

**Grade Level:**3<sup>rd</sup> – 5<sup>th</sup>**Time:**

100 Minutes

**Season:**

All

**Objectives:**

Students will be able to...

- Describe features of a healthy salmon ecosystem
- Recall ways in which threats to an ecosystem impact salmon habitat

**Key Concepts:**

- Salmon are an indicator of the overall health of an ecosystem
- Healthy salmon habitats have key biotic and abiotic factors

# Salmon Habitat – Build A Healthy Salmon Stream

Lesson 1 of 2

## Background & Summary

This lesson teaches about salmon from an ecological perspective. Instead of addressing salmon habitat, students will learn about the biotic and abiotic factors that constitute a healthy salmon ecosystem and how those factors influence habitat. Students apply their knowledge of salmon life cycle, anatomy, and adaptations to investigate ecosystem requirements for each life stage. The first activity establishes the role of salmon as an indicator species and demonstrate how disruptions to the ecosystem affect salmon habitat. Next students incorporate the information they learned from the first activity to develop their own version of a healthy salmon stream.

This is a fairly long lesson, if you are short on time, consider doing the first two activities (Steps 1-6) on Day 1 and the last two activities (Steps 7-8) on Day 2.

This lesson is supplemented with an outdoor activity where students take a field trip to a stream bed and assess biotic and abiotic features to determine whether it's suitable habitat for salmon. That activity concludes by having students make recommendations for improving the habitat, providing students with career insight into the job duties of a habitat restoration biologist or fish passage engineer.

## Procedure

### Warm-Up Activity: Habitat vs Ecosystem

1. Ask students what they need to survive. They have one minute to write down as many things as they can think of. Examples include food, shelter, warmth, water, oxygen, family, etc. Discuss their lists by having students share out some of the things they wrote down.

Key messages to share with students:

*The things they wrote down can be classified as biotic (living factors) or abiotic (non-living factors).*

*Other biotic factors besides food include the microorganisms living in your gut that help you digest food, fungi that make life saving antibiotics such as penicillin, or trees that produce the oxygen we breathe*

*Abiotic factors include the soil we grow our food in (which contain biotic factors we also benefit from), clean water we drink, nutrients we get from the food we eat.*

*An ecosystem is made of all the interacting biotic and abiotic parts.*

Explain to students that the list they just made can be thought of as their ecosystem. (5 minutes)

Courtesy of Columbia River FWCO Information and Education, 2022



## Procedure (Continued)

2. Looking at their list, give students another minute to write down the names of places that play vital roles in their survival, learning and development.

Examples include home, school, doctor/dentist office, etc.

Key messages to share with students:

*A habitat is a place where an organism naturally lives and grows.*

Explain that the second list they made can be thought of as their habitat. (3 minutes)

3. Apply the definitions of habitat vs ecosystem by asking students to think about fish (in general, not necessarily salmon) and share out examples of fish habitat followed by examples of fish ecosystems. Examples of habitat include ocean (open ocean, or reefs), rivers, streams, lakes, estuaries. Examples of ecosystems include salt- or freshwater, prey items, parasites, temperature and sunlight, or shelter (reef, abandoned shell). (5 minutes)

### Salmon Ecosystem Requirements

Learning objectives:

a. Each life stage has a different ecosystem requirement

b. Salmon face ecosystem threats at all life stages

4. Ask students to share what they think would happen if there were changes to an aquatic ecosystem. For example, what would happen if the water in a river or lake started to get warmer? Student answers might fall into the following categories:

- Loss of biodiversity (e.g. fish or other animals dying)
- Unchecked growth (e.g. toxic algal blooms, mosquito abundance)
- Degraded habitat (e.g. receded banks or shorelines, muddy/turbid water)

Explain that all living organisms are impacted when an ecosystem is altered but not all organisms are impacted at the same time or to the same degree. Some are sensitive to changes will others tolerate them. (5 minutes)

Key messages to share with students:

*Indicator species are organisms whose presence, absence or abundance reflects the health of an ecosystem.*

*The presence of some indicator species reflect a healthy ecosystem while the presence of others reflect an unhealthy ecosystem.*

Note: See “Extension Activities” for ideas about exploring this topic further

*Salmon are an indicator species that are negatively impacted by threats to their ecosystem. As an ecosystem degrades and disappears, so do salmon.*

5. Split students into groups of 5 and provide each student in the group with a different “Salmon Ecosystem Worksheet”. You should decide how you want to divide the workload between groups of four or six. Explain to students that an ecosystem must have certain features in order to be considered healthy for salmon and those features



## Procedure (Continued)

vary by life stage. Instruct students to use their computers to fill in the worksheet with information about ecosystem requirements for their assigned life stage. (20 minutes)

### Teaching Tip:

Review the “Salmon Ecosystem Answer Key” for search engine terms that can assist students who struggle to find information.

6. Review the worksheet with the class using the “Salmon Ecosystem Presentation” as a guide. Call on students to share out as time permits. Instruct students to add the information from the presentation to the answers they provided on their worksheets. (15 minutes)

## Build A Healthy Salmon Stream

### Learning objectives:

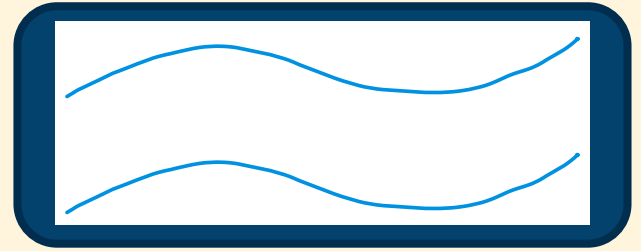
- a. Healthy salmon habitats have recognizable features
7. Students will work in their groups to build their version of a healthy salmon stream using the information from the previous activity to set parameters necessary for salmon survival.

Provide each group with a corrugated cardboard sheet, a “Salmon Stream Build Kit”, markers/crayons/color pencils, scissors, tape and glue.

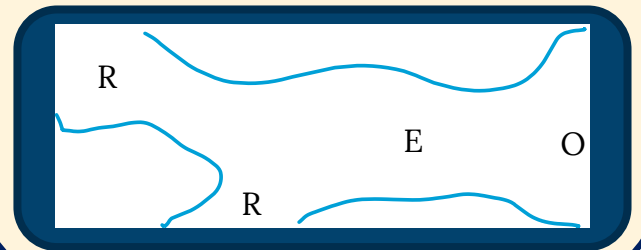
Groups are free to draw their own system boundaries on the cardboard sheet. It can be simple (Figure A) or complex (Figure B) as they deem fit, and can feature systems such as oceans, estuaries, rivers or streams.

The only requirement is that all their diagrams must include a key (like on a map) that explains the components of their stream. (45 minutes)

**Figure A:** A system boundary showing a single aquatic system (river/stream) with no branching



**Figure B:** A system boundary showing three aquatic systems (ocean [O], estuary [E], river/stream [R]) with multiple branch points



## Wrap-Up

8. Reflect on the activity by having students share their thoughts. Use the prompts below to guide the discussion.

- What are the needs and threats for a salmon throughout its life cycle?
- What makes the best environment for a salmon?
- How can we as humans keep salmon and their habitat safe?
- When a salmon habitat is threatened, who is responsible for fixing it?

The last prompt can be used to explain the duties of a habitat biologist or fish passage engineer. Explain to students that there are people whose jobs are to restore habitat for salmon and other aquatic organisms. See “Extension Activities” for ideas on how to further explore that topic. (5 minutes)



## Extensions

### Additional Activities

#### Salmon Stream Walk

Have the class walk along a stream or lakeshore and identify features that are good or bad for salmon. Use the lesson plan (included) from Alaska Department of Fish and Game to guide the activity. Contact the Columbia River FWCO about borrowing water quality testing components. Invite a biologist or naturalist to lead the visit.

#### Chat with a Biologist

Reach out to the Columbia River FWCO about a class visit or video chat from a biologist in the region that does habitat restoration work or salmon habitat research.

#### Salmon Stream Build Kit

If time allows, have students go outside and collect moss, twigs, grass or other components to use when building their salmon stream.

### Dig Deeper

#### Indicator Species

Have students research indicator species for a given habitat. Encourage them to identify which species are present in a healthy ecosystem and which are present in an unhealthy ecosystem.

#### Macroinvertebrates and Water Pollution

Macroinvertebrates are popular indicator species for the health of an aquatic system. Students can research how the presence and absence of certain species are used to monitor water pollution.

## Vocabulary to Know

**Abiotic** – a nonliving part of an ecosystem that shapes its environment

**Biotic** – living or once living components of an ecosystem

**Ecosystem** – the interactions and relationships between biotic and abiotic factors in a physical environment

**Habitat** – the home, or environment, of a plant, animal or other organism

**Indicator Species** – an organism whose presence, absence or abundance reflects the condition of a particular ecosystem

**Organism** – a living biological entity



## Materials

### Included:

Salmon Ecosystem Presentation  
Salmon Ecosystem Worksheet  
Salmon Ecosystem Answer Key  
(Optional) Salmon Stream Walk Activity

### Request to Borrow from Columbia River FWCO:

Note: Requests are pending availability and geographical location

5 sets – Salmon Stream Build Kit

- Dry rice, beans and/or pasta
- Pom poms
- Construction paper
- Popsicle sticks
- Beads
- Pipe Cleaners

### Not Included:

5 – Corrugated cardboard sheets. You decide the size.  
Glue, tape and/or glue sticks (enough for each group)  
Scissors (enough for each group)  
Instructor laptop and projector  
Pencil and Paper (Loose Leaf, Notebook or Journal)  
Laptops connected to WiFi (1 for each student)  
Markers, color pencils and/or crayons

## Next Generation Science Standards

### Life Science

#### LS1- From Molecules to Organisms: Structures and Processes

4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

#### LS4- Biological Evolution: Unity and Diversity

3-LS4-3: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

3-LS4-4: Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.



## Next Generation Science Standards (Continued)

### Earth and Space Sciences

#### ESS2- Earth's Systems

5-ESS2-2: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

## Common Core Standards

### English Language Arts

#### Reading: Informational Text

3.4/4.4/5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area

3.5 Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently

3.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur)

4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, timelines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears

4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.

5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

#### Speaking and Listening

3.1/4.1/5.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly

3.2/4.2/5.2 Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

# Salmon Ecosystem Worksheet



# Eggs/Alevin Ecosystem Requirements

## Water Quality

- Little to no silt
- Flowing water
- 
- 

## Physical Features

- Soil and roots for filtering rainwater and runoff
- Pools with deep still water for habitat and riffles for adding oxygen to the water
- Vegetation for...
  
- Gravel and rocks for...

## Threats to Egg/Alevin Survival

- 
  
- 
  
- 





# Fry

## Ecosystem Requirements

### Water Quality

- Little to no silt
- Flowing water
- 
- 

### Physical Features

- Soil and roots for filtering rainwater and runoff
- Pools with deep still water for habitat and riffles for adding oxygen to the water
- Fallen leaves and vegetation to feed aquatic insects that in turn, feed fry
- Fallen logs to...
- Macroinvertebrates to...

### Threats to Fry Survival

- 
- 
- 



# Smolt

## Ecosystem Requirements

### Water Quality

- **Brackish water (mix of freshwater and saltwater)**
- Flowing water
- 
- 

### Physical Features

- Soil and roots for filtering rainwater and runoff
- Fallen leaves and vegetation to feed aquatic insects that in turn, feed smolt
- Fallen logs to...
- Macroinvertebrates, small fish and crustaceans to...

### Threats to Smolt Survival

- 
- 
- 



# Ocean Adult

## Ecosystem Requirements

### Water Quality

- Saltwater
- 
- 

### Physical Features

- (Hint: What do they eat? List 3 animals)

### Threats to Ocean Adult Survival

- Climate change
- 
- 



# Spawning Adult Ecosystem Requirements

## Water Quality

- Freshwater
- 
- 

## Physical Features

- Deep enough water to swim through
- Fish ladders to ...
- Gravel beds to....

## Threats to Spawning Adult Survival

- Climate change
- Shallow water in small streams
- 
- 
- 



# Salmon Ecosystem Answer Key



# Eggs/Alevin Ecosystem Requirements

## Water Quality

Search: Water type of water do salmon [insert life stage] need

- Little to no silt
- Flowing water
- Oxygen rich
- Clean and cold

## Physical Features

Search: What do salmon [insert life stage] need for survival

Search: Why do salmon [insert life stage] need [insert physical feature]

- Soil and roots for filtering rainwater and runoff
- Pools with deep still water for habitat and riffles for adding oxygen to the water
- Vegetation for... shade or to hide
- Gravel and rocks to... nest in, grow/hatch and hide from predators

## Threats to Egg/Alevin Survival

Search: Threats to salmon [insert life stage] survival

Note: Student worksheet only requires students to list a minimum of 3 threats

- Predators (birds or other fish)
- Excessive silt or sediment that buries the eggs and alevin or cause disease
- Gravel disturbances (example: floods or human activity)
- Low oxygen
- Pollution
- Low water levels
- Climate change



# Fry

## Ecosystem Requirements

### Water Quality

Search: Water type of water do salmon [insert life stage] need

- Little to no silt
- Flowing water
- Oxygen rich
- Clean and cold

### Physical Features

Search: What do salmon [insert life stage] need for survival

Search: Why do salmon [insert life stage] need [insert physical feature]

- Soil and roots for filtering rainwater and runoff
- Pools with deep still water for habitat and riffles for adding oxygen to the water
- Fallen leaves and vegetation to feed aquatic insects that in turn, feed fry
- Fallen logs to... hide and rest behind and/or find food
- Macroinvertebrates to... eat

### Threats to Fry Survival

Search: Threats to salmon [insert life stage] survival

Note: Student worksheet only requires students to list a minimum of 3 threats

- Predators (birds or other fish)
- Low oxygen in the water
- Pollution
- Low water levels
- Climate change



# Smolt

## Ecosystem Requirements

### Water Quality

Search: Water type of water do salmon [insert life stage] need

- **Brackish water (mix of freshwater and saltwater)**
- Flowing water
- Oxygen rich
- Clean and cold

### Physical Features

Search: What do salmon [insert life stage] need for survival

Search: Why do salmon [insert life stage] need [insert physical feature]

- Soil and roots for filtering rainwater and runoff
- Fallen leaves and vegetation to feed aquatic insects that in turn, feed smolt
- Fallen logs to... **hide and rest behind and/or find food**
- Macroinvertebrates, small fish and crustaceans to... **eat**

### Threats to Smolt Survival

Search: Threats to salmon [insert life stage] survival

Note: Student worksheet only requires students to list a minimum of 3 threats

- Predators (example: birds, seals, sea lions, snakes, orcas)
- Pollution
- Dams or other fish passage inhibitors
- Habitat destruction (loss of estuaries due to human development)
- Climate change





# Ocean Adult Ecosystem Requirements

## Water Quality

Search: Water type of water do salmon [insert life stage] need

- Saltwater
- Oxygen rich
- Clean and cold

## Physical Features

Search: What do salmon need to survive in the ocean

- (Hint: What do they eat? List 3 animals) **Small fish, crustaceans, and squid for food**

## Threats to Ocean Adult Survival

Search: Threats to salmon in the ocean

Note: Student worksheet only requires students to list a minimum of 3 threats

- Climate change
- Predators (example: orcas, seals, sea lions)
- Overfishing



# Spawning Adult Ecosystem Requirements

## Water Quality

Search: Water type of water do salmon [insert life stage] need

- Freshwater
- Oxygen rich
- Clean and cold

## Physical Features

Search: What do spawning salmon need

Search: Why do spawning salmon need [insert feature]

- Deep enough water to swim through
- Fish ladders to ... pass over dams
- Gravel beds to....make a redd and lay eggs

## Threats to Spawning Adult Survival

Search: Threats to salmon in the ocean

Note: Student worksheet only requires students to list a minimum of 3 threats

- Climate change
- Shallow water in small streams
- Predators (example: orcas, bears, otters, birds)
- Dams, culverts or other fish passage inhibitors
- Habitat loss



# Salmon Ecosystem Presentation





# Salmon Ecosystems

Salmon Habitat: Build a Healthy Salmon Stream



# Select a life stage to learn more about its ecosystem requirements

[Eggs and Alevin](#)

[Fry](#)

[Smolt](#)

[Ocean Adult](#)

[Spawning Adult](#)



# Eggs and Alevin

## Water Quality

- Little to no silt
- Flowing water
- Oxygen rich
- Clean and cold

## Physical Features

- Soil and roots for filtering rainwater and runoff
- Pools with deep still water for habitat and riffles for adding oxygen to the water
- Vegetation for... shade or to hide
- Gravel and rocks to... nest in, grow/hatch and hide from predators

## Threats to Egg/Alevin Survival

- Predators – birds and other fish
- Excessive silt or sediment
- Gravel disturbances
- Low oxygen
- Pollution
- Low water levels
- Climate change

Main  
Menu



# Fry

## Water Quality

- Little to no silt
- Flowing water
- Oxygen rich
- Clean and cold

## Physical Features

- Soil and roots for filtering rainwater and runoff
- Pools with deep still water for habitat and riffles for adding oxygen to the water
- Fallen leaves and vegetation to feed aquatic insects that in turn, feed fry
- Fallen logs to...hide and rest behind and/or find food
- Macroinvertebrates to... eat

## Threats to Egg/Alevin Survival

- Predators – birds and other fish
- Low oxygen
- Pollution
- Low water levels
- Climate change

Main  
Menu



# Smolt

## Water Quality

- Brackish water (mix of freshwater and saltwater)
- Flowing water
- Oxygen rich
- Clean and cold

## Physical Features

- Soil and roots for filtering rainwater and runoff
- Fallen leaves and vegetation to feed aquatic insects that in turn, feed fry
- Fallen logs to...hide and rest behind and/or find food
- Macroinvertebrates, small fish and crustaceans to... eat

## Threats to Egg/Alevin Survival

- Predators – birds , seals, sea lions, snakes, orca whales
- Pollution
- Dams
- Human activity that destroy estuaries
- Climate change

Main  
Menu





# Ocean Adult

## Water Quality

- Saltwater
- Oxygen rich
- Clean and cold

## Physical Features

- Small fish, crustaceans and squid for food

## Threats to Egg/Alevin Survival

- Climate change
- Predators (orca whales, seals, sea lions)
- Dams

[Main Menu](#)



# Spawning Adult

## Water Quality

- Freshwater
- Oxygen rich
- Clean and cold

## Physical Features

- Deep enough water to swim through
- Fish ladders to...pass over dams
- Gravel beds to...make a redd and lay eggs

## Threats to Egg/Alevin Survival

- Climate change
- Shallow water in small streams
- Predators (orca whales, bears, otters and birds)
- Dams and culverts
- Habitat loss

[Main Menu](#)

# Salmon Stream Walk Activity



# Rules For Salmonid<sup>P/I</sup>

## Handout 5.1

Illustration: Karen Urdal-Ekman



- 1 Follow directions.
- 2 Stay in your groups.
- 3 Walk only. Do not run.
- 4 Play only where allowed.
- 5 Stay on the paths.
- 6 Do not pick plants.
- 7 Do not disturb fish or other animals.
- 8 Take your things with you when you leave.

# A Healthy Salmon Habitat

Handout 5.2



Illustration: Karen Udall-Ekman

Salmon need many things to make a home.

Salmon live in streams and lakes. They like cold water. The water must run fast. It must be clean. Salmon also like to rest in still pools.

The lakebed or streambed must have clean rocks and gravel. Gravel is a mix of small stones and sand. Salmon do not like mud or dirt.

Salmon need bushes and branches to shade the water. The shade keeps the water cool. Salmon can hide in the shade.

If a lake or stream has all these things, it is a good home for salmon.

Do not play in a salmon stream. Salmon do not like to be disturbed.

# What To Look For

## Materials:

- Copies of Handout 5.3, "Salmon Habitat Study No. 1," for each student
- Copies of Handout 5.4, "Salmon Habitat Study No. 2," for each student
- Writing supplies
- Chart paper

## Time Required:

One lesson, plus follow-up time after the field trip

## Level of Conceptual Difficulty:

Simple

## Evidence for Assessment:

Review student handouts and monitor in-class discussion to ensure that the students can observe and describe a variety of phenomena from nature.

## INTRODUCTION

- ☞ Shortly before the field trip (earlier in the day if feasible), have small groups of students use Handout 5.3, "Salmon Habitat Study No. 1," to list things they think they will see.
- ☞ Have the groups report their lists to the class and make a class list on a chart.
- ☞ Have the class divide the list into items from nature and items from humans.

## RESEARCH/DISCUSSION

- ☞ Give the students copies of Handout 5.4, "Salmon Habitat Study No. 2," and have them use it on the field trip to write or draw their observations. Stop several times during the field trip and have students record their observations on the handout.
- ☞ Following the field trip, have students read their notes or describe their observations to the class.

## SUMMATION

- ☞ Discuss with the class similarities and differences between their observations and the list of what they expected to see. If necessary, prompt them with questions, such as:
  - What did you observe that you did not think of before the field trip?
  - What were you expecting that you did not observe?
  - What did you think would be most interesting and what turned out to be most interesting?
  - Did you see more or less items from humans than you expected?
  - Why were there differences between what you expected and what you observed?

## NOTE

- ☞ These handouts would be good accompaniment to your egg-take field trip.

# On The Salmon Habitat Study, No. 1

Handout 5.3

Name \_\_\_\_\_

On the salmon habitat study, I think

I Will See

--	--	--

I Will Hear

--	--	--

I Will Touch

--	--	--

I Will Smell

--	--	--

# On The Salmon Habitat Study, No. 2

Handout 5.4

Name \_\_\_\_\_

On the salmon habitat study,

I See

--	--	--

I Hear

--	--	--

I Touch

--	--	--

I Smell

--	--	--





This activity will be most meaningful when repeated over time (e.g., visit the chosen stream in both the fall and spring). Teachers could research the historical characteristics of the stream or arrange for a guest speaker to share his or her knowledge.

#### **Materials:**

- Copies of Handout 5.5, "Salmon Habitat Survey and Data Sheet," for each student
- Thermometer
- Meter stick

#### **Time Required:**

Several hours for field trip

#### **Level of Conceptual Difficulty:**

Moderate

#### **Evidence for Assessment:**

Monitor student discussions and notes to ensure that the students can describe the site and identify features about the habitat that make it suitable for salmon.

## **INTRODUCTION**

- Assemble the class in groups of four or five, each with an adult supervisor. Remind the class of the class rules for habitat study.

## **INVESTIGATIONS**

- Option: Have different groups of students take a five-minute walk, each focusing on one specific thing.  
*List all the colors you can identify; List all the sounds you hear; List all the smells you can; List all the trees or leaves you can find; List all the things you can see on the ground; List all the things less than one centimeter in size; etc.*
- Have the groups reassemble and compare the results of their walks on-site or in class.
- Have the class walk to the stream or lakeshore. Have students identify features that would identify the site as good or bad for salmon.  
*Clean, cold running water, gravel stream bottom, vegetation on stream banks, insects for food.*
- Have them carefully look for signs of salmon or other fish in the water. Have them record their observations.
- Have students in pairs or small groups use Handout 5.5, "Salmon Habitat Survey and Data Sheet," to record information about the stream. If necessary, have the adult supervisor lead students through the survey.
- Have the class look for evidence of people near the stream or lake.  
*Signs, construction, trails, pipes, waste, etc.*
- Have the students record their observations.
- Have the class look for things they could do to make the site better for salmon and other animals.  
*Remove waste, restore minor damage, etc.*

# Salmon Habitat Survey & Data Sheet

Handout 5.5

Name \_\_\_\_\_

Date \_\_\_\_\_

Materials:

- 4 Thermometers
- 4 Meter sticks

1. How cold is the water?

Use a thermometer. Hold it in the water for one minute.

The water is \_\_\_\_\_ degrees Celsius.

2. How deep is the water?

Use a meter stick. Do not go more than 50 cm deep.

The water is \_\_\_\_\_ centimeters deep.

3. How clear is the water?

The water is: clear / muddy

4. Look at the stream or lake bottom. What kind of rocks does it have?

mud / gravel / boulders

5. Look at the stream or lake sides. What kind of plants does it have?

none / low bushes / trees

# Salmon Habitat Study Field Trip [research/discussion]

## ADVANCE PREPARATION

- ☞ Review your school's field trip guidelines. Then review Advance Preparation (Page 4) and contact State Fish and Game for additional resources.

## FIELD RESEARCH

- ☞ Assemble the class into five groups, with an adult supervisor for each group. (Adult supervisors can also rotate between groups if fewer than five are available). Remind the class of the class rules for habitat study.
- ☞ Option: Have the class walk the banks of the stream or lake, either together or in their groups. Every two to three minutes stop and have students describe the general sights, sounds, smells, and other characteristics of the site. Have students write or draw their observations in the salmon science notebook. Have students sketch a map of the site.
- ☞ Have students, in their groups, use Handout 5.6, "Habitat Survey and Data Sheet," (Part 1), and/or Handout 5.6, "Advanced Habitat Survey and Data Sheet," (Part 2), to record information about the stream. Have the class walk to the stream or lakeshore. Have students identify features that would identify the site as good or bad for salmon.
- ☞ Note: you may wish to laminate the handout sheets for future reuse, in which case overhead pens may be required for recording information.
- ☞ Have the class look for evidence of people near the stream or lake.  
*Signs, construction, trails, pipes, waste, etc.*
- ☞ Have the students record their observations.

### Materials:

- ☞ Copies of Handout 5.6, "Habitat Survey and Data Sheet," (Parts 1 & 2), for each student
- ☞ HACH field testing kits to measure dissolved oxygen
- ☞ pH testing kit
- ☞ Thermometers for measuring air and water temperature
- ☞ Meter sticks or other measuring tools
- ☞ Stopwatch or other watch with a second hand
- ☞ Writing and drawing supplies

### Time Required:

Several hours for field trip

### Level of Conceptual Difficulty:

Simple to moderate

### Evidence for Assessment:

Monitor student discussions and review their written observations to ensure that the students can describe the site and identify features that make the habitat suitable for salmon.

- 47 Have the class look for things they could do to make the site better for salmon and other animals.

*Remove waste, restore minor damage, replant shoreline vegetation, etc.*



Illustration: Donald Gunn

# Habitat Survey and Data Sheet<sup>I</sup>

Handout 5.6, (Part 1)

Name \_\_\_\_\_

Name of stream or lake \_\_\_\_\_

## Habitat checklist

Check the box if you see any evidence that the stream or lake meets these conditions.

- The stream or lake bed has clean gravel.
- The stream or lake has clean flowing water
- The stream or lake does not dry up.
- The stream or lake floods easily.
- The stream or lake is not blocked by waterfalls.
- The stream or lake has vegetation on its banks.
- There are signs of animals near the stream or lake.
- The stream or lake is not damaged by people.
- The stream or lake is cared for by people.

Does the stream or lake appear to be a good salmon habitat? What makes it look like a good or poor habitat? \_\_\_\_\_

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What could be done to make the stream or lake a better habitat for salmon? \_\_\_\_\_

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Who could do something to make the stream or lake a better habitat for salmon? \_\_\_\_\_

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Other evidence you observe \_\_\_\_\_

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# Habitat Survey and Data Sheet<sup>I</sup>

Handout 5.6, (Part 2)

Physical characteristics of the stream or lake banks and bottom					
1. Stream or lake bank Estimate the portion of the bank that is made up of:	N/A	25%	50%	75%	ALL
Bedrock (solid rock):					
Boulders (rock pieces of 30 cm across or larger)					
Cobble (rock pieces of 10 to 30 cm across)					
Gravel (rock pieces 1 to 10 cm across)					
2. Stream or lake bottom Estimate how much of the bottom is made up of:	N/A	25%	50%	75%	ALL
Bedrock (solid rock):					
Boulders (rock pieces of 30 cm across or larger)					
Cobble (rock pieces of 10 to 30 cm across)					
Gravel (rock pieces 1 to 10 cm across)					
Sand					
Mud					
3. Plant life along the stream or lake banks Estimate the portion of the bank with the following types of vegetation:	N/A	25%	50%	75%	ALL
Tall trees					
Low bushes					
Overhanging bushes					
Ferns					
Grass					

# SALMON HABITAT STUDIES

## WRAP-UP

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### EVIDENCE FOR SKEIN ASSESSMENT

- ☞ Have students describe in writing or draw one or more things they did not know before the field trip or one thing they found interesting on the field trip.
- ☞ Have students complete a stem sentence, such as, "I used to think... about salmon habitat but now I know that...," or, "One thing I learned about salmon habitat is...".
- ☞ Have students add their materials to their salmon science notebook and write a sentence explaining what they learned.

### LANGUAGE AND ARTS INTEGRATION

- ☞ Invite a local naturalist or other resource person to the class to prepare students or to lead the visit. For information, contact local organizations, such as the Alaska Department of Fish and Game.
- ☞ Arrange a visit to another type of salmon resource, such as a local hatchery or salmon enhancement project, a local spawning stream or lake, a salmon processing facility, or a commercial fishing boat. Discuss the kinds of jobs people hold that involve working with salmon.

- ☞ Have students imagine the site from a bird's-eye view. Have them identify the main visible features, such as the road, parking lot, stream, clearings, trees, and buildings. Have students draw the site as they would see it if they were a bird flying overhead.
- ☞ Arrange for the class, or for a group of students, to view the site at different seasons and to compare their observations using notes, illustrations, photos, or other media.
- ☞ Have students make a map of a local stream or lake, showing its main features and ways to protect these features from damage.
- ☞ Have the class paint a mural showing the site and labeling features that salmon would like.

### HOME CONNECTIONS

- ☞ Have students guide an adult around a stream or lake and identify features about the stream or lake that salmon would like.

# SALMON HABITAT: ON-SITE STUDIES

## WRAP-UP

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### EXTENSION AND INTEGRATION

- ☞ Invite a local naturalist or other resource person to the class to prepare students or to lead the visit.
- ☞ Arrange a visit to another type of salmon resource, such as a local hatchery or salmon enhancement project, a local spawning stream or lake, an estuary, a salmon-processing facility, or a commercial fishing boat. Discuss the kinds of jobs people have working with salmon.
- ☞ Have students imagine the site from a bird's-eye view. Have them identify the main visible features, such as the road, parking lot, stream, clearings, trees, and buildings. Have students draw the site as they would see it if they were a bird flying overhead. Obtain an aerial photograph of the site from the local planning office and have them compare their views with the photograph.
- ☞ Arrange for the class, or for a group of students, to view the site at different seasons and to compare their observations using notes, illustrations, photos, or other media.
- ☞ Have students make a map of a local stream or lake, showing its main features and ways of protecting them from damage. Alternatively, have students add the features they observed to a topographical map of the site.
- ☞ Have the class paint a mural showing the site and labeling features that salmon would like.
- ☞ Build a mock stream. Have the water flow across the mock stream and discuss the anatomy of the stream. Modify the stream and see how it impacts the water. Predict what will happen to the salmon habitat with the changes.

### EVIDENCE FOR SKEIN ASSESSMENT

- ☞ Have students make notes listing at least six important ideas or facts about the stream they studied.
- ☞ Have students share their lists in pairs and negotiate an agreement on the four most important ideas about the stream they studied.
- ☞ Have the pairs share their ideas with the class and discuss any differences between the lists the different pairs negotiated.





## Common Core Standards (Continued)

3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

4.4 Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace

5.4 Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

### Language Standards

3.4a/4.4.a/5.4.a Use context (e.g., definitions, examples, or restatements in text) as a clue to the meaning of a word or phrase.

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