

Complete Report

Results of a Fisheries Lake Assessment in the Black River Mouth Lake Unit, Navigation Pool 7 of the upper Mississippi River, Fall 2010.

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Purpose

The purpose of this work is to monitor the fall population length frequency and catch per unit effort of sunfishes, yellow perch and crappie in the Black River Mouth (BRM) Lake Unit. A secondary purpose is to estimate length and size distributions of other game fishes caught incidentally.

Methods

The BRM Lake Unit is located in Navigation Pool 7 of the upper Mississippi River (Figure 1). This lake unit has a total water surface area of 855 acres.

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. Nets were set at locations thought likely to catch centrarchids and other fishes typical of backwaters from September 7 through September 10, 2010 (Figure 2). A total of 13 locations were chosen, with 1 fyke net at each. These nets fished a total of 34.41 net-days and were emptied every day.

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. A total of 33 runs were done during 5.43 hours of sampling (Figure 3 and Table 1) during September 21 and 22 and October 12, 2010. For both gears, all fish were counted, identified to species, measured by total length and returned to the river.

We calculated Proportional Size Structures for selected quality (PSS_Q) and preferred (PSS_P) game fishes as well as catch per effort for these size categories. Because our fyke nets had bar mesh greater than 0.5 inches, we calculated PSS_Q and PSS_P for bluegill and pumpkinseed using a four-inch stock size rather a three-inch stock size and then converted these two metrics to three-inch PSS using the following formulas (Wisconsin Department of Natural Resources, 2010):

$$PSS_{Q3} = -4.10 + 0.97 (PSS_{Q4})$$

$$PSS_{P3} = -0.41 + 0.76 (PSS_{P4}).$$

Statistical tests were done using SAS® (2002-2003) software for Windows version 9.13's General linear models (ANOVA) and were done at the $\alpha=0.05$ level. For catch per effort calculations, tests were done on geometric means.

Findings

The mean daily ambient water temperatures during 2010 sampling was 17.0°C and was generally stable over the six days of sampling (Table 2). During sampling, the water surface elevation measured at the Dakota, Minnesota gage changed as much as 1.9 feet and generally increased. The mean daily flow in cubic feet per second taken from Dam 7 was 48,782 and fluctuated as much as 57,899 cubic feet per second. Flows and elevations were higher during electro shocking than fyke netting.

Fyke Netting Catch Per Effort

A total of 22 fish species were recorded from a total of 548 fish captured in fyke nets (Table 3). The most common was bluegill followed by black crappie, yellow perch and common carp. Mean catch per net-day for these four fish species was 6.96, 3.16, 1.14 and 1.15, respectively. The mean catch per net-day for all species combined was 15.75 (standard deviation = 15.40, n=34).

Electro Shocking Catch Per Effort

A total of 36 fish species were recorded from 910 fish captured during electro shocking (Table 4). The most common was bluegill followed by largemouth bass, spotted sucker and yellow perch. Mean catch per hour for these four fish species was 54.81, 29.77, 22.68, and 14.88, respectively. The mean catch per hour for all species combined was 170.45 (standard deviation = 90.15, n=33).

Length Distribution from Fyke Netting

The frequency distribution of total length in inches for black crappie, bluegill and yellow perch from fyke nets are given in Figures 4 to 6. The mean lengths of selected fish species are given in Table 5. A total of 13.89 percent of the black crappie was greater than 9 inches. For bluegill, a total of 6.61 percent was greater than 7 inches. A total of 63.41 percent of yellow perch was larger than 7 inches while 46.34 percent was larger than 8 inches.

We also calculated Proportional Size Structures (PSS) for fish (Guy, et al., 2006) using values from (Gabelhouse, 1984) (Table 6). The PSS_Q and PSS_P by species are presented in Table 7. The “acceptable” value of PSS_Q for bluegill is 40 to 60 and is 40 for crappie (Wisconsin Department of Natural Resources, 2010). No guidance is provided for yellow perch. Black crappie PSS_Q from the fall 2010 BRM fyke netting data was 49.4, above the state level for “acceptable”. For bluegill the PSS_Q was 23.0, below the “acceptable” range. The “acceptable” value of PSS_P for bluegill and crappie is 5. Black crappie exceeded this (8.43), but bluegill (0.71) did not. This suggests that black crappie population size structure during fall 2010 sampling at BRM was “acceptable”, but standards for bluegill were not met.

Length Distribution from Electro Shocking

The frequency distribution for total length in inches for bluegill, largemouth bass, spotted sucker and yellow perch are given in Figures 7 to 10. The mean lengths of fish species measured are given in Table 8. A total of 2.36 percent of bluegill was greater than 7 inches. A total of 6.88 percent of the largemouth bass was larger than 14 inches. A total of 9.76 percent of yellow perch was larger than 7 inches and 6.10 percent were larger than 8 inches.

The PSS_Q and PSS_P for electro shocked species are presented in Table 9. PSS_Q for bluegill (5.7) was below “acceptable” (40-60). Bluegill (0.00) was below the “acceptable” standard for preferred fish (5.0). This suggests that electro shocked bluegill did not meet “acceptable” state standards for quality and preferred fish.

Comparisons with Other Lake Units and Time Periods, Fyke Netting

Fyke netting data from the BRM Lake Unit was compared to 20 other upper Mississippi River lake units sampled during the falls of 2007-2010 (Figure 1). Catch per net-day for all fish combined was greatest in Harpers (77.38) (Table 10) and least in Upper Pool 6 (10.46). BRM (15.75) was statistically the same as 12 other lake units and was less than the remaining eight lake units.

Similarly, we tested mean catch per day for all fish combined among all five lake units sampled in 2010 (Table 11). BRM was the same as two other lake units was statistically lower than the remaining two 2010 lake units.

Catch per net-day for selected target species combined is presented in Table 12. Target species included black crappie, bluegill, largemouth bass, northern pike, smallmouth bass, pumpkinseed, white crappie, rock bass and yellow perch. For these species combined, BRM (12.23 fish per net-day) was the same as 14 lake units and was less than the remaining six lake units (about 34.6). Similarly, we tested mean catch per day for target fish combined among all five 2010 lake units and found the BRM catch rate was lower than two lake units (about 26.1 fish per net-day) and was not different from the remaining two lake units (Table 13).

We compared mean total length of selected individual species caught with fyke nets among five other lake units sampled in 2010 (Table 14). BRM black crappie (7.10 inches) were the same size as the Lower Pool 5A and Cassville Slough Area lake units (about 7.5 inches), and was smaller than those from the remaining two lake units (about 8.4 inches). BRM bluegill (4.70 inches) was the same as the Lower Pool 5A Lake Unit and smaller than those from the remaining three lake unit (about 5.3 inches). Mean length of BRM yellow perch (7.33 inches) was statistically the same as the other four 2010 lake units.

Comparisons with Other Lake Units, Electro Shocking

Electro shocking data from the BRM Lake Unit was compared to 20 other upper Mississippi River lake units sampled in the fall of 2007-2010. Catch per hour for all target fish combined was the same in BRM (110.35) as 19 other lake units (Table 15) and less than one.

Similarly, we tested mean catch per hour for all fish combined among all five lake units sampled in 2010 (Table 16). BRM had the same catch rate as three other lake units and was statistically lower than the remaining lake unit.

We compared mean total length of individual species caught with electro shocking among five 2010 lake units (Table 17). Mean total length of BRM bluegill (3.56 inches) was smaller than three other lake units (about 4.7 inches) and larger than one (2.7 inches). Largemouth bass from BRM (6.50 inches) were smaller than two other lake units (about 8.1 inches) and larger one (5.02 inches). Northern pike were the same at all 2010 lake units. Mean size of BRM yellow perch (4.22 inches) were smaller than those from all other lake units (about 6.8 inches).

Conclusions

The BRM Lake Unit had a statistically lower catch rate than other Mississippi River lake units. For the four comparisons made among gears and species groups, this lake unit always ranked in the lower one-fifth of catch rates for units sampled since 2007.

Sizes of fish captured in the BRM Lake Unit were generally smaller compared to other lake units sampled in 2010. With the exception of electro shocked northern pike, mean length for all target fish species ranked in the bottom one-fifth of the five lake units. Black crappie from fyke nets exceeded recommended Proportional Size Structures. Bluegill from fyke netting and electro shocking did not meet these recommended standards.

In Navigation Pool 7 of the Mississippi River bordering Minnesota, Wisconsin fishing regulations limit harvest to 25 of yellow perch, rock bass and crappie in total, with no size limit. Bluegill and pumpkinseed are limited to 25 in total with no size limit. White bass and yellow bass are also restricted to 25 in total and no size limit. Largemouth bass and smallmouth bass are limited to 5 in total with a 14 inch minimum size limit. All these fish species have continuous open seasons.

Recommendations

1. Continue to monitoring backwater fish in Pool 7 and other pools.
2. Using additional data explore any longitudinal trends in mean total length or catch per effort along the Mississippi River bordering Wisconsin.

Literature Cited

- Gabelhouse, D. W., Jr. 1984. A length categorization system to assess fish stocks. *North American Journal of Fisheries Management* 4:371–384.
- Guy, Christopher S., Robert M. Neumann and David W. Willis. 2006. New Terminology for Proportional Stock Density (PSD) and Relative Stock Density (RSD): Proportional Size Structure (PSS). *Opinion: Fisheries Forum. Fisheries* 31(2): 86-87.
- SAS Institute Inc. 2002-2003. SAS® software for Windows version 9.13. SAS Institute Inc., Cary, NC, USA.
- Wisconsin Department of Natural Resources. 2010. *Fish Management Handbook 3605.9*. Wisconsin Department of Natural Resources, Madison, WI. 239 pp.

FIGURE 1. LOCATION OF 34 WDNR LAKE UNITS, UPPER MISSISSIPPI RIVER.
 (based on 1989 Long Term Resource Monitoring Program Land/Water and Aquatic Area Coverage)

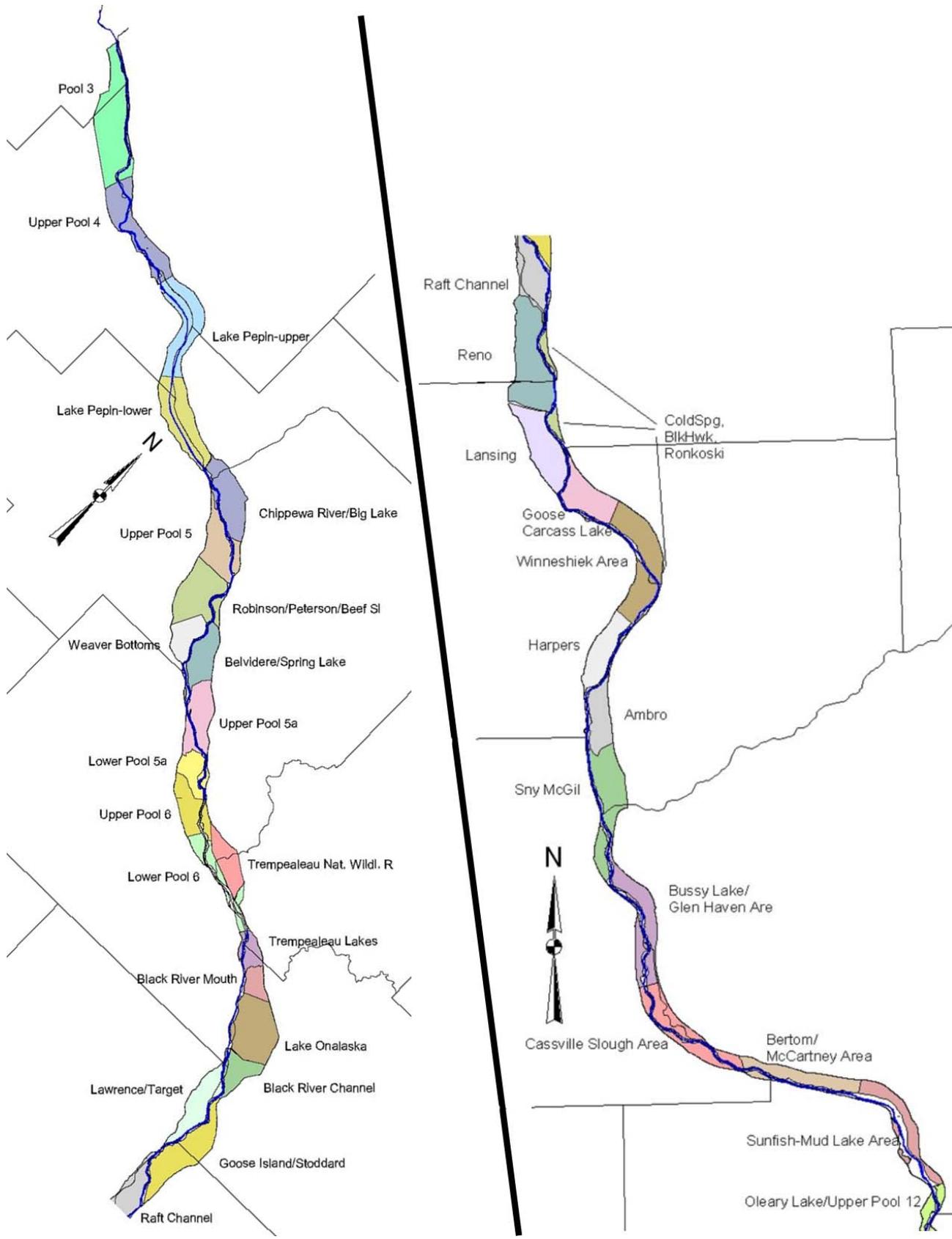


FIGURE 2. FALL 2010 FYKE NET LOCATIONS, BRM LAKE UNIT. (2010 NAIP PHOTO).

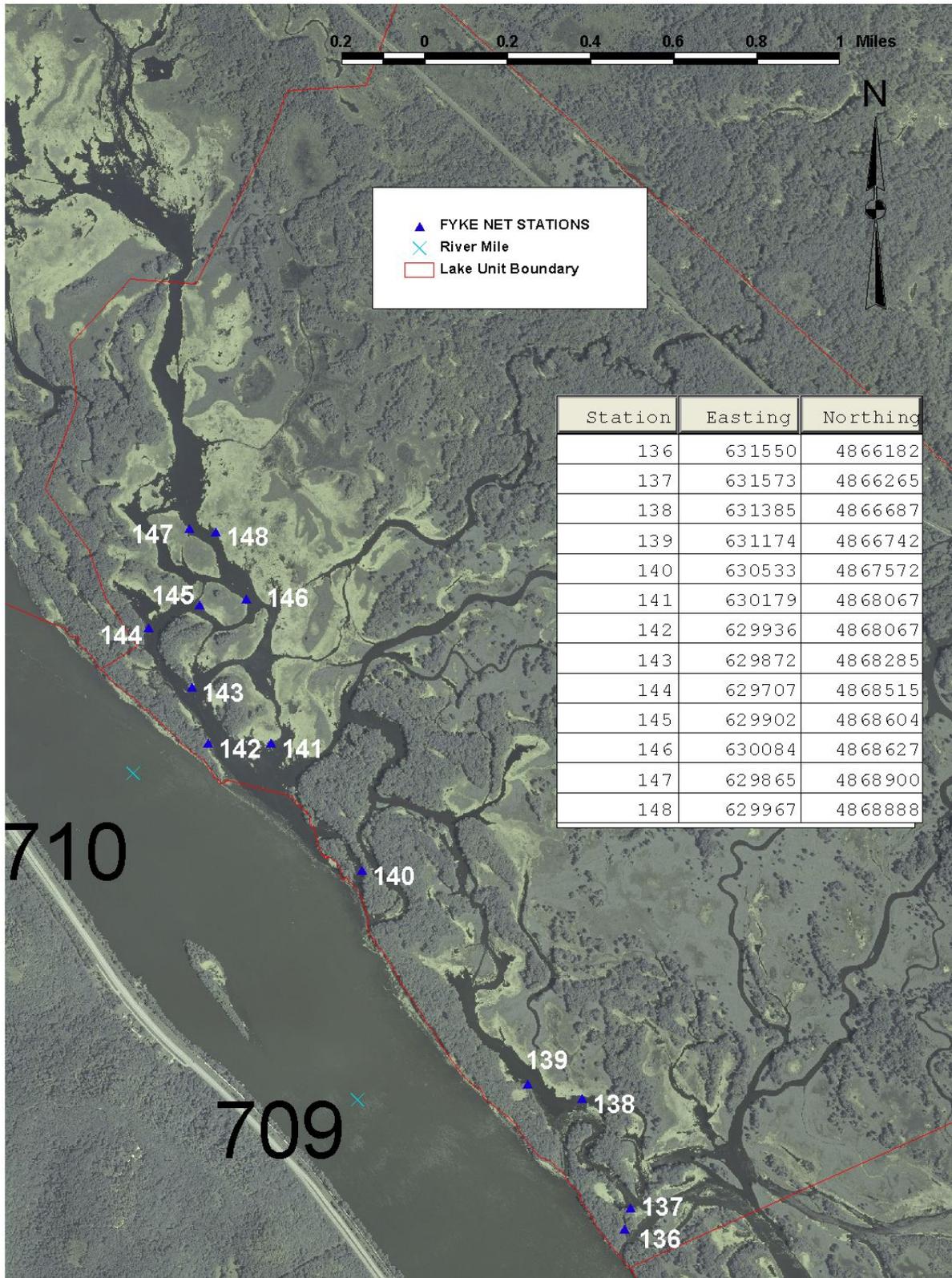


FIGURE 3. FALL 2010 ELECTROSHOCKING RUNS, BRM LAKE UNIT. (2010 NAIP Photo).

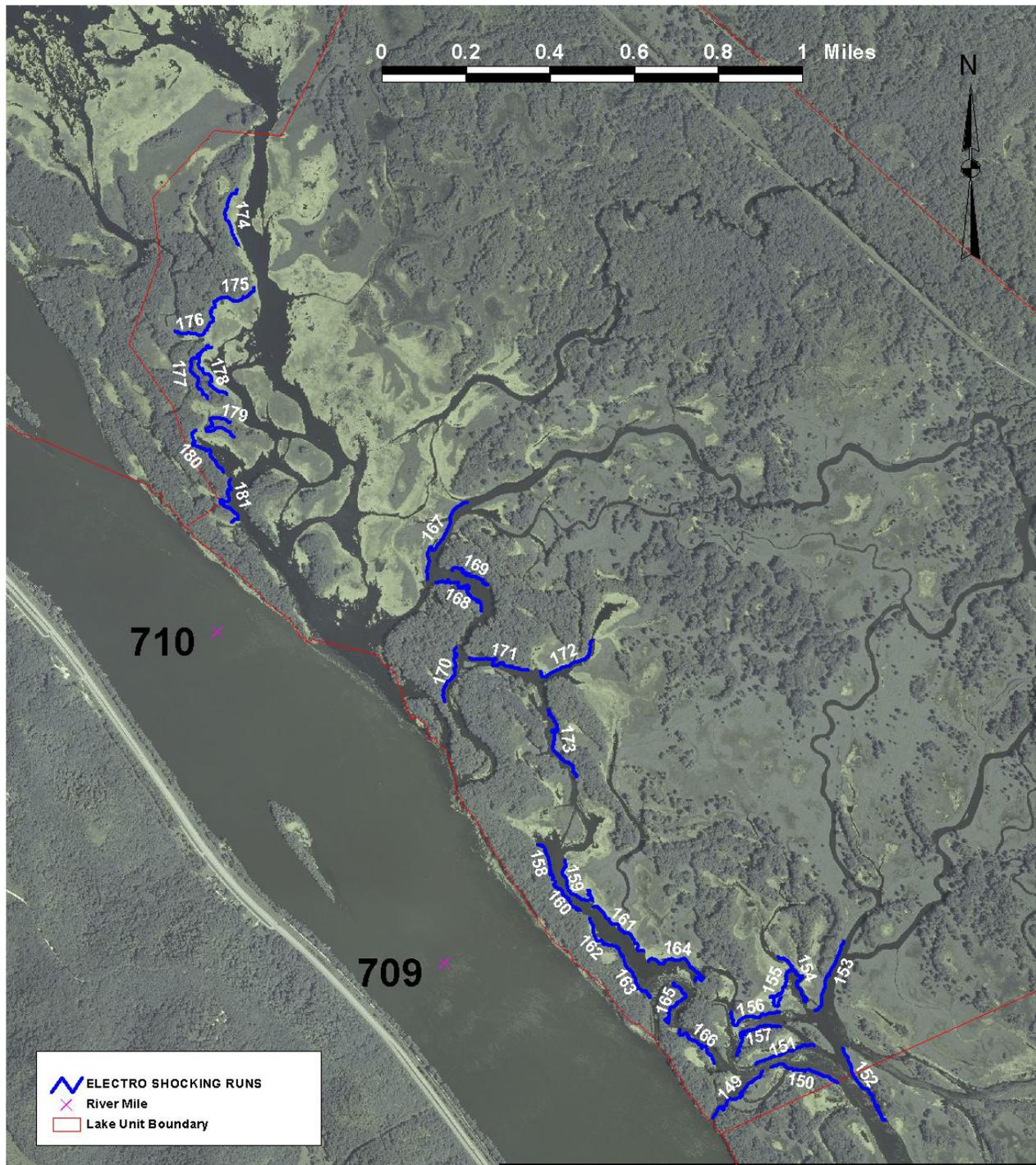


TABLE 1. ELECTRO SHOCKING STATION LOCATIONS, LENGTHS (M) AND WATERBODIES, FALL 2010 BRM LAKE UNIT.

STATION	UTM15STX	UTM15STY	UTM15EDX	UTM15EDY	WATERBDY	LENGTH (m)
149	631536	4866090	631726	4866271	NO NAME CHUTE	356
150	631758	4866285	632015	4866224	NO NAME CHUTE	287
151	631699	4866294	631924	4866366	NO NAME CHUTE	260
152	632030	4866360	632194	4866086	NO NAME CHUTE	401
153	632039	4866762	631927	4866500	DODGE CHUTE	333
154	631784	4866708	631882	4866545	BACKWATER L N OF DODGE CHUTE	280
155	631839	4866672	631798	4866550	BACKWATER L N OF DODGE CHUTE	294
156	631606	4866495	631792	4866498	UNNAMED SLOUGH N OF NO NAME CHUTE	254
157	631629	4866329	631795	4866440	UNNAMED SLOUGH N OF NO NAME CHUTE	305
158	630866	4867136	630928	4867009	SILVER LAKE	231
159	630971	4867078	631062	4866943	SILVER LAKE	327
160	630936	4866996	631030	4866884	SILVER LAKE	244
161	631077	4866898	631274	4866729	SILVER LAKE	302
162	631067	4866854	631191	4866709	SILVER LAKE	239
163	631190	4866716	631296	4866558	SILVER LAKE	238
164	631289	4866688	631468	4866615	SILVER LAKE	326
165	631387	4866604	631355	4866465	UNNAMED SLOUGH N OF NO NAME CHUTE	311
166	631413	4866429	631543	4866300	UNNAMED SLOUGH N OF NO NAME CHUTE	302
167	630598	4868449	630446	4868152	HAMMOND CHUTE	397
168	630479	4868139	630654	4868033	UNNAMED SLOUGH S OF HAMMOND CHUTE	334
169	630541	4868186	630670	4868135	UNNAMED SLOUGH S OF HAMMOND CHUTE	257
170	630554	4867891	630511	4867684	UNNAMED SLOUGH S OF HAMMOND CHUTE	294
171	630605	4867851	630833	4867805	UNNAMED SLOUGH SE OF HAMMOND CHUTE	327
172	631077	4867917	630879	4867800	UNNAMED SLOUGH SE OF HAMMOND CHUTE	288
173	630908	4867652	631014	4867399	UNNAMED SLOUGH N OF SILVER LAKE	388
174	629720	4869644	629724	4869432	BACKWATERS, N OF HAMMOND CHUTE MOUTH	258
175	629785	4869270	629617	4869176	BACKWATERS, N OF HAMMOND CHUTE MOUTH	263
176	629623	4869177	629481	4869102	BACKWATERS, N OF HAMMOND CHUTE MOUTH	224
177	629608	4869049	629605	4868842	BACKWATERS, N OF HAMMOND CHUTE MOUTH	295
178	629623	4869041	629678	4868860	BACKWATERS, N OF HAMMOND CHUTE MOUTH	301
179	629694	4868755	629706	4868696	BACKWATERS, N OF HAMMOND CHUTE MOUTH	276
180	629562	4868724	629665	4868562	BACKWATERS, N OF HAMMOND CHUTE MOUTH	278
181	629694	4868536	629696	4868371	BACKWATERS, N OF HAMMOND CHUTE MOUTH	305

TABLE 2. MEAN TEMPERATURE, WATER SURFACE ELEVATION AND FLOW DURING FALL 2010 BRM LAKE UNIT SAMPLING.

DATE	MEAN DAILY TEMPERATURE °C	WATER SURFACE ELEVATION (ft), DAKOTA, MN	FLOW (cfs) DAM 7
09/08/2010	17.0	639.62	35200
09/09/2010	16.6	639.63	35000
09/10/2010	17.1	639.59	34500
09/21/2010	18.1	640.25	55200
09/22/2010	16.7	640.21	54600
10/12/2010	16.6	641.51	92399
MEAN (by date, station)	17.0	640.05	48782

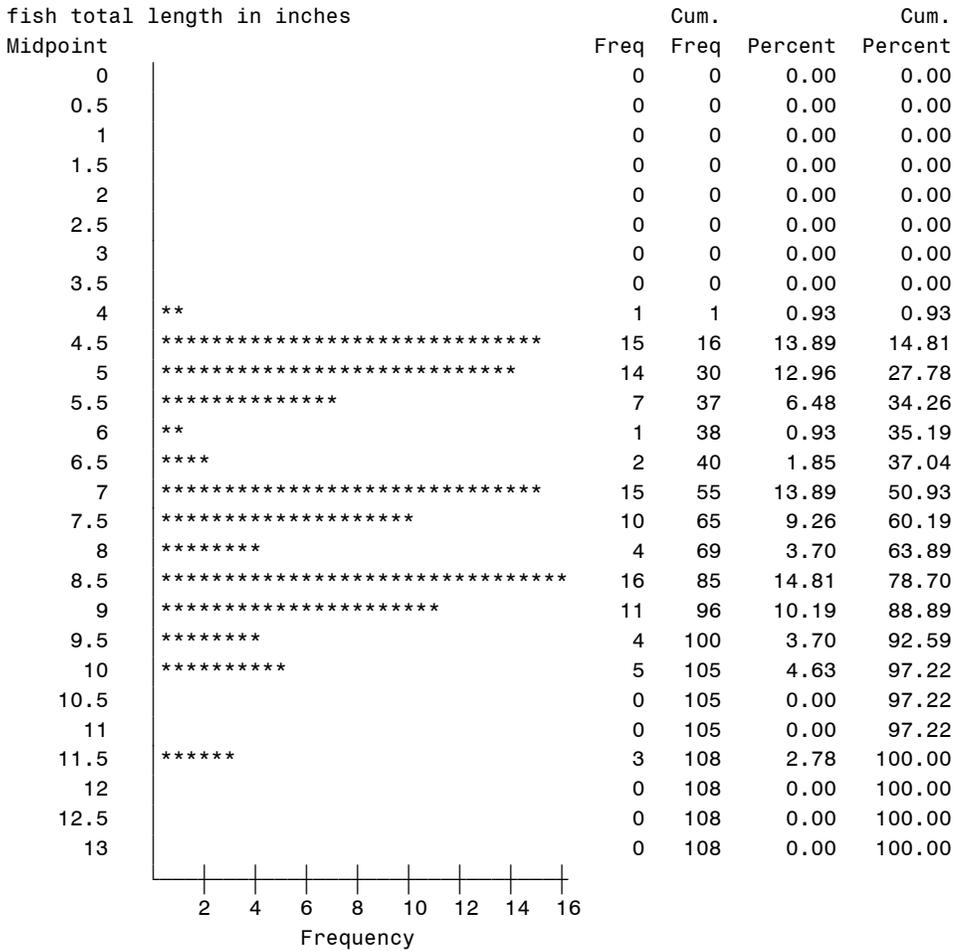
TABLE 3. RELATIVE ABUNDANCE, MEAN CATCH PER NET-DAY, FYKE NETS, FALL 2010, BRM LAKE UNIT.

	SPECIES	FREQUENCY	PERCENT	MEAN	STANDARD DEV.	MIN.	MAX.	NET-DAYS
1	black crappie	108	19.71	3.16	3.30	0.00	13.13	34.41
2	bluegill	242	44.16	6.96	10.74	0.00	45.83	34.41
3	bowfin	9	1.64	0.26	0.49	0.00	1.93	34.41
4	common carp	39	7.12	1.15	1.89	0.00	7.22	34.41
5	common shiner	1	0.18	0.03	0.17	0.00	0.97	34.41
6	flathead catfish	6	1.09	0.18	0.71	0.00	3.93	34.41
7	freshwater drum	20	3.65	0.59	1.03	0.00	4.21	34.41
8	gizzard shad	6	1.09	0.18	0.59	0.00	3.13	34.41
9	golden shiner	2	0.36	0.06	0.24	0.00	1.05	34.41
10	largemouth bass	6	1.09	0.17	0.60	0.00	2.96	34.41
11	longnose gar	1	0.18	0.03	0.18	0.00	1.04	34.41
12	northern pike	9	1.64	0.25	0.47	0.00	1.72	34.41
13	pumpkinseed	15	2.74	0.41	1.34	0.00	6.25	34.41
14	rock bass	4	0.73	0.11	0.40	0.00	1.97	34.41
15	shorthead redhorse	2	0.36	0.06	0.23	0.00	0.98	34.41
16	silver redhorse	23	4.20	0.63	1.58	0.00	8.62	34.41
17	spotted sucker	9	1.64	0.25	0.58	0.00	1.96	34.41
18	walleye	2	0.36	0.06	0.24	0.00	1.13	34.41
19	white crappie	1	0.18	0.03	0.15	0.00	0.87	34.41
20	white sucker	1	0.18	0.03	0.17	0.00	0.98	34.41
21	yellow bullhead	1	0.18	0.03	0.17	0.00	0.98	34.41
22	yellow perch	41	7.48	1.14	2.16	0.00	11.21	34.41
	ALL SPECIES	548	100.00	15.75	15.40	0.00	67.71	34.41

TABLE 4. RELATIVE ABUNDANCE, MEAN CATCH PER HOUR, ELECTRO SHOCKING, FALL 2010, BRM LAKE UNIT.

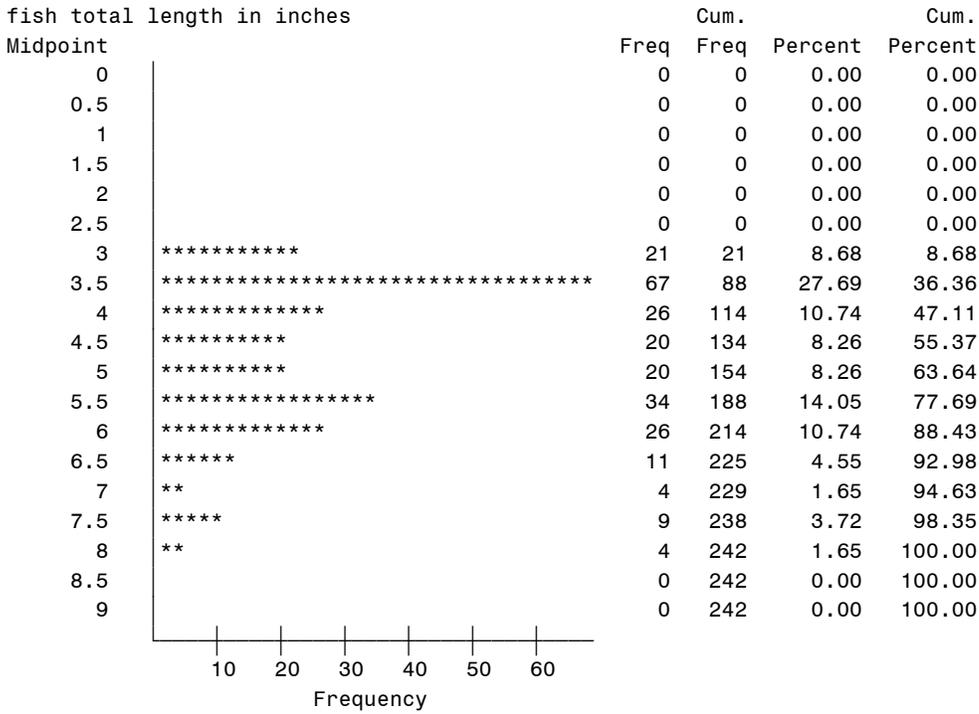
	SPECIES	FREQ.	PERCENT	MEAN PER HR	STANDARD DEV.	MIN.	MAX.	NO. OF RUNS	TOTAL HRS
1	black crappie	8	0.88	1.45	3.36	0.00	11.98	33	5.43
2	bluegill	296	32.53	54.81	49.30	0.00	197.61	33	5.43
3	bowfin	17	1.87	3.09	6.01	0.00	23.95	33	5.43
4	central mudminnow	15	1.65	2.72	8.99	0.00	47.90	33	5.43
5	channel catfish	7	0.77	2.01	8.47	0.00	48.19	33	5.43
6	chestnut lamprey	1	0.11	0.18	1.04	0.00	5.99	33	5.43
7	common carp	22	2.42	3.99	7.28	0.00	29.94	33	5.43
8	common shiner	7	0.77	2.01	8.47	0.00	48.19	33	5.43
9	darters (Percina spp.)	1	0.11	0.18	1.04	0.00	5.99	33	5.43
10	emerald shiner	32	3.52	6.73	15.21	0.00	60.24	33	5.43
11	freshwater drum	14	1.54	2.91	5.64	0.00	24.10	33	5.43
12	gizzard shad	6	0.66	1.09	3.80	0.00	17.96	33	5.43
13	golden redhorse	5	0.55	0.91	2.64	0.00	11.98	33	5.43
14	golden shiner	5	0.55	0.91	3.04	0.00	11.98	33	5.43
15	largemouth bass	160	17.58	29.77	26.04	0.00	125.75	33	5.43
16	longnose gar	1	0.11	0.18	1.04	0.00	5.99	33	5.43
17	northern pike	16	1.76	2.90	3.99	0.00	11.98	33	5.43
18	pirate perch	11	1.21	2.00	5.53	0.00	23.95	33	5.43
19	pumpkinseed	17	1.87	3.09	4.76	0.00	17.96	33	5.43
20	pumpkinseed x bluegill	1	0.11	0.18	1.04	0.00	5.99	33	5.43
21	quillback	1	0.11	0.18	1.04	0.00	5.99	33	5.43
22	redhorses	1	0.11	0.18	1.04	0.00	5.99	33	5.43
23	river redhorse	1	0.11	0.18	1.04	0.00	5.99	33	5.43
24	rock bass	5	0.55	1.09	2.79	0.00	12.05	33	5.43
25	sauger	9	0.99	1.63	3.44	0.00	11.98	33	5.43
26	shiners	15	1.65	2.72	9.71	0.00	47.90	33	5.43
27	shorthead redhorse	5	0.55	0.91	2.18	0.00	5.99	33	5.43
28	silver redhorse	5	0.55	1.09	2.79	0.00	12.05	33	5.43
29	smallmouth bass	11	1.21	2.18	4.19	0.00	12.05	33	5.43
30	spottail shiner	4	0.44	0.73	2.49	0.00	11.98	33	5.43
31	spotted sucker	124	13.63	22.68	23.42	0.00	71.86	33	5.43
32	walleye	2	0.22	0.36	1.45	0.00	5.99	33	5.43
33	warmouth	1	0.11	0.18	1.04	0.00	5.99	33	5.43
34	white crappie	1	0.11	0.18	1.04	0.00	5.99	33	5.43
35	white sucker	1	0.11	0.18	1.04	0.00	5.99	33	5.43
36	yellow perch	82	9.01	14.88	18.10	0.00	71.86	33	5.43
	ALL SPECIES	910	100.00	170.45	90.15	59.88	431.14	33	5.43

FIGURE 4. FALL 2010 BLACK CRAPPIE LENGTH DISTRIBUTION (INCHES), BRM LAKE UNIT FYKE NETTING.



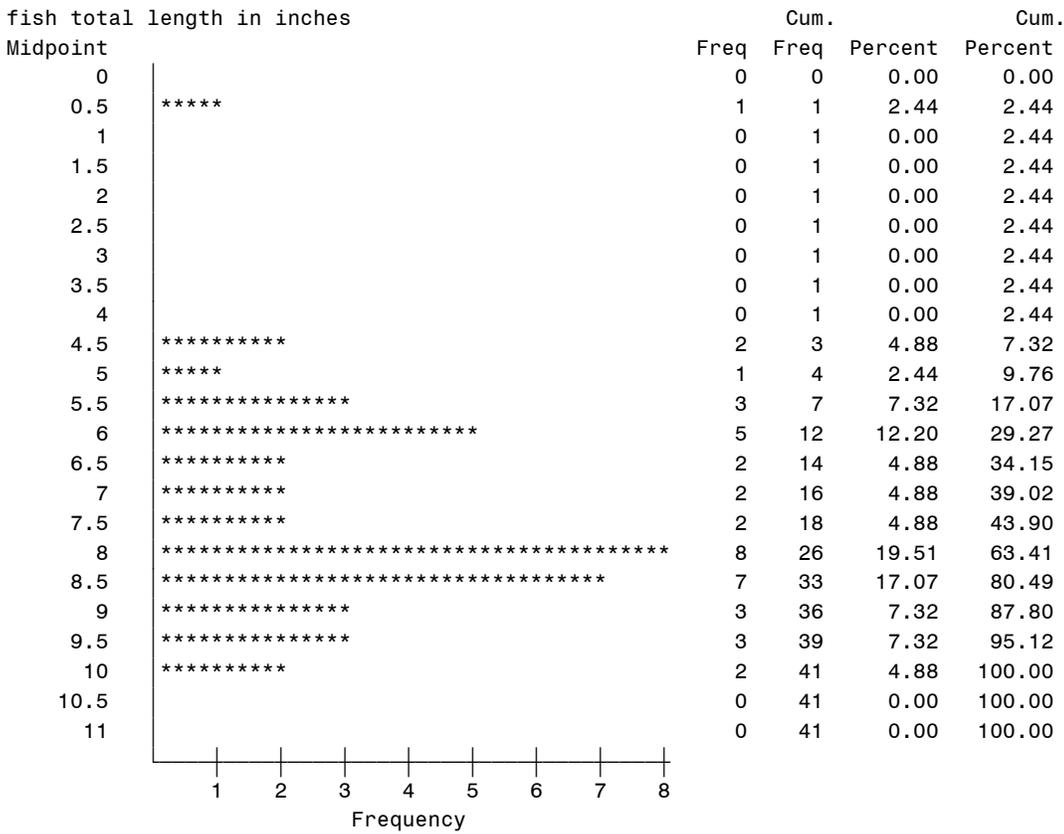
N	Mean	Std Dev	Minimum	Maximum
108	7.1008148	1.9041322	4.2130000	11.5350000

FIGURE 5. FALL 2010 BLUEGILL LENGTH DISTRIBUTION (INCHES), BRM LAKE UNIT FYKE NETTING.



N	Mean	Std Dev	Minimum	Maximum
242	4.6972231	1.2750201	2.9530000	8.1100000

FIGURE 6. FALL 2010 YELLOW PERCH LENGTH DISTRIBUTION (INCHES), BRM LAKE UNIT FYKE NETTING.

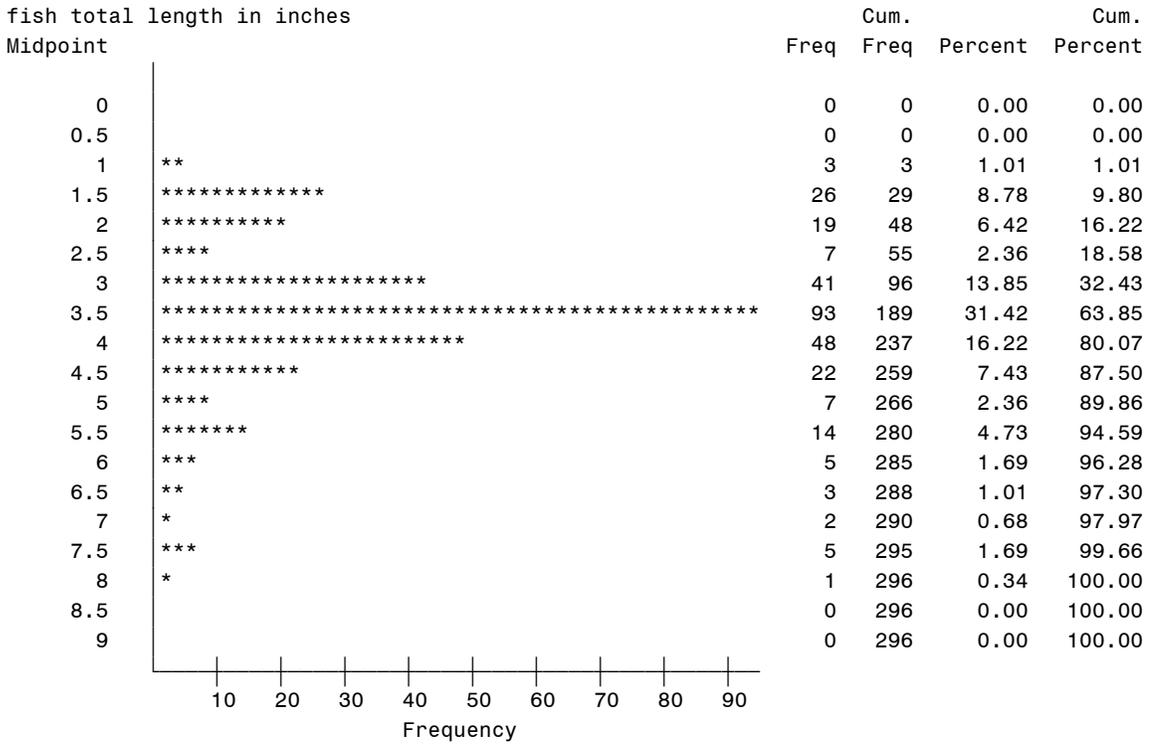


N	Mean	Std Dev	Minimum	Maximum
41	7.3286341	1.8290623	0.5910000	9.8820000

TABLE 5. MEAN LENGTH IN INCHES FOR SELECTED SPECIES, FALL 2010, BRM LAKE UNIT, FYKE NETTING.

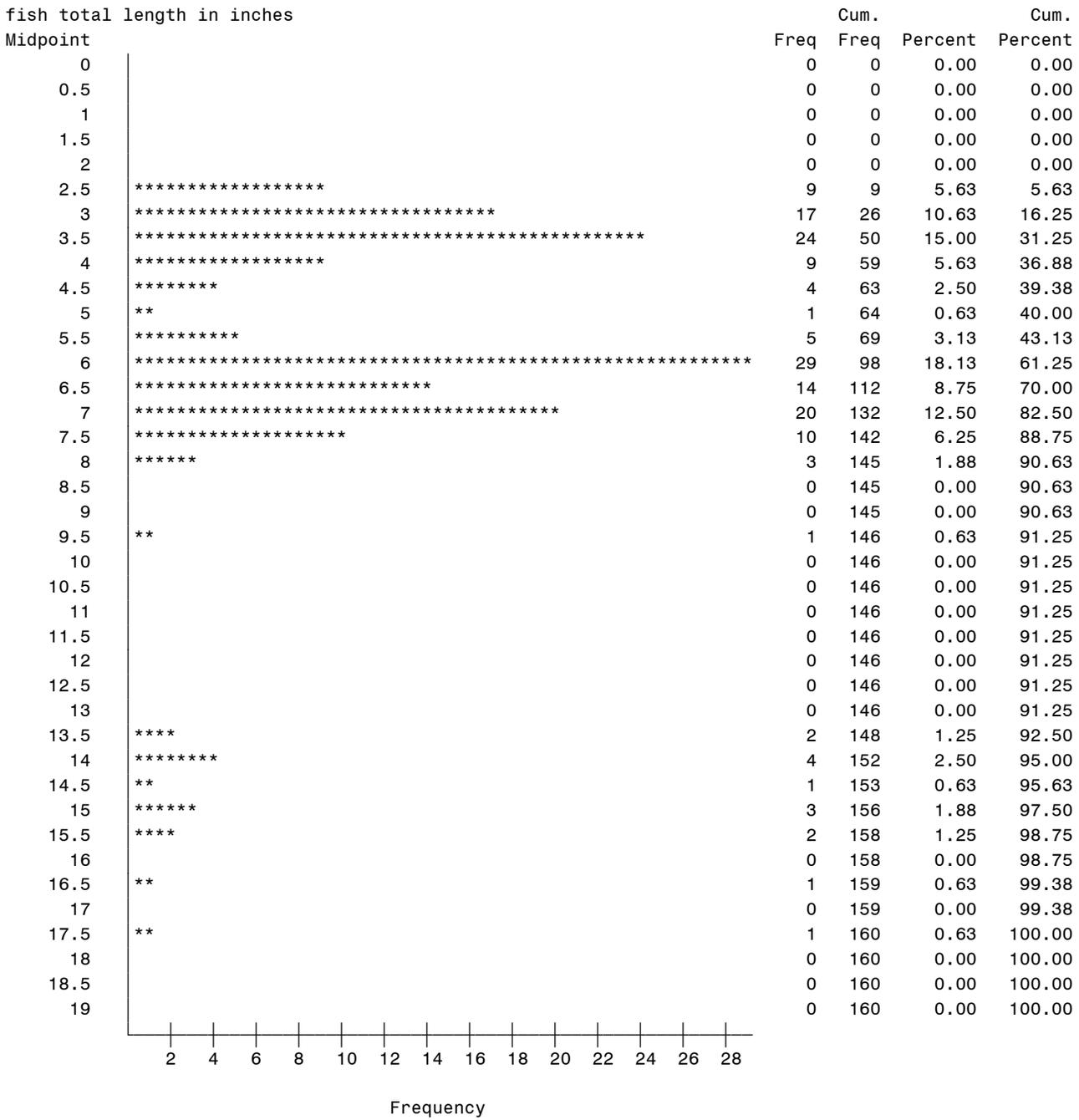
SPECIES	MEAN LENGTH	STANDARD DEV.	MIN.	MAX.	N
black crappie	7.10	1.90	4.21	11.54	108.00
bluegill	4.70	1.28	2.95	8.11	242.00
common carp	24.35	4.29	4.92	30.71	39.00
freshwater drum	14.34	2.43	5.71	17.52	20.00
silver redhorse	22.04	1.48	18.11	24.41	23.00
yellow perch	7.33	1.83	0.59	9.88	41.00

FIGURE 7. FALL 2010 BLUEGILL LENGTH DISTRIBUTION (INCHES), BRM LAKE UNIT ELECTRO SHOCKING.



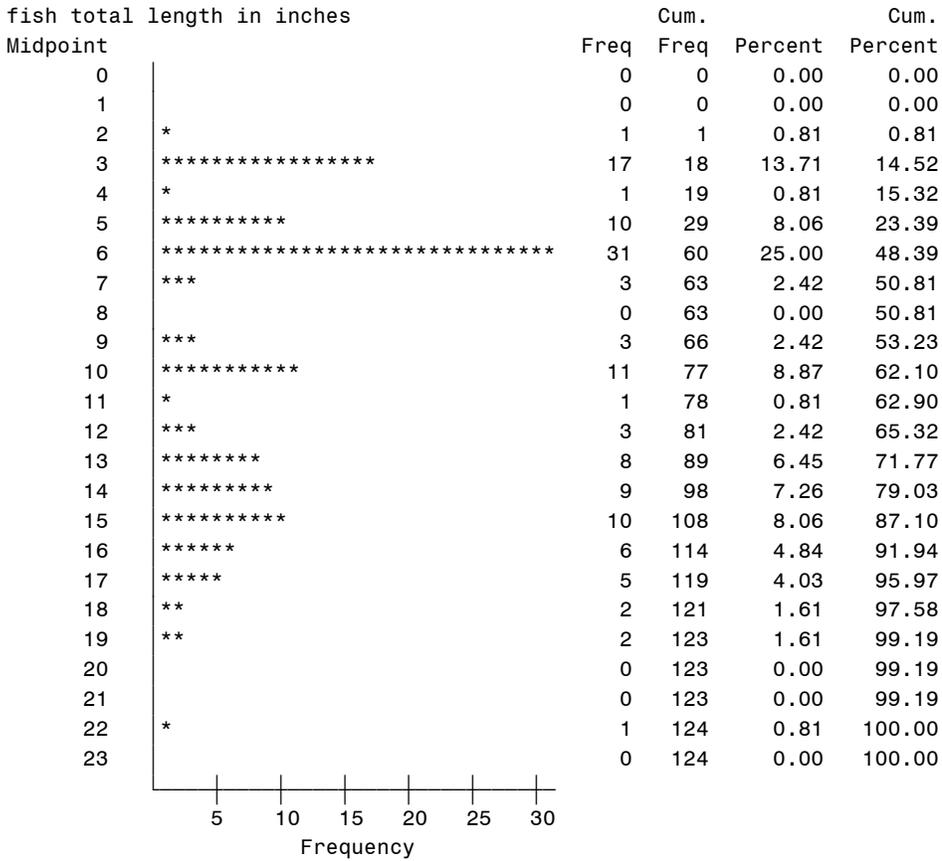
N	Mean	Std Dev	Minimum	Maximum
296	3.5645743	1.2503821	1.2200000	7.8740000

FIGURE 8. FALL 2010 LARGEMOUTH BASS LENGTH DISTRIBUTION (INCHES), BRM LAKE UNIT ELECTRO SHOCKING.



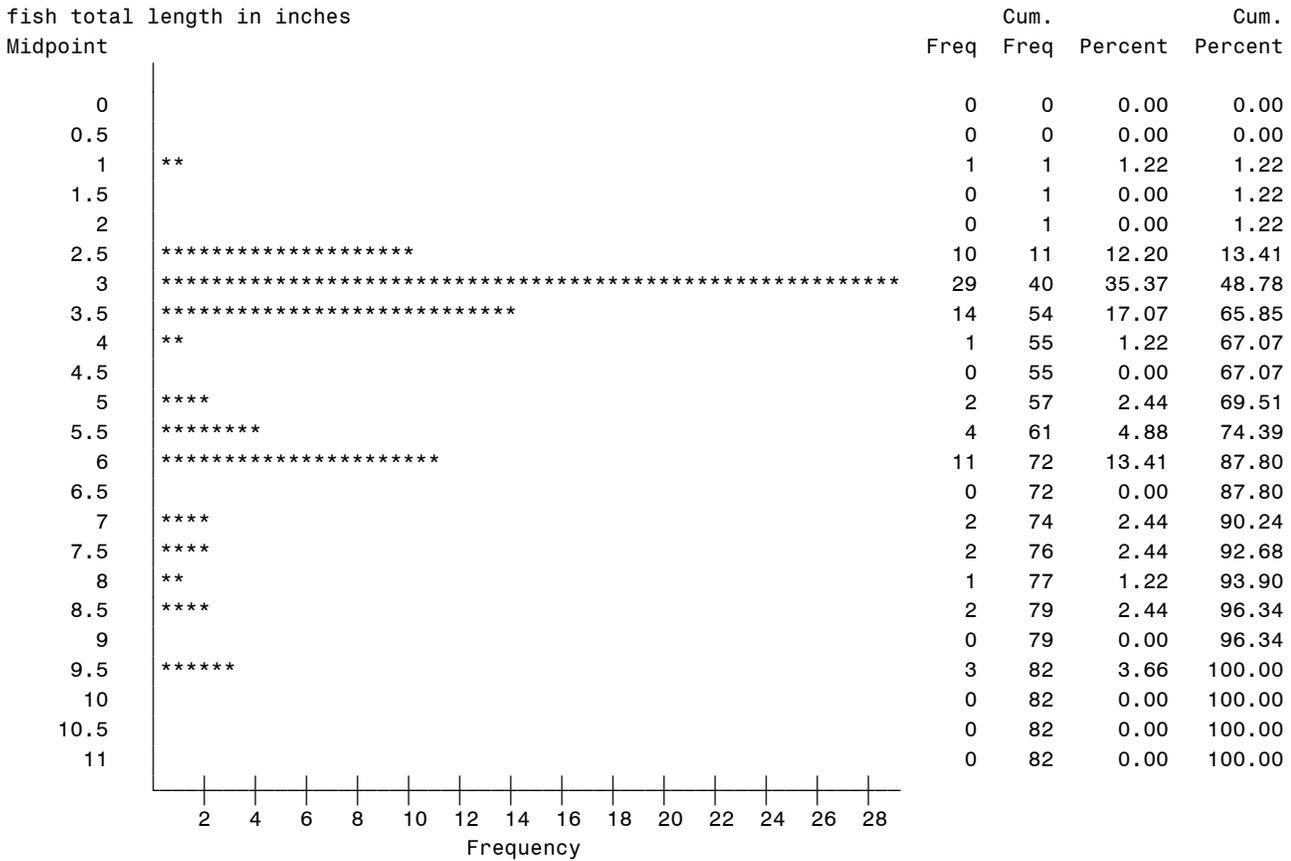
N	Mean	Std Dev	Minimum	Maximum
160	6.0489625	3.1909099	2.5200000	17.4410000

FIGURE 9. FALL 2010 SPOTTED SUCKER LENGTH DISTRIBUTION (INCHES), BRM LAKE UNIT ELECTRO SHOCKING.



N	Mean	Std Dev	Minimum	Maximum
124	9.2976855	4.9705831	2.4800000	22.0870000

FIGURE 10. FALL 2010 YELLOW PERCH LENGTH DISTRIBUTION (INCHES), BRM LAKE UNIT ELECTRO SHOCKING.



N	Mean	Std Dev	Minimum	Maximum
82	4.2212073	1.9079172	0.8660000	9.6460000

TABLE 6. LIST OF STOCK SIZE, QUALITY SIZE (PSS_Q) AND PREFERRED SIZE (PSS_P) IN INCHES FOR SELECTED FISH SPECIES.

FISH SPECIES	PSS SOURCE	STOCK	QUALITY	PREFERRED
black crappie	Gabelhouse (1984)	5.0	8.0	10.0
bluegill	Gabelhouse (1984)	3.0	6.0	8.0
largemouth bass	Gabelhouse (1984)	8.0	12.0	15.0
northern pike	Gabelhouse (1984)	14.0	21.0	28.0
pumpkinseed	Gabelhouse (1984)	3.0	6.0	8.0
sauger	Gabelhouse (1984)	8.0	12.0	15.0
smallmouth bass	Gabelhouse (1984)	7.0	11.0	14.0
walleye	Gabelhouse (1984)	10.0	15.0	20.0
warmouth	Gabelhouse (1984)	3.0	6.0	8.0
white crappie	Gabelhouse (1984)	5.0	8.0	10.0
yellow perch	Gabelhouse (1984)	5.0	8.0	10.0

TABLE 7. COMPARISON OF MEAN CATCH PER DAY AND PSS FOR SELECTED SPECIES OF SELECTED SIZES IN BRM UNIT, FYKE NETTING, FALL 2010.

SPECIES	MEAN CPD	STD. DEV. CPD	N	# OF STOCK	PSS _Q	PSS _P
BLACK CRAPPIE				83	49.40	8.43
QUALITY (≥ 8 INCHES)	1.18	1.32	34			
PREFERRED (≥ 10 INCHES)	0.19	0.38	34			
BLUEGILL				136	23.0	0.71
QUALITY (≥ 6 INCHES)	1.10	1.71	34			
PREFERRED (≥ 8 INCHES)	0.06	0.24	34			
YELLOW PERCH				38	50.00	0.00
QUALITY (≥ 8 INCHES)	0.54	0.92	34			
PREFERRED (≥ 10 INCHES)	0.00	0.00	34			

TABLE 8. MEAN LENGTH IN INCHES FOR SELECTED SPECIES, FALL 2010, BRM LAKE UNIT, ELECTRO SHOCKING.

SPECIES	MEAN LENGTH	STANDARD DEV.	MIN.	MAX.	N
bluegill	3.56	1.25	1.22	7.87	296
common carp	23.98	1.56	20.91	27.32	22
emerald shiner	2.47	0.40	1.61	3.23	32
largemouth bass	6.05	3.19	2.52	17.44	160
spotted sucker	9.30	4.97	2.48	22.09	124
yellow perch	4.22	1.91	0.87	9.65	82

TABLE 9. COMPARISON OF MEAN CATCH PER HOUR AND PSS FOR SELECTED SPECIES OF SELECTED SIZES IN BRM LAKE UNIT. ELECTRO SHOCKING, FALL 2010.

SPECIES	MEAN CPH	STD. DEV. CPH	N	# OF STOCK	PSS _Q	PSS _P
BLUEGILL				228	5.70	0.00
QUALITY (≥ 6 INCHES)	2.36	4.48	33			
PREFERRED (≥ 8 INCHES)	0.00	0.00	33			
LARGEMOUTH BASS						
QUALITY (≥ 12 INCHES)	2.54	5.19	33			
PREFERRED (≥ 15 INCHES)	1.01	3.50	33			
YELLOW PERCH				26	19.23	0.00
QUALITY (≥ 8 INCHES)	0.91	2.64	33			
PREFERRED (≥ 10 INCHES)	0.00	0.00	33			

TABLE 10. COMPARISON OF MEAN CATCH PER FYKE NET-DAY FOR ALL SPECIES COMBINED AMONG TWENTY-ONE LAKE UNITS, FALL 2007-2010.

MEAN	STD. DEV.	N	LAKE UNIT	DIFFERENT (means with the same letter are not Sign. Different)							
77.38	101.02	32	2007 HARPERS	A							
51.24	30.76	32	2007 GOOSE ISLAND/STODDARD	A		B					
50.82	40.96	30	2008 SNY MCGIL	A		B		C		D	
48.44	35.68	34	2010 BLACK RIVER CHANNEL	A		B		C			
48.39	29.01	30	2007 COLD SPRG/BLKHWK/RONK	A		B					
43.98	29.99	24	2007 AMBRO	A		B		C		D	
36.08	34.22	33	2008 TREMPEALEAU LAKES	A		B		C		D E F	
34.06	21.40	32	2007 UPPER POOL 5	A		B		C		D E	
33.90	38.44	32	2007 UPPER POOL 5A	A		B		C		D E F	
33.00	18.07	32	2010 LOWER POOL 5A	A		B		C		D E	
27.29	22.66	35	2008 LAKE ONALASKA	A		B		C		D E F	
26.43	26.07	32	2008 GOOSE CARCASS LAKE	G		B		C		D E F	
25.84	30.34	35	2009 LAWRENCE/TARGET	G		C		D		E F	
25.47	27.01	16	2008 BELVIDERE/SPRING LAKE	G		D		E		F	
23.92	33.63	24	2010 BUSSY LAKE/GLEN HAVEN	G		E		F			
23.62	20.25	39	2010 CASSVILLE SLOUGH AREA	G		C		D		E F	
21.68	29.97	32	2008 ROBINSON/PETERSON/BEE	G		F					
17.39	23.28	23	2009 BERTOM/MCCARTNEY AREA	G		E		F			
15.75	15.40	34	2010 BLACK RIVER MOUTH	G		F					
15.36	14.74	34	2009 LANSING	G		F					
10.46	8.32	32	2009 UPPER POOL 6	G		F					
32.94	37.98	647	ALL								

TABLE 11. COMPARISON OF MEAN CATCH PER FYKE NET-DAY FOR ALL SPECIES COMBINED AMONG FIVE LAKE UNITS, FALL 2010.

MEAN	STD. DEV.	N	LAKE UNIT	DIFFERENT (means with the same letter are not Sign. Different)	
48.44	35.68	34	2010 BLACK RIVER CHANNEL	A	
33.00	18.07	32	2010 LOWER POOL 5A	A	B
23.92	33.63	24	2010 BUSSY LAKE/GLEN HAVEN		C
23.62	20.25	39	2010 CASSVILLE SLOUGH AREA	B	C
15.75	15.40	34	2010 BLACK RIVER MOUTH		C
29.04	27.52	163	ALL		

TABLE 12. COMPARISON OF MEAN CATCH PER FYKE NET-DAY FOR ALL TARGET SPECIES COMBINED AMONG TWENTY-ONE LAKE UNITS, FALL 2007-2010.

MEAN	STD. DEV.	N	LAKE UNIT	DIFFERENT (means with the same letter are not Sign. Different)						
42.89	35.31	34	2010 BLACK RIVER CHANNEL	A	B					
41.41	28.39	32	2007 GOOSE ISLAND/STODDARD	A						
37.59	30.17	32	2007 HARPERS	A	B					
31.85	30.67	33	2008 TREMPLEALEAU LAKES	A	B	C	D	E	F	
30.58	37.27	30	2008 SNY MCGIL	A	B	C	D	E	F	
30.26	20.63	30	2007 COLD SPRG/BLKHWK/RONK	A	B	C	D			
29.19	17.05	32	2010 LOWER POOL 5A	A	B	C				
26.85	38.73	32	2007 UPPER POOL 5A	A	B	C	D	E	F	G
25.95	16.13	32	2007 UPPER POOL 5	A	B	C	D	E		
25.03	22.18	35	2008 LAKE ONALASKA	A	B	C	D	E	F	
24.93	23.11	24	2007 AMBRO	A	B	C	D	E	F	
23.15	27.08	16	2008 BELVIDERE/SPRING LAKE	A	B	C	D	E	F	G
22.24	28.21	35	2009 LAWRENCE/TARGET	A	B	C	D	E	F	G
20.78	24.12	32	2008 GOOSE CARCASS LAKE		B	C	D	E	F	G
18.06	26.59	24	2010 BUSSY LAKE/GLEN HAVEN			C	D	E	F	G
17.13	18.82	39	2010 CASSVILLE SLOUGH AREA				D	E	F	G
12.52	13.56	34	2009 LANSING					E	F	G
12.23	14.94	34	2010 BLACK RIVER MOUTH						F	G
11.98	25.89	32	2008 ROBINSON/PETERSON/BEE							H
7.53	6.79	32	2009 UPPER POOL 6							G
5.72	5.64	23	2009 BERTOM/MCCARTNEY AREA							H
23.92	26.65	647	ALL							

TABLE 13. COMPARISON OF MEAN CATCH PER FYKE NET-DAY FOR ALL TARGET SPECIES COMBINED AMONG FIVE LAKE UNITS, FALL 2010.

MEAN	STD. DEV.	N	LAKE UNIT	DIFFERENT (means with the same letter are not Sign. Different)
42.89	35.31	34	2010 BLACK RIVER CHANNEL	A
29.19	17.05	32	2010 LOWER POOL 5A	A
18.06	26.59	24	2010 BUSSY LAKE/GLEN HAVEN	B
17.13	18.82	39	2010 CASSVILLE SLOUGH AREA	B
12.23	14.94	34	2010 BLACK RIVER MOUTH	B
24.0	25.78	163	ALL	

TABLE 14. COMPARISON OF MEAN TOTAL LENGTH FOR SELECTED INDIVIDUAL SPECIES, AMONG FIVE LAKE UNITS, FYKE NETS, FALL 2010.

SPECIES	MEAN	STD. DEV.	N	LAKE UNIT	DIFFERENT (means with the same letter are not Sign. Different)
BLACK CRAPPIE	8.61	1.63	178	2010 BLACK RIVER CHANNEL	A
	8.10	2.43	68	2010 BUSSY LAKE/GLEN HAVEN	A B
	7.50	2.1	140	2010 CASSVILLE SLOUGH AREA	C B
	7.47	1.89	159	2010 LOWER POOL 5A	C
	7.10	1.9	108	2010 BLACK RIVER MOUTH	C
	7.79	2.01	653	ALL	
BLUEGILL	5.77	1.1	337	2010 BUSSY LAKE/GLEN HAVEN	A
	5.49	1.34	1064	2010 BLACK RIVER CHANNEL	B
	5	1.2	422	2010 CASSVILLE SLOUGH AREA	C
	4.85	1.64	623	2010 LOWER POOL 5A	C D
	4.7	1.28	242	2010 BLACK RIVER MOUTH	D
	5.23	1.41	2688	ALL	
YELLOW PERCH	8.43	1.82	15	2010 LOWER POOL 5A	A
	7.86	1.02	30	2010 CASSVILLE SLOUGH AREA	A
	7.36	0.37	4	2010 BUSSY LAKE/GLEN HAVEN	A
	7.33	1.83	41	2010 BLACK RIVER MOUTH	A
	7.05	1.5	115	2010 BLACK RIVER CHANNEL	A
	7.33	1.57	205	ALL	

TABLE 15. COMPARISON OF MEAN CATCH PER HOUR FROM ELECTRO SHOCKING FOR ALL TARGET SPECIES COMBINED AMONG TWENTY-ONE LAKE UNITS, FALL 2007-2010.

MEAN	STD. DEV.	N	LAKE UNIT	DIFFERENT (means with the same letter are not Sign. Different)			
402.93	359.86	45	2010 BLACK RIVER CHANNEL	A			
296.67	303.22	25	2007 COLD SPRG/BLKHWK/RONK	A	B	C	D
251.81	189.69	38	2009 LAWRENCE/TARGET	A	B	C	
219.87	131.32	32	2008 TREMPEALEAU LAKES	A	B		
208.83	152.54	52	2007 GOOSE ISLAND/STODDARD	A	B	C	
197.61	127.12	25	2007 UPPER POOL 5A	A	B	C	D
187.17	145.07	31	2007 AMBRO	A	B	C	D
171.74	133.38	47	2008 LAKE ONALASKA	A	B	C	D
168.66	142.26	30	2008 GOOSE CARCASS LAKE	A	B	C	D
152.97	189.77	27	2009 BERTOM/MCCARTNEY AREA				D
151.15	205.44	33	2008 ROBINSON/PETERSON/BEE		B	C	D
149.88	126.11	33	2009 LANSING		B	C	D
147.22	161.21	29	2010 BUSSY LAKE/GLEN HAVEN		B	C	D
144.51	101.82	30	2009 UPPER POOL 6		B	C	D
143.27	80.23	27	2007 UPPER POOL 5		B	C	D
140.92	86.80	30	2010 LOWER POOL 5A		B	C	D
135.13	120.06	30	2007 HARPERS		B	C	D
116.24	91.03	30	2008 SNY MCGIL		B	C	D
110.35	73.99	33	2010 BLACK RIVER MOUTH		B	C	D
109.18	108.36	30	2008 BELVIDERE/SPRING LAKE		B	C	D
103.35	80.81	30	2010 CASSVILLE SLOUGH AREA			C	D
182.26	182.04	687	ALL				

TABLE 16. COMPARISON OF MEAN CATCH PER HOUR FOR ALL TARGET SPECIES COMBINED AMONG FIVE LAKE UNITS, FALL 2010.

MEAN	STD. DEV.	N	LAKE UNIT	DIFFERENT (means with the same letter are not Sign. Different)
402.93	359.86	45	2010 BLACK RIVER CHANNEL	A
147.22	161.21	29	2010 BUSSY LAKE/GLEN HAVEN	B
140.92	86.80	30	2010 LOWER POOL 5A	B
110.35	73.99	33	2010 BLACK RIVER MOUTH	B
103.35	80.81	30	2010 CASSVILLE SLOUGH AREA	B
199.83	240.39	167	ALL	

TABLE 17. COMPARISON OF MEAN TOTAL LENGTH FOR SELECTED INDIVIDUAL SPECIES, AMONG FIVE LAKE UNITS, ELECTRO SHOCKING, FALL 2010.

SPECIES	MEAN	STD. DEV.	N	LAKE UNIT	DIFFERENT (means with the same letter are not Sign. Different)	
BLUEGILL	5.09	1.26	308	2010 BUSSY LAKE/GLEN HAVEN	A	
	4.83	1.51	286	2010 LOWER POOL 5A	A	
	4.08	3.09	219	2010 CASSVILLE SLOUGH AREA	B	
	3.56	1.25	296	2010 BLACK RIVER MOUTH	C	
	2.70	1.47	1647	2010 BLACK RIVER CHANNEL	D	
	3.39	1.87	2756	ALL		
LARGEMOUTH BASS	8.12	4.38	231	2010 CASSVILLE SLOUGH AREA	A	
	8.01	4.28	296	2010 LOWER POOL 5A	A	
	6.50	4.01	1052	2010 BLACK RIVER CHANNEL	B	
	6.05	3.19	160	2010 BLACK RIVER MOUTH	B	
	5.02	2.89	282	2010 BUSSY LAKE/GLEN HAVEN	C	
	6.66	4.02	2021	ALL		
NORTHERN PIKE	17.33	6.93	40	2010 LOWER POOL 5A	A	
	16.53	6.61	16	2010 BLACK RIVER MOUTH	A	
	16.36	7.04	38	2010 BLACK RIVER CHANNEL	A	
	14.08	6.49	26	2010 BUSSY LAKE/GLEN HAVEN	A	
	13.34	4.27	18	2010 CASSVILLE SLOUGH AREA	A	
	15.84	6.63	138	_ALL		
YELLOW PERCH						
	7.33	2.04	21	2010 LOWER POOL 5A	A	
	7.08	1.62	55	2010 BUSSY LAKE/GLEN HAVEN	A	
	6.84	2.29	24	2010 CASSVILLE SLOUGH AREA	A	B
	5.84	1.62	248	2010 BLACK RIVER CHANNEL		B
	4.22	1.91	82	2010 BLACK RIVER MOUTH	C	
	5.82	1.97	430	_ALL		