



# **BRING BACK THE SALMON**

**LAKE ONTARIO**

supported by

**ONTARIO POWER  
GENERATION**

**\*DRAFT\***

**CLASSROOM HATCHERY PROGRAM**

**GRADE 3 LESSON GUIDE**

Made possible through funding from:



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## Lesson Summaries

<p><b><i>Lesson 1:</i></b>  <b>Name that Fish – The Importance of Proper Identification</b></p>	<p>Students will be introduced to basic fish biology and identification to assist them to identify adult Atlantic Salmon. In groups of 2-3 they will use a basic characteristic key to identify and label a diagram containing 5 species of salmon found in Lake Ontario.</p>	<p>50-60 Minutes</p>
<p><b><i>Lesson 2:</i></b>  <b>The Green Ribbon of Life</b></p>	<p>In this experiment, students will build a model to observe how erosion occurs in river systems. They will attempt to reduce erosion using artificial root systems to demonstrate the importance of vegetation and healthy riparian buffer zones for streams and ultimately, Atlantic Salmon.</p>	<p>90-120 Minutes</p>
<p><b><i>Lesson 3</i></b>  <b>The Role of Plants and Soils in Healthy Riparian Buffer Zones: Filtration</b></p>	<p>In this experiment, potted plants and soil will be used to filter water mixed with various artificial contaminants. This will demonstrate how vegetation can improve water quality in streams and stop the inflow of contaminants from human sources.</p>	<p>60-90 Minutes</p>
<p><b><i>Lesson 4:</i></b>  <b>Atlantic Salmon Bingo</b></p>	<p>This bingo activity is to correspond with the Bring Back the Salmon classroom presentation delivered by OFAH staff. It can also be played at other times.</p>	<p>50-60 Minutes</p>
<p><b><i>Lesson 5:</i></b>  <b>Fish Need Trees</b></p>	<p>Students will learn how Atlantic Salmon depend on trees and shrubs for their survival. The students will also learn about environmental stewardship and how they can be involved in improving ecosystem health, benefiting all of nature including Atlantic Salmon and humans. Students will write a letter to enquire about undertaking a stewardship project.</p>	<p>120 Minutes</p>
<p><b><i>Lesson 6:</i></b>  <b>Dangerous River</b></p>	<p>A dynamic game that teaches the students about some of the hardships that migrating Atlantic Salmon face.</p>	<p>60 Minutes</p>

## Grade 3 Curriculum Connections

Curriculum	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6
<b>Science &amp; Technology</b>						
<b>UNDERSTANDING LIFE SYSTEMS GROWTH AND CHANGES IN PLANTS</b>						
<i><b>Expectations</b></i>						
1. assess ways in which plants have an impact on society and the environment, and ways in which human activity has an impact on plants and plant habitats		<b>X</b>	<b>X</b>		<b>X</b>	
1.1 assess ways in which plants are important to humans and other living things, taking different points of view into consideration		<b>X</b>	<b>X</b>		<b>X</b>	
1.2 assess the impact of different human activities on plants, and list personal actions they can engage in to minimize harmful effects and enhance good effects		<b>X</b>	<b>X</b>		<b>X</b>	
2.1 follow established safety procedures during science and technology investigations		<b>X</b>	<b>X</b>			
3.6 describe ways in which plants and animals depend on each other		<b>X</b>	<b>X</b>		<b>X</b>	
<b>UNDERSTANDING MATTER AND ENERGY FORCES CAUSING MOVEMENT</b>						
<i><b>Expectations</b></i>						
1.1 assess the effects of the action of forces in nature (natural phenomena) on the natural and built environment, and identify ways in which human activities can reduce or enhance this impact		<b>X</b>	<b>X</b>			
<b>UNDERSTANDING EARTH AND SPACE SYSTEMS SOILS IN THE ENVIRONMENT</b>						
<i><b>Expectations</b></i>						
1.1 assess the impact of soils on society and the environment, and suggest ways in which humans can enhance positive effects and/or lessen or prevent harmful effects			<b>X</b>			
1.2 assess the impact of human action on soils, and suggest ways in which humans can affect soils positively and/or lessen or prevent harmful effects on soils		<b>X</b>	<b>X</b>			

2.1 follow established safety procedures during science and technology investigations		X	X			
2.2 investigate the components of soil, the condition of soil, and additives found in soil, using a variety of soil samples from different local environments, and explain how the different amounts of these components in a soil sample determine how the soil can be used			X			
3.2 identify additives that might be in soil but that cannot always be seen			X			
3.3 describe the interdependence between the living and non-living things that make up soil			X			

## Health and Physical Education

### ACTIVE LIVING

#### *Expectations*

A1. participate actively and regularly in a wide variety of physical activities, and demonstrate an understanding of the value of regular physical activity in their daily lives						X
A1.1 actively participate in a wide variety of program activities, according to their capabilities, while applying behaviours that enhance their readiness and ability to take part						X
A1.2 demonstrate an understanding of factors that contribute to their personal enjoyment of being active						X
A1.3 describe the benefits of participating in physical activity every day						X
A2. demonstrate an understanding of the importance of being physically active, and apply physical fitness concepts and practices that contribute to healthy, active living						X
A2.1 daily physical activity: participate in sustained moderate to vigorous physical activity, with appropriate warm-up and cool-down activities, to the best of their ability for a mini-mum of twenty minutes each day						X
A2.2 identify new capabilities and other benefits that may result from improved cardio respiratory fitness						X
A2.3 assess their degree of physical exertion during cardiorespiratory fitness activities, using simple self-assessment methods						X
A3. demonstrate responsibility for their own safety and the safety of others as they participate in physical activities						X

A3.1 demonstrate behaviours and apply procedures that maximize their safety and that of others during physical activity						<b>X</b>
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**MOVEMENT COMPETENCE: SKILLS, CONCEPTS, AND STRATEGIES**

***Expectations***

B1. perform movement skills, demonstrating awareness of the basic requirements of the skills and applying movement concepts as appropriate, as they engage in a variety of physical activities						<b>X</b>
B1.1 perform controlled transitions between static positions, using different body parts and shapes and different levels, with and without equipment						<b>X</b>
B1.2 demonstrate the ability to jump for distance or height, using two-foot and one-foot take-offs, while remaining in control						<b>X</b>
B1.3 perform a variety of locomotor movements with and without equipment, alone and with others, moving at different levels, using different pathways, and travelling in different directions						<b>X</b>
B2. apply movement strategies appropriately, demonstrating an understanding of the components of a variety of physical activities, in order to enhance their ability to participate successfully in those activities.						<b>X</b>
B2.1 demonstrate an understanding that different physical activities have different components, and apply this understanding as they participate in and explore a variety of individual and small-group activities						<b>X</b>
B2.2 apply a variety of simple tactics to increase their chances of success during physical activities						<b>X</b>

**Language**

**ORAL COMMUNICATION**

***Expectations***

1. listen in order to understand and respond appropriately in a variety of situations for a variety of purposes	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
1.1 identify purposes for listening in a variety of situations, formal and informal, and set personal goals related to listening tasks	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

1.2 demonstrate an understanding of appropriate listening behaviour by using active listening strategies in order to contribute meaningfully and work constructively in groups	X	X	X	X	X	X
2. use speaking skills and strategies appropriately to communicate with different audiences for a variety of purposes						X
2.2 demonstrate an understanding of appropriate speaking behaviour in a variety of situations, including small and large-group discussions						X

### READING

#### ***Expectations***

3. use knowledge of words and cueing systems to read fluently	X			X	X	
Reading Familiar Words 3.1 automatically read and understand most high-frequency words, many regularly used words, and words of personal interest or significance, in a variety of reading contexts	X			X	X	
Reading Unfamiliar Words 3.2 predict the meaning of and rapidly solve unfamiliar words using different types of cues	X			X	X	

### WRITING

#### ***Expectations***

1. generate, gather, and organize ideas and information to write for an intended purpose and audience	X				X	
Purpose and Audience 1.1 identify the topic, purpose, audience, and form for writing	X				X	
Developing Ideas 1.2 generate ideas about a potential topic, using a variety of strategies and resources					X	
Review 1.6 determine whether the ideas and information they have gathered are relevant and adequate for the purpose, and gather new material if necessary					X	
2. draft and revise their writing, using a variety of informational, literary, and graphic forms and stylistic elements appropriate for the purpose and audience	X				X	
Form 2.1 write short texts using a variety of forms	X				X	

Word Choice 2.3 use words and phrases that will help convey their meaning as specifically as possible	X				X	
Sentence Fluency 2.4 vary sentence structures and maintain continuity by using joining words (e.g., and, or) to combine simple sentences and using words that indicate time and sequence to link sentences					X	
Preparing for Revision 2.6 identify elements of their writing that need improvement, using feedback from the teacher and peers, with a focus on specific features	X				X	
Revision 2.7 make revisions to improve the content, clarity, and interest of their written work, using several types of strategies	X				X	
3. use editing, proofreading, and publishing skills and strategies, and knowledge of language conventions, to correct errors, refine expression, and present their work effectively	X				X	
Spelling Familiar Words 3.1 spell familiar words correctly	X				X	
Spelling Unfamiliar Words 3.2 spell unfamiliar words using a variety of strategies that involve understanding sound-symbol relationships, word structures, word meanings, and generalizations about spelling	X				X	
Vocabulary 3.3 confirm spellings and word meanings or word choice using several different types of resources	X				X	
Punctuation 3.4 use punctuation to help communicate their intended meaning, with a focus on the use of: quotation marks to indicate direct speech; commas to mark grammatical boundaries within sentences; capital letters and final punctuation to mark the beginning and end of sentences					X	
Grammar 3.5 use parts of speech appropriately to communicate their meaning clearly, with a focus on the use of: proper nouns for titles					X	
Proofreading 3.6 proofread and correct their writing using guidelines developed with peers and the teacher	X				X	





<b>Class size:</b> Unlimited
<b>Setting:</b> Classroom
<b>Time:</b> 50-60 Minutes

## Grade 3 Classroom Hatchery Activities

### ***Lesson 1: Name that Fish – The Importance of Proper Identification***

#### **Lesson Objectives:**

- Familiarize students with the identification of Atlantic Salmon;
- Familiarize students with basic fish biology, identification, and terminology;
- Assist students to recognize the value of proper species identification.

#### **Materials:**

- Projector connected to computer or printed presentation (found below);
- Copies of last page of lesson (enough for groups of 2-3);
- Pencils;
- Field Guide on Fish if available (from home or library)

#### **Background**

Ontario is home to nearly 150 fish species, 129 of which are native. Proper identification of individual species is useful for monitoring (species presence and location, population size, fish community health, etc), and for managing and complying with fishing regulations. Identification can also help build a deeper connection with a species and enable the observation of patterns and life stories. It can also be a lot of fun!

Fish just like all other living things have unique physical characteristics that distinguish one species from another. Size, colouration, shape, and presence or absence of particular features are some of these characteristics. Atlantic Salmon like some other fish (trout and catfish) have an adipose fin (the small fin on the back of fish just in front of tail) and a soft dorsal fin. The purpose of this fin remains a bit of mystery. One leading theory on its function is that it senses current for more efficient swimming upstream. Atlantic Salmon have dark spots (sometimes x shaped) on a lighter coloured body, only 2-3 large spots on the gill cover, a mouth that stops at the eye, and a long narrow caudal peduncle (the part of the fish that connects the body to the tail). These characteristics are shown in the presentation below.

It is important that scientists and anglers can properly identify Atlantic Salmon to give the Atlantic Salmon the best level of care and so that anglers can follow fishing regulations. Anglers with proper identification skills can be valuable citizen scientists who can greatly contribute to monitoring efforts.

## Teaching and Learning Sequence

**Part A:** Share this **Cool Atlantic Salmon Fact:** *Atlantic salmon are known as the "leaper". They can jump out of the water 3 metres high! That is as high as a basketball net!!*

**Part B.** Ask these **Guiding Questions:**

1. Has anyone ever seen an Atlantic Salmon? (They may have seen them in the grocery store – all of these fish are farmed!)
2. How might you tell the difference between an Atlantic Salmon and another fish?

**Part C.** Present "**Basic Fish ID**" (on a projector screen or print/display to class).

1. Page 1 of Presentation: Allow time for the students to talk about what they see. You are not looking for specific answers, rather you are engaging their observation skills.
2. Ask the students how a fish breathes? Point out and define the ***gills*** = *the breathing organ of fish and some other animals used to extract oxygen from water.*
3. Page 2- 4: Show the 1 or 2 characteristics identified on each fish. This can be done quickly and is intended to show the students some of the main physical differences between fish. Atlantic Salmon being our focus fish has more characteristics identified.
4. Page 5 shows the fins of the Atlantic Salmon. The presence of these fins are characteristic of all the salmon species. Point out and define the ***adipose fin*** = *a small fleshy fin just ahead of the tail. Found on only a small number of fish species including salmon.*
5. Divide students into groups of 2-3 and give each group a copy of the final (7<sup>th</sup>) page of this lesson.
6. While displaying page 6 of the presentation, have the students use the displayed page 7 to identify each fish and write 3 identifying characteristics as per the sheet.

**Part D.** Ask these **Reflection Questions** (can be done as a Think, Pair, Share in their existing groups):

1. Why is the proper identification of fish important?
2. Name some identifying characteristics of an adult Atlantic Salmon.

**ANSWER KEY:** \*All have adipose fins\* 1<sup>st</sup> Fish: Chinook Salmon (no spots on gill cover, black mouth, black gums, spots on tail); 2<sup>nd</sup>: Brown Trout (spots on gill cover, no spots on tail); 3<sup>rd</sup>: Atlantic Salmon (2-3 spots on gill cover, mouth stops at the eye, pale mouth, few or no spots on the tail, dark spots on upper half of the body, long narrow caudal peduncle); 4<sup>th</sup>: Coho Salmon (no spots on gill cover, black mouth, pale gums, spots on upper lobe only of tail); Rainbow Trout (no spots on gill cover, spots on tail, pale mouth)

# Presentation: Basic Fish Identification

## What Differences Do You See?



THE SMALL-MOUTHED BLACK BASS. (MICROPTERUS DOLOMIEU.)

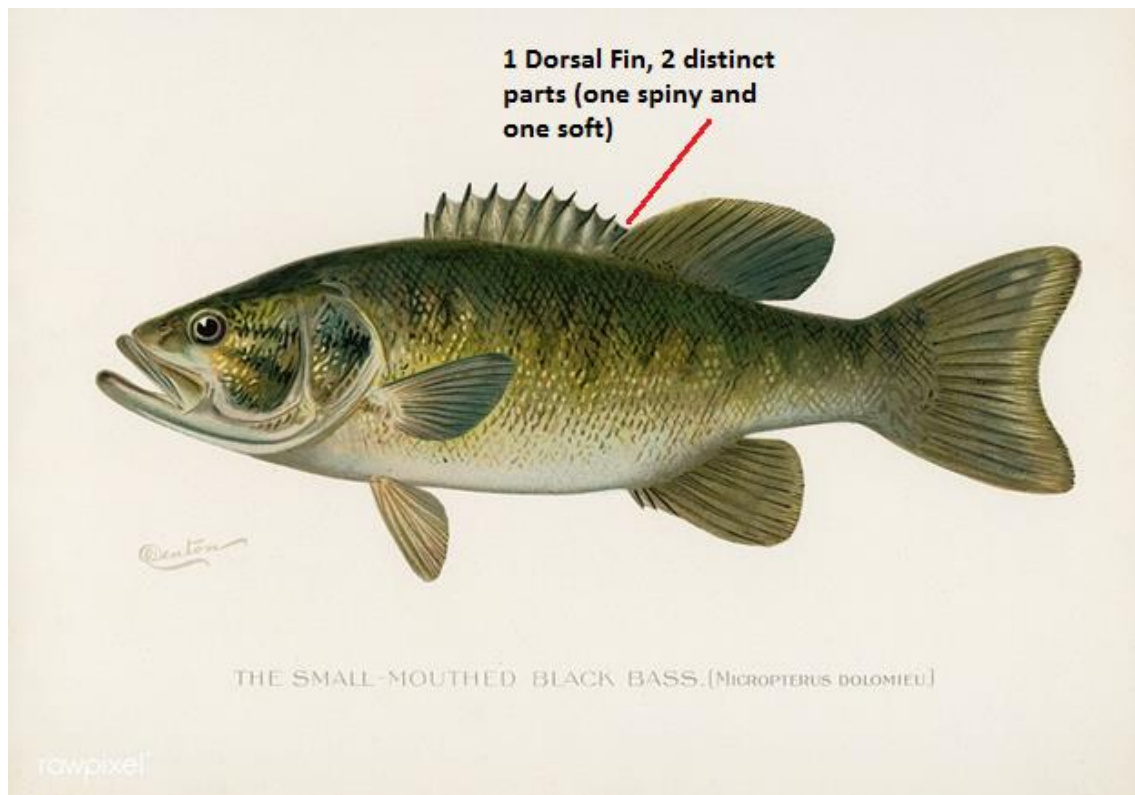
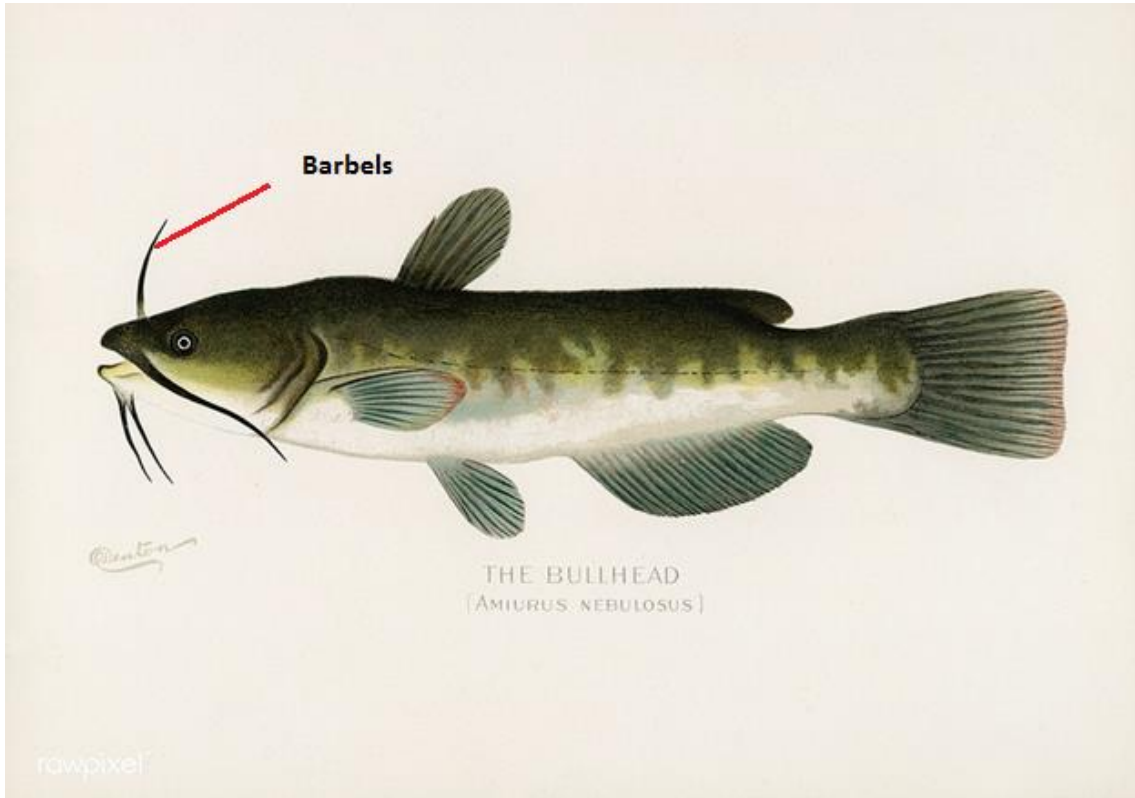
rawpixel



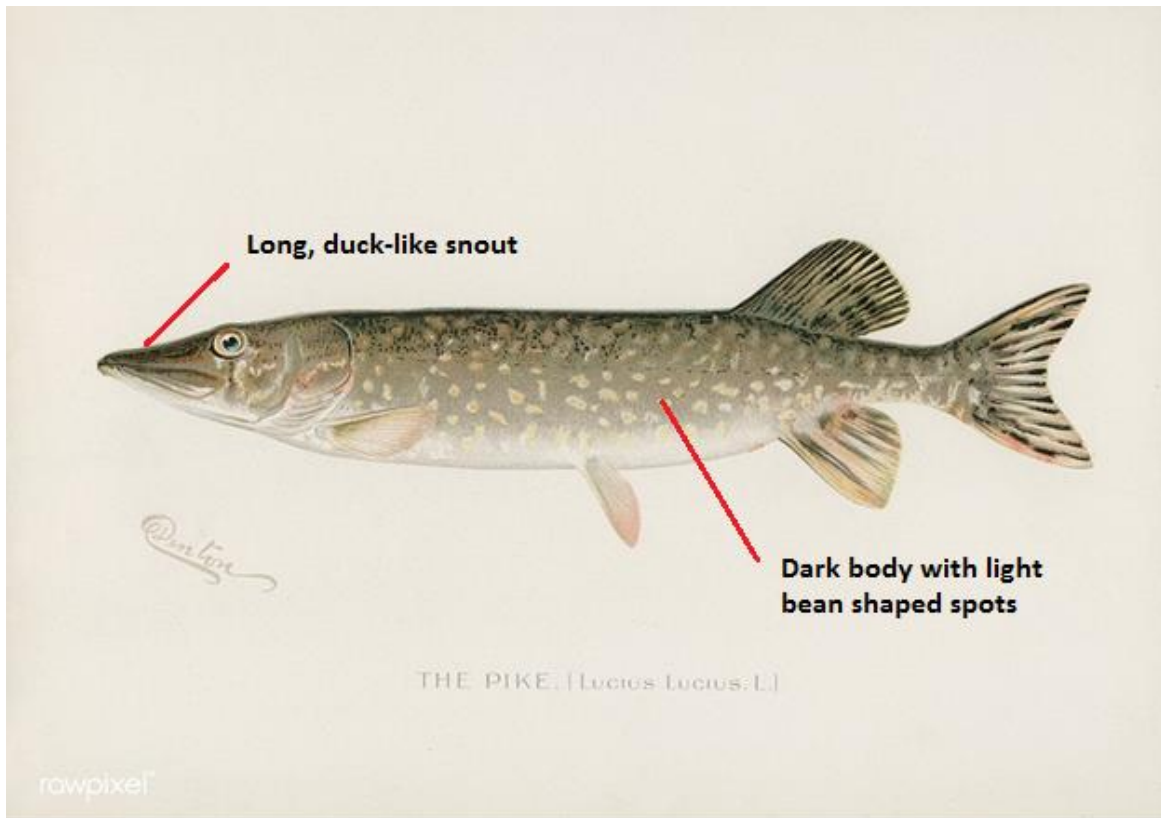
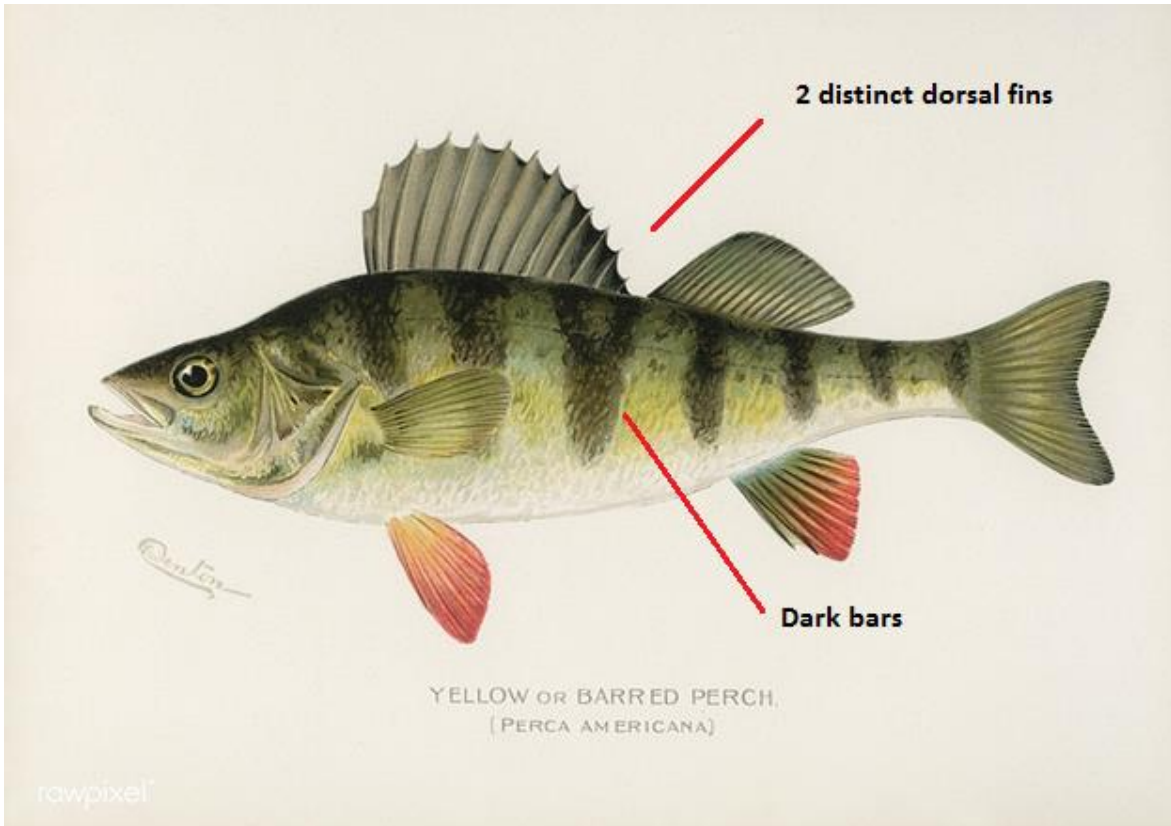
THE ATLANTIC SALMON. (SALMO SALAR.)

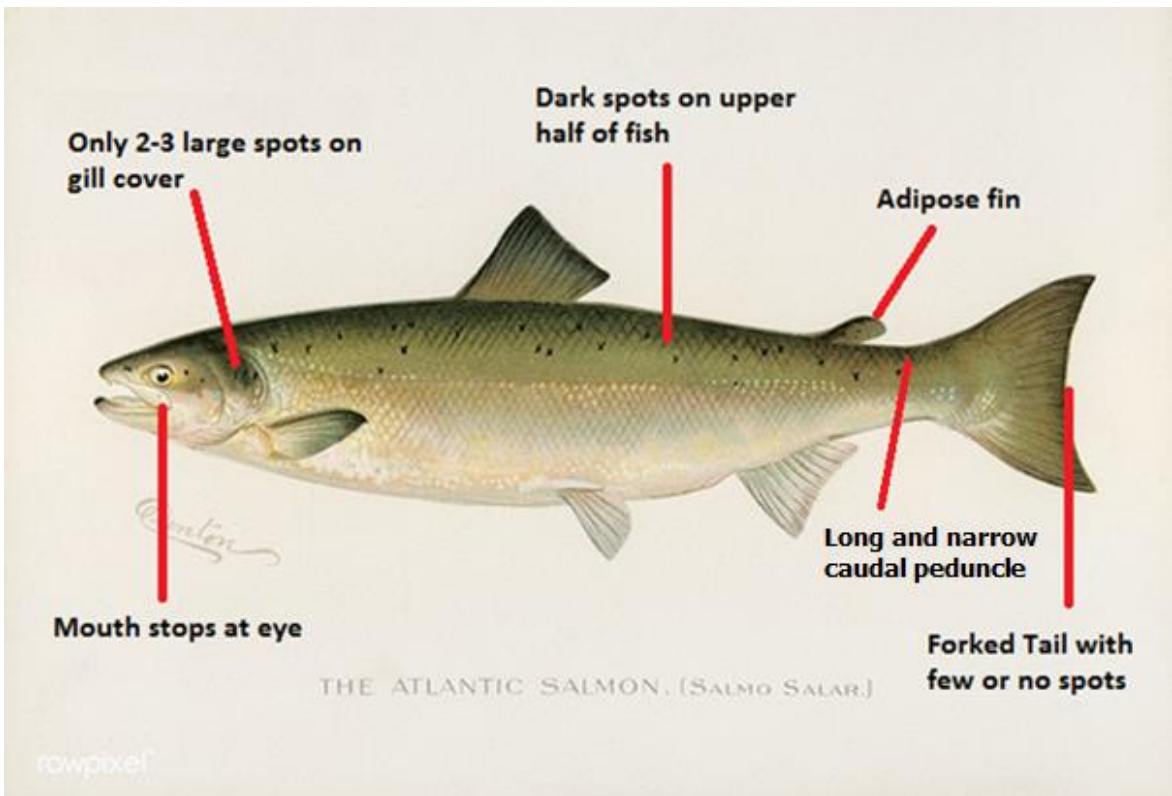
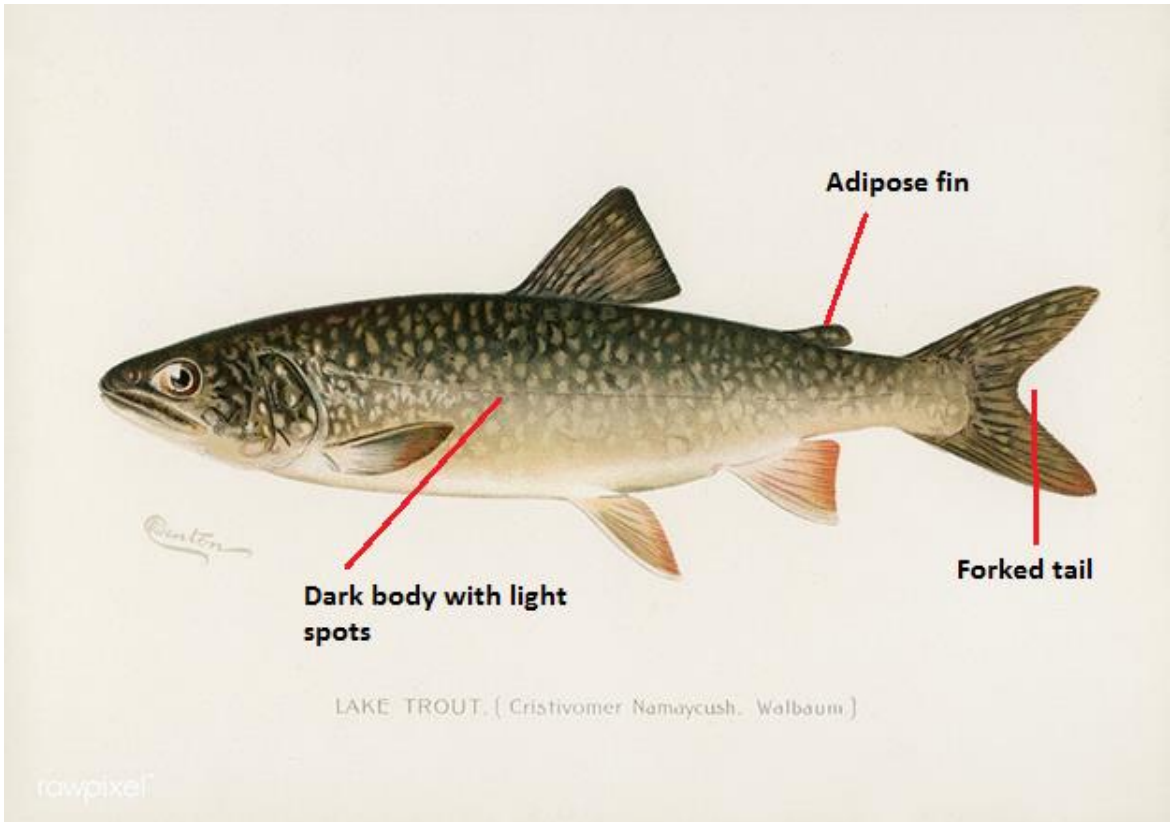
rawpixel

## Some Basic Physical Characteristic Differences

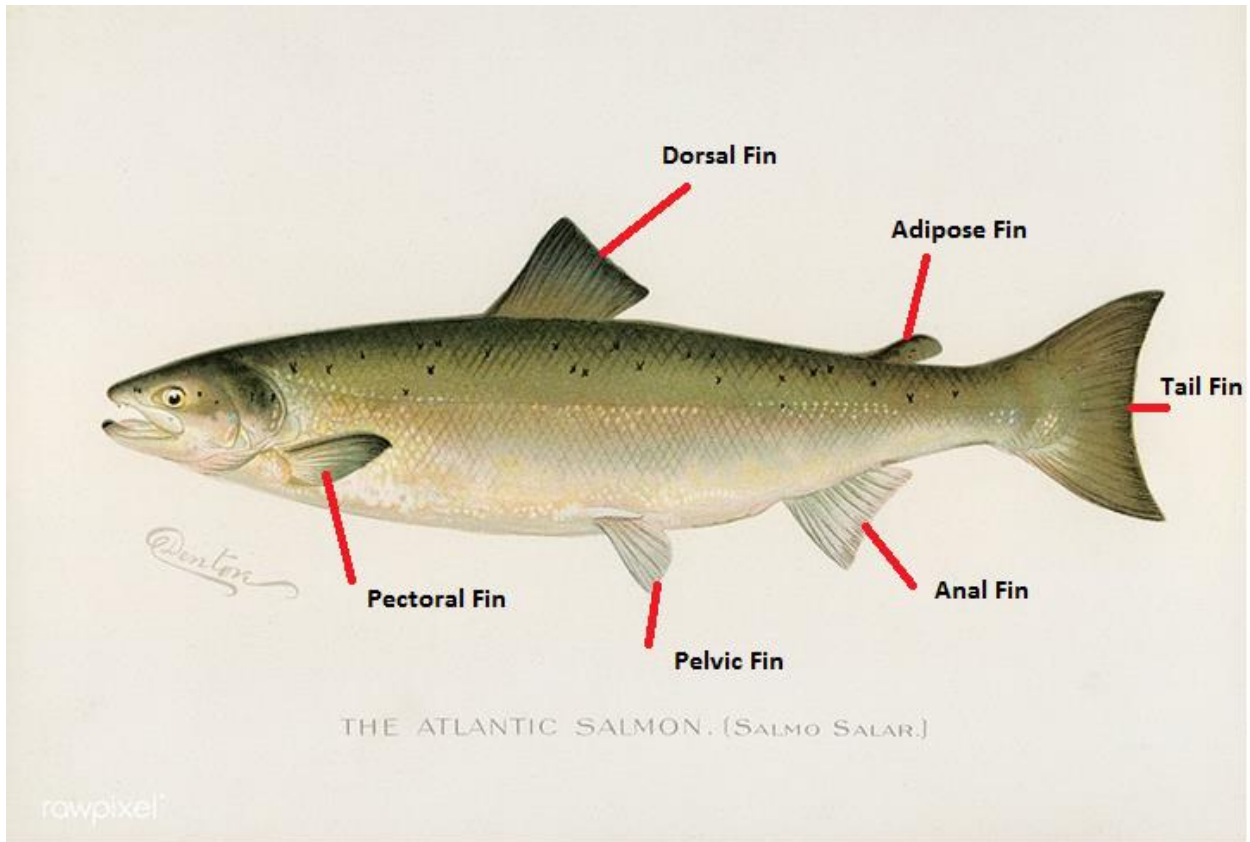






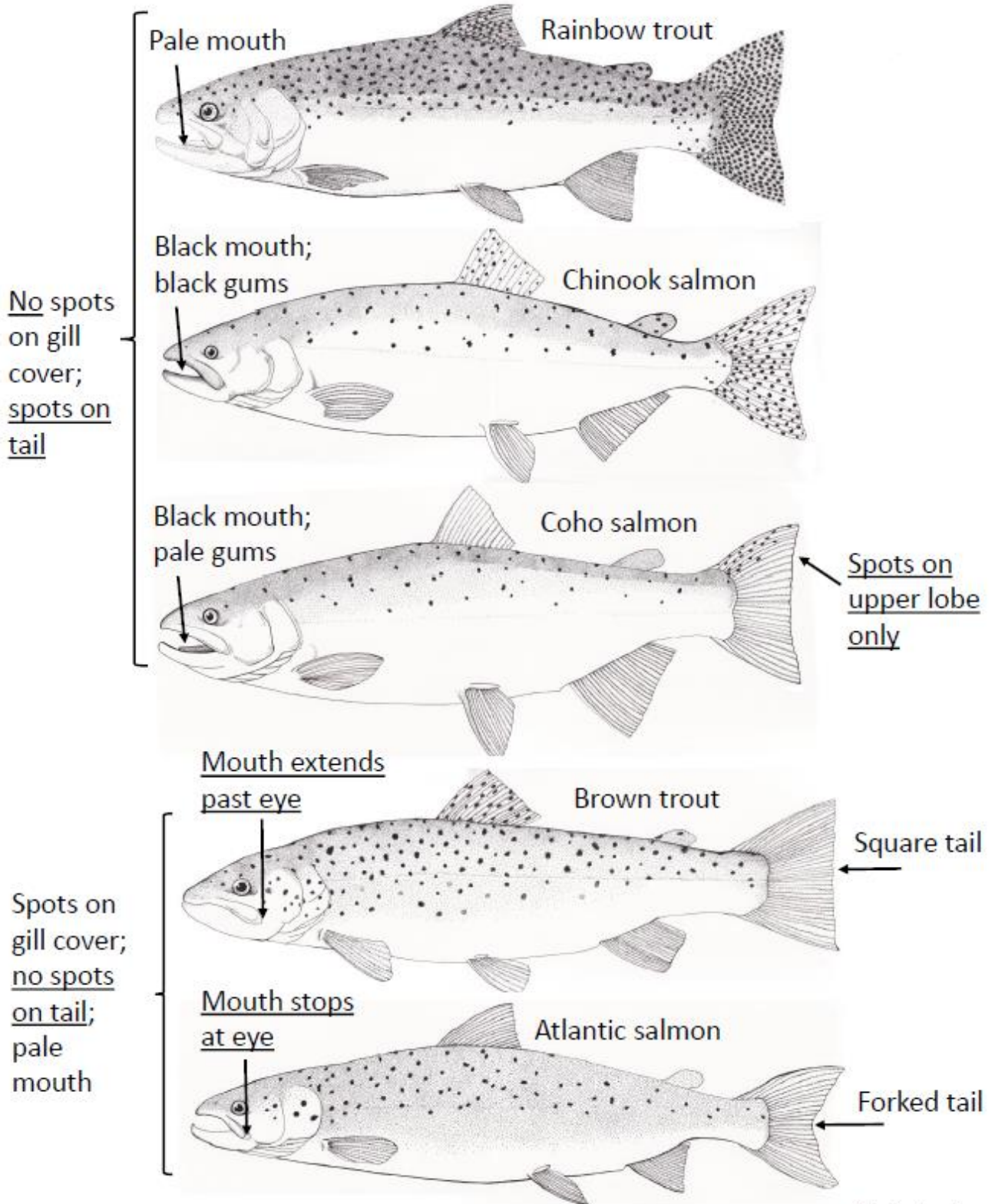


## Fins of a Salmon



Fish Illustrations from Game Birds and Fishes of North America; illustrated by Sherman F. Denton (1856–1937)

**Fishing regulations differ among species! Make sure you can tell species apart.**





Copy Me

## NAME THAT SALMON

Student Names \_\_\_\_\_  
\_\_\_\_\_

Beside each fish write the species name and 3 identifying characteristics (e.g. has an adipose fin; no spots on the gill cover; black mouth with black gums).



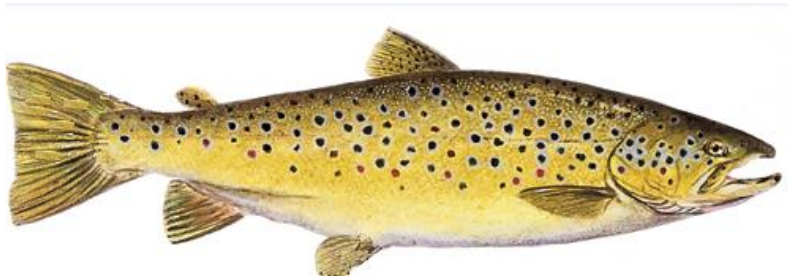
Species Name: \_\_\_\_\_

Characteristics:

#1 \_\_\_\_\_

#2 \_\_\_\_\_

#3 \_\_\_\_\_



Species Name: \_\_\_\_\_

Characteristics:

#1 \_\_\_\_\_

#2 \_\_\_\_\_

#3 \_\_\_\_\_



Species Name: \_\_\_\_\_

Characteristics:

#1 \_\_\_\_\_

#2 \_\_\_\_\_

#3 \_\_\_\_\_



Species Name: \_\_\_\_\_

Characteristics:

#1 \_\_\_\_\_

#2 \_\_\_\_\_

#3 \_\_\_\_\_



Species Name: \_\_\_\_\_

Characteristics:

#1 \_\_\_\_\_

#2 \_\_\_\_\_

#3 \_\_\_\_\_



<b>Class size:</b> Unlimited
<b>Setting:</b> Outdoors (preferred) or classroom
<b>Time:</b> 90-120 Minutes

## Grade 3 Classroom Hatchery Activities

### *Lesson 2: The Green Ribbon of Life*

#### **Lesson Objectives:**

- Familiarize students with important characteristics of riparian buffer zones
- Familiarize students with characteristics of plants
- Assess ways in which plants have an impact on the environment, and how humans may negatively impact plants
- Practice laboratory and safety skills

#### **Materials:**

- Gently sloping surface 1m or more in length (can be a long table with one end propped up, or 2 desks with the first desk propped up – the momentum will carry the water over the second flat desk)
- Cardboard or similar material to build side walls
- Tape
- Water
- Soil/dirt (can be mixed with small rocks and debris)
- Small shovel for the soil
- Pipe cleaners (5-10 per student)
- Buckets to catch the water at the end of the stream

#### **Background**

The **riparian zone** is the area along the banks of a stream where the water meets the land. When this area is filled with vegetation, it is called a **riparian buffer zone**. Riparian buffer zones are important for stream health because they help take care of the stream. Some riparian zones may not have plants anymore because humans removed them to gain easier access to the stream, or because they have channelized that area of the stream.

**Channelization** is a process where a stream is straightened and sometimes lined with concrete so it hardly resembles the natural system it once was. Channelization has a negative impact on the stream because it reduces the diversity of fish habitat, causes the water to warm more quickly, and increases erosion and flow rates.

Healthy riparian buffer zones are natural zones with lots of vegetation (a green ribbon of life) that provides shade to the water, resources to the animals who live there, filters incoming water, and reduces erosion. Atlantic Salmon need cold water to thrive. It is important that their stream habitat is shaded so the water doesn't heat up too much. Without vegetation filtering rain and other water that flows into the stream off the land, anything could be carried into the stream, including garbage, contaminants, or sediment. Excessive erosion is bad for salmon because it results in a lot of dirt particles in the water that settle out and bury their gravel spawning areas so they aren't accessible, or even bury eggs under the sediment where they will suffocate and die.

## Teaching and Learning Sequence

### **Part A.**

1. Read the background above to the students.
2. Share this interesting fact: Did you know that healthy riparian zones can be used as a wildlife corridor for land animals to travel along? They can act like a hallway through an urban area where animals will be safe from cars and other hazards as they travel across the landscape.

### **Part B. Give the students an overview of what makes a healthy riparian buffer zone (see attached resources).**

#### Ask these **Guiding Questions**:

1. Knowing what humans have done in the past to damage riparian buffer zones, what could we do to improve them today?
2. What species of animals do you think rely on healthy riparian buffer zones? (fish, aquatic bugs, aquatic animals (otters, beavers, etc), many different bird species but also land animals that travel through – deer, snakes, turtles, squirrels, etc.)

### **Part C.**

1. Gather your materials and head outside for the experiment. Completing the experiment outdoors is ideal because it can get quite messy. This experiment can be completed as a demonstration where the teacher builds one stream using tree root systems made by the students, or in groups of 4-6 students.
2. Distribute the supplies to each group and have the students begin building their roots by bending and joining pipe cleaners into the shape of roots.
3. Build the stream bed using the cardboard and tape to make side walls, then fill with soil, and carve out the winding shape of a stream with a width of about 5cm.
4. Bury the roots in the stream bank soil **on only one side** of the stream and then pack the soil down tightly around the roots.
5. Make predictions about what will happen when the water is poured down: will the side with the roots or the side without roots erode more easily? (The side with no roots should erode more.) Will there be more erosion at the bends in the stream where the water is moving more quickly? (Yes.)
6. Feel free to take a picture of the stream before and after the water is added to compare.
7. Slowly pour water down the channel and catch it in the bucket at the end of the stream.
8. Observe the changes in the stream banks.
9. Repeat the experiment if desired using an increased number of roots or different materials to make roots (sticks collected from the ground, recycled materials, etc.).  
\*This experiment could also be done as a contest to see which group can engineer the best root system.

### **Part D. Ask these **Reflection Questions** (can be done as a Think, Pair, Share):**

1. What was the most effective method of keeping your banks stable?
2. Which materials worked best, and how would you change materials or use materials differently to stop even more erosion? How can this be applied to a real stream?

## Teacher Resources

Comparison of a healthy riparian buffer zone vs. an impacted riparian zone:



<b>Healthy Riparian Buffer Zone</b>	<b>Impacted Riparian Zone</b>
<ul style="list-style-type: none"><li>• trees and shrubs lining the edges of the stream</li><li>• barrier between human land use (agriculture) and the stream</li><li>• water is shaded for most of its length</li></ul>	<ul style="list-style-type: none"><li>• no plants lining the edge of the stream</li><li>• human land use (agriculture) right beside the stream</li><li>• water is exposed to sunlight for most of its length</li></ul>



<b>Class size:</b> Unlimited
<b>Setting:</b> Classroom
<b>Time:</b> 60-90 Minutes

## Grade 3 Classroom Hatchery Activities

### *Lesson 3: The Role of Plants in Healthy*

### *Riparian Buffer Zones: Filtration*

*\*Adapted from United States Environmental Protection Agency Environmental Education*

#### **Lesson Objectives:**

- Familiarize students with important characteristics of riparian buffer zones
- Familiarize students with characteristics of plants
- Explore the efficacy of plants at filtering different substances out of water
- Practice laboratory and safety skills

#### **Materials:**

- Six potted plants, with pots roughly six to eight inches in diameter, and holes in the bottom. These plants need to be moderately dry, as if they had not been watered for a couple of days. Plants with saturated soil will not absorb water, and very dry plants will absorb it all
- Six clear containers, such as cups, which will support the plants and allow drainage to be viewed. You will need separate plants and cups for each of the materials in the water
- Soil (from outside or store bought). The best soil is loam
- Unsweetened powdered drink mix, preferably grape or cherry for color
- Vegetable oil

#### **Background:**

Soil and plants work together to filter ground and surface water that enters streams. They are able to remove many of the substances carried by water. Materials can bind to soil particles and be taken up by plant roots. Things like phosphorus and nitrogen are used for plant growth, but have negative impacts when they are in excess in aquatic systems. Nutrients from farm fields for example could be carried towards a stream by heavy rainfall, but if there are plants beside the stream, they can help filter out these nutrients so they don't harm the stream and lakes they connect to. Excess nutrients in lakes can cause lots of algae growth, which can make lakes less welcoming for swimming, reduce the amount of oxygen available in the water for fish, and even contain harmful toxins. Plants and soils are not able to filter out everything that flows through them, but depending on the flow rate of the water, and the type and quantity of the substance, they can help. This is why it is important to have healthy riparian buffer zones surrounding streams.

**Riparian buffer zones** are areas surrounding streams where there is lots of vegetation. This vegetation will help filter the water entering the stream. The vegetation also provides shade to keep the stream cool, reduces erosion, and provides habitat for many animal species.



## Teaching and Learning Sequence

**Part A.** Share this interesting fact: soil is not just dirt. It is a living ecosystem containing a multitude of microorganisms that play an extremely important role in nutrient cycling. Some soil microorganisms can break down contaminants into less toxic or non-toxic components.

**Part B.** Give the students an overview of the role of plants and soils in a healthy riparian buffer zone.

Ask these **Guiding Questions**:

1. What do you predict will happen when we pour a solution of water and another substance through a flower pot?
2. Would these substances flow through with the water? Why or why not?

### **Part C.**

1. Make sure your soil is loose enough by pouring plain water through. About 30mL of water should percolate through per minute. Pack the soil tighter or loosen it up until you approximately achieve this rate.
2. Set each of the plants on their cup.
3. Begin with plain water, and pour it through flower pot #1. It should come out as clean as when it went in.
4. **Dirty Water Trial:** add a tablespoon of soil to 100mL of water and mix, then pour it over flower pot #2. The water coming through should have less dirt than the beginning mixture.
5. **Oil and Water Trial:** add a tablespoon of oil to 100mL of water and mix slightly, then pour over flower pot #3. See if the oil percolates through or is trapped by the soil and plant.
6. **Juice Trial:** add ½ teaspoon of drink mix to 100mL of water, mix well and then pour over flower pot #4. See if the water coming through is still coloured.
7. **Powdered Soap Trial:** add a teaspoon of powdered soap to 100mL of water, mix well. Pour over flower pot #5.
8. **Liquid Soap Trial:** add a tablespoon of liquid soap to 100mL of water and mix. Pour over flower pot #6.
9. Now you will simulate a rain event by pouring clean water through each flower pot to see if heavy rain could cause more of the substance to make its way through the soil.
10. If students have an idea for another material readily available in the classroom, you can reuse flower pot #1 to test this substance.

**Part D.** Ask these **Reflection Questions** (can be done as a Think, Pair, Share):

1. Reflect on which substances went through the soil and which did not. Was this what you predicted?
2. How does this apply to Atlantic Salmon habitat? Do you think vegetation is an important component of their habitat?



<b>Class size:</b> Unlimited
<b>Setting:</b> Classroom
<b>Time:</b> 50-60 Minutes

## Grade 3 Classroom Hatchery Activities

### *Lesson 4: Atlantic Salmon Bingo*

#### **Lesson Objectives:**

- Keep students engaged during the presentation
- Help familiarize students with words associated with Lake Ontario Atlantic Salmon
- Expand the student's vocabulary

#### **Materials:**

- Bingo Card Handout
- Pencils, pens or markers
- Buttons or stones instead of writing utensils if planning to reuse the bingo sheets

#### **Background**

During your classroom hatchery program, OFAH will be delivering a presentation titled "**LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure**". Contained in the presentation are a number of key terms related to Atlantic Salmon.

### **Teaching and Learning Sequence**

**Part A.** Prior to OFAH arriving for the presentation, print off the Atlantic Salmon Bingo cards below. There are 30 bingo cards. Cards can be duplicated as needed for larger classes. Instruct students on how to play the game. As a group read all the words on the bingo cards and have the students try and define unfamiliar words.

**Part B.** When a word is displayed on the screen, students mark the word off. Students can win by being the first to have a complete vertical, horizontal, or diagonal line, at which point they call out "smolt" to win.

**Part C.** Play the game at other times by cutting out the words and randomly picking them out of a hat or have students take turns reading out 1 word each. Instead of marking off the words, use items such as buttons or stones so the cards can be reused.

# Atlantic Salmon Bingo

Lake Ontario	parr	rocky	smolt
fry	monitoring	overfishing	egg
stocking	native	spawn	restoration
barriers	alevin	pollution	invertebrates

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

When one of the words above are displayed on the screen mark off the word. When you have a completed line (vertical, horizontal, or diagonal) call out "smolt". The first student to get to smolt wins and the game is over – but still pay attention to the presentation! 😊



# Atlantic Salmon Bingo

alevin	parr	spawn	monitoring
smolt	stocking	egg	fry
native	restoration	rocky	barriers
invertebrates	Lake Ontario	overfishing	pollution

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

parr	fry	rocky	stocking
Lake Ontario	egg	native	smolt
spawn	restoration	barriers	monitoring
overfishing	pollution	invertebrates	alevin

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

invertebrates	alevin	pollution	overfishing
native	spawn	restoration	barriers
monitoring	smolt	Lake Ontario	egg
stocking	rocky	fry	parr

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

rocky	parr	fry	smolt
spawn	native	egg	Lake Ontario
overfishing	barriers	restoration	monitoring
pollution	alevin	invertebrates	stocking

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

alevin	monitoring	smolt	Lake Ontario
parr	native	stocking	egg
fry	pollution	rocky	barriers
overfishing	spawn	restoration	invertebrates

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

Lake Ontario	spawn	smolt	parr
fry	rocky	stocking	barriers
restoration	overfishing	pollution	invertebrates
egg	native	alevin	monitoring

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

alevin	smolt	Lake Ontario	spawn
pollution	parr	egg	barriers
native	monitoring	stocking	restoration
fry	rocky	overfishing	invertebrates

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

alevin	native	barriers	overfishing
parr	Lake Ontario	egg	pollution
restoration	smolt	stocking	spawn
monitoring	rocky	invertebrates	fry

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

alevin	parr	restoration	rocky
spawn	egg	Lake Ontario	native
monitoring	barriers	smolt	stocking
invertebrates	fry	pollution	overfishing

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

pollution	alevin	parr	monitoring
fry	stocking	rocky	smolt
egg	native	Lake Ontario	spawn
overfishing	invertebrates	barriers	restoration

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

barriers	rocky	monitoring	restoration
smolt	Lake Ontario	egg	native
overfishing	spawn	fry	pollution
invertebrates	parr	alevin	stocking

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

spawn	overfishing	native	invertebrates
pollution	barriers	restoration	alevin
fry	parr	rocky	stocking
smolt	Lake Ontario	monitoring	egg

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

fry	overfishing	egg	spawn
alevin	parr	stocking	Lake Ontario
invertebrates	rocky	restoration	native
pollution	barriers	smolt	monitoring

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

native	stocking	alevin	invertebrates
barriers	rocky	restoration	smolt
overfishing	spawn	egg	Lake Ontario
parr	monitoring	fry	pollution

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

restoration	pollution	overfishing	fry
alevin	invertebrates	rocky	monitoring
smolt	spawn	stocking	egg
native	parr	Lake Ontario	barriers

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

restoration	smolt	rocky	parr
alevin	monitoring	fry	pollution
native	invertebrates	egg	spawn
overfishing	stocking	barriers	Lake Ontario

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

stocking	invertebrates	overfishing	pollution
restoration	spawn	barriers	native
alevin	fry	smolt	parr
monitoring	egg	Lake Ontario	rocky

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

egg	invertebrates	restoration	rocky
barriers	fry	native	Lake Ontario
spawn	monitoring	parr	overfishing
stocking	pollution	alevin	smolt

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

overfishing	invertebrates	pollution	stocking
rocky	fry	parr	alevin
smolt	Lake Ontario	barriers	restoration
egg	monitoring	spawn	native

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

alevin	smolt	fry	spawn
stocking	Lake Ontario	egg	monitoring
rocky	overfishing	pollution	parr
restoration	invertebrates	native	barriers

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

parr	fry	rocky	stocking
monitoring	smolt	Lake Ontario	egg
native	spawn	restoration	barriers
overfishing	pollution	invertebrates	alevin

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# Atlantic Salmon Bingo

rocky	native	Lake Ontario	spawn
fry	restoration	monitoring	barriers
overfishing	egg	pollution	stocking
invertebrates	parr	alevin	smolt

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

barriers	overfishing	stocking	alevin
restoration	rocky	fry	pollution
parr	monitoring	smolt	invertebrates
native	Lake Ontario	spawn	egg

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

parr	restoration	smolt	egg
overfishing	stocking	monitoring	barriers
spawn	native	pollution	rocky
fry	alevin	invertebrates	Lake Ontario

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

barriers	alevin	parr	restoration
smolt	monitoring	fry	pollution
Lake Ontario	rocky	egg	stocking
overfishing	native	spawn	invertebrates

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

Lake Ontario	overfishing	native	smolt
alevin	barriers	egg	monitoring
invertebrates	restoration	parr	stocking
pollution	spawn	rocky	fry

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

Lake Ontario	spawn	alevin	invertebrates
overfishing	fry	smolt	restoration
pollution	native	barriers	egg
parr	monitoring	stocking	rocky

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

Lake Ontario	alevin	invertebrates	restoration
rocky	pollution	smolt	spawn
fry	overfishing	native	barriers
egg	stocking	parr	monitoring

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

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# Atlantic Salmon Bingo

fry	invertebrates	native	alevin
egg	parr	spawn	restoration
rocky	pollution	stocking	monitoring
barriers	Lake Ontario	smolt	overfishing

Instructions: Pay attention to the presentation **LAKE ONTARIO ATLANTIC SALMON: Bringing back Ontario's lost treasure.**

When one of the words above are displayed on the screen mark off the word. When you have a completed line (vertical, horizontal, or diagonal) call out "smolt". The first student to get to smolt wins and the game is over – but still pay attention to the presentation! 😊



<b>Class size:</b> Unlimited
<b>Setting:</b> Classroom
<b>Time:</b> 2 Hours

## Grade 3 Classroom Hatchery Activities

### *Lesson 5: Fish Need Trees*

#### **Lesson Objectives:**

- Familiarize students with the habitat requirements of Atlantic Salmon
- Introduce vocabulary relevant to Atlantic Salmon habitat
- Introduce the idea of environmental stewardship
- Have the students write a short and friendly letter

#### **Materials:**

- Reading worksheet - printed 1 per student
- Lined paper
- Pencils and pens
- Projector connected to computer

#### **Background**

Human activity has changed the world and some of these changes have resulted in severe ecological degradation. Deforestation, dams, pollution, and overfishing resulted in the extirpation of Atlantic Salmon from Lake Ontario. However, human activities are not only negative. With awareness and a desire to make things better we can restore the health and integrity of the world around us. This has many benefits not only for humans but also for the biodiversity that we share this planet with.

Environmental stewardship means taking care of the environment. Author and wildlife ecologist Aldo Leopold coined the phrase "land ethic" which states that humans have a moral responsibility to care for nature. Environmental stewardship and restoration ecology are critical pieces of the project to bring back the Atlantic Salmon. Ecologists look at the habitat that Atlantic Salmon require for survival and identify areas where habitat quality can be improved. Dams are removed or altered to allow fish passage, rock structures are returned, litter is removed, and trees and shrubs are planted in areas where the water is exposed to erosion, runoff, and excess sunlight (warming the water).

The letter writing assignment in this lesson looks at a golf course where the golf green is right up to the water's edge, causing warming of the water, erosion, and pollution impacts. Golf course greens, fairways, tees, and roughs are exempt from pesticide bans. These pesticides along with fertilizers can wash into the waterways. A buffer of trees, shrubs, and low vegetation can greatly minimize what gets washed into the water. This is a great place for a stewardship project! The golf course managers may or may not be aware of these impacts; either way, tactful communication and building a positive relationship is the preferred approach.

## **Teaching and Learning Sequence**

**Part A.** Share this **Atlantic Salmon Fact:** *Atlantic Salmon first started to inhabit Lake Ontario 11,000 years ago. Land changes caused by a few hundred years of European settlement caused them to disappear!*

**Part B.** Ask these **Guiding Questions** for the students to discuss as a group:

1. How do trees affect Atlantic Salmon?
2. Is there anything that you can do to help Atlantic Salmon?

### **Part C.**

1. Print off the next page (Assignment 1) of this lesson and give a copy to each student.
2. Have the students either individually or as a group read "Salmon and Trees" and complete the word match.
3. Introduce the letter writing assignment and show the pictures below to give the students more context. Leave the assignment with the template displayed while they write their letters.
4. Have the students draft a letter.
5. Give the students feedback and have them write a final revision.

**Part D.** Ask these **Reflection Questions** and facilitate a group discussion:

1. Is a healthy salmon habitat also good for humans? If so, how?
2. What other stewardship actions could students do to help Atlantic Salmon?

# Assignment 1: Read *Salmon and Trees*

COPY ME

Match the word list with the meanings to help understand the reading.

## Salmon and Trees

Atlantic Salmon depend on two very different *habitats*. As adults they live out in the big water (the ocean or a large lake) where they hunt fish and grow big. The adults will then *migrate* into *tributaries* (rivers or streams) for *spawning*. The young fish hatch and spend the first few years of their lives eating aquatic *invertebrates*. They hide in rocks to avoid being food for other fish, large *invertebrates*, birds, and mammals.

For salmon to survive, both habitats need to be healthy. The area where land meets water is known as the *riparian zone*. The riparian zone is very important for stream health. A riparian zone with lots of plant life or vegetation is called a riparian buffer zone. This is because it protects (or buffers) the stream from the land surrounding the water.

Plants protect the water in many different ways. The plant roots help to stabilize the banks of the stream or river. This reduces soil *erosion*, so that less sediment ends up in the water. The canopy from the trees provides shade, which cools the water of the *tributaries*. Branches and leaves fall into the water and provide food for small animals like bugs (invertebrates) which are then food for the fish.

The plants act like a filter, stopping pollution from entering the stream. Good riparian buffer zones slow down the water that runs into streams during heavy rains. This helps to reduce flooding. Riparian buffer zones are a habitat for otters, beavers, birds, and other animals that visit streams to find food or to drink. Atlantic Salmon need cool, clean water in streams and creeks for *spawning* and for the growth of the juvenile fish.

## Word Match

<b>A. Migrate</b>		<i>wearing away</i>
<b>B. Tributaries</b>		<i>animals without backbones</i>
<b>C. Habitat</b>		<i>an area where land and water meet</i>
<b>D. Spawning</b>		<i>the job of taking care of something such as the environment</i>
<b>E. Invertebrates</b>		<i>an organism's natural home</i>
<b>F. Stewardship</b>		<i>to move from one part, region, or habitat to another</i>
<b>G. Erosion</b>		<i>the process of depositing and fertilizing eggs</i>
<b>H. Riparian zone</b>		<i>rivers and streams that feed into a larger body of water</i>



## Assignment 2: Letter Writing

You are hosting an event called "Fish Need Trees" and are looking for a spot on your release stream where you, along with members from your nature group, can improve habitat by planting trees and shrubs. You see that at "Whispering Salmon Golf and Country Club" there is an area that has no tree cover.

Write a short letter to the manager Mrs. Fairway asking if she would consider your project at the golf course. Make sure that your letter is friendly and has tact (understanding, sensitivity, and respect). Tell her that the project will benefit water quality, wildlife habitat (including for Atlantic Salmon), reduce erosion, and look nice. Tell her you would like to plant cedars, dogwood, and maple trees. Ask her if she would be willing to talk about the project further. Make up a 10 digit phone number to give her.

Letter template. Write the letter on lined paper.

Date

Dear \_\_\_\_\_

My name is \_\_\_\_\_. I am writing you today to {tell her about the project and ask if she is interested}

Sincerely,

{Your Name}

{Your made-up phone number}

**Example 1: Good habitat**





**Example 2: Stewardship in action:  
students planting trees and shrubs**





**Examples 3 and 4**

- **Which looks like better habitat?**
- **Where could we improve habitat?**





<b>Class size:</b> Unlimited
<b>Setting:</b> Outdoors or gym
<b>Time:</b> 1 Hour

## Grade 3 Classroom Hatchery Activities

### *Lesson 6: Dangerous River*

#### **Lesson Objectives:**

- Demonstrate some of the hazards that Lake Ontario Atlantic Salmon face during their migration to and from the lake
- Assist students in participating in a dynamic and active game developing personal and interpersonal skills

#### **Materials:**

- 3 pool noodles
- 25 popsicle sticks (put large black dots on 5 of the sticks)
- 50' of rope
- 6 pylons (or similar – to be used as boundary markers)

#### **Background**

For a salmon, migration along a river is a hazardous activity. Juvenile Lake Ontario Atlantic Salmon spend 1-3 years in their natal stream before swimming downstream to the lake. Guided only by instinct and the current, they make their way into an unknown world where predators, including humans who are fishing, await. Many rivers contain dams. Some of these dams have large unnatural and potentially fatal drops.

Once the fish make it to the lake, they find different types of food that allows them to grow in preparation for their eventual (if they survive) migration back up their natal stream as spawning adults. On the upstream journey they must navigate past dams. Some dams are simply unpassable for fish migrating upstream because they are too high; others have fish ladders that allow some fish to pass to get to their spawning areas and lay eggs, starting the life cycle all over again.

Some of the adults will perish after spawning, however unlike many of the other species of salmon, Atlantic Salmon are iteroparous which means that can survive spawning, return to the lake and then spawn in subsequent years. They have been known to spawn up to 5 times.

## Teaching and Learning Sequence

**Part A.** Share the background information above.

**Part B.** Ask this **Guiding Question**:

1. What perils do Atlantic Salmon face on their migrations to and from the lake?

**Part C.** The Game

1. Select and delineate with the pylons an activity area of 15' x 75'. This will be the river. One end is the spawning grounds and the other end is the lake.
2. Place the popsicle sticks at the lake end of the river. Place at least one stick for each student.

### Round 1

Have the students run from the spawning grounds (this is where they hatched and started to grow) to the lake, get food (one popsicle stick each) and then return to the spawning grounds.

### Round 2

Same as round 1 except add the rope as a dam. Double the rope over to make a small gap of ~1 foot for them to jump over. Explain that a dam was placed in the river but the Atlantic Salmon can jump up to 3 metres high and this one is easy for them.

### Round 3

Keep everything the same except this time have them wait at the lake while you make the dam higher. You can either make the dam too high for all of them or high enough that only a few students can jump it. Explain that a large lumber mill was put on the river. Ask them what will happen to the fish? (They cannot make it back to their spawning grounds and the life cycle will not continue.) Install a fish ladder by changing one side of the dam to be a series of small jumps.

### Round 4

Have them do another run like round 1.

### Round 5

This time remove two sticks. This year there was less prey in the lake and some of the fish starved to death.

### Round 6

The students who starved become predators (osprey or bald eagle). The predators can only catch 1 student each per round.

### Round 7

The 2 students caught in round 6 will become fishermen. They can position themselves anywhere on the river and without moving their feet use the pool noodle to tag one student per round. The tagged students are out. If they set up right at the dam ask the students what can be put in place to give the fish a better chance. (Fishing regulations that set a minimum distance from the dam.)

### Next Rounds

Add other factors:

- You can use the marked sticks as disease
- You can add students back in as juveniles
- Ask questions like what would happen if there were lots more fishermen; predators; disease; polluted water; less food; better habitat; fewer barriers; less fishing pressure; healthy water; more reproduction and survival...? What if fewer/more fish survive than are hatched?