Carr Lake

Kosciusko County

Supplemental Evaluation

Date of Survey: May 27 to May 28, 2008

Date of Vegetation Survey: July 23, 2008

Biologist: Rod A. Edgell

Survey Objectives: To obtain additional data on bluegill and largemouth bass populations at Carr Lake.

Methods: Temperature and oxygen profiles were collected at the deepest point using a Hydrolab Quanta®. Submersed aquatic plants were sampled according to the Tier II Aquatic Vegetation Survey Protocol (IDNR 2007). A global positioning system device was used to record the location of all sampling locations.

Fish collection effort consisted of 1.0 h of pulsed D.C. night electrofishing with two dippers, and four trap nets set overnight (Figure 1). Bluegill and largemouth bass were the only two species collected during electrofishing. Total length of bluegill and largemouth bass was measured to the nearest 0.1 in and weight was measured to the nearest 0.01 lbs. Five scales per half-inch group were collected for age determination and back-calculated lengths-at-age. Length frequency distribution for reporting purposes will be grouped in half-inch groups which are defined as X.0 – X.4 and X.5 – X.9. Age length keys were also constructed to determine mean length at age. Proportional stock density (PSD) was calculated using electrofishing catch only (Anderson and Neumann 1996).

Summary: On May 27 the water temperature was 67.5ºF at the surface and a dissolved oxygen concentration greater than 3.0 ppm was present down to a depth of 16 ft. Submersed plants were recorded at a maximum depth of 12 ft, in July of 2008. A total of three native species and two non-native species were collected. The plant community is comprised mainly of coontail (frequency = 68%) and Eurasian watermilfoil (frequency = 43%). Eurasian watermilfoil was

only collected at 10% of the sample sites during the 2006 survey. Other species collected included water stargrass, southern naiad, and curly-leaf pondweed. Other species observed but not collected were Chara sp. and sago pondweed.

A total of 189 bluegills, ranging in total length from 1.1 to 9.4 in was collected at Carr Lake. The electrofishing and trap net catch rates were 155 fish/h and 9 fish/lift, respectively. The PSD for bluegill was 49 and the RSD-P was 24. Bluegills of quality size (6 in or greater) and preferred size (8 in or greater) comprised 47% and 28% of the sample, respectively. Based on the age length key and back calculated lengths at age the majority of bluegills reach 6 in between ages 3 - 4.

A total of 284 largemouth bass was collected at Carr Lake. The electrofishing and trap net catch rates were 283 fish/h and 0.25 fish/lift, respectively. Total length of largemouth bass collected ranged from 3.9 to 18.2 in. The PSD for largemouth bass during this survey was 49. Of the largemouth bass collected 52% were between 11 and 14 in, and only 4% were above the minimum size limit of 14 in. Based on the age length key and back calculated lengths at age the majority of largemouth bass reach 12 in between ages 4 - 5.

The bluegill population at Carr Lake has changed very little since the last survey, but has undergone noteworthy changes since the two previous surveys in 1988 and 2000 (Walterhouse 1988, Braun 2000, Grier 2007). Growth rates of bluegills continue to be average or above and the population contains a high percentage of fish greater than or equal to 8 in. Electrofishing catch rate of bluegills in 2008 was also very similar to that of 2006, but was much lower than what was observed during surveys in 1988 and 2000 (Table 1). Furthermore, there also appears to be a slight increase in growth rates of older age groups and the percentage of the population greater than or equal to 8 in has also increased since 1988. The decreasing catch rate of bluegills observed over the past few surveys loosely corresponds to the increase in catch rate of largemouth bass over the same time period. The establishment of a 14 in minimum size limit in 1998 could be responsible for the observed increase in the abundance of largemouth bass (Pearson 2008). The increased predation on bluegills by bass may explain the observed changes in the bluegill population. However, growth rates of bass remain average and the size structure is very similar to what was observed during past surveys.

It is premature to conclude that the increase in the bass population is exclusively responsible for the observed changes in bluegills. A number of factors can influence fish

populations including weather patterns and year class strength. Time of sampling can play a significant role in catch rates of certain species and can also influence survey results. This survey was conducted in late May as opposed to July when the aforementioned surveys were completed. Cooler temperatures in combination with the spawning period could have a played a role in the catch rate of largemouth bass during this survey.

Recommendations:

- Although no management actions are necessary at this time, the fishery should be resurveyed within the next five years in an effort to monitor any further changes. If resources are available a bass population estimate in combination with an angler creel survey should be considered.

- The bluegill fishery at Carr Lake is of high quality and should be promoted through the media.

- While some development of Carr Lake has taken place the entire shoreline remains relatively unchanged. Efforts by local residents and the Division of Fish and Wildlife to conserve and protect the natural shoreline at Carr Lake should be continued.

- The Lake and River Enhancement Program (LARE) provides technical and financial assistance to address non-point source pollution and exotic species within watersheds. One of the goals of this program is to protect or enhance aquatic habitat and recreational opportunities on Indiana's lakes and streams. A lake association should be formed by Carr Lake residents to utilize the LARE program for enhancement of water quality within the Carr Lake watershed.

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.

Braun, E. R. 2000. Carr Lake, Kosciusko County, 2000 Fish Management Report. Indiana Department of Natural Resources. Indianapolis, Indiana.

Grier, A. C. 2007. Carr Lake, Kosciusko County, 2006 Fish Management Report. Indiana Department of Natural Resources. Indianapolis, Indiana.

Indiana Department of Natural Resources. 2006. Tier II Aquatic Vegetation Survey Protocol. Indianapolis, Indiana.

Pearson, J. 2008. A long-term summary of largemouth bass population changes associated with minimum size limits at Indiana natural lakes. Indiana Department of Natural Resources. Indianapolis, Indiana.

Walterhouse, M. B. 1988. Carr Lake, Kosciusko County, 1988 Fish Management Report. Indiana Department of Natural Resources. Indianapolis, Indiana.

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Date: 7/25/2008

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Date: 7/28/2008

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Date: 7/30/2008

Figure 1. Sampling gear locations at Carr Lake, Kosciusko County, Indiana in May 2008.

Table 1. Electrofishing catch rate per hour (CPUE), back calculated lengths at age-3 and age-4, proportional stock density (PSD), percentage of the sample greater than or equal to 8 in (% ≥8in), and percentage of the sample greater than or equal to 14 in (% ≥14in) of bluegills and largemouth bass collected Carr Lake, Kosciusko County, Indiana from 1988 through 2008.

Year	CPUE	Age - 3	Age - 4	PSD	% ≥8in
			Bluegill		
1988	446	5.4	6.5	73	2%
2000	415	4.2	6.7	42	14%
2006	147	5.7	7.7	49	18%
2008	155	6.1	7.7	49	28%

Year	CPUE	Age - 3	Age - 4	PSD	% ≥14in
			Largemouth Bass		
1988	146	10.0	10.6	18	6%
2000	153	9.9	12.2	43	11%
2006	192	9.6	12.2	28	10%
2008	283	9.5	11.2	49	4%

Appendix
Lake Pages

LAKE SURVEY REPORT

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

Lake Name	County	Date of survey (Month, day, year)
Carr Lake	Kosciusko	5/27/2008
Biologist's name		Date of survey (Month, day, year)
Rod Edgell		5/28/2008

LOCATION		
Quadrangle Name	Range	Section
Warsaw	6E	9, 4
Township Name	Nearest Town	
31N	Claypool	

ACCESSIBILITY					
State owned public access site			Privately owned public access site		Other access site
Northwest Shore					
Surface acres	Maximum depth	Average depth	Acre feet	Water level	Extreme fluctuations
79	35 ft	17 ft	1,342	848.88 MSL	1 ft
Location of benchmark					
A water level gauge is located on the south shore.					

INLETS		
Name	Location	Origin
Unamed	Northwest	Reed Lake

OUTLETS	
Name	Location
Unamed to Walnut Creek	North Shore
Water level control	
Concrete Dam	

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

Bottom type

	Bolder
	Gravel
x	Sand
x	Muck
x	Clay
x	Marl

Watershed use

General Farming and Woodlots

Development of shoreline

South and northeast shorelines are developed for residential use. No shoreline modifications have been made.

Previous surveys and investigations

General Surveys: 1970, 1977, 1978, 1980, 1988, 2000, and 2006 (IDNR).

SAMPLING EFFORT					
ELECTROFISHING	Day hours		Night Hours		Total Hours
			1		1
TRAP NETS	Number of Traps		Number of Lifts		Total Lifts
	4		1		4
GILL NETS	Number of Nets		Number of Lifts		Total Lifts
ROTENONE	Gallons	ppm	Acre-feet Treated	SHORELINE SEINING	Number of 100 ft Seine Hauls

May 27, 2008 10:30 A.M.

PHYSICAL AND CHEMICAL CHARACTERISTICS						
Color	Turbidity (Secchi Disk)				Air Temperature	60.8 F
Brown	3	Feet	0	Inches	Water temperature	67.5 F
Water Chemistry GPS Coordinates	N	41.15812	W	85.86246		

WATER QUALLITY 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	67.5	11.5	0.4	8.5	0.3	130		52							
2	67.4	11.3	0.4	8.5	0.3	127		54							
4	67.1	11.0	0.4	8.5	0.3	124		56							
6	64.8	10.3	0.4	8.3	0.3	113		58							
8	62.3	9.3	0.4	9.3	0.3	99		60							
10	60.7	8.1	0.4	8.9	0.3	92		62							
12	60.0	8.0	0.4	8.0	0.3	82		64							
14	58.9	6.9	0.4	7.7	0.3	70		66							
16	57.4	4.7	0.4	7.3	0.3	48		68							
18	54.6	1.3	0.4	7.0	0.3	13		70							
20	51.7	0.0	0.4	6.8	0.3	0		72							
22	49.1	0.0	0.4	6.8	0.3	0		74							
24	48.1	0.0	0.4	6.8	0.3	0		76							
26	47.7	0.0	0.4	6.8	0.3	0		78							
28	47.2	0.0	0.4	6.7	0.3	0		80							
30	46.6	0.0	0.4	6.7	0.3	0		82							
32	46.3	0.0	0.4	6.6	0.3	0		84							
33	46.1	0.0	0.5	6.5	0.3	0		86							
36								88							
38								90							
40								92							
42								94							
44								96							
46								98							
48								100							
50															

COMMENTS
Air temperatures reached an overnight low of 41 F during sampling.

Occurrence and Abundance of Submersed Aquatic Plants - Overall

Lake: Carr Lake	Secchi(ft): 4.5	SE Mean species / site: 0.15
Date: 7/23/2008	Littoral sites with plants: 27	Mean natives / site: 0.73
Littoral Depth (ft): 12.0	Number of species: 5	SE Mean natives / site: 0.09
Littoral Sites: 31	Maximum species / site: 3	Species diversity: 0.54
Total Sites: 40	Mean species / site: 1.18	Native diversity: 0.13

	Frequency of	Score Frequency				
Species	**Occurrence**	**0**	**1**	**3**	**5**	**Dominance**
Coontail	67.5	32.5	17.5	7.5	42.5	50.5
Eurasian watermilfoil	42.5	57.5	20.0	10.0	12.5	22.5
Curly-leaf pondweed	2.5	97.5	2.5	0.0	0.0	0.5
Southern naiad	2.5	97.5	2.5	0.0	0.0	0.5
Water stargrass	2.5	97.5	2.5	0.0	0.0	0.5
Filamentous Algae	60.0					

Other species noted: Chara sp. and Sago pondweed

Occurrence and Abundance of Submersed Aquatic Plants - 0 to 5 ft.

Lake: Carr Lake	Secchi(ft): 4.5	SE Mean species / site: 0.17
Date: 7/23/2008	Littoral sites with plants: 17	Mean natives / site: 1.12
Littoral Depth (ft): 12.0	Number of species: 5	SE Mean natives / site: 0.08
Littoral Sites: 17	Maximum species / site: 3	Species diversity: 0.56
Total Sites: 17	Mean species / site: 1.71	Native diversity: 0.19

	Frequency of	Score Frequency				
Species	**Occurrence**	**0**	**1**	**3**	**5**	**Dominance**
Coontail	100.0	0.0	11.8	11.8	76.5	85.9
Eurasian watermilfoil	52.9	47.1	17.6	11.8	23.5	34.1
Curly-leaf pondweed	5.9	94.1	5.9	0.0	0.0	1.2
Southern naiad	5.9	94.1	5.9	0.0	0.0	1.2
Water stargrass	5.9	94.1	5.9	0.0	0.0	1.2
Filamentous Algae	94.1					

Other species noted:

Occurrence and Abundance of Submersed Aquatic Plants - 5 to 10 ft.

Lake: Carr Lake	Secchi(ft): 4.5	SE Mean species / site: 0.26	
Date: 7/23/2008	Littoral sites with plants: 9	Mean natives / site: 0.75	
Littoral Depth (ft): 12.0	Number of species: 2	SE Mean natives / site: 0.13	
Littoral Sites: 12	Maximum species / site: 2	Species diversity: 0.49	
Total Sites: 12	Mean species / site: 1.33	Native diversity: 0.00	

	Frequency of	Score Frequency				
Species	**Occurrence**	**0**	**1**	**3**	**5**	**Dominance**
Coontail	75.0	25.0	33.3	8.3	33.3	45.0
Eurasian watermilfoil	58.3	41.7	33.3	16.7	8.3	25.0
Curly-leaf pondweed	0.0	100.0	0.0	0.0	0.0	0.0
Southern naiad	0.0	100.0	0.0	0.0	0.0	0.0
Filamentous Algae	58.3					

Other species noted:

Occurrence and Abundance of Submersed Aquatic Plants - 10 to 15 ft.

Lake: Carr Lake	Secchi(ft): 4.5	SE Mean species / site: 0.18	
Date: 7/23/2008	Littoral sites with plants: 1	Mean natives / site: 0.09	
Littoral Depth (ft): 12.0	Number of species: 2	SE Mean natives / site: 0.09	
Littoral Sites: 2	Maximum species / site: 2	Species diversity: 0.50	
Total Sites: 11	Mean species / site: 0.18	Native diversity: 0.00	

	Frequency of	Score Frequency				
Species	**Occurrence**	**0**	**1**	**3**	**5**	**Dominance**
Coontail	9.1	90.9	9.1	0.0	0.0	1.8
Eurasian watermilfoil	9.1	90.9	9.1	0.0	0.0	1.8
Curly-leaf pondweed	0.0	100.0	0.0	0.0	0.0	0.0
Southern naiad	0.0	100.0	0.0	0.0	0.0	0.0
Filamentous Algae	9.1					

Other species noted:

SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT						
*COMMON NAME OF FISH	NUMBER	PERCENT	LENGTH RANGE (inches) minimum	LENGTH RANGE (inches) maximum	WEIGHT (pounds)	PERCENT
Bluegill	189	40.0	1.1	9.4	41.22	19.1
Largemouth bass	284	60.0	3.9	18.2	174.14	80.9
Total	473	100.0			215.36	100.0

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

Abundance of fish collected during general surveys at Carr Lake from 1980 through 2008.

Species	1980	1988	2000	2006	2008
Bluegill	280	268	613	219	189
Largemouth bass	87	153	120	203	284
Yellow perch	37	9	102	52	
Warmouth	16	16	69	20	
Yellow bullhead	14	27	40	16	
Spotted gar	12	27	16	12	
Lake chubsucker	14	6	9	10	
White sucker	3	3		9	
Pumpkinseed	5	7	16	7	
Common carp	6	3	9	4	
Brown bullhead	16	8	19	2	
Spotted sucker	1			2	
Gizzard shad		195	76	2	
Redfin pickerel			2	1	
Redear sunfish			2		
Black crappie	16	24	38		
Channel catfish	1				
Golden shiner	40	28	50		
Hybrid bluegill			10		
White bass		1			
Quillback			1		
Total	548	775	1192	559	473
Electrofishing Effort (h)	1.37*	0.5**	0.75	1.0	1.0***
# of Gill Net Lifts	9	8	6	4	0
# of Trap Net Lifts	9	6	6	2	4

*Day time effort equaled 0.32, Night time effort equaled 1.05
**An additional 0.5 h of effort was given to collect largemouth bass only
***Collected bluegill and largemouth only

					TN	GN	EF
Lake:	Carr Lake						
Date:	5/27/2008	to	5/28/2008	Total #	34	0	155
Species:	Bluegill			Effort	4	0	1
Total number:	189			CPUE	9	0	155
Total weight:	41.22						
Length range:	1.1	to	9.4				

Group	TL (in)	TN	GN	EF	TOTAL	RSD
Stock	3	24	0	136	160	-
Quality	6	22	0	67	89	49
Preferred	8	20	0	33	53	24
Memorable	10	0	0	0	0	
Trophy	12	0	0	0	0	

Length group (in)	#	Mean weight (lbs)	Length group (in)	#	Mean weight (lbs)	Length group (in)	#	Mean weight (lbs)
1.0	4	0.00	17.5			34.0		
1.5	2	0.00	18.0			34.5		
2.0	9	0.01	18.5			35.0		
2.5	14	0.01	19.0			35.5		
3.0	20	0.02	19.5			36.0		
3.5	20	0.03	20.0			36.5		
4.0	20	0.05	20.5			37.0		
4.5	5	0.08	21.0			37.5		
5.0	4	0.09	21.5			38.0		
5.5	2	0.15	22.0			38.5		
6.0	1	0.17	22.5			39.0		
6.5	11	0.23	23.0			39.5		
7.0	10	0.31	23.5			40.0		
7.5	14	0.38	24.0			40.5		
8.0	17	0.45	24.5			41.0		
8.5	28	0.51	25.0			41.5		
9.0	8	0.61	25.5			42.0		
9.5			26.0			42.5		
10.0			26.5			43.0		
10.5			27.0			43.5		
11.0			27.5			44.0		
11.5			28.0			44.5		
12.0			28.5			45.0		
12.5			29.0			45.5		
13.0			29.5			46.0		
13.5			30.0			46.5		
14.0			30.5			47.0		
14.5			31.0			47.5		
15.0			31.5			48.0		
15.5			32.0			48.5		
16.0			32.5			49.0		
16.5			33.0			49.5		
17.0			33.5			50.0		

					TN	GN	EF
Lake:	Carr Lake			Total #	1	0	283
Date:	5/27/2008	to	5/28/2008	Effort	4	0	1
Species:	Largemouth bass			CPUE	0	0	283
Total number:	284						
Total weight:	174.14						
Length range:	3.9	to	18.2				

Group	TL (in)	TN	GN	EF	TOTAL	RSD
Stock	8	1	0	247	248	-
Quality	12	1	0	121	122	49
Preferred	15	0	0	4	4	2
Memorable	20	0	0	0	0	
Trophy	25	0	0	0	0	

Length group (in)	#	Mean weight (lbs)	Length group (in)	#	Mean weight (lbs)	Length group (in)	#	Mean weight (lbs)
1.0			17.5			34.0		
1.5			18.0	1	2.95	34.5		
2.0			18.5			35.0		
2.5			19.0			35.5		
3.0			19.5			36.0		
3.5	1	0.02	20.0			36.5		
4.0	3	0.03	20.5			37.0		
4.5	3	0.04	21.0			37.5		
5.0	3	0.05	21.5			38.0		
5.5	1	0.08	22.0			38.5		
6.0	1	0.08	22.5			39.0		
6.5	1	0.12	23.0			39.5		
7.0	6	0.15	23.5			40.0		
7.5	17	0.18	24.0			40.5		
8.0	15	0.22	24.5			41.0		
8.5	10	0.27	25.0			41.5		
9.0	17	0.31	25.5			42.0		
9.5	16	0.37	26.0			42.5		
10.0	15	0.43	26.5			43.0		
10.5	15	0.51	27.0			43.5		
11.0	8	0.58	27.5			44.0		
11.5	30	0.67	28.0			44.5		
12.0	35	0.78	28.5			45.0		
12.5	35	0.84	29.0			45.5		
13.0	32	0.95	29.5			46.0		
13.5	7	1.04	30.0			46.5		
14.0	5	1.16	30.5			47.0		
14.5	4	1.24	31.0			47.5		
15.0			31.5			48.0		
15.5	2	1.58	32.0			48.5		
16.0			32.5			49.0		
16.5			33.0			49.5		
17.0	1	2.29	33.5			50.0		

Back-calculated lengths-at-age for bluegills captured at Carr Lake, Kosciusko County, Indiana in May 2008.

		Age					
Year Class	# Aged	I	II	III	IV	V	VI
2007	14	1.8					
	SD	0.5					
2006	21	1.7	3.4				
	SD	0.4	0.9				
2005	19	2.0	3.7	6.1			
	SD	0.3	0.7	1.4			
2004	10	1.8	3.6	6.3	7.7		
	SD	0.5	0.6	1.0	1.1		
2003	4	1.4	3.1	5.1	7.7	8.6	
	SD	0.2	0.4	0.4	0.3	0.3	
2002	1	1.5	2.9	4.4	7.9	8.9	9.2
	SD	0.0	0.0	0.0	0.0	0.0	0.0
Mean*		1.7	3.5	5.8	7.7	8.6	0.0
SD		0.4	0.7	0.9	0.7	0.3	0.0

*Does not include age groups with less than three samples.

Age-length key for bluegills captured at Carr Lake, Kosciusko County, Indiana in May 2008.

Length Group	# in sample	# (age) in subsample	Age					
			1	2	3	4	5	6
1.0	4	4(1)	1					
1.5	2	2(1)	2					
2.0	9	5(1)	9					
2.5	14	2(1), 3(2)	6	8				
3.0	20	1(1), 3(2), 1(3)	4	12	4			
3.5	20	5(2)		20				
4.0	20	5(2)		20				
4.5	5	2(3)			5			
5.0	4	3(2), 1(4)		3	1			
5.5	2	1(2), 1(4)		1		1		
6.0	1	1(2)		1				
6.5	11	6(3)			11			
7.0	10	4(3), 1(4)			8	2		
7.5	14	5(3)			14			
8.0	17	1(3), 4(4)			3	14		
8.5	28	3(4), 2(5)				17	11	
9.0	8	1(4), 2(5), 1(6)				2	4	2
Mean TL			2.5	3.8	6.7	8.4	8.9	9.3
SE			0.1	0.1	0.2	0.1	0.1	0.0

Back-calculated lengths-at-age for largemouth bass captured at Carr Lake, Kosciusko County, Indiana in May 2008.

		Age					
Year Class	# Aged	I	II	III	IV	V	VI
2007	11	4.2					
	SD	0.7					
2006	20	3.7	7.4				
	SD	0.5	0.8				
2005	18	2.6	6.7	9.5			
	SD	0.5	1.1	1.0			
2004	13	3.7	7.1	9.6	11.2		
	SD	1.0	1.6	1.5	1.3		
2003	24	4.3	8.4	10.6	12.0	12.9	
	SD	0.8	1.4	1.3	1.1	1.0	
2002	6	4.3	8.5	11.1	12.9	13.9	14.7
	SD	0.4	0.9	0.7	0.8	0.6	0.7
Mean*		3.8	7.6	10.2	12.0	13.4	14.7
SD		0.6	1.2	1.1	1.0	0.8	0.7

*Does not include age groups with less than three samples.

Age-length key for largemouth bass captured at Carr Lake, Kosciusko County, Indiana in May 2008.

Length Group	# in sample	# (age) in subsample	Age					
			1	2	3	4	5	6
3.5	1	1(1)	1					
4.0	3	3(1)	3					
4.5	3	3(1)	3					
5.0	3	2(1), 1(2)	2	1				
5.5	1	1(1)	1					
6.0	1	1(1)	1					
6.5	1	1(2)		1				
7.0	6	5(2)		6				
7.5	17	5(2)		17				
8.0	15	5(2)		15				
8.5	10	3(2), 2(3)		6	4			
9.0	17	4(3), 1(4)			14	3		
9.5	16	4(3), 1(4)			13	3		
10.0	15	4(3), 1(4)			12	3		
10.5	15	4(3), 1(4)			12	3		
11.0	8	3(4), 1(5)				6	2	
11.5	30	1(4), 4(5)				6	24	
12.0	35	2(4), 3(5)				14	21	
12.5	35	2(4), 3(5)				14	21	
13.0	32	1(4), 4(5)				6	26	
13.5	7	5(5)					7	
14.0	5	2(5), 2(6)					2	3
14.5	4	2(5), 2(6)					2	2
15.0								
15.5	2	2(6)						2
16.0								
16.5								
17.0	1							
17.5								
18.0	1							
Mean TL			4.8	7.9	9.9	11.8	12.7	14.9
SE			0.2	0.1	0.1	0.1	0.1	0.3