

**SUMMARY REPORT:
RAFT CHANNEL AREA, POOL 8 ISLANDS, PHASE III, STAGE II PRE-PROJECT FISHERIES
EVALUATION, POOL 8, 2007, 2008.**

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PURPOSE

The purpose of this work is to describe the baseline fisheries community prior to completion of the Pool 8 Islands, Phase III, Stage II habitat rehabilitation and enhance project Navigation Pool 8 of the Mississippi River.

METHODS

The Pool 8 Islands, Phase III, Stage II Habitat Rehabilitation and Enhancement Project is located in Navigation Pool 8 of the upper Mississippi River (Figure 1). The study area is located in the downstream one-third of the pool formed by Lock and Dam 8 and had a total water surface area of 19,676 acres as of the year 2002.

Stage II has a total of 12 planned islands. Construction of four West Islands and three of the North Islands began in spring 2008. Construction of four seed islands and one North Island began in July 2007 and was completed in summer 2008. In the fall of 2008, all islands were in place, but additions to these islands is planned for 2009. By August 2009, construction of all islands in Stage II will be completed.

Standard Upper Mississippi River Conservation Committee (UMRCC) fyke nets were set by fisheries personnel. These fyke nets had a 50ft floating lead line, 3ft high and 6ft wide frame, and had a 0.75 inch bar mesh. During 2007, nets were set at randomly selected locations. This was done using an ArcView GIS 3.3® random point generating script and the Long Term Resource Monitoring Program (http://www.umesc.usgs.gov/data_library.html) 1998 bathymetric data (Rogala, 1997). Points were generated only in locations that had 0.3 to 1.1m water depth as measured at the middle of the net. During 2008, fyke netting locations were chosen in a similar fashion, except that we ensured that the about same proportion of nets were set on a shoreline as were set in 2007 (2 of 9 in 2007 and 3 of 9 in 2008). Nine locations were chosen each of the two sampling years. During both years, if a location was found to be unsuitable for fyke netting, a randomly selected alternate location was chosen instead.

Fyke nets were fished from October 15 through 19, 2007 and October 13 through 17, 2008 (Figures 2 and 3, Table 1). These nets fished a total of 27.503 and 35.799 net-days in 2007 and 2008, respectively. Nets were emptied every day during which all fish were removed.

In addition to fyke netting, an 18 foot-long welded aluminum flat-bottomed maxi-boom electro shocking boat equipped with a Wisconsin Box was used on approximately 10 minute day-time runs. Two booms extended 8 feet from the bow and the box controls were adjusted to produce 16 amps. Runs were randomly chosen from available locations that were between 0.4 and 1.6m deep. Randomly selected runs that were too shallow or too deep or otherwise adverse to electro shocking were not done and replaced with another randomly selected run. In 2007, a total of 44 runs were done during 7.331 hours of sampling (Figure 4) done on five days from October 23 through October 29. During 2008, we shocked a total of 42 runs during 7.014 hours (Figure 5) on four days from October 21 through October 24. For both gears, all fish were counted. Of these fish, all pan fish and game fish were measured by total length.

FINDINGS

The mean daily ambient water temperatures during 2007 sampling was 12.6°C and generally declined over the sampling period (Table 3). During sampling, the water surface elevation measured at the Brownsville, Minnesota, gage changed as much as 1.06 feet. The mean daily flow in cubic feet per second was 64353 and fluctuated as much as 22800 cubic feet per second.

The mean daily ambient water temperatures during 2008 sampling was 12.0°C and generally declined over the sampling period (Table 3). During sampling, the water surface elevation measured at the Brownsville, Minnesota gage changed as much as 0.25 feet. The mean daily flow in cubic feet per second was 21209 and fluctuated as much as 8500 cubic feet per second.

Catch per Effort, Fyke Netting

During 2007 fyke netting, a total of 23 fish species and 2003 individuals were recorded. The most common fish recorded was gizzard shad (37.64% of the total catch) followed by bluegill (32.80%), black crappie (7.49%) and freshwater drum (6.54%) (Table 4). Mean catch per net-day for all species combined was 71.26 (standard deviation = 59.35, n = 27) during 27.503 net days of fishing and varied from a minimum of 2.97 to a maximum of 223.06. Catch rates for individual species are given in Table 4.

During 2008 fyke netting, a total of 23 fish species and one hybrid were found among a total of 1459 individuals. The most common fish recorded was bluegill (50.93% of the total catch) followed by black crappie (14.46%), largemouth bass (9.53%) and pumpkinseed (7.54%) (Table 5). The greatest change in relative abundance between the years was for gizzard shad. It dropped from 37.64% of the catch in 2007 to 1.78% of the catch in 2008. Mean catch per net-day for all species combined was 41.10 (standard deviation = 47.63, n = 36) during 35.799 net days of fishing and varied from a minimum of 1.97 to a maximum of 194.56. Catch rates for individual species are given in Table 5.

Fyke net catch rates between 2007 (71.26) and 2008 (41.10) for all species combined (Table 6) were significantly different ($p=0.0289$). Since gizzard shad abundance dropped drastically from 2007 to 2008, we tested fyke net catch rates between these years for all species combined excluding gizzard shad. Without this fish, catch rates between 2007 (44.05 fish/net-day, standard deviation = 41.68, n=27) were not significantly different ($p=0.7493$) from 2008 rates (40.37 fish/net-day, standard deviation =47.43, n=36) (Table 7). This suggests that the difference in total fish catch rates between these years (30.16 fish/net-day) was due to a large inter-annual change in the gizzard shad catch rate.

Catch per Effort, Electro Shocking

During 2007 electro-shocking, at least 34 fish species and one hybrid were among 4319 individuals recorded. The most common fish recorded was gizzard shad (73.25% of the total catch) followed by bluegill (8.75%), largemouth bass (5.17%) and shorthead redhorse (2.2%) (Table 8). Mean catch per hour for all species combined was 669.99 (standard deviation = 1361.24, n = 44) during 7.331 total hours of fishing and varied from a minimum of 11.98 to a maximum of 8431.14. Catch rates for individual species are given in Table 8.

During 2008 electro-shocking, at least 27 fish species were found among a total of 755 individuals. The most common fish recorded was largemouth bass (34.44% of the total catch) followed by bluegill (32.58%), northern pike (7.15%) and yellow perch (6.75%) (Table 9). The greatest change in relative abundance between the years was for gizzard shad. It dropped from 73.25% of the catch in 2007 to 0.79% of the catch in 2008. Mean catch per hour for all species combined was 107.64 (standard deviation = 112.33, n = 42) during 7.014 total hours of fishing and varied from a minimum of 11.98 to a maximum of 514.97. Catch rates for individual species are given in Table 9.

Electro-shocking catch rates, in number of fish per hour, between 2007 (669.99) and 2008 (107.64) for all species combined (Table 10) were significantly different ($p=0.0092$). Since gizzard shad abundance dropped drastically from 2007 to 2008, we tested electro shocking catch rates between these years for all species combined excluding gizzard shad. As opposed to fyke netting, electro shocking without this fish, catch

rates between 2007 (179.43 fish/hour, standard deviation = 187.74, n=44) and 2008 rates (106.79 fish/hour, standard deviation = 112.53, n=42) were not significantly different ($p=0.0333$) (Table 11). This suggests that, unlike fyke netting, the difference in total fish catch rates between these years (562.35 fish/hour) was influenced by a decline in gizzard shad catch rate but was not important enough to significantly change that rate.

Length Distributions

For fyke netted 2007 and 2008 fishes where there were sufficient numbers, we generated total length distributions and mean total lengths (Figures 6 through 17). Of the five fishes tested for differences in mean total length among years (black crappie, bluegill, largemouth bass, pumpkinseed and rock bass) only pumpkinseed was significantly different. In 2008, pumpkinseeds were 0.36 inches smaller than those from 2007 ($P=0.0034$).

For electro shocked 2007 and 2008 fishes where there were sufficient numbers, we generated total length distributions and mean total lengths (Figures 18 through 27). Of the five fishes tested for differences in mean total length among years (black crappie, bluegill, largemouth bass, pumpkinseed and yellow perch) only bluegill was significantly different. In 2008, bluegills were 0.56 inches larger than those from 2007 ($p<0.0001$).

CONCLUSIONS

Combined species fyke net catch rates from 2007 were 71.26 fish/net-day. In 2008, combined species catch rate was significantly lower at 41.10 fish/net-day. Substantially lower abundance of gizzard shad accounted for this difference from 2007 to 2008. Without this fish, 2007 catch rates were 44.05 fish/net-day, compared with 40.37 fish/net-day in 2008 and were not statistically different. In the northern Midwest, it is not unusual to observe gizzard shad populations fluctuate greatly. In Wisconsin, they are on the northern end of their geographic range and die in large numbers during long, cold, snowy winters. During 2007 and 2008, lower populations were observed in other WDNR investigations on the Mississippi River.

Combined species electro shocking catch rates from 2007 were 669.99 fish/hour. In 2008, combined species catch rate was significantly lower at 107.64 fish/hour. Unlike fyke netting results, substantially lower abundance of gizzard shad in 2008 influenced this inter-annual difference but did not determine it.

Mean total length of selected species were generally the same among years. Only fyke netted pumpkinseeds, which were 0.36 inches smaller in 2008, and electro shocked bluegills, which were 0.56 inches larger in 2008 changed.

RECOMMENDATIONS

1. Continue to monitor the fisheries community in the Pool 8 Islands, Phase III, Stage II habitat rehabilitation and enhancement project in Navigation Pool 8 of the Mississippi River. Monitoring should continue for several years after the 2009 completion of this project.
2. Monitoring results should be compared with ongoing Lake Assessment sampling results, which could serve as a reference condition.

REFERENCES

Rogala, James T. 1997. Bathymetry Data for the Upper Mississippi River. Project Status Report, Upper Mississippi River, Long Term Resource Monitoring Program, U.S. Geological Survey. PSR 97-09, USGS, La Crosse, WI. 2 pp.

FIGURE 1. LOCATION OF PHASE III, STAGE II (RAFT CHANNEL AREA) STUDY FISHERIES AREA IN NAVIGATION POOL 8 OF THE UPPER MISSISSIPPI RIVER.

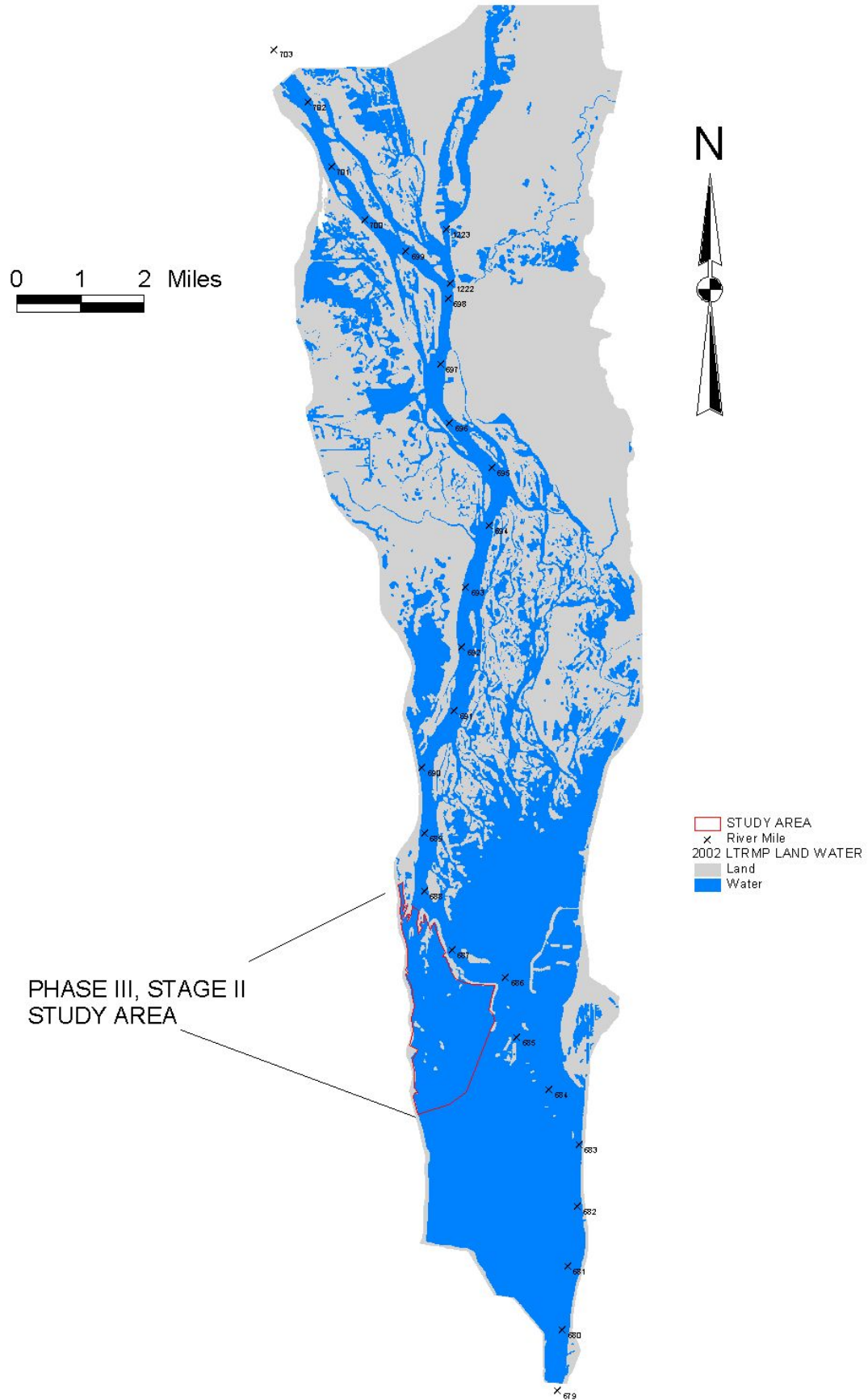


FIGURE 2. LOCATION OF 2007 RAFT CHANNEL FYKE NETTING STATIONS. (2006 NAIP PHOTO).

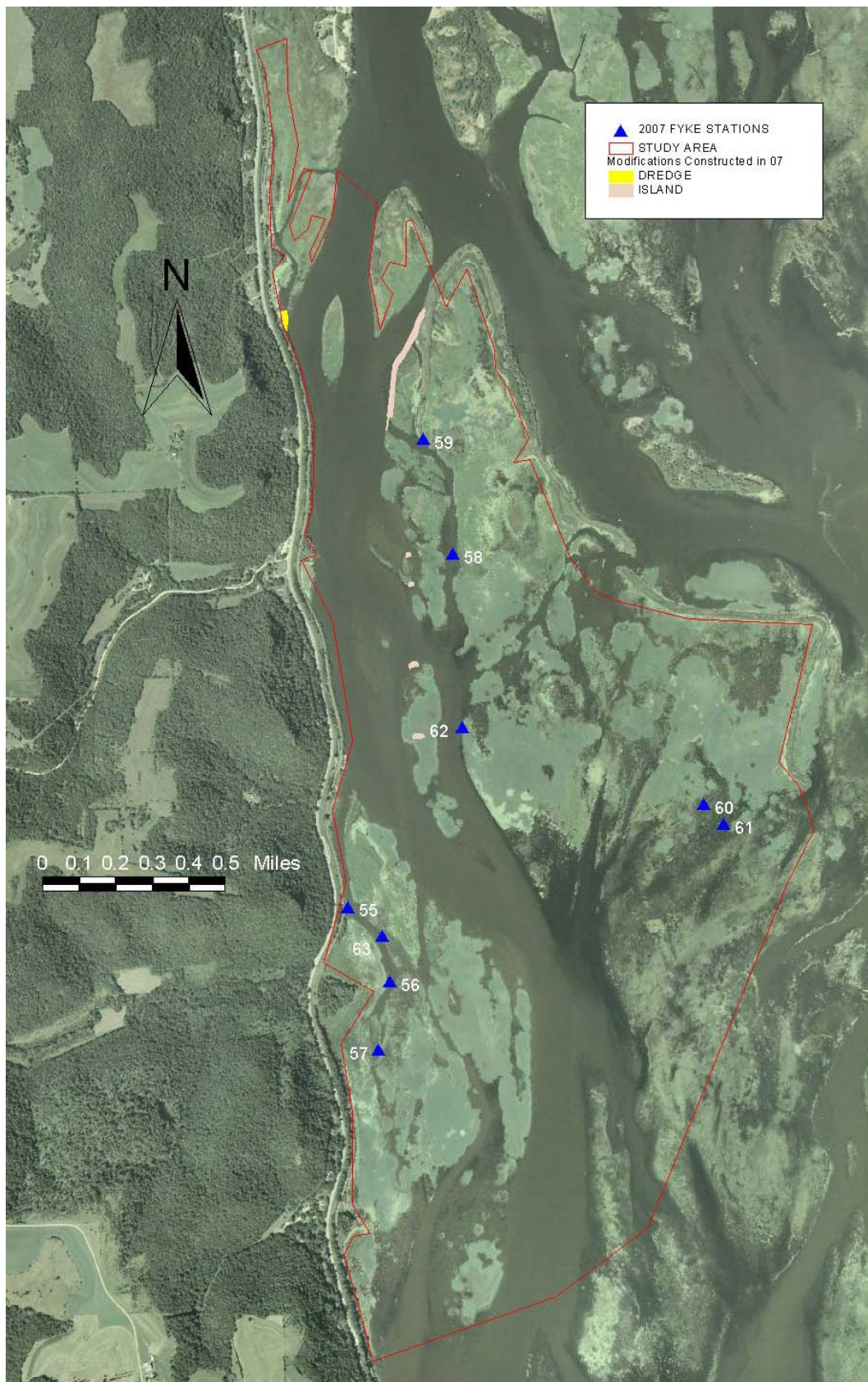


FIGURE 3. LOCATION OF 2008 RAFT CHANNEL FYKE NETTING STATIONS. (2008 NAIP PHOTO).

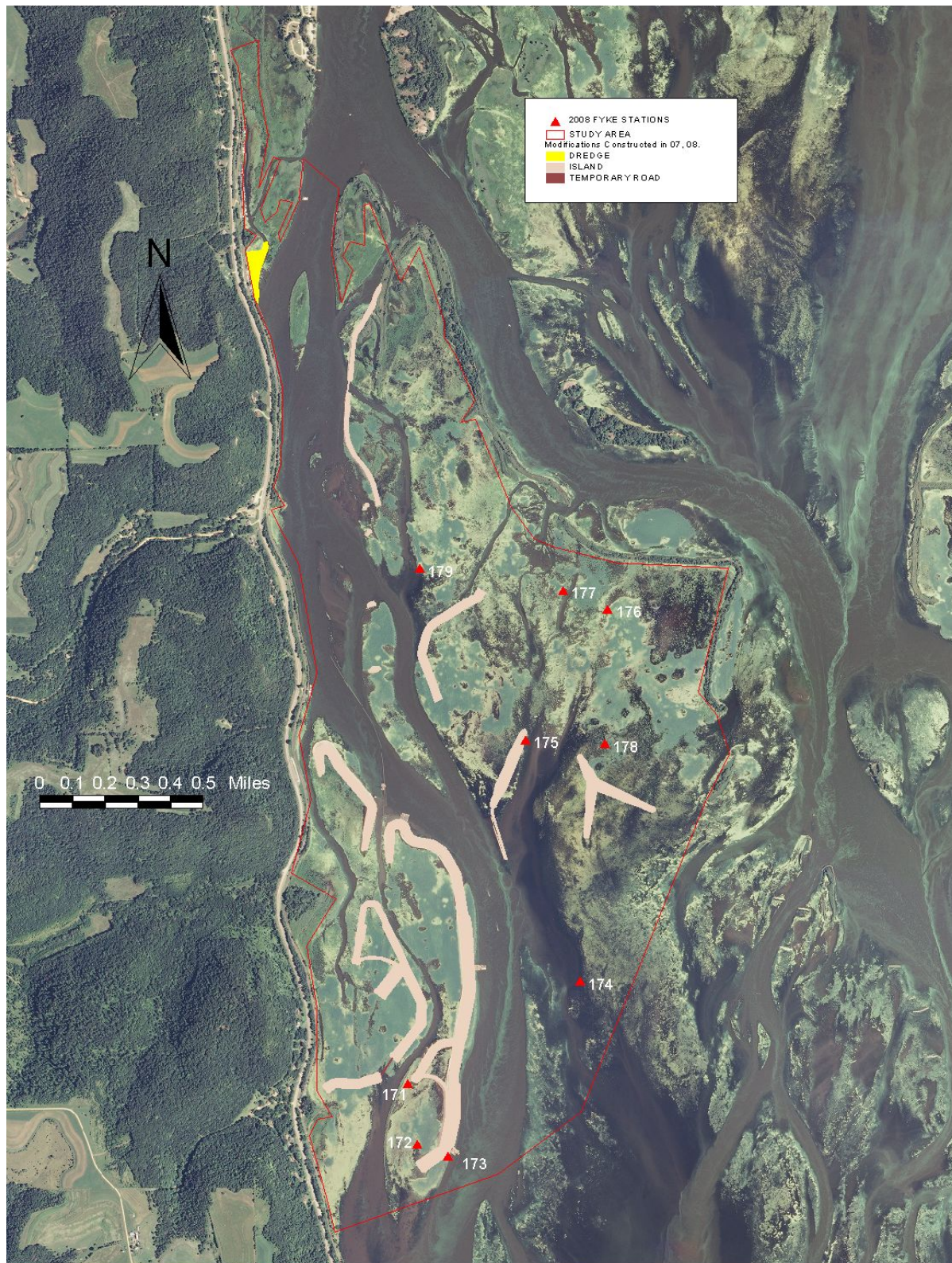


TABLE 1. FYKE NETTING STATION LOCATIONS, 2007, 2008 RAFT CHANNEL AREA.

STATION	UTM15STX	UTM15STY
55	639205	4834413
56	639388	4834083
57	639339	4833782
58	639665	4835972
59	639534	4836476
60	640766	4834868
61	640855	4834779
62	639709	4835204
63	639356	4834284
171	639671	4833136
172	639716	4832840
173	639868	4832779
174	640514	4833637
175	640246	4834819
176	640650	4835459
177	640430	4835551
178	640637	4834799
179	639727	4835657

FIGURE 4. LOCATION OF 2007 RAFT CHANNEL ELECTRO SHOCKING STATIONS. (2006 NAIP PHOTO).

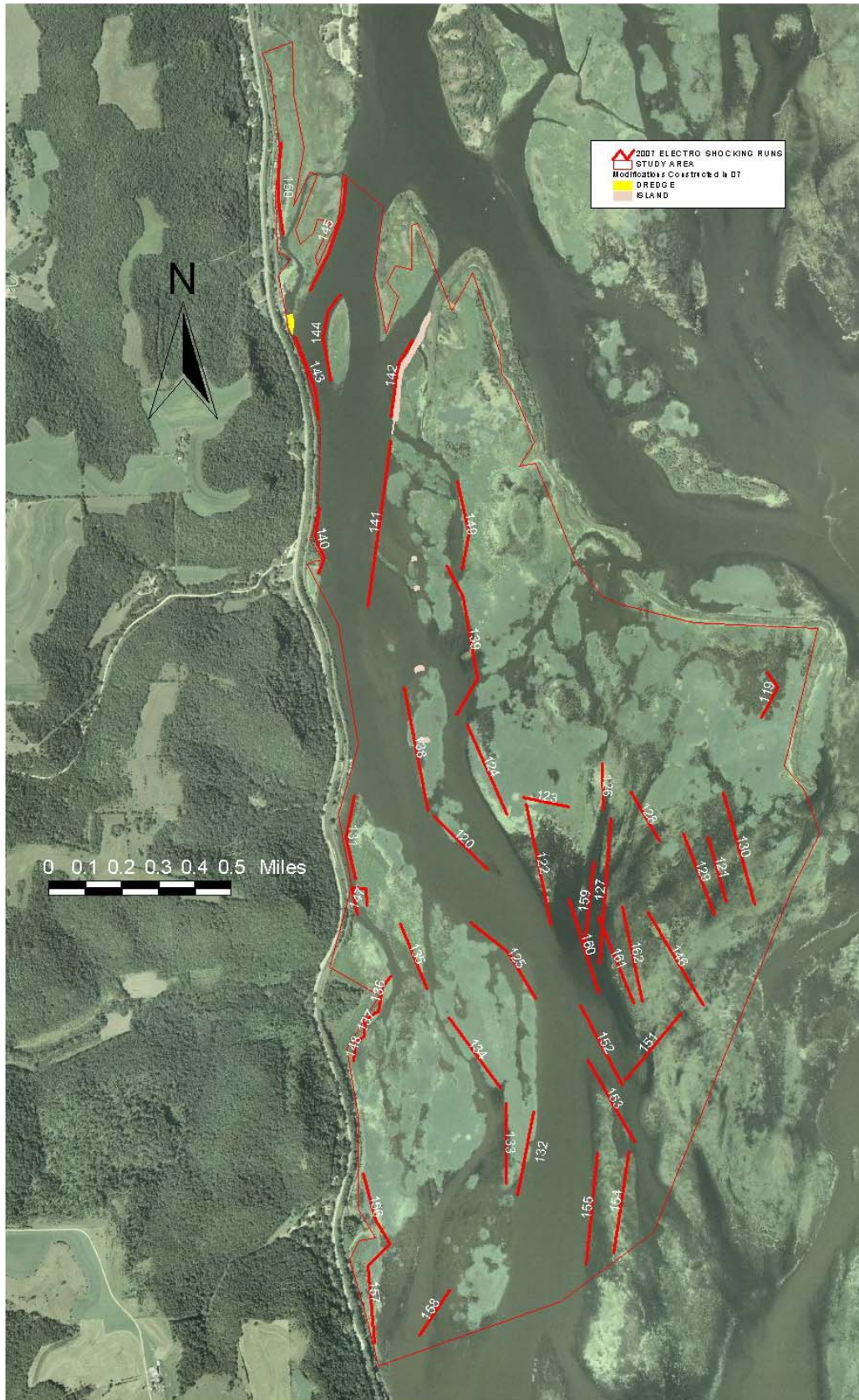


FIGURE 5. LOCATION OF 2008 RAFT CHANNEL ELECTRO SHOCKING STATIONS. (2008 NAIP PHOTO).

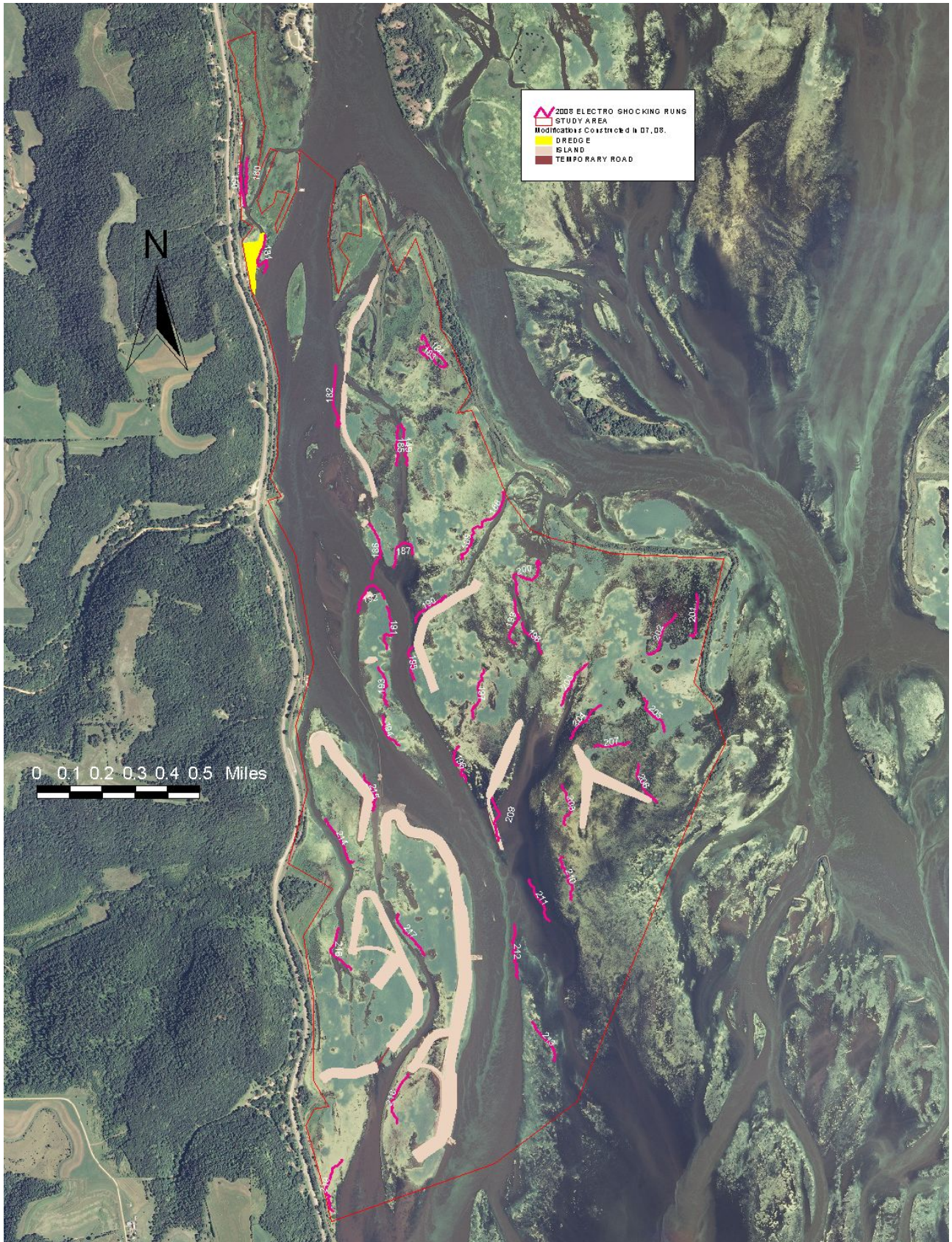


TABLE 2. ELECTRO SHOCKING STATION LOCATIONS, 2007, 2008 RAFT CHANNEL AREA.

STATION	LENGTH (M)	UTM15STX	UTM15STY	UTM15EDX	UTM15EDY
119	232	640993	4835264	641016	4835465
120	336	639553	4834833	639791	4834596
121	295	640837	4834452	640757	4834736
122	542	639958	4834883	640068	4834353
123	202	639947	4834912	640145	4834871
124	435	639697	4835234	639877	4834838
125	444	640000	4834028	639716	4834359
126	207	640298	4834859	640294	4835066
127	643	640331	4834822	640281	4834180
128	251	640545	4834723	640419	4834940
129	386	640787	4834396	640648	4834756
130	512	640824	4834933	640963	4834440
131	375	639207	4834921	639211	4834555
132	377	639922	4833159	639991	4833529
133	355	639868	4833566	639873	4833211
134	383	639618	4833943	639844	4833634
135	312	639522	4834069	639406	4834358
136	176	639309	4833966	639366	4834127
137	138	639248	4833861	639309	4833970
138	554	639425	4835399	639528	4834855
139	703	639609	4835934	639653	4835278
140	306	639051	4836193	639046	4835902
141	738	639365	4836485	639264	4835754
142	358	639462	4836931	639364	4836593
143	381	638947	4836942	639048	4836577
144	402	639144	4837130	639102	4836752
145	527	639166	4837643	639008	4837148
146	476	640738	4833995	640496	4834405
147	258	639261	4834437	639217	4834398
148	126	639200	4833751	639245	4833860
149	223	639653	4836317	639684	4836114
150	237	638885	4837385	638865	4837593
151	385	640392	4833667	640640	4833962
152	395	640198	4833996	640380	4833646
153	417	640437	4833393	640229	4833755
154	456	640344	4832903	640410	4833354
155	497	640273	4833349	640224	4832854
156	335	639362	4832948	639244	4833258
157	478	639294	4832509	639362	4832944
158	241	639490	4832542	639623	4832741
159	358	640217	4834274	640255	4834630
160	433	640147	4834465	640277	4834052
161	410	640429	4834004	640276	4834385
162	431	640380	4834433	640471	4834013
180	196	638897	4837622	638892	4837448
181	302	638981	4837061	638984	4837249
182	360	639326	4836608	639343	4836306
183	205	639825	4836612	639785	4836644
184	257	639757	4836732	639842	4836602
185	214	639635	4836312	639631	4836113

TABLE 2. (CONTINUED)

STATION	LENGTH (M)	UTM15STX	UTM15STY	UTM15EDX	UTM15EDY
186	309	639494	4835831	639505	4835557
187	232	639616	4835617	639712	4835678
188	257	640152	4835985	640026	4835818
189	215	640022	4835811	639946	4835657
190	247	639873	4835475	639723	4835345
191	270	639580	4835424	639582	4835213
192	272	639570	4835460	639438	4835394
193	227	639539	4835126	639586	4834936
194	209	639562	4834888	639644	4834743
195	249	639707	4835229	639719	4835062
196	245	639938	4834739	639969	4834566
197	278	640061	4835114	640010	4834875
198	196	640247	4835344	640343	4835192
199	263	640208	4835461	640218	4835238
200	336	640336	4835629	640225	4835481
201	235	641073	4835281	641106	4835486
202	267	641003	4835385	640863	4835194
203	259	640567	4835145	640439	4834938
204	236	640485	4834778	640635	4834940
205	225	640844	4834977	640946	4834810
206	237	640905	4834464	640819	4834651
207	188	640604	4834732	640775	4834760
208	242	640458	4834354	640443	4834550
209	254	640100	4834488	640131	4834274
210	255	640448	4834192	640490	4833984
211	248	640279	4834087	640383	4833879
212	291	640211	4833863	640226	4833597
213	242	640297	4833384	640407	4833194
214	269	639419	4834173	639281	4834381
215	246	639470	4834599	639512	4834422
216	267	639342	4833848	639408	4833640
217	260	639638	4833916	639768	4833713
218	279	639684	4833133	639634	4832887
219	307	639364	4832710	639320	4832457

TABLE 3. MEAN TEMPERATURE, WATER SURFACE ELEVATION AND FLOW DURING FALL 2007, 2008 RAFT CHANNEL AREA.

DATE	MEAN DAILY TEMPERATURE °C	WATER SURFACE ELEVATION (ft), BROWNSVILLE	FLOW (cfs) DAM 8
10/16/2007	14.3	631.21	54600
10/17/2007	14.4	631.15	52000
10/18/2007	14.6	631.15	51400
10/19/2007	13.9	631.26	52700
10/23/2007	12.0	630.47	66500
10/24/2007	11.7	630.44	73000
10/25/2007	12.0	630.38	74200
10/26/2007	11.3	630.31	74200
10/29/2007	11.1	630.20	70700
2007 MEAN	12.6	630.68	64353
10/14/2008	15.6	631.22	23200
10/15/2008	14.4	631.32	26400
10/16/2008	13.3	631.07	26100
10/17/2008	12.6	631.09	18700
10/21/2008	12.4	631.13	23300
10/22/2008	9.9	631.21	18600
10/23/2008	9.6	631.16	17900
10/24/2008	10.4	631.20	18000
2008 MEAN	12.0	631.18	21209

TABLE 4. FALL 2007 RAFT CHANNEL AREA RELATIVE ABUNDANCE, MEAN CATCH PER NET-DAY, FYKE NETS.

	SPECIES	FREQUENCY	PERCENT	MEAN	STANDARD DEV.	MIN.	MAX.	NET-DAYS
1	black crappie	150	7.49	5.28	5.51	0.00	22.22	27.503
2	bluegill	657	32.80	23.05	25.72	0.00	94.76	27.503
3	bowfin	2	0.10	0.07	0.26	0.00	1.04	27.503
4	channel catfish	34	1.70	1.28	1.82	0.00	6.26	27.503
5	freshwater drum	131	6.54	4.66	6.67	0.00	26.50	27.503
6	gizzard shad	754	37.64	27.21	30.96	0.00	148.08	27.503
7	golden shiner	15	0.75	0.51	1.04	0.00	4.69	27.503
8	green sunfish	3	0.15	0.11	0.42	0.00	2.03	27.503
9	largemouth bass	55	2.75	1.94	2.84	0.00	13.02	27.503
10	northern pike	1	0.05	0.04	0.20	0.00	1.02	27.503
11	pumpkinseed	46	2.30	1.55	3.04	0.00	11.54	27.503
12	quillback	2	0.10	0.06	0.33	0.00	1.74	27.503
13	rock bass	61	3.05	2.19	3.51	0.00	15.08	27.503
14	sauger	1	0.05	0.04	0.20	0.00	1.03	27.503
15	shorthead redhorse	20	1.00	0.71	1.04	0.00	3.75	27.503
16	silver redhorse	12	0.60	0.45	0.76	0.00	2.05	27.503
17	spotted sucker	4	0.20	0.14	0.43	0.00	1.87	27.503
18	tadpole madtom	2	0.10	0.07	0.39	0.00	2.01	27.503
19	walleye	1	0.05	0.03	0.18	0.00	0.94	27.503
20	white bass	15	0.75	0.53	1.22	0.00	5.13	27.503
21	white crappie	2	0.10	0.08	0.27	0.00	1.03	27.503
22	yellow bullhead	9	0.45	0.31	0.77	0.00	2.94	27.503
23	yellow perch	26	1.30	0.93	1.25	0.00	3.10	27.503
	ALL SPECIES	2003	100.0	71.26	59.35	2.97	223.06	27.503

TABLE 5. FALL 2008 RAFT CHANNEL AREA RELATIVE ABUNDANCE, MEAN CATCH PER NET-DAY, FYKE NETS.

	SPECIES	FREQUENCY	PERCENT	MEAN	STANDARD DEV.	MIN.	MAX.	NET-DAYS
1	black crappie	211	14.46	6.00	11.90	0.00	67.94	35.799
2	bluegill	743	50.93	20.99	30.51	0.00	127.02	35.799
3	bowfin	3	0.21	0.08	0.27	0.00	0.98	35.799
4	brown bullhead	1	0.07	0.03	0.18	0.00	1.09	35.799
5	channel catfish	10	0.69	0.28	0.51	0.00	1.97	35.799
6	common carp	20	1.37	0.56	0.85	0.00	4.06	35.799
7	flathead catfish	1	0.07	0.03	0.16	0.00	0.98	35.799
8	freshwater drum	17	1.17	0.47	0.91	0.00	3.93	35.799
9	gizzard shad	26	1.78	0.73	1.12	0.00	3.95	35.799
10	golden redhorse	2	0.14	0.06	0.35	0.00	2.08	35.799
11	golden shiner	13	0.89	0.38	1.09	0.00	5.42	35.799
12	largemouth bass	139	9.53	3.85	7.41	0.00	37.30	35.799
13	northern pike	13	0.89	0.36	0.76	0.00	3.02	35.799
14	pumpkinseed	110	7.54	3.10	4.69	0.00	17.77	35.799
15	pumpkinseed x bluegill	1	0.07	0.03	0.16	0.00	0.99	35.799
16	rock bass	29	1.99	0.81	1.39	0.00	6.72	35.799
17	shorthead redhorse	23	1.58	0.64	1.08	0.00	4.80	35.799
18	shortnose gar	9	0.62	0.25	0.44	0.00	1.09	35.799
19	silver redhorse	58	3.98	1.62	3.17	0.00	17.26	35.799
20	spotted sucker	5	0.34	0.14	0.59	0.00	3.00	35.799
21	walleye	5	0.34	0.14	0.36	0.00	1.09	35.799
22	white bass	1	0.07	0.03	0.16	0.00	0.98	35.799
23	white crappie	2	0.14	0.06	0.23	0.00	1.04	35.799
24	yellow perch	17	1.17	0.47	0.95	0.00	3.84	35.799
	ALL SPECIES	1459	100.0	41.10	47.63	1.97	194.56	35.799

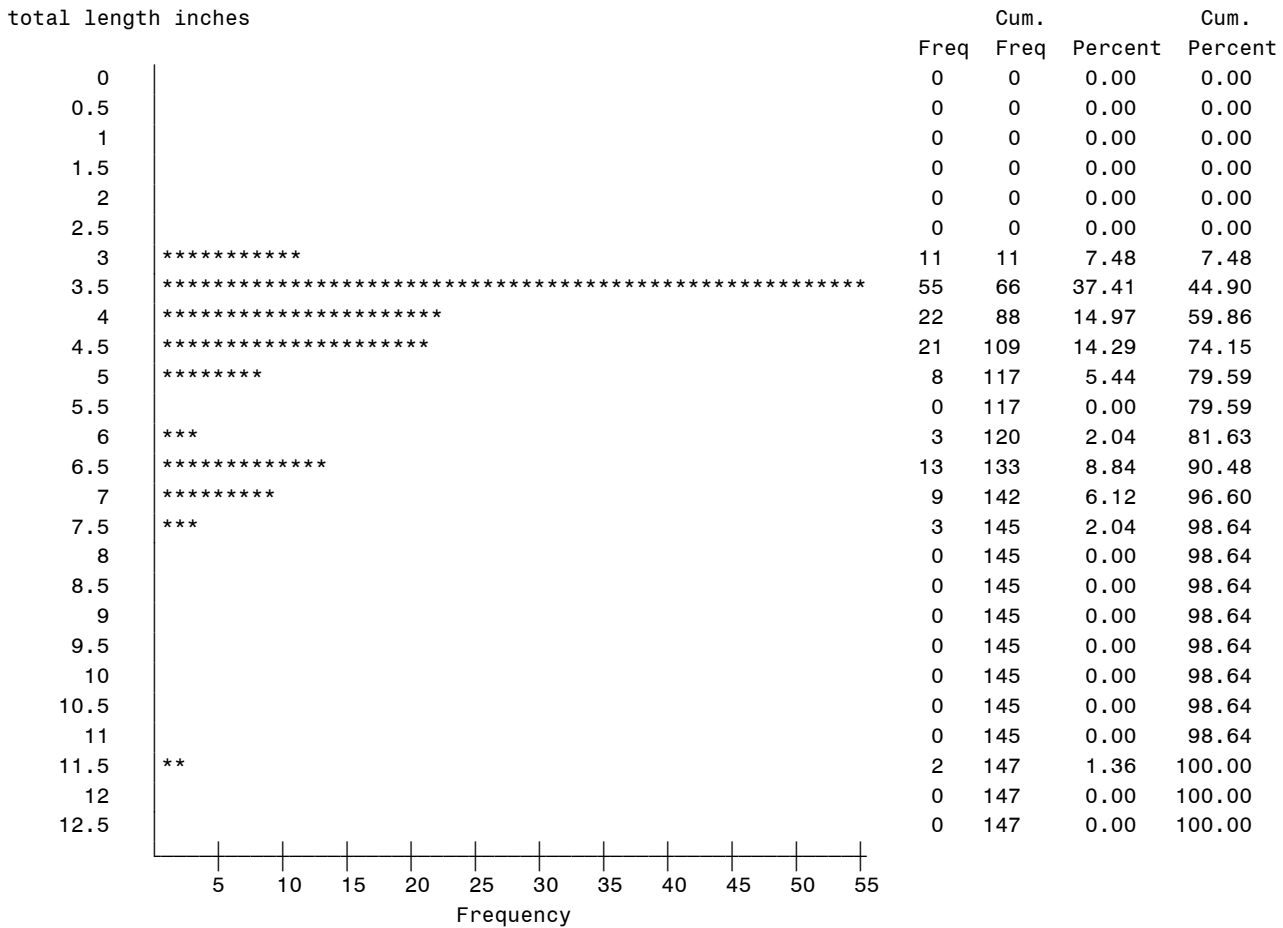
TABLE 6. COMPARISON OF MEAN RAFT CHANNEL CATCH PER NET-DAY BETWEEN 2007 AND 2008 FOR ALL SPECIES COMBINED, FYKE NETTING.

YEAR	MEAN	STD. DEV.	N	NET DAYS	DIFFERENT (means with the same letter are not Sign. Different)
2007	71.26	59.35	27	27.503	A
2008	41.10	47.63	36	35.799	B
ALL YEARS	54.02	54.63	63	63.302	

TABLE 7. COMPARISON OF MEAN RAFT CHANNEL CATCH PER NET-DAY BETWEEN 2007 AND 2008 FOR ALL SPECIES COMBINED EXCLUDING GIZZARD SHAD, FYKE NETTING.

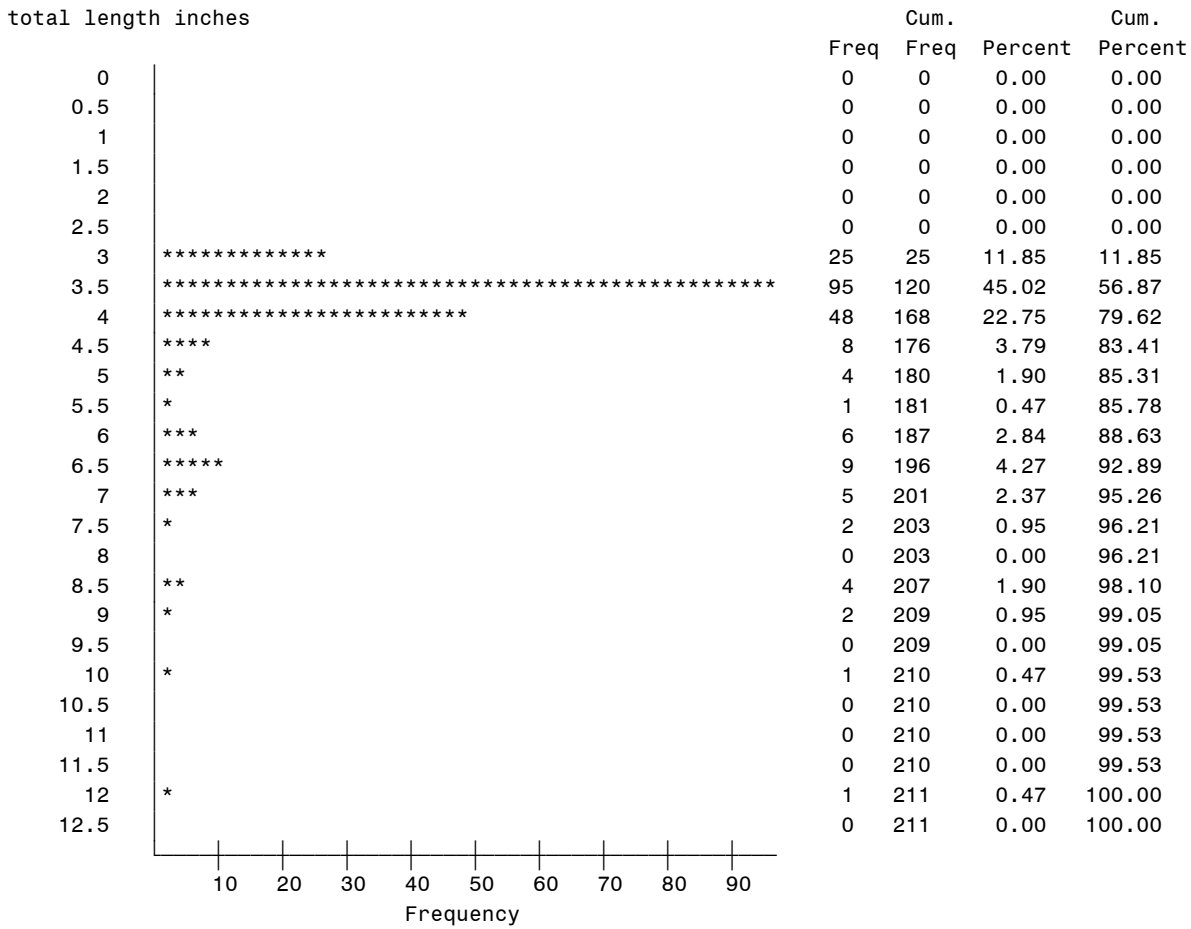
YEAR	MEAN	STD. DEV.	N	NET DAYS	DIFFERENT (means with the same letter are not Sign. Different)
2007 WITHOUT GIZZARD SHAD	44.05	41.68	27	27.503	A
2008 WITHOUT GIZZARD SHAD	40.37	47.43	36	35.799	A
ALL YEARS WITHOUT GIZZARD SHAD	41.95	44.74	63	63.302	

FIGURE 6. BLACK CRAPPIE LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, FYKE NETS, 2007.



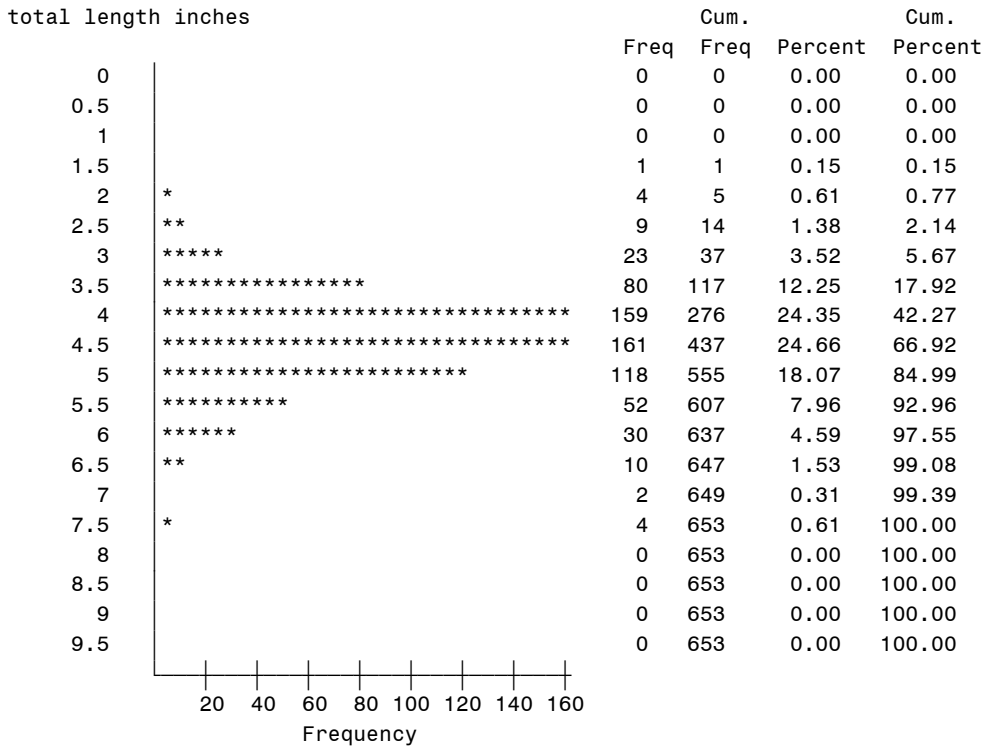
N	Mean	Std Dev	Minimum	Maximum
147	4.4752993	1.4999777	2.7950000	11.5350000

FIGURE 7. BLACK CRAPPIE LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, FYKE NETS, 2008.



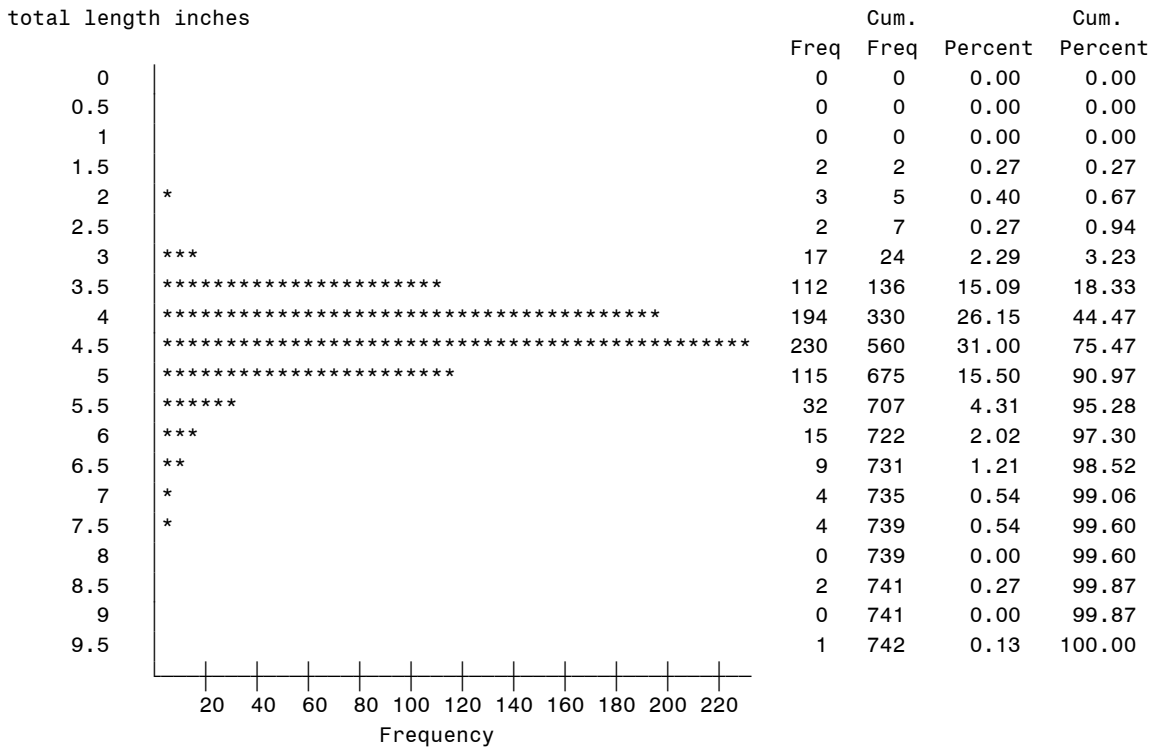
N	Mean	Std Dev	Minimum	Maximum
211	4.1668910	1.4323301	2.8740000	12.1650000

FIGURE 8. BLUEGILL LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, FYKE NETS, 2007.



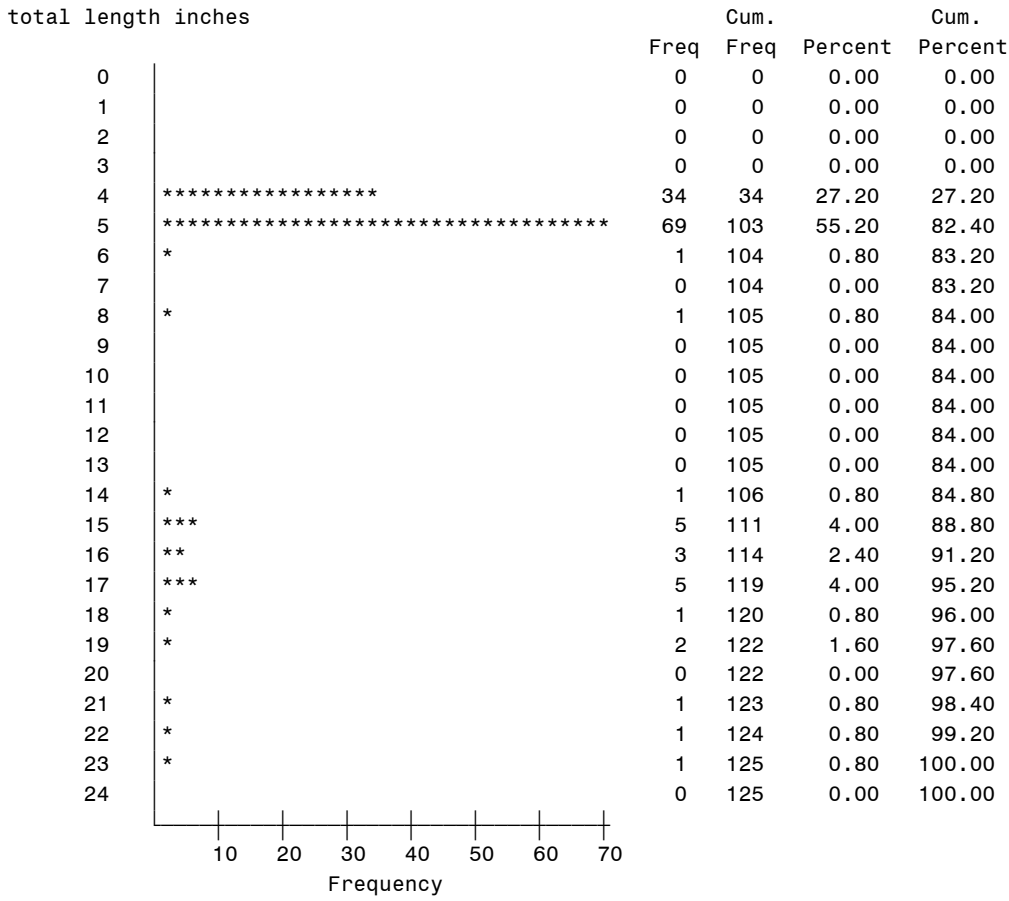
N	Mean	Std Dev	Minimum	Maximum
653	4.4437305	0.8513560	1.6930000	7.5200000

FIGURE 9. BLUEGILL LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, FYKE NETS, 2008.



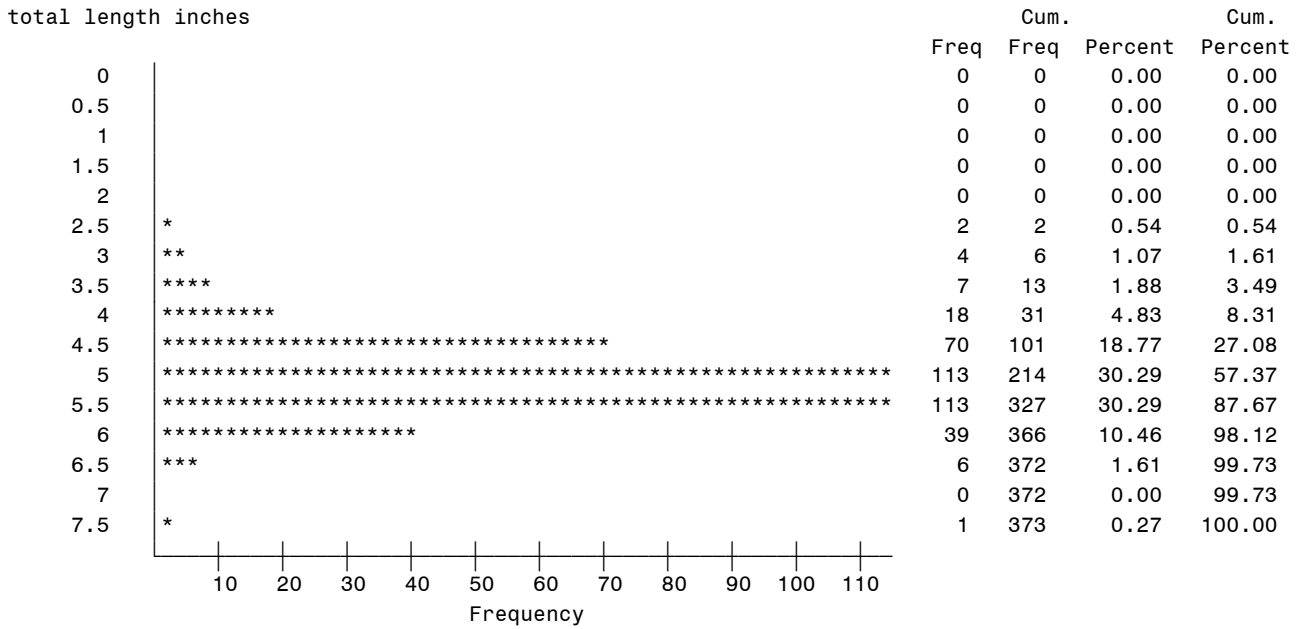
N	Mean	Std Dev	Minimum	Maximum
742	4.3856119	0.8002616	1.5750000	9.3700000

FIGURE 10. FRESHWATER DRUM LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, FYKE NETS, 2007.



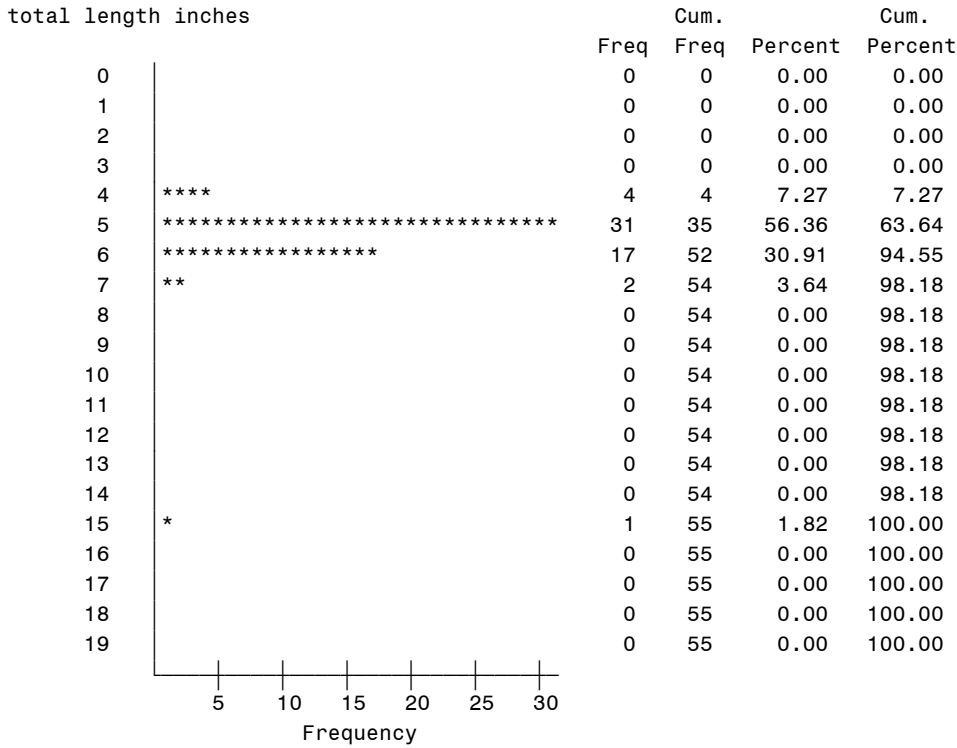
N	Mean	Std Dev	Minimum	Maximum
125	6.7177760	4.7393298	3.8980000	22.9130000

FIGURE 11. GIZZARD SHAD LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, FYKE NETS, 2007.



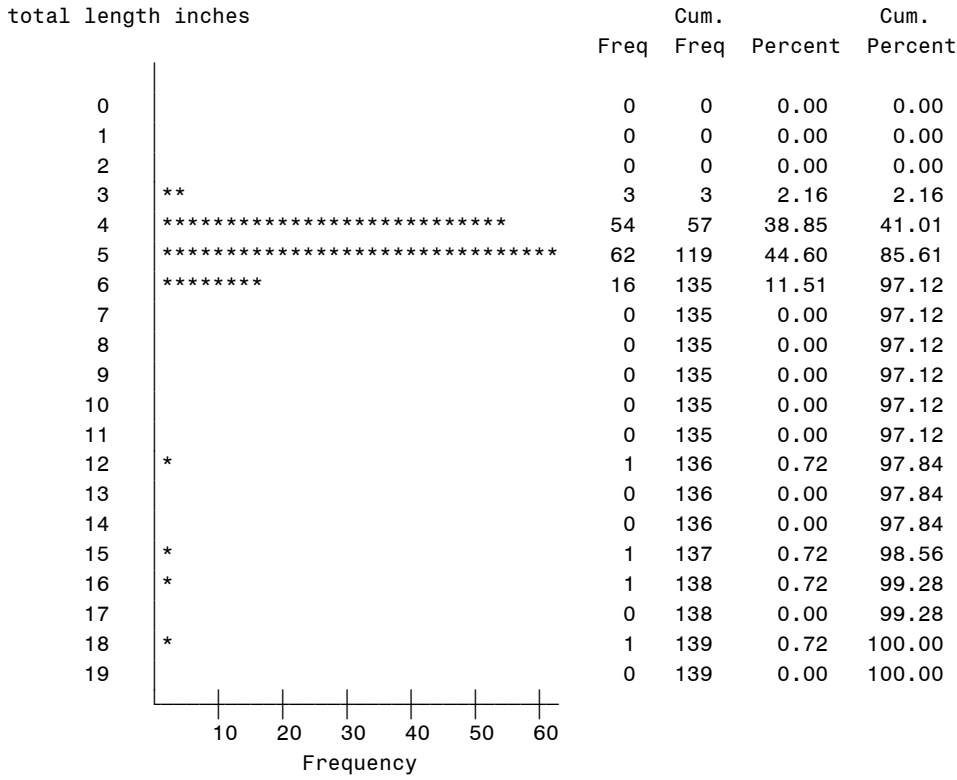
N	Mean	Std Dev	Minimum	Maximum
373	5.0967828	0.6420741	2.6770000	7.4020000

FIGURE 12. LARGEMOUTH BASS LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, FYKE NETS, 2007.



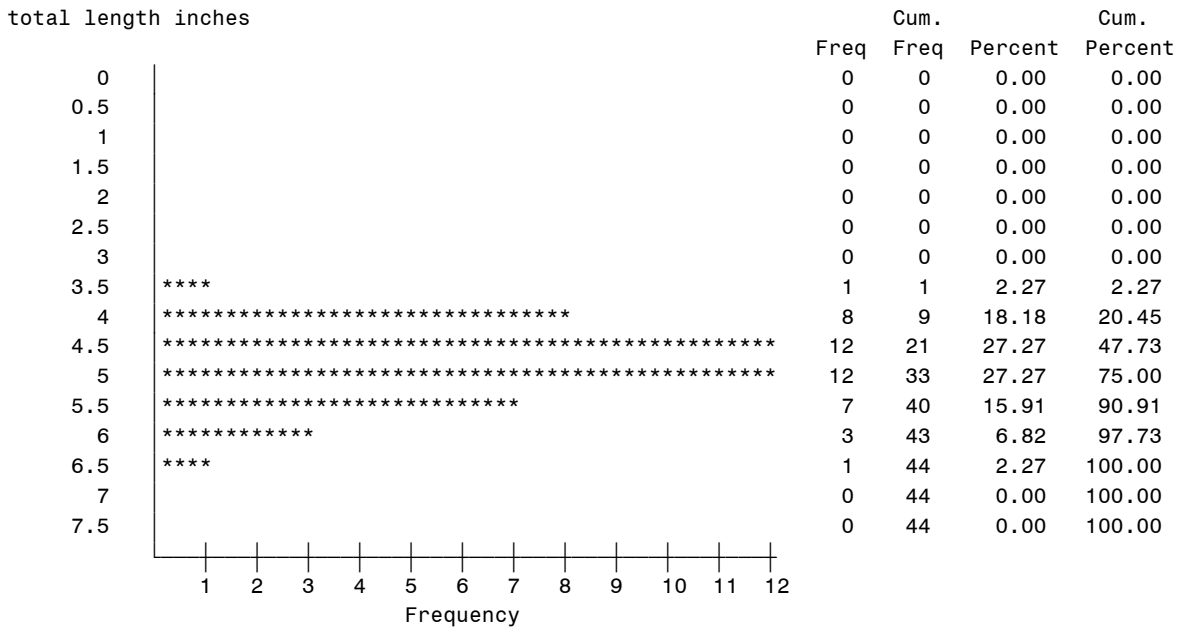
N	Mean	Std Dev	Minimum	Maximum
55	5.4352364	1.3790317	4.3700000	14.6460000

FIGURE 13. LARGEMOUTH BASS LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, FYKE NETS, 2008.



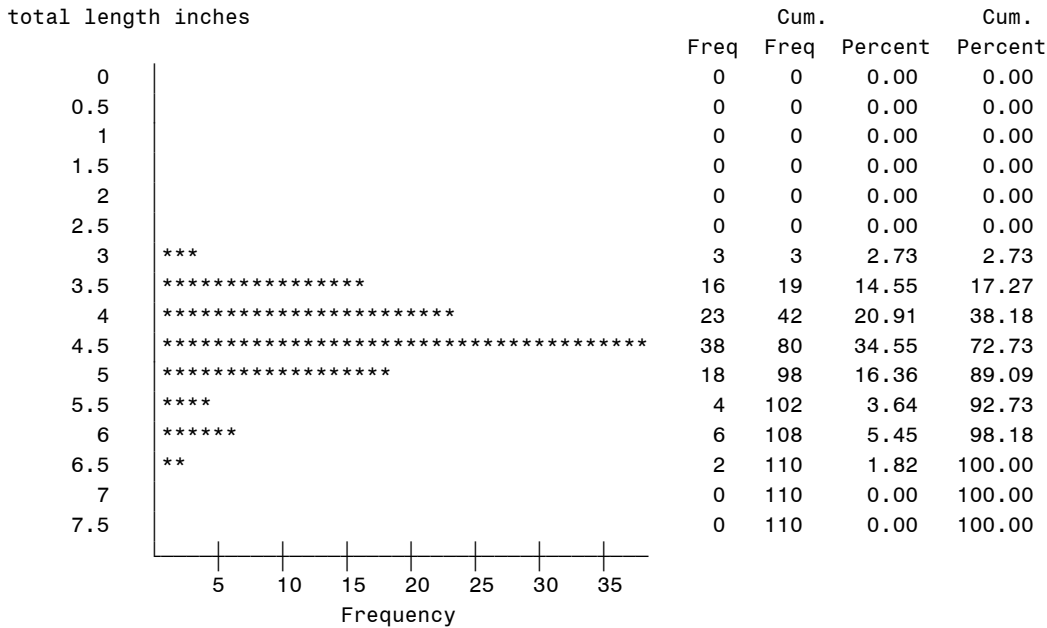
N	Mean	Std Dev	Minimum	Maximum
139	4.9552014	1.9308064	3.1890000	18.1500000

FIGURE 14. PUMPKINSEED LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, FYKE NETS, 2007.



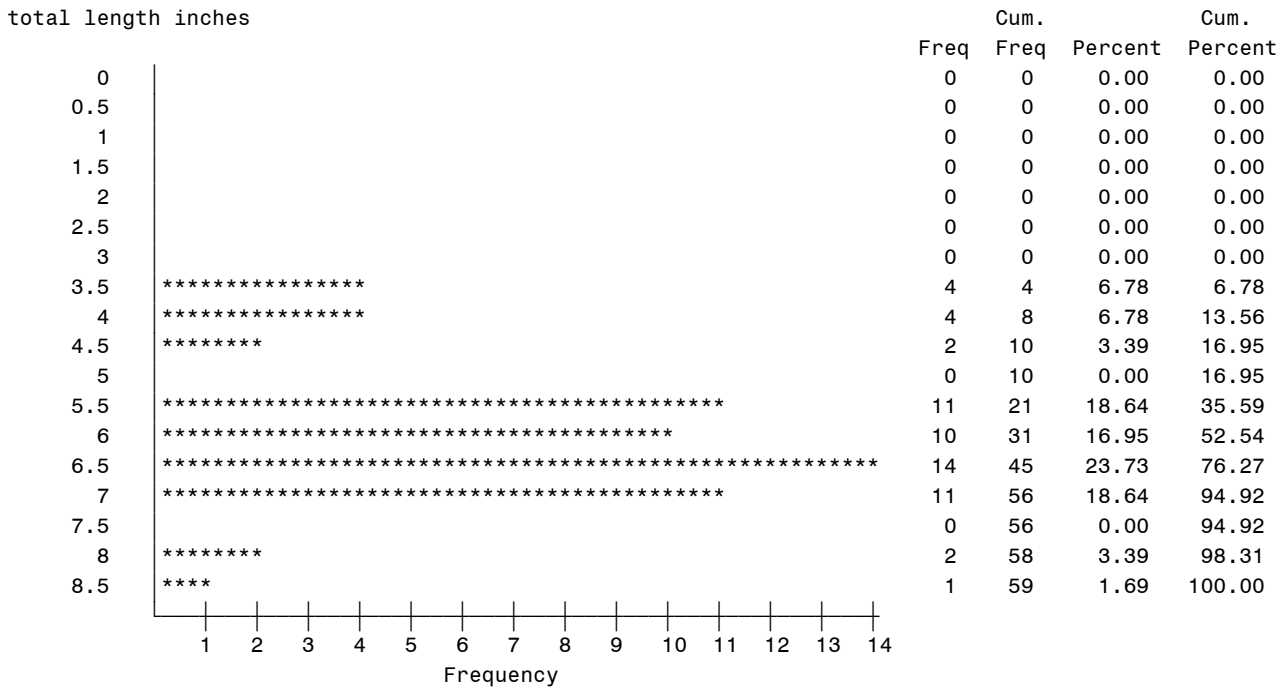
N	Mean	Std Dev	Minimum	Maximum
44	4.7968864	0.6390958	3.4650000	6.2600000

FIGURE 15. PUMPKINSEED LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, FYKE NETS, 2008.



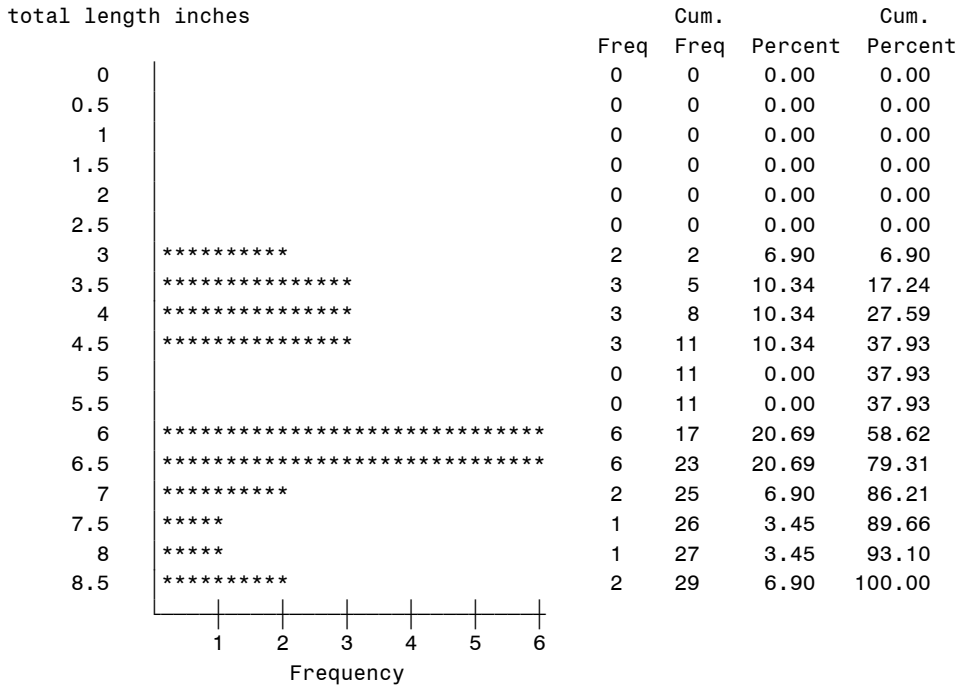
N	Mean	Std Dev	Minimum	Maximum
110	4.4387818	0.6891643	3.1500000	6.2990000

FIGURE 16. ROCK BASS LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, FYKE NETS, 2007.



N	Mean	Std Dev	Minimum	Maximum
59	5.9589831	1.1199495	3.3860000	8.6610000

FIGURE 17. ROCK BASS LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, FYKE NETS, 2008.



N	Mean	Std Dev	Minimum	Maximum
29	5.6638966	1.5768303	3.1890000	8.6220000

TABLE 8. FALL 2007 RAFT CHANNEL AREA RELATIVE ABUNDANCE, MEAN CATCH PER HOUR, ELECTRO SHOCKING.

	SPECIES	FREQUENCY	PERCENT	MEAN	STANDARD DEV.	MIN.	MAX.	RUNS	TOTAL HOURS
1	black crappie	78	1.59	10.62	41.22	0.00	257.49	44	7.331
2	bluegill	430	8.75	58.78	91.59	0.00	383.23	44	7.331
3	bowfin	2	0.04	0.27	1.81	0.00	11.98	44	7.331
4	brook silverside	2	0.04	0.27	1.81	0.00	11.98	44	7.331
5	bullhead minnow	1	0.02	0.14	0.90	0.00	5.99	44	7.331
6	channel catfish	4	0.08	0.54	2.83	0.00	17.96	44	7.331
7	common carp	89	1.81	12.13	15.08	0.00	71.86	44	7.331
8	emerald shiner	15	0.31	2.04	4.46	0.00	17.96	44	7.331
9	freshwater drum	22	0.45	2.99	7.25	0.00	41.92	44	7.331
10	gizzard shad	3599	73.25	490.56	1308.17	0.00	8083.83	44	7.331
11	golden redhorse	4	0.08	0.54	2.17	0.00	11.98	44	7.331
12	golden shiner	5	0.10	0.68	2.95	0.00	17.96	44	7.331
13	green sunfish	7	0.14	0.95	3.86	0.00	17.96	44	7.331
14	green sunfish x pumpkinseed	1	0.02	0.14	0.90	0.00	5.99	44	7.331
15	largemouth bass	254	5.17	34.72	57.77	0.00	359.28	44	7.331
16	logperch	5	0.10	0.68	3.70	0.00	23.95	44	7.331
17	minnows & cyprinidae carps unsp.	4	0.08	0.54	3.61	0.00	23.95	44	7.331
18	mooneye	1	0.02	0.14	0.90	0.00	5.99	44	7.331
19	northern pike	9	0.18	1.26	3.17	0.00	13.33	44	7.331
20	orangespotted sunfish	1	0.02	0.14	0.90	0.00	5.99	44	7.331
21	pumpkinseed	44	0.90	5.99	23.03	0.00	149.70	44	7.331
22	quillback	1	0.02	0.14	0.90	0.00	5.99	44	7.331
23	river carpsucker	1	0.02	0.14	0.90	0.00	5.99	44	7.331
24	river shiner	1	0.02	0.14	0.90	0.00	5.99	44	7.331
25	rock bass	28	0.57	3.81	15.29	0.00	95.81	44	7.331
26	sauger	3	0.06	0.41	1.53	0.00	5.99	44	7.331
27	shorthead redhorse	108	2.2	14.74	20.69	0.00	89.82	44	7.331
28	silver redhorse	12	0.24	1.63	3.95	0.00	17.96	44	7.331
29	smallmouth bass	12	0.24	1.63	5.38	0.00	29.94	44	7.331
30	spottail shiner	34	0.69	4.67	10.78	0.00	47.90	44	7.331
31	spotted sucker	62	1.26	8.47	11.37	0.00	65.87	44	7.331
32	walleye	5	0.1	0.68	2.32	0.00	11.98	44	7.331
33	weed shiner	1	0.02	0.14	0.90	0.00	5.99	44	7.331
34	white bass	7	0.14	0.95	2.87	0.00	11.98	44	7.331
35	white sucker	2	0.04	0.27	1.26	0.00	5.99	44	7.331
36	yellow perch	59	1.2	8.05	16.18	0.00	89.82	44	7.331
	ALL SPECIES	4913	100.00	669.99	1361.24	11.98	8431.14	44	7.331

TABLE 9. FALL 2008 RAFT CHANNEL AREA RELATIVE ABUNDANCE, MEAN CATCH PER HOUR, ELECTRO SHOCKING.

	SPECIES	FREQUENCY	PERCENT	MEAN	STANDARD DEV.	MIN.	MAX.	RUNS	TOTAL HOURS
1	American brook lamprey	1	0.13	0.14	0.92	0.00	5.99	42	7.014
2	black crappie	16	2.12	2.28	6.34	0.00	29.94	42	7.014
3	bluegill	246	32.58	35.07	79.45	0.00	461.08	42	7.014
4	bowfin	5	0.66	0.71	3.02	0.00	17.96	42	7.014
5	brook silverside	1	0.13	0.14	0.92	0.00	5.99	42	7.014
6	channel catfish	5	0.66	0.71	3.02	0.00	17.96	42	7.014
7	common carp	1	0.13	0.14	0.92	0.00	5.99	42	7.014
8	freshwater drum	19	2.52	2.71	14.07	0.00	89.82	42	7.014
9	gizzard shad	6	0.79	0.86	4.09	0.00	23.95	42	7.014
10	golden redhorse	3	0.40	0.43	1.56	0.00	5.99	42	7.014
11	golden shiner	3	0.40	0.43	1.56	0.00	5.99	42	7.014
12	johnny darter	2	0.26	0.29	1.29	0.00	5.99	42	7.014
13	largemouth bass	260	34.44	37.07	47.45	0.00	167.67	42	7.014
14	logperch	1	0.13	0.14	0.92	0.00	5.99	42	7.014
15	northern pike	54	7.15	7.70	10.10	0.00	47.90	42	7.014
16	pumpkinseed	7	0.93	1.00	2.26	0.00	5.99	42	7.014
17	rock bass	9	1.19	1.28	4.29	0.00	17.96	42	7.014
18	shorthead redhorse	15	1.99	2.14	6.04	0.00	29.94	42	7.014
19	silver redhorse	3	0.40	0.43	2.05	0.00	11.98	42	7.014
20	smallmouth bass	16	2.12	2.28	6.61	0.00	29.94	42	7.014
21	spottail shiner	6	0.79	0.86	3.12	0.00	17.96	42	7.014
22	spotted sucker	20	2.65	2.85	6.90	0.00	35.93	42	7.014
23	suckers n08-13 n17	1	0.13	0.14	0.92	0.00	5.99	42	7.014
24	walleye	1	0.13	0.14	0.92	0.00	5.99	42	7.014
25	warmouth	1	0.13	0.14	0.92	0.00	5.99	42	7.014
26	white sucker	1	0.13	0.14	0.92	0.00	5.99	42	7.014
27	yellow bullhead	1	0.13	0.14	0.92	0.00	5.99	42	7.014
28	yellow perch	51	6.75	7.27	8.10	0.00	29.94	42	7.014
	ALL SPECIES	755	100.0	107.64	112.33	11.98	514.97	42	7.014

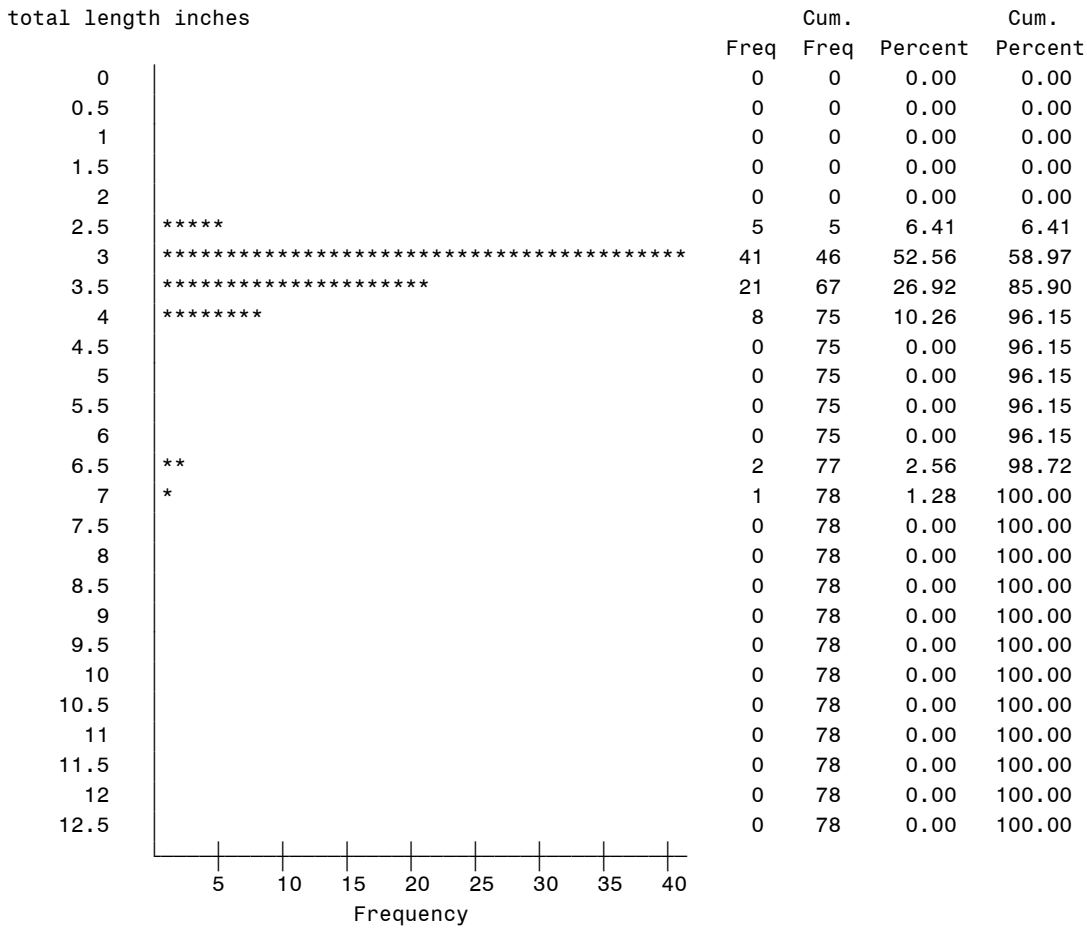
TABLE 10. COMPARISON OF MEAN RAFT CHANNEL CATCH PER HOUR BETWEEN 2007 AND 2008 FOR ALL SPECIES COMBINED, ELECTRO SHOCKING.

YEAR	MEAN	STD. DEV.	NUMBER OF RUNS	TOTAL HOURS	DIFFERENT (means with the same letter are not Sign. Different)
2007	669.99	1361.24	44	7.331	A
2008	107.64	112.33	42	7.014	B
ALL YEARS	395.36	1011.64	86	14.345	

TABLE 11. COMPARISON OF MEAN RAFT CHANNEL CATCH PER HOUR BETWEEN 2007 AND 2008 FOR ALL SPECIES COMBINED EXCLUDING GIZZARD SHAD, ELECTRO SHOCKING.

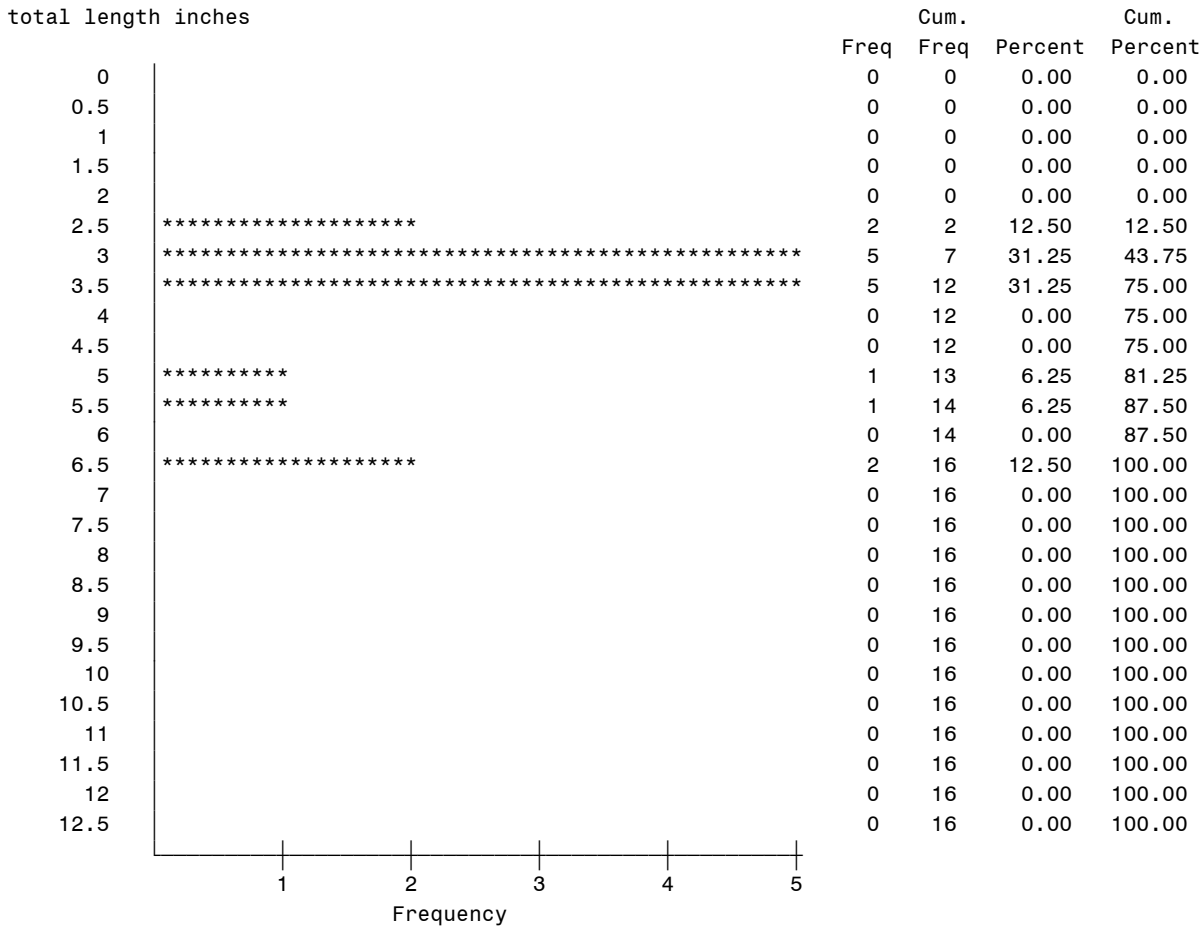
YEAR	MEAN	STD. DEV.	NUMBER OF RUNS	TOTAL HOURS	DIFFERENT (means with the same letter are not Sign. Different)
2007 WITHOUT GIZZARD SHAD	179.43	187.74	44	7.331	A
2008 WITHOUT GIZZARD SHAD	106.79	112.53	42	7.014	B
ALL YEARS WITHOUT GIZZARD SHAD	143.95	158.97	86	14.345	

FIGURE 18. BLACK CRAPPIE LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, ELECTRO SHOCKING, 2007.



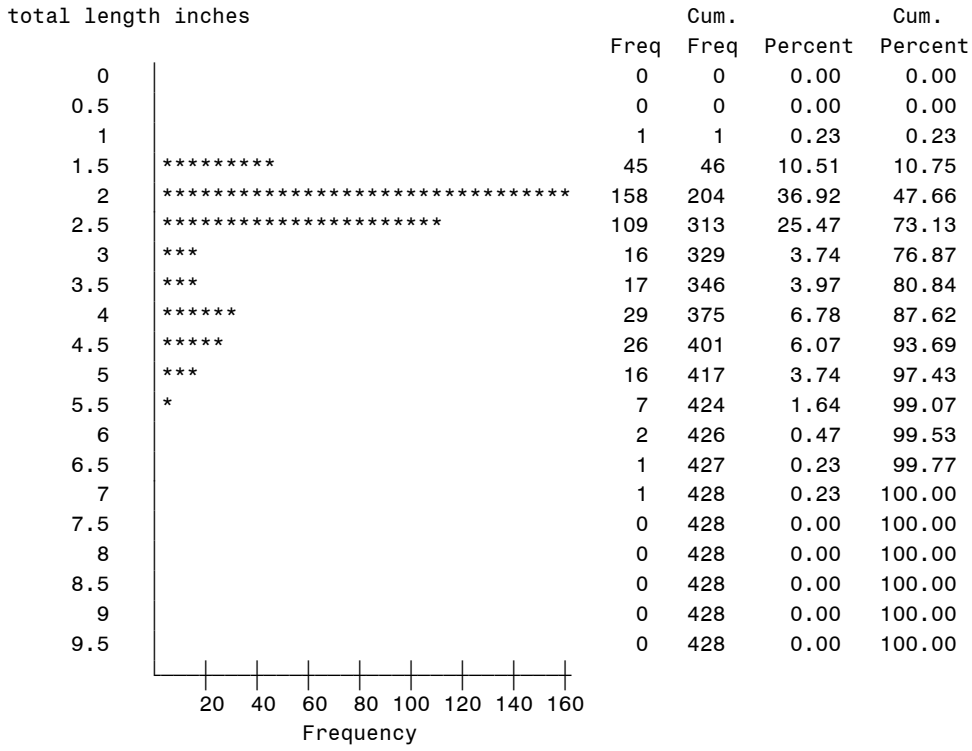
N	Mean	Std Dev	Minimum	Maximum
78	3.3252821	0.7787858	2.5590000	6.9690000

FIGURE 19. BLACK CRAPPIE LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, ELECTRO SHOCKING, 2008.



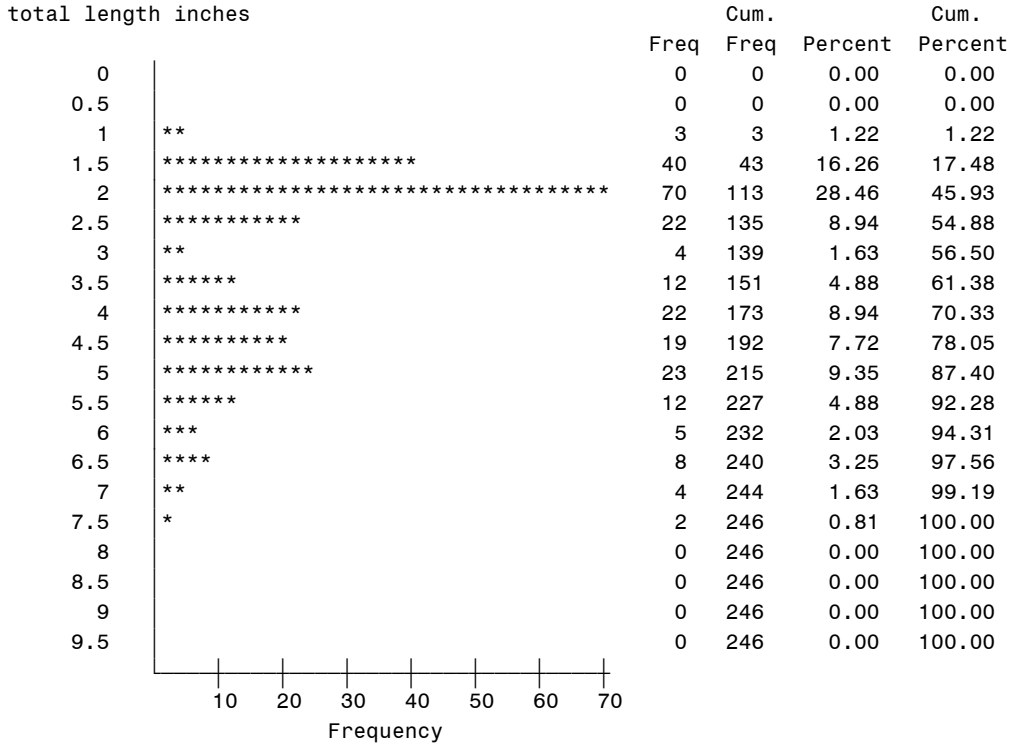
N	Mean	Std Dev	Minimum	Maximum
16	3.7968125	1.2942690	2.4020000	6.4170000

FIGURE 20. BLUEGILL LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, ELECTRO SHOCKING, 2007.



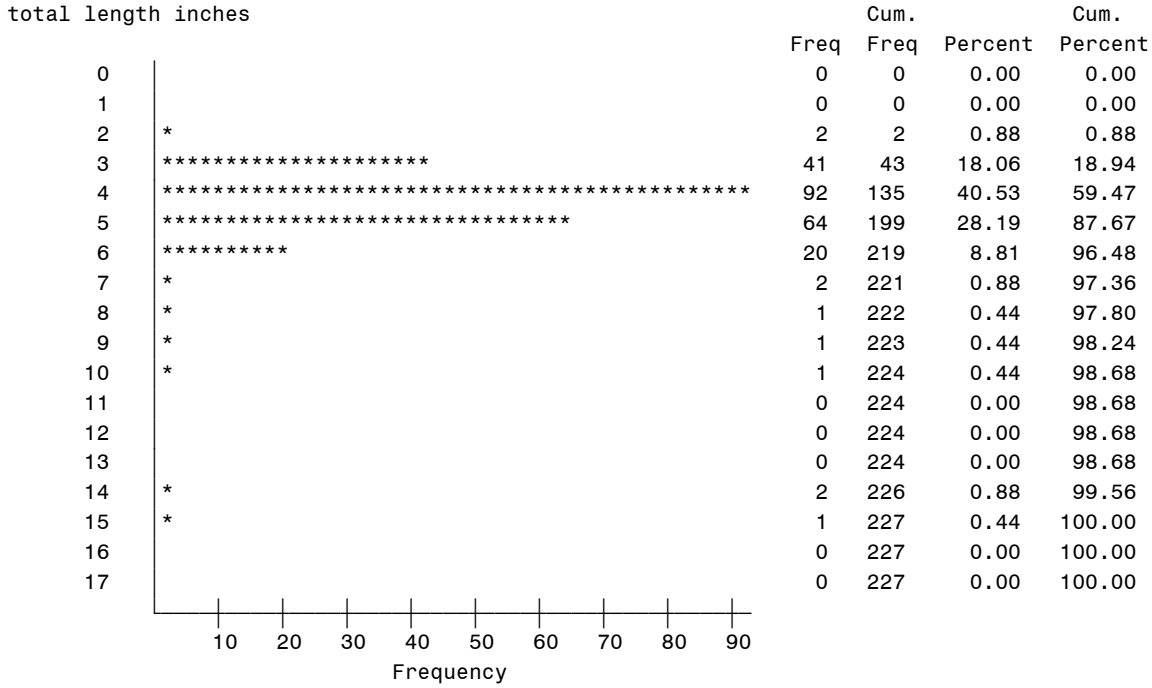
428	2.6634860	1.0645861	1.2200000	6.8110000
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FIGURE 21. BLUEGILL LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, ELECTRO SHOCKING, 2008.



246	3.2249878	1.6308634	1.1020000	7.6380000
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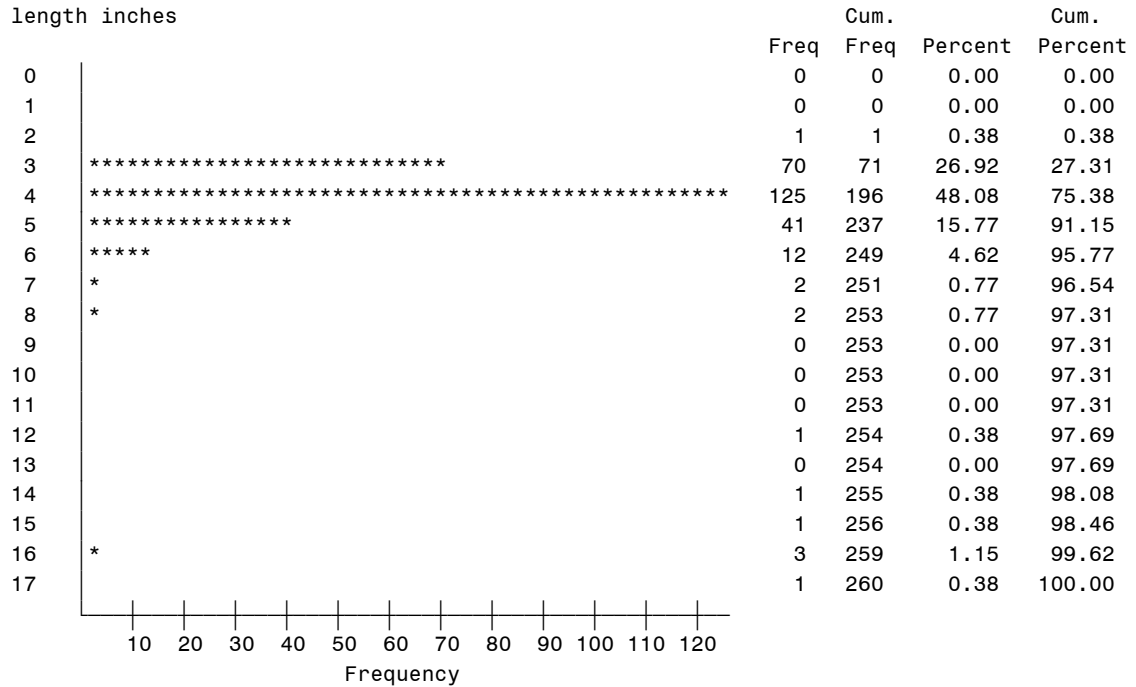
FIGURE 22. LARGEMOUTH BASS LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, ELECTRO SHOCKING, 2007.



N	Mean	Std Dev	Minimum	Maximum
227	4.4819295	1.5333902	2.1650000	15.1970000

FIGURE 23. LARGEMOUTH BASS LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, ELECTRO SHOCKING, 2008.

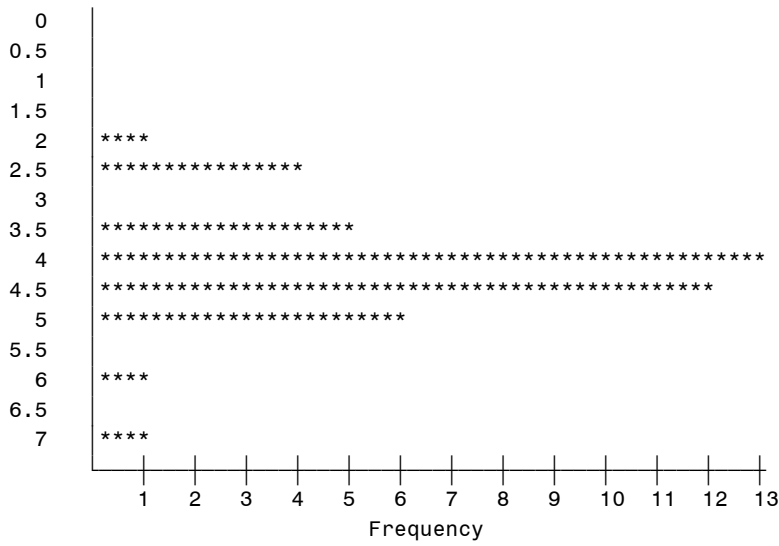
total length inches



N	Mean	Std Dev	Minimum	Maximum
260	4.3061654	2.0129233	2.1650000	17.0080000

FIGURE 24. PUMPKINSEED LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, ELECTRO SHOCKING, 2007.

total length inches

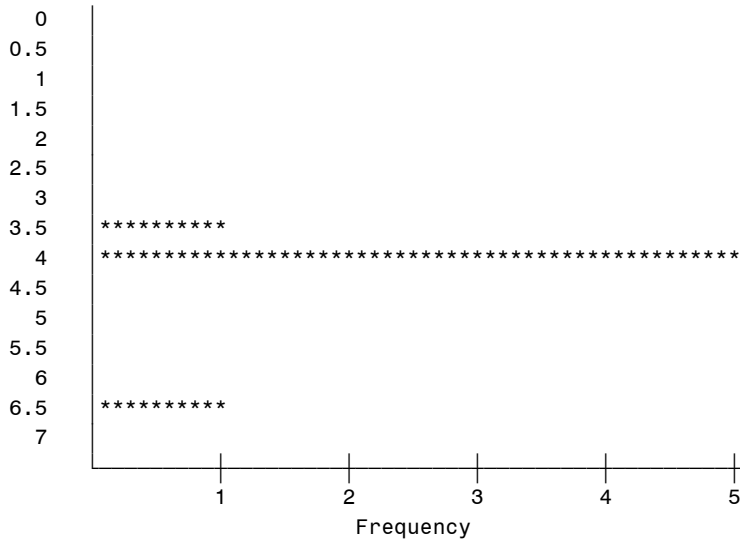


	Freq	Cum. Freq	Percent	Cum. Percent
0	0	0	0.00	0.00
0.5	0	0	0.00	0.00
1	0	0	0.00	0.00
1.5	0	0	0.00	0.00
2	1	1	2.33	2.33
2.5	4	5	9.30	11.63
3	0	5	0.00	11.63
3.5	5	10	11.63	23.26
4	13	23	30.23	53.49
4.5	12	35	27.91	81.40
5	6	41	13.95	95.35
5.5	0	41	0.00	95.35
6	1	42	2.33	97.67
6.5	0	42	0.00	97.67
7	1	43	2.33	100.00

N	Mean	Std Dev	Minimum	Maximum
43	4.1513256	0.9017081	1.8900000	6.8900000

FIGURE 25. PUMPKINSEED LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, ELECTRO SHOCKING, 2008.

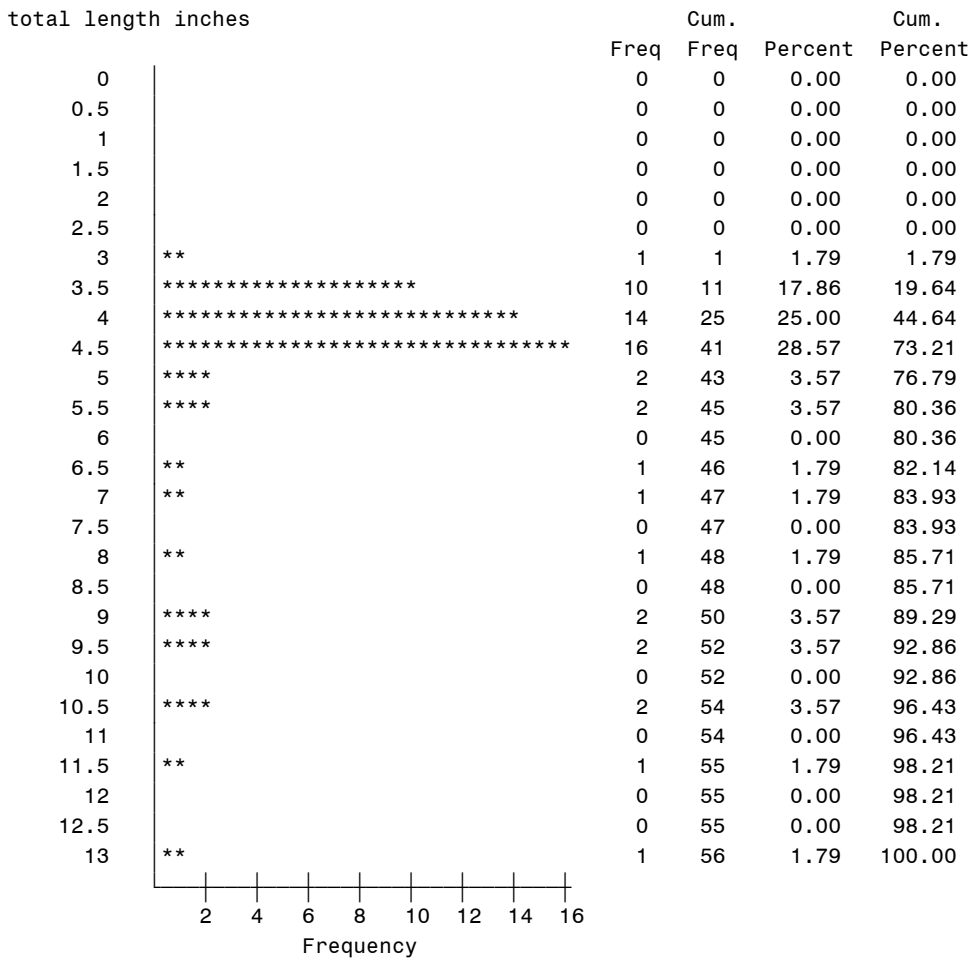
total length inches



	Freq	Cum. Freq	Percent	Cum. Percent
0	0	0	0.00	0.00
0.5	0	0	0.00	0.00
1	0	0	0.00	0.00
1.5	0	0	0.00	0.00
2	0	0	0.00	0.00
2.5	0	0	0.00	0.00
3	0	0	0.00	0.00
3.5	1	1	14.29	14.29
4	5	6	71.43	85.71
4.5	0	6	0.00	85.71
5	0	6	0.00	85.71
5.5	0	6	0.00	85.71
6	0	6	0.00	85.71
6.5	1	7	14.29	100.00
7	0	7	0.00	100.00

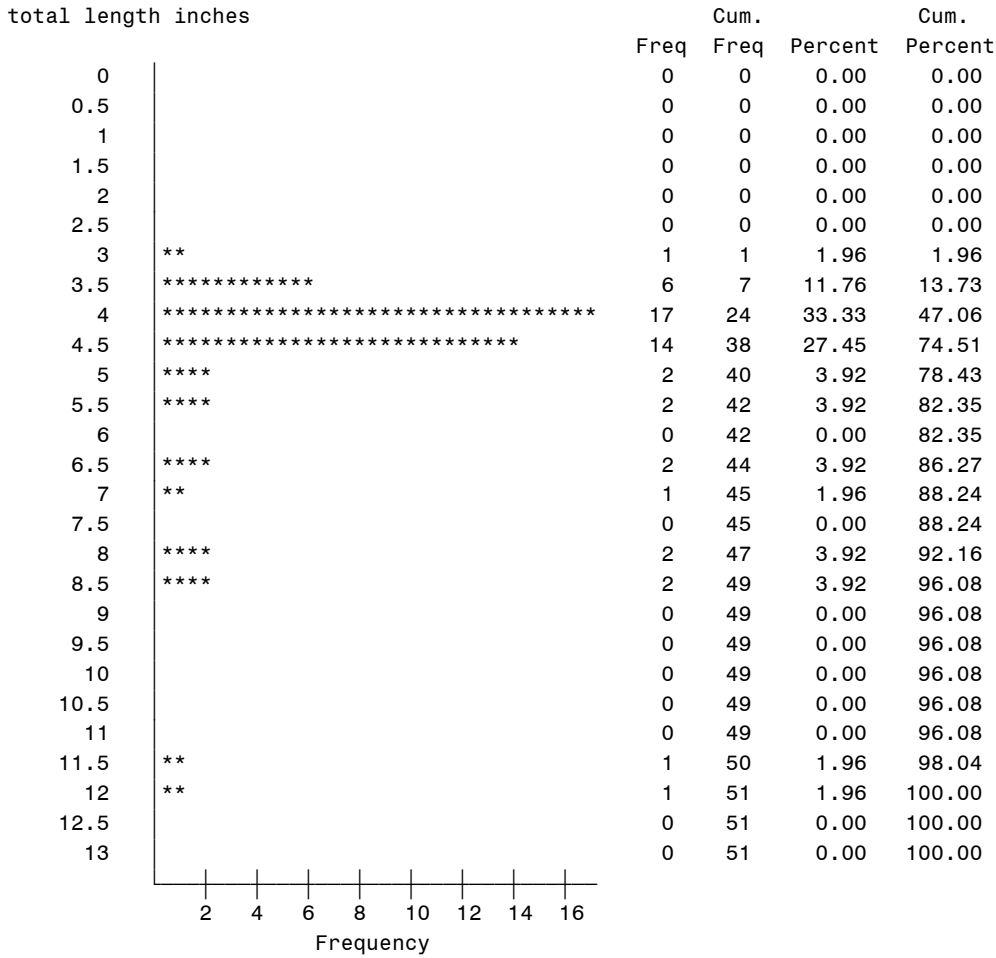
N	Mean	Std Dev	Minimum	Maximum
7	4.2295714	0.9046592	3.6610000	6.2600000

FIGURE 26. YELLOW PERCH LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, ELECTRO SHOCKING, 2007.



N	Mean	Std Dev	Minimum	Maximum
56	5.1912500	2.3392773	3.1500000	12.8350000

FIGURE 27. YELLOW PERCH LENGTH DISTRIBUTION, RAFT CHANNEL AREA, POOL 8, ELECTRO SHOCKING, 2008.



N	Mean	Std Dev	Minimum	Maximum
51	4.9436275	1.9105623	2.9530000	12.2050000