



Department of  
Environmental  
Conservation

# LAKE STURGEON POPULATION ASSESSMENT REPORT

2021



## Executive Summary

Lake sturgeon is the largest freshwater fish in New York and has been on the state's list of Threatened Species since 1983. In the absence of natural recovery, a restoration stocking program began for the species in 1993. Recovery plans for the species were written in 1994, and revised in 2000, 2005, and 2018. The 2018 revision set population and recruitment goals for the species to be achieved by 2024. The overall species recovery goal is recovery in six of the seven Management Units. The plan also included a recommendation for an annual Species Status Assessment Report to document progress toward the recovery goals. There was little new data to report in 2019 or 2020, so this report is the first update since 2018.

We conclude that four Management Units have achieved both the adult population and recruitment goals, up from three Management Units in the 2018 assessment. All three of the remaining Management Units show promising signs of population improvement. There are plans to collect and analyze additional data in two of the three unrecovered Management Units from 2022 to 2024. The Central New York Management Unit continues to demonstrate recruitment and the presence of many mature adult lake sturgeon. The Eastern Lake Ontario Unit will be assessed using acoustic telemetry to determine if most lake sturgeon spawning in the Unit remain resident in eastern Lake Ontario or come from other parts of the species' range. If they come from elsewhere, then the Management Unit boundary may need to be redrawn. Vermont Agency of Natural Resources staff continue to collect data in the Lake Champlain Management Unit which demonstrate some recovery. Vermont Agency of Natural Resources also has their own lake sturgeon recovery plan.

Progress is summarized in the Lake Sturgeon Recovery Dashboard below. The Upper St. Lawrence Management Unit has changed to fully recovered since the last report and is highlighted in green.

## Lake Sturgeon Recovery Dashboard

|                                | Management Unit  | Adult Goal | Reproduction Goal | Unit Recovery |
|--------------------------------|--|------------|-------------------|---------------|
| <b>Goals</b><br>Met<br>Not Met | <b>Species Recovery Goal =</b><br>6 Management Units Recovered<br>               |            |                   |               |
| More Data Needed               | >750 spawning adults total;<br>≥ 150 spawning adults per spawning site in the MU |            |                   |               |
|                                | >3 naturally reproduced year classes in a 5 year period                          |            |                   |               |
|                                | Both Adult Goal and Reproduction Goal met  |            |                   |               |
|                                | MU 1: Lake Erie  |            |                   |               |
|                                | MU 2: Western Lake Ontario   |            |                   |               |
| Highly Positive Trend          | MU 3: Central NY   |            |                   |               |
| Positive Trend                 | MU 4: Eastern Lake Ontario   |            |                   |               |
|                                | MU 5: Upper St. Lawrence River   |            |                   |               |
|                                | MU 6: Lower St. Lawrence River   |            |                   |               |
|                                | MU 7: Lake Champlain   |            |                   |               |

## Introduction

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This Lake Sturgeon Population Assessment Report is intended to measure progress in the recovery of New York State lake sturgeon populations. The Lake Sturgeon Recovery Plan 2018-2024 divides the range of lake sturgeon across the state into seven Management Units. The overall recovery goal for the species in New York is to:

**Establish or maintain sufficient self-sustaining populations of lake sturgeon within six of the seven Management Units to warrant removal of lake sturgeon from the list of Threatened Species in New York.**

Success metrics for self-sustaining populations of lake sturgeon are:

- Evidence of at least 750 sexually mature lake sturgeon in a Management Unit. This may be determined by actual census numbers, or by acceptable scientific methods to estimate populations. In the case of population estimates, the lower limit of the 95% confidence interval should be no less than 500 animals.
- Where smaller spawning aggregations are measured and collectively used to meet the 750 sexually mature lake sturgeon per Management Unit target, each spawning aggregation should include 150 sexually mature adults. In the case of population estimates, the lower limit of the 95% confidence interval should be no less than 80 animals.
- Evidence of natural recruitment in at least 3 years of a 5-year period within the last 20 calendar years in a Management Unit.

Department of Environmental Conservation (DEC) staff consulted with partners from US Fish and Wildlife Service (USFWS), US Geological Survey (USGS), Cornell University, Saint Regis Mohawk Tribe, Vermont Agency of Natural Resources, and University of Vermont in 2021 to review extant data collected from each of the Management Units across the state. The following Management Unit sections reflect the discussion and consensus of that group.

Further information on the restoration program, Management Unit descriptions and stocking histories in each Management Unit can be found in the Lake Sturgeon Recovery Plan 2018-2024 available at:

[https://www.dec.ny.gov/docs/fish\\_marine\\_pdf/lakesturgeonrp.pdf](https://www.dec.ny.gov/docs/fish_marine_pdf/lakesturgeonrp.pdf) .

## Management Unit 1. Lake Erie



### Adult Population Data ✓

The adult population of eastern Lake Erie has been sampled with large mesh gill nets during spring spawning staging near Buffalo Harbor from 2012 to 2018. Captured sturgeon have been tagged with passive integrated transponders (PIT) since 2012 and 66 have been acoustic tagged since 2014. USFWS analyzed mark-recapture data using the best-fit POPAN function in the MARK software package and calculated a fixed capture probability based on the acoustic data only. As of 2019, the population estimate for eastern Lake Erie is 889 (611-1352 @ 95% CI). No acoustic or netting data was collected in 2020 or 2021.

Based on this estimate we conclude the Management Unit has exceeded the adult population metric.

### Recruitment Information ✓

During the adult population sampling, captured individuals were aged by sectioning the first pectoral fin ray. The results show that most year classes from 1974 to 2006 are represented in the captured population by at least one individual (N=179). Ninety percent of the individuals aged came from the 1990 to 2006 year classes, and the median ages of the spawning sturgeon were 23 for females and 15.5 for males and unknown sex individuals. Additionally, egg mats placed on Bird Island Reef captured viable lake sturgeon eggs in 2017.

Based on the information above we conclude the Management Unit has exceeded the natural recruitment metric.

## Discussion ✓

This Management Unit has exceeded both the adult and recruitment metrics; therefore, the unit is recovered.

Genetic analysis carried out by the USFWS indicated that sturgeon captured in Buffalo Harbor are genetically similar to individuals analyzed from the Detroit and St. Clair rivers. This is contrasted with the acoustic tracking data discussed above that shows most of the acoustic tagged sturgeon remained in the eastern part of Lake Erie year-round. However, three lake sturgeon originally tagged in Buffalo Harbor have been recaptured in the Detroit River/Lake St. Clair area. Furthermore, the acoustic data showed no Buffalo Harbor tagged lake sturgeon traveled into the Upper Niagara River during the study. Numerous anecdotal reports have documented the regular presence of lake sturgeon in the Upper Niagara River.

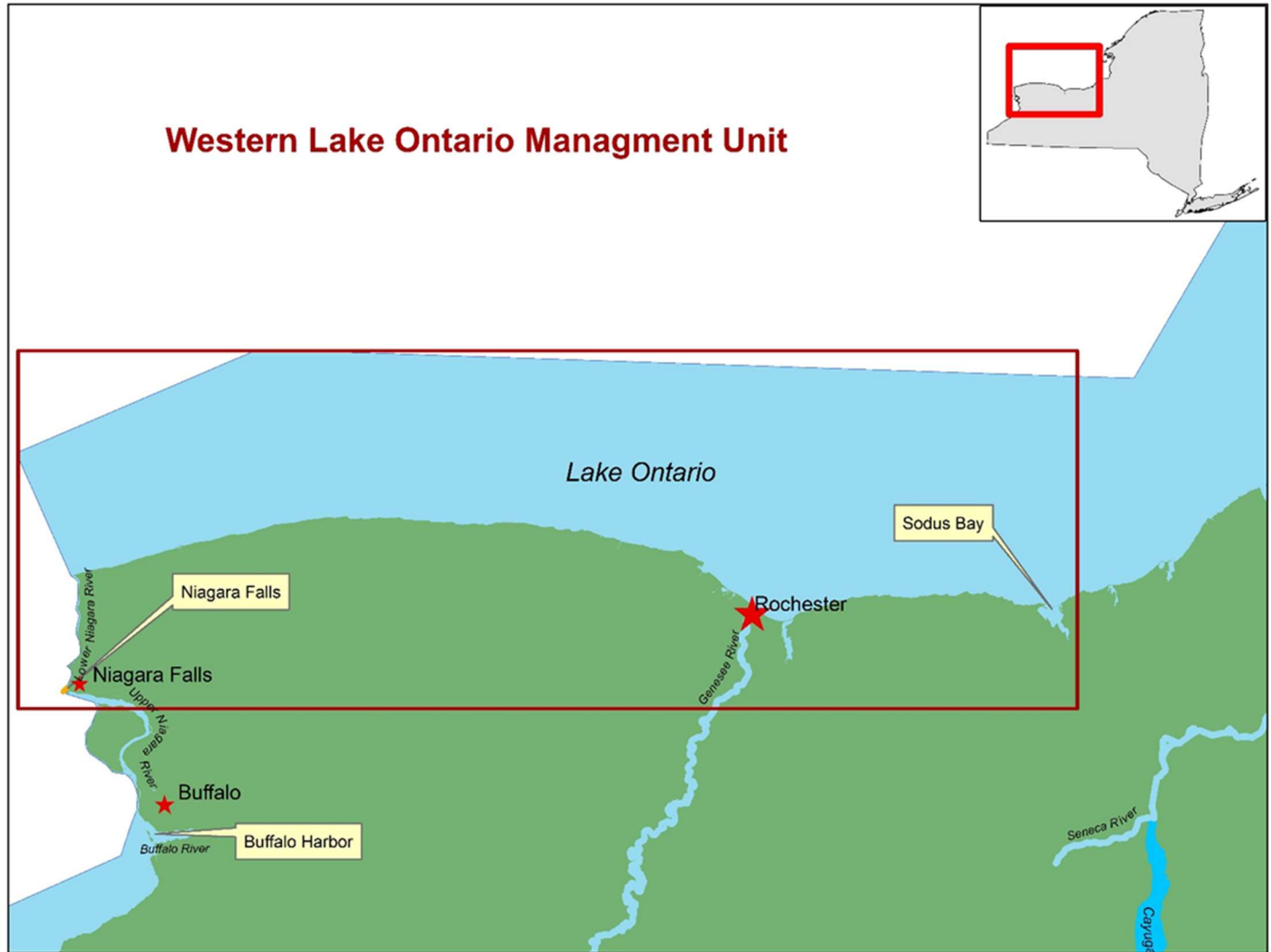
Continued periodic population assessment of the Buffalo Harbor spawning aggregation will inform future post-recovery actions in this Management Unit. Refining our understanding of the mixing that may be taking place between eastern and western Lake Erie sturgeon populations will be useful moving forward, and the status of the apparently distinct Upper Niagara River lake sturgeon population should be investigated as time and resources allow.

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## Management Unit 2. Western Lake Ontario



### Adult Population Data ✓

The adult population in the Lower Niagara River was extensively sampled by USFWS from 2010 to 2017 using set lines throughout the field season when water temperatures fell between 46° F to 70° F. They analyzed mark-recapture data using the POPAN function of the MARK software program, the population was calculated with a 95% fixed survival and 4% fixed capture probability. As of 2017 the population of the Lower Niagara River is estimated at 6,465 (6027-6941 @ 95% CI).

The stocked Lake Sturgeon population in the Genesee River has been extensively sampled by USGS from 2003 to 2021 using gill nets. The estimated population of adult size Lake Sturgeon that may use the Genesee River habitat in 2021 is 222 males and 222 females from the 2003 and 2004 released year classes. These population number estimates are based on Wisconsin Lake Sturgeon survival and maturity rates for Lake Sturgeon developed by R. Bruch. The first mature female attempting to spawn in the Genesee River was confirmed in May 2021 and one ripe male of the 2013 year class was also confirmed May 2021.

Based on the population estimates above we conclude the Management Unit has exceeded the adult population metric and continues to grow in the Genesee River.

### Recruitment Information ✓

During the USFWS adult population sampling in the Lower Niagara River, captured individuals were aged by sectioning the first pectoral fin ray. Six individuals representing the 2005, 2007, 2008 and 2009 year classes were captured in the

Lower Niagara River between 2010 and 2015. Egg mats placed in the Niagara Gorge captured lake sturgeon eggs in 2016-2018.

In the Genesee River a mature female was confirmed in May 2021 and an additional 345 stocked males from the 2013 year class likely reached sexual maturity.

Based on this information we conclude the Management Unit has exceeded the recruitment metric.

## Discussion ✓

This Management Unit has exceeded both the adult and recruitment metrics; therefore, the unit is recovered.

The population in the lower Niagara River, despite being quite large, seems to be experiencing very low recruitment rates compared to observed recruitment from 1992 to 2002. Possible explanations of the reduced detection include botulism-related mortality of spawning adults in the early 2000s, artifacts of pulsed spawning and recruitment, juvenile habitat alteration by invasive dreissenid mussels, or round goby invasion resulting in egg predation. Sampling bias has already been ruled out as a cause of the reduced juvenile observations and future research should seek an explanation. In addition, discussion should focus on appropriate frequency and intensity of adult sampling in the Lower Niagara River to inform post-recovery management actions.

The population estimate for mature adults is expected to rise in the short term for the Genesee River as cohorts of 500 to 1,000 fingerlings have been stocked there annually from 2013 to 2020, further boosting the population. An additional 345 males from the 2013 year-class potentially reached maturity in 2021.

Lake sturgeon tagged in the Genesee River have been recaptured in the Lower Niagara River and vice-versa. Future sampling should target spawning activity and recruitment within both rivers.

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## Management Unit 3. Central New York



### Adult Population Data ✗

Current sampling intensity throughout the Management Unit is insufficient to produce a robust estimate of population size in this Management Unit.

In Oneida Lake there was a targeted mark-recapture sampling of 5,000 juveniles stocked into the lake in 1995 to calculate survival rates over 7 years. Using that estimate, Cornell University calculated an extrapolated population using the POPAN function in the MARK software package. As of 2018, the estimated survival of mature adults yielded a population estimate of 489 (34-944 @ 95% CI).<sup>1</sup>

<sup>1</sup> Lake sturgeon in Oneida Lake were intensively sampled by gill net May through September of 2002 – 2004. During this time all fish captured were tagged (Carlin dangler tags and PIT tags) and the POPAN routine of Program MARK was used to estimate population size at the start of the sampling period. The estimate of the number of fish from the 1995 stocking present in the lake at the initiation of sampling in 2002 was 1184 (+/- 1105). This implies survival (losses come from both mortality and outmigration) of 24% of stocked fish through the 7th year after stocking (range 2-44%). Both POPAN and an independent catch curve analysis of catches of the 1995 year class indicated an annual mortality rate of 10% (which includes outmigration). Applying the 24% survival at year 7 to all 7 stocked cohorts from 1995-2004, and then applying 10% annual losses through 2018 produces a current (2018) population of 489 fish (95% CI range based on initial survival estimate error 34-944). The assumption of equal survival of all stockings is supported by assessments of catch ratios of year classes, which agree well with differences in stocking numbers. Cohorts stocked after 2004 were not yet mature and not included in the calculation.



In Cayuga Lake 117 adult and juvenile lake sturgeon were tagged from 2011 thru the end of 2019. Of those, 92 have been recaptured, yielding an initial Schnable population estimate of 354 adults (no confidence intervals available). There were no appreciable tagging efforts in 2020 and no observed spawning since 2017.

In the Seneca River from the dam at Cayuga Outlet to the canal lock at Baldwinsville there have been 293 individual lake sturgeon tagged between 2005 and 2021, but no population estimate has been calculated.

Based on the above estimates we conclude the Management Unit has not yet reached the adult population metric due to the lower end of the confidence interval ranges. However, improved sampling effort and data analysis is expected to yield better population estimates for the areas outside of Oneida Lake.

### Recruitment Information ✓

Thirteen untagged juveniles have been captured in Oneida Lake representing seven year classes from 2006 to 2014. No stocking took place in Oneida Lake in 2011, 2012, or 2013, and one untagged individual aged to the 2011 year class and five untagged individuals aged to the 2012 year class have been caught.

There is a constructed spawning bed in place in the Seneca River near Cayuga Outlet with documented spawning activity since 2016. One ripe male from the 2013 year class was caught on the bed in 2021.

Spawning was documented via eggs and larvae in Fall Creek, a tributary to Cayuga Lake, in 2017. No spawning has been subsequently observed in that location.

Based on the information above, we conclude the Management Unit has exceeded the natural recruitment metric.

### Discussion ✗

This Management Unit has not conclusively reached the adult population metric; therefore, the unit is not recovered.

Given the high level of uncertainty associated with estimates based on even our most intensive period of sampling, the current estimate of 489 adult fish in Oneida Lake should be approached with caution. Because lake sturgeon have been documented to leave Oneida Lake and travel throughout the species range, the relatively low survival rate can be interpreted as likely including sturgeon that survive, but out-migrate from the lake. In 2021 a lake sturgeon originally tagged in Onondaga Lake was recaptured in Black River Bay. Since the population estimate in Oneida Lake was calculated, CPUE of lake sturgeon there remains variable, but there is no indication of any decline in the adult population. Other studies of lake sturgeon populations have documented annual adult survival rates of 95-99%, so the Oneida Lake population estimate is likely conservative. The calculation for surviving adults in Oneida Lake should be recalculated to include the 2004, 2005 and 2006 stocked cohorts.

All surviving lake sturgeon from the 1994 stocked year class in Oneida Lake are expected to have reached sexual maturity by 2010. Some males may have been mature as early as 2005. Based on the stocking history of the Management Unit and tagging information above, we expect that seven stocked year classes may be included as mature adults in the population as of 2021. The calculation for surviving adults in Oneida Lake should be recalculated to include the 2004, 2005 and 2006 stocked cohorts.

The number of adults tagged in the Cayuga Outlet to Baldwinsville reach of the Seneca River reach hints at a potential spawning population large enough to be included in the Management Unit's total spawning adult calculations.

Spawning was documented via eggs and larvae in Fall Creek, a tributary to Cayuga Lake, in 2017, but flow rates are too low at the appropriate temperatures in spring to attract adult lake sturgeon to spawn in Fall Creek in most years. Adult aggregations have been observed by the break wall near Allan Treman State Marine Park. A telemetry study is underway to document adult lake sturgeon movement within Cayuga Lake. Adult and subadult lake sturgeon have been captured in Cayuga Inlet in May and June. It is hoped that additional spawning locations will be identified, and lake sturgeon

outmigration to the Seneca River can be characterized. Future field work should enhance the population estimates for this management unit.

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## Management Unit 4. Eastern Lake Ontario



### Adult Population Data ✘

Recapture data from PIT tagging the Black River spawning population was analyzed by DEC. Population estimates with mark-recapture data from 2009 through 2019 range from 274 to 318 and corresponding 95% confidence intervals ranging from 187 to 427.

While adult sturgeon have been reported in the Oswego River mouth, not enough data has been collected to analyze at this time.

Based on the above estimates we conclude the Management Unit has not reached the adult population metric.

### Recruitment Information ✘

Lake Sturgeon eggs have been documented in the Black River during spawning season, but no juveniles have been captured here.

In summer 2018, eight untagged juvenile sturgeon were captured via gill net in Chaumont Bay, nearby to the Black River, but ages are unknown.

Based on the information above, we conclude the Management Unit has not reached the natural recruitment metric.

## Discussion ✘

This Management Unit has not reached the adult or recruitment metrics; therefore, the unit is not recovered.

The number of spawning adults handled in the Black River is still fairly small but the data point to a viable spawning aggregation, especially with confirmation of lake sturgeon eggs in the river. More spawning locations will need to be documented to achieve the recovery goal in this Management Unit.

Oswego Harbor was investigated for spawning activity in 2019 and 2020 and adult lake sturgeon were captured moving into the river. Additionally, a project to use the Great Lakes Acoustic Telemetry Observation System to understand lake sturgeon movement in the eastern basin of Lake Ontario is in development. The movement patterns may show that the Management Unit is part of a larger metapopulation that extends into Canadian waters and possibly the Upper St. Lawrence River. In spring 2016, one adult lake sturgeon was captured in Black River Bay that had been previously tagged at Cayuga Outlet in 2008. In 2021, a lake sturgeon originally tagged in Onondaga Lake in 2006 was recaptured in Black River Bay. As of 2021, there have been 10 lake sturgeon recaptured in Black River Bay that were originally tagged in different management units. Two other tagged fish are of unknown origin. Once results of the telemetry study are analyzed, the Management Unit boundaries may need to be reconsidered.

Lake sturgeon have been incidentally captured in Chaumont Bay during the Eastern Basin of Lake Ontario Warm Water Fisheries Assessment. Eight untagged juvenile fish captured in Chaumont Bay in 2018 hint at successful natural reproduction in the Black River or elsewhere nearby. Based on length-at-age curves from the Grasse River and St. Lawrence River, the juveniles captured are likely age 6 or less. Captured juveniles in Chaumont Bay need to be aged and further examined for traces of Calcein in their bony structures to document year classes and confirm wild status before the recovery goal can be declared met.

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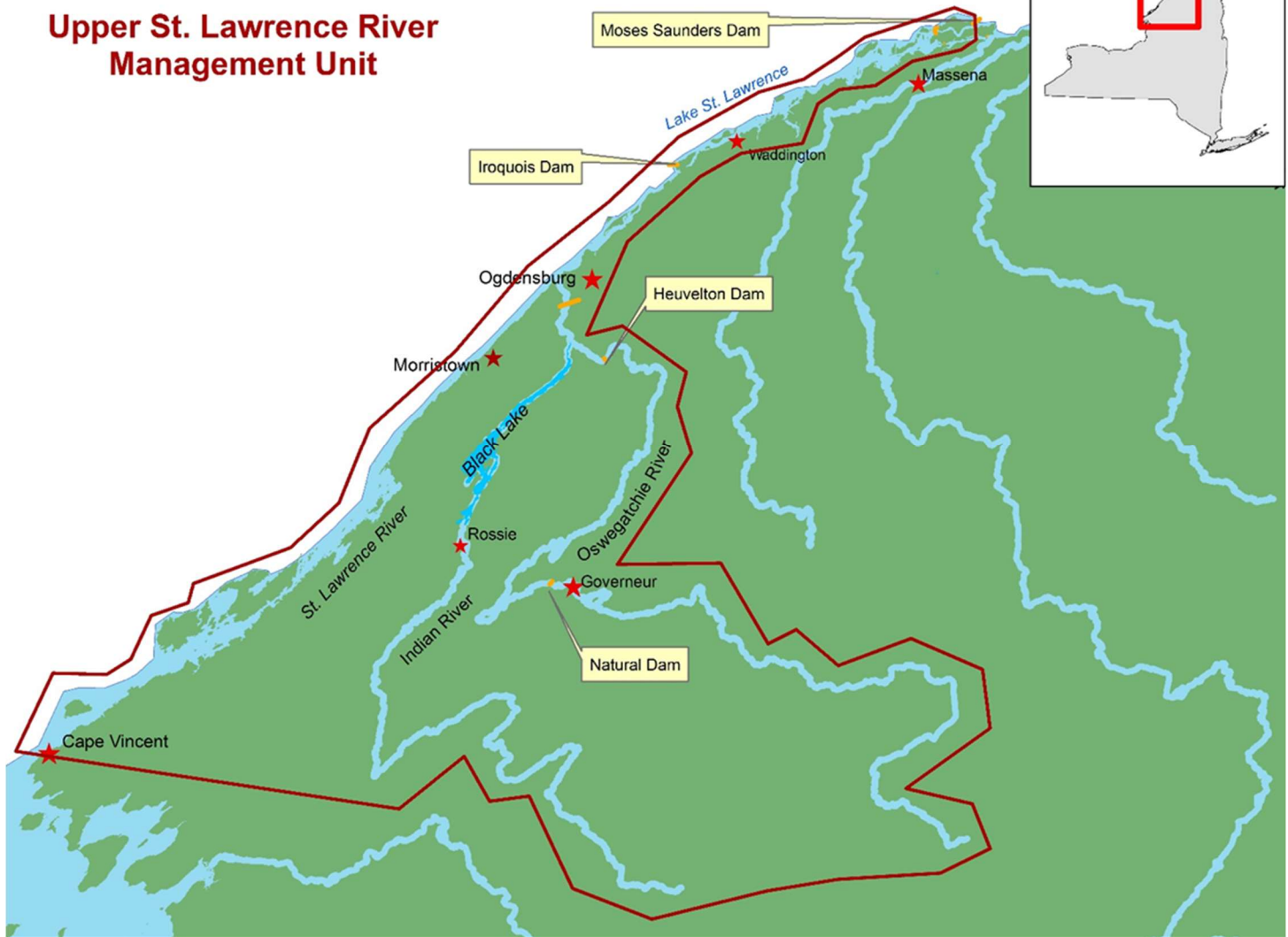
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## Management Unit 5. Upper St. Lawrence River

### Upper St. Lawrence River Management Unit



#### Adult Population Data ✓

Visual count transects using video cameras have been run in spring from 2008 to 2019 at the Iroquois Dam constructed spawning beds give instantaneous counts of spawning lake sturgeon. Methodology developed by Environment Illimite<sup>2</sup> extrapolated daily counts based on an estimated 40% visual coverage of the beds. This yielded a 2009 season peak spawning population estimate for the Iroquois Dam spawning beds of 709 (249-1230 @ 95% CI) for the upstream bed and 278 (95-478 @ 95% CI) for the downstream bed.

However, questions about the annual variability of spawning sturgeon have been raised and the raw visual count numbers can be used as a more conservative estimate. Peak combined observations range from 71 to 395 for transects run in spring from 2008 to 2016 with no discernable pattern to the variability. Counts from 2017-2019 have been excluded due to excessively high flows associated with flooding in the Great Lakes and St. Lawrence River system that appear to have greatly reduced spawning activity at the Iroquois spawning beds in those years. A simple average of peak numbers from 2008-2016 is 220 adults annually which represent a partial count on the peak day of spawning in each year.

<sup>2</sup> Environment Illimite'. 2010. Investigation of Lake Sturgeon spawning activities at Iroquois Dam on the St. Lawrence River in 2009: final report. Prepared for: New York Power Authority. White Plains, NY. 31 pp.

A mark-recapture study was carried out by DEC in Black Lake in 2019. Using the Chapman modification of a simple Petersen population estimate, 488 (379-597 @ 95% CI) adult lake sturgeon are estimated to be present in Black Lake.

Adults and juveniles have been netted in the Oswegatchie River since the 1990s, but no specific mark-recapture or other population estimate study has been undertaken. Sixty-two adult lake sturgeon have been PIT tagged in the Oswegatchie River and 72 adult lake sturgeon were tagged in the upper St. Lawrence River within the Management Unit between 1992 and 2019.

Based on the above estimates we conclude the Management Unit has reached the adult population metric.

### Recruitment Information ✓

Iroquois Dam spawning beds have documented eggs and larval production, though no juveniles have been found upstream of the power dam in the main stem of the St. Lawrence River. Downstream settlement by drifting larvae is a likely scenario due to swift currents in the St. Lawrence overall, but no juveniles have been found in any tributaries downstream of the dam. Subadults have been captured in the mouth of Coles Creek and the mouth of the Oswegatchie River below the Ogdensburg Dam.

Several juveniles have been captured in the Oswegatchie River. In 2016, 13 untagged juveniles were captured and aged by fin ray sectioning. Age estimates ranged from 5 to 13 years old, representing all cohorts from the 2003 to 2011 year classes. No stocking took place in the entire Oswegatchie system between 2005 and 2014. This seems to indicate that there is successful natural reproduction in the Oswegatchie River over several years. However, the earliest fish stocked into the system would only have been 11 years old at the time the 2005 year class was produced.

Furthermore, Welsh et al (2020<sup>3</sup>) determined that natural reproduction and recruitment was occurring in the middle reach of the Oswegatchie River. Genetic analysis detected multiple family groups which suggests multiple spawning events have occurred. Age determination detected several year classes for years where no stocking occurred. The sampled reach of the Oswegatchie was isolated between an impassable (at that time) impoundment barrier at Heuvelton and a natural barrier at Natural Dam, therefore sturgeon encountered originated there. A likely explanation for this is the presence of a small remnant population of wild lake sturgeon that predated the stocking program begun in 1992.

Based on the information above, we conclude the Management Unit has exceeded the natural recruitment metric.

### Discussion ✓

This Management Unit has exceeded both the adult and recruitment metrics; therefore, the unit is recovered.

Lake Sturgeon are readily caught in the Oswegatchie River/Black Lake system. Better understanding of the movement and use of the Oswegatchie River by lake sturgeon, particularly in light of the fish passage structures built at Heuvelton and Eel Weir is desirable.

Reproduction in the Oswegatchie may have involved some number of female lake sturgeon that remained in the river prior to the 1994 stocking. Stocked males may have been mature by 2005. Alternatively, the fish aged to the 2005-2011 year classes may have lost their tags, though the odds of that happening to all of the fish are low. Tag retention rates have been tested by Oneida Hatchery and Cornell University and indicate that tag retention is over 90%. Resampling in the Oswegatchie River and ageing adult fish captured may clarify the origin of the untagged juveniles.

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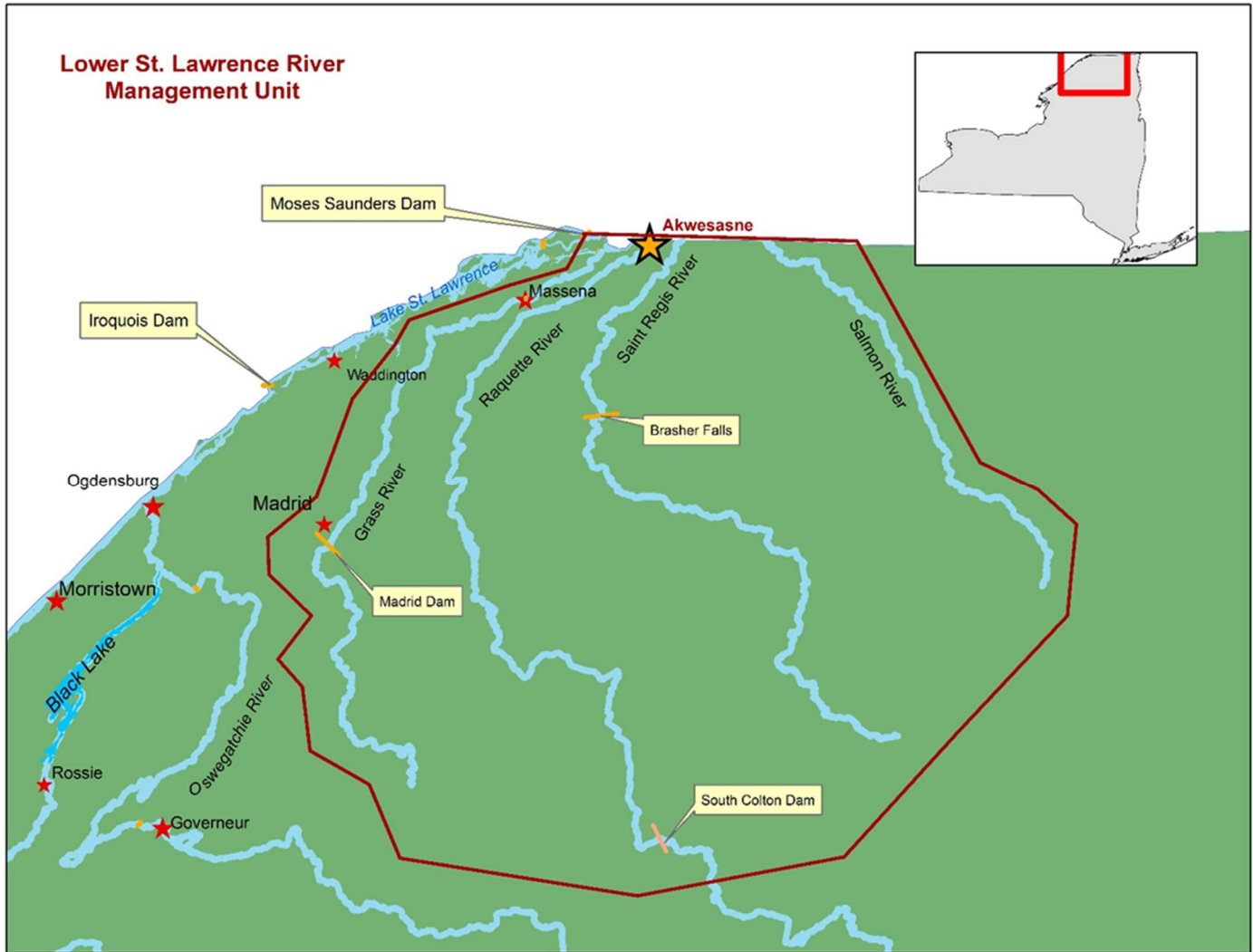
<sup>3</sup> Welsh, A.B., D.M. Carlson, S.L. Schlueter, J.R. Jackson. 2020. Tracking stocking success in a long-lived species through genetics and demographics: evidence of natural reproduction in Lake Sturgeon after twenty-two years. *Trans of the Amer. Fisheries Soc.* 149:1.

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## Management Unit 6. Lower St. Lawrence River



### Adult Population Data ✓

Adults have been gill netted for egg takes annually at Massena since 1996. Between 1996 and 2017, PIT tags were placed in 1,282 adult sturgeon. The recapture rate during that period has been 16% or lower.

At the Grasse River, Trested and Isley (2010<sup>4</sup>) performed a mark-recapture study that estimated a population of 793 (337-1249 @ 95% CI).

Based on this information we conclude the Management Unit has exceeded the adult population metric.

### Recruitment Information ✓

During the egg take netting operations at Massena, unmarked 1,000 mm individuals are handled annually. Based on DEC data generated age-length curves from the St. Lawrence River, this size corresponds to fish that are 7 to 11 years old. This indicates ongoing annual recruitment in that population.

The Trested and Isley study (2010) concluded the Grasse River had 15 consecutive year classes present as of 2010.

<sup>4</sup> Trested, D.G., J.J. Isley. 2010. Age, growth, Mortality, and abundance of lake sturgeon in the Grasse River, New York, U.S.A. Journal of Applied Ichthyology. 27:13-19.



Based on the information above, we conclude the Management Unit has exceeded the natural recruitment metric.

## Discussion ✓

This Management Unit has exceeded both the adult and recruitment metrics; therefore, the unit is recovered.

The population captured at Massena for egg takes is part of a much larger population in the Lake St. Francis reach of the St. Lawrence River. Understanding how the aggregations at Massena interact with the population in the Canadian and Akwesasne portions of Lake St. Francis would be useful for fishery management in Akwesasne waters and for post-recovery management in NY waters. Coordination with Canadian and Akwesasne managers should be pursued.

The Saint Regis Mohawk Tribe is conducting an acoustic telemetry study of the lake sturgeon population in the St. Regis River in 2022/2023. This should provide information regarding spawning activity on the riffle habitats at the site of the former dam at Hogansburg and upstream at Brasher Falls.

The Raquette and Salmon rivers should also be evaluated for spawning adults no later than 2028. Because the rivers are open to the Lake St. Francis population, there may be spawning in those locations by existing adults prior to stocked fish reaching maturity.

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## Management Unit 7. Lake Champlain



### Adult Population Data ✗

Sampling at historic spawning sites in Vermont from 1998 to 2008 documented that lake sturgeon ranging in age from 5 to 50 years continue to spawn in The Winooski, Lamoille and Missisquoi rivers, tributaries to Lake Champlain.

From 1998 to 2002, there were 9 individual lake sturgeon captured and PIT tagged in the Lamoille River during spring sampling. From 1998 to 2003, there were 17 individual lake sturgeon captured and PIT tagged in the Winooski River during spring sampling. More tagging and sonar studies in the Winooski River yielded preliminary spawning run abundance estimates as follows:

2017: 99 (42-215 @ 95% CI).

2018: 131 (82-248 @ 95% CI)

2019: 92 (47-184 @ 95% CI)

Based on the above information we conclude the Management Unit has not reached the adult population metric.

### Recruitment Information ✗

Eggs were collected in the Winooski, Lamoille and Missisquoi rivers between 2003 and 2007, but larvae were only collected in the Winooski and Lamoille rivers from 2004 to 2008. Additionally, three juvenile sturgeon were captured in the Winooski River in 2018.

Based on the above information we conclude the Management Unit has not reached the natural recruitment metric.

## Discussion

This Management Unit has not reached any of the recovery metrics but shows positive trends. We will continue to cooperate with the State of Vermont as requested in monitoring the natural recovery of the Lake Champlain lake sturgeon population.

Since no spawning has ever been documented on the New York side of Lake Champlain or its tributaries, there are no specific data collection needs for DEC to implement.

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