

## 2022 Lake Sturgeon Research and Stocking Summary

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The 2022 Black Lake research season began on April 28th when Michigan State University (MSU) and Michigan Department of Natural Resources (MDNR) researchers captured one adult Lake Sturgeon ascending the Upper Black River. Radio Frequency Identification (RFID) data indicated the first sturgeon entered the river on April 23rd, 2022, with the first fish reaching the spawning grounds on April 25th.

A total of 316 adult Lake Sturgeon were captured during the spawning season, of which 68 were captured for the first time (21.52%). Of the first-time captures, four fish were confirmed to be of hatchery origin. The largest single day capture was on May 7th, where the crew sampled 40 fish. Unfortunately, this just so happened to fall on the day of the 20th anniversary celebration day! The largest fish captured this year was a 6.3 ft female that weighed 145.95 lbs. The smallest fish this year was a 12 lb, 2.9 ft lake sturgeon which was originally released above Tower Dam in 2015 as part of a study of how young lake sturgeon interact with the hydropower facilities. This marks the first time one of these fish has been captured in the annual adult survey.

In addition to raising a small number of eggs in the hatchery for research, wild larval Lake Sturgeon were captured as they drifted downstream. Previous research conducted by MSU and MDNR found that wild larvae represent the highest quality genetic source stock, so MSU and MDNR make an effort to fulfill all stocking quotas with fish captured in the wild, where possible. This year, larval drift sampling began on May 19th and continued sparsely until June 12th. At the historical drift site, MSU personnel captured 13,704 larvae across 20 drift nights.

In 2022, 560 Lake Sturgeon were released into the Black River. All fish that were stocked into the Black River were implanted with a passive integrated transponder tag, which will aid future management efforts. In addition, 524 Lake Sturgeon were released into Mullet Lake, all of which were implanted with a PIT tag.

At the direction of the Lake Sturgeon committee and in collaboration with the United States Fish and Wildlife Service, Black Lake Sturgeon for Tomorrow, and Michigan Sea Grant, fall fingerling Lake Sturgeon were released into the Titabawassee (n = 129), Flint (n = 130), Shiawassee (n = 130), and Cass Rivers (n = 130), respectively as part of an ongoing rehabilitation and research effort. This project will continue at an approximate density of 125 Lake Sturgeon from the Black River Streamside Rearing Facility for the foreseeable future. In addition, as part of the ongoing effort to monitor young-of-year lake sturgeon movement, 20 fish from each of the four Saginaw Bay tributaries were implanted with a hydroacoustic transmitter. These transmitters allow researchers to passively monitor the movements of lake sturgeon both in the river, and throughout Saginaw Bay for up to a year post stocking. 2022 was the first of a two-year effort to evaluate how fish move in each of these rivers. Researchers conducted a mark-recapture assessment across four transects from the mouth of the river to Red Bridge nightly from dusk until completion during the week of August 1st, 2022. 26 fish were recaptured across four recapture nights. Based on 17 recapture events, MSU calculated that an estimated 30 lake sturgeon



Michigan State University Facility Supervisor, Doug Larson, holds an adult Lake Sturgeon in 2022.

were in the lower stretch of the upper Black River this year. This survey will continue in 2023, and is a great example of collaboration between MDNR, MSU, and the five

Chippewa-Ottawa Resource Authority Tribes.

Research efforts in 2022 focused on factors contributing to reproductive success; particularly those that can be quantified by data collected from Radio Frequency Identification (RFID) antennas placed throughout the Upper Black River including migratory strategy, inter-annual migratory trade-offs and sperm quality. This work resulted in a publication in the Canadian Journal of Fisheries and Aquatic Sciences.

Finally, Michigan State University collaborated with Dr. Gary Anderson and graduate student Alaina Taylor to collect fin ray samples from adult lake sturgeon for elemental signature analysis. Elemental signatures in fin rays have been used to predict past life history events in fish, such as migration, habitat use, and exposure to pollutants. This study aimed to compare fin rays to known life history events (i.e. point of first known spawn) to determine if onset of sexual maturity can be identified based on elemental composition and/or morphology of the fin ray. Pectoral fin clips were collected from the Black Lake sturgeon population because it has been closely monitored since 2001. Individuals inter-spawning intervals were available from fish tagged with Passive Integrated Transponder (PIT) tags and monitoring with Radio Frequency Identification (RFID) antennas (established 2016).

Continuing research through MSU includes: the selective properties of female lake sturgeon ovarian fluid; downstream outmigration of drifting Lake Sturgeon and the consequences for recruitment; behavioral plasticity as a function of intra-species reproductive competition and its consequences for current and future reproduction. In total, Michigan State University published 9 papers related to lake sturgeon in Black Lake in 2022. Additionally, two manuscripts are in revision or review.

Finally, Michigan State University, Michigan Department of Natural Resources, Tower-Klieber Limited Partnership, and The Black Lake Chapter of Sturgeon for Tomorrow celebrated 20 years of partnership on lake sturgeon restoration on May 7th, 2022. An estimated 200 members of the public were on hand to tour the facility, view lake sturgeon on the spawning grounds, and learn about lake sturgeon life history. The event was documented in a short video, which can be found here: [https://www.youtube.com/watch?v=U\\_K19etbZc](https://www.youtube.com/watch?v=U_K19etbZc). This collaboration was also highlighted in a recent issue of the Lakes Letter, a quarterly publication by International Association for Great Lakes Research.

More information can be found at [glsturgeon.com](http://glsturgeon.com), as can the 20-year bibliography of lake sturgeon research.