



### Introduction And Objectives

The Winnebago System has one of the largest and most closely monitored Lake Sturgeon populations in the nation. Through meticulous management, this species' population thrives and allows for a sustainable harvest spear fishery during the winter. Stock assessments of Lake Sturgeon in the spring have occurred since 1953, though intermittently between 1953 and 1975. It wasn't until 1975 that annual spring spawning surveys were conducted.

Lake Sturgeon usually spawn when spring water temperatures are between 52 and 58 degrees Fahrenheit. During the spring, thousands of Lake Sturgeon migrate up the Upper Fox, Wolf, Little Wolf and Embarrass rivers to spawn at one of over 75 spawning sites. Many spawning sites have annual spawning pods of Lake Sturgeon, while other sites are only periodically used. Spawning sites in New London, Shiocton and the Shawano Paper Mill Dam are great for the public to come see hundreds of Lake Sturgeon spawning on the rip-rapped shores.

Sturgeon tagging during the spring spawning assessment has allowed the Wisconsin Department of Natural Resources (DNR) to gain a better understanding of Lake Sturgeon life history. This tagging effort also makes up part of the framework used to estimate the Lake Sturgeon population abundance and, ultimately, the harvest caps and rates for the annual spear fishing season in the winter. The primary objectives are:

- 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

### DNR Contact

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### Lake Information

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

### Regulations

Daily Bag and Size Limit:  
Lake Sturgeon harvest only during the  
February spearing season  
One Sturgeon per Season  
36 inch minimum length

### Metric Descriptions

- **A population estimate is a metric that describes population size and is estimated by mark and recapture.** Lake Sturgeon captured during the 2021 spawning assessment were internally PIT tagged and released. During the 2022 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 2022.
- **Length frequency distribution (LFD) 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 yet migrating to spawn.

### Survey Method

1. The Upper Fox and Wolf river systems and all tributaries were sampled for adult spawning Lake Sturgeon using dip nets at spawning locations.
2. DNR Fisheries staff work during the spawning run and handle as many fish as possible.
3. Captured fish are measured for total length to the nearest 0.1 inches. Sex (male/female) and spawning stage (green/ripe/spent) are determined.
4. Fish are inspected for internal (PIT tags) and external (MONEL tags) tags. New PIT tags are inserted into any unmarked fish.

### LAKE STURGEON — CATCH PER SITE

Site	River System	Females	Males	Total Number Captured
Princeton	Fox River	3	23	27
Sturgeon Trail	Wolf River	17	129	148
Bamboo Bend	Wolf River	53	470	536
The Pines	Wolf River	9	97	106
Diemels	Wolf River	3	30	35
Hwy 156	Wolf River	0	4	4
Boat Ramp CCC	Wolf River	0	14	15
Shawano Dam	Wolf River	145	726	883
Pfiefer Park	Embarrass River	0	6	6
Total New Fish Tagged	Winnebago System	163	722	885
Total Recaptured Fish	Winnebago System	67	777	844

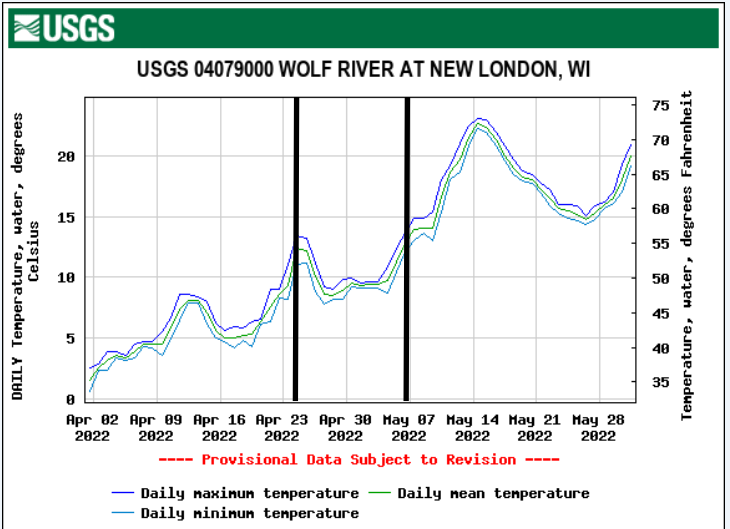


Figure 1. Water temperature of the Wolf River near New London, WI during the spring 2022 from the USGS gauge. Vertical black lines indicate spawning days.



Photo Credit: Rachael Valeria



2022 Lake Sturgeon Stock Assessment Report  
The Winnebago System

Lake Sturgeon

2022 SPWANING SIZE STRUCTURE METRICS				
Total Number	Average Length (inches)	Length Range (inches)	Average Length of Females (inches)	Average Length of Males (inches)
2,047	58.2	37.8 — 82.0	66.0	57.1

ADULT POPULATION ESTIMATE FOR 2022					
	New Fish Marked in Spring 2021	Total Harvest from 2022 Spawning Season	Recaptures from the 2022 Spawning Season	Population Estimate (95% CI)	5-year Average Population Estimate
Male	600	691	148	24,061 (20,913—27,957)	24,622
Female	133	624	69	12,304 (9,899—15,575)	15,857

Species Summary

- The spring weather in 2022 was punctuated by a fluctuation of very warm days followed by very cold days, affecting water temperatures (Figure 1). This caused the spawn to happen later than usual. Most years, the spawning lasts only seven days, with fish only spawning at a site for only two to three days. The spawning period is usually shortened in years when the spawn occurs later in the season. This year, though, was different. The spawn began late on April 25 and lasted over two weeks, extending into May. Sturgeon were spawning at sites for up to six days. DNR crews worked until May 4 but reports indicated Lake Sturgeon continued to spawn 4-5 days after this date.
- Lake Sturgeon were observed spawning on the Fox, Wolf, Little Wolf and Embarrass rivers, though they were only tagged on the Fox, Wolf and Embarrass rivers. While a majority of fish were handled along the Wolf River and its tributaries, there was a record number of fish (28 Lake Sturgeon) handled at the Princeton spawning site on the Upper Fox River.
- In the spring of 2022, 1,499 male Lake Sturgeon were handled. Of these, 777 were recaptured fish. 230 female Lake Sturgeon were handled during the 2022 spawn, with 67 being recaptured.
- The average length of male Lake Sturgeon in the spring of 2022 was 57.1 inches (range 39.8—76.2 inches) and 66.0 inches for female Lake Sturgeon (range 49.4—82.0 inches; Figure 2). Lake Sturgeon exhibit sexual dimorphic growth, with female Lake Sturgeon growing to larger sizes than male Lake Sturgeon. It is not uncommon for female Lake Sturgeon to grow over 70 inches, even reaching 80 inches. What is uncommon is male Lake Sturgeon growing to over 75 inches. In 2022, a male Lake Sturgeon over 76.2 inches long was handled at Shiocton (Figure 2). He is most likely between 65 and 70 years old. He had been caught only once before, in 2011, where when initially tagged at Shiocton.
- Utilizing a mark-recapture system, populations of Lake Sturgeon are estimated using both spawning and spearing information. This year, adult male Lake Sturgeon were estimated at 24,061 fish, with a 5-year average of 24,622 fish (Figure 3). The 5-year average for adult males has been around 24,000 fish for the last eight years. The adult female population was estimated at 12,304 fish, with a 5-year average of 15,857 fish (Figure 4). While it might appear that the population of adult females is declining, this year's population estimates fall within the last 5-year confidence intervals. This means the likelihood is that the decrease in 2022 is a reflection of the variation in the population estimate. Either way, the population estimates continue to be higher than population estimates from the last two decades.
- Gamete collection efforts were successful this year with hatchery staff from the DNR and U.S. Fish and Wildlife Service collecting eggs and milt for rehabilitation programs in Lake Michigan and the Tennessee River watershed. DNR hatcheries also raise Wolf River Lake Sturgeon to help augment spawning population runs in the Upper Fox River. This year, 742 fingerlings were stocked into the Upper Fox River near Monticello. These supplemental stockings are proving fruitful, as two of the fish handled in Princeton this year were stocked in 2003 as a part of this effort.
- I would also like to take a moment and thank all the people who volunteered during the spawn. The information we collect during this time is crucial to the management of this species. If you are interested in Lake Sturgeon and want to learn more about either the spearing season or the spawn, visit:  
<https://dnr.wisconsin.gov/topic/Fishing/sturgeon/SturgeonSpawning.html>

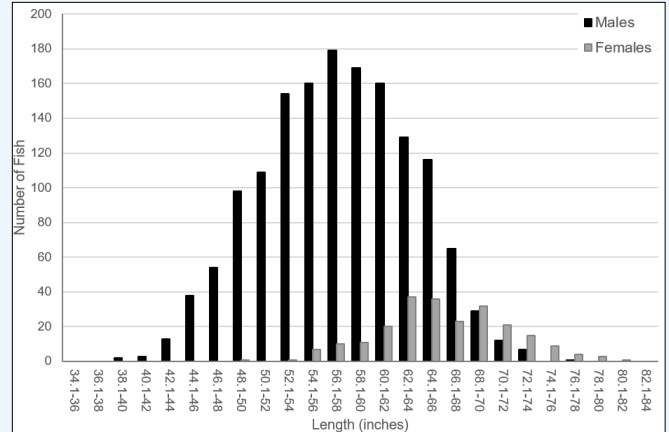


Figure 2. Length frequency of adult female and male Lake Sturgeon handled during the spring of 2022 spawning stock assessment conducted on the Winnebago System.

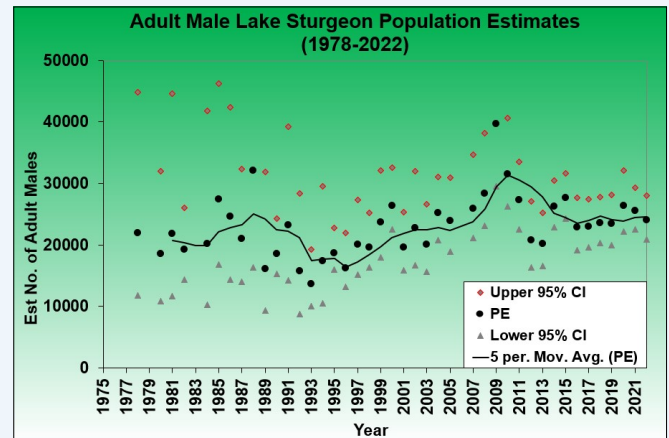


Figure 3. The population estimate of adult male Lake Sturgeon (black dots). The solid line indicates the 5-year average of the

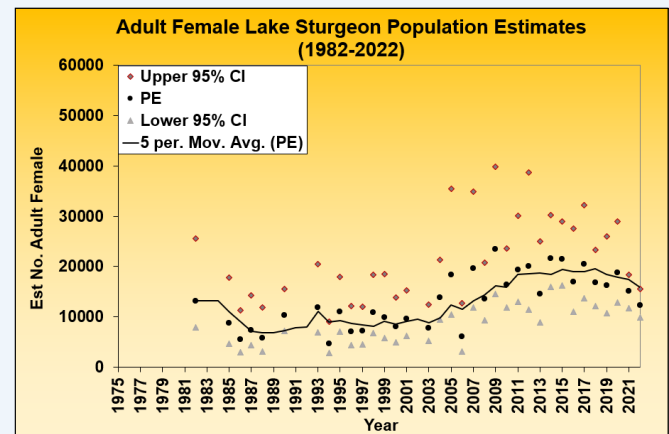


Figure 4. The population estimate of adult female Lake Sturgeon (black dots). The solid line indicates the 5-year average of the population estimate.