

Lesson 2-4: Nechako White Sturgeon Habitat and Humans

Time of Lesson: 1.5 hours

Instruction Objectives: Students understand the basic habitat needs of Nechako white sturgeon. Students can identify human made impacts to riparian zones that impact biodiversity, river habitat, water quality and watershed health. Relate these impacts to Nechako white sturgeon.

Strategies and Activities: Read and discuss the poem *Sturgeon*, review sturgeon habitat needs and discuss impacts by humans on sturgeon habitat. Create a poem about Nechako white sturgeon.

Materials:

- Handout: *Worksheet 2e - Sturgeon Poem*. Go to <http://www.lornacrozier.ca> for more information about the poet.
- Handout: *Worksheet 2f - Habitat Requirements T-Chart*.
- Experiment: 2 glass jars, access to water tap, a sunny spot and a shady spot in the classroom, thermometer.
- Activity: Paper, pens, pencils to create poem.

Student Assessment:

- Observation and participation in class and small group activities.
- Ability to identify basic habitat needs of Nechako white sturgeon.
- Understanding of how humans influence sturgeon habitat specifically in the Nechako Watershed.

LESSON PLAN

Experiment (5 minutes)

Conduct an in-class experiment. Fill two jars up with water. Place one in the sun and one in the shade. Leave the jars for at least 30 minutes. The jars will be discussed later in the lesson.

Ask

What do you think this experiment is testing for? *Test how having no shade can increase the water temperature.*

What do you predict will be the outcome? *Sunny jar will be warmer.*

Introduction (20 minutes)

Discuss the habitat requirements of Nechako white sturgeon. This topic will be covered in more detail in Unit 3, however a basic understanding is needed here to help relate sturgeon population health to river habitat, riparian zone ecosystem, watershed health and human influences.

On the white board, brainstorm the habitat requirements of Nechako white sturgeon.

Ask

What are the habitat requirements of sturgeon - or in other words, what types of areas or conditions do Nechako white sturgeon need in the river to survive? Consider the different life stages.

Eggs

- Clean, rocky substrate in turbulent river habitats (eggs stick to rocks)
- Temperatures of 14 – 18 degrees Celcius for optimum incubation
- POOR HABITAT: extreme water temperatures, abrupt temperature changes, contaminants, shallow water, low velocity, sediment accumulation silt

Larvae

- Require clean, rocky substrate in turbulent river habitats (for hiding and eating)
- Murky water (helps hide young sturgeon)
- POOR HABITAT: extreme water temperatures, abrupt temperature changes, contaminants, shallow water, low velocity, silt, increased water clarity, reduced food availability

Juveniles/Sub-adults/Mature adult population

- Deep pools, slow back eddies (to hide and rest)
- Lakes in the winter months (sometimes)
- Fast flowing areas below rapids (good place to get food)
- Prefer deep and faster flowing areas to spawn

Transition to next activity.

Activity (30 minutes)

Pass out the Handout *Worksheet 2e - Sturgeon Poem*. Read the poem out loud to the class. Stop to provide definitions of words or explain ideas. Have the students write comments or draw images of what they understand about the poem on the Handout. Allow for a classroom discussion.

Ask

What does this poem tell us about Nechako white sturgeon habitat? *Inhabits deep, cool water. In lakes. They live and eat at the bottom of the river or lake.*

What else does this poem tell us? *Human catch and eat sturgeon. Humans don't fully understand the sturgeon and our actions have an impact on their overall survival.*

Transition to next activity.

Experiment (15 minutes)

Recover the jars and record the water temperature from each jar. Write these on the white board and discuss the results. The results should show that the sunny jar was warmer. As previously discussed, eggs and young sturgeon and salmon do not prefer warm water temperatures. Salmon are a food source for sturgeon. If water temperature is too high, salmon survival is low and there is less food for sturgeon.

Ask

What factors cause water temperature in a river to rise? *Reduced riparian zone/vegetation that shades the river and water. Shallower water from dam activity or a naturally dry season.*

Are these factors natural or human made? *Both but mostly human made.*

Relate the discussion back to Nechako white sturgeon and the Nechako River.

This experiment is just one example of how humans can have an impact on riparian ecosystem health and river habitat, particularly for sturgeon and other fish that they eat. Hand out *Worksheet 2f - Habitat Requirements T-Chart*.

Ask

List other human impacts to sturgeon habitat and their food sources (salmon and invertebrates) that are specific to the Nechako Watershed.

Often culverts under roads (paved and gravel roads) are not installed properly and they block access for smaller fish (food source) to their spawning areas, thereby reducing the amount of small fish to feed upon.

Kenney Dam reduces the overall amount of water and depth of the river. This can be harmful for spawning, eggs and juvenile fish in particular.

Logging and agricultural practices tend to reduce the amount of riparian vegetation available along rivers, which can affect water temperature, food source and bank stability (added silt to the water covered good gravel beds needed for eggs and small sturgeon).

Transition to next activity.

Activity (20 minutes)

Have students work individually or in groups to create an original poem about the Nechako white sturgeon. Use the poem *Sturgeon* as an example, however the poem can be as simple as two or three lines. The poem should include details about sturgeon habitat and what factors impact their habitat and survival.

If time permits, have the students illustrate their poems and either present orally to the class or post on the wall for other classes to read.

Sturgeon Poem

Read the poem *Sturgeon*. This is a free verse poem with ideas that flow like ripples in a river. Remember when you read to follow the punctuation marks so the meaning is clear. Use the space beside the poem to write or draw what you understand about the poem. What is happening to the sturgeon in the poem? Where does the sturgeon spend its time within the river? Does the poet tell a happy or sad story in this poem?

Sturgeon

By Lorna Crozier
(from *Inventing the Hawk*)

Bottom feeders, the sturgeon move
their long snouts through the darkest part
of water, unchanged, Antediluvian
they are older than the oldest man,
older than any spirits of the air
Grandmother, grandfather, fish,
surely they are holy, worshipped
by the shamans when our world
was full of wonder. Too huge to hold
in the mind, they may be
what we have called Ogopogo, Loch Ness
fabulous, long-necked monsters
of the lakes, solitary, shy of man...
They are a heavy, bony fish
with thick sucking lips. They are
edible, their eggs consumed as caviar
black translucent pearls
the female lays after twenty years
without a mate.
Though they move
where light cannot reach them
as we move each night in dream,
unchanged, we pull them from
the bottoms of lake or river or sea
without awe or mercy,
thrust them into the sun
their old toothless mouths large as caves
their stunned eyes holding at the last
instant of their ancient lives
a human face.

Habitat Requirements T-Chart

Fill in the following chart with what you have learned about sturgeon habitat needs and how humans impact them (negatively and positively) in the Nechako Watershed.

<i>Nechako white sturgeon habitat requirements</i>	<i>Human Impacts in the Nechako Watershed</i>

GRADE: _____ TEACHER: _____

Feedback Form for Unit 2 - Lesson 2-4

Please fill in the information below. If you have additional comments, please make them directly in the lesson plan. Please feel free to email me any immediate concerns: michelle@mrconcepts.ca.

Background Information:

Was there enough information provided to conduct the lesson successfully?
Yes or No

If no, what additional information and/or resources would be useful for this lesson?

Activities:

Were the activities engaging to the students? Yes or No

Was the timeline of the activities a good estimate?
Too Long ____ Too Short ____ Just Right ____

Any comments?

Worksheets:

Were the worksheet(s) effective in teaching and/or reviewing the lesson material?
Yes or No

Was the answer key helpful? Yes or No

Additional Resources:

If used, were the resources suggested or provided for this lesson useful? Yes or No

What else would you suggest be needed for this lesson?