This document is intended to provide an update regarding lake sturgeon activities within the Lake Erie basin. Please contact the agency leads listed for more information about a specific project.
Location: Southern Lake Huron and Upper St. Clair River

Project Title: Lake Sturgeon Population Assessment in Southern Lake Huron

Project Description: Southern Lake Huron (Upper St. Clair River) contains one of the largest populations of lake sturgeon in the Great Lakes. In 1995, the Ministry of Natural Resources and Forestry began a mark-recapture study to gain a better understanding of lake sturgeon population demographics at this location. Tagging operations ceased in 2008. Overall, 1,657 lake sturgeon were marked and it is estimated that the lake sturgeon population is near 30,000 individuals. In 2012, the U.S. Fish and Wildlife Service along with the Ministry of Natural Resources and Forestry and Purdy Fisheries resurrected lake sturgeon tagging operations at this location. Lake sturgeon are tagged annually with the cooperation of Purdy Fisheries. Since 2012, 941 sturgeon have been tagged, with 150 tagged in 2018. The goal of this work is to obtain a more precise estimate of lake sturgeon abundance and monitor trends in abundance overtime.

Project Duration: Spring 2012 - Annually

Contact Information:
Justin Chiotti, USFWS, Alpena FWCO - Detroit River Substation, 248-891-0087, justin_chiotti@fws.gov
Chris Davis, MNRF, Upper Great Lakes Management Unit - Lake Huron, 519-371-8303, chris.davis@ontario.ca
**Location:** Southern Lake Huron and Upper St. Clair River

**Project Title:** Lake Sturgeon Gamete Collection in Southern Lake Huron

**Project Description:** Beginning in 2017, the U.S. Fish and Wildlife Service, Ontario Ministry of Natural Resources and Forestry, Michigan Department of Natural Resources, University of Windsor, and Purdy Fisheries began collecting lake sturgeon gametes in order to stock fall fingerling lake sturgeon in the Lake Erie and Huron basins.

The gametes collected will be used to restore the Maumee River, OH and Saginaw River, MI lake sturgeon populations. These lake sturgeon restoration programs are a bi-national effort between Federal, Provincial, State, and non-governmental agencies. The lake sturgeon gametes collected will be reared at either the U.S. Fish and Wildlife Service Genoa National Fish Hatchery or a streamside rearing facility operated along the Maumee River by the Toledo Zoological Society. The upper St. Clair River lake sturgeon population is being proposed as the stock for this reintroduction effort due the large size of the population, on-going monitoring efforts, and is likely similar genetically to what was historically found in the Saginaw and Maumee Rivers (GSU 1; Welsh et al. 2010). All fall fingerlings stocked will receive a PIT tag.

**Project Duration:** Spring 2017 - Annually

**Contact Information:**
Justin Chiotti, USFWS, Alpena FWCO - Detroit River Substation, 248-891-0087, justin_chiotti@fws.gov
Doug Aloisi, USFWS, Genoa National Fish Hatchery, 608-689-2605, doug_aloisi@fws.gov
Rich Drouin, Ontario Ministry of Natural Resources, 519-873-4611, richard.drouin@ontario.ca
**Location:** St. Clair River and Lake St. Clair

**Project Title:** Survey of Lake Sturgeon Populations in the St. Clair River and Lake St. Clair

**Project Description:** The Michigan Department of Natural Resources’ Lake St. Clair Fisheries Research Station (LSCFRS) has been conducting Lake Sturgeon assessment surveys since 1996. Setlines with large and small hooks baited with Round Goby are used in the St. Clair River to catch juvenile, subadult, and adult Lake Sturgeon. A custom trawl, designed to ride over vegetation, is used to capture Lake Sturgeon in the open waters of Lake St. Clair during the summer. Most Lake Sturgeon captured in Lake St. Clair are subadult or adult size fish. All sturgeon captured are scanned for PIT tags and untagged fish are PIT tagged prior to release. Lake Sturgeon over 1,016 mm also receive external Monel tags. The data obtained during these assessments have been used to obtain growth, genetics, distribution, spawning site, and population demographic information. In 2018 we captured a total of 122 Lake Sturgeon during our annual St. Clair River Setline Survey. Of these, 30 were recaptures from previous year’s surveys (25%). Fish caught on setlines ranged from 559 to 1745 mm total length. We captured a total of 29 Lake Sturgeon during our annual Lake St. Clair trawls that target Lake Sturgeon. Of these, two were recaptures from previous surveys (7%). Fish caught in trawls ranged from 1156 to 1808 mm total length.

**Project Duration:** 1996 – Present (annually)

**Contact Information:**
Andrew Briggs, Michigan DNR, Lake St. Clair Fisheries Research Station, Phone: 586-465-4771 ext. 23, BriggsA4@michigan.gov
Location: Buffalo Harbor

Project Title: Lake Sturgeon Monitoring in Buffalo Harbor

Project Description: The New York State Department of Environmental Conservation (NYSDEC) initiated a lake sturgeon population study in 2012 in response to reports of anglers catching lake sturgeon in the Buffalo Harbor. Initially, NYSDEC conducted a gill net and set line assessment, targeting lake sturgeon during the spawning season. After the first two years, it was determined that daytime gill nets, set for approximately 2 to 3 hours, were the most effective method for capturing lake sturgeon in this area. Since then, the gill net assessment has continued annually. In 2014, NYSDEC partnered with the U.S. Fish and Wildlife Service Northeast Fishery Center to monitor lake sturgeon movements using archival satellite transmitters and surgically implanted acoustic telemetry transmitters. All captured lake sturgeon were measured for total length, fork length, girth, weight and tagged using external FLOY tags and internal PIT tags. Also, a small section of the leading spine of the left pectoral fin was removed from each fish, for age determination. A total of 242 sturgeon have been caught, with assigned ages ranging from 8 to 42 years old. Most of these fish were determined to be less than 20 years old. The population of lake sturgeon in the Buffalo Harbor appears to be relatively young; however, this population is meeting restoration objectives outlined in the 2018 NYSDEC Lake Sturgeon Recovery Plan, showing positive signs toward recovery.

Project Duration: Annually

Contact Information: Christopher Driscoll, New York State Department of Environmental Conservation, Region 9, Buffalo, NY

Phone: 716-851-7010, Christopher.Driscoll@dec.ny.gov
**Project Title:** Geographic organization and population structure of lake sturgeon in the Lake Huron-to-Lake Erie corridor

**Location:** Detroit-St. Clair River System; Lake Huron; Lake Erie

**Project Description** This study is using acoustic telemetry to describe the spatial structure and habitat use of lake sturgeon populations that spawn in the St. Clair and Detroit rivers. Since 2011, a total of 282 adult lake sturgeon have been captured in the Detroit and St. Clair rivers, implanted with high-power acoustic tags with a battery life of 10 years, and then released near the capture site. Strategically-located acoustic receivers in the Detroit-St. Clair river system (see map to the right), as well as in lakes Huron and Erie, are allowing scientists to track sturgeon movements over thousands of square miles. Study results have been used to test the hypothesis that a number of separate sturgeon populations occur in the Lake Huron-to-Lake Erie corridor rather than one large population.

**Preliminary results:** The most significant finding of the study so far has been the discovery of significant within-population variability in lake sturgeon migratory behavior (graphic below). Analysis of the movements of 178 individuals over several years identified as many as five distinct migratory strategies or behaviors based on the phenology and duration of river (red) and lake (blue) use. Specific strategies included year-round river residency and multiple lake-migrant behaviors that involved movements between lakes and rivers. Individual movements were repeatable, which suggested that lake sturgeon do not switch behaviors. Differential use of specific rivers or lakes by acoustic-tagged lake sturgeon further grouped individuals into “contingents.” Contingent structure and dynamics suggested that lake sturgeon in the Detroit and St. Clair rivers function as semi-independent units that require separate management consideration. Limited exchange of
spawners between rivers likely prevents the Detroit and St. Clair lake sturgeon populations from becoming genetically distinct. Additional insights provided by the study included 1) the importance of Lake St. Clair as overwintering habitat for lake sturgeon, 2) the potential for complex metapopulation dynamics among lake sturgeon populations in lakes Huron and Erie, and 3) the potential for navigational engineering practices such as channelization to increase lake sturgeon vulnerability to ship strikes. Study results suggest that priorities for future lake sturgeon rehabilitation efforts in the Great Lakes include the protection and restoration of fluvial lakes (e.g., Lake St. Clair), the conservation of genetic and phenotypic diversity (e.g., year-round river residency), and consideration of how lake sturgeon interact with their habitat in human-dominated landscapes.

**Project Duration:** 2012-2022

**Contact Information:** Darryl Hondorp, USGS, Great Lakes Science Center
Phone: 734-214-7241, dhondorp@usgs.gov
**Project Title:** Lake Sturgeon Population Demographics in the Detroit River

**Location:** Detroit River

**Project Description:** The U.S. Fish and Wildlife Service (Service) has been conducting setline assessments in the Detroit River annually since 2002 to obtain information on adult and subadult lake sturgeon. This data is used to obtain growth information, genetics, distribution, potential spawning sites, and population demographic information. To date, the Service has tagged 522 lake sturgeon in the Detroit River. Using mark-recapture data, the estimated population size of adult and subadult lake sturgeon in the Detroit River is 4,422 (95% CI = 2,758 – 6,087) individuals. In the spring of 2018, 45 lake sturgeon were captured during setline assessments. Between 2012 - 2014, 76 lake sturgeon captured in the Detroit River have received transmitters as part of a larger project funded by the Great Lakes Fishery Trust to monitor movement throughout the St. Clair-Detroit River System (see “Geographic organization and population structure of lake sturgeon in the Lake Huron-to-Lake Erie corridor as inferred from long-term, population-scale movement patterns” brief in this report).

**Project Duration:** 2002 - Annually

**Contact Information:** Justin Chiotti, USFWS, Alpena FWCO (Waterford Substation)
Phone: 248-891-0087, justin_chiot@fws.gov
**Project Title:** Juvenile Lake Sturgeon Assessments

**Location:** St. Clair-Detroit River System and western Lake Erie

**Project Description:** The U.S. Fish and Wildlife Service (Service) has been conducting juvenile lake sturgeon (< 1000 mm) assessments in the St. Clair-Detroit River System (SCDRS) since 2010 to evaluate habitat restoration efforts and gain better understanding of juvenile distribution and abundance in the system. Juvenile lake sturgeon have been targeted using otter trawls (4.9 and 6.1 m head rope; 3 mm and 32 mm cod end, respectively), gill nets of varying mesh sizes, and setlines.

In 2018, the Service deployed setlines in the Detroit River, western Lake Erie, and in Maumee Bay targeting juvenile lake sturgeon. A total of 25 setlines were deployed in the Detroit River and five juvenile lake sturgeon were captured. A total of 65 setlines were deployed in the western basin of Lake Erie where 13 juvenile lake sturgeon were captured. Juvenile lake sturgeon captured in the western basin also received an acoustic transmitter to monitor movement and survival. No juvenile lake sturgeon were captured on 18 setlines deployed in Maumee Bay. Setlines were deployed in Maumee Bay to evaluate the success of lake sturgeon stocking in the Maumee River. While we didn’t expect to capture any lake sturgeon in 2018, it will serve as a reference to compare future work.

The Service plans to continue this work in 2019. In addition, habitat attributes will assessed through the collection of various water chemistry and physical habitat parameters including substrate, flow, water temperatures, dissolved oxygen etc.

**Project Duration:** 2010 - Annually

**Contact Information:** Justin Chiotti, USFWS, Alpena FWCO (Waterford Substation)
Phone: 248-891-0087, justin_chiotti@fws.gov
Project Title: Maumee River Lake Sturgeon Rearing Facility

Location: Maumee River

Project Description: Lake sturgeon recruitment in the Lake Erie basin is currently supported by two connecting channels, the St. Clair – Detroit River System and Niagara River. Historically, there were 16 other spawning populations in Lake Erie. In an effort to delist this endangered species in the State of Ohio and throughout the Lake Erie basin, efforts are underway to rehabilitate lake sturgeon populations in suitable river systems. The Maumee River, located in western Lake Erie, historically supported large runs of lake sturgeon, but currently are considered functionally extirpated from this system. A habitat suitability model for spawning adult and age-0 lake sturgeon indicates sufficient habitat is present in the Maumee River (Collier, 2018). Therefore, the river is a strong candidate for a lake sturgeon reintroduction. A lake sturgeon restoration plan has been created for the system (Collier, 2018) and in the fall of 2018, 2,949 age-0 lake sturgeon were released in the Maumee River. This was the first lake sturgeon stocking event in Lake Erie and is planned to continue on an annual basis. An acoustic telemetry project is currently underway to evaluate survival and movement of the stocked fish.


Project Duration: 2017 - Annually

Contact Information:
Kent Bekker - kent.bekker@toledozoo.org, Toledo Zoo
Richard Drouin – richard.drouin@ontario.ca, Ontario Ministry of Natural Resources and Forestry
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James Boase – james_boase@fws.gov, U.S. Fish and Wildlife Service
Justin Chiotti – justin_chiotti@fws.gov, U.S. Fish and Wildlife Service
Christine Mayer – christine.mayer@utoldeo.edu, University of Toledo
Eric Weimer – eric.weimer@dnr.state.oh.us, Ohio Department of Natural Resources
Chris Vandergoot – cvandergoot@usgs.gov, U.S. Geological Survey
Project Title: Monitoring Lake Sturgeon in Ohio waters of Lake Erie

Location: Western basin Lake Erie

Project Description: In an effort to gain a better understanding of lake sturgeon presence and abundance in western Lake Erie, the Ohio DNR and USFWS Alpena FWCO are working with commercial fisherman in Ohio waters of Lake Erie to collect lake sturgeon information. A total of 512 lake sturgeon have been documented in the Lake Erie commercial catch since 1989. Using commercial catch data, lake sturgeon presence and distribution will be identified. A group of fisherman have also received PIT tag readers to scan lake sturgeon for the presence of tags. This information will also be useful to determine the contribution of lake sturgeon resulting from restoration programs taking place in the future.

Project Duration: Annually

Contact Information:
Brian Schmidt, Ohio DNR, Phone: 419-625-8062, Brian.Schmidt@dnr.state.oh.us
Jennifer Johnson, USFWS, Phone: 248-891-2762, jennifer_le_johnson@fws.gov
**Project Title:** Monitoring Lake Sturgeon in the Ontario Waters of Lake Erie

**Location:** Lake Erie

**Project Description:** The Ontario Ministry of Natural Resources and Forestry (OMNRF) Lake Erie Management Unit (LEMU) does not conduct annual targeted survey for lake sturgeon on Lake Erie. Instead, LEMU relies on indirect sources of information in order to track lake sturgeon presence and absence over time across the Ontario waters of Lake Erie. These sources of information include; Ontario’s Partnership Index Fishing Gill Netting Program, our Inter-agency Trawl Program and reported commercial catch and release of lake sturgeon.

The Ontario’s Partnership Index Fishing Gill Netting Program is a cooperative fisheries assessment program with the Ontario Commercial Fisheries Association (OCFA). This program monitors the abundance, age structure, size, and species composition throughout Lake Erie. In 2015, 133 sites lake-wide were fished from August to November and catching two lake sturgeon. Over the course of the last 26 years, this program averages approximately 2 lake sturgeon per year for a total catch of 51 lake sturgeon. The majority (48 lake Sturgeon) have been caught in the west basin of Lake Erie; particularly around Pelee Island and the mouth of the Detroit River.

The west basin interagency trawling index is conducted by Ontario and Ohio and is used to assess the year class strength of species based on catches of young-of-the-year, yearlings and older fish. Approximately 36 stations are trawled over a two week period starting around mid-August. Records indicate that 6 out of the 28 year time series lake sturgeon (juveniles and adults) have been caught

As a condition of their commercial fishing license, an Ontario commercial fisher is required to submit daily catch reports (DCR’s) prior to landing any fish. DCR’s are used to record the amount of fish caught, effort, gear, time and location, as well as any discards and released fish. Since 2011, LEMU has made an effort to monitor DCR’s for reported catch and release of lake sturgeon. Less than 1% of all DCR’s submitted on Lake Erie on an annual basis record the presence of a lake sturgeon caught and released. Over the past five years, a total of 650 DCR’s report incidentally caught and released lake sturgeon; of which 310 DCR’s reported caught and released sturgeon in 2015. The small number of reported lake sturgeon by commercial DCR’s occur in the west basin, in the spring (April/May) and fall (November/December), as part of the large mesh fishery targeting walleye/white bass.

**Project Duration:** Annually

**Contact Information:** Rich Drouin, OMNRF, Lake Erie Management Unit (London office)
Phone: 519-873-4611, richard.drouin@ontario.ca
**Project Title:** Life history of Lake Sturgeon in eastern Lake Erie

**Location:** Eastern Lake Erie and upper Niagara River

**Project Description:** The U.S. Fish and Wildlife Service Northeast Fishery Center and Lower Great Lakes Fish and Wildlife Conservation Office, in partnership with the U.S. Army Corp of Engineers, the Great Lakes Center at SUNY Buffalo State and the New York Department of Environmental Conservation are collecting life history and population demographics for the lake sturgeon population near Buffalo Harbor. Lake sturgeon were captured with gillnets. Ten sturgeon had archival satellite transmitters applied and 35 sturgeon were surgically implanted with acoustic transmitters to analyze coarse- and fine-scale spatiotemporal movement, behavior and habitat use within Buffalo Harbor. The total number of sturgeon at large with acoustic transmitters in the system is now 53 fish and satellite tags are set to pop off in July 2017. To connect sturgeon space-use choices with available substrate, a categorical habitat map is being constructed from sidescan and multibeam sonar imagery. Raw imagery was collected in 2015 and the categorical map will be completed in 2017. Additionally, biometric, age, blood and genetic data for each individual will be used to describe population demographics and health. Setline deployment efforts were conducted in the upper Niagara River in a random stratified sampling design to determine presence/absence of adult and sub-adult lake sturgeon in various habitat types throughout the river during the spawning season; however no sturgeon were caught in the river. These results will guide future work to determine appropriate survey sampling design and inform demographic parameter estimation in future stock assessments for eastern Lake Erie lake sturgeon.

**Project Duration:** Annually

**Contact Information:**
John Sweka – USFWS, Northeast Fishery Center, 570-726-4247 x 153, john_sweka@fws.gov
Dimitry Gorsky – USFWS, Lower Great Lakes FWCO, 585-948-7045, dimitry_gorsky@fws.gov
**Project Title:** Genetic analysis of Lake Sturgeon in eastern Lake Erie and Niagara River

**Location:** Eastern Lake Erie and upper Niagara River

**Project Description:** Defining genetic population structure and genetic relationships to other populations is critical to manage lake sturgeon. The upper Niagara River lake sturgeon population has not previously been analyzed, and its relationship to the downriver population, which is separated by Niagara Falls, is unknown. Previous genetic analysis of lake sturgeon from the Great Lakes included a limited number of samples from the lower Niagara River to characterize that population and to understand its relationship to other lake sturgeon populations throughout the region (Welsh et al. 2008). Inclusion of the additional lower river samples would improve upon the previous analysis, and provide additional information as other biological information is available to link individual samples to year class. For example, with the inclusion of age data, estimates such as of the number of breeders per cohort, estimates of genetic relationships within cohorts, as well as overall estimates of genetic diversity of Lake Sturgeon from both locations will provide insight into the genetic status of the populations.

Genetic analysis of the Lake Sturgeon sampled in the Niagara River and eastern Lake Erie will improve the understanding of the genetic relationship between lake sturgeon from both the upper and lower Niagara River, as well as in comparison to other populations throughout the Great Lakes.

A total of 968 samples that have been collected by USFWS Lamar Fish Technology Center, USFWS Lower Great Lakes Fish and Wildlife Conservation Office, and the NY DEC have been extracted. These samples are in the process of being genotyped using 13 microsatellite loci to obtain estimates of genetic variation.

**Project Duration:** Annual

**Contact Information:** Meredith Bartron, USFWS Lamar Fish Technology Center
Phone: 570-726-4247 x155, Meredith_Barton@fws.gov

Table 1. Observations or general status of lake sturgeon populations in the Lake Erie. Population status definitions are: Extirpated or Extant; or Unk = unknown. A “Yes” indicates regular observation or presumed annual occurrence. Occasional (Occ) observations are as noted. Successful reproduction was defined as recent capture of larval or juvenile sturgeon. Notes on allowed harvest follow the table.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Site Name</th>
<th>Population Status</th>
<th>Stock Population Size (includes juveniles)</th>
<th>Adults</th>
<th>Spawning</th>
<th>Larva</th>
<th>Juveniles</th>
<th>Reproduction Successful?</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Upper Niagara River/Buffalo Harbor</td>
<td>Extant</td>
<td>≈ 950(^1)</td>
<td>Yes</td>
<td>Occ</td>
<td>Unk</td>
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<td>2</td>
<td>Eastern basin (NYS)</td>
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<tr>
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<td>Cattaraugus Creek</td>
<td>Extirpated</td>
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<td></td>
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<td>Extirpated</td>
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\(^1\) Withers, JL, D Einhouse, M Clancy, L Davis, R Neuenhoff, and J Sweka. In Review. Integrating acoustic telemetry into a mark-recapture model to improve catchability parameters and abundance estimates of lake sturgeon in eastern Lake Erie. North American Journal of Fisheries Management 00:00-00.

\(^2\) Justin Chiotti, U.S. Fish and Wildlife Service, Personal Communication

\(^3\) Todd Wills, Michigan Department of Natural Resources, Personal Communication