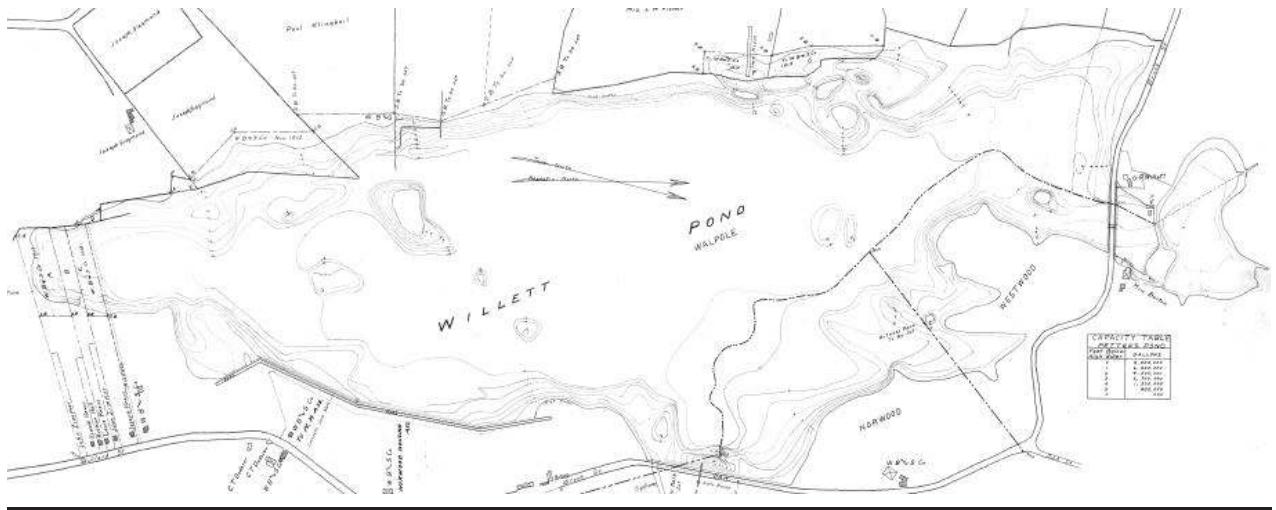


Willetts Pond Fish Survey



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Under the guidance of Tom Palmer, Neponset River Watershed
Association

Summer 2010

9/Jul/2010 - 24/Sep/2010

Willett Pond fish documentation project

The goal of this survey is to document the diverse population of fish currently living in Willett Pond.

This project was undertaken by suggestion from Tom Palmer (Willett Pond Manager) of Neponset River Watershed Association during the summer of 2010.

Throughout the project several methods of capture were utilized. The first and most widely used was hook and line. This category includes trolling and active fishing (casting). Another method used was trapping and netting. This includes the use of minnow traps, shore line nets, and night fishing with nets. It is important to note that certain fish were targeted at certain times, so it would be inappropriate to use this data to calculate catch rates. It was the intention of this project to be a broad survey of the diversity of fish living in Willett Pond. Although not all species were targeted equally, they were all targeted at a certain point throughout the project. It is also important to note that all fish (unless found dead) were released back into Willett Pond. Although this project was able to successfully capture and document eleven different species of fish, it is probable that other undocumented species still exist.

Early this summer, heavy rains put the lake level approximately two feet above the high water mark. Later on in the summer months, a prolonged dry period caused the water to fall to approximately three feet below the high water mark. Willett Pond enjoyed a relatively low turbidity during the study.

Table of Contents

Part I: List of documented species	(See pages 4-6)
Part II: Graphs and data analysis.....	(See pages 7-11)
Part III: Raw data chart	(See pages 12-21)
Part IV: Individual Images.....	(See pages 22-34)
Part V: Instrument calibration sheet	(See page 35)
Part VI: Bibliography	(See page 35)

Part I:

List of documented species

1.



Ameiurus nebulosus (Bullhead Catfish)

2.



Angilla rostrata (American Eel)

3.



Esox niger (Chain Pickerel)

4.



Etheostoma fusiforme (Swamp Darter)

5.



Fundulus diaphanous (Banded Killifish)

6.



Lepomis gibbosus (Pumpkinseed)

7.



Lepomis macrochirus (Bluegill)

8.



Micropterus salmoides (Large Mouth Bass)

9.



Oncorhynchus mykiss (Rainbow Trout)

10.



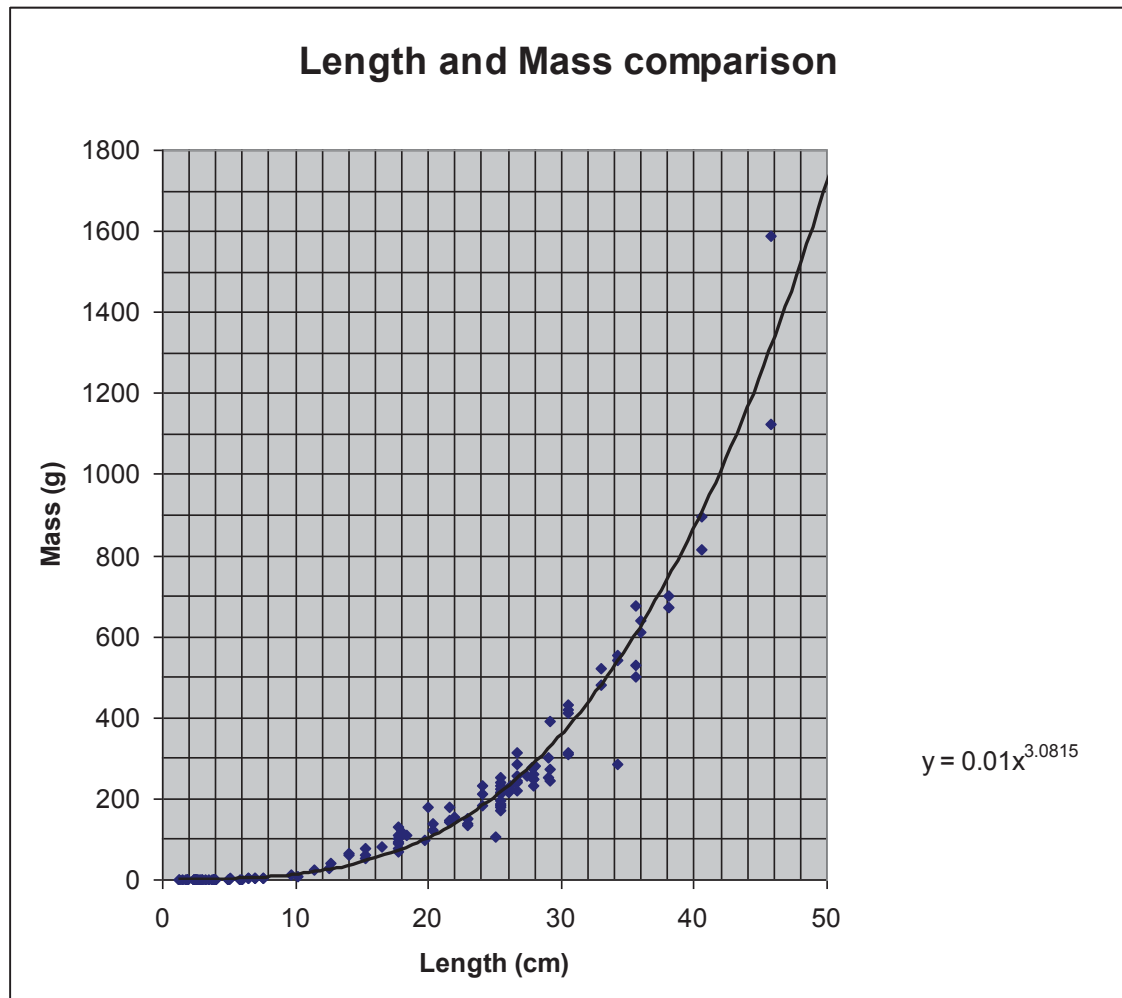
Perca flavescens (Yellow Perch)

11.



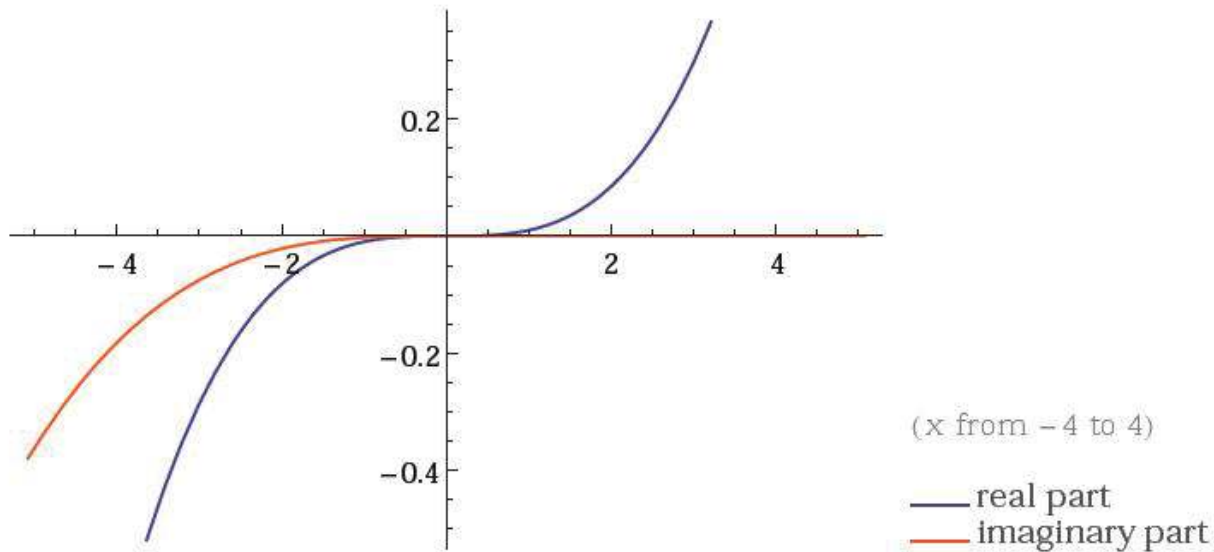
Pomoxis nigromaculatus (Black Crappie)

Part II:



Graph 1:

This graph depicts a basic length versus mass exponential growth curve demonstrating the correlation of length and mass of specimens from Willett Pond. All 150 data points are represented here. Most of the true outliers on the bottom side of the exponential curve are either specimens of Chain Pickerels or of American Eels. Their body shapes account for this discrepancy since they encompass a more streamlined body shape than most of the other species in this study; they are more likely to be longer and have less mass. The species accounting for the upper extreme of the curve are most likely to be the older Large Mouth Bass and adult specimens of Bullhead Catfish. These two species have more condensed bodies that are shorter in length and have more substance to them than the eels or Pickerels. The other species of fish appear to fit well in the middle ground of this model. Their bodies are evidently the average in between the extremes of the outliers already discussed. Although these are individual specimens being recorded and the body mass index of individuals can vary greatly, the large quantity of data counter balances the individual outliers and gives us an accurate model of length to mass comparisons.



Graph 2:

$$f(x) = \frac{{}^{2000}\sqrt{x^{6163}}}{100} \quad (\text{This is the same function from graph 1, but in rational form})$$

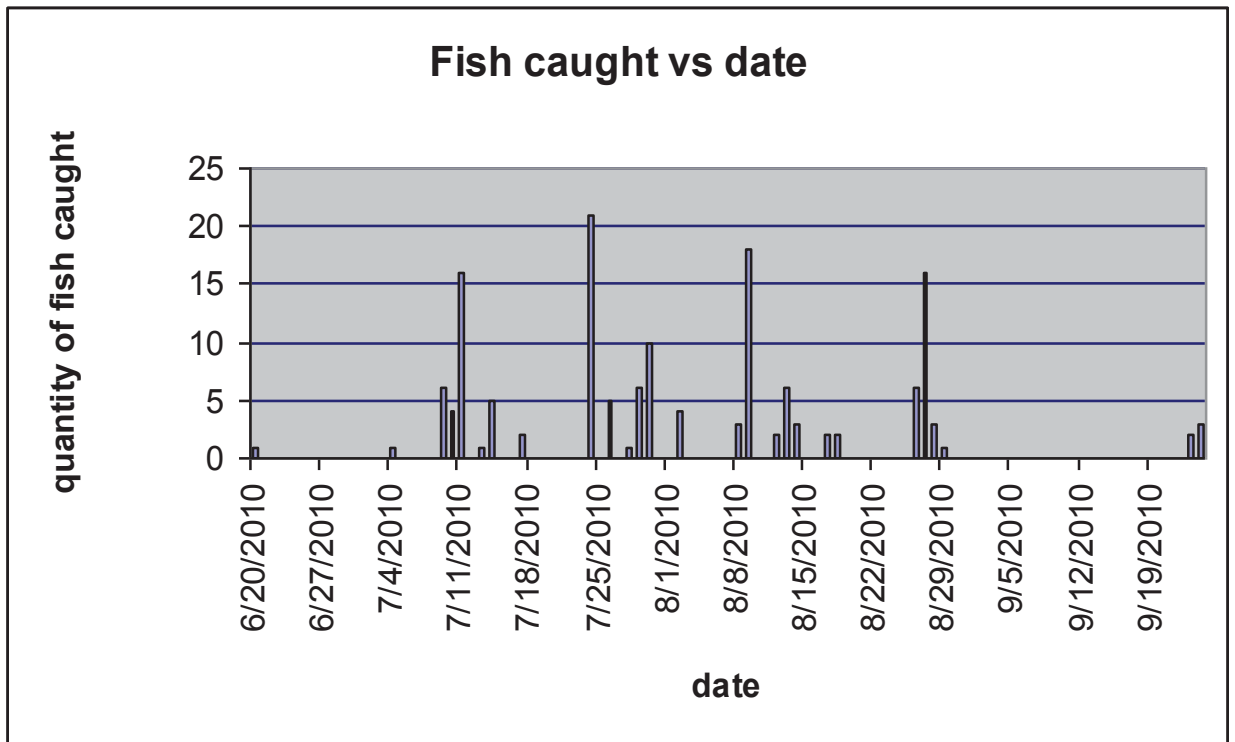
This is a function of mass with x defined as the length.

The inverse is as follows:

$$f(y) = {}^{6163}\sqrt{(100y)^{2000}}$$

The inverse function describes length in terms of mass.

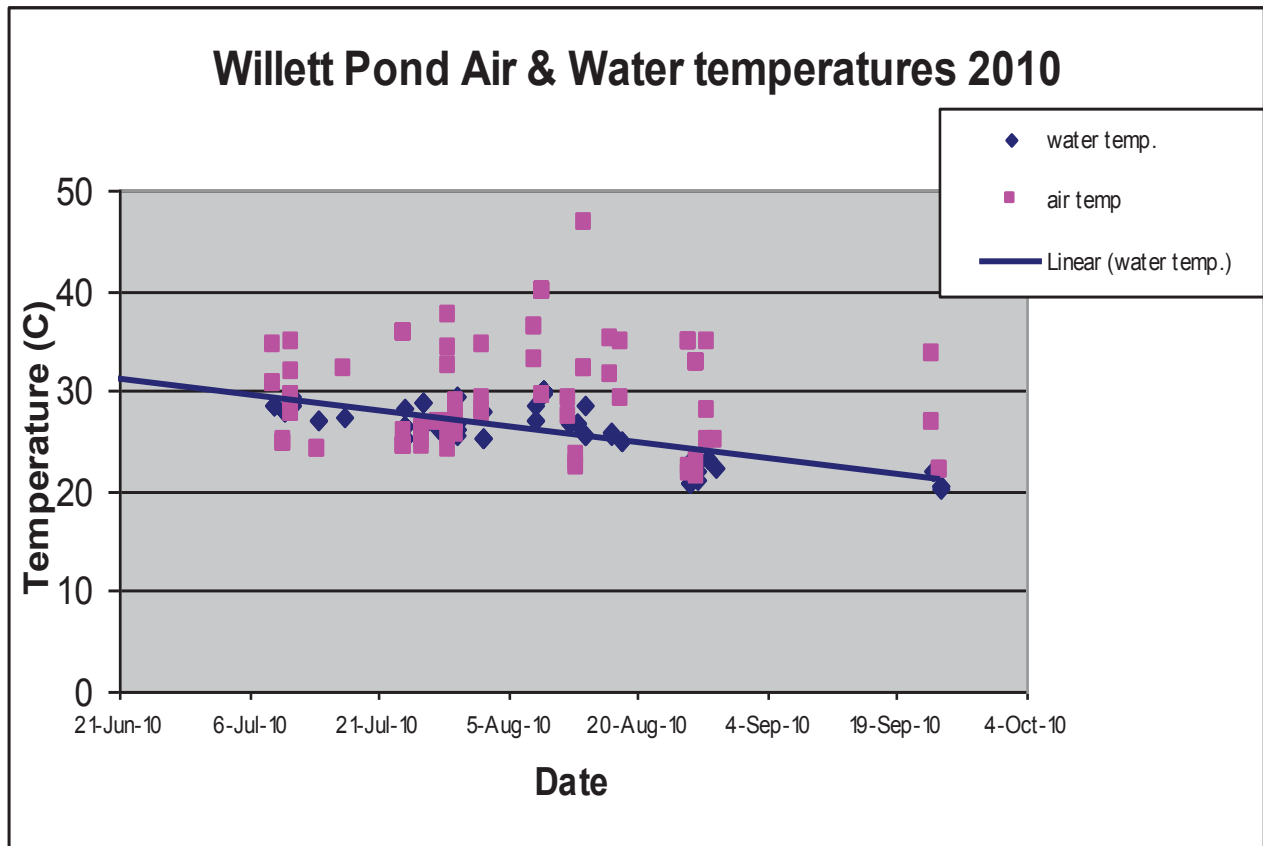
This is a plot of the above curve of best fit to describe the relation between mass (g) and length (cm). We can ignore the imaginary parts and the negative section. This graph is a good approximation of smaller fish with body shapes resembling that of a bluegill or a small Large mouth bass but since it is an exponential function, it losses accuracy as the length increases.



Graph 3:

This graph is a representation of the number of fish caught on each day of the study. Each day's catch is represented by a single bar. The most significant daily production on the four outstanding days is due to the concerted effort of multiple anglers*.

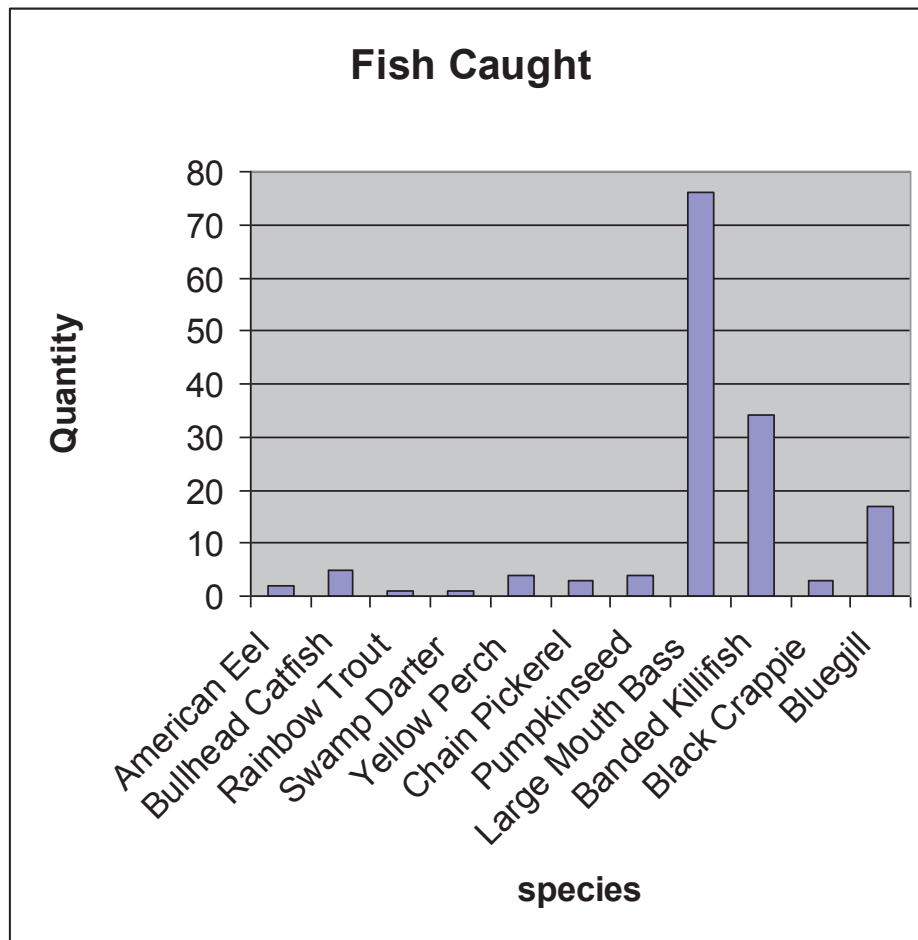
*Other anglers involved
Brian DeMeo, Chris DeMeo



Graph 4:

This graph depicts the temperature variation throughout the study. The blue points represent the water temperature and the blue trend line corresponds to the water temperatures. Water, having a higher thermal capacity than air, tends to keep a more consistent temperature over time. The trend line depicts the water temperature, which as expected begins to drop off in the latter half of summer. Even though the line suggests a higher temperature in early June, no data is available from that time point to support this, so it cannot be assumed.

As for the air temperature, it is much more inconsistent than the water. Some of these inconsistencies are due in part to the nature of the operation. The thermometer used throughout the entire project was black, and as a result the temperatures measured out in un-shaded areas are likely to be higher than the actual daily average. Because of the vast fluctuation in air temperatures, a trend line would be inappropriate for this graph.



Graph 5:

This graph reflects the method of capture relative to species and time of day that specimens were acquired. Relatively few numbers of American Eels and Bullhead Catfish were caught because the vast majority of the time spent fishing was during the day time. Most of the night fishing was done by net which would exclude larger Bullhead Catfish and Eels from the catch. The majority of Bullheads caught were juveniles that were easily caught by net. The Eels were both found post mortem. Minnows such as the Banded Killifish and the Swamp Darter were only occasionally caught along the shore by net. The Chain-linked Pickerel and the Yellow Perch are both more likely to be caught in colder deeper waters that were fished less often, consequently less were caught. Rainbow Trout could to some extent fall into this category except for the fact that there is no self-populating population of Rainbow Trout in Willett Pond. They all are stock fish, so their population only can be increased by a fixed number twice annually. Half of the fish caught were Largemouth Bass, which are the predominant target of freshwater angling. The remaining species, Bluegill, Yellow Perch, and Black Crappy, were all inadvertently captured while bass fishing. These species are all fairly similar in dietary requirements and as a result they will hit the same bait as the bass.

Part III:

Fish caught in Willett Pond 2010

Fish number	Common name	Scientific name	Date	Time	Water temp (C)	Air temp (C)	length (cm)	Mass (g)	Picture numbers	Notes
1	Large mouth bass	Micropterus salmoides	9-Jul-10	3:44 PM	28.7	34.5	45.72	1122	FISH PICTURES 1-3	caught in open water on a hook
2	Large mouth bass	Micropterus salmoides	9-Jul-10	5:34 PM	28.7	30.8	24.13	210	FISH PICTURES 4-7	caught in open water on a hook
3	Large mouth bass	Micropterus salmoides	9-Jul-10	5:46 PM	28.7	30.8	27.94		FISH PICTURES 7-11	caught in open water on a hook
4	Chain pickerel	Esox niger	9-Jul-10	10:30 PM	28.7		7.6	3.6	FISH 11-12, 14-16	Caught at night in a net.
5	Bullhead Catfish	Ameiurus nebulosus	20-Jun-10	No data			2.5	0.3	FISH 1-3,18	Caught in a net. From a large school. Maybe 1000+
6	Banded Killifish	Fundulus diaphanus	4-Jul-10	9:00 AM			7.6	3.6	FISH 4-5,17	Caught at night in a net.
7	Bullhead Catfish	Ameiurus nebulosus	9-Jul-10	10:30 PM	28.7		3.8	1.2	FISH 6-7	*fish were similar enough to share information
8	Bullhead Catfish	Ameiurus nebulosus	9-Jul-10	10:30 PM	28.7		3.8	1.2	FISH 6-7	*fish were similar enough to share information
9	Bluegill	Lepomis macrochirus	summer of 2009	No data			3.9	1.7	FISH 8-10	Caught at night in a net.
10	Pumpkin seed	Lepomis gibbosus	summer of 2009	No data			6.5	2.9	FISH 13	Caught at night in a net.
11	Large mouth bass	Micropterus salmoides	10-Jul-10	7:28 PM	27.9	24.9	25.4	224.2	FISH 19-21	chased hooked bait into the boat

12	Black crappie	Pomoxis nigromaculatus	10-Jul-10	7:42 PM	27.9	24.7	21.6	180	FISH 22	Caught in open water over a weed bed
13	Bluegill	Lepomis macrochirus	10-Jul-10	7:50 PM	27.9	24.7	14	66.7	FISH 23-24	Caught in open water over a weed bed
14	Black crappie	Pomoxis nigromaculatus	10-Jul-10	7:57 PM	27.9	24.7	22.9	152.4	FISH 25	Caught in open water over a weed bed
15	Large mouth bass	Micropterus salmoides	11-Jul-10	12:30 PM	28.5	27.6	19.7	98.4	FISH 26-29	Caught by submerged island on a hook (has damage to one side)
16	Banded Killifish	Fundulus diaphanus	11-Jul-10	1:00 PM	28.7	27.7	7	2.8	FISH 30-33	Caught by net
17	Bluegill	Lepomis macrochirus	11-Jul-10	1:22 PM	29.1	27.9	15.2	52.4	FISH 34-35	Caught by submerged island on a hook
18	Bluegill	Lepomis macrochirus	11-Jul-10	1:34 PM	29.1	29.4	17.8	91.6	FISH 37	Caught by submerged island on a hook
19	Large mouth bass	Micropterus salmoides	11-Jul-10	1:38 PM	29.1	29.4	22.9	133.4	FISH 38-39	Caught by submerged island on a hook
20	Large mouth bass	Micropterus salmoides	11-Jul-10	1:45 PM	29.1	29.4	22.9	152.6	FISH 41	Caught by submerged island on a hook
21	Bluegill	Lepomis macrochirus	11-Jul-10	3:40 PM	29.1	28.9	16.5	81.1	FISH 42	Caught by submerged island on a hook
22	Bluegill	Lepomis macrochirus	11-Jul-10	3:48 PM	29.1	28.9	14	61	FISH 44	Caught by submerged island on a hook
23	Bluegill	Lepomis macrochirus	11-Jul-10	3:54 PM	29.1	28.9	11.4	22.4	FISH 45	Caught by submerged island on a hook

24	Bluegill	Lepomis macrochirus	11-Jul-10	4:00 PM	29.1	28.9	12.7	40.7	FISH 47	Caught by submerged island on a hook
25	Bluegill	Lepomis macrochirus	11-Jul-10	4:10 PM	29.1	28.9	20.3	121.3	FISH 49	Caught by submerged island on a hook
26	Bluegill	Lepomis macrochirus	11-Jul-10	4:19 PM	29.1	28.9	15.2	79.4	FISH 51	Caught by submerged island on a hook
27	Bluegill	Lepomis macrochirus	11-Jul-10	4:23 PM	28.8	29	17.8	109.5	FISH 53	Caught by submerged island on a hook
28	Bluegill	Lepomis macrochirus	11-Jul-10	5:10 PM	29.5	34.9	18.4	111	FISH 55	Caught over a submerged island on a hook
29	Large mouth bass	Micropterus salmoides	11-Jul-10	5:30 PM	29.1	31.9	26.2	232	FISH 57-58	caught on a hook over a drop off
30	Large mouth bass	Micropterus salmoides	13-Jul-10	9:45 PM			5	1.1	FISH 73-74	caught in a net under the rocks
31	Large mouth bass	Micropterus salmoides	14-Jul-10	12:20 PM	27.1	24	30.5	315	FISH 59-60	Caught in open water over a weed bed
32	Large mouth bass	Micropterus salmoides	14-Jul-10	12:25 PM	27.1	24	35.6	529	FISH 62-64	Caught in open water over a weed bed
33	Large mouth bass	Micropterus salmoides	14-Jul-10	1:00 PM			30.5	420	FISH 67-68	Caught in open water over a weed bed
34	Large mouth bass	Micropterus salmoides	14-Jul-10	1:15 PM			21.6	143.5	FISH 70-71	Caught in open water over a weed bed
35	Bullhead Catfish	Ameiurus nebulosus	14-Jul-10	9:30 PM			3.75	1	FISH 75	Caught at night in a net.

36	Large mouth bass	Micropterus salmoides	17-Jul-10	9:35 AM	27.5	32.1	45.72	1588	FISH 76-83	Caught in open water over a weed bed
37	Rainbow Trout	Oncorhynchus mykiss	17-Jul-10	2:30 PM					FISH 84-85	found dead
38	Large mouth bass	Micropterus salmoides	24-Jul-10	8:26 AM	25.4	24.5		493.4	FISH 89	Caught in open water over a weed bed
39	Large mouth bass	Micropterus salmoides	24-Jul-10	8:37 AM	25.4	24.5	24.1	181.8	FISH 91-92	Caught in open water over a weed bed
40	Large mouth bass	Micropterus salmoides	24-Jul-10	8:42 AM	25.4	24.5	17.8	79	FISH 93	Caught in open water over a weed bed
41	Large mouth bass	Micropterus salmoides	24-Jul-10	9:15 AM	25.4	24.5	25.4	172	FISH 95	Caught in open water over a weed bed
42	Large mouth bass	Micropterus salmoides	24-Jul-10	9:27 AM	25.4	24.5	25.4	188	FISH 97	Caught in open water over a weed bed
43	Large mouth bass	Micropterus salmoides	24-Jul-10	9:33 AM	25.4	24.5	25.4		FISH 99	Caught in open water over a weed bed
44	Large mouth bass	Micropterus salmoides	24-Jul-10	9:40 AM	26.5	35.6	22.9		FISH 101	Caught in open water over a weed bed
45	Large mouth bass	Micropterus salmoides	24-Jul-10	12:00 PM	26.5	35.6	27.9	250	FISH 103	Caught in open water over a weed bed
46	Large mouth bass	Micropterus salmoides	24-Jul-10	12:19 PM	26.5	35.6	26.7	218	FISH 105	Caught in open water over a weed bed
47	Large mouth bass	Micropterus salmoides	24-Jul-10	12:30 PM	26.5	35.6	30.5	310	FISH 108	Caught in open water over a weed bed
48	Large mouth bass	Micropterus salmoides	24-Jul-10	12:40 PM	26.5	35.6	22.9		FISH 109	Caught in open water over a weed bed

49	Large mouth bass	Micropterus salmoides	24-Jul-10	12:48 PM	26.5	35.6	25.4	210	FISH 112	Caught over drop off
50	Large mouth bass	Micropterus salmoides	24-Jul-10	12:58 PM	26.5	35.6	30.5	410	FISH 114	Caught in open water over a weed bed
51	Large mouth bass	Micropterus salmoides	24-Jul-10	1:13 PM	26.5	35.6	30.5	430	FISH 116	Caught in deep water
52	Large mouth bass	Micropterus salmoides	24-Jul-10	1:20 PM	26.5	35.6	33	480	FISH 117	Caught in deep water
53	Large mouth bass	Micropterus salmoides	24-Jul-10	1:30 PM	26.5	35.6	33	520	FISH 118	Caught in deep water
54	Large mouth bass	Micropterus salmoides	24-Jul-10	1:40 PM	26.5	35.6	34.3	555	FISH 120	Caught in deep water
55	Large mouth bass	Micropterus salmoides	24-Jul-10	1:46 PM	26.5	35.6	35.6	500	FISH 122-123	Caught in deep water
56	Large mouth bass	Micropterus salmoides	24-Jul-10	1:50 PM	26.5	35.6	38.1	670	FISH 125-126	Caught in deep water
57	Large mouth bass	Micropterus salmoides	24-Jul-10	6:30 PM	28.2	25.8	34.3	540	FISH 128	Caught in shallow water
58	Large mouth bass	Micropterus salmoides	24-Jul-10	9:11 PM			7	5.2	FISH 133-136	caught in net
59	Banded Killifish	Fundulus diaphanus	26-Jul-10	12:06 PM	28.9	26.1	2.7		Fish 129-132	caught in net
60	Banded Killifish	Fundulus diaphanus	26-Jul-10	12:06 PM	28.9	26.1	1.5		Fish 129-132	caught in net
61	Banded Killifish	Fundulus diaphanus	26-Jul-10	12:06 PM	28.9	26.1	2.8		Fish 129-132	Caught by net
62	Large mouth bass	Micropterus salmoides	26-Jul-10	7:15 PM	26.5	24.5	26.7	255.4	FISH 137	caught at submerged island
63	Black crappie	Pomoxis nigromaculatus	26-Jul-10	7:30 PM	26.7	25.1	20.3	136.7	FISH 139-140	caught at submerged island
64	Large mouth bass	Micropterus salmoides	28-Jul-10	6:34 PM	26.3	26.9	26.7	286.6	FISH 141-142	caught over a weed bed
65	Large mouth bass	Micropterus salmoides	29-Jul-10	12:26 PM	26.9	32.5	21.6	147	FISH 143	caught at submerged island

66	Large mouth bass	Micropterus salmoides	29-Jul-10	12:43 PM	27.1	34.3	40.6	815	FISH 145	caught over weed bed
67	Large mouth bass	Micropterus salmoides	29-Jul-10	1:05 PM	27.1	37.5	26	215.9	FISH 147	caught over a weed bed
68	Large mouth bass	Micropterus salmoides	29-Jul-10	6:44 PM	26.6	26.7	29.2	242.4	FISH 148	caught in open water
69	Large mouth bass	Micropterus salmoides	29-Jul-10	7:29 PM	26.3	25.2	26.7	314.9	FISH 150	caught over a weed bed
70	Large mouth bass	Micropterus salmoides	29-Jul-10	8:08 PM	26.2	24.1	24.1	231.4	FISH 152	caught over a drop off
71	Yellow Perch	Perca flavescens	30-Jul-10	9:30 AM	25.5	28.9	24.1		FISH 153	found dead
72	Swamp Darter	Etheostoma fusiforme	30-Jul-10	2:13 PM	29.5	27.6	3.2	0.3	FISH 154-168	caught in minnow trap
73	Yellow Perch	Perca flavescens	30-Jul-10	2:30 PM	29.5	27.6	5	1.8	FISH 169-170	caught in minnow trap
74	Large mouth bass	Micropterus salmoides	30-Jul-10	6:24 PM	26.7	25.5	29.2	391	FISH 171	caught in over drop off
75	Large mouth bass	Micropterus salmoides	30-Jul-10	6:30 PM	26.3	26.9	26.7	240	FISH 174	Caught over drop off
76	Large mouth bass	Micropterus salmoides	30-Jul-10	6:41 PM	26.3	26.9	26.7	243.9	FISH 176	Caught over drop off
77	Large mouth bass	Micropterus salmoides	30-Jul-10	7:30 PM	26.3	26.9	27.9	249	FISH 178	Caught over drop off
78	Large mouth bass	Micropterus salmoides	30-Jul-10	7:30 PM	26.3	26.9	25.4	233	FISH 180	Caught over drop off
79	Yellow Perch	Perca flavescens	30-Jul-10	10:20 PM			12.5	26.9	FISH 181	caught at night in a net
80	Large mouth bass	Micropterus salmoides	30-Jul-10	10:30 PM			5.1	2.4	FISH 182	caught at night in a net
81	Bullhead Catfish	Ameiurus nebulosus	2-Aug-10	1:01 PM	28	34.5	6.4	2.5	FISH 183-184	caught under a rock
82	Large mouth bass	Micropterus salmoides	2-Aug-10	5:00 PM	25.4	28.1	27.9	276.8	FISH 186	caught over a weed bed

83	Large mouth bass	Micropterus salmoides	2-Aug-10	5:30 PM	25.4	29.2	25.4	253	FISH 188	caught over a weed bed
84	Pumpkin seed	Lepomis gibbosus	2-Aug-10	6:10 PM	25.3	27.3	17.8	132	FISH 189	caught over a weed bed
85	Large mouth bass	Micropterus salmoides	8-Aug-10	2:30 PM	28.5	33.1	40.6	895	FISH 190-191	Caught by submerged island on a hook
86	Large mouth bass	Micropterus salmoides	8-Aug-10	3:00 PM	27.1	36.2	25.4	196	FISH 192	Caught in open water over a weed bed
87	Large mouth bass	Micropterus salmoides	8-Aug-10	3:30 AM	27.1	36.2	38.1	700	FISH 194	Caught in open water over a weed bed
88	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	2.3	0.1	FISH 195-199	Caught by net
89	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	2.5	0.1	FISH 195-199	Caught by net
90	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	3	0.2	FISH 195-199	Caught by net
91	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	3	0.1	FISH 195-199	Caught by net
92	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	2.9	0.3	FISH 195-199	Caught by net
93	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	2.7	0.1	FISH 195-199	Caught by net
94	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	2.6	0.3	FISH 195-199	Caught by net
95	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	1.5	0.05	FISH 195-199	Caught by net
96	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	2.3	0.09	FISH 195-199	Caught by net
97	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	1.7	0.05	FISH 195-199	Caught by net
98	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	4	0.6	FISH 195-199	Caught by net
99	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	3.5	0.5	FISH 195-199	Caught by net
100	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	2.6	0.09	FISH 195-199	Caught by net
101	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	2.3	0.08	FISH 195-199	Caught by net
102	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	5	2	FISH 200	Caught by net
103	Banded Killifish	Fundulus diaphanus	9-Aug-10	11:30 AM	30.2	40	6	2	FISH 201	Caught by net

104	Large mouth bass	Micropterus salmoides	9-Aug-10	1:45 PM	29.9	29.5	27.4	258.1	FISH 202	caught at submerged island
105	Large mouth bass	Micropterus salmoides	9-Aug-10	2:00 PM	29.9	29.5	25.4	240	FISH 203	caught at submerged island
106	Large mouth bass	Micropterus salmoides	12-Aug-10	2:08 PM	26.8	27.5	34.3	287	FISH 206	caught in open water
107	Yellow Perch	Perca flavescens	12-Aug-10	2:20 PM	26.7	29.1	22.9	138.6	FISH 207	Caught in open water over a weed bed
108	Large mouth bass	Micropterus salmoides	13-Aug-10	6:28 PM	26.8	23.4	25.4	182	FISH 208	caught over a weed bed
109	Large mouth bass	Micropterus salmoides	13-Aug-10	6:42 PM	26.8	22.7	17.7	69	FISH 210	caught over a weed bed
110	Large mouth bass	Micropterus salmoides	13-Aug-10	6:58 PM	26.7	22.2	35.6	676.5	FISH 212	caught over a weed bed
111	Yellow Perch	Perca flavescens	13-Aug-10	9:04 PM			9.7	10.7	FISH 213-214	Caught by net
112	Chain pickerel	Esox niger	13-Aug-10	9:30 PM			17.8	100	FISH 215-216, 220	Caught by net, note damaged lip in last picture
113	American Eel	Angilla rostrata	13-Aug-10	No data			55.9	302.5	FISH 217-219	found dead
114	Large mouth bass	Micropterus salmoides	14-Aug-10	10:20 AM	25.5	32.2	26	222	FISH 221	caught over a weed bed
115	Large mouth bass	Micropterus salmoides	14-Aug-10	10:34 AM	25.5	32.2	22	153	FISH 222	caught over a weed bed
116	Bluegill	Lepomis macrochirus	14-Aug-10	1:23 PM	28.6	46.7	4	1	FISH 223	caught in a bucket
117	Large mouth bass	Micropterus salmoides	17-Aug-10	11:22 AM	25.5	31.5	25.4	217	FISH 224	caught over weed bed
118	Large mouth bass	Micropterus salmoides	17-Aug-10	11:41 AM	25.9	35.1	27.9	262	FISH 225	caught over weed bed
119	Large mouth bass	Micropterus salmoides	18-Aug-10	10:00 AM	24.9	29.1	27.9	232	FISH 227	caught over weed bed

120	Large mouth bass	Micropterus salmoides	18-Aug-10	11:00 AM	25	34.7	27.8	275	FISH 228	caught over weed bed
121	Bluegill	Lepomis macrochirus	26-Aug-10	10:25 AM	20.8	34.7	3.8	1.5	FISH 229	caught in minnow trap
122	Bluegill	Lepomis macrochirus	26-Aug-10	10:25 AM	20.8	34.7	5.8	1.6	FISH 230	caught in minnow trap
123	Bluegill	Lepomis macrochirus	26-Aug-10	10:25 AM	20.8	34.7	3.8	1.1	FISH 231	caught in minnow trap
124	Large mouth bass	Micropterus salmoides	26-Aug-10	10:37 AM	20.8	34.7	25.4	178.9	FISH 232	caught over a weed bed
125	Pumpkin seed	Lepomis gibbosus	26-Aug-10	6:50 PM	22.9	22.3	15.2	61	FISH 233	Caught over a submerged island on a hook
126	Large mouth bass	Micropterus salmoides	26-Aug-10	7:20 PM	22.8	21.8	17.7	92.4	FISH 234	Caught over a submerged island on a hook
127	American Eel	Angilla rostrata	27-Aug-10	9:16 AM	21.2	23			FISH 235-239	found dead floating out in open water
128	Large mouth bass	Micropterus salmoides	27-Aug-10	9:29 AM	21.9	21.5	10.2	8	FISH 240	Caught by net
129	Banded Killifish	Fundulus diaphanus	27-Aug-10	11:36 AM	22.8	32.7	1.9	0.05	FISH 241-243	Caught by net
130	Banded Killifish	Fundulus diaphanus	27-Aug-10	11:36 AM	22.8	32.7	1.9	0.05	FISH 241-243	Caught by net
131	Banded Killifish	Fundulus diaphanus	27-Aug-10	11:36 AM	22.8	32.7	2.5	0.1	FISH 241-243	Caught by net
132	Banded Killifish	Fundulus diaphanus	27-Aug-10	11:36 AM	22.8	32.7	2.5	0.1	FISH 241-243	Caught by net
133	Banded Killifish	Fundulus diaphanus	27-Aug-10	11:36 AM	22.8	32.7	1.3	0.05	FISH 241-243	Caught by net
134	Banded Killifish	Fundulus diaphanus	27-Aug-10	11:36 AM	22.8	32.7	1.9	0.08	FISH 241-243	Caught by net
135	Banded Killifish	Fundulus diaphanus	27-Aug-10	11:36 AM	22.8	32.7	1.9	0.05	FISH 241-243	Caught by net
136	Banded Killifish	Fundulus diaphanus	27-Aug-10	11:36 AM	22.8	32.7	1.3	0.05	FISH 241-243	Caught by net
137	Banded Killifish	Fundulus diaphanus	27-Aug-10	11:36 AM	22.8	32.7	2.5	0.1	FISH 241-243	Caught by net

138	Banded Killifish	Fundulus diaphanus	27-Aug-10	11:36 AM	22.8	32.7	3.8	0.4	FISH 241-243	Caught by net
139	Banded Killifish	Fundulus diaphanus	27-Aug-10	11:36 AM	22.8	32.7	2.5	0.1	FISH 241-243	Caught by net
140	Banded Killifish	Fundulus diaphanus	27-Aug-10	11:36 AM	22.8	32.7	3.8	0.4	FISH 241-243	Caught by net
141	Banded Killifish	Fundulus diaphanus	27-Aug-10	11:36 AM	22.8	32.7	2.5	0.1	FISH 241-243	Caught by net
142	Large mouth bass	Micropterus salmoides	28-Aug-10	1:53 PM	23.2	27.9	36	641	FISH 244	caught over a weed bed
143	Large mouth bass	Micropterus salmoides	28-Aug-10	2:04 PM	23.1	24.9	36	609	FISH 245	In the shade by the shore
144	Large mouth bass	Micropterus salmoides	28-Aug-10	2:44 PM	23.2	34.7	29.2	274	FISH 246	caught over a weed bed
145	Large mouth bass	Micropterus salmoides	29-Aug-10	9:27 AM	22.3	24.9	29	303	FISH 247	caught over a weed bed
146	Large mouth bass	Micropterus salmoides	23-Sep-10	3:50 PM	21.9	26.7	29	252	FISH 248	caught over a weed bed
147	Chain pickerel	Esox niger	23-Sep-10	4:30 PM	22.1	33.7	25	105	FISH 249(1) AND (2)	Caught over a submerged island on a hook
148	Pumpkin seed	Lepomis gibbosus	24-Sep-10	7:45 AM	20.4	21.9	20	179.9	FISH 250 (1) AND (2)	Caught over a submerged island on a hook
149	Bluegill	Lepomis macrochirus	24-Sep-10	8:00 AM	20.4	21.9	18	118.2	FISH 251	Caught over a submerged island on a hook
150	Large mouth bass	Micropterus salmoides	24-Sep-10	8:30 AM	20.3	21.9	28	279	FISH 252 (1) AND (2)	Caught in deep water

Part IV:



FISH 001



FISH 002



FISH 003



FISH 004



FISH 005



FISH 006



FISH 007



FISH 008



FISH 009



FISH 010



FISH 011



FISH 012



FISH 013



FISH 014



FISH 015



FISH 016



FISH 017



FISH 018



FISH 019



FISH 020



FISH 021



FISH 022



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FISH 025



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FISH 027



FISH 028



FISH 029



FISH 030



FISH 031



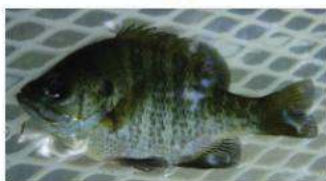
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FISH 033



FISH 034



FISH 035



FISH 037



FISH 038



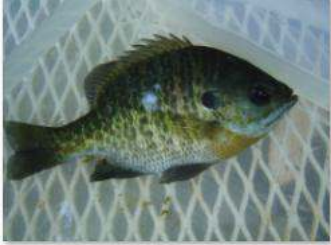
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FISH 041



FISH 042



FISH 044



FISH 045



FISH 047



FISH 049



FISH 051



FISH 053



FISH 055



FISH 057



FISH 058



FISH 059



FISH 060



FISH 062



FISH 063



FISH 064



FISH 067



FISH 068



FISH 070



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FISH 145



FISH 147



FISH 148



FISH 150



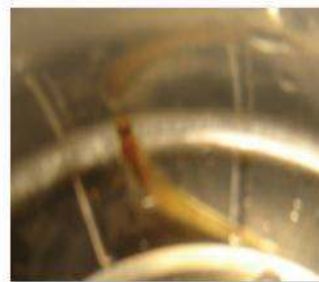
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FISH 153



FISH 154



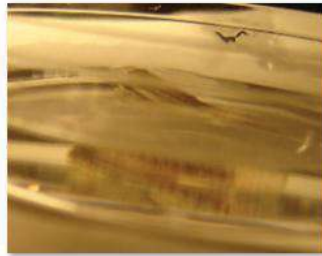
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FISH 157



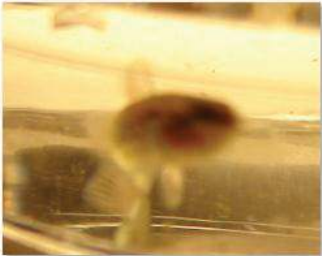
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FISH 162



FISH 163



FISH 164



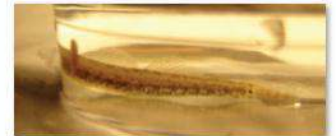
FISH 165



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FISH 167



FISH 168



FISH 169



FISH 170



FISH 171



FISH 174



FISH 176



FISH 178



FISH 180



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FISH 182



FISH 183



FISH 184



FISH 186



FISH 188



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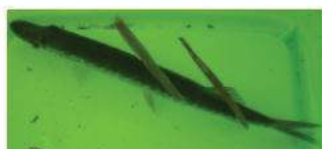
FISH 212



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FISH 220



FISH 221



FISH 222



FISH 223



FISH 224



FISH 225



FISH 227



FISH 228



FISH 229



FISH 230



FISH 231



FISH 232



FISH 233



FISH 234



FISH 235



FISH 236



FISH 237



FISH 238



FISH 239



FISH 240



FISH 241



FISH 242



FISH 243



FISH 244



FISH 245



FISH 246



FISH 247



FISH 248



FISH 249 (1)



FISH 249 (2)



FISH 250 (1)



FISH 250 (2)



FISH 251



FISH 252 (1)



FISH 252 (2)



FISH PICTURES 001



FISH PICTURES 002



FISH PICTURES 003



FISH PICTURES 004



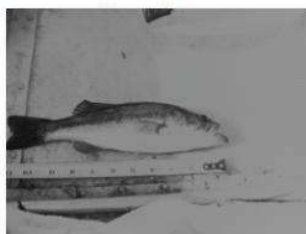
FISH PICTURES 005



FISH PICTURES 006



FISH PICTURES 007



FISH PICTURES 009



FISH PICTURES 010



FISH PICTURES 011

Willet Pond fish documentation project instrument calibration sheet.

Air temperature readings expressed in centigrade are subject to deviation. All air and water temperatures were recorded with the same thermometer throughout the entire project. Although water temperatures are consistent, air temperatures can display a range due to extra heat absorbed by the black thermometer in the sun. (Please see attached calibration sheet.)

All length measurements on fish were originally recorded as inches. These measurements were then converted to centimeters using the conversion factor of 2.54

All masses were recorded with the same digital scale throughout the entire project. Although the scale is fairly accurate (tenths of a gram) some of the fish measurements are subject to slight deviation due to water on their bodies. Keep in mind these are live fish being measured.

1. Digital scale

I. Accuracy (0.1) Grams

II. Calibration (average deviation from a 100 gram calibration weight)

$$\frac{0.1+0.1+0.0}{3}$$

III Average deviation= ± 0.067 Grams

2. Digital thermometer

I. Accuracy (0.1) degrees centigrade

II. Calibration by ice water test (ice water allowed to sit for 5 minutes)

III. Calibration (average deviation from 0C)

$$\frac{0.1+0.2}{2}$$

IV Average deviation = ± 0.15 degrees centigrade

Part VI:

Resources used

1. Hartel, Karsten E., David B. Halliwell, and Alan E. Launer. *Inland Fishes of Massachusetts*. Lincoln, MA: Massachusetts Audubon Society, 2002. Print.
(Used to identify fish)
2. *Metric Conversion Charts and Calculators*. Web. 29 Sept. 2010. <<http://www.metric-conversions.org>>.
(Used to convert inches to centimeters)
3. *Wolfram|Alpha: Computational Knowledge Engine*. Web. 13 July 2011.
<<http://Wolframalpha.com>>.
(Used to plot the function on page. 8)