

Session 5
Watershed SOS
Educator's Guide



Jump into some action-oriented, solution-based learning focused on the protection and restoration of our watersheds.



The Big Question: How can we protect and restore our watershed?

This session is very exciting because learners will be jumping into more action-oriented and solution-based learning, discovering:

- › How we can learn from Indigenous knowledge of local plants
- › Practices that can be changed to prevent further damage to our watersheds
- › How we can actively work to restore the areas that have been damaged already
- › How we can help mitigate flooding and other impacts to our communities that result from altered watersheds

Indigenous Knowledge Element

In this session, the Indigenous knowledge element is focused on the local Indigenous language names and uses of riparian plants. It would be ideal for you to have an Elder or Knowledge/Culture-Keeper, knowledgeable about plants, to visit your class during this session. Ask them in advance to bring in plant samples and/or products that have been made using native plant material, such as hats, baskets, or medicines.

Often, local Indigenous communities will have stories or legends that help impart the value of different plants for ecological value, food, or medicine. If you can't have a special visitor come to this session, check out the resource section of the *Best Water Ways* website for stories or information you can share about Indigenous plants from an Indigenous perspective.

Preparation

For Activity 1, you will need:

- › Grade-level appropriate Ecology textbooks, articles, and research papers
- › Large paper
- › Pens/felts, etc.

If you do not have an Indigenous guest visit during this session, decide how you want to integrate the Indigenous element and bring whatever materials you require for this piece.

Introducing the Concept

In this session, it is important for students to understand that there are threats to our watersheds, including degradation of fish habitat and ecological diversity, but that there are many actions that can be taken to help protect our watersheds to prevent further damage, and to restore damaged areas back into health. It's all about active hope and human participation to get this important work underway!

Learning the Content

Hope and Action

After introducing that this session is about *hope* and *action*, break the students into small groups, and follow the instructions for Activity 1 in your Session 5 Activity Plan (page AP5-3).

There are several options for additional activities that will take you and your students out of the classroom and into the community. These activities are focused on stewardship. A local conservation or Streamkeeper group will be able to help you with these activities.

Words and Terms

- Decontamination** the process of removing or neutralizing contaminants that have accumulated somewhere.
- Ecological restoration** the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed.
- Local Indigenous Plants** local Indigenous language words for willow and/or red-osier dogwood (these native plants are widespread in B.C.).
- Mitigation** action taken to make something less harmful.
- Rain gardens** a garden of native shrubs, perennials, and flowers that are planted in a small depression. Usually planted on a natural slope, it is designed to temporarily hold and soak in rainwater run-off that flows from roofs, driveways, patios, or lawns.
- Selective forestry** logging selected trees in a forest, ensuring the growth of other trees, and that the dynamics of the surrounding natural ecosystems are not affected.
- Stewardship** activities such as water quality monitoring, habitat assessment, and storm drain marking that help us assess and protect the health of our watersheds.

Get Involved!

Fisheries and Oceans Canada have some great learning activities that you can get involved in with your learners. These integrate fun, hands-on learning with stewardship contributions in your community. These include activities such as storm drain marking.

Learn more at <https://www.pac.dfo-mpo.gc.ca/education/stormdrain-collecteur-eng.html>

The **Great Shoreline Clean Up** program is also a great community activity that your group can participate in.

Visit <https://www.shorelinecleanup.ca/>

“Shout Out and Share!” Preparation

The “Watershed Reflection” portion of this session is used as a time for learners to start planning an independent communication component about their watershed learning. Consider it to be an independent mini-project nested with the *Best Water Ways* learning experience as a whole.

This element of the learning project effectively hones in on the curriculum competency of ‘Communication’.

“Communicate scientific ideas and information, and perhaps a suggested course of action for a specific purpose and audience; constructing evidence-based arguments and using appropriate scientific language, conventions, and representations; and express and reflect on a variety of experiences, perspectives, and worldviews through place.”

Prepare for this part of the session by looking over the “Shout Out and Share!” planning process shown on page AP5-4 of this guide. This series of questions has been developed to help learners consider and decide what they want to do for the “Shout Out and Share!” component. Jot down notes about ideas that stand out for you, and add any emerging concepts and questions that you feel will enrich the process.

Sharing Circle

Take a few moments to sit in a circle and invite participants to share something from their “Shout Out and Share!” planning. It is an excellent opportunity for learners to provide feedback for one another.

Place-based learning at the Cowichan River.

Photo: Stephanie Cottell



Watershed SOS: Grade Curriculum and Competency Connections

For detailed information visit <https://curriculum.gov.bc.ca/curriculum/science>

Grade Level and Subject	Content Connections	Curricular Competencies
Grade 9 Science	<ul style="list-style-type: none"> • Matter cycles within biotic and abiotic components of ecosystems • Sustainability of systems • First Peoples knowledge of interconnectedness and sustainability 	<ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analyzing data and information • Evaluating • Applying and innovating • Communicating
Grade 11 Earth Science	<ul style="list-style-type: none"> • The hydrologic cycle • Water as a unique resource • Influences of large bodies of water on local and global climates • Evidence of climate change • First Peoples knowledge of climate change and interconnectedness as related to environmental systems • First Peoples knowledge and perspectives of water resources and processes 	<ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analyzing data and information • Evaluating • Applying and innovating • Communicating
Grade 11 Environmental Science	<ul style="list-style-type: none"> • Succession • Matter cycles through and between living systems • First Peoples ways of knowing and doing • Benefits of ecosystem services • First Peoples knowledge and other traditional ecological knowledge in sustaining biodiversity • Ecosystem complexity • Resource stewardship • Restoration practices 	<ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analyzing data and information • Evaluating • Applying and innovating • Communicating

Grade Level and Subject	Content Connections	Curricular Competencies
Grade 11 Science for Citizens	<ul style="list-style-type: none"> • Evidence-based decision making through science • Beneficial scientific innovations • Human impact on Earth’s systems • Actions and decisions affecting the local and global environment, including those of First Peoples 	<ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analyzing data and information • Evaluating • Applying and innovating • Communicating
Grade 12 Environmental Science	<ul style="list-style-type: none"> • Mitigation and adaptations • Soil characteristics and ecosystem services • Land management • Personal choices and sustainable living • Global environmental ethics, policy, and law 	<ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analyzing data and information • Evaluating • Applying and innovating • Communicating
Grade 12 Specialized Science	<ul style="list-style-type: none"> • Biodiversity is dependent on the complex interactions and processes between biotic and abiotic factors • Climate change impacts biodiversity and ecosystem health 	<ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analyzing data and information • Evaluating • Applying and innovating • Communicating

Activity Plan

Session 5: Watershed SOS



Big Idea/Inquiry

How can we protect and restore our watershed?



Time

Approximately 2.5 hours

Indigenous Knowledge Element

Local Indigenous language names of riparian plants.



Purpose

The purpose of the session is for students to learn:

- How we can change practices and prevent further damage to our watersheds
- How we can actively work to restore the areas that have been damaged already
- How we can help mitigate flooding and other impacts to our communities that result from altered watersheds
- How we can learn from Indigenous knowledge of local plants



Handouts/Materials

- *Session 5: Watershed SOS Learner's Guides*
- Map from Session 4
- Chart paper
- Grade-level appropriate ecology textbooks, articles, and research papers
- "Shout Out and Share!" planning guide (this guide, page AP5-4)



Equipment Needed

- Internet access



Learning Goals

- To understand that practices can be changed to prevent damage to our watersheds.
- To learn ways people can restore the health of local watersheds.

Learning Outcomes

Students will be able to:

- › Name two important stewardship activities that help us assess the health of streams, creeks, lakes, and rivers
- › Name two practices that could be changed to help prevent damage to watersheds. For example, small fish-bearing streams in parks and public areas are often subjected to degradation from off-leash animals, kids playing, etc. v
- › Talk about how they can help protect the streams
- › Describe one approach to restoring riparian ecosystems
- › Explain how rain gardens help mitigate flooding in urban areas
- › Practice saying a riparian plant name in the local Indigenous language

Key Learning Points

- › Stewardship activities such as storm drain marking, water quality, and habitat monitoring help us know how healthy our watershed is, and help us determine when restoration action is needed
- › Selective logging rather than clear-cutting, and not logging on steep slopes and in riparian areas, would help prevent on-going damage to our watersheds
- › Ecological agricultural practices, such as ensuring there is sufficient native vegetation to filter farm runoff, removing invasive plants, capturing fertilizer runoff with zeolite stone before it enters the watershed, helps to reduce contamination
- › Ecological restoration techniques, such as stabilizing slopes with willow cuttings and stimulating/accelerating natural succession process, can re-establish the health of riparian ecosystems
- › Reducing the residential use of phosphorus soaps and products will help prevent contamination
- › Creating rain gardens in residential and commercial areas will help filter contaminants from the water and reduce its flow, which can help mitigate flooding
- › Local Indigenous communities have traditional language names and ways of classifying riparian plants

Introducing the Topic

Begin the session by reflecting on what was learned about threats to our watersheds in the previous session. Emphasize the fact that many of these threats are consequences of human practices that can be changed. Share your excitement and hope about learning some of the alternatives and solutions that can help bring our watersheds back into good health.



Activity 1: Helping Our Watersheds

Divide into small groups (different groups from Session 4, if possible). Using the inquiry questions in their Learner's Guides, each group will research one or more watershed health solution in the vocabulary list, come up with a simple image and bulleted key information, and share what they have learned using the method in the Learner's Guide (20 min).

*There is a table in the Learner's Guide for learners to draw and record what they learned about other groups' words and terms as they share. One side is for the image, and one is for the bullet notes.

Learners can complete the table in their guides while listening to the other groups (total 30 mins.).

Closing the Session

Summarizing, Reflecting and Communicating: Have learners complete the following activities.



Activity 2: Shout Out and Share!

The "Watershed Reflection" portion of this session is being used as a time for learners to consider, through a series of guided questions, what and how they want to communicate about the riparian restoration activities.



Activity 3: Sharing Circle

Take a few moments to sit in a circle and invite participants to share something about their "Shout Out and Share!" planning.

Shout Out and Share! Planning Guide

Note: This content is in the Learner's Guide of this session. It is included here for your reference but there is no need to print multiple copies for your learners.

So here you are learning about your watershed while doing some incredibly valuable ecological stewardship and restoration while you are at it!

One important element of this place-based learning project involves creating your unique way to share what you are learning and doing. Communicating about your learning helps you to gain a better understanding of the ideas and information, and your sharing is a powerful way to spread awareness about the health of our Watersheds.

This planning guide has been developed to help you consider, decide on, and plan your communication element.

Step 1: What

Answer the following exploratory questions. Answering these questions will help you decide what you want to communicate about the Riparian Restoration activities.

1. What specific parts of the learning projects are you finding most interesting?
2. What has surprised you about what you have been learning in this project?
3. What do you think is the most important information or concept that you've learned?
4. What do you think it would be like to communicate on one or two specific aspects of the Riparian Restoration activities?
5. What would it be like to communicate about the activities as a whole?

Looking back over your answers above, does something jump out at you about what you would like to communicate about this project? Chat with your teacher or classmates if you think it would be helpful to you.

I would like to communicate about:

Step 2: How

Answer the following exploratory questions. Answering these questions will help you decide how you want to communicate about this project.

1. How do you like to communicate - verbally, or through writing? If it's writing, is it creative writing or more technical writing? Do you like to interview experts? Do you like to do visual/graphic communication or a mix of methods?
2. What do you think would be some effective ways to communicate about this project?
3. What kinds of resources and tools do you have available to use for this communication? Can you access a camera or video-recorder? Art supplies?
4. What way of communicating would you most enjoy?

Looking back over your answers above, what jumps out at you about how you would like to communicate about this project? Chat with your teacher or classmates if you think it would be helpful to you.

I would like to communicate through:

Step 3: Who

Answer the following exploratory questions. Answering these questions will help you decide who to connect with to help with your communication element. Please note you might decide you don't need to connect specifically for this element.

1. How could my communication element benefit from connecting with a mentor?
2. Who would be helpful to connect with regarding my communication element?

Looking back over your answers above, does something jump out at you about who you would like to connect with about this project? Chat with your teacher or classmates if you think it would be helpful to you.

I would like to connect with:

Step 4: Plan

Now that you have a clear idea of what you want to share, how you want to share it, and who to connect with for input and mentorship (if anyone), it's time to plan your process.

Planning Questions:

1. How is timing related to what and how I want to share about the riparian restoration activities?
2. What kinds of additional equipment or material will I require and when? (Examples: camera, poster paper, materials)
3. What else do I need to do to prepare ahead for my Shout out and Share element?

Step 5: Do

As you are participating in the riparian restoration session activities, you are also going to be working on your "Shout out and Share!" element. Depending on what you've chosen and how you're going to share, this may mean taking some special notes/writing down questions, making some sketches, or taking some targeted photos.

You will have time after the Riparian Restoration activities to finalize your "Shout Out and Share!" element.

