

Grand River Revitalization & Restoration Project

1.5 GRR Sturgeon Activity



This activity is intended to focus on the structure and function, as well as the unity and diversity, of life. To complete the activity, the class works together to learn about the different life cycles of fish in the Grand River and to determine why the sturgeon population is so low compared to other native and non-native species.

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Necessary Teacher Prior Knowledge

Sourced from Hanshue, S. K., and A. H. Harrington. 2017. Grand River Assessment. Michigan Department of Natural Resources Fisheries Report 20, Lansing.

History

Information on the fish communities in the Grand River watershed prior to European settlement is lacking. Based on evidence collected from archaeological sites and historical accounts from early settlers, it is evident that lake sturgeon were an important resource to residents from the Woodland period (1000 BCE-1000 CE) until the 1850's. Lake sturgeon remains are common artifacts at many archaeological sites in the valleys of the Grand, Kalamazoo, and St. Joseph rivers where they migrated upstream to riffles for spawning. Such large congregations of fish in relatively shallow water allowed them to easily be speared from shore or canoe.

Harvesting of lake sturgeon has been attributed as the main reason for choosing a habitation site during the Middle Woodland period (200 BCE-500 CE). Historical accounts suggest lake sturgeon were harvested from the main stem of the Grand River as far upstream as Eaton Rapids. The main food of early pioneers in the Grandville area was sturgeon, which were plentiful in the river. Mrs. Henry Leonard, an early settler in Lyons, described how the Native Americans would form a line with their canoes across the river and advance, shouting and splashing water, to drive lake sturgeon into shallow water before spearing them. The fish were salted and smoked and then stored for winter food. Early settlers in Ionia during a long winter lived on "corn cake and maple sugar, with a piece of smoked sturgeon, or a venison steak occasionally." Lake sturgeon were so plentiful in Stony Creek that an early settler was overheard having an imaginary conversation with his family back home remarking, "Oh, if you old folks could only know how we're living out here in Michigan." Another local observed, "The dam across the river was an obstacle to the upward passage of fish, which they had never before met. Consequently there was in this spring an unprecedented catch upon the rapids, of sturgeon, pickerel, bass, suckers, and other members of the finny tribe, to the great sport and profit of fishermen, with spears and nets."

This early documentation of a barrier to the spawning run, combined with the extensive harvest of spawning adults, points to the probable causes of the decline in lake sturgeon populations in the Grand River basin.

Biology

Detailed information on Great Lakes Sturgeon Biology can be found at Great Lakes Sturgeon: <https://www.glsturgeon.com/sturgeon/>

Lesson Sequence

(This activity adapted from: *Life Cycle Comparison* https://media.fisheries.noaa.gov/dam-migration/scutes_lifecycle_508.pdf and *Fish Life Cycle* <https://www.michiganseagrant.org/lessons/lessons/by-broad-concept/life-science/fish-life-cycle/>)

Engage

1. Show a short video of Sturgeon for students. Here are two possible choices:
 - Restoration of sturgeon in Manistee River <https://www.youtube.com/watch?v=PIYMFijCEz4&index=3&list=PLE1D819DFABED035>
 - Or
 - Sturgeon caught by Fish Ladder in Grand Rapids <https://fox17online.com/2017/07/17/fisherman-catches-three-sturgeon-in-grand-river/>
2. Ask students what fish live in the Grand River. What do they know about these fish? Have they heard of the Sturgeon? What do they know?

Explore

1. Let students know that, while there are many species of fish living in the Grand River, only about 100 Great Lakes Sturgeon currently live in the Grand River. However, other fish have much larger populations. In 2004, fisherpeople caught the following amounts of fish in the Lower Grand River:
 - 5,948 Chinook salmon
 - 15,852 rainbow trout (steelhead)
 - 2,473 walleye
 - 2,880 smallmouth bass
2. Let students know that they are going to examine the life cycles of different fish living in the Grand River to try to understand why the sturgeon has such a small population compared to other species.
3. Review with students the life cycle of fish, either using the diagram on **1.5a GRR Sturgeon Student Handout** or the videos below:

Fish Life Cycle Videos

- General and a little silly - <https://www.youtube.com/watch?v=nYZzqZPnzPA>
- Sturgeon Specific - <https://www.youtube.com/watch?v=412Qm4ceVWQ&list=PLE1D819DFABED035C>

4. Divide students up in groups and have them research the life cycles of the different fish in the Grand River using the Internet. If needed, below are a list of reliable websites for each species. Have the students use **1.5a GRR Sturgeon Student Handout**.

Explain

5. Draw a table on the board and have the different groups put their findings on the board.
6. Have students work with their groups to answer the analysis questions. Share out answers with the class.
7. Discuss how we might help the sturgeon population increase. Once students come up with habitat restoration, let them know that in other areas of Michigan we have built spawning areas for sturgeon (e.g., the St. Claire River; the Michigan Sea Grant has lots of material on this) and that the Rapids Restoration and Revitalization would provide over 80 acres of additional spawning habitat for Sturgeon.

Extensions

Have students research the St. Claire restoration on the Michigan Sea Grant Website and compare it to the proposed Grand River Restoration. What are the similarities/differences? Do they think the Grand River Restoration will be as successful? Why, Why not?

Resources

Below are quality sources of information that will allow students to answer all questions asked in this lesson:

Sturgeon

- <https://www.glsturgeon.com/sturgeon/>
- <https://www.fws.gov/midwest/sturgeon/biology.htm>
- https://www.dnr.state.mn.us/minnaqua/speciesprofile/lake_sturgeon.html
- <https://www.fisheries.noaa.gov/new-england-mid-atlantic/endangered-species-conservation/scutes-student-resources>

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Salmon

- <https://www.nps.gov/olym/learn/nature/the-salmon-life-cycle.htm>
- <https://www.fws.gov/sites/default/files/documents/Fish-Need-to-Move-Alaska-Chinook-salmon.pdf>
- http://www.krisweb.com/aqualife/lifecycle_early.htm
- <https://www.michiganseagrant.org/salmonid/>

Rainbow Trout (Steelhead)

- <https://www.fws.gov/sites/default/files/documents/Fish-Need-to-Move-Steelhead-trout.pdf>
- <http://www.lakesuperiorstreams.org/understanding/rainbowtrout.html>
- <https://www.nwf.org/Educational-Resources/Wildlife-Guide/Fish/Rainbow-Trout-Steelhead>
- https://dnr.wisconsin.gov/sites/default/files/topic/Fishing/Species_rainbowtrout.pdf

Walleye

- <https://dnr.wisconsin.gov/topic/Fishing/species/walleye.html>
- <https://www.michigan.gov/dnr/education/michigan-species/fish-species/walleye>
- http://www.biokids.umich.edu/critters/Sander_vitreus/

Smallmouth Bass

- https://www.michigan.gov/dnr/0,4570,7-350-79135_79218_79614_82601---,00.html
- <https://ohiodnr.gov/discover-and-learn/animals/fish/smallmouth-bass>
- https://www.bassresource.com/fish_biology/smallmouth-fry.html
- <https://ontariobassfishing.net/smallmouth-bass-biology/>

Additional Sturgeon Information Websites

- Students Collaborating to Undertake Tracking Efforts for Sturgeon: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/endangered-species-conservation/scutes-students-collaborating-undertake>
- Sturgeon for Tomorrow - <https://www.sturgeonfortomorrow.org/>
- MI Sea Grant Lake Sturgeon - <https://www.michiganseagrant.org/topics/ecosystems-and-habitats/native-species-and-biodiversity/lake-sturgeon/>
- USGS Lake Sturgeon - <https://nas.er.usgs.gov/queries/FactSheet.aspx?speciesID=299>
- USGS Sturgeon Printable Poster - <https://www.scriver.org/wp-content/uploads/2019/01/DinosaurGreatLakes.pdf>

Other Fisheries Information

- Why stock non-natives - http://www.shorelinemedia.net/ludington_daily_news/news/local/dnr-to-increase-salmon-stocking-reducing-lake-trout-brown-trout/article_1eccc8f2-fa0f-11e7-a9a8-e3a149c08922.html