4+
14.5	0	2	0	2	1.60	4+, 5+
15.0	0	8	0	8	1.72	4+, 5+
15.5	0	5	0	5	1.98	4+, 5+
16.0	0	4	0	4	1.92	5+, 6+
16.5	1	4	0	5	2.31	5+, 6+
17.0	0	1	0	1	2.75	6+
18.0	1	0	0	1	3.22	6+, 7+, 8+, 9+
18.5	0	1	0	1	3.56	8+, 9+

Body of water: Palestine Lake

Date: 7/14-15/2003

Species: Black crappie

PSD: 23.6

CPUE:

Gill nets: 18.3 fish/lift

Electrofishing: 0 fish/h

Trap nets: 17 fish/lift

	GN	EF	TN	Total	
SS <sup>a</sup>	55	0	51	106	<sup>a</sup> SS = stock size
QS <sup>b</sup>	13	0	12	25	<sup>b</sup> QS = quality size
PS <sup>c</sup>	3	0	0	3	<sup>c</sup> PS = preferred size
MS <sup>d</sup>	3	0	0	3	<sup>d</sup> MS = memorable size
TS <sup>e</sup>	0	0	0	0	<sup>e</sup> TS = trophy size
HS <sup>f</sup>	8	0	9	17	<sup>f</sup> HS = harvest size
Total	55	0	51	106	

Length	GN	EF	TN	Total	Avg. Wt. (lbs)	Age
6.0	3	0	2	5	0.12	2+
6.5	13	0	12	25	0.14	2+, 3+
7.0	10	0	13	23	0.19	2+, 3+
7.5	12	0	10	22	0.23	2+, 3+
8.0	9	0	5	14	0.28	2+, 3+
8.5	4	0	7	11	0.35	2+, 3+, 4+
9.0	1	0	2	3	0.36	3+, 4+
12.0	2	0	0	2	0.98	4+, 5+, 6+
12.5	1	0	0	1	1.09	3+, 4+, 5+, 6+

Species: Bluegill  
Intercept = 0.8

Year Class	Number Aged	Back Calculated Length (inches) at Each Age							
		I	II	III	IV	V	VI	VII	VIII
2002	26	1.8	0	0	0	0	0	0	0
2001	39	1.9	3.4	0	0	0	0	0	0
2000	32	1.7	3.5	5.5	0	0	0	0	0
1999	7	1.8	3.4	5.5	6.4	0	0	0	0
1998	8	2.6	4.2	5.6	6.8	7.7	0	0	0
1997	4	2.5	4.2	5.6	6.6	7.6	8	0	0
1996	2	2.5	4.3	5.8	6.6	7.1	8	8.4	0
1995	2	1.9	3.4	4.5	5.9	6.6	7	7.5	8.2
Average Length		2.1	3.8	5.5	6.6	7.6	8	0	0
Standard Deviation		0.42	0.43	0.05	0.19	0.04	0	0	0
Yr. Classes Averaged		6	5	4	3	2	1	0	0

Species: Largemouth bass  
Intercept = 0.8

Year Class	Number Aged	Back Calculated Length (inches) at Each Age								
		I	II	III	IV	V	VI	VII	VIII	IX
2002	14	5.6	0	0	0	0	0	0	0	0
2001	47	4.2	8.9	0	0	0	0	0	0	0
2000	1	4.1	8.2	10.8	0	0	0	0	0	0
1999	8	4.5	8.8	11.4	13.9	0	0	0	0	0
1998	11	4.9	9	11.3	13.9	15.1	0	0	0	0
1997	5	4.5	8	10.9	12.8	15.3	16.2	0	0	0
0	0	0	0	0	0	0	0	0	0	0
1995	1	7.2	11.1	13.8	14.9	16.2	16.9	17.7	18.1	0
1994	1	7	8.7	10.5	12.7	14.3	16.1	16.6	17.2	17.9
Average Length		4.7	8.7	11.2	13.5	15.2	16.2	0	0	0
Standard Deviation		0.53	0.43	0.31	0.59	0.12	0	0	0	0
Yr. Classes Averaged		5	4	3	3	2	1	0	0	0

Species: Black crappie  
Intercept = 1.4

Year Class	Number Aged	Back Calculated Length (inches) at Each Age					
		I	II	III	IV	V	VI
0	0	0	0	0	0	0	0
2001	29	2.6	5.1	0	0	0	0
2000	19	2.9	5.5	7.1	0	0	0
1999	4	3.5	5.8	7.7	9	0	0
0	0	0	0	0	0	0	0
1997	1	3.1	5.7	7.4	9	10.3	12
Average Length		3	5.5	7.4	9	0	0
Standard Deviation		0.43	0.33	0.42	0	0	0
Yr. Classes Averaged		3	3	2	1	0	0