

# Complete Report

## Results of Lake Assessment in the Lawrence/Target Lake Unit, Navigation Pool 8 of the upper Mississippi River, Fall 2009.

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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 crappies in parts of Navigation Pool 8 of the upper Mississippi River. A secondary purpose is to estimate length and size distributions of other game fishes caught incidentally.

### Methods

The Lawrence/Target (L/T) Lake Unit is located in Navigation Pool 8 of the upper Mississippi River (Figure 1). The lake unit has a total water surface area of 2607 acres.

Standard Upper Mississippi River Conservation Committee (UMRCC) fyke nets were set by WDNR 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 8 through September 11, 2009 (Figure 2). A total of 12 locations were chosen, with 1 fyke net at each. These nets fished a total of 34.90 net-days and 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 about 16 amperes. A total of 38 runs were done during 6.346 hours of sampling (Figure 3 and Table 1) during four days from September 24 through October 02, 2009. 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 and were done at the  $\alpha=0.05$  level.

### Findings

The mean daily ambient water temperatures during 2009 sampling was 19.5°C and generally declined over the eight days of sampling (Table 2). During sampling, the water surface elevation measured at the La Crosse gage changed as much as 0.26 feet. The mean daily flow, taken from Lock and Dam 8, in cubic feet per second was 11651 and fluctuated as much as 4500 cubic feet per second.

### **Fyke Netting Catch Per Effort**

A total of 24 fish species and 2 hybrids were recorded from 910 fish captured in fyke nets (Table 3). The most common was bluegill followed by yellow perch, pumpkinseed and black crappie. Mean catch per net-day for these four fishes was 12.20, 3.71, 3.06 and 1.76, respectively. The mean catch per net-day for all species combined was 25.84 (standard deviation = 30.34, n=35).

### **Electro Shocking Catch Per Effort**

A total of 37 taxa were recorded from 1909 fish captured during electro shocking (Table 4). The most common was largemouth bass followed by yellow perch, bluegill, central mudminnow and bowfin. Mean catch per hour for these five fishes was 101.80, 81.63, 53.26, 9.14 and 9.14, respectively. The mean catch per hour for all taxa combined was 300.82 (standard deviation = 202.98, n=38).

### **Length Distribution from Fyke Netting**

The frequency distribution of total length in inches for black crappie, bluegill, northern pike, pumpkinseed, and yellow perch from fyke nets are given in Figures 4, 6, 11, 12, and 13. The mean lengths of measured fishes are given in Table 5. A total of 29.51 percent of the black crappies were greater than 9 inches. For bluegill, a total of 5.59 percent were greater than 7 inches while no pumpkinseeds were greater than 7 inches. A total of 45.00 percent of northern pike were greater than 21 inches. A total of 5.30 percent of yellow perch were 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 and pumpkinseed is 40 to 60 and is 40 for crappies (Wisconsin Department of Natural Resources, 2010).  $PSS_Q$ 's from the fall 2009 L/T fyke netting data for these three species were all greater than 40. The “acceptable” value of  $PSS_P$  for bluegill, pumpkinseed and crappies is 5. Black crappies exceeded this (27.3), but bluegills (4.1) and pumpkinseeds 0.00 did not. This suggests that these population size structures are “acceptable” for standards for quality fish, but preferred fish standards were only met by black crappies.

### **Length Distribution from Electro Shocking**

The frequency distribution for total length in inches for electro shocked black crappie, bluegill, bowfin, mudminnow, largemouth bass, and yellow perch are given in Figures 5, 7, 8, 9, 10, and 14. The mean lengths of fishes measured are given in Table 8. A total of 16.67 percent of the black crappie were greater than 9 inches. For bluegill, a total of 6.21 percent were greater than 7 inches while 8.37 percent of largemouth bass were larger than 14 inches. A total of 1.16 percent of yellow perch was larger than 8 inches.

The  $PSS_Q$  and  $PSS_P$  for electro shocked species are presented in Table 9.  $PSS_Q$  for bluegill (32.1) was below “acceptable” (40-60) and was 72.0 for largemouth bass. Bluegills (1.90) were below the “acceptable” standard for preferred fish (5.0). This suggests that electro shocked bluegills did not meet “acceptable” state standards for quality and preferred fish.

### **Comparisons with Other Lake Units, Fyke Netting**

Fyke netting data from the L/T Lake Unit was compared to 15 other upper Mississippi River lake units sampled in the fall of 2007-2009 (Figure 1). Catch per net-day for all fish combined was greatest in Harpers (77.38) (Table 10) and L/T (25.84) was different from Harpers, Goose Island/Stoddard, and Cold Springs, Blackhawk, Ronkoski Slough, but was the same as the remaining twelve. Similarly, we tested mean catch per day for all fish combined among all four 2009 lake units and found no difference.

Catch per net-day for selected target species combined is presented in Table 11. Target species included black crappie, bluegill, largemouth bass, northern pike, smallmouth bass, pumpkinseed, white crappie, rock bass and yellow perch. For these species combined, L/T (22.24 fish per day) did not differ from any of the 15 other lake units. Similarly, we tested mean catch per day for target fish combined among all four 2009 lake units and found L/T was different from Upper Pool 6 and Bertom/McCartney and was not different from Lansing (Table 12).

We compared mean total length of selected individual species caught with fyke nets among three other lake units sampled in 2009 (Table 13). Overall, sizes of selected L/T fish were smaller than the other lake units. L/T black crappie mean size (7.06 inches) was smaller than the other three lakes. L/T had the smallest bluegills (4.57 inches). L/T yellow perch (6.31 inches) were smaller than two other lake units.

### **Comparisons with Other Lake Units, Electro Shocking**

Electro shocking data from the L/T Lake Unit was compared to 15 other upper Mississippi River lake units sampled in the fall of 2007-2009. Catch per hour for all target fish combined was the same in L/T (251.81) as all the other lake units except Bertom/McCartney (Table 14). Similarly, we tested mean catch per hour for target fish combined among all four 2009 lake units and found L/T was different only from Bertom/McCartney (152.97).

We compared mean total length of individual species caught with electro shocking among lake units (Table 15). Mean total length of L/T black crappie (5.10 inches) differed only from Bertom/McCartney Area (8.94 inches). Mean total length of L/T bluegills (4.70 inches) was the same as Bertom/McCartney but was smaller than Upper Pool 6 (5.16) and larger than Lansing (4.34). Largemouth bass from L/T (6.73 inches) were smaller than Bertom/McCartney Area (9.04) and Upper Pool 6 (9.15) lake units and the same as Lansing. Northern pike (14.00 inches) were the same as other lake units. Upper Pool 6 and Lansing yellow perch (5.00 to 5.77) were larger than those from L/T (4.65 inches). Mean size of L/T yellow perch were the same as those from Bertom/McCartney.

### **Conclusions**

The L/T Lake Unit appears generally similar in catch rates to the other three Mississippi River lake units surveyed during the fall of 2009. Fyke net target species catch rate for this lake unit (22.24 fish per net-day) was different from two 2009 lake units and the same as one. For all species combined, catch per net-day (25.84) was the same as the other three lake units sampled in 2009. Similarly, the electro shocking catch rate of target species combined from the L/T Lake Unit (251.81 fish per hour) was the same as two other 2009 lake units but different from one.

Fyke netted L/T Lake unit selected game fishes were generally smaller than ones from the other 2009 lake units while those collected by electro shocking were generally similar to all other 2009 lake units.

In Navigation Pool 8 of the Mississippi River, Wisconsin and Minnesota fishing regulations limit harvest to 25 of each of yellow perch, rock bass and crappie. Bluegill and pumpkinseed are limited to 25 in total. White bass and yellow bass are also restricted to 25 in total. All these fishes have continuous open seasons.

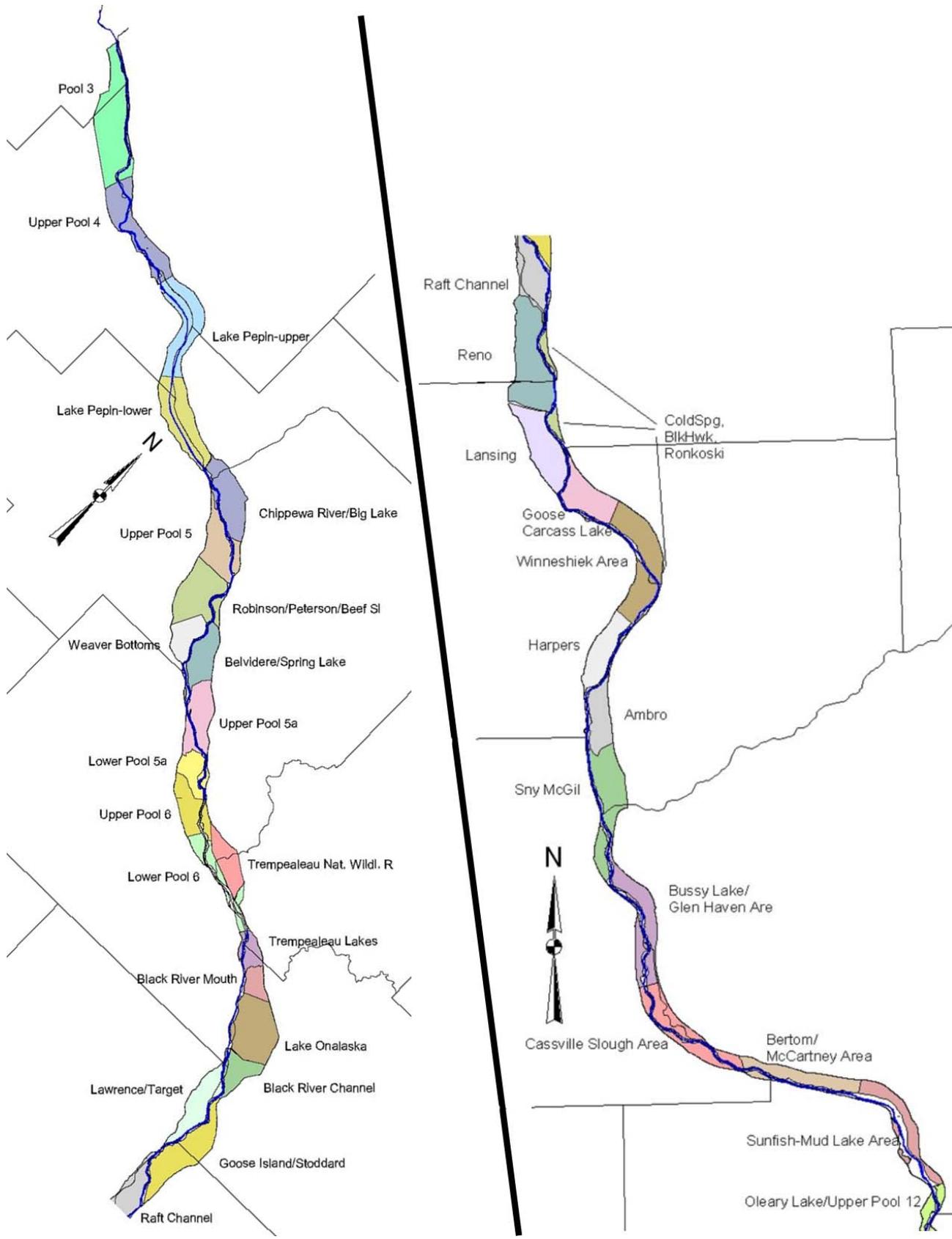
### **Recommendations**

1. Continue to monitoring backwater fishes in Pool 8 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.
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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)



**FIGURE 2. FALL 2009 FYKE NET LOCATIONS, LAWRENCE/TARGET LAKE UNIT. (2008 NAIP Photo).**

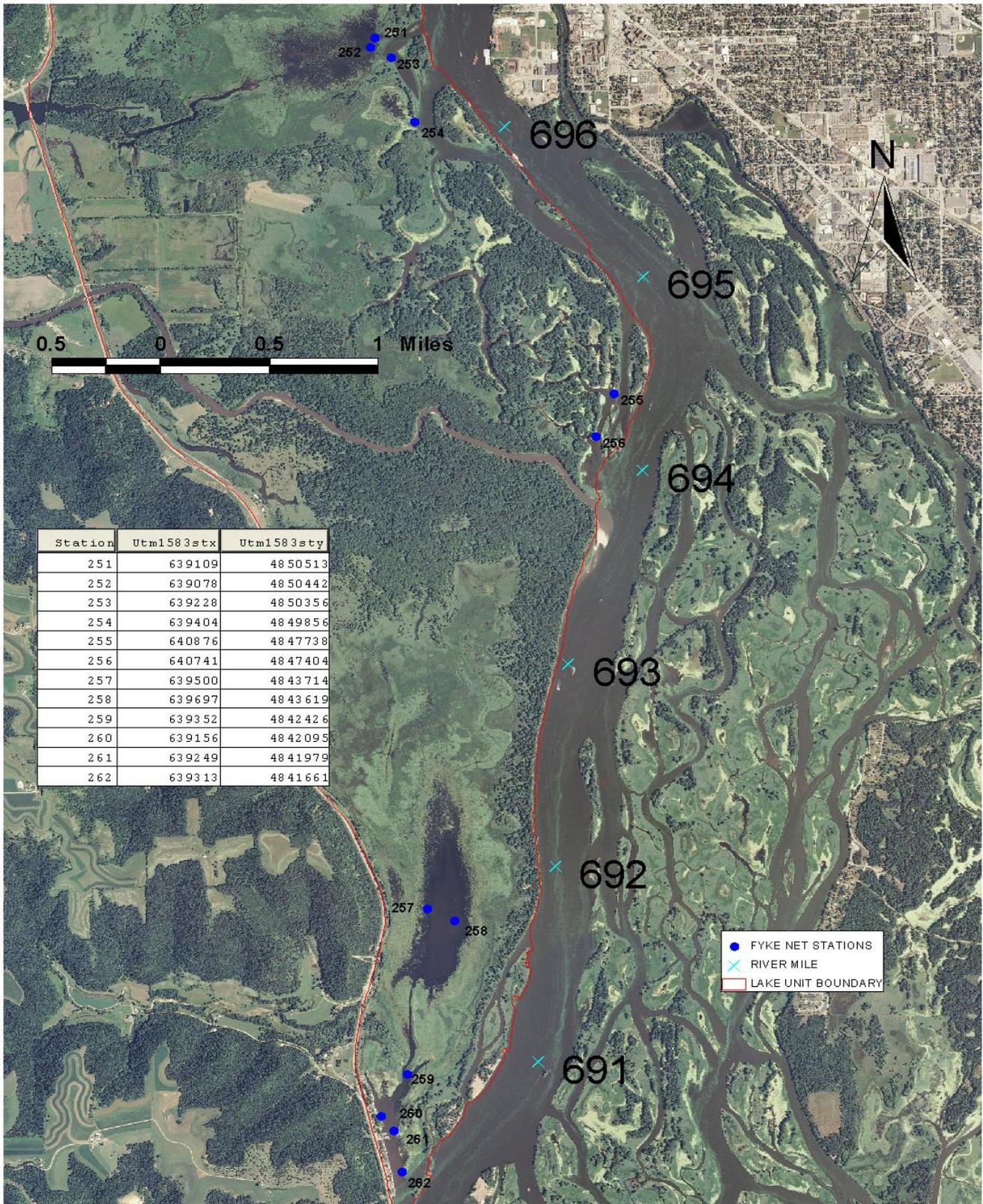
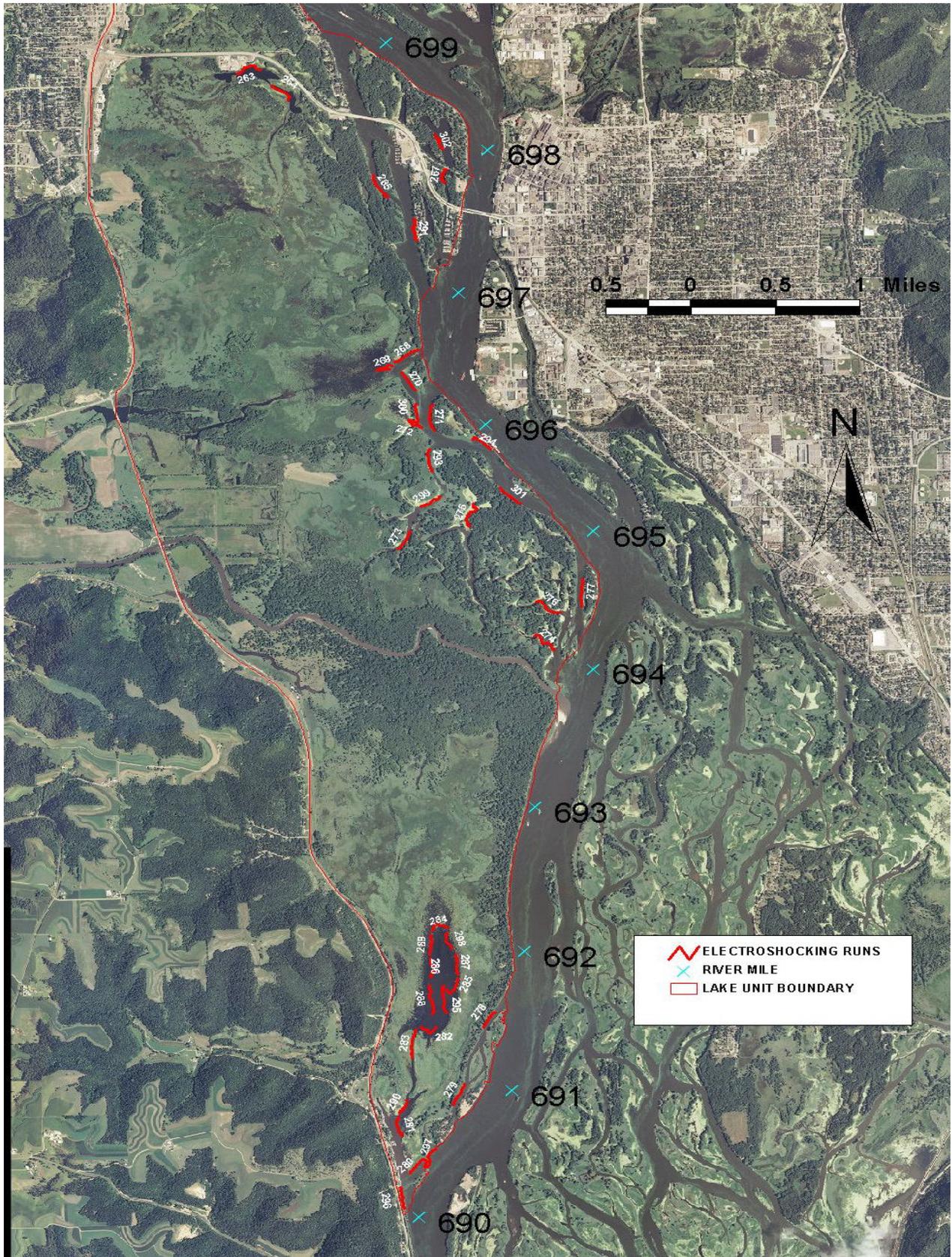


FIGURE 3. FALL 2009 ELECTROSHOCKING RUNS, LAWRENCE/TARGET LAKE UNIT. (2008 NAIP Photo).



**TABLE 1. ELECTRO SHOCKING STATION LOCATIONS AND LENGTH (M), FALL 2009  
LAWRENCE/TARGET LAKE UNIT.**

| <b>Station</b> | <b>LENGTH</b> | <b>Utm15stx</b> | <b>Utm15sty</b> | <b>Utm15edx</b> | <b>Utm15edy</b> |
|----------------|---------------|-----------------|-----------------|-----------------|-----------------|
| 288            | 346           | 639556          | 4843356         | 639530          | 4843678         |
| 289            | 224           | 639548          | 4844223         | 639536          | 4844011         |
| 286            | 243           | 639540          | 4843979         | 639538          | 4843769         |
| 282            | 226           | 639598          | 4843221         | 639445          | 4843219         |
| 283            | 318           | 639402          | 4843190         | 639366          | 4842878         |
| 290            | 191           | 639311          | 4842424         | 639245          | 4842280         |
| 281            | 251           | 639241          | 4842234         | 639263          | 4842023         |
| 295            | 328           | 639693          | 4843382         | 639673          | 4843665         |
| 285            | 258           | 639693          | 4843639         | 639803          | 4843756         |
| 287            | 248           | 639801          | 4843789         | 639776          | 4844024         |
| 298            | 216           | 639744          | 4844076         | 639700          | 4844255         |
| 284            | 226           | 639702          | 4844305         | 639550          | 4844274         |
| 278            | 221           | 640153          | 4843380         | 640043          | 4843214         |
| 279            | 258           | 639867          | 4842594         | 639759          | 4842365         |
| 297            | 310           | 639597          | 4841884         | 639497          | 4841714         |
| 280            | 309           | 639485          | 4841699         | 639344          | 4841614         |
| 296            | 256           | 639258          | 4841470         | 639296          | 4841225         |
| 263            | 298           | 637930          | 4853712         | 637705          | 4853666         |
| 264            | 278           | 638031          | 4853535         | 638190          | 4853368         |
| 302            | 295           | 639590          | 4852997         | 639650          | 4852832         |
| 267            | 324           | 639696          | 4852614         | 639673          | 4852465         |
| 265            | 407           | 639002          | 4852564         | 639139          | 4852315         |
| 291            | 351           | 639387          | 4852082         | 639410          | 4851833         |
| 268            | 281           | 639428          | 4850639         | 639202          | 4850500         |
| 269            | 289           | 639183          | 4850464         | 639156          | 4850433         |
| 270            | 245           | 639266          | 4850395         | 639401          | 4850199         |
| 271            | 323           | 639562          | 4850039         | 639580          | 4849756         |
| 300            | 296           | 639399          | 4850049         | 639454          | 4849789         |
| 272            | 231           | 639422          | 4849846         | 639400          | 4849812         |
| 301            | 275           | 640204          | 4849136         | 640392          | 4848954         |
| 294            | 251           | 640107          | 4849547         | 639937          | 4849654         |
| 293            | 263           | 639533          | 4849554         | 639557          | 4849305         |
| 299            | 259           | 639637          | 4849040         | 639450          | 4848921         |
| 273            | 252           | 639227          | 4848462         | 639344          | 4848651         |
| 275            | 352           | 639913          | 4848700         | 639948          | 4848957         |
| 276            | 304           | 640541          | 4847873         | 640775          | 4847761         |
| 274            | 316           | 640708          | 4847347         | 640528          | 4847506         |
| 277            | 303           | 640984          | 4848127         | 640977          | 4847826         |

**TABLE 2. MEAN TEMPERATURE, WATER SURFACE ELEVATION AND FLOW DURING FALL 2009 L/T LAKE UNIT SAMPLING.**

| <b>DATE</b>                        | <b>MEAN<br/>DAILY<br/>TEMPERA-<br/>TURE<br/>°C</b> | <b>WATER<br/>SURFACE<br/>ELEVATION<br/>(ft), LA<br/>CROSSE</b> | <b>FLOW (cfs)<br/>DAM 8</b> |
|------------------------------------|--|--|-----------------------------|
| 09/09/2009                         | 22.6   | 630.94   | 11100                       |
| 09/10/2009                         | 22.7   | 630.96   | 10600                       |
| 09/11/2009                         | 23.0   | 631.05   | 10200                       |
| 09/24/2009                         | 22.7   | 631.2  | 11200                       |
| 09/29/2009                         | 15.1   | 631.18   | 14700                       |
| 09/30/2009                         | 14.7   | 631.07   | 12800                       |
| 10/02/2009                         | 12.3   | 631.19   | 11100                       |
| <b>MEAN (by<br/>date, station)</b> | 19.5   | 631.07   | 11651                       |

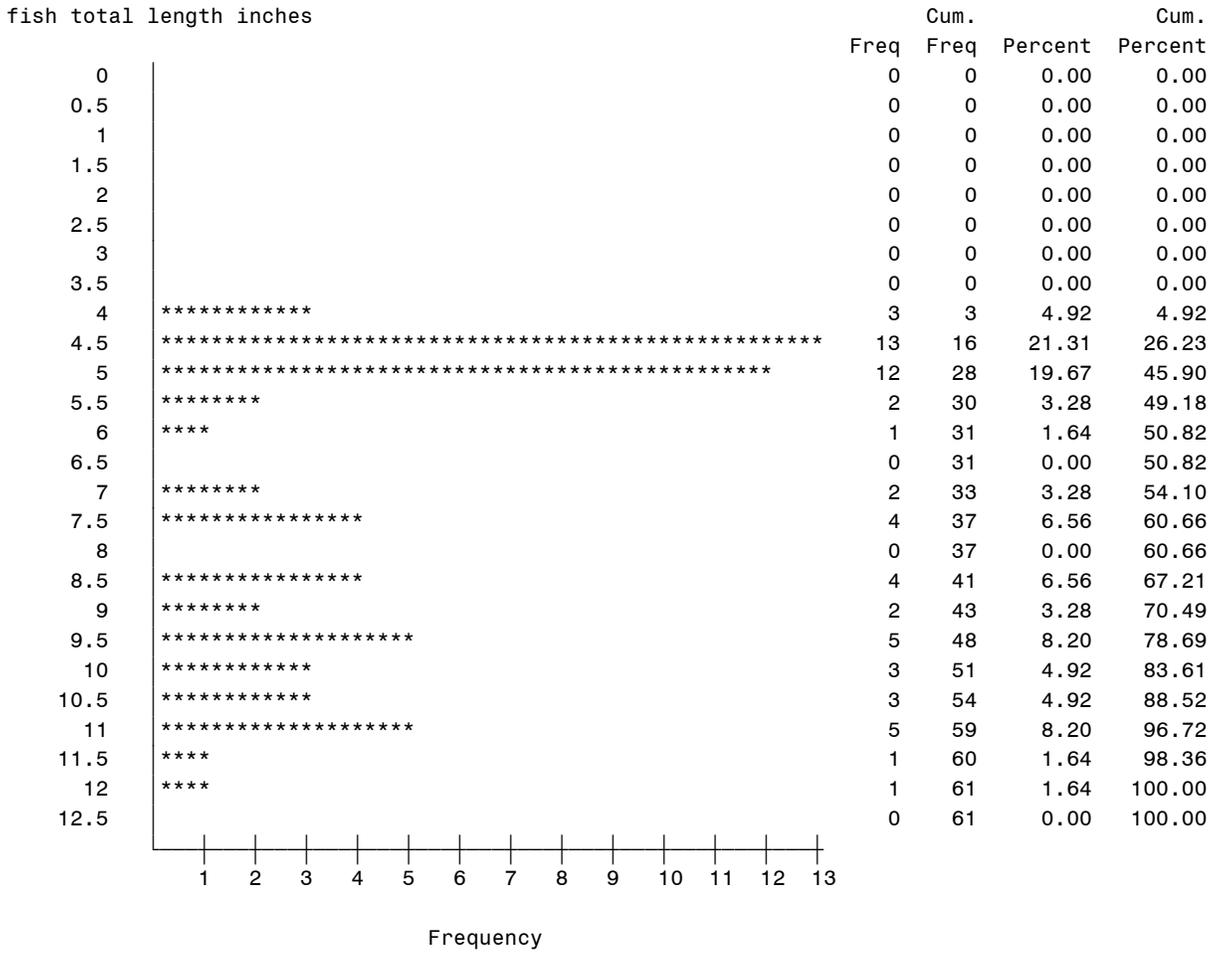
**TABLE 3. RELATIVE ABUNDANCE, MEAN CATCH PER NET-DAY, FYKE NETS, FALL 2009, L/T LAKE UNIT.**

|           | <b>SPECIES</b>              | <b>FREQUENCY</b> | <b>PERCENT</b> | <b>MEAN</b> | <b>STANDARD DEV.</b> | <b>MIN.</b> | <b>MAX.</b> | <b>NET-DAYS</b> |
|-----------|-----------------------------|------------------|----------------|-------------|----------------------|-------------|-------------|-----------------|
| <b>1</b>  | black crappie               | 61               | 6.70           | 1.76        | 1.73                 | 0.00        | 7.30        | 34.90           |
| <b>2</b>  | bluegill                    | 429              | 47.14          | 12.20       | 17.82                | 0.00        | 68.76       | 34.90           |
| <b>3</b>  | bowfin                      | 14               | 1.54           | 0.40        | 0.77                 | 0.00        | 3.11        | 34.90           |
| <b>4</b>  | channel catfish             | 4                | 0.44           | 0.11        | 0.32                 | 0.00        | 1.11        | 34.90           |
| <b>5</b>  | common carp                 | 3                | 0.33           | 0.08        | 0.28                 | 0.00        | 1.01        | 34.90           |
| <b>6</b>  | flathead catfish            | 1                | 0.11           | 0.03        | 0.15                 | 0.00        | 0.91        | 34.90           |
| <b>7</b>  | freshwater drum             | 25               | 2.75           | 0.71        | 2.86                 | 0.00        | 16.83       | 34.90           |
| <b>8</b>  | gizzard shad                | 1                | 0.11           | 0.03        | 0.19                 | 0.00        | 1.10        | 34.90           |
| <b>9</b>  | golden shiner               | 3                | 0.33           | 0.09        | 0.41                 | 0.00        | 2.21        | 34.90           |
| <b>10</b> | green sunfish               | 3                | 0.33           | 0.08        | 0.28                 | 0.00        | 1.04        | 34.90           |
| <b>11</b> | green sunfish x pumpkinseed | 3                | 0.33           | 0.09        | 0.38                 | 0.00        | 2.07        | 34.90           |
| <b>12</b> | largemouth bass             | 10               | 1.10           | 0.28        | 1.11                 | 0.00        | 5.84        | 34.90           |
| <b>13</b> | longnose gar                | 14               | 1.54           | 0.39        | 0.95                 | 0.00        | 4.85        | 34.90           |
| <b>14</b> | northern pike               | 40               | 4.40           | 1.14        | 1.36                 | 0.00        | 6.62        | 34.90           |
| <b>15</b> | pumpkinseed                 | 109              | 11.98          | 3.06        | 9.94                 | 0.00        | 52.53       | 34.90           |
| <b>16</b> | pumpkinseed x bluegill      | 10               | 1.10           | 0.28        | 0.81                 | 0.00        | 3.89        | 34.90           |
| <b>17</b> | river carpsucker            | 1                | 0.11           | 0.03        | 0.19                 | 0.00        | 1.11        | 34.90           |
| <b>18</b> | rock bass                   | 1                | 0.11           | 0.03        | 0.16                 | 0.00        | 0.97        | 34.90           |
| <b>19</b> | shorthead redhorse          | 2                | 0.22           | 0.06        | 0.24                 | 0.00        | 1.04        | 34.90           |
| <b>20</b> | shortnose gar               | 8                | 0.88           | 0.23        | 0.51                 | 0.00        | 2.21        | 34.90           |
| <b>21</b> | silver redhorse             | 24               | 2.64           | 0.70        | 1.11                 | 0.00        | 4.03        | 34.90           |
| <b>22</b> | spotted sucker              | 2                | 0.22           | 0.06        | 0.25                 | 0.00        | 1.10        | 34.90           |
| <b>23</b> | Walleye                     | 1                | 0.11           | 0.03        | 0.18                 | 0.00        | 1.09        | 34.90           |
| <b>24</b> | Warmouth                    | 7                | 0.77           | 0.20        | 0.74                 | 0.00        | 3.89        | 34.90           |
| <b>25</b> | white crappie               | 2                | 0.22           | 0.06        | 0.33                 | 0.00        | 1.96        | 34.90           |
| <b>26</b> | yellow perch                | 132              | 14.51          | 3.71        | 4.10                 | 0.00        | 14.16       | 34.90           |
| <b>27</b> | <b>ALL TAXA</b>             | 910              | 100.00         | 25.84       | 30.34                | 0.00        | 145.91      | 34.90           |

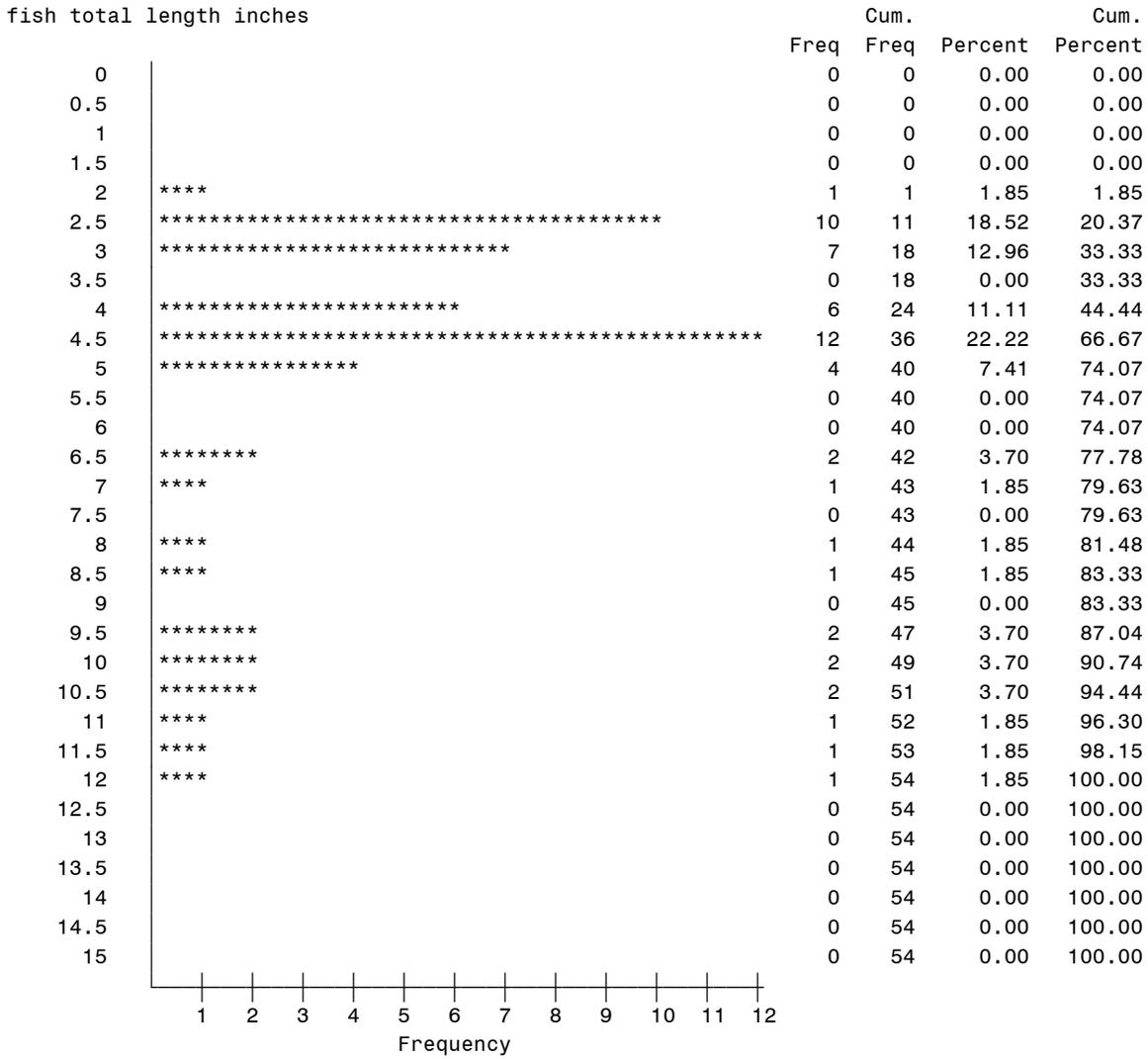
**TABLE 4. RELATIVE ABUNDANCE, MEAN CATCH PER HOUR, ELECTRO SHOCKING, FALL 2009, L/T LAKE UNIT.**

| SPECIES                             | FREQ. | PERCENT | MEAN PER HR | STANDARD DEV. | MIN.  | MAX.   | NO. OF RUNS | TOTAL HRS |
|-------------------------------------|-------|---------|-------------|---------------|-------|--------|-------------|-----------|
| 1 bigmouth buffalo                  | 1     | 0.05    | 0.16        | 0.97          | 0.00  | 5.99   | 38          | 6.346     |
| 2 black bullhead                    | 2     | 0.10    | 0.32        | 1.94          | 0.00  | 11.98  | 38          | 6.346     |
| 3 black crappie                     | 54    | 2.83    | 8.51        | 10.10         | 0.00  | 47.90  | 38          | 6.346     |
| 4 bluegill                          | 338   | 17.71   | 53.26       | 58.24         | 0.00  | 215.57 | 38          | 6.346     |
| 5 bowfin                            | 58    | 3.04    | 9.14        | 22.87         | 0.00  | 137.73 | 38          | 6.346     |
| 6 brook silverside                  | 1     | 0.05    | 0.16        | 0.97          | 0.00  | 5.99   | 38          | 6.346     |
| 7 central mudminnow                 | 58    | 3.04    | 9.14        | 28.32         | 0.00  | 107.78 | 38          | 6.346     |
| 8 channel catfish                   | 4     | 0.21    | 0.63        | 2.33          | 0.00  | 11.98  | 38          | 6.346     |
| 9 chestnut lamprey                  | 1     | 0.05    | 0.16        | 0.97          | 0.00  | 5.99   | 38          | 6.346     |
| 10 common carp                      | 19    | 1.00    | 2.99        | 7.72          | 0.00  | 35.93  | 38          | 6.346     |
| 11 common shiner                    | 6     | 0.31    | 0.95        | 3.56          | 0.00  | 17.96  | 38          | 6.346     |
| 12 emerald shiner                   | 9     | 0.47    | 1.42        | 4.04          | 0.00  | 17.96  | 38          | 6.346     |
| 13 freshwater drum                  | 9     | 0.47    | 1.42        | 3.80          | 0.00  | 17.96  | 38          | 6.346     |
| 14 gizzard shad                     | 17    | 0.89    | 2.68        | 12.74         | 0.00  | 77.84  | 38          | 6.346     |
| 15 golden redhorse                  | 20    | 1.05    | 3.15        | 10.58         | 0.00  | 59.88  | 38          | 6.346     |
| 16 green sunfish                    | 5     | 0.26    | 0.79        | 4.86          | 0.00  | 29.94  | 38          | 6.346     |
| 17 largemouth bass                  | 646   | 33.84   | 101.80      | 132.71        | 0.00  | 712.58 | 38          | 6.346     |
| 18 logperch                         | 9     | 0.47    | 1.42        | 4.04          | 0.00  | 17.96  | 38          | 6.346     |
| 19 longnose gar                     | 1     | 0.05    | 0.16        | 0.97          | 0.00  | 5.99   | 38          | 6.346     |
| 20 minnows & cyprinidae carps unsp. | 1     | 0.05    | 0.16        | 0.97          | 0.00  | 5.99   | 38          | 6.346     |
| 21 northern pike                    | 22    | 1.15    | 3.47        | 4.95          | 0.00  | 17.96  | 38          | 6.346     |
| 22 orangespotted sunfish            | 1     | 0.05    | 0.16        | 0.97          | 0.00  | 5.99   | 38          | 6.346     |
| 23 pumpkinseed                      | 6     | 0.31    | 0.95        | 2.61          | 0.00  | 11.98  | 38          | 6.346     |
| 24 river redhorse                   | 1     | 0.05    | 0.16        | 0.97          | 0.00  | 5.99   | 38          | 6.346     |
| 25 rock bass                        | 5     | 0.26    | 0.79        | 2.48          | 0.00  | 11.98  | 38          | 6.346     |
| 26 sauger                           | 7     | 0.37    | 1.10        | 2.73          | 0.00  | 11.98  | 38          | 6.346     |
| 27 shorthead redhorse               | 12    | 0.63    | 1.89        | 4.64          | 0.00  | 23.95  | 38          | 6.346     |
| 28 silver redhorse                  | 16    | 0.84    | 2.52        | 8.19          | 0.00  | 47.90  | 38          | 6.346     |
| 29 smallmouth bass                  | 5     | 0.26    | 0.79        | 2.84          | 0.00  | 11.98  | 38          | 6.346     |
| 30 spottail shiner                  | 13    | 0.68    | 2.05        | 6.57          | 0.00  | 29.94  | 38          | 6.346     |
| 31 spotted sucker                   | 25    | 1.31    | 3.94        | 6.72          | 0.00  | 23.95  | 38          | 6.346     |
| 32 walleye                          | 4     | 0.21    | 0.63        | 1.86          | 0.00  | 5.99   | 38          | 6.346     |
| 33 warmouth                         | 9     | 0.47    | 1.42        | 4.28          | 0.00  | 23.95  | 38          | 6.346     |
| 34 white bass                       | 1     | 0.05    | 0.16        | 0.97          | 0.00  | 5.99   | 38          | 6.346     |
| 35 white crappie                    | 4     | 0.21    | 0.63        | 3.89          | 0.00  | 23.95  | 38          | 6.346     |
| 36 yellow bullhead                  | 1     | 0.05    | 0.16        | 0.97          | 0.00  | 5.99   | 38          | 6.346     |
| 37 yellow perch                     | 518   | 27.13   | 81.63       | 112.38        | 0.00  | 425.15 | 38          | 6.346     |
| 38 ALL TAXA                         | 1909  | 100.00  | 300.82      | 202.98        | 29.94 | 862.28 | 38          | 6.346     |

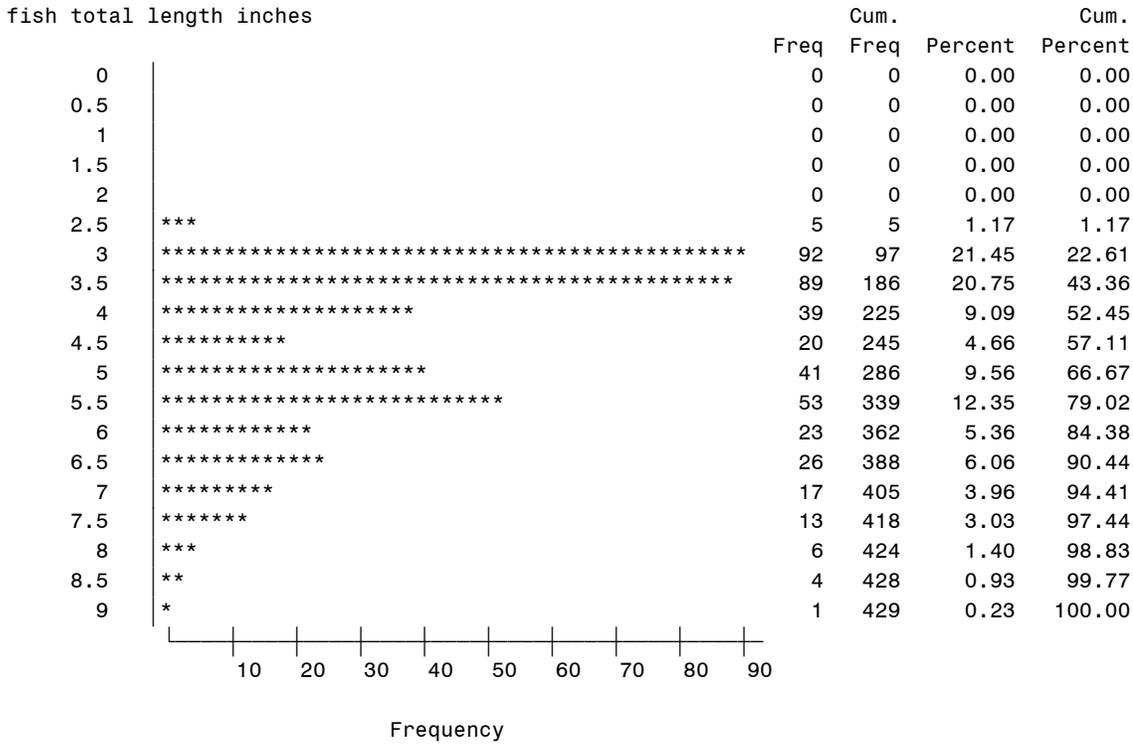
**FIGURE 4. FALL 2009 BLACK CRAPPIE LENGTH DISTRIBUTION (INCHES), L/T LAKE UNIT FYKE NETTING.**



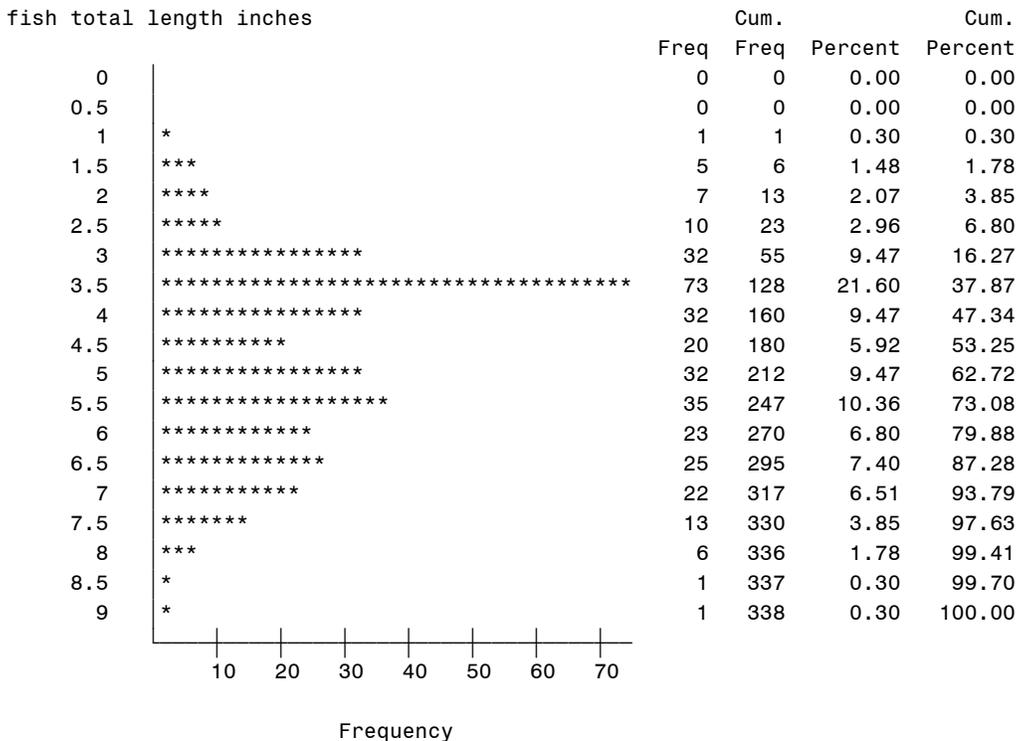
**FIGURE 5. FALL 2009 BLACK CRAPPIE LENGTH DISTRIBUTION (INCHES), L/T LAKE UNIT ELECTRO SHOCKING.**



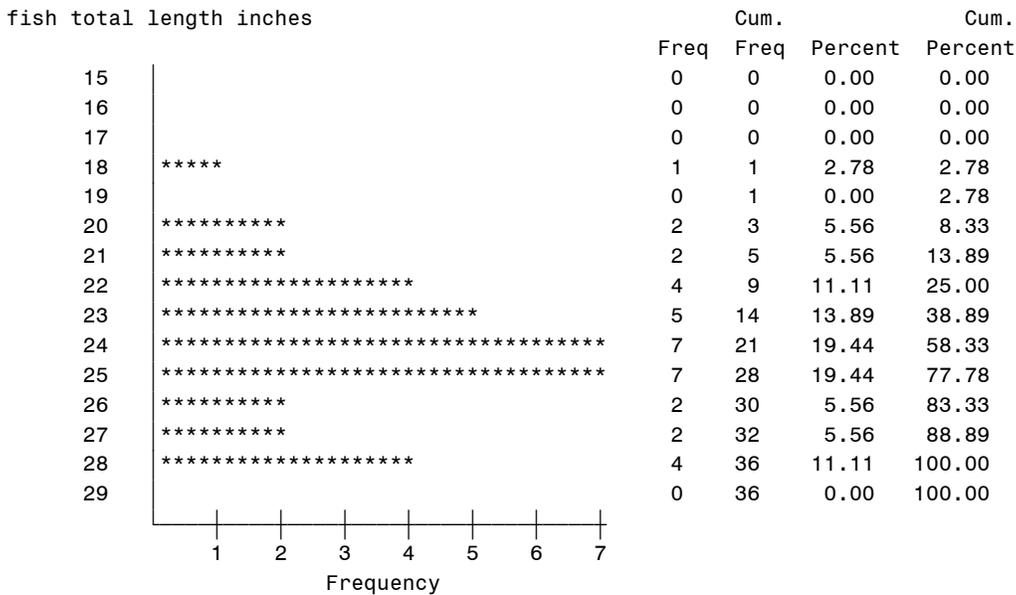
**FIGURE 6. FALL 2009 BLUEGILL LENGTH DISTRIBUTION (INCHES), L/T LAKE UNIT FYKE NETTING.**



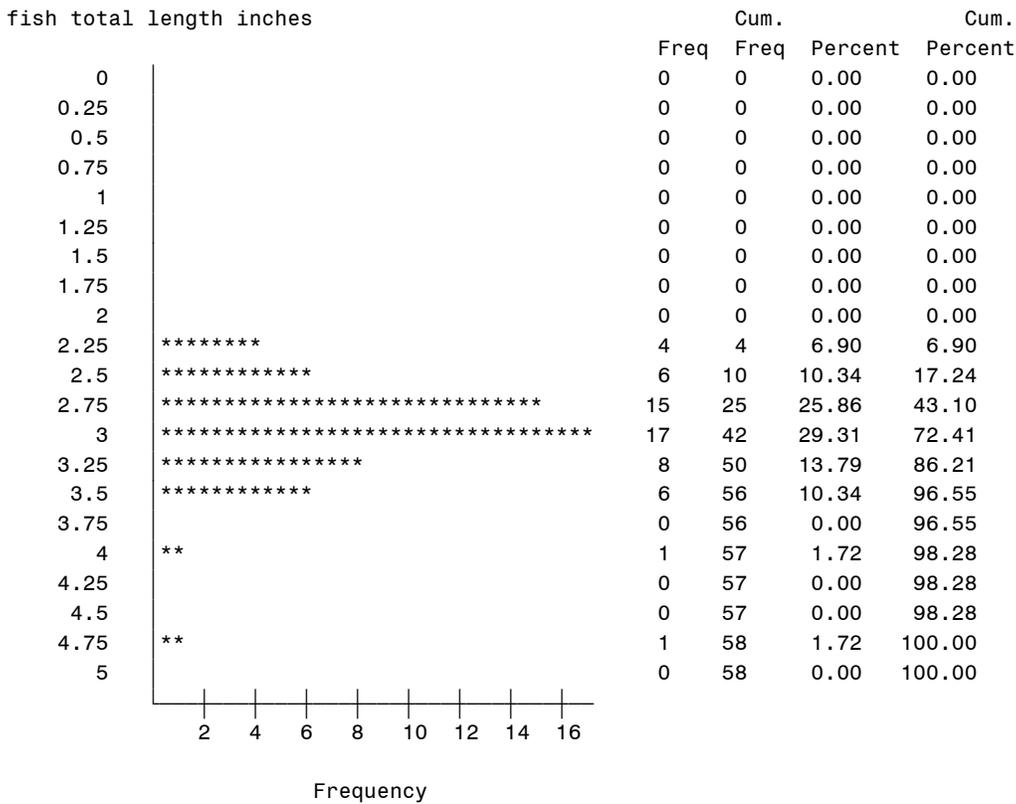
**FIGURE 7. FALL 2009 BLUEGILL LENGTH DISTRIBUTION (INCHES), L/T LAKE UNIT ELECTRO SHOCKING.**



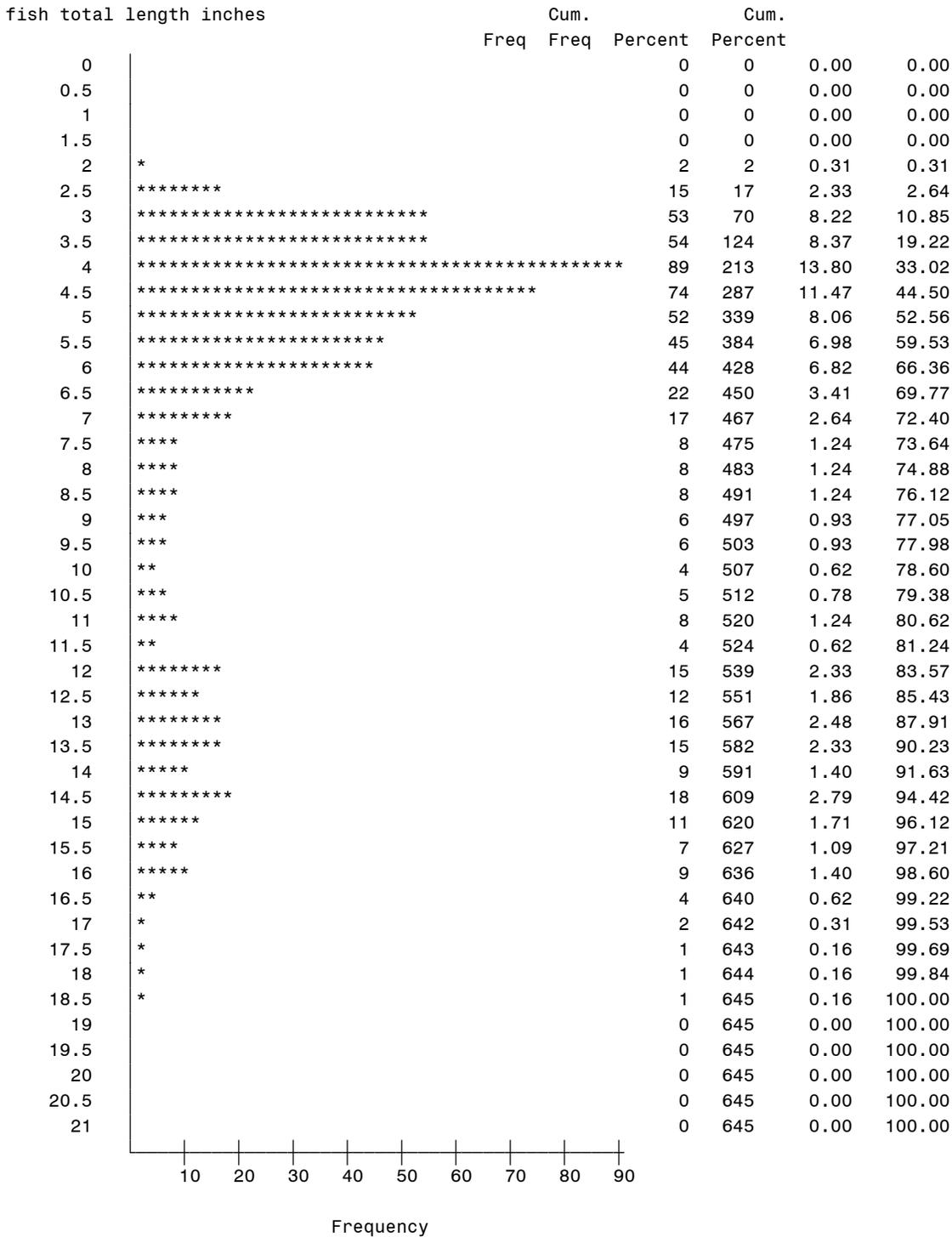
**FIGURE 8. FALL 2009 BOWFIN LENGTH DISTRIBUTION (INCHES), L/T LAKE UNIT ELECTRO SHOCKING.**



**FIGURE 9. FALL 2009 CENTRAL MUDMINNOW LENGTH DISTRIBUTION (INCHES), L/T LAKE UNIT ELECTRO SHOCKING.**

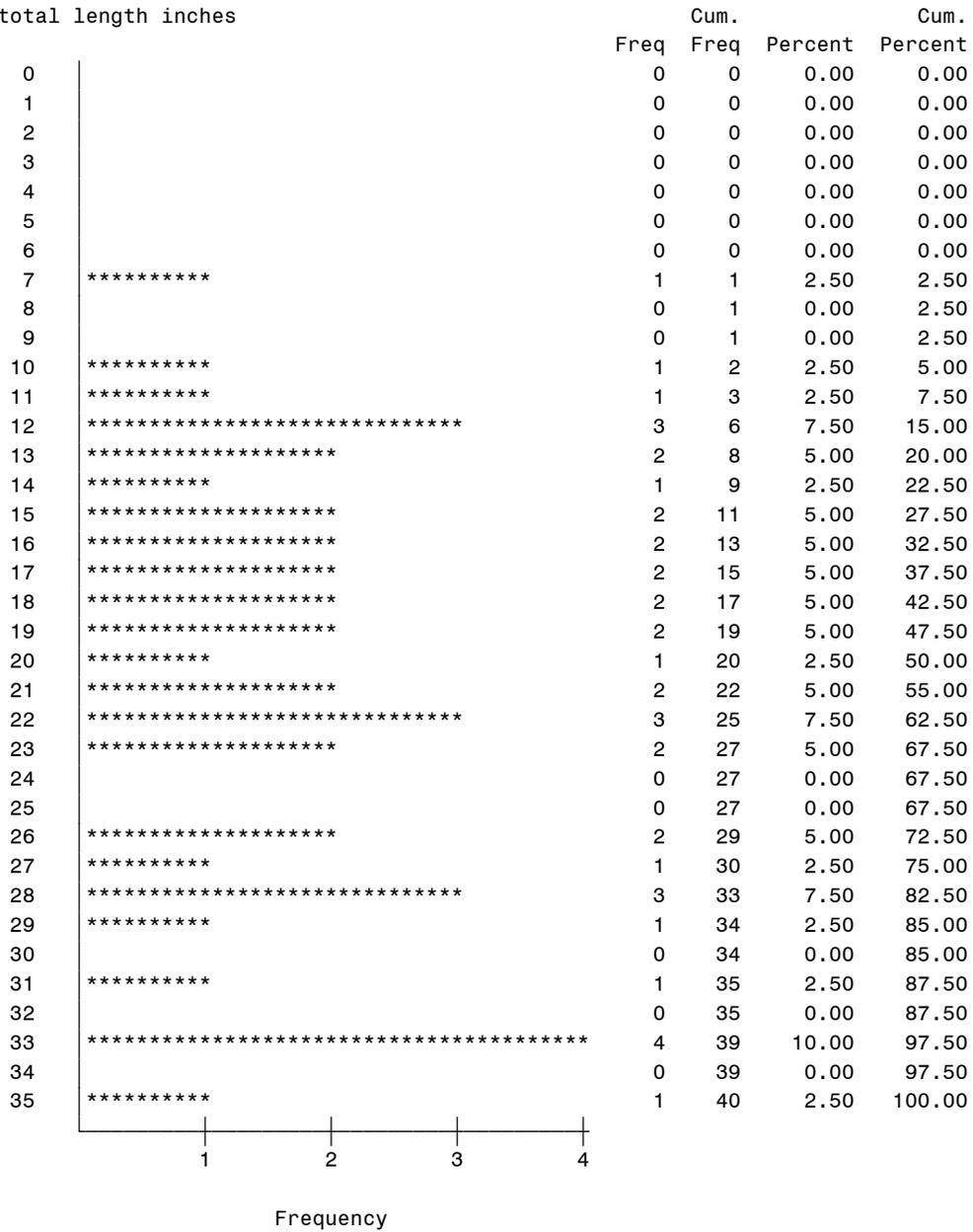


**FIGURE 10. FALL 2009 LARGEMOUTH BASS LENGTH DISTRIBUTION (INCHES), L/T LAKE UNIT ELECTRO SHOCKING.**

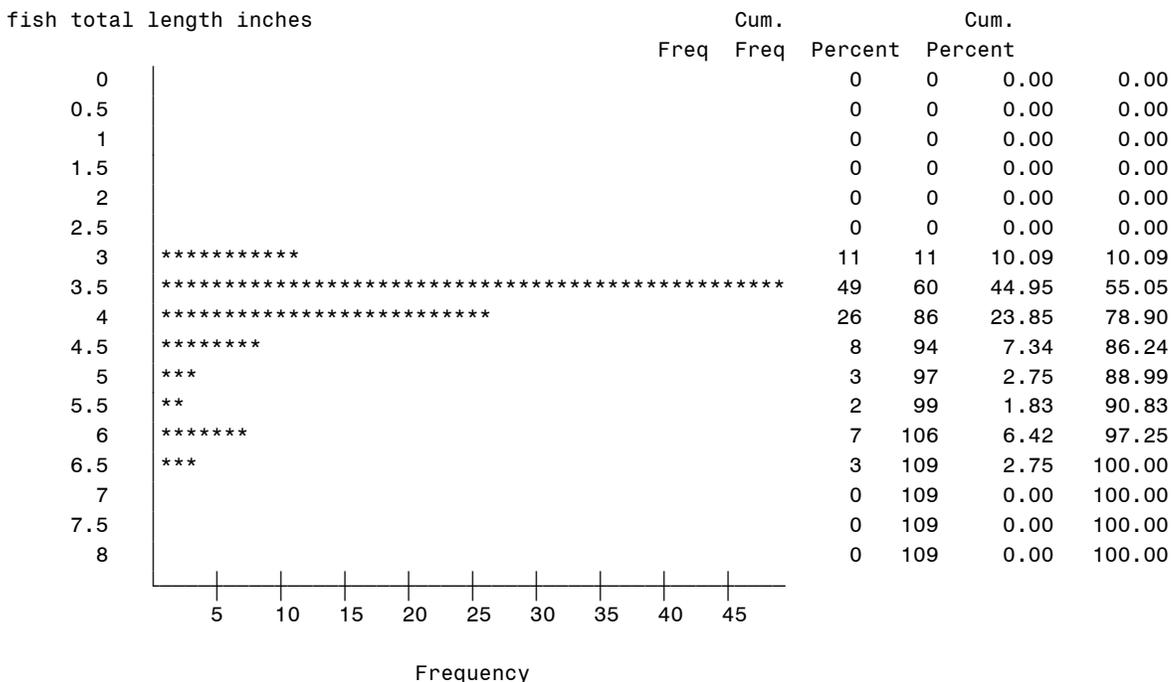


**FIGURE 11. FALL 2009 NORTHERN PIKE LENGTH DISTRIBUTION (INCHES), L/T LAKE UNIT FYKE NETTING.**

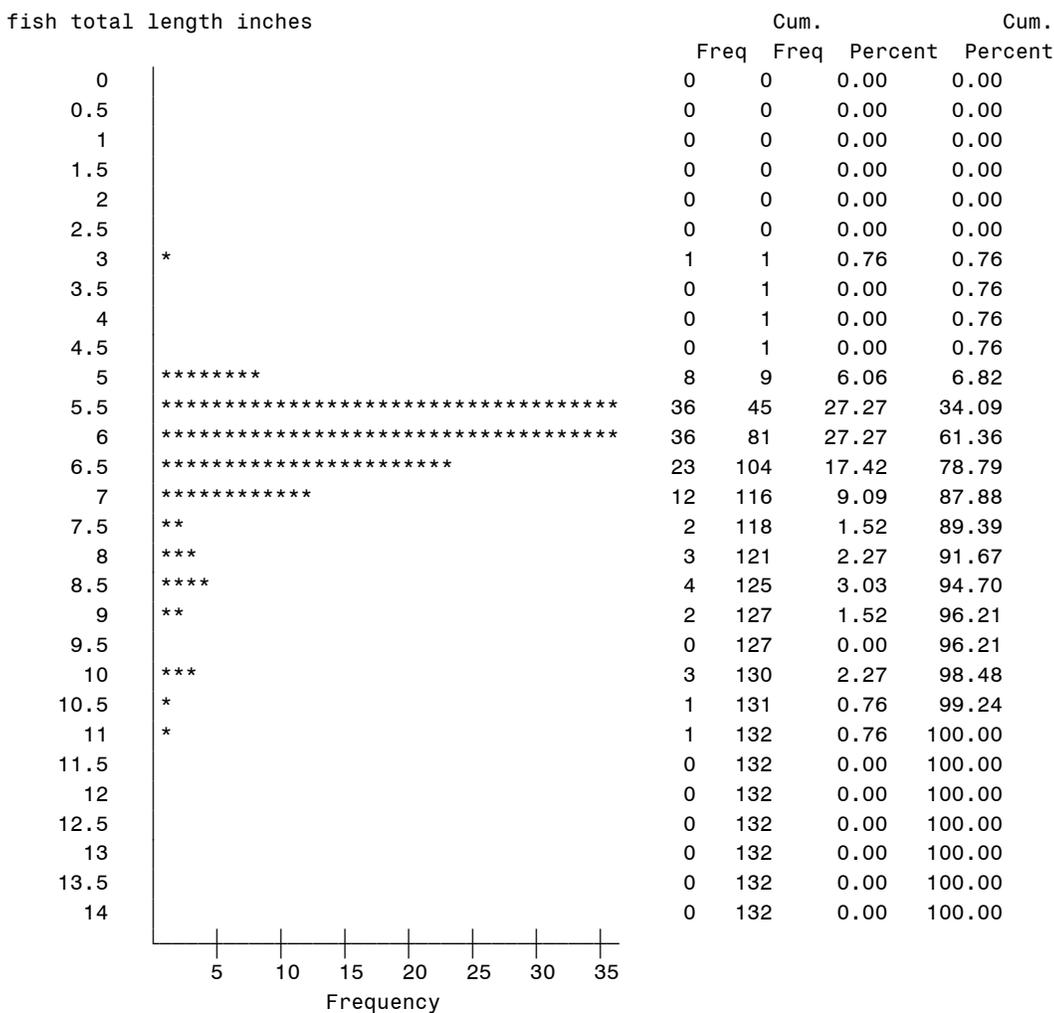
fish total length inches



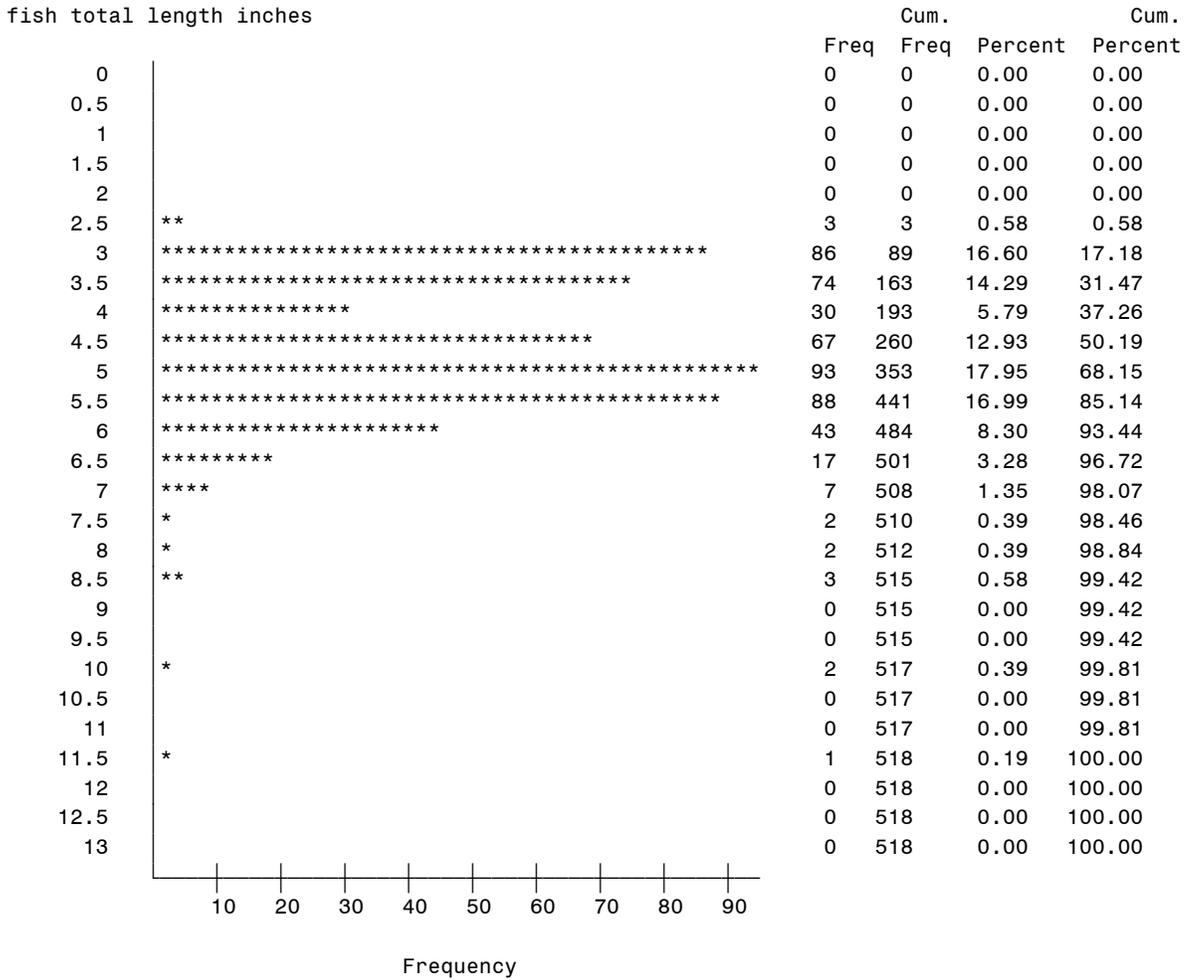
**FIGURE 12. FALL 2009 PUMPKINSEED LENGTH DISTRIBUTION (INCHES), L/T LAKE UNIT FYKE NETTING.**



**FIGURE 13. FALL 2009 YELLOW PERCH LENGTH DISTRIBUTION (INCHES), L/T LAKE UNIT FYKE NETTING.**



**FIGURE 14. FALL 2009 YELLOW PERCH LENGTH DISTRIBUTION (INCHES), L/T LAKE UNIT ELECTRO SHOCKING.**



**TABLE 5. MEAN LENGTH IN INCHES FOR MEASURED SPECIES, FALL 2009, L/T LAKE UNIT, FYKE NETTING.**

| <b>SPECIES</b>  | <b>MEAN LENGTH</b> | <b>STANDARD DEV.</b> | <b>MIN.</b> | <b>MAX.</b> | <b>N</b> |
|-----------------|--------------------|----------------------|-------------|-------------|----------|
| black crappie   | 7.06               | 2.59                 | 3.82        | 12.09       | 61       |
| bluegill        | 4.57               | 1.47                 | 2.44        | 8.90        | 429      |
| freshwater drum | 15.52              | 2.08                 | 10.75       | 19.69       | 25       |
| northern pike   | 20.89              | 7.56                 | 7.40        | 35.04       | 40       |
| pumpkinseed     | 3.99               | 0.84                 | 2.95        | 6.42        | 109      |
| silver redhorse | 21.07              | 1.08                 | 19.45       | 23.23       | 24       |
| yellow perch    | 6.31               | 1.17                 | 2.87        | 10.83       | 132      |

**TABLE 6. LIST OF STOCK SIZE, QUALITY SIZE (PSS<sub>Q</sub>) AND PREFERRED SIZE (PSS<sub>P</sub>) IN INCHES FOR SELECTED FISH SPECIES.**

| <b>FISH SPECIES</b> | <b>PSS SOURCE</b> | <b>STOCK</b> | <b>QUALITY</b> | <b>PREFERRED</b> |
|---------------------|-------------------|--------------|----------------|------------------|
| 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 LAWRENCE/TARGET LAKE UNIT, FYKE NETTING, FALL 2009.**

| SPECIES                 | MEAN CPD | STD. DEV. CPD | # OF STOCK | N  | MEAN PSS <sub>o</sub> | MEAN PSS <sub>p</sub> | STD PSS <sub>o</sub> | STD PSS <sub>p</sub> |
|-------------------------|----------|---------------|------------|----|-----------------------|-----------------------|----------------------|----------------------|
| BLACK CRAPPIE           |          |               | 38         | 11 | 52.3                  | 27.3                  | 46.0                 | 31.9                 |
| QUALITY (≥ 8 INCHES)    | 0.70     | 1.02          | 38         | 35 |                       |                       |                      |                      |
| PREFERRED (≥ 10 INCHES) | 0.34     | 0.63          | 38         | 35 |                       |                       |                      |                      |
| BLUEGILL                |          |               | 224        | 11 | 44.1                  | 4.1                   | 32.6                 | 9.3                  |
| QUALITY (≥ 6 INCHES)    | 2.30     | 2.66          | 224        | 35 |                       |                       |                      |                      |
| PREFERRED (≥ 8 INCHES)  | 0.22     | 1.13          | 224        | 35 |                       |                       |                      |                      |
| PUMPKINSEED             |          |               | 35         | 6  | 43.8                  | 0.00                  | 48.6                 |                      |
| QUALITY (≥ 6 INCHES)    | 0.19     | 0.45          | 35         | 35 |                       |                       |                      |                      |
| PREFERRED (≥ 8 INCHES)  |          |               | 35         | 35 |                       |                       |                      |                      |
| YELLOW PERCH            |          |               | 130        | 12 | 23.4                  | 8.9                   | 36.8                 | 28.8                 |
| QUALITY (≥ 8 INCHES)    | 0.37     | 0.66          | 130        | 35 |                       |                       |                      |                      |
| PREFERRED (≥ 10 INCHES) | 0.06     | 0.24          | 130        | 35 |                       |                       |                      |                      |

**TABLE 8. MEAN LENGTH IN INCHES FOR MEASURED SPECIES, FALL 2009, L/T LAKE UNIT, ELECTRO SHOCKING.**

| SPECIES           | MEAN LENGTH | STANDARD DEV. | MIN.  | MAX.  | N   |
|-------------------|-------------|---------------|-------|-------|-----|
| bluegill          | 4.70        | 1.58          | 1.22  | 8.90  | 338 |
| bowfin            | 24.00       | 2.37          | 18.31 | 28.35 | 36  |
| central mudminnow | 2.98        | 0.42          | 2.21  | 4.76  | 58  |
| northern pike     | 14.00       | 10.40         | 4.37  | 34.65 | 21  |
| largemouth bass   | 6.73        | 3.95          | 2.09  | 18.47 | 645 |
| spotted sucker    | 14.34       | 3.41          | 3.78  | 17.91 | 25  |
| yellow perch      | 4.65        | 1.24          | 2.60  | 11.54 | 518 |

**TABLE 9. COMPARISON OF MEAN CATCH PER HOUR AND PSS FOR SELECTED SPECIES OF SELECTED SIZES IN LAWRENCE/TARGET LAKE UNIT, ELECTRO SHOCKING, FALL 2009.**

| SPECIES                 | MEAN CPH | STD. DEV. CPH | # OF STOCK | N  | MEAN PSS <sub>O</sub> | MEAN PSS <sub>P</sub> | STD PSS <sub>O</sub> | STD PSS <sub>P</sub> |
|-------------------------|----------|---------------|------------|----|-----------------------|-----------------------|----------------------|----------------------|
| BLUEGILL                |          |               | 299        | 30 | 32.1                  | 1.90                  | 26.1                 | 5.70                 |
| QUALITY (≥ 6 INCHES)    | 13.08    | 16.05         | 299        | 38 |                       |                       |                      |                      |
| PREFERRED (≥ 8 INCHES)  | 0.79     | 2.50          | 299        | 38 |                       |                       |                      |                      |
| LARGEMOUTH BASS         |          |               | 164        | 29 | 72.0                  | 21.20                 | 31.40                | 27.10                |
| QUALITY(≥ 12 INCHES)    | 18.28    | 27.00         | 164        | 38 |                       |                       |                      |                      |
| PREFERRED (≥ 15 INCHES) | 4.73     | 7.26          | 164        | 38 |                       |                       |                      |                      |
| YELLOW PERCH            |          |               | 210        | 28 | 10.60                 | 5.40                  | 23.50                | 20.80                |
| QUALITY(≥ 8 INCHES)     | 1.26     | 2.84          | 210        | 38 |                       |                       |                      |                      |
| PREFERRED (≥ 10 INCHES) | 0.32     | 1.36          | 210        | 38 |                       |                       |                      |                      |

**TABLE 10. COMPARISON OF MEAN CATCH PER FYKE NET-DAY FOR ALL SPECIES COMBINED AMONG SIXTEEN LAKE UNITS, FALL 2007-2009.**

| 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     |
| 48.39 | 29.01     | 30 | 2007 COLDSPG, BLKHWK, RONKOWSKI |  | B |   |  |  | A     |
| 43.98 | 29.99     | 24 | 2007 AMBRO                      |  | B |   |  |  | A C   |
| 50.82 | 40.96     | 30 | 2008 SNY MCGIL                  |  | B | D |  |  | A C   |
| 34.06 | 21.40     | 32 | 2007 UPPER POOL 5               | E  | B | D |  |  | A C   |
| 33.90 | 38.44     | 32 | 2007 UPPER POOL 5A              | E  | B | D |  |  | A C F |
| 36.08 | 34.22     | 33 | 2008 TREMPEALEAU LAKES          | E  | B | D |  |  | A C F |
| 27.29 | 22.66     | 35 | 2008 LAKE ONALASKA              | E  | B | D |  |  | A C F |
| 26.43 | 26.07     | 32 | 2008 GOOSE CARCASS LAKE         | E  | B | D |  |  | G C F |
| 25.84 | 30.34     | 35 | 2009 LAWRENCE/TARGET            | E  |   | D |  |  | G C F |
| 25.47 | 27.01     | 16 | 2008 BELVIDERE/SPRING LAKE      | E  |   | D |  |  | G C F |
| 17.39 | 23.28     | 23 | 2009 BERTOM/MCCARTNEY AREA      | E  |   |   |  |  | G C F |
| 15.36 | 14.74     | 34 | 2009 LANSING                    |  |   |   |  |  | G C F |
| 21.68 | 29.97     | 32 | 2008 ROBINSON/PETERSON/BEEF SL. |  |   |   |  |  | G C F |
| 10.46 | 8.32      | 32 | 2009 UPPER POOL 6               |  |   |   |  |  | G     |

**TABLE 11. COMPARISON OF MEAN CATCH PER FYKE NET-DAY FOR ALL TARGET SPECIES COMBINED AMONG SIXTEEN LAKE UNITS, FALL 2007-2009.**

| MEAN  | STD. DEV. | N  | LAKE UNIT                       | DIFFERENT (means with the same letter are not Sign. Different) |   |   |     |
|-------|-----------|----|---------------------------------|--|---|---|-----|
| 41.41 | 28.39     | 32 | 2007 GOOSE ISLAND/STODDARD      |  |   |   | A   |
| 37.59 | 30.17     | 32 | 2007 HARPERS                    | B  |   |   | A   |
| 30.26 | 20.63     | 30 | 2007 COLD SPRG/BLKHWK/RONKOSKI  | B  |   |   | A   |
| 25.95 | 16.13     | 32 | 2007 UPPER POOL 5               | B  |   |   | A C |
| 31.85 | 30.67     | 33 | 2008 TREMPEALEAU LAKES          | B  |   |   | A C |
| 25.03 | 22.18     | 35 | 2008 LAKE ONALASKA              | B  |   |   | A C |
| 24.93 | 23.11     | 24 | 2007 AMBRO                      | B  |   |   | A C |
| 30.58 | 37.27     | 30 | 2008 SNY MCGIL                  | B  |   |   | A C |
| 26.85 | 38.73     | 32 | 2007 UPPER POOL 5A              | B  |   |   | A C |
| 23.15 | 27.08     | 16 | 2008 BELVIDERE/SPRING LAKE      | B  | D |   | A C |
| 22.24 | 28.21     | 35 | 2009 LAWRENCE/TARGET            | E  | B | D | A C |
| 20.78 | 24.12     | 32 | 2008 GOOSE CARCASS LAKE         | E  | B | D | C   |
| 12.52 | 13.56     | 34 | 2009 LANSING                    | E  |   | D | F C |
| 7.53  | 6.79      | 32 | 2009 UPPER POOL 6               | E  |   | D | F   |
| 11.98 | 25.89     | 32 | 2008 ROBINSON/PETERSON/BEEF SL. | E  |   |   | F   |
| 5.72  | 5.64      | 23 | 2009 BERTOM/MCCARTNEY AREA      |  |   |   | F   |

**TABLE 12. COMPARISON OF MEAN CATCH PER FYKE NET-DAY FOR ALL TARGET SPECIES COMBINED AMONG FOUR LAKE UNITS, FALL 2009.**

| MEAN  | STD. DEV. | N  | LAKE UNIT                  | DIFFERENT (means with the same letter are not Sign. Different) |  |   |   |
|-------|-----------|----|----------------------------|--|--|---|---|
| 22.24 | 28.21     | 35 | 2009 LAWRENCE/TARGET       |  |  |   | A |
| 12.52 | 13.56     | 34 | 2009 LANSING               |  |  | B | A |
| 7.53  | 6.79      | 32 | 2009 UPPER POOL 6          |  |  | B | C |
| 5.72  | 5.64      | 23 | 2009 BERTOM/MCCARTNEY AREA |  |  |   | C |

**TABLE 13. COMPARISON OF MEAN TOTAL LENGTH FOR SELECTED INDIVIDUAL SPECIES, AMONG FOUR LAKE UNITS, FYKE NETS, FALL 2009.**

| SPECIES              | MEAN | STD. DEV. | N   | LAKE UNIT             | DIFFERENT (means with the same letter are not Sign. Different) |
|----------------------|------|-----------|-----|-----------------------|--|
| <b>BLACK CRAPPIE</b> |      |           |     |                       |  |
|                      | 9.04 | 1.97      | 69  | UPPER POOL 6          | A  |
|                      | 9.03 | 2.47      | 85  | LANSING               | A  |
|                      | 7.45 | 2.14      | 37  | BERTOM/MCCARTNEY AREA | B  |
|                      | 7.06 | 1.47      | 61  | LAWRENCE/TARGET       | B  |
|                      |      |           |     |                       |  |
| <b>BLUEGILL</b>      |      |           |     |                       |  |
|                      | 5.62 | 1.68      | 76  | UPPER POOL 6          | A  |
|                      | 4.71 | 1.06      | 73  | BERTOM/MCCARTNEY AREA | B  |
|                      | 4.62 | 1.28      | 270 | LANSING               | B  |
|                      | 4.57 | 1.02      | 429 | LAWRENCE/TARGET       | B  |
|                      |      |           |     |                       |  |
| <b>YELLOW PERCH</b>  |      |           |     |                       |  |
|                      | 8.41 | 2.71      | 19  | LANSING               | A  |
|                      | 7.32 | 1.79      | 70  | UPPER POOL 6          | B  |
|                      | 6.31 | 2.69      | 132 | LAWRENCE/TARGET       | C  |
|                      |      |           |     |                       |  |
|                      |      |           |     |                       |  |

**TABLE 14. COMPARISON OF MEAN CATCH PER HOUR FROM ELECTRO SHOCKING FOR ALL TARGET SPECIES COMBINED AMONG SIXTEEN LAKE UNITS, FALL 2007-2009.**

| MEAN   | STD. DEV. | N  | LAKE UNIT                       | DIFFERENT (means with the same letter are not Sign. Different) |   |
|--------|-----------|----|---------------------------------|--|---|
| 296.70 | 303.22    | 25 | 2007 COLD SPRG/BLKHWK/RONKOSKI  | B  | A |
| 251.81 | 189.69    | 38 | 2009 LAWRENCE/TARGET            |  | A |
| 219.87 | 131.31    | 32 | 2008 TREMPEALEAU LAKES          |  | A |
| 208.83 | 152.54    | 52 | 2007 GOOSE ISLAND/STODDARD      |  | A |
| 197.61 | 127.12    | 25 | 2007 UPPER POOL 5A              | B  | A |
| 187.17 | 145.07    | 31 | 2007 AMBRO                      | B  | A |
| 168.67 | 142.26    | 30 | 2008 GOOSE CARCASS LAKE         | B  | A |
| 171.74 | 133.38    | 47 | 2008 LAKE ONALASKA              | B  | A |
| 152.97 | 189.77    | 27 | 2009 BERTOM/MCCARTNEY AREA      | B  |   |
| 151.15 | 205.44    | 33 | 2008 ROBINSON/PETERSON/BEEF SL. | B  | A |
| 149.88 | 126.11    | 33 | 2009 LANSING                    | B  | A |
| 144.51 | 101.82    | 30 | 2009 UPPER POOL 6               | B  | A |
| 143.27 | 80.23     | 27 | 2007 UPPER POOL 5               | B  | A |
| 135.13 | 120.06    | 30 | 2007 HARPERS                    | B  | A |
| 116.24 | 91.03     | 30 | 2008 SNY MCGIL                  | B  | A |
| 109.18 | 108.36    | 30 | 2008 BELVIDERE/SPRING LAKE      | B  | A |

**TABLE 15. COMPARISON OF MEAN TOTAL LENGTH FOR SELECTED INDIVIDUAL SPECIES, AMONG FOUR LAKE UNITS, ELECTRO SHOCKING, FALL 2009.**

| SPECIES                | MEAN  | STD. DEV. | N   | LAKE UNIT             | DIFFERENT (means with the same letter are not Sign. Different) |
|------------------------|-------|-----------|-----|-----------------------|--|
| <b>BLACK CRAPPIE</b>   |       |           |     |                       |  |
|                        | 8.94  | 2.87      | 72  | BERTOM/MCCARTNEY AREA | A  |
|                        | 6.57  | 2.91      | 10  | LANSING               | B  |
|                        | 6.37  | 2.84      | 15  | UPPER POOL 6          | B  |
|                        | 5.10  | 2.82      | 54  | LAWRENCE/TARGET       | B  |
| <b>BLUEGILL</b>        |       |           |     |                       |  |
|                        | 5.16  | 1.71      | 222 | UPPER POOL 6          | A  |
|                        | 4.82  | 1.14      | 278 | BERTOM/MCCARTNEY AREA | B  |
|                        | 4.70  | 1.58      | 338 | LAWRENCE/TARGET       | B  |
|                        | 4.34  | 1.49      | 207 | LANSING               | C  |
| <b>BOWFIN</b>          |       |           |     |                       |  |
|                        | 24.00 | 2.37      | 36  | LAWRENCE/TARGET       | A  |
|                        | 22.24 | 2.27      | 52  | LANSING               | B  |
| <b>LARGEMOUTH BASS</b> |       |           |     |                       |  |
|                        | 9.15  | 4.97      | 314 | UPPER POOL 6          | A  |
|                        | 9.04  | 3.86      | 260 | BERTOM/MCCARTNEY AREA | A  |
|                        | 6.73  | 4.00      | 645 | LAWRENCE/TARGET       | B  |
|                        | 7.15  | 4.00      | 445 | LANSING               | B  |
| <b>NORTHERN PIKE</b>   |       |           |     |                       |  |
|                        | 18.97 | 7.92      | 4   | BERTOM/MCCARTNEY AREA | A  |
|                        | 15.89 | 6.95      | 43  | LANSING               | A  |
|                        | 14.60 | 8.44      | 72  | UPPER POOL 6          | A  |
|                        | 14.00 | 10.40     | 21  | LAWRENCE/TARGET       | A  |
| <b>YELLOW PERCH</b>    |       |           |     |                       |  |
|                        | 5.77  | 1.61      | 97  | UPPER POOL 6          | A  |
|                        | 5.00  | 2.45      | 107 | LANSING               | B  |
|                        | 4.65  | 1.24      | 518 | LAWRENCE/TARGET       | BC   |
|                        | 4.25  | 1.17      | 91  | BERTOM/MCCARTNEY AREA | C  |