Sturgeon Hurdle:

A Game of Obstacles to Survival

Photo: Ontario Ministry of Natural Resources, Upper Great Lakes Management Unit.

Ontario Ministry of Natural Resources Lake Sturgeon Recovery Team.

DESCRIPTION

Lake Sturgeon are listed by the Committee on the Status of Endangered Wildlife (COSEWIC) in Canada as a threatened species - which means that they are likely to become endangered if the threats to them are not reversed.

Outdoor Classroom

Students participate in a game that examines the historical interactions between Lake Sturgeon and humans. Students take the role of Lake Sturgeon swimming upstream to their spawning beds. The objective of the game is to make it through each round, which represent different times in the last few hundred years, to ensure that the next generation and the entire population can continue to survive.

Learning Environment:

Outdoor Classroom:

- Any playing field

Prep Time: 15 min

Length of Lesson: 45 min

Key Vocabulary: biodiversity, species at risk, spawning, habitat fragmentation, fish ladders.

Staffing: 1 adult/5 students

Resources:

- 2 long ropes

Groupings:

- Whole Class

Teaching/Learning Strategies:

- Game

Assessment Strategy: R.A.F.T. Writing Assignment

If you see a sturgeon, especially in the spring, please report your sighting on our web site www.gbbr.ca.

Understanding Life Systems: Biodiversity

Lesson for Grade 6 Science and Technology

EXPECTATIONS

Overall Expectations

6s1 1. assess human impacts on biodiversity, and identify ways of preserving biodiversity;

Relating Science and Technology to Society and the Environment

6s4 1.1 analyse a local issue related to biodiversity (e.g., the effects of human activities on urban biodiversity, flooding of traditional Aboriginal hunting and gathering areas as a result of dam construction), taking different points of view into consideration (e.g., the points of view of members of the local community, business owners, people concerned about the environment, mine owners, local First Nations, Métis, Inuit), propose action that can be taken to preserve biodiversity, and act on the proposal. Sample issue: A local forest is slated to be cut down to make room for a new shopping plaza. Sample guiding questions: What are the positive and negative aspects of the issue (e.g., a community will have access to goods and services in the new shopping plaza that were not there before; getting the land for the shopping plaza means losing a local forest)? Who might have differing opinions on this issue? Why? What are some of the things that you might do as an individual, or that we might do as a class, to make others aware of the issues and concerns (e.g., write a letter to the local newspaper, the mayor, or the Member of Parliament; design and hang awareness posters in the community)?

BACKGROUND

Georgian Bay's Link to the Dinosaurs

By Glenda Clayton, GBBR SAR Coordinator

Lake Sturgeon have been found in our planet's waters since the Upper Cretaceous Period, a time when dinosaurs still roamed the earth! Despite surviving as a species for over 80 million years, early commercial fishing on the Great Lakes quickly drove the population towards extinction.

At first, European settlers to the Great Lakes considered sturgeon a nuisance since they damaged their nets. Large numbers of sturgeon were killed and burnt as fuel or used as fertilizer. Attitudes quickly changed when they realized the meat and caviar could be sold and sturgeon became a commercially harvested species. This harvest peaked at 4,900 metric tons per year. By the 1930's as much as 80 per cent of the sturgeon were gone from several of the Great Lakes. Sturgeon are surviving but are considered to be a threatened species in our Great Lakes.

The Lake Sturgeon is Canada's largest freshwater fish. It has been recorded in excess of 2 m in length and 136 kg in weight, although most sturgeon today are much smaller and weigh between 4kg - 36 kg with an average length of .9 - 1.5 m. They are a long-living fish; a typical life-span of a Lake Sturgeon is 55 years for males and 80-150 years for females.

Primitive in appearance, there are five rows of thick armour like platelets along the back and sides. Unlike most fish, the sturgeon does not have scales. The skin is covered with tiny tooth like projections that give it the feel of fine sandpaper. The fins are dark brown or grey and they have a single fin located just in front of their shark-like tail. Their belly is white or light-coloured and contrasts with the darker back and sides.

Lake Sturgeon are bottom feeders and vacuum in their food through a nozzle like mouth located on the underside of the head. They feed on insect larvae, crayfish, molluscs, small fish and occasionally plants. Barbels (whisker-like tentacles) dangle in front of the mouth to help locate food.

Sturgeon are slow to mature. Females spawn for the first time at 15 to 25 years of age, with males spawning at a slightly younger age. Lake Sturgeon spawn in the spring from May-June. Prior to spawning, adult sturgeon form groups in deep holes near the spawning site. At this time, the sturgeon may perform "staging" displays that include rolling near the bottom then leaping out of the water to fall with a loud splash. The female spawn on clean, gravel shoals in swiftly flowing water only once every 4 to 9 years. Sturgeon usually return to the same spawning rivers year after year. Known spawning areas in our area include the Pickerel and Moon Rivers. Any of the large river mouths emptying into Georgian Bay could be potential or existing spawning sites.

Overfishing certainly led to the decline of Lake Sturgeon in the Great Lakes. Additional threats to their population include the construction of dams which block access to spawning habitat and land

practices, such as construction, that produce silt that damages spawning habitat. Pollution in the Great Lakes has also reduced the survival rate.

To help Lake Sturgeon recover, the Ontario Ministry of Natural Resources has banned recreational fishing for sturgeon and in 2009 reduced commercial fishing quotas to zero.

TEACHING/LEARNING

Game Objective: To survive the journey upstream to lay your eggs.

Round #1 – First Nations

Round #2 – Arrival of European Fishermen

Round #3 – Overfishing

Round #4 – Dams

Round #5 – Restoration

Introduction and Instructions:

You are female sturgeon. Every year female sturgeon return to the same river to spawn (lay their eggs). Your objective is to make it up the river to the spawning site, past the obstacles without getting caught or blocked. If you succeed, you will have successfully laid your eggs and ensured that your genes have made it to the next generation. You will get to continue to the next round. If you are touched, you have been killed and need to step to the side of the river. We will play five rounds of the game. After each round we will meet to discuss who survived and what happened.

Round #1 – First Nations People

Introduction: *This is the year 1790's. First Nations people have been spearing fish in this area for centuries. They use the fish for food, containers (from the skin), fuel (from the oil), glue, arrow heads, and in rituals.*
Set-up: Have two adults represent native people spearing fish as they travel upstream tagging students as they run by.
Discussion – *How many of you made it through?* (Most.) *Why?* (Not that many people catching them.)

Explanation: *During this time, the sturgeon populations were stable and they were not hunted in large enough numbers to really cause a large change in the ecosystem.*

Round #2 – Arrival of European Fishermen

Introduction: *This is the year 1880. European fishermen have started commercial fishing in this area. They considered the sturgeon a "nuisance" fish that destroyed their nets because of their size.*

Set-up: Have the students that have been eliminated represent white fishermen casting nets for sturgeon. For every two fish that they catch, they throw one back.

Discussion: *How many of you made it through?* (Most.) *Why?*

Explanation: At first, European settlers to the Great Lakes considered sturgeon a nuisance since they damaged their nets. Large numbers of sturgeon were killed and burnt as fuel or used as fertilizer during this time.

Round #3 – Overfishing

Introduction: *The year is 1920. There are lots of commercial fishermen on the Georgian Bay fishing sturgeon.*

Set-up: All students caught are fishermen. Everyone caught is eliminated. No fish are thrown back.

Discuss – *How many of you made it through?* (Not many.) *Why? What is it called when most of a species is gone?*

Explanation – *When it was realized that meat and caviar could be sold, sturgeon became a commercially harvested species. This harvest peaked at 4,900 metric tons per year. By the 1930's, as much as 80% of the sturgeon were gone from several of the Great Lakes.*

Round #4 – Dams

Introduction: *The year is 1960.*

Set-up: All players caught block the entire river, representing a dam. No students can make it through. (Remind students that as soon as they are touched they are eliminated, not British Bulldog in which you can barrel yourself through.)

Discussion: *How many of you made it through?*

Photo: OMNR, Upper Great Lakes Management Unit.

Lake Sturgeon fry.

(None.) *Why?* (Dam completely stopped any sturgeon from getting upstream.)

Explanation: *Although dams are needed for hydro, the complete blockage of rivers prevents fish like Lake Sturgeon to travel upstream to spawn. Building complete obstructions on rivers essentially breaks their needed habitat in two. What do you think can be done to ensure that Lake Sturgeon are able to migrate upstream on rivers ?*

Round #5 – Recovery

Introduction: *The present. Fish ladders have been installed around dams. These structures are designed to allow fish the opportunity to migrate upstream around dams.*

Set-up: Block half the river with players. Empty space represents the fish ladder. Allow all other players back into the game.

Discussion: *How many of you made it through?* (Some.) *Why?* (Opening to get upstream.)

Explanation: *All around the Lake Huron and the Georgian Bay there are numerous impassable registered dams and probably twice as many unregistered dams and poorly designed culverts. Fragmentation of rivers can and has resulted in the decline of fish production from those waters.*

Game Debrief:

Questions: *Why is it important that Lake Sturgeon are part of the Georgian Bay ecosystem? What would we lose if Lake Sturgeon went extinct? What actions can you think of that would help Lake Sturgeon recover?*

Conclusion: *To help Lake Sturgeon recover, the Ontario Ministry of Natural Resources has banned recreational fishing for sturgeon and reduced commercial fishing quotas to zero in 2009.*

ASSESSMENT ACTIVITY

Activity: Students create a newspaper article using R.A.F.T.

Format as follows:

- Role of the Writer – As the writer, the student takes the perspective of a threatened Lake Sturgeon of the eastern Georgian Bay.
- Audience – The audience is the people of Parry Sound.
- Format – The format is a newspaper article written for the Parry Sound North Star.
- Topic + strong Verb – The point of the article: To convince your audience that it is important that Lake Sturgeon be saved from extinction.

1. Assign students to small groups of four or five and have them "put their heads together" to write their R.A.F.T. assignment.
2. Circulate among the groups to provide assistance as needed.
3. Have the groups share their completed assignments with the class.

(Adapted from Instructional Strategies Online, found at: http://olc.spsd.sk.ca/DE/PD/instr/strats/raft/)

Young Lake Sturgeon being measured and checked for overall health.

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