

Results of Lake Assessment in the Lawrence/Target Lake Unit, Navigation Pool 8 of the upper Mississippi River, Fall 2013

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Purpose

The purpose of this work is to monitor the fall population length frequency and catch per unit effort of game fishes in the approximately 2607 acres Lawrence/Target Lake Unit, located in Navigation Pool 8 of the upper Mississippi River length and size distributions of other fishes are also included the analysis.

Introduction

The Wisconsin Department of Natural Resources' Mississippi River Fisheries Team (MRFT) conducts annual fall fish surveys using electro fishing. The river bordering Wisconsin was divided into 34 "lake units", which included all waters except the main channel (Figure 1). Each fall, at least three lake units are sampled, and the highest priority lake units are sampled approximately every four years. During 2013, Lawrence/Target was one of the Lake Units sampled.

Methods

Sampling was done using an 18 foot-long welded aluminum flat-bottomed maxi-boom electro fishing boat using a two-anode-one-cathode system with a Wisconsin Control Box. Two booms extended 8 feet from the bow. Each boom was terminated with an anode which consisted of two stainless steel rings, 1m in diameter, equipped with eight 15cm by 1.6cm dropper cables. We used pulsed direct current at 16 amps while volts varied from 130 to 300.

A total of 40 randomly selected ~10 minute day-time runs were done during 6.68 hours of electro fishing (Figure 2 and Table 1) between September 16 and 30, 2013. Starting points of random runs were selected using an ArcView GIS 3.3® software random point generating script and the Long Term Resource Monitoring Program (http://www.umesc.usgs.gov/data_library.html) 1998 bathymetric data (Rogala, 1997). Runs were randomly chosen from available aquatic locations that were between 0.6 and 2.5m deep. Once in the field, randomly selected runs that were too shallow or too deep or otherwise adverse to electro fishing were not done and replaced with another randomly selected run, or done within 50m of the initial run.

In addition to randomly selected runs, we electro fished 11 spatially fixed ~10 minute day-time runs done over 1.84 hours during the same dates. Spatially fixed stations were chosen in a biased manner where we had an interest in fish populations or fish habitat. Spatially fixed stations are periodically re-sampled among years. All fish were counted, identified to species, measured by total length and returned to the river.

We calculated Proportional Size Structures (Guy, et al., 2006; Gabelhouse, 1984; Anderson and Gutreuter, 1983) for quality (PSS_Q) and preferred (PSS_P) selected game fishes as well as catch per effort for these size categories. PSS is a measure, expressed as percentage, of the proportion of the number of fish greater than or equal to a "quality" or "preferred" length divided by the number of fish greater than or equal to the stock length. "Quality" and "preferred" lengths vary by species, and are determined by what most anglers consider quality or preferred fish sizes. Stock lengths also vary by species and are determined by recommendations in the literature.

Statistical tests were done using SAS® (2002-2003) software for Windows version 9.'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

During the 2013 sampling, daily mean water temperature ranged from 16.2 to 21.4°C. The mean water temperature was 19.1°C and generally decreased over the six days of sampling. Water surface elevation measured at the Lock and Dam 8 pool gage ranged from 631.19 to 631.27ft (average 631.23ft), changed as much as 0.08ft, and generally fluctuated over the sampling period (Table 2). This elevation was 0.51ft higher than the mean for this month and days during the period of record from 1937 through 2013

(631.74 ft). The mean daily flow in cubic feet per second taken from Dam 8 was 16,567 and ranged from 14,000 to 18,300 (Table 2). Flow fluctuated as much as 4,300cfs. This mean daily flow was less than the mean flow on these months and days (29,095 cfs) for the period of record of 1959 through 2013.

Electro Fishing Catch per Effort

A total of 34 species were recorded from 955 fish captured during the 40 random electro fishing runs (Table 3). The three most common species were bluegill, gizzard shad, and largemouth bass. Mean catch rates for these three species was 42.46, 32.40 and 22.03 fish per hour, respectively. Yellow perch were the fourth most common species captured, with a mean catch rate of 13.80. The catch rates for the remaining 30 species ranged 0.15 to 6.56 per hour. The mean catch per hour for all species combined was 143.43 (standard deviation = 109.81).

A total of 23 species were recorded from 417 fish captured during the 11 fixed electro fishing runs (Table 4). The three most common species were bluegill, largemouth bass, and gizzard shad. Mean catch rates for these three species was 69.13, 55.53, and 35.38 fish per hour, respectively. The catch rates for the remaining eight species ranged from 0.54 to 12.52. The mean catch per hour for all species combined was 227.00 (standard deviation = 115.29).

We tested for differences in catch rates for common species between random and fixed samples. There was a significant difference in rates for bluegill, largemouth bass, yellow perch, black crappie and spotted sucker but not for gizzard shad. This is not surprising since the bias in fixed stations was toward locations that are known to have more game fish.

Length Distribution

We tested the difference in mean lengths of the most common game fishes between random and fixed sampling runs. There was no difference ($p=0.05$). Therefore, we combined summaries of mean lengths and length distributions from both sampling methods. The mean lengths of fish species where there were more than 5 individuals are given in Table 5. A total of 2.8 percent of the largemouth bass was larger than 14 inches. A total of 5.05 percent of bluegill was greater than 7 inches. A total of 20.01 percent of yellow perch was larger than 7 inches and 9.57 percent were larger than 8 inches. The frequency distribution for total length in inches for the most common species (bluegill, largemouth bass, yellow perch, black crappie, gizzard shad and spotted sucker), are given in Figures 3 through 8.

Total length values for quality, preferred and stock sizes used to calculate Proportional Size Structures (PSS) are given in Table 6. The PSS_Q and PSS_P by species are presented in Table 7. Bluegill PSS_Q was 25.51, below the “acceptable” range. Also, bluegill (1.65) did not meet the acceptable PSS_P standard. The “acceptable” value of PSS_Q for bluegill is 40 to 60 and the “acceptable” value of PSS_P is a minimum of 5 (Wisconsin Department of Natural Resources, 2010).

Yellow perch PSS_Q was 30.56 which was below the “acceptable” value. Also, yellow perch ($PSS_P=8.33$) met the acceptable PSS_P standard. The “acceptable” value of PSS_Q for yellow perch is 40 and the “acceptable” value of PSS_P is a minimum of 5 (Wisconsin Department of Natural Resources, 2010).

No guidance is provided for other fish species where we calculated PSS_Q and PSS_P . The PSS_Q and PSS_P for largemouth bass (55.77 and 9.62), were relatively high.

A comparison between values from 2009 and 2013 generally showed that the proportion of quality sized fish was about the same. The proportion of preferred sized fish was the same for bluegill, decreased for largemouth bass, and increased for yellow perch.

We tested the mean size of fish greater than or equal to the stock size among years. Yellow perch and largemouth bass were significantly larger in 2013 than 2009 and bluegills were the same. This suggests that yellow perch and largemouth bass sizes have increased since 2009 while bluegill remained the same.

Comparisons of Random Electro Fishing Runs with Other Lake Units

Catch per effort data collected from randomly selected fall electro fishing runs are available for the years 2011 through 2013, from a total of seventeen lake units. Six lake units were sampled in 2011, three were sampled in 2012, and eight were sampled in 2013. Catch per hour for all target fish combined (bluegill, black crappie, largemouth bass, northern pike, smallmouth bass, pumpkinseed, rock bass, white crappie and yellow perch) in Lawrence/Target (84.99) was somewhere in the middle amongst values for all other units (Table 8). This suggests that there is a moderate population density in Lawrence/Target.

We also tested mean catch per hour for selected individual species among nine 2011 through 2013 lake units (Table 9). Lawrence/Target Lake Unit bluegill catch rate (42.46) was higher than seven other lake units, but lower than one. The catch rate for largemouth bass at the Lawrence/Target Lake Unit (22.03) was higher than three lake units and lower than one. The Lawrence/Target Lake Unit had the same catch rate of rock bass (0.00) as fourteen others, lower than two, and was higher than six others. Lawrence/Target smallmouth bass catch rate (0.45) was the same as fourteen, and but lower than two. Lawrence/Target yellow perch catch rate (13.80) was higher than three other lake units and was lower than three other lake units.

We did a similar test of mean catch per hour for selected individual species among the seventeen 2011 through 2013 lake units except we excluded any presumed young-of-the-year fish (i.e., age zero). Ranks of catch per effort were identical or similar to those found using all sizes. This suggests that excluding putative age zero fish from this catch per effort analysis did not have an overwhelming effect on comparisons.

We compared mean total length of selected individual species caught with electro fishing among seventeen 2011 through 2013 lake units (Table 10). For all four selected species, Lawrence/Target mean total lengths ranked in the bottom half of all lake units. Mean total length of Lawrence/Target bluegill (3.45 inches) was smaller than nine lake units and larger than one. Largemouth

bass from Lawrence/Target (5.17 inches) were smaller than ten other lake units and larger than none. Lawrence/Target black crappies (3.89 inches) were smaller than five lake units and larger than no lake units. Mean length of Lawrence/Target yellow perch (4.59 inches) were the smaller than 8 lake units and larger than none.

We compared PSS from Lawrence/Target to other lake units from 2007 through 2013 where the number of stock sized game fish was greater than or equal to 29 in the Lawrence/Target lake unit during 2013 (Table 11). For bluegill, 2013 Lawrence/Target ranked 21th for quality fish and 14th in preferred sized fish in 37 comparisons. For quality largemouth bass, 2013 Lawrence/Target ranked 18th in 35 comparisons and the 29th for preferred sized fish. For yellow perch, 2013 Lawrence/Target ranked 8th for quality and 5th in preferred sized fish in 16 comparisons.

Comparisons of Electro Fishing Runs among Years

We compared mean total length among years within the Lawrence/Target lake unit. Mean total length of 2009 bluegill greater than 3 inches (non young-of-the-year) was 5.0 inches and was not significantly different from 2013 (5.0 inches) ($p=0.94$). Largemouth bass mean length for those greater than 5.2 inches in 2009 was 9.8 inches, and was significantly different from 2013 (11.1 inches) ($p=0.0030$). The magnitude of this difference was 1.3 inches. Non young-of-the-year yellow perch (> 4.5 inches) had a mean of 7.6 inches in 2013 and 5.5 inches in 2009. These were significantly different.

Comparisons using Fixed Electro Fishing Runs, 2009 and 2013

Spatially fixed electro fishing runs were done in the Lawrence/Target lake unit each year during 2009 and 2013. Mean daily water temperatures were higher in 2013 (19.2°C) compared to 2009 (16.5°C), and the flows and water surface elevations were nearly identical. A total of 31 kinds of fish were caught among all years totaling 1199 fish (Table 12). Yellow perch was the most common followed by largemouth bass, bluegill, gizzard shad, and central mudminnow.

Catch per hour for all target fish combined in Lawrence/Target was 227.0 in 2013 and was 585.3 in 2009. These means differed statistically ($p=0.0050$). Target species included black crappie, bluegill, largemouth bass, northern pike, smallmouth bass, pumpkinseed, white crappie, rock bass and yellow perch. In addition, when all game and non-game fish species were combined, these means between years differed as well ($p=0.0335$). This suggests that catch rates were significantly lower in 2013 than 2009.

Conclusions

In 2013, yellow perch sizes increased, on average, since 2009 while bluegill stayed about the same and largemouth bass were much smaller. In 2013, the percent of “quality” and “preferred” sized bluegill were below the WDNR’s recommendations while yellow perch had a mix of results. Bluegill and largemouth bass sizes have decreased since 2009 while yellow perch sizes have increased dramatically.

Compared to sixteen other lake units in the Mississippi River bordering Wisconsin, Lawrence/Target ranked medium to low in size of fish. Yellow perch were smaller than 8 lake units and the same as the remaining ones. Largemouth bass were smaller than ten and the same as the remaining ones. Black crappie were smaller than 5 lake units and larger than none. Bluegill were smaller than 9 lake units and larger than one. The proportion of “quality” and “preferred” sized fish for bluegill and largemouth bass was about average. Yellow perch ranked relatively high compared to other lake units and years.

Game fish catch rates from our samples suggest a medium abundance out of sixteen other lake units similarly sampled since 2011. Combined game fish catch rates were lower in 2013 than in 2009 within Lawrence/Target.

In general, our samples suggest that Lawrence/Target has a relatively average abundance of game fish that are relatively small. This may suggest good recruitment of young individuals.

In Navigation Pool 8 of the Mississippi River bordering Minnesota, Wisconsin fishing regulations limit harvest to 25 each of yellow perch, rock bass and crappie, with no size limit. Bluegill and pumpkinseed are limited to 25 in total with no size limit. White bass and yellow bass are limited to 25 in total with no size limit. Largemouth bass and smallmouth bass are limited to 5 in total with a 14 inch minimum size limit. Northern pike have a bag limit of 5 and no size limit. All these fish species have continuous open seasons.

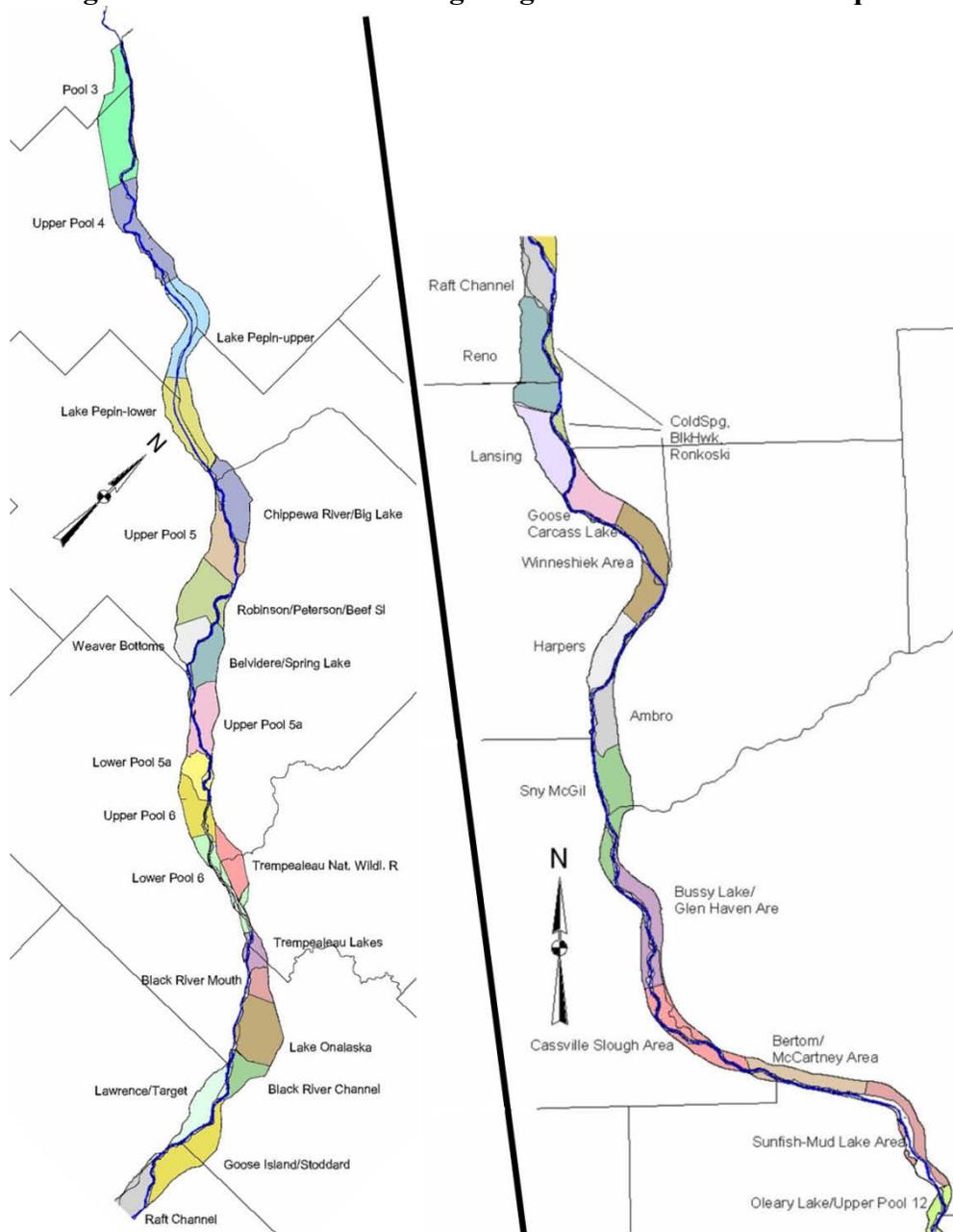
Recommendations

1. Continue to monitoring backwater fish in Pool 8 and other pools to determine any trends.
2. Using additional data explore any longitudinal trends in mean total length or catch per effort along the Mississippi River bordering Wisconsin.

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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)



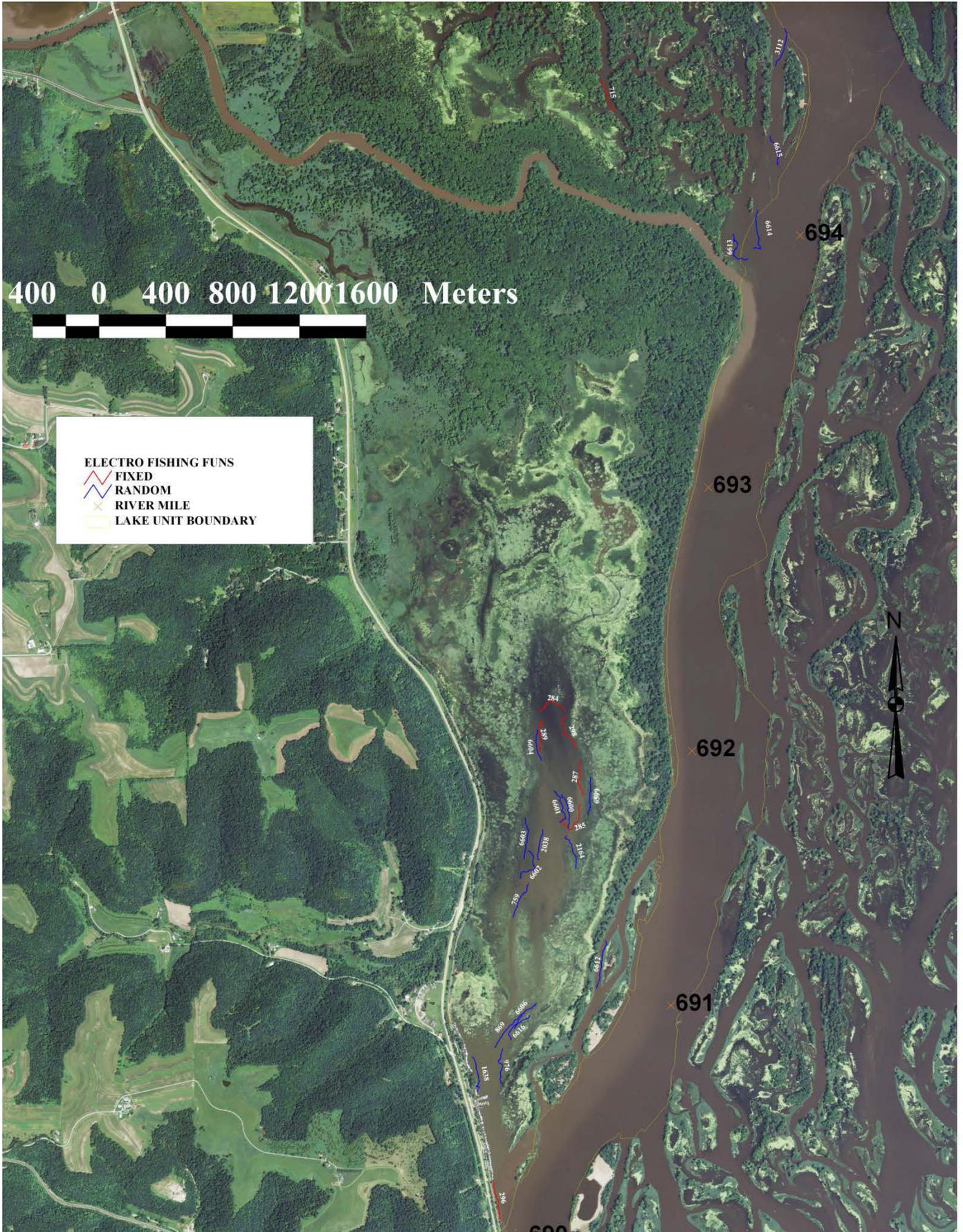


TABLE 1. LOCATIONS OF FALL 2013 ELECTRO FISHING RUNS, THE LAWRENCE/TARGET LAKE UNIT INCLUDING STATION LENGTHS IN METERS AND STARTING AND ENDING COORDINATES (Z15N UTM NAD83.)

STATION	STATION LENGTH (M)	UTM_START_X	UTM_START_Y	UTM_END_X	UTM_END_Y	RANDOM OR FIXED
32	289	639732	4852635	639730	4852817	RANDOM
275	274	639895	4848709	639997	4848913	FIXED
284	269	639695	4844306	639550	4844259	FIXED
285	292	639681	4843650	639776	4843733	FIXED
287	223	639793	4843782	639758	4843992	FIXED
289	235	639545	4844231	639535	4844050	FIXED
293	275	639534	4849568	639549	4849323	FIXED
296	235	639255	4841468	639297	4841243	FIXED
298	240	639740	4844086	639674	4844270	FIXED
715	273	639914	4848063	640013	4847842	FIXED
759	237	639468	4843251	639374	4843051	RANDOM
869	279	639435	4842481	639264	4842272	RANDOM
872	221	639715	4852257	639672	4852451	FIXED
976	236	639311	4842265	639299	4842060	RANDOM
1124	251	639684	4852847	639625	4852709	FIXED
1519	275	638831	4853463	638956	4853236	RANDOM
1597	273	639040	4852559	639166	4852341	RANDOM
1638	252	639130	4842216	639162	4842009	RANDOM
2038	198	639551	4843580	639526	4843398	RANDOM
2164	228	639694	4843540	639748	4843347	RANDOM
2216	267	639752	4849551	639963	4849539	RANDOM
3112	253	640998	4848381	640943	4848157	RANDOM
5022	191	639603	4852744	639518	4852892	RANDOM
5330	242	637975	4853695	637777	4853726	RANDOM
5688	323	638801	4853573	638919	4853307	RANDOM
5692	234	638503	4850259	638711	4850304	RANDOM
6593	228	639051	4850487	638856	4850388	RANDOM
6594	216	638632	4850217	638809	4850290	RANDOM
6595	232	638788	4850478	638694	4850327	RANDOM
6598	273	639057	4850560	638901	4850451	RANDOM
6599	240	639823	4843671	639839	4843895	RANDOM
6600	224	639666	4843789	639705	4843590	RANDOM
6601	251	639630	4843826	639634	4843619	RANDOM
6602	253	639466	4843453	639414	4843286	RANDOM
6603	259	639446	4843650	639440	4843403	RANDOM
6604	201	639521	4844178	639544	4843993	RANDOM
6605	260	639377	4848861	639178	4848791	RANDOM
6606	214	639381	4842386	639511	4842539	RANDOM
6607	341	637517	4855270	637731	4855061	RANDOM
6608	290	638737	4854022	638760	4853758	RANDOM
6609	229	639412	4850106	639413	4849922	RANDOM
6610	277	640004	4849519	640178	4849325	RANDOM

STATION	STATION LENGTH (M)	UTM_START_X	UTM_START_Y	UTM_END_X	UTM_END_Y	RANDOM OR FIXED
6611	250	639673	4851798	639649	4851720	RANDOM
6612	304	639929	4842911	639871	4842626	RANDOM
6613	212	640691	4847147	640777	4847002	RANDOM
6614	299	640837	4847294	640815	4847064	RANDOM
6615	219	640914	4847739	640962	4847571	RANDOM
6616	222	639473	4842466	639359	4842320	RANDOM
6617	238	639409	4850201	639377	4850190	RANDOM
6618	275	639404	4851856	639462	4851599	RANDOM
6619	222	639257	4851779	639318	4851584	RANDOM

TABLE 2. MEAN WATER TEMPERATURE, WATER SURFACE ELEVATION AND FLOW DURING FALL 2013 LAWRENCE/TARGET LAKE UNIT SAMPLING.

DATE	MEAN DAILY TEMPERATURE °C	WATER SURFACE ELEVATION (ft), LA CROSSE	FLOW (cfs) DAM 8
09/16/2013	21.4	631.24	15,300
09/17/2013	17.9	631.19	16,800
09/19/2013	21.2	631.27	16,100
09/20/2013	19.8	631.20	16,100
09/23/2013	17.8	631.27	18,300
09/24/2013	19.0	631.19	16,800
09/30/2013	16.2	631.25	14,000
MEAN (by date, station)	19.1	631.23	16,567

TABLE 3. RELATIVE ABUNDANCE, MEAN CATCH PER HR, ELECTRO FISHING, FALL 2013, LAWRENCE/TARGET LAKE UNIT. RANDOM RUNS.

	SPECIES	FREQ.	PERCENT	MEAN PER HR	STANDARD DEV.	MIN.	MAX.	NO. OF RUNS	TOTAL HRS
1	black crappie	28	2.93	4.17	8.36	0	41.92	40	6.68
2	bluegill	285	29.84	42.46	54.19	0	197.61	40	6.68
3	bowfin	44	4.61	6.56	8.86	0	35.93	40	6.68
4	brook silverside	3	0.31	0.45	1.60	0	5.99	40	6.68
5	channel catfish	1	0.11	0.15	0.95	0	5.99	40	6.68
6	common carp	5	0.52	0.75	3.09	0	17.96	40	6.68
7	emerald shiner	22	2.30	3.31	10.24	0	53.89	40	6.68
8	freshwater drum	11	1.15	1.65	6.02	0	35.93	40	6.68
9	gizzard shad	210	21.99	32.40	75.85	0	380.00	40	6.68
10	golden redhorse	17	1.78	2.56	6.35	0	29.94	40	6.68
11	golden shiner	13	1.36	1.95	4.37	0	17.96	40	6.68
12	green sunfish	2	0.21	0.30	1.32	0	5.99	40	6.68
13	green sunfish x bluegill	1	0.11	0.15	0.95	0	5.99	40	6.68
14	largemouth bass	148	15.50	22.03	26.52	0	89.82	40	6.68
15	logperch	2	0.21	0.30	1.89	0	11.98	40	6.68
16	minnows & cyprinidae unsp.	6	0.63	0.90	2.89	0	11.98	40	6.68
17	mooneye	1	0.11	0.15	0.95	0	5.99	40	6.68
18	northern pike	10	1.05	1.50	2.96	0	11.98	40	6.68
19	pumpkinseed	4	0.42	0.60	1.82	0	5.99	40	6.68
20	pumpkinseed x bluegill	3	0.31	0.50	2.10	0	11.98	40	6.68
21	quillback	4	0.42	0.60	2.27	0	11.98	40	6.68
22	river carpsucker	1	0.11	0.15	0.95	0	5.99	40	6.68
23	shiners	8	0.84	1.20	3.88	0	17.96	40	6.68
24	shorthead redhorse	2	0.21	0.30	1.32	0	5.99	40	6.68
25	silver redhorse	2	0.21	0.30	1.89	0	11.98	40	6.68
26	smallmouth bass	3	0.31	0.45	1.60	0	5.99	40	6.68
27	smallmouth buffalo	1	0.11	0.15	3.83	0	5.99	40	6.68
28	spottail shiner	3	0.31	0.44	1.55	0	5.99	40	6.68
29	spotted sucker	11	1.15	1.65	3.83	0	17.96	40	6.68
30	walleye	1	0.11	0.14	0.86	0	5.46	40	6.68
31	warmouth	5	0.52	0.75	3.09	0	17.96	40	6.68
32	weed shiner	3	0.31	0.45	2.84	0	17.96	40	6.68
33	white bass	2	0.21	0.30	1.98	0	11.98	40	6.68
34	yellow perch	93	9.74	13.80	26.80	0	125.75	40	6.68
	ALL SPECIES	955	100.01	143.43	109.80	11.98	413.33	40	6.68

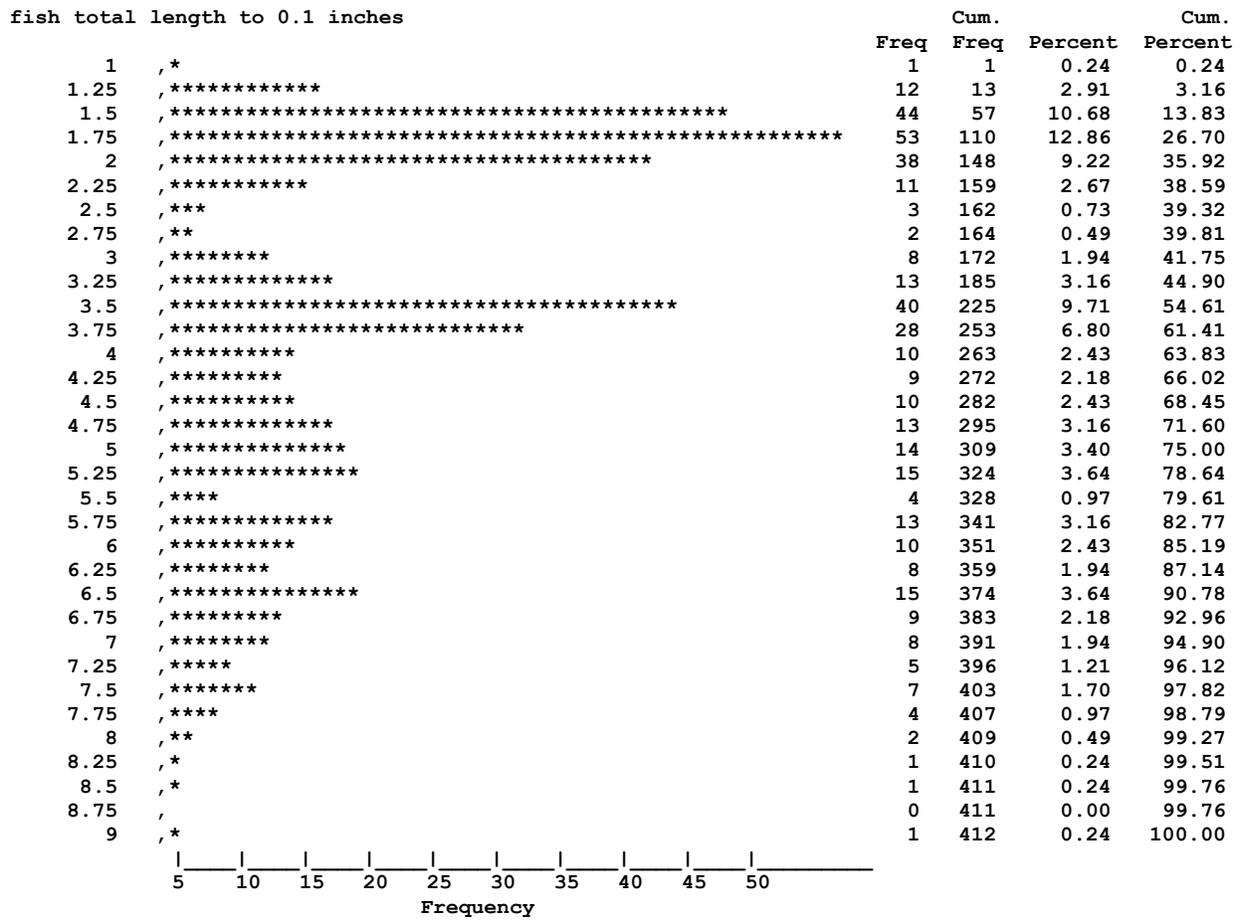
TABLE 4. RELATIVE ABUNDANCE, MEAN CATCH PER HR, ELECTRO FISHING, FALL 2013, LAWRENCE/TARGET LAKE UNIT. FIXED RUNS.

	SPECIES	FREQ.	PERCENT	MEAN PER HR	STANDARD DEV.	MIN.	MAX.	NO. OF RUNS	TOTAL HRS
1	bigmouth buffalo	2	0.48	1.09	3.61	0.00	11.98	11	1.84
2	black crappie	4	0.96	2.18	3.02	0.00	5.99	11	1.84
3	bluegill	127	30.46	69.13	50.91	11.98	185.63	11	1.84
4	bowfin	15	3.60	8.17	8.58	0.00	17.96	11	1.84
5	common carp	5	1.20	2.72	7.27	0.00	23.95	11	1.84
6	emerald shiner	3	0.72	1.63	3.87	0.00	11.98	11	1.84
7	freshwater drum	3	0.72	1.63	3.87	0.00	11.98	11	1.84
8	gizzard shad	65	15.59	35.38	82.34	0.00	275.45	11	1.84
9	golden redhorse	14	3.36	7.62	19.51	0.00	65.87	11	1.84
10	golden shiner	6	1.44	3.17	7.27	0.00	23.95	11	1.84
11	johnny darter	1	0.24	0.54	1.81	0.00	5.99	11	1.84
12	largemouth bass	102	24.46	55.53	50.96	11.98	179.64	11	1.84
13	logperch	5	1.20	2.72	9.03	0.00	29.94	11	1.84
14	longnose gar	2	0.48	1.09	2.42	0.00	5.99	11	1.84
15	northern pike	8	1.92	4.36	8.51	0.00	23.95	11	1.84
16	pumpkinseed	4	0.96	2.18	3.02	0.00	5.99	11	1.84
17	river carpsucker	1	0.24	0.54	1.81	0.00	5.99	11	1.84
18	sauger	6	1.44	3.27	9.03	0.00	29.94	11	1.84
19	shorthead redhorse	1	0.24	0.54	1.81	0.00	5.99	11	1.84
20	smallmouth bass	9	2.16	4.90	14.38	0.00	47.90	11	1.84
21	smallmouth buffalo	1	0.24	0.54	1.81	0.00	5.99	11	1.84
22	spotted sucker	10	2.40	5.44	7.79	0.00	17.96	11	1.84
23	yellow perch	23	5.52	12.52	11.19	0.00	29.94	11	1.84
	ALL SPECIES	417	100	227.00	115.29	101.80	479.04	11	1.84

TABLE 5. MEAN LENGTH IN INCHES FOR SELECTED GAME FISH SPECIES, FALL 2013, LAWRENCE/TARGET LAKE UNIT, FROM ELECTRO FISHING AT RANDOM AND FIXED STATIONS.

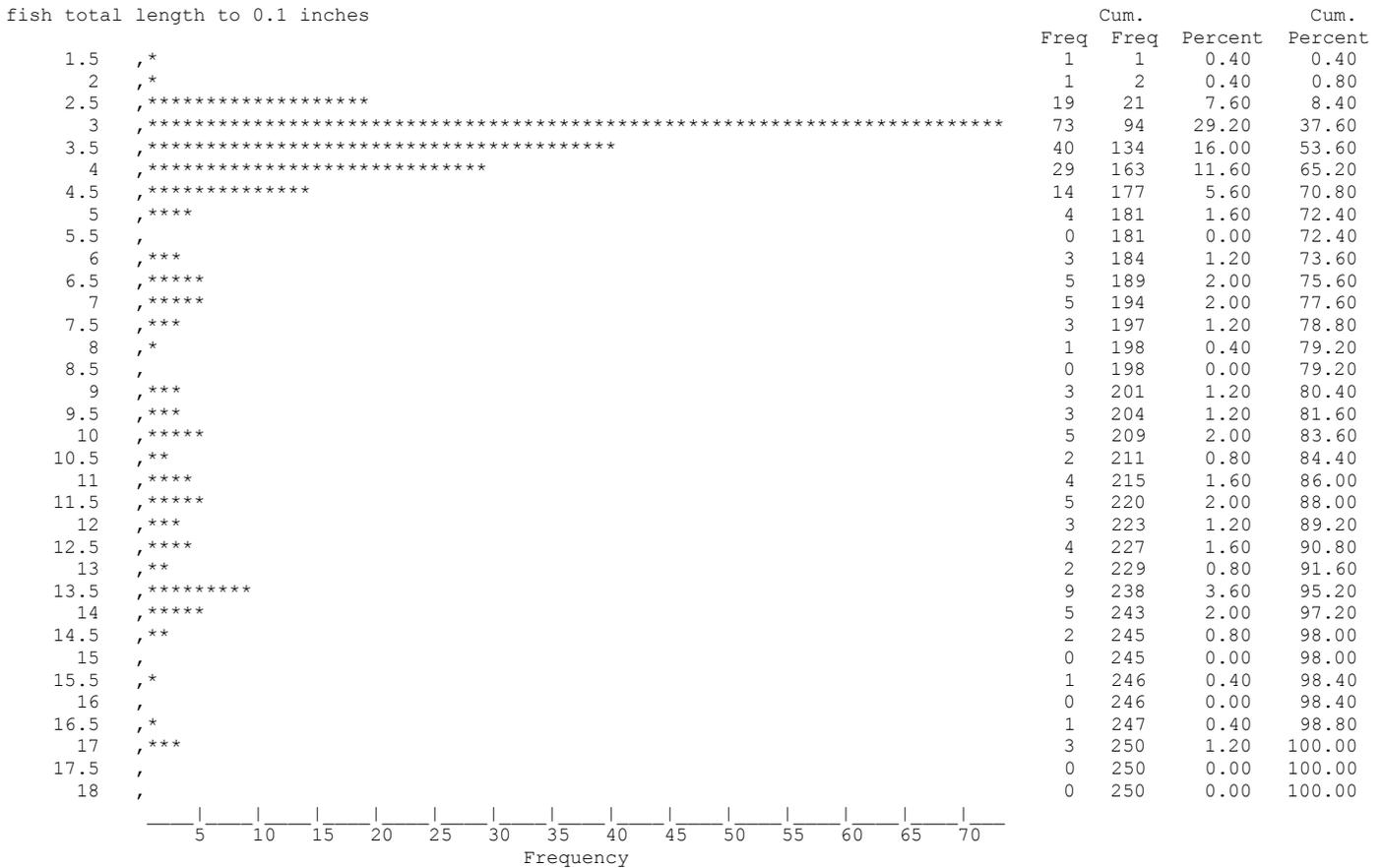
SPECIES	MEAN LENGTH	STANDARD DEV.	MIN.	MAX.	N
black crappie	4.17	3.06	2.24	11.65	32
bluegill	3.68	1.92	0.95	9.37	412
gizzard shad	4.93	1.47	1.81	13.35	275
largemouth bass	5.46	3.79	1.69	16.89	250
smallmouth bass	7.62	3.91	3.27	17.13	12
spotted sucker	11.79	4.62	3.39	20.12	21
yellow perch	4.61	2.25	2.17	11.50	115

FIGURE 3. FALL 2013 BLUEGILL LENGTH DISTRIBUTION (INCHES), LAWRENCE/TARGET LAKE UNIT, ELECTRO FISHING. RANDOM AND FIXED RUNS.



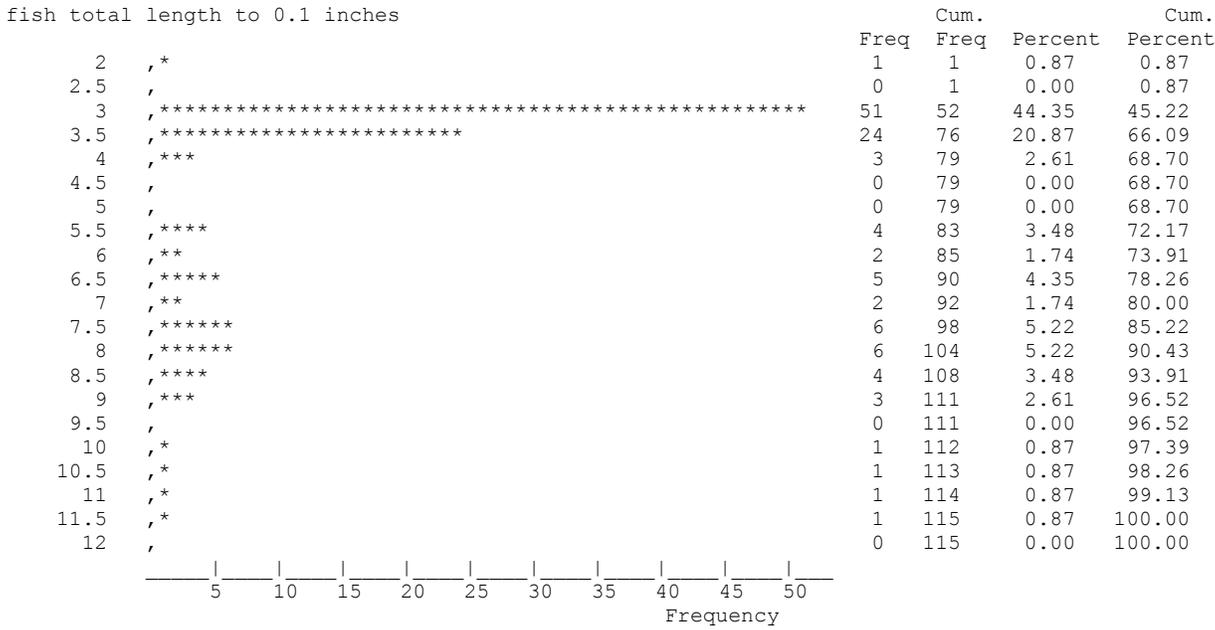
N	Mean	Std Dev	Minimum	Maximum
412	3.6815704	1.9220309	0.9450000	9.3700000

FIGURE 4. FALL 2013 LARGEMOUTH BASS LENGTH DISTRIBUTION (INCHES), LAWRENCE/TARGET LAKE UNIT, ELECTRO FISHING. RANDOM AND FIXED RUNS.



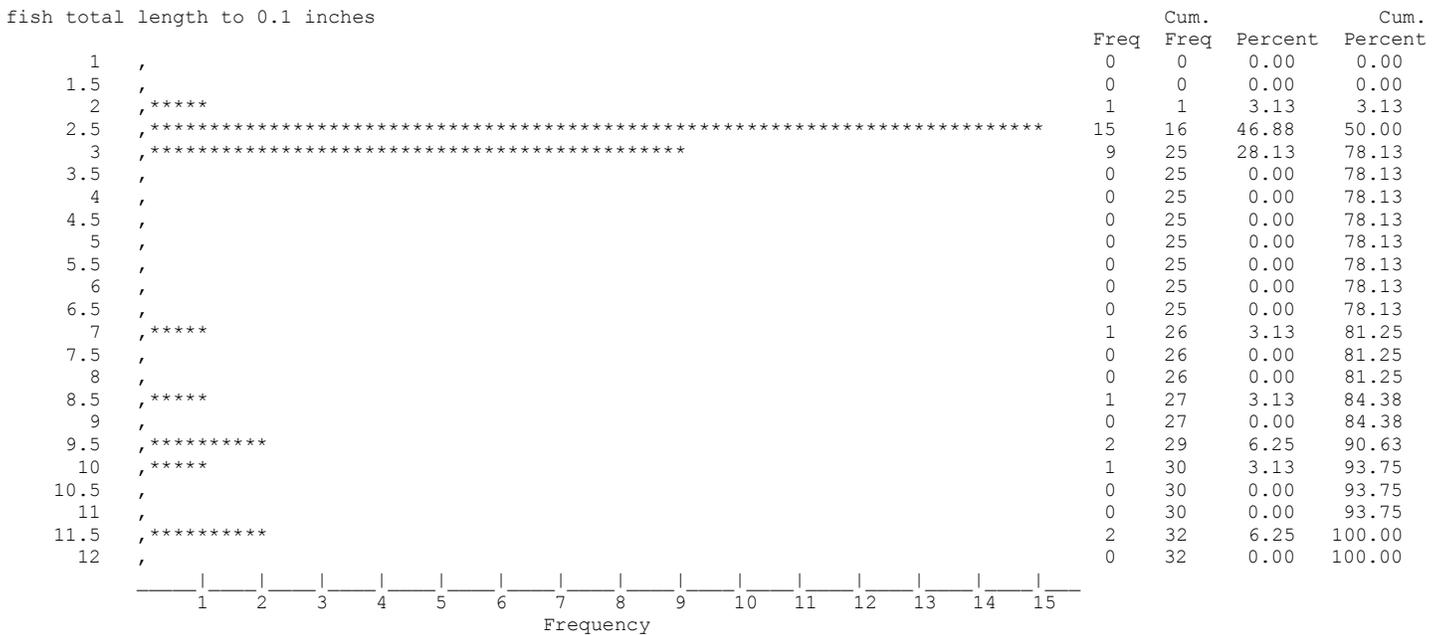
N	Mean	Std Dev	Minimum	Maximum
250	5.4596560	3.7933938	1.6930000	16.8900000

FIGURE 5. FALL 2013 YELLOW PERCH LENGTH DISTRIBUTION (INCHES), LAWRENCE/TARGET LAKE UNIT, ELECTRO FISHING. RANDOM AND FIXED RUNS.



N	Mean	Std Dev	Minimum	Maximum
115	4.6093391	2.2524436	2.1650000	11.4960000

FIGURE 6. FALL 2013 BLACK CRAPPIE LENGTH DISTRIBUTION (INCHES), LAWRENCE/TARGET LAKE UNIT, ELECTRO FISHING. RANDOM AND FIXED RUNS.



N	Mean	Std Dev	Minimum	Maximum
32	4.1658750	3.0605125	2.2440000	11.6540000

FIGURE 7. FALL 2013 GIZZARD SHAD LENGTH DISTRIBUTION (INCHES), LAWRENCE/TARGET LAKE UNIT, ELECTRO FISHING. RANDOM AND FIXED RUNS.

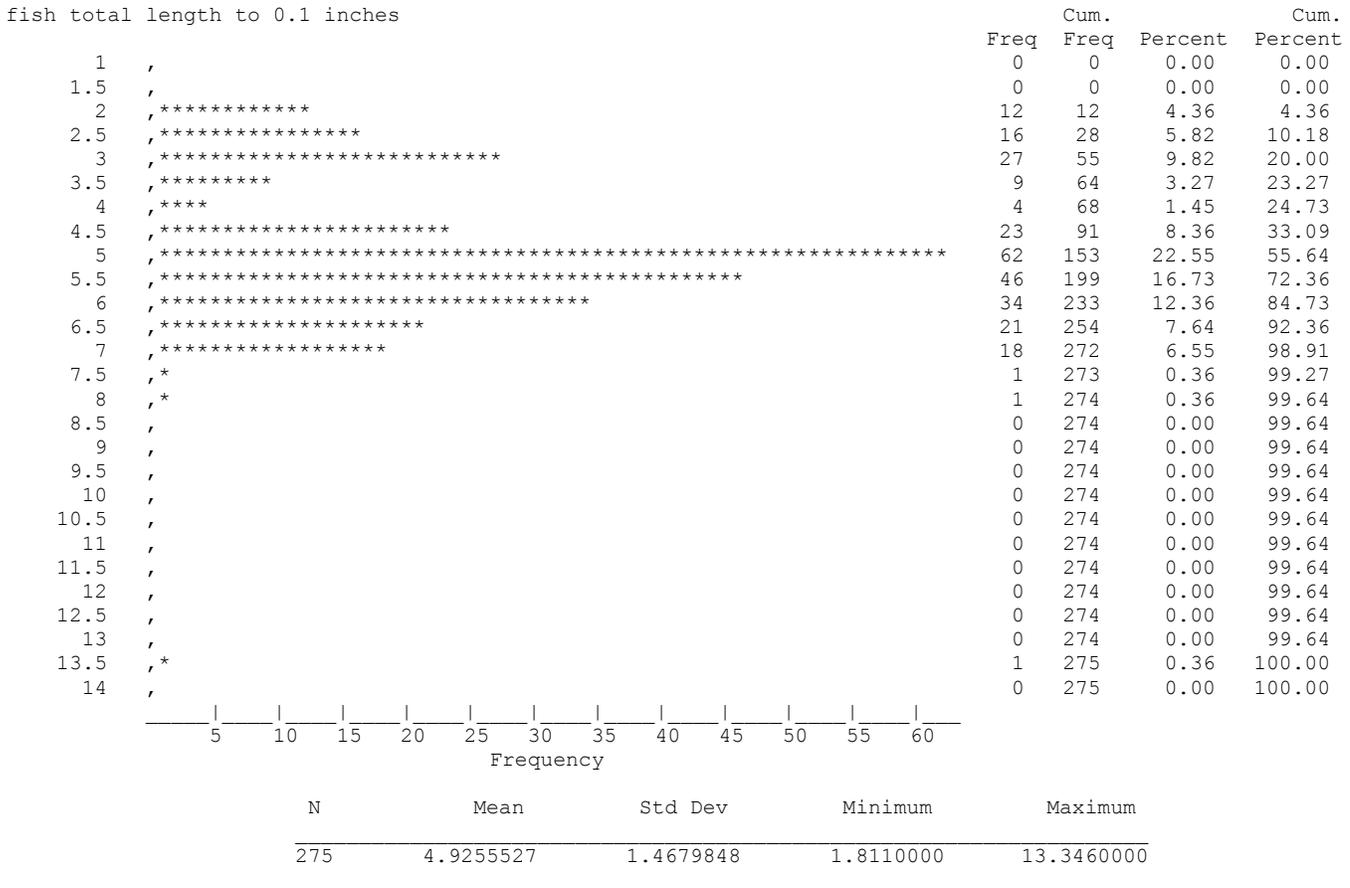


FIGURE 8. FALL 2013 SPOTTED SUCKER LENGTH DISTRIBUTION (INCHES), LAWRENCE/TARGET LAKE UNIT, ELECTRO FISHING. RANDOM AND FIXED RUNS.

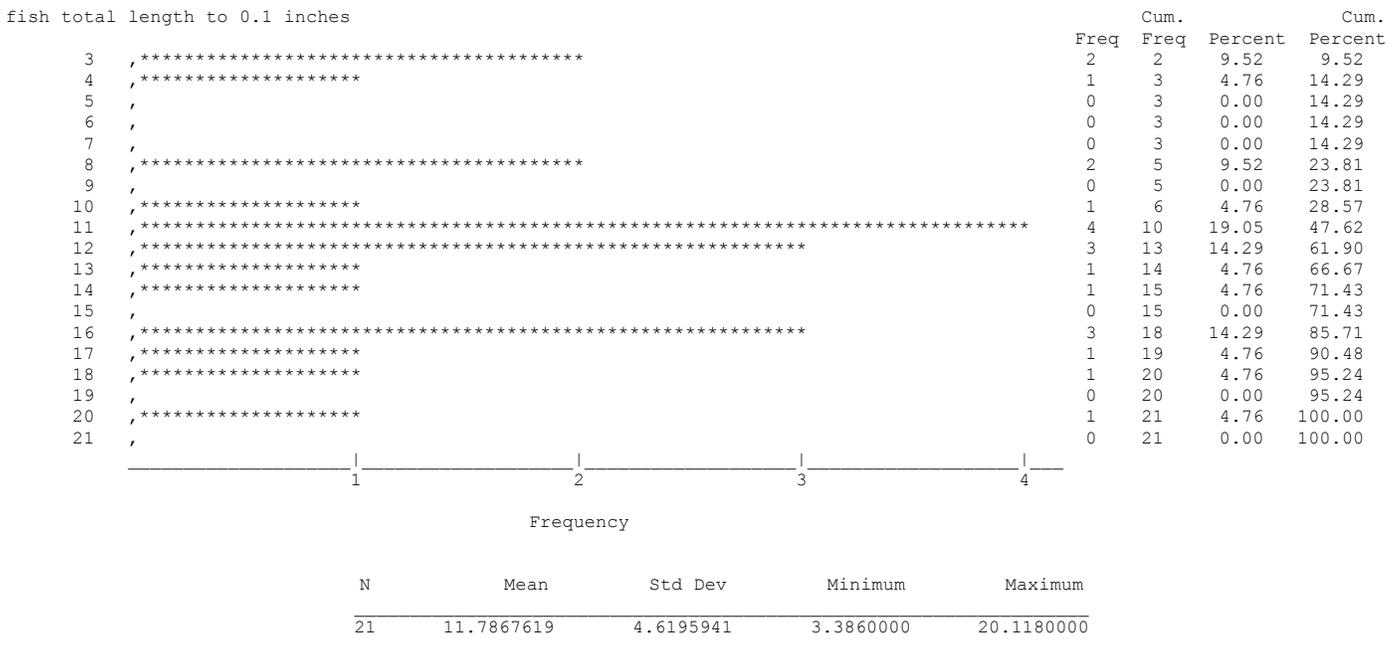


TABLE 6. LIST OF STOCK SIZE, QUALITY SIZE (PSS_Q) AND PREFERRED SIZE (PSS_P) IN INCHES FOR SELECTED FISH SPECIES.

FISH SPECIES	PSS SOURCE	STOCK	QUALITY	PREFERRED
bluegill	Gabelhouse (1984)	3.0	6.0	8.0
black crappie	Gabelhouse (1984)	5.0	8.0	10.0
gizzard shad	Anderson and Gutreuter (1983)	7.0	11.0	-
largemouth bass	Gabelhouse (1984)	8.0	12.0	15.0
yellow perch	Gabelhouse (1984)	5.0	8.0	10.0

TABLE 7. COMPARISON OF PSS FOR SELECTED SPECIES IN LAWRENCE/TARGET LAKE UNIT. ELECTRO FISHING, FALL 2009 AND 2013, RANDOM AND FIXED RUNS.

SPECIES	2009			2013		
	# OF STOCK	PSS _Q	PSS _P	# OF STOCK	PSS _Q	PSS _P
bluegill	299	27.76	1.67	243	25.51	1.65
largemouth bass	164	70.73	18.29	52	55.77	9.62
yellow perch	210	3.81	0.95	36	30.56	8.33

TABLE 8. COMPARISON OF MEAN CATCH PER HOUR FROM ELECTRO FISHING AT RANDOMLY SELECTED LOCATIONS FOR ALL TARGET SPECIES* COMBINED AMONG SEVENTEEN FALL 2011 THROUGH 2013 LAKE UNITS.

MEAN	STD. DEV.	N	LAKE UNIT			
189.18	149.98	86	2011 GOOSE ISLAND/STODDARD	A		
228.48	215.69	23	2012 UPPER POOL 5	A	B	
151.21	142.39	63	2011 COLD SPRG/BLKHWK/RONK	A	B	
124.75	114.05	30	2011 CHIPPEWA RIVER/BIG LK	A	B	
129.36	121.86	63	2011 AMBRO	A	C	B
85.11	95.71	42	2011 HARPERS	A	C	B
84.99	91.52	40	2013 LAWRENCE/TARGET		C	B
86.69	109.44	44	2013 UPPER POOL 5A		C	B
48.68	49.32	39	2012 GOOSE CARCASS LAKE		C	B
70.26	70.62	30	2013 UPPER POOL 6		C	B
39.12	38.96	30	2011 WEAVER BOTTOMS	D	C	B
73.12	116.56	52	2013 SNY MCGIL	D	C	E
33.33	76.03	53	2013 BERTOM/MCCARTNEY AREA	D	F	E
21.96	30.63	60	2012 LAKE ONALASKA		F	E
16.03	18.80	34	2013 TREMPLEAU LAKES		F	E
12.80	20.48	29	2013 RENO		F	
3.88	6.50	37	2013 WINNESHIEK AREA		F	
90.20	123.12	764	ALL			

- Target species include: bluegill, black crappie, largemouth bass, northern pike, smallmouth bass, pumpkinseed, rock bass, white crappie and yellow perch.

TABLE 9. COMPARISON OF MEAN CATCH PER HOUR FROM ELECTRO SHOCKED RANDOMLY SELECTED STATIONS FOR SELECTED INDIVIDUAL SPECIES, AMONG SEVENTEEN FALL 2011 THROUGH 2013 LAKE UNITS. ALL FISH SIZES.

SPECIES	MEAN	STD. DEV.	N	LAKE UNIT	DIFFERENT (means with the same letter are not Sign. Different)		
black crappie	10.29	19.37	32	2012 UPPER POOL 5	A		
	3.99	6.36	30	2011 CHIPPEWA RIVER/BIG LK	A	B	
	5.70	11.60	63	2011 AMBRO	C	A	B
	2.99	4.23	42	2011 HARPERS	C	A	D B
	4.17	8.36	40	2013 LAWRENCE/TARGET	C	A	D B E
	2.19	4.60	52	2013 SNY MCGIL	C	F	D B E
	2.99	12.75	44	2013 UPPER POOL 5A	C	F	D B E
	1.25	2.92	86	2011 GOOSE ISLAND/STODDARD	C	F	D B E
	1.23	3.41	39	2012 GOOSE CARCASS LAKE	C	F	D B E
	1.14	3.01	63	2011 COLD SPRG/BLKHWK/RONK	C	F	D B E
	0.79	2.36	53	2013 BERTOM/MCCARTNEY AREA	C	F	D B E
	0.70	2.45	34	2013 TREMPLEALEAU LAKES	C	F	D E
	0.60	2.12	60	2012 LAKE ONALASKA	F	D	E
	0.40	1.52	30	2013 UPPER POOL 6	F		E
	0.40	1.52	30	2011 WEAVER BOTTOMS	F		E
	0.00	0.00	29	2013 RENO	F		
	0.00	0.00	37	2013 WINNESHIEK AREA	F		
bluegill	125.19	140.91	32	2012 UPPER POOL 5	A		
	74.71	93.49	42	2011 HARPERS	A	B	
	66.41	74.93	63	2011 COLD SPRG/BLKHWK/RONK	A	B	
	76.51	88.65	63	2011 AMBRO	C	A	B
	44.91	68.54	86	2011 GOOSE ISLAND/STODDARD	C	A	B
	42.46	54.19	40	2013 LAWRENCE/TARGET	C	A	B
	28.74	41.29	30	2011 CHIPPEWA RIVER/BIG LK	C	A	B
	43.69	81.89	44	2013 UPPER POOL 5A	C	B	D
	47.25	93.54	52	2013 SNY MCGIL	C	B	D
	30.74	49.72	30	2013 UPPER POOL 6	C	E	D
	7.26	9.91	39	2012 GOOSE CARCASS LAKE	F	E	D
	9.18	20.91	30	2011 WEAVER BOTTOMS	F	E	D
	19.66	63.30	53	2013 BERTOM/MCCARTNEY AREA	F	E	
	6.19	16.28	29	2013 RENO	F	E	
	3.70	6.92	34	2013 TREMPLEALEAU LAKES	F	E	
	4.19	8.49	60	2012 LAKE ONALASKA	F	E	
	1.30	1.50	37	2013 WINNESHIEK AREA	F		
largemouth bass	99.85	108.66	86	2011 GOOSE ISLAND/STODDARD	A		
	59.13	66.15	32	2012 UPPER POOL 5	A	B	
	52.19	66.13	63	2011 COLD SPRG/BLKHWK/RONK	A	B	
	37.92	45.12	30	2011 CHIPPEWA RIVER/BIG LK	A	B	
	32.67	41.45	39	2012 GOOSE CARCASS LAKE		B	
	33.46	46.89	63	2011 AMBRO	C	B	
	22.16	21.28	30	2011 WEAVER BOTTOMS	C	B	

SPECIES	MEAN	STD. DEV.	N	LAKE UNIT	DIFFERENT (means with the same letter are not Sign. Different)		
northern pike	25.55	30.45	30	2013 UPPER POOL 6	C	B	
	31.30	41.36	44	2013 UPPER POOL 5A	C	D	B
	22.03	26.52	40	2013 LAWRENCE/TARGET	C	D	B E
	18.42	25.09	52	2013 SNY MCGIL	C	D	B E F
	11.28	19.12	60	2012 LAKE ONALASKA	C	D	G E F
	8.47	16.91	53	2013 BERTOM/MCCARTNEY AREA		D	G E F
	4.54	7.45	29	2013 RENO			G E F
	4.13	6.81	42	2011 HARPERS			G F
	4.23	8.28	34	2013 TREMPPEALEAU LAKES			G F
	1.13	2.77	37	2013 WINNESHIEK AREA			G
	4.79	5.97	30	2011 CHIPPEWAS RIVER/BIG LK		A	
	3.44	4.69	63	2011 COLD SPRG/BLKHWK/RONK		A	B
	3.40	6.11	44	2013 UPPER POOL 5A	C	A	B
	3.59	6.78	30	2013 UPPER POOL 6	C	A	B
	1.50	3.49	40	2013 LAWRENCE/TARGET	C		B D
	1.60	3.49	30	011 WEAVER BOTTOMS	C		B D
	1.39	3.40	86	2011 GOOSE ISLAND/STODDARD	C		B D
	1.33	3.31	63	2011 AMBRO	C		B D
	0.94	2.68	32	2012 UPPER POOL 5	C		D
	0.81	2.38	52	2013 SNY MCGIL	C		D
	0.57	1.78	42	2011 HARPERS	C		D
	0.40	1.87	60	2012 LAKE ONALASKA			D
	0.35	2.05	34	2013 TREMPPEALEAU LAKES			D
	0.22	1.15	53	2013 BERTOM/MCCARTNEY AREA			D
	0.21	1.11	29	2013 RENO			D
	0.15	0.96	39	2012 GOOSE CARCASS LAKE			D
	0.00	0.00	37	2013 WINNESHIEK AREA			D
rock bass	5.78	12.41	86	2011 GOOSE ISLAND/STODDARD		A	
	5.89	16.85	63	2011 COLD SPRG/BLKHWK/RONK		A	B
	1.79	4.49	30	2013 UPPER POOL 6	C	A	B
	0.61	1.84	39	2012 GOOSE CARCASS LAKE	C		B
	0.60	1.83	30	2011 CHIPPEWA RIVER/BIG LK	C		B
	1.04	4.55	52	2013 SNY MCGIL	C		B
	1.91	11.75	44	2013 UPPER POOL 5A	C		B
	0.40	1.87	60	2012 LAKE ONALASKA	C		B
	0.21	1.11	29	2013 RENO	C		
	0.19	1.06	63	2011 AMBRO	C		
	0.19	1.06	32	2012 UPPER POOL 5	C		
	0.18	1.03	34	2013 TREMPPEALEAU LAKES	C		
	0.11	0.82	53	2013 BERTOM MCCARTNEY AREA	C		
	0.00	0.00	42	2011 HARPERS	C		
	0.00	0.00	40	2013 LAWRENCE/TARGET	C		
	0.00	0.00	30	2011 WEAVER BOTTOMS	C		
	0.00	0.00	37	2013 WINNESHIEK AREA	C		
	sauger	4.42	5.30	42	2011 HARPERS		A

SPECIES	MEAN	STD. DEV.	N	LAKE UNIT	DIFFERENT (means with the same letter are not Sign. Different)	
smallmouth bass	4.85	6.79	63	2011 AMBRO	A	
	6.00	10.20	63	2011 COLD SPRG/BLKHWK/RONK	A	
	1.80	3.43	52	2013 SNY MCGIL	A B	
	2.20	5.77	30	2013 UPPER POOL 6	B	
	1.23	2.13	39	2012 GOOSE CARCASS LAKE	B	
	1.24	3.35	29	2013 RENO	B	
	1.69	6.47	53	2013 BERTOM/MCCARTNEY AREA	B	
	1.11	3.25	86	2011 GOOSE ISLAND/STODDARD	B	
	1.09	4.14	44	2013 UPPER POOL 5A	B	
	0.53	1.72	34	2013 TREMPEALEAU LAKES	B	
	0.16	0.98	37	2013 WINNESHIEK AREA	B	
	0.10	0.77	60	2012 LAKE ONALASKA	B	
	0.00	0.00	30	2011 CHIPPEWA RIVER/BIG LK	B	
	0.00	0.00	40	2013 LAWRENCE/TARGET	B	
	0.00	0.00	30	2011 WEAVER BOTTOMS	B	
	0.00	0.00	32	2012 UPPER POOL 5	B	
	10.54	22.83	63	2011 COLD SPRG/BLKHWK/RONK	A	
	5.54	10.92	86	2011 GOOSE ISLAND/STODDARD	A B	
	3.19	7.50	30	2013 UPPER POOL 6	A C B	
	2.99	7.11	34	2013 TREMPEALEAU LAKES	A C B	
	2.82	12.63	53	2013 BERTOM/MCCARTNEY/AREA	C B	
	2.19	6.94	30	2011 CHIPPEWA RIVER/BIG LK	C B	
	1.34	3.64	52	2013 SNY MCGIL	C	
	1.12	3.20	32	2012 UPPER POOL 5	C	
	1.07	3.03	39	2012 GOOSE CARCASS LAKE	C	
	0.83	2.64	29	2013 RENO	C	
	0.45	1.60	40	2013 LAWRENCE/TARGET	C	
	0.38	1.47	63	2011 AMBRO	C	
	0.60	3.93	60	2012 LAKE ONALASKA	C	
	0.14	0.90	44	2013 UPPER POOL 5A	C	
	0.00	0.00	42	2011 HARPERS	C	
	0.00	0.00	30	2011 WEAVER BOTTOMS	C	
	0.00	0.00	37	2013 WINNESHIEK AREA	C	
	walleye	4.56	7.19	63	2011 AMBRO	A
		3.39	5.14	30	2011 CHIPPEWA RIVER/BIG LK	A
		2.48	5.12	63	2011 COLD SPRG/BLKHWK/RONK	A B
		2.16	4.68	86	2011 GOOSE ISLAND/STODDARD	A B
		1.45	3.10	29	2013 RENO	A B
1.29		2.87	37	2013 WINNESHIEK AREA	A B	
1.57		2.13	39	2012 GOOSE CARCASS LAKE	A B	
2.00		7.76	30	2013 UPPER POOL 6	A B	
0.60		1.83	30	2011 WEAVER BOTTOMS	B	
0.65		2.19	352	2013 SNY MCGIL	B	
0.82		3.79	44	2013 UPPER POOL 5A	B	
0.56		2.12	53	2013 BERTOM/MCCARTNEY AREA	B	
0.50		2.00	60	2012 LAKE ONALASKA	B	

SPECIES	MEAN	STD. DEV.	N	LAKE UNIT	DIFFERENT (means with the same letter are not Sign. Different)	
yellow perch	0.43	1.56	42	2011 HARPERS	B	
	0.35	1.43	34	2013 TREAMPEALEAU LAKES	B	
	0.14	0.86	40	2013 LAWRENCE/TARGET	B	
	0.00	0.00	32	2012 UPPER POOL 5	B	
	43.31	39.37	30	2011 CHIPPEWA RIVER/BIG LK	A	
	28.55	45.08	86	2011 GOOSE ISLAND/STODDARD	A	B
	31.25	40.66	32	2012 UPPER POOL 5	A	B
	10.17	13.76	63	2011 AMBRO	C	B
	13.80	26.80	40	2013 LAWRENCE/TARGET	C	D
	11.32	28.02	63	2011 COLD SPRG/BLKHWK/RONK	C	D
	5.37	10.71	39	2012 GOOSE CARCASS LAKE	E	C
	4.39	8.09	60	2012 LAKE ONALASKA	E	C
	4.39	7.19	30	2011 WEAVER BOTTOMS	E	C
	3.87	7.35	34	2013 TREAMPEALEAU LAKES	E	C
	4.99	12.39	30	2013 UPPER POOL 6	E	C
	3.27	8.90	44	2013 UPPER POOL 5A	E	D
	1.85	3.32	42	2011 HARPERS	E	D
	1.24	3.19	53	2013 BERTOM/MCCARTNEY AREA	E	D
	0.83	2.10	29	2013 RENO	E	
	1.29	4.27	37	2013 WINNESHIEK AREA	E	
0.92	3.22	52	2013 SNY MCGIL	E		

TABLE 10. COMPARISON OF MEAN TOTAL LENGTH FOR SELECTED INDIVIDUAL SPECIES, AMONG SEVENTEEN 2011-2013 LAKE UNITS, ELECTRO FISHING, FALL. RANDOM AND FIXED STATIONS.

SPECIES	MEAN	STD. DEV.	N	LAKE UNIT			
BLUEGILL	5.84	1.50	411	2013 SNY MCGIL			A
	5.82	1.77	21	2013 TREMPEALEAU LAKES			A
	5.80	1.60	154	2013 UPPER POOL 6			A
	5.57	1.62	30	2013 RENO			A
	5.56	1.03	697	2011 COLD SPRG/BLKHWK/RONK			A B
	5.50	1.48	321	2013 UPPER POOL 5A			A B
	5.36	1.31	805	2011 AMBRO			A B
	5.09	1.25	524	2011 HARPERS			A B
	4.58	1.45	669	2012 UPPER POOL 5		C	B
	3.93	2.24	174	2013 BERTOM/MCCARTNEY AREA		C	D
	3.57	2.06	144	2011 CHIPPEWA RIVER/ BIG LK			D E
	3.45	1.85	285	2013 LAWRENCE/TARGET		F	D E
	3.44	1.72	643	2011 GOOSE ISLAND/STODDARD		F	D E
	3.24	1.83	47	2012 GOOSE CARCASS LAKE		F	D E
	2.85	1.59	42	2012 LAKE ONALASKA		F G	E
	2.57	1.63	46	2011 WEAVER BOTTOMS		F G	
	2.20	0.67	8	2013 WINNESHIEK AREA			G
4.79	1.75	5021	ALL				
BLACK CRAPPIE	8.91	1.92	21	2011 HARPERS			
	8.77	1.70	60	2011 AMBRO			A
	8.23	3.59	4	2013 TREMPEALEAU LAKES			A
	8.22	2.00	19	2013 SNY MCGIL			A
	8.21	3.72	7	2013 BERTOM/MCCARTNEY AREA		A	B
	7.99	1.77	12	2011 COLD SPRG/BLKHWK/RONK		C	A B
	6.48	1.38	6	2012 LAKE ONALASKA		C	A D B
	6.18	1.67	22	2013 UPPER POOL 5A		C	A D B
	5.71	3.90	2	2013 UPPER POOL 6		C	A D B
	4.83	3.54	18	2011 GOOSE ISLAND/STODDARD		C	A D B
	4.08	1.85	20	2011 CHIPPEWA RIVER/BIG LK		C	D B
	4.06	0.72	8	2012 GOOSE CARCASS LAKE		C	D
	3.89	2.85	28	2013 LAWRENCE/TARGET		C	D
	3.88	2.54	55	2012 UPPER POOL 5		C	D
	3.03	0.06	2	2011 WEAVER BOTTOMS			D
6.24	3.11	284	ALL				
LARGEMOUTH BASS	12.89	3.1	230	2013 UPPER POOL 5A			A
	12.16	3.04	22	2013 RENO			A B
	11.86	3.41	29	2011 HARPERS			A B
	11.17	4.17	128	2013 UPPER POOL 6		C	A B
	11.12	3.48	352	2011 AMBRO		C	A B
	10.98	3.18	160	2013 SNY MCGIL		C	A B
	10.61	2.88	75	2013 BERTOM/MCCARTNEY AREA		C	B
	10.48	4.83	7	2013 WINNESHIEK AREA		C	B
	10.29	2.55	546	2011 COLS SPRG/BLKHWK/RONK		C	B
	9.51	3.72	24	2013 TREMPEALEAU LAKES		C	
6.36	3.53	113	2012 LAKE ONALASKA			D	

	6.00	3.20	212	2012 GOOSE CARCASS LAKE	D	E			
	5.55	3.97	216	2012 UPPER POOL 5	D	E			
	5.17	3.49	148	2013 LAWRENCE/TARGET	D	E			
	4.53	2.32	190	2011 CHIPPEWA RIVER/BIG LK	D	E			
	4.36	2.94	1434	2011 GOOSE ISLAND/STODDARD	D	E			
	3.99	1.32	111	2011 WEAVER BOTTOMS		E			
	7.19	4.41	4097	ALL					
YELLOW PERCH									
	7.73	2.23	24	2013 UPPER POOL 5A	A				
	7.50	1.89	8	2013 SNY MCGIL	A	B			
	7.47	2.44	13	2011 HARPERS	A	B			
	7.43	1.49	22	2013 TREMPLEAU LAKES	A	B			
	7.27	1.86	107	2011 AMBRO	A	B			
	7.06	2.57	35	2012 GOOSE CARCASS LAKE	C	A	B		
	6.91	2.64	25	2013 UPPER POOL 6	C	A	B		
	6.90	2.58	11	2013 BERTOM/MCCARTNEY AREA	C	A	B		
	6.86	1.46	119	2011 COLD SPRG/BLKHWK/RONK	C	A	D	B	
	6.67	1.86	44	2012 LAKE ONALASKA	C	A	D	B	
	6.58	1.92	22	2011 WEAVER BOTTOMS	C	A	D	B	
	6.39	1.99	410	2011 GOOSE ISLAND/STODDARD	C	A	D	B	E
	6.36	2.11	217	2011 CHIPPEWA RIVER/BIG LK	C	A	D	B	E
	5.36	1.96	167	2012 UPPER POOL 5	C		D	B	E
	4.89	0.41	8	2013 WINNESHIEK AREA	C		D	E	
	4.59	2.39	93	2013 LAWRENCE/TARGET		D	E		
	4.14	1.89	4	2013 RENO				E	
	6.33	2.14	1329	ALL					

TABLE 11. COMPARISON OF QUALITY AND PREFERRED PSS FOR SELECTED SPECIES FROM 2007-2013 LAKE UNITS WHERE COUNT OF STOCK WAS GREATER THAN 29 AND OCCURRED IN THE 2013 LAWRENCE/TARGET LAKE UNIT. FALL ELECTRO FISHING. RANDOM AND FIXED STATIONS.

Common Name	Lake Unit	PSS q	PSS p
bluegill	2007 AMBRO	39.76	0.89
bluegill	2007 COLD SPRG/BLKHWK/RONK	20.16	1.83
bluegill	2007 GOOSE ISLAND/STODDARD	16.57	0.45
bluegill	2007 HARPERS	1353	1.88
bluegill	2007 UPPER POOL 5	45.57	0.84
bluegill	2007 UPPER POOL 5A	38.42	1.58
bluegill	2008 BELVIDERE/SPRING LK	15.95	0.61
bluegill	2008 GOOSE CARCASS LAKE	20.59	1.68
bluegill	2008 LAKE ONALASKA	13.26	0.00
bluegill	2008 ROBINSON/PETERSON/BEE	18.01	0.31
bluegill	2008 SNY MCGIL	29.14	0.00
bluegill	2008 TREMPLEAU LAKES	28.45	0.00
bluegill	2009 BERTOM/MCCARTNEY AREA	16.79	0.00
bluegill	2009 LANSING	18.89	1.11
bluegill	2009 LAWRENCE/TARGET	27.76	1.67
bluegill	2009 UPPER POOL 6	40.91	3.03
bluegill	2010 BLACK RIVER CHANNEL	14.63	0.17
bluegill	2010 BLACK RIVER MOUTH	5.70	0.00
bluegill	2010 BUSSY LAKE/GLEN HAVEN	29.55	0.00
bluegill	2010 CASSVILLE SLOUGH AREA	20.77	0.77
bluegill	2010 LOWER POOL 5A	30.42	1.14
bluegill	2011 AMBRO	32.02	2.29
bluegill	2011 CHIPPEWA RIVER/BIG LK	36.72	2.30
bluegill	2011 COLD SPRG/BLKHWK/RONK	34.25	0.28
bluegill	2011 GOOSE ISLAND/STODDARD	21.71	0.00
bluegill	2011 HARPERS	24.02	0.59
bluegill	2011 WEAVER BOTTOMS	24.94	2.66
bluegill	2012 GOOSE CARCASS LAKE	27.06	4.71
bluegill	2012 LAKE ONALASKA	22.48	0.78
bluegill	2012 UPPER POOL 5	21.88	0.64
bluegill	2013 BERTOM/MCCARTNEY AREA	45.87	0.43
bluegill	2013 LAWRENCE/TARGET	25.51	1.65
bluegill	2013 RENO	54.35	4.35
bluegill	2013 SNY MCGIL	58.41	1.35
bluegill	2013 TREMPLEAU LAKES	52.27	4.55
bluegill	2013 UPPER POOL 5A	44.71	2.38
bluegill	2013 UPPER POOL 6	44.70	3.36
largemouth bass	2007 AMBRO	57.31	18.71
largemouth bass	2007 COLD SPRG/BLKHWK/RONK	35.19	5.57
largemouth bass	2007 GOOSE ISLAND/STODDARD	44.01	11.99
largemouth bass	2007 HARPERS	45.35	14.53

largemouth bass	2007 UPPER POOL 5	51.36	16.36
largemouth bass	2007 UPPER POOL 5A	58.30	22.88
largemouth bass	2008 BELVIDERE/SPRING LK	73.44	25.78
largemouth bass	2008 GOOSE CARCASS LAKE	79.02	20.98
largemouth bass	2008 LAKE ONALASKA	41.88	11.97
largemouth bass	2008 ROBINSON/PETERSON/BEE	71.35	25.73
largemouth bass	2008 SNY MCGIL	65.10	20.83
largemouth bass	2008 TREMPLEALEAU LAKES	51.13	8.27
largemouth bass	2009 BERTOM/MCCARTNEY AREA	57.04	8.45
largemouth bass	2009 LANSING	83.33	22.22
largemouth bass	2009 LAWRENCE/TARGET	70.73	18.29
largemouth bass	2009 UPPER POOL 6	78.92	24.70
largemouth bass	2010 BLACK RIVER CHANNEL	45.85	17.94
largemouth bass	2010 BUSSY LAKE/GLEN HAVEN	48.39	29.03
largemouth bass	2010 CASSVILLE SLOUGH AREA	46.55	22.41
largemouth bass	2010 LOWER POOL 5A	63.37	35.64
largemouth bass	2011 AMBRO	57.53	21.62
largemouth bass	2011 CHIPPEWA RIVER/BIG LK	60.87	23.91
largemouth bass	2011 COLD SPRG/BLKHWK/RONK	22.51	7.86
largemouth bass	2011 GOOSE ISLAND/STODDARD	39.74	20.53
largemouth bass	2011 WEAVER BOTTOMS	37.50	17.39
largemouth bass	2012 GOOSE CARCASS LAKE	73.91	19.25
largemouth bass	2012 LAKE ONALASKA	51.92	21.15
largemouth bass	2012 UPPER POOL 5	64.81	16.05
largemouth bass	2013 BERTOM/MCCARTNEY AREA	34.39	5.14
largemouth bass	2013 LAWRENCE/TARGET	55.77	9.62
largemouth bass	2013 SNY MCGIL	51.20	11.48
largemouth bass	2013 TREMPLEALEAU LAKES	41.89	8.11
largemouth bass	2013 UPPER POOL 5A	71.04	20.08
largemouth bass	2013 UPPER POOL 6	64.63	16.59
largemouth bass	2013 AMBRO	54.05	16.22
yellow perch	2008 LAKE ONALASKA	38.89	11.11
yellow perch	2009 LAWRENCE/TARGET	3.81	0.95
yellow perch	2009 UPPER POOL 6	9.38	0.00
yellow perch	2010 BLACK RIVER CHANNEL	14.59	2.16
yellow perch	2010 BUSSY LAKE/GLEN HAVEN	34.04	4.26
yellow perch	2011 AMBRO	40.00	5.00
yellow perch	2011 CHIPPEWA RIVER/BIG LK	24.41	6.30
yellow perch	2011 COLD SPRG/BLKHWK/RONK	26.13	1.80
yellow perch	2011 GOOSE ISLAND/STODDARD	28.34	4.89
yellow perch	2011 WEAVER BOTTOMS	47.62	9.52
yellow perch	2012 GOOSE CARCASS LAKE	53.85	20.51
yellow perch	2012 LAKE ONALASKA	22.62	8.33
yellow perch	2012 UPPER POOL 5	27.37	6.32
yellow perch	2013 LAWRENCE/TARGET	30.56	8.33
yellow perch	2013 TREMPLEALEAU LAKES	35.90	2.56
yellow perch	2013 UPPER POOL 6	45.67	10.00

TABLE 12. RELATIVE ABUNDANCE, MEAN CATCH PER HR, ELECTRO FISHING, FALL 2013 AND 2009, LAWRENCE/TARGET LAKE UNIT. FOR FIXED RUNS DONE BOTH IN 2009 AND 2013.

	SPECIES	2013						2009					
		FREQ.	PERCENT	MEAN PER HR	STND. DEV.	NO. OF RUNS	TOTAL HRS	FREQ.	PERCENT	MEAN PER HR	STND. DEV.	NO. OF RUNS	TOTAL HRS
1	bigmouth buffalo	2	0.45	1.09	3.61	11	1.84						
2	black bullhead							2	0.26	1.50	4.23	8	1.34
3	black crappie	4	0.96	2.18	3.02	11	1.84	18	2.30	13.47	10.92	8	1.34
4	bluegill	127	30.46	69.13	50.91	11	1.84	143	18.29	107.04	65.55	8	1.34
5	bowfin	15	3.60	8.17	8.58	11	1.84	8	1.02	5.99	8.47	8	1.34
6	central mudminnow							55	7.03	41.17	52.25	8	1.34
7	channel catfish							1	0.13	0.75	2.12	8	1.34
8	common carp	5	1.20	2.72	7.27	11	1.84	2	0.26	1.50	4.23	8	1.34
9	emerald shiner	3	0.72	1.63	3.87	11	1.84						
10	freshwater drum	3	0.72	1.63	3.87	11	1.84	3	0.38	2.25	6.35	8	1.34
11	gizzard shad	65	15.59	35.38	82.34	11	1.84						
12	golden redhorse	14	3.36	7.62	19.51	11	1.84	1	0.13	0.75	2.12	8	1.34
13	golden shiner	6	1.44	3.27	7.27	11	1.84						
14	johnny darter	1	0.24	0.54	1.81	11	1.84						
15	largemouth bass	102	24.46	55.53	50.96	11	1.84	191	24.43	142.96	232.12	8	1.34
16	logperch	5	1.20	2.72	9.03	11	1.84	3	0.38	2.25	6.35	8	1.34
17	longnose gar	2	0.48	1.09	2.42	11	1.84						
18	northern pike	8	1.92	4.36	8.51	11	1.84	10	1.28	7.49	7.68	8	1.34
19	pumpkinseed	4	0.96	2.18	3.02	11	1.84	3	0.38	2.25	4.46	8	1.34
20	river carpsucker	1	0.24	0.54	1.81	11	1.84						
21	river redhorse							1	0.13	0.75	2.12	8	1.34
22	sauger	6	1.44	3.27	9.03	11	1.84	1	0.13	0.75	2.12	8	1.34
23	shorthead redhorse	1	0.24	0.54	1.81	11	1.84	1	0.13	0.75	2.12	8	1.34
24	smallmouth bass	9	2.16	4.90	14.38	11	1.84	2	0.26	1.50	4.23	8	1.34
25	smallmouth buffalo	1	0.24	0.54	1.81	11	1.84						
26	spotted sucker	10	2.40	5.44	7.79	11	1.84	3	0.38	2.25	4.46	8	1.34
27	walleye							1	0.13	0.75	2.12	8	1.34
28	warmouth							6	0.77	4.49	8.32	8	1.34
29	white bass							1	0.13	0.75	2.12	8	1.34
30	yellow bullhead							1	0.13	0.75	2.12	8	1.34
31	yellow perch	23	5.52	12.52	11.19	11	1.84	325	41.56	243.26	154.17	8	1.34
	ALL SPECIES	417	100.00	227.00	115.29	11	1.84	782	100.00	585.33	176.64	8	1.34