WISCONSIN DEPARTMENT OF NATURAL RESOURCES

2025 Lake Sturgeon Spawning and Population Assessment
The Winnebago System

Introduction And Objectives

The Wisconsin Department of Natural Resources (DNR) has closely monitored the Winnebago System lake sturgeon population through annual spawning surveys since 1975. To estimate the population of lake sturgeon in the Winnebago system, the biologists need information from both the tagging efforts during the spring spawning run as well as the information on the number of recaptured fish during the spearing season. This consistent monitoring has allowed the lake sturgeon population to increase and thrive over the decades.

During the spawning run, DNR employees and volunteers tag lake sturgeon and collect vital information to ensure the population is healthy. There are over 70 spawning sites throughout the Winnebago System. Many sites are only used by a few lake sturgeon each year, while others attract hundreds of fish. During the spawning season, the primary objectives include:

1) Mark fish for estimates of abundance and exploitation (harvest rates)
2) Monitor size structure
3) Evaluate growth and mortality
4) Evaluate movement
5) Determine river and spawning site fidelity of adult lake sturgeon

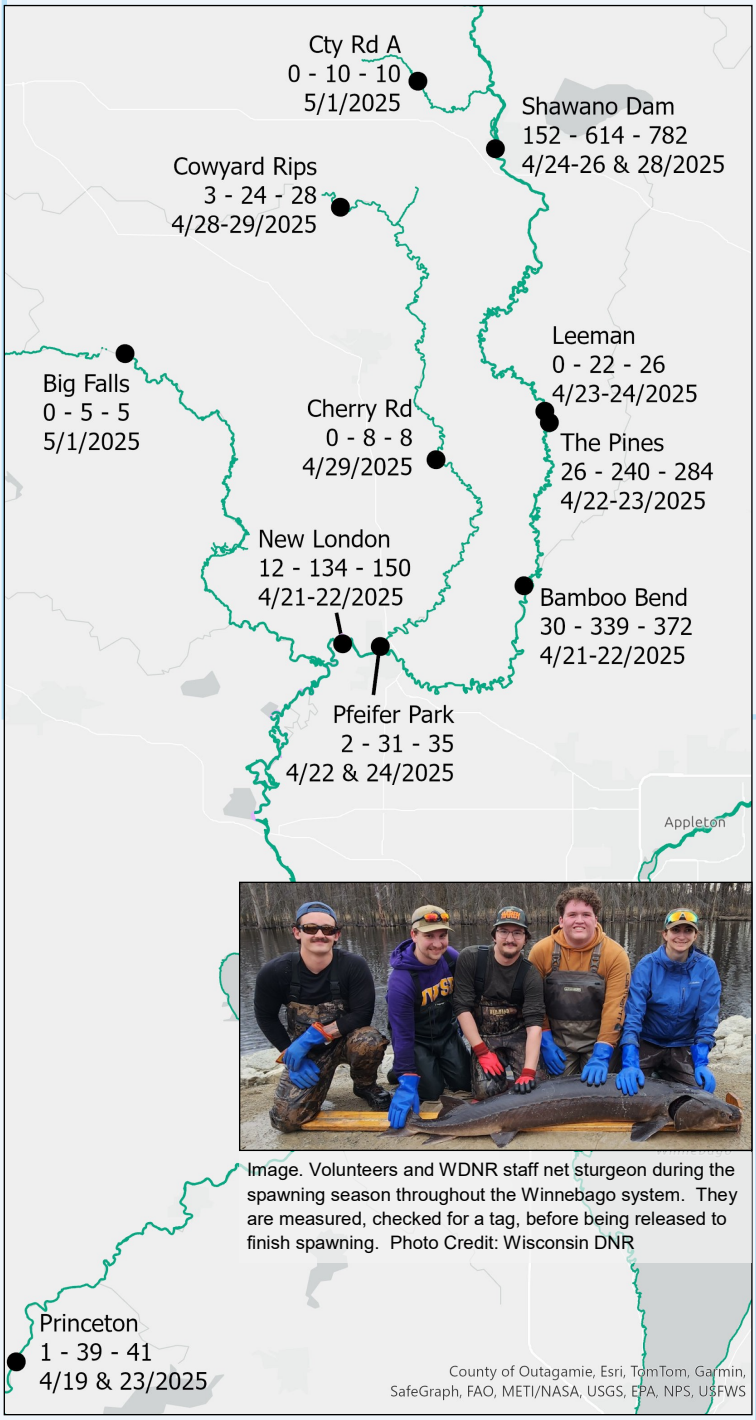


Figure 1 (left). Spawning sites sampled within the Winnebago system in 2025. Numbers at each site indicate the number of females, males, and total number of lake sturgeon handled, respectively. Dates sampled for each site are also noted.

Image. Volunteers and WDNR staff net sturgeon during the spawning season throughout the Winnebago system. They are measured, checked for a tag, before being released to finish spawning. Photo Credit: Wisconsin DNR

DNR Contact

Margaret Stadig
Winnebago Lake Sturgeon Biologist
625 E County Rd Y
Oshkosh, WI
Phone: 920-410-8670
Email: Margaret.stadig@wisconsin.gov

System Information

Wolf River Miles: 167 miles
Little Wolf River Miles: 14 miles
Embarrass River Miles: 54 miles
Upper Fox River Miles: 41 miles

Regulations

Harvest is only permitted during the February spearing season
Annual Bag and Size Limit:
One Lake Sturgeon per season
Minimum length: 36 inches

Survey Method

- The Upper Fox, Wolf River and all tributaries were sampled for adult spawning lake sturgeon using dip nets at spawning locations and electrofishing at other locations.
- DNR staff handle as many fish as possible during the spawning run.
- Captured fish are measured for total length to the nearest 0.1 inches. Sex (male/female) and spawning stage (green/ripe/spent) are determined.
- Fish are inspected for internal (PIT) and external (MONEL) tags. New PIT tags are inserted into any unmarked fish.

Metric Descriptions

- A **mark-recapture method** is used to estimate the population. Lake sturgeon are captured during the spring spawning assessment and internally PIT-tagged and released. This is the fish's initial mark. During the spearing season, all harvested lake sturgeon were checked for PIT tags. This is the fish's recapture.
- A **population estimate** is a metric that describes population size. For Winnebago lake sturgeon, the number of previously tagged individuals during the spearing season, and proportions of marked individuals to unmarked individuals were used to estimate the population estimate of the lake sturgeon for 2025.
- **Length frequency distribution** is a graphical representation of the number or percentage of fish captured by two-inch size intervals. Smaller fish (or younger age classes) may not always be represented in the length frequency as they are usually not sexual mature and do not make the migration to spawn.

2025 Lake Sturgeon Spawning Summary

- Weather this spring was as normal as it can get for Wisconsin with air and water temperatures gradually increasing. This likely contributed to a fairly standard lake sturgeon spawning season. Spawning activity started in Princeton around April 19th. As the water warmed, lake sturgeon in New London and Shiocton started spawning on April 20th. On the Wolf River, this gradual warming culminated in spawning at the Shawano Dam on April 24th (Figure 2).
- From April 21st through May 1st, 1,741 of lake sturgeon were handled by the DNR (1,579 unique individuals).
- We handled fish on the Embarrass River (71 sturgeon), the Fox River (41 sturgeon), the Little Wolf River (5 sturgeon), the Wolf River (1,614 sturgeon), and the Red River (10 sturgeon).
- We continue to see a good range of lengths for both males and females (Figure 3). It is not surprising that we are once again seeing a good number of large female lake sturgeon (66 sturgeon over 70 inches). Females regularly grow faster and bigger than males. But what is surprising is the number of large males we continue to see during the spawning season. Male lake sturgeon are estimated to need more than 55 years to reach 70 inches compared to 50 years for females. This year there were 23 male lake sturgeon over 70 inches in length. This is the most number of males over 70 inches ever captured during the spawning season (Figure 4).
- 79 females (87.7% of females) were captured were not previously tagged. 694 males were not previously tags (51.9% of males). This is about the average percentage of both males and females handled during the spawning season that were not previously tagged.
- In 2021, a habitat project was completed off Cherry Road on the Embarrass River. There has been regular reports of spawning at this location, but DNR staff had not yet been able to handle fish here, until this past year. When DNR staff arrived, there were likely about 10 to 20 fish cruising around exhibiting some pre-spawning activity. The DNR were able to handle eight lake sturgeon. Of these fish six were new individuals. Surprisingly, the last two fish were both previously tagged at the Shawano Dam and not on the Embarrass River.
- There were other sites on the Embarrass River with regular accounts of lake sturgeon spawning but the DNR has never able to catch fish. The Cowyard Rips is in a state natural area and has natural riffles for spawning. This year, about 30 to 40 fish were observed spawning throughout the site in the deep parts of the riffles. Twenty-four sturgeon were handled at this site over two days with only 6 of these fish being tagged previously. Surprisingly only 1 of these 6 fish was initially tagged in the Embarrass River. All the other previously tagged fish came from the Wolf River.
- Gametes were successfully collected for the various rehabilitation programs and research projects in areas throughout the United States.

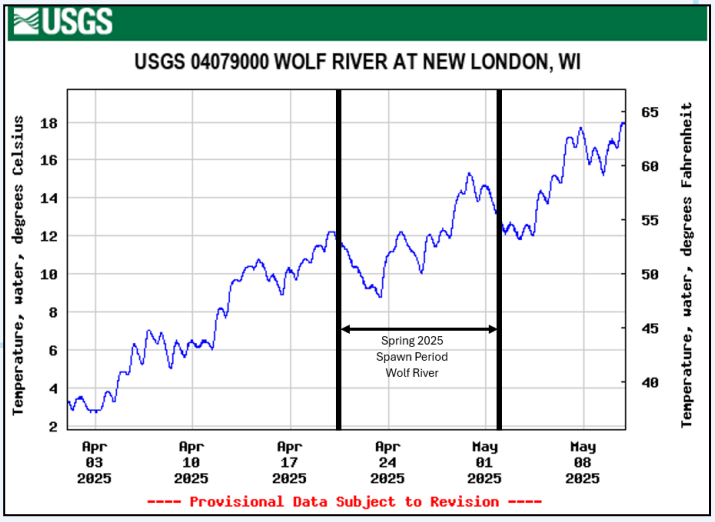


Figure 2. Water temperature taken from the USGS monitoring station on the Wolf River near New London, Wisconsin, during the spring of 2025. Vertical black lines indicate spawning periods on the Wolf River.

2025 SPAWNING SIZE STRUCTURE METRICS

Total Number	Total Handled	New Fish Tagged	Length Range (inches)	Average Length (inches)
Males	1,466	694	35.9—73.8	58.7
Females	226	179	52.2—78.6	66.3
Unknown	49	31	41.0—70.9	54.8
Total	**1,741**	**904**	**35.9—78.6**	**59.6**

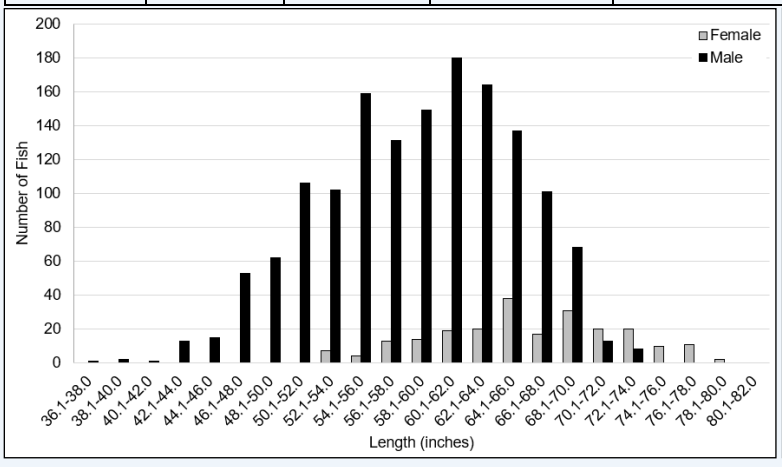


Figure 3. Length Frequency of adult female and male lake sturgeon handled during the 2025 spring spawning stock assessment conducted on the Winnebago System

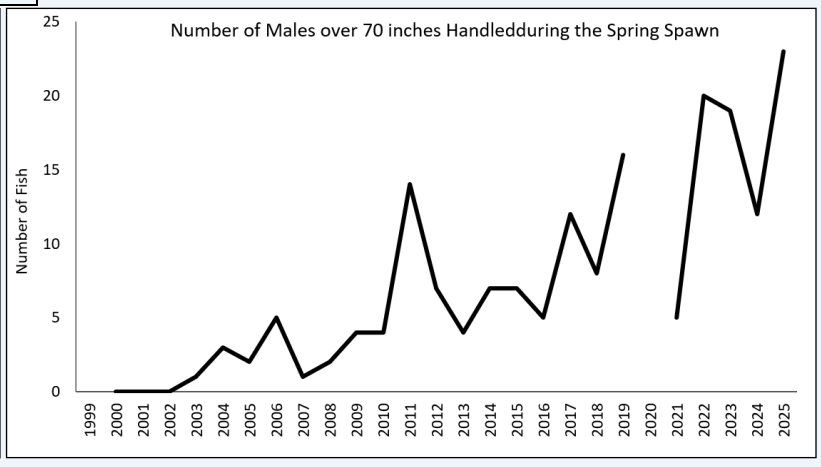


Figure 4. Number of males handled during the spring spawning season that were over 70 inches in length (no sturgeon were sampled in the year 2020).

ADULT POPULATION ESTIMATES FOR 2025		
	Male	**Female**
New Fish Marked in Spring 2024	556	114
2025 Spearing Season Total Harvest	478	322
2025 Spearing Season Recaptures	120	36
Population Estimate (95% CI)	23,797 (20,453—28,037)	12,288 (9,138—17,084)
5-year Average Population Estimate	24,528	14,654

2025 Lake Sturgeon Population Estimates

- The adult male lake sturgeon population estimate continues to be stable at about 25,000 individuals in the Winnebago System. In 2025, the adult male population is estimated to be 23,797 (Figure 5).

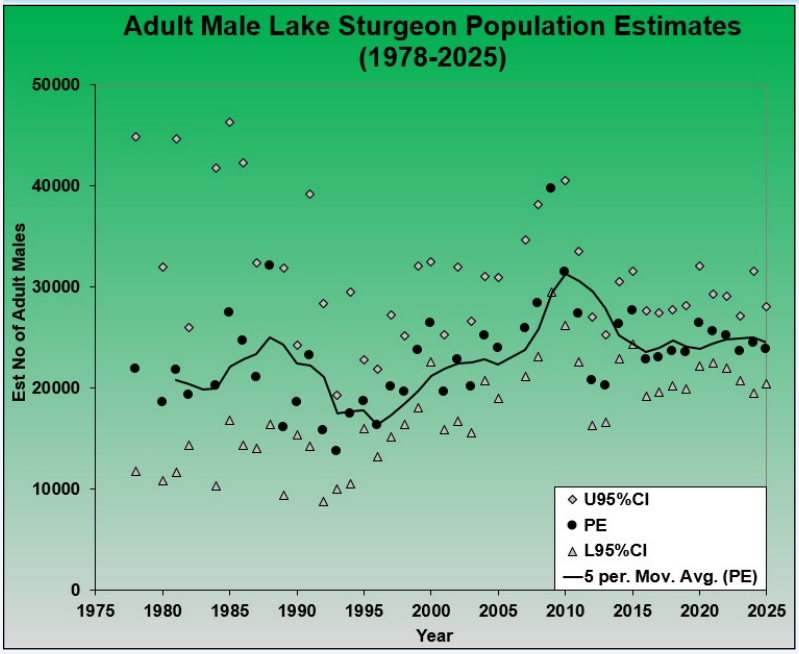
- The adult female population estimate continues to fluctuate between 12,000 and 18,000 individuals. There was estimated to be 12,288 fish in 2025 (Figure 6) with a 5-year average of 14,654 fish. Despite a modest decline, the population remains at healthy levels above those from the 1980s through early 2000s.

- The population of female sturgeon is healthy and within the range of population levels that has allowed for a healthy population and good harvest in recent years. While the population estimate has declined slightly in recent years, there is not a reason for concern at this point. First, due to it being impossible to physically count every fish in the population, we must make an estimate based on the mark-recapture sample. There is inherently some uncertainty around any population estimate. The estimate currently used to calculate the population is highly sensitive to number of fish tagged annually as well as the number of fish harvested. This can lead to fluctuations in the population estimate that can either be real or due to random chance such as years where weather plays a significant role in the outcome of either spearing or spawning. When all that uncertainty in each estimate is taken into account, we cannot find a statistically significant trend. In other words, we cannot say confidently that the trend is real, as it could also likely just be due to random chance associated with our sample.

- Another reason we are not concerned with this modest decrease is because the male population is not experiencing the same fluctuations. The female population estimate is likely more susceptible to random chance and fluctuations due to fewer females tagged and harvested annually. The male population estimate regularly has more fish tagged annually and harvested accounting for less variation and fluctuations.

- Finally, and more importantly, if there has been a modest decline, this is why the harvest cap is set at 5% of the last 5-year population estimates. By using a 5-year average, some of the variation is already accounted for in the harvest cap. The harvest cap set at 5% also has been set to ensure that it is very unlikely that harvest is the reason for the decline. This harvest cap also was set to allow the system to respond positively if the population ever does start to decline.

- Overall, the Winnebago lake sturgeon population has healthy numbers of individuals . Continuing to monitor the sturgeon population annually is critical to ensure the long-term sustainability of the population.



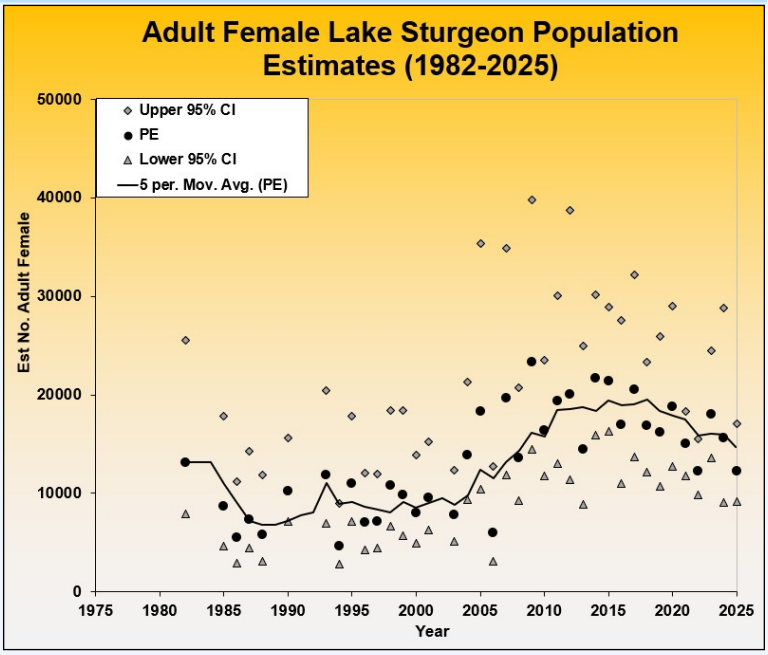


Figure 5 (left graph) & 6 (right graph). The population estimate (black dots) of the adult male lake sturgeon (left graph) and adult female lake sturgeon (right graph) within the Winnebago system. The solid line indicates the 5-years average of the population estimate.