

Lake Winnebago Pool Lakes Winter Fish Movement Study 2010

Wisconsin Department of Natural Resources, Fisheries Management, Oshkosh

Thousands of people peering down sturgeon spearing holes each February on Lake Winnebago provides a great opportunity to study the seasonal movements of fish in the lake. In 2009 a Winter Fish Movement Study was initiated by the Department of Natural Resources Fisheries Management staff in Oshkosh in which spearkers were asked to keep records of their fish observations. The survey had only 28 responses in its first year, so help was solicited from the Boy Scouts in 2010. Under the direction of D.T. McDonald, members of troop 618 worked at sturgeon spearing registration stations on opening weekend in February 2010 and boosted the number of completed surveys to 253 for the 2010 sturgeon spearing season. This report summarizes the physical conditions and fish observations by location on Lake Winnebago (Figure 1) that were reported in the surveys.

Physical Conditions: In 2010 ice thickness ranged from 14-25 inches with an average of 20 inches, compared to 24-34 inches reported in 2009¹. Shacks were situated over water approximately 7 to 25 feet deep. There were few complaints about water clarity although many reported that it became dirtier over the opening weekend. The reports of poorest water clarity came from Areas 3 and 4 and the reports of best water clarity came from Areas 5 and 6. Last year the only reports of poor water clarity came from Area 2. All but two spearkers reported fishing over mucky, muddy, sandy, or silty bottom composition. The remaining two reported spearing over a rocky bottom in Areas 1 & 3. Eight people reported seeing zebra mussels with the greatest number of zebra mussel observations made in Area 4.

Fish Observations: The number of fish seen per person is summarized by species and location in Figure 2 and Table 2. Of the 253 people surveyed, 26 saw no fish at all. The most frequently observed species was gizzard shad, which were often reported as dying. Minnows were the most commonly observed fish in 2009. Lake sturgeon were the second most commonly observed fish, followed by yellow perch, minnows, sheepshead, walleye, catfish, white bass, gar, and bluegill. Most sheepshead were observed in Area 2.

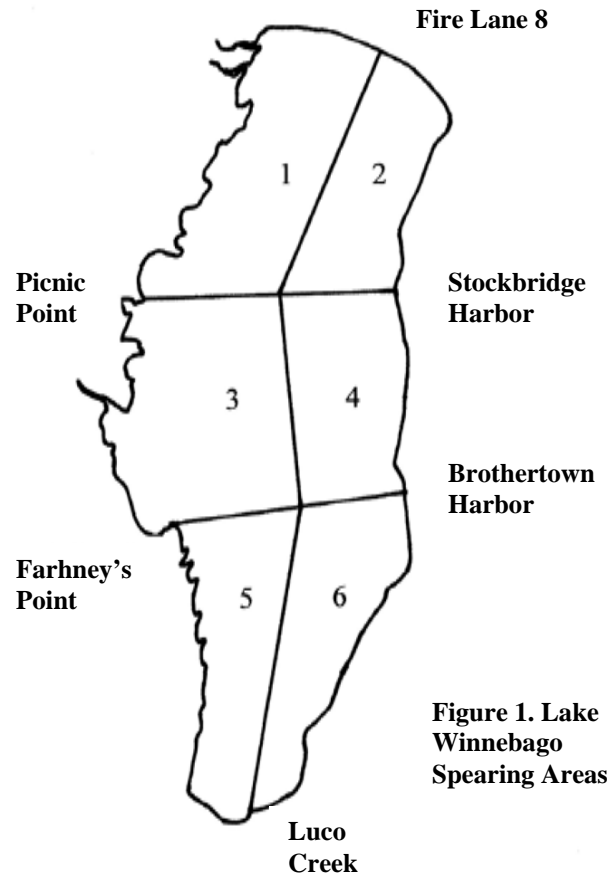


Figure 1. Lake Winnebago Spearing Areas

¹ When comparing this year's results to last year's, keep in mind that last year's survey was much smaller, and therefore much more likely to be biased than this year's survey. Also, the upper river lakes were generally excluded from this summary due to small sample size.

Table 1. The total number of respondents by area and the maximum, minimum, and average conditions they reported.

| Location | No. of Respondents | Average ice thickness (in) | Minimum ice thickness (in) | Maximum ice thickness (in) | Average depth (ft) | Minimum depth (ft) | Maximum depth (ft) |
|-----------------------|--------------------|----------------------------|----------------------------|----------------------------|--------------------|--------------------|--------------------|
| Lake Winnebago Area 1 | 66 | 19.8 | 14.0 | 25.0 | 15.8 | 10.0 | 19.0 |
| Lake Winnebago Area 2 | 65 | 20.2 | 16.0 | 24.0 | 17.4 | 14.0 | 20.0 |
| Lake Winnebago Area 3 | 28 | 20.1 | 15.0 | 24.0 | 14.8 | 7.0 | 18.5 |
| Lake Winnebago Area 4 | 56 | 20.0 | 16.0 | 24.0 | 17.7 | 15.0 | 20.0 |
| Lake Winnebago Area 5 | 5 | 18.6 | 17.0 | 20.0 | 12.2 | 9.0 | 15.0 |
| Lake Winnebago Area 6 | 18 | 18.9 | 15.0 | 24.0 | 15.0 | 11.0 | 25.0 |
| Lake Butte des Morts | 1 | 20.0 | 20.0 | 20.0 | 6.0 | 6.0 | 6.0 |
| Lake Poygan | 1 | 20.0 | 20.0 | 20.0 | 6.0 | 6.0 | 6.0 |
| Location not reported | 13 | 19.6 | 18.0 | 20.0 | 15.3 | 9.0 | 18.0 |
| Overall | 253 | 19.7 | 16.8 | 22.3 | 13.4 | 9.7 | 16.4 |

Summary of all other species are as follows:

- Walleye were primarily observed in Areas 2, 3, & 4.
- Sauger were reported only in Area 4.
- Yellow perch were reported being observed in Areas 2, 3, 4, and 6.
- The numbers of white bass observed were low and only observed in Areas 4 & 6.
- Gizzard shad were most commonly reported from Area 2 and least reported from Area 6.
- Burbot were observed in Areas 1 & 4.
- Gar were observed only in Area 3.
- Minnows were most commonly reported from Area 4 although not as frequently observed this year compared to last year.
- Bluegill were observed in Areas 1 & 4.
- No smallmouth bass, largemouth bass, muskellunge, or northern pike were observed.

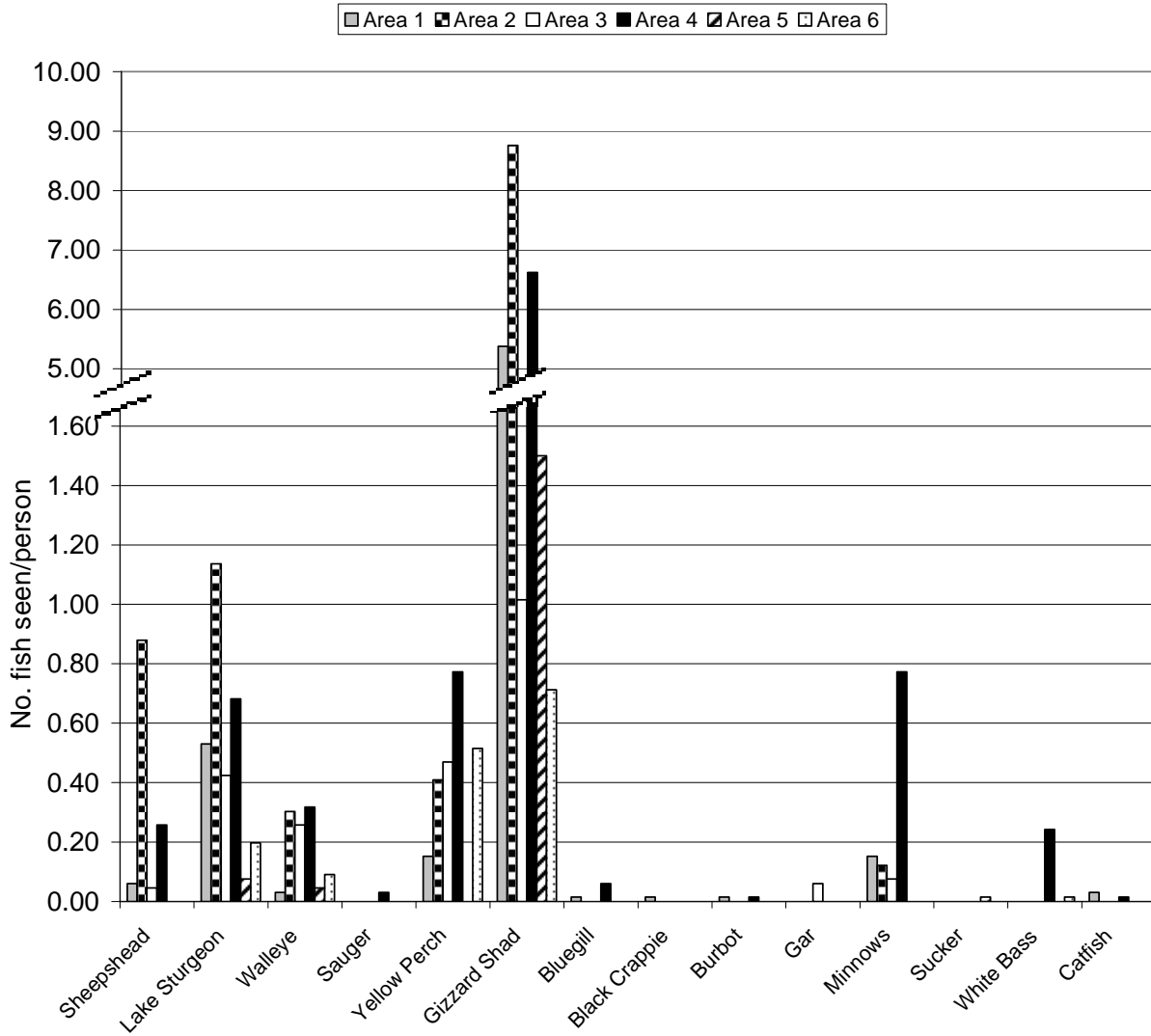


The whole family gets involved. The McDonald sisters are helping out their brother, D.T. McDonald, who organized the Boy Scouts involvement with conducting the surveys.

A total of 216 lake sturgeon were reportedly seen or speared. Similar to last year, the highest proportion of respondents saw lake sturgeon in Area 2 (1.1 sturgeon per person) and the fewest in Area 5 (0.08 sturgeon per person). Keep in mind that these reports could be biased depending on where the interviews were conducted (e.g. closer to the registration station where a person had a sturgeon or closer to the lake access points where spearers may or may not have speared a sturgeon).

The greatest proportion of fish (all species combined) were observed in 12-13 feet of water, compared to 16 feet last year. Averaged by area, the greatest number of fish (all species combined) were observed in Area 2, compared to Area 5 last year.

Figure 2. The number of fish seen per person summarized by species and location in Lake Winnebago, excluding species not observed.



An informational meeting held by the Boy Scouts Troop 618 before sturgeon spearing season 2010 to prepare for the winter fish movement surveys.

Acknowledgements

Thank you to all the sturgeon spears who participated in the survey this year. Special thanks go to D.T. McDonald and Boy Scouts Troop 618. D.T. organized the troop to conduct the Lake Winnebago Fish Movement study for Sturgeon Spearing Season 2010. The large number of surveys completed would not have been accomplished without their assistance.

Table 2. The number of fish seen per person by species and location.

| Location | Sheepshead | Lake Sturgeon | Walleye | Sauger | Yellow Perch | Gizzard Shad | Bluegill | Black Crappie | Burbot | Gar | Minnows | Sucker | White Bass | Catfish |
|-----------------------|------------|---------------|---------|--------|--------------|--------------|----------|---------------|--------|------|---------|--------|------------|---------|
| Lake Winnebago Area 1 | 0.06 | 0.53 | 0.03 | 0.00 | 0.15 | 5.38 | 0.02 | 0.02 | 0.02 | 0.00 | 0.15 | 0.00 | 0.00 | 0.03 |
| Lake Winnebago Area 2 | 0.88 | 1.14 | 0.30 | 0.00 | 0.41 | 8.76 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 |
| Lake Winnebago Area 3 | 0.05 | 0.42 | 0.26 | 0.00 | 0.47 | 1.02 | 0.00 | 0.00 | 0.00 | 0.06 | 0.08 | 0.00 | 0.00 | 0.00 |
| Lake Winnebago Area 4 | 0.26 | 0.68 | 0.32 | 0.03 | 0.77 | 6.62 | 0.06 | 0.00 | 0.02 | 0.00 | 0.77 | 0.00 | 0.24 | 0.02 |
| Lake Winnebago Area 5 | 0.00 | 0.08 | 0.05 | 0.00 | 0.00 | 1.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 |
| Lake Winnebago Area 6 | 0.00 | 0.20 | 0.09 | 0.00 | 0.52 | 0.71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 |
| Lake Butte des Morts | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 1.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lake Poygan | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Location not reported | 0.02 | 0.11 | 0.03 | 0.00 | 0.85 | 0.70 | 0.03 | 0.00 | 0.00 | 0.00 | 0.77 | 0.00 | 0.05 | 0.02 |
| Average | 0.14 | 0.36 | 0.12 | 0.00 | 0.35 | 2.91 | 0.01 | 0.00 | 0.00 | 0.01 | 0.21 | 0.00 | 0.03 | 0.06 |

Trophy-Sized Sheepshead and Zebra Mussels

Competitors in Lake Winnebago area sheepshead tournaments have long been heading to the rivers and using live crayfish as bait to capture the winning fish, but the locations of the big fish could be shifting. The Wisconsin DNR has been collecting data on sheepshead every fall since 1984 and has observed an increase in maximum size of these fish in Lake Winnebago in recent years (**Table 3**). Prior to 2001, trophy-sized drum were only occasionally reported in local news stories; there were *no* observations of sheepshead longer than 19 inches from Lake Winnebago by the DNR from 1984 to 2001. To date, the largest sheepshead from Lake Winnebago was captured summer 2009 measuring 31 inches in total length and weighing more than 18 pounds.



The pharyngeal molars used for crushing mussel shells by sheepshead.

The shift in the locations of large sheepshead corresponds to the arrival of zebra mussels in Lake Winnebago, which were first observed in November 1998. Diet analysis has revealed that the majority of large sheepshead (>15 inches) are consuming large quantities of zebra mussels. Small sheepshead (<15 inches) primarily eat small invertebrates including lake fly larvae. Lake fly larvae are also the primary component of lake sturgeon diet in the Winnebago System. Winnebago lake sturgeon eat zebra mussels but not in proportion to zebra mussel abundance.

Another common name of sheepshead is “gasper goo”, which is actually an English mispronunciation of the French name “casse burgau” (mussel breaker). Some sheepshead from Lake Winnebago have been observed with large clams (~4 inches in diameter) broken up in their stomachs.

Table 3. Statistics from sheepshead captured during Lake Winnebago Fall Assessment Trawling (1984-2009).

| Year | Number of Fish Measured | Maximum Length (inches) | Maximum Weight (pounds) | Maximum Age | No. of Fish > 20 inches |
|------|-------------------------|-------------------------|-------------------------|-------------|-------------------------|
| 1984 | 338 | 17.1 | 1.6 | NA | 0 |
| 1985 | 616 | 18.0 | 2.1 | NA | 0 |
| 1986 | 1227 | 19.4 | 2.7 | 39 | 0 |
| 1987 | 108 | 18.2 | 2.3 | NA | 0 |
| 1988 | 297 | 17.0 | 1.7 | NA | 0 |
| 1989 | 181 | 17.6 | 1.7 | NA | 0 |
| 1990 | 173 | 16.5 | 1.3 | NA | 0 |
| 1991 | 316 | 16.1 | 1.5 | NA | 0 |
| 1992 | 225 | 16.1 | 1.2 | NA | 0 |
| 1993 | 285 | 16.7 | 1.6 | NA | 0 |
| 1995 | 159 | 16.2 | 1.4 | NA | 0 |
| 1996 | 194 | 16.2 | 1.4 | NA | 0 |
| 1997 | 101 | 15.8 | 1.2 | NA | 0 |
| 1998 | 99 | 18.9 | 3.1 | NA | 0 |
| 1999 | 110 | 16.2 | 1.6 | NA | 0 |
| 2000 | 133 | 16.6 | 2.0 | NA | 0 |
| 2001 | 114 | 22.6 | 6.0 | NA | 1 |
| 2002 | 189 | 18.5 | 3.2 | NA | 0 |
| 2003 | 146 | 25.4 | 8.1 | 47 | 8 |
| 2004 | 120 | 23.7 | 6.7 | 34 | 3 |
| 2005 | 107 | 24.7 | 8.4 | 58 | 11 |
| 2006 | 109 | 30.6 | 16.3 | 51 | 4 |
| 2007 | 373 | 27.6 | 11.0 | 49 | 62 |
| 2008 | 232 | 26.5 | 9.8 | 49 | 67 |
| 2009 | 321 | 31.4 | 18.3 | 53 | 87 |



WDNR Fish Biologist Kendall Kamke holding six trophy-sized sheepshead on the assessment trawler fall 2008.

Report Prepared by Shannon Davis-Foust
30 June 2010