



# WISCONSIN DEPARTMENT OF NATURAL RESOURCES

## 2023 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. The combined tagging efforts during the spring spawning run and identifying recaptured fish during the spearing season help biologists estimate this sturgeon population. 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 sturgeon each year, while others attract hundreds of fish. During the spawning season, the DNR's 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

### Metric Descriptions

- **A population estimate** is a metric that describes population size, and it's estimated by the **mark-recapture method**. Lake sturgeon captured during and before the 2022 spawning assessment were internally PIT-tagged and released. During the 2023 spearing season, all lake sturgeon were checked for PIT tags. The number of previously tagged individuals was recorded, and proportions of marked individuals to unmarked individuals were used to estimate the total abundance of the lake sturgeon population for 2024.
- **Length frequency distribution** is a graphical representation of the number or percentage of fish captured by 2-inch intervals. Smaller fish (or younger age classes) may not always be represented in the length frequency because they are usually not migrating to spawn yet.

### DNR Contact

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### River 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.
- 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.

### LAKE STURGEON — CATCH PER SITE

Site	River System	Females	Males	Total Number Captured
Riverside Park - Berlin	Fox River	1	2	3
Princeton	Fox River	0	15	15
Pfiefer Park	Embarrass River	3	14	17
Hwy X - New London	Wolf River	2	24	26
Bamboo Bend - Shiocton	Wolf River	13	168	181
The Pines	Wolf River	0	1	1
Shawano Dam	Wolf River	96	491	587
Total New Fish Tagged	Winnebago System	76	314	390
Total Recaptured Fish	Winnebago System	39	401	440

### 2023 SPAWNING SIZE STRUCTURE METRICS

Total Number	Total Number Handled	Length Range (inches)	Average Length (inches)
Males	715	38.9 - 75.4	58.0
Females	115	54.0 - 79.3	66.3
<b>Total</b>	<b>830</b>	<b>38.9 - 79.3</b>	<b>59.1</b>



A large spawning female from the Shawano dam being measured and tagged by the DNR and volunteers during the 2023 spawning season. / Photo credit: Wisconsin DNR

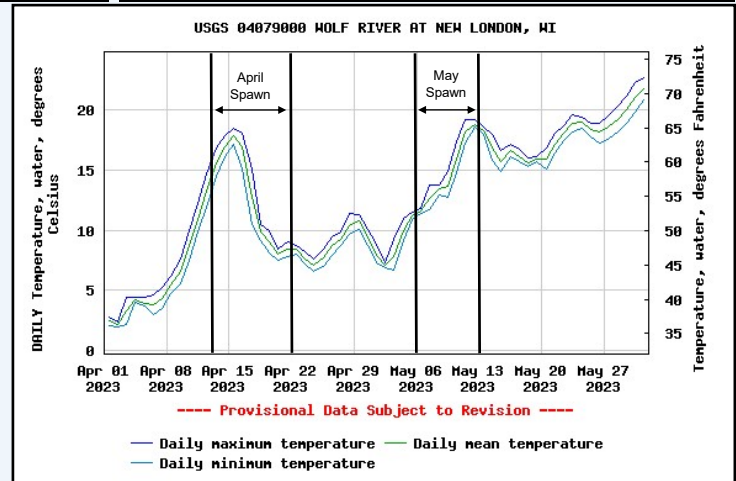


Figure 1. Water temperature of the Wolf River near New London, Wisconsin, during the spring of 2023 from the USGS gauge. Vertical black lines indicate spawning periods.



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2023 Lake Sturgeon Spawning Summary

- With both warm and cold periods of weather (Figure 1), lake sturgeon had two distinct spawning periods in 2023. From April 13-22, 231 lake sturgeon were handled. The second spawn occurred from May 5-9, and a total of 599 lake sturgeon were handled.
- Lake sturgeon were observed spawning on the Fox, Wolf, Little Wolf and Embarrass Rivers. While no fish were tagged at the Manawa Dam on the Little Wolf River, field observation indicates a higher number of spawning fish at this site compared to other years. Larval fish were observed downstream of the Manawa Dam after the spawn.
- Only 830 fish were handled. This is fewer fish than average (an average of 1,138 fish have been handled annually since 1999), likely due to cold weather during the April spawn. River conditions in April were unstable, and the fish were hard to net and remained mostly offshore.
- Of the fish that were handled, 50% were new, and 50% were recaptured. This is nearly the same proportion regularly seen during the spawn, and it's usually affected by the sites sampled during the spawn. Large sites, such as New London, Shiocton and Shawano, have a higher proportion of tagged fish compared to smaller sites.
- Average lengths of both females and males were comparable to previous years. The largest fish handled during the 2023 spawning season was a 79.3-inch female at the Shawano dam in May (Figure 2).

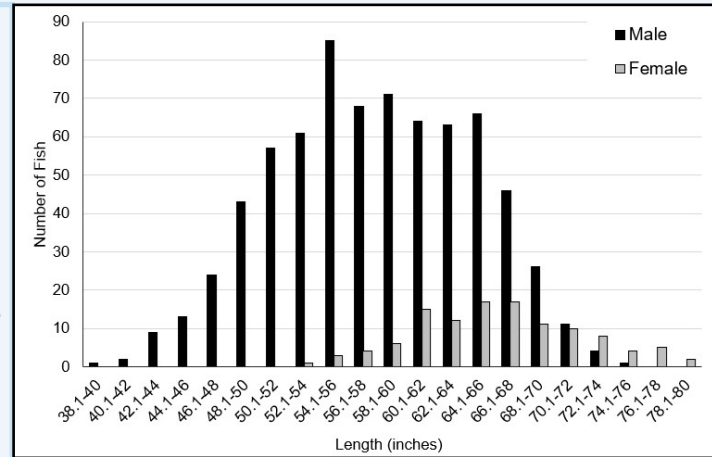


Figure 2. Length frequency of adult female and male lake sturgeon handled during the 2023 spring spawning stock assessment conducted on the Winnebago System.

2023 Lake Sturgeon Population Estimates

- Lake sturgeon population estimates are calculated using a mark-recapture method. For the Winnebago System, lake sturgeon mark events occur during the spring spawning assessment, and recapture events occur the following spawning season. For the 2023 population assessment, the mark information is from the 2022 spawning assessment, while the recaptured fish information is from fish harvested during the 2023 spawning season (table below).
- In 2023, an estimated 23,625 adult male lake sturgeon are within the system, with a 5-year average of 24,851 fish (Figure 3). It's the eighth year the population estimate for adult males has been approximately 24,000 fish.
- The adult female population was estimated to be 18,061 fish in 2023 (Figure 4). This is an increase from the 2022 population, and it's consistent with population estimates from 2016 to 2021. The 5-year average is 16,099 fish.
- The Winnebago System continues to have stable numbers of lake sturgeon, indicating a good, sustainable population.

ADULT POPULATION ESTIMATES FOR 2023

Total Sampled	New Fish Marked In Spring 2022	Total Harvest For 2023 Spawning Season	Recaptures From The 2023 Spawning Season	Population Estimate (95% CI)	5-year Average Population Estimate
Male	722	649	207	23,625 (20,757—27,135)	24,851
Female	163	756	78	18,061 (13,613—24,479)	16,099

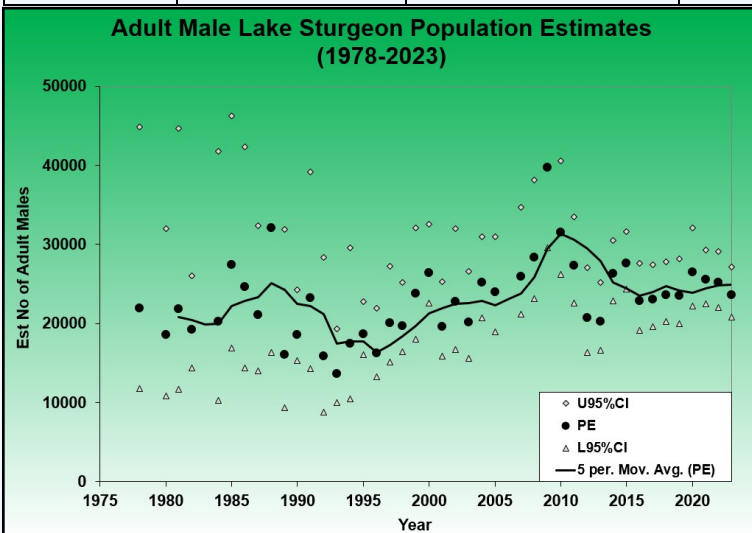


Figure 3. The population estimate of adult male lake sturgeon (black dots). The solid line indicates the 5-year average of the population estimate.

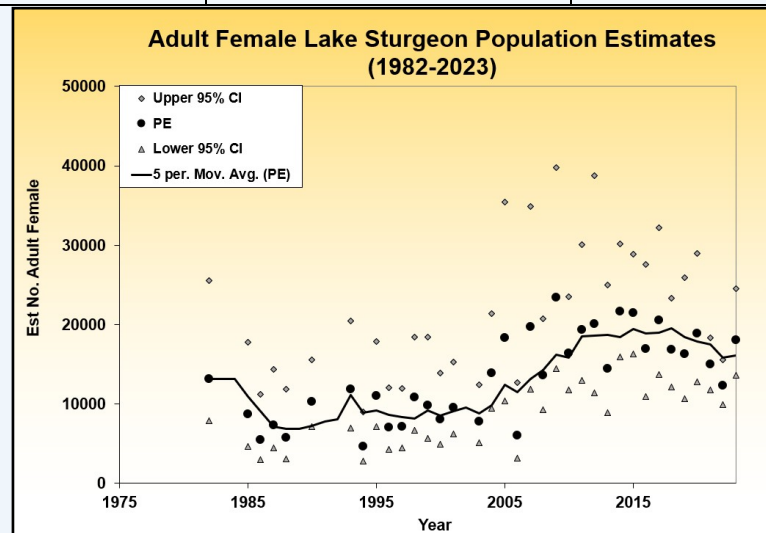


Figure 4. The population estimate of adult female lake sturgeon (black dots). The solid line indicates the 5-year average of the population estimate.