2016 Winnebago System Sturgeon Spearing Season

Post-Season Synopsis

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License sales for the Lake Winnebago spear fishery have steadily been increasing since 2006 and a record number of licenses (13,190) were sold prior to the 2016 season. An additional 484 spearing licenses were sold for the Upriver Lakes fishery (5,981 applicants were in the lottery). Applicants needed a minimum of 6 preference points to be drawn for an Upriver Lakes license in 2016.

Water clarity is by far the biggest predictor of spearing success. Clarity averaged 9' on Lake Winnebago and 7' on the Upriver Lakes leading up to the start of the 2016 sturgeon spearing season. Seven feet of visibility on the Upriver Lakes allowed spearers to see bottom throughout most areas, but clarity on Lake Winnebago was less than ideal and spearers braced for a long season. Typically clarity of 12' or greater is required for a harvest that would reach the caps and trigger an early season closure.

Further, it had been a mild winter, but a well-timed cold snap the week of the season firmed up ice conditions for opening weekend. However, warm weather combined with rain during the first full week deteriorated lake access points and many spearers decided to pull their shacks from the ice well before season's closure. There's a saying in the area that "Mother Nature protects her own" and it appeared that would be the case for the 2016 sturgeon spearing season.

The opening day harvest of 84 lake sturgeon from Lake Winnebago was the 4th lowest since spearing hours were shortened, a regulation enacted prior to the 2002 season (Table 1). Only the 2006, 2012, and 2013 seasons had lower opening day harvests and each of those seasons had similarly poor water clarity conditions. The Upriver Lakes fishery boasted an opening day harvest of 151 fish, ranking 6th highest of the 10 seasons occurring since the lottery fishery was implemented in 2007.

Table 1. Number of lake sturgeon harvested, average water clarity, and shanty counts for opening day of the 2002-2016 sturgeon spear fisheries on Lake Winnebago.

Year	LW Harvest	Water Clarity (ft)	LW Shanty Count
2016	84	9	3831
2015	468	12	4436
2014	636	15	4046
2013	41	8	2724
2012	39	10	2197
2011	283	13	4321
2010	515	16	4033
2009	389	14	5958
2008	635	18	3171
2007	195	10	4411
2006	39	6	3434
2005	215	16	2604
2004	1310	15	4751
2003	248	7.5	4150
2002	228	7.5	4368

The Upriver Lakes fishery closed after 7 days with a harvest of 307 fish (32 juvenile females, 94 adult females, and 181 males). The 7 day season was the 2nd longest since the lottery fishery was implemented in 2007, with only the 10-day season in 2011 being longer. A total of 11 fish 100 pounds or larger were harvested during the Upriver Lakes fishery, including Daniel Bloesl's 77.0", 147.9 (photo inset right) pound female that was the largest fish harvested from the Winnebago System during the 2016 season.

As anticipated based on poor water clarity, the Lake Winnebago fishery went the full 16 days. The harvest of 397 fish (52 juvenile females, 155 adult females, and 189 males) was well below average, ranking 55th out of 74 seasons dating back to 1941. There were 8 fish tipping the scales at 100 pounds or larger harvested, with Jeremy Witzel's 78.3" 131.6 (photo inset below) pound fish being the heaviest fish taken from Lake Winnebago.

We have been tracking the contribution of 100 pound and larger fish to the harvest since the 1950s (Figure 1). The 1955-2005 seasons on Lake Winnebago averaged 0.82% of the fish harvested being 100 pounds or larger, while the percentages of these large fish increased drastically during the 2006-2014 seasons (average 4.8%). This was highlighted by the 2013 season where 9.5% of the fish harvested from Lake Winnebago were 100 pounds or larger. Contribution of these large fish decreased to 2.0% for the 2015 and 2016 seasons but percentages are still above the long-term average. Percentages of 100+ pound fish in the harvests from the Upriver Lakes have followed similar trends, with the exception that peak percentage of large fish topped out at 6.2% in 2012 and have remained above 3% during the last few seasons (Figure 1).

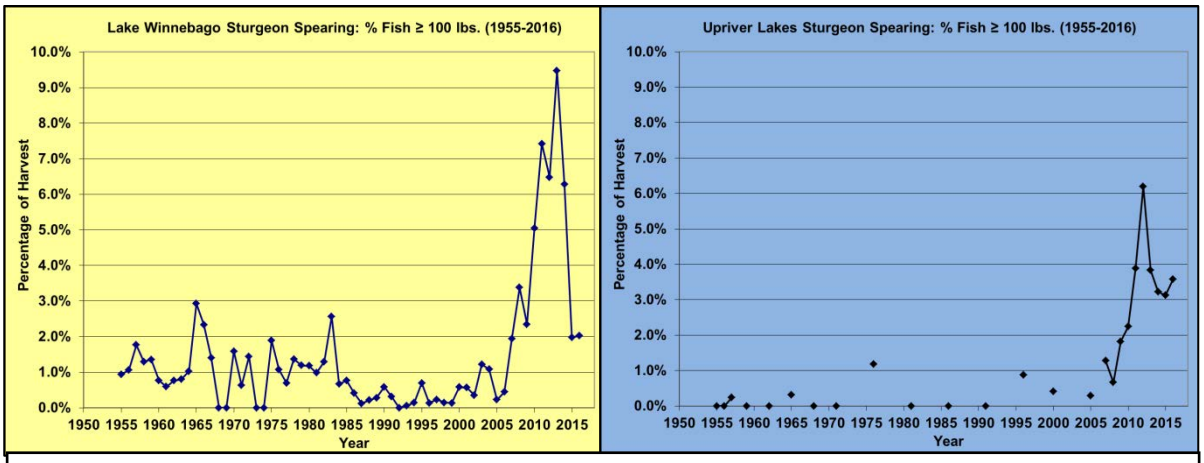


Figure 1. Percentage of 100+ pound fish in the Lake Winnebago (top panel) and Upriver Lakes (bottom panel) lake sturgeon harvest (1955-2016 seasons).

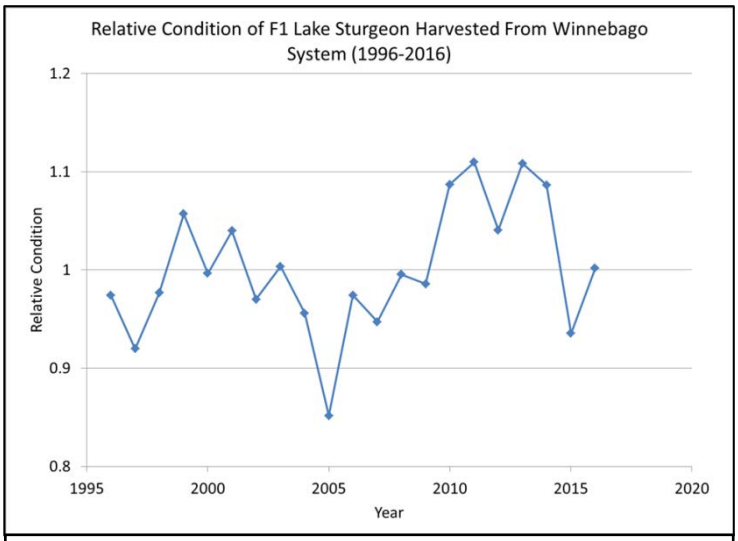


Figure 2. Relative condition (plumpness) of lake sturgeon harvested from the Winnebago System during the 1996-2016 sturgeon spearing seasons.

On the surface, the stark decrease in 100+ pound fish in the harvest is alarming and may be cause for concern. However, when taking a closer look at length-weight relationships of fish in the respective harvests, it's apparent that the decrease is a result of decreased fish condition (relative plumpness) not a decrease in size structure (Figure 2). Relative condition has fluctuated wildly over the past 20+ years, but there was a five year stretch from 2010-2014 where condition was much higher, which coincided with the highest contribution of 100+ pound fish (Figures 1-2). Fish harvested in 2015 were in the lowest condition since 2005, but condition did rebound to more normal levels in 2016.

Condition data also explains the complete rewriting of the record books that took place from 2010-2013. 8 of the top 11 heaviest fish dating back to 1941 were harvested during these 4 seasons. This includes the current state record 212.2 pound lake sturgeon that was harvested in 2010. There have been fish of greater length than the majority of these heaviest fish on record, but they simply aren't in the same condition (weight) as fish harvested from 2010-2013. For example, the two longest fish harvested in 2015 were 80.1" (122.5 pounds) and 81.3" (137.5 pounds). The 81.3" fish was longer than 9 of the top 11 heaviest fish on record, but was 34 pounds short of making the list. Further, the 80.1" fish was longer than 8 of the top 11 heaviest fish, but 49 pounds lighter than the 11th heaviest fish.

Variability in fish condition data is mostly due to changes in abundance of forage items from year to year. Chironomid lake fly larvae (redworms) and gizzard shad are the two primary forage items for lake sturgeon in the Winnebago System, but fish will also feed on isopods and zebra mussels. Foraging patterns of lake sturgeon during the spearing season has been thoroughly evaluated through stomach content analyses conducted during the 1994 and 2013-2016 seasons. Chironomid larvae were the staple food source observed in sturgeon stomachs collected from Lake Winnebago during the 1994, 2015, and 2016 seasons, while gizzard shad were the primary diet item observed in 2013 and 2014 (Figure 3). Further, 46.2% of sturgeon stomachs sampled from Lake Winnebago in 2015 were empty indicating that both shad and Chironomid larvae abundances were down, resulting in poor condition. A marginal shad hatch and increased Chironomid larvae abundance was observed in advance of the 2016 season, which lead to the uptick in fish condition relative to the 2015 season. These data show the importance of gizzard shad to sturgeon condition.

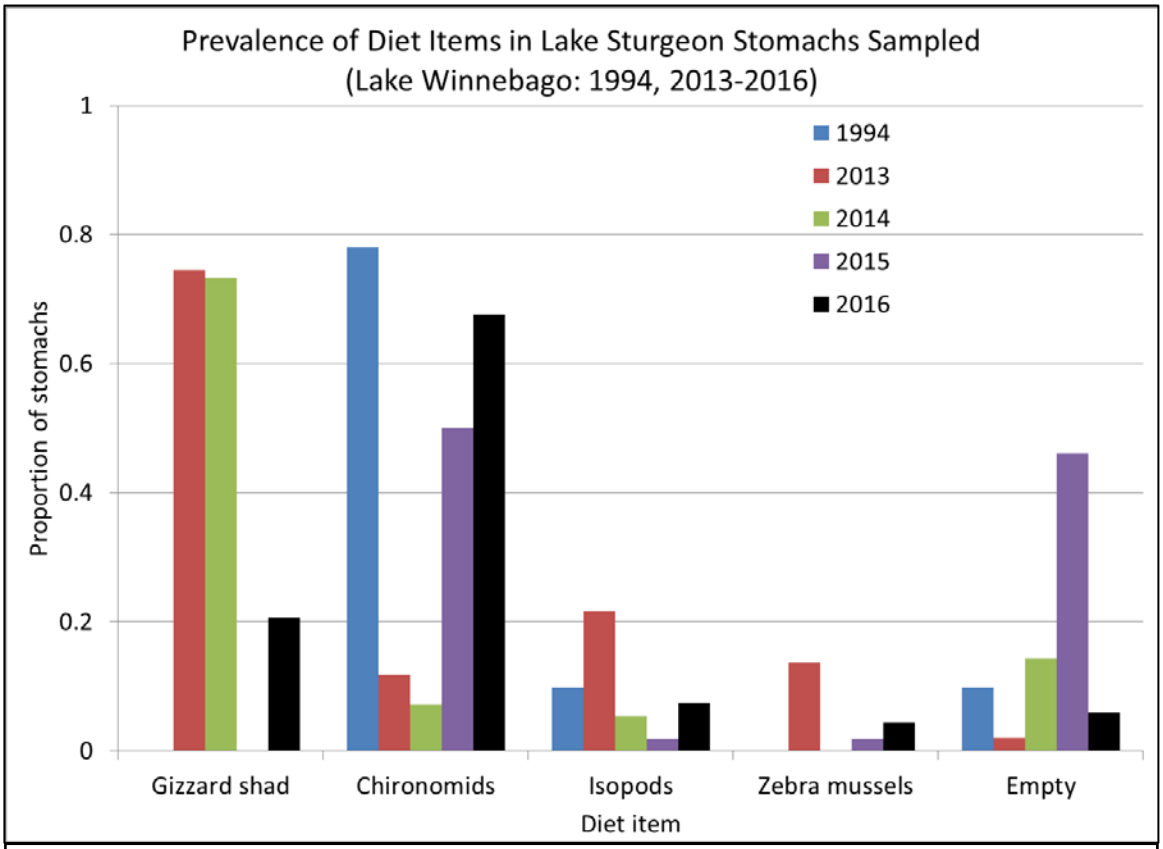


Figure 3. Proportion of lake sturgeon stomachs collected from Lake Winnebago that contained gizzard shad, Chironomid larvae (redworms), isopods, zebra mussels, and were empty (1994; 2013-2016 seasons).

Overall, the 2016 sturgeon spearing season went as predicted. Water clarity conditions were not ideal and ice conditions deteriorated during the season leading to reduced effort. However, after reflecting further I believe that this season was a success given the conditions. The lakes were still open in early January and there was concern of whether there would even be a season. Luckily we did get some cold weather to make

ice, but the water was extremely dirty at time of ice formation. I heard numerous reports of water so dirty that you could hardly see the bottom of the ice in some areas. However, clarity improved to about 9-10' on Lake Winnebago and 7' on the Upriver Lakes around the beginning of February. Further, the 2016 harvest may have been below average, but the season provided another opportunity for spearers to renew traditions, spend time with family and friends, and make memories of another spearing season. Over 700 spearers were able to fill their tag and there were no major safety issues meaning everyone was able to pursue their fish safely. Thank you to everyone for making the 2016 sturgeon spear fishery another safe and successful season!

Ryan Koenigs

Winnebago Sturgeon Biologist

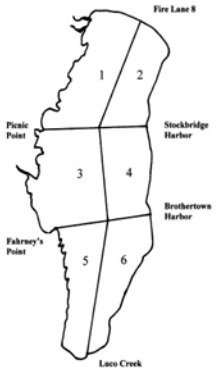
Station Totals

	Juv. Female	Mat. Female	Male	Totals
Waverly Beach	1	4	2	7
Harrison Town Hall	0	1	1	2
Stockbridge	23	39	46	108
Quinney	9	21	16	46
Pipe	9	25	30	64
Wendt's	7	25	50	82
Jerry's	1	17	11	29
Payne's Point	2	23	33	58
Critters	12	44	83	139
Indian Point	8	30	59	97
Boom Bay	12	20	39	71

L. Winnebago	52	155	189	396
Upriver Lakes	32	94	181	307
Total	84	249	370	703

Area Totals

	Juv. Female	Mat. Female	Male	Totals
L. Winnebago Area 1	3	17	26	46
L. Winnebago Area 2	13	25	31	69
L. Winnebago Area 3	1	25	21	47
L. Winnebago Area 4	19	41	33	93
L. Winnebago Area 5	6	26	49	81
L. Winnebago Area 6	10	21	29	60
L. Butte des Morts	5	15	33	53
L. Poygan	20	65	121	206
L. Winneconne	7	14	27	48



Lake Winnebago Averages

	Length	Weight	Number
Juv. Female	47.47	23.13	52
Mat. Female	64.09	66.15	155
Male	54.97	39.29	189

Upriver Lakes Averages

	Length	Weight	Number
Juv. Female	47.08	24.23	32
Mat. Female	63.36	70.60	94
Male	54.69	41.58	181