

Session 6
Riparian Restoration Workshop
Educator's Guide



Take action! Learners will have an opportunity to learn, and practice, restoration techniques that will help restore a riparian area in your area



The Big Question: How do you DO riparian restoration?

This exciting session of *Best Water Ways* is all about action-action-action!

Learners will have an opportunity to learn, and practice, restoration techniques that will help restore a riparian area in your area.

For this session, learners are asked to plan how they will communicate about this restoration project with their peers and family. There is a “Shout Out and Share!” planning resource in the Session 6 Learner’s Guide that will help participants make decisions and plan how they want to let people know about what they learned and achieved by participating in this project.

The “Shout Out and Share!” component can be done visually, through art or a video. It can be expressed in a literary way, through poetry or a report, or it can be a blend of mediums. Students are invited to get creative about how they “Shout Out and Share!” about their experience in the riparian restoration.

Indigenous Knowledge Element

The local Indigenous language place name for the creek, stream, lake, marsh, etc. where you are doing your restoration project

Consult your Aboriginal Education department or Indigenous mentor to help find this information. If possible, have them come in at the beginning to offer a land acknowledgement, and throughout the restoration project activities to share stories and knowledge from the local Indigenous perspective.

Preparation

As mentioned in the Educator’s Guide Introduction, this session of the *Best Water Ways* place-based learning projects should involve planning and preparation before and during the delivery of the other sessions. As early as possible, you will need to explore potential restoration sites with support from conservation groups like the Cowichan Land Trust and an ecological restoration specialist to help you prepare and schedule these activities. You will want the groups and professionals to have reviewed the *Best Water Ways* resources so that you are all on the same page about the aim of your learning activities.

For this session have the ecological restoration professional review the riparian restoration project session materials, so that they know the terms and techniques you expect to be covered.

If you are looking to connect with a restoration specialist, check out the Western Canadian chapter of the Society for Ecological Restoration at chapter.ser.org/westerncanada. In the Cowichan Valley, a great local resource is biologist David Polster’s website: polsterenvironmental.com.

Introducing the Concept

You have been working up to this concept of hands-on ecological restoration throughout the previous sessions of this place-based learning project. At this stage, be ready to welcome your restoration specialist, and invite them to provide a bit of background as to how and why they ended up in this important specialized field.

Learning the Content

In this part of the learning project, you can relax and participate in the learning activities with your group! Keep in mind that each ecological restoration specialist will have a different style or approach to sharing the learning content with you and your students. They may want to teach concepts using slides in a classroom session and go into the field afterwards. Or, they may want to offer the whole learning experience in the field through hands-on activities. Just make sure to communicate in advance regarding their approach, so that you can be prepared to support them as needed.

Words and Terms

- Bioengineering** the use of living plant materials to perform an engineering function, such as erosion control, drain-ways, or slope stabilization.
- Hand-pruners** hand-held cutting tool used for pruning and taking cuttings.
- Live staking** staking a long (2m) cutting of plant material into the soil where it will root and grow.
- Loppers** long-handled cutting tool used for pruning and taking cuttings.
- Natural succession species** indigenous species and communities of plants, animals, and insects that occur and evolve over time in an ecosystem.
- Plant cuttings** cuttings of plant material taken from well-established sources.
- Planting bar** a long heavy metal bar used to make deep, narrow holes for planting.
- Pruning saw** a small hand-held saw used for pruning trees or taking cuttings.

Evaluating the Learning

The “Shout Out and Share!” component of the restoration project provides an effective way for you to evaluate the learning level of your group. Your learners will have taken some time to decide how they want to share their learning in earlier sessions. Learners will take notes and think about their “Shout Out and Share!” component throughout the last two sessions. However, the final work and presentation of this element will need to happen after the final sessions.

Riparian Restoration Workshop: 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"> • 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 6: Riparian Restoration Workshop



Big Idea/Inquiry

How can we protect and restore our watershed?



Time

Full-day or half-day field session (or more, depending on your context)

Indigenous Knowledge Element

The local Indigenous language place name for the creek, stream, lake, marsh, or estuary where you are learning.



Purpose

The purpose of the session is for students to learn bioengineering skills and techniques that help restore damaged riparian ecosystems along the watershed.



Handouts/Materials

- *Session 6: Riparian Restoration Workshop Learner's Guides*
- Map from Session 4
- Chart paper
- "Shout Out and Share!" planning guide (Session 5 activity plan, page AP5-4)



Equipment Needed

You will need:

- Gloves
- Pruning saws and loppers
- Trowels
- Planting bars
- Shovels
- Rakes



Learning Goals

- To learn and understand more about how restoring riparian areas help protect our watersheds, drinking water, quality of life, fish populations
- To learn a specific riparian restoration approach called *bioengineering*

Learning Outcomes

Students will be able to:

- › Name two practices that could be changed to help prevent damage to watersheds
- › Describe one approach to restoring riparian ecosystems
- › Explain how rain gardens help mitigate flooding in urban areas

Key Learning Points

- › Degraded areas within a watershed can be restored using a variety of techniques
- › Riparian areas can be restored with an approach called bioengineering
- › The overall aim is to stabilize slopes and soil enough to allow natural ecological succession to take hold and re-establish the natural ecological system

Techniques include:

- › Making the soil surface rough and loose to promote drainage
- › Taking with live cuttings from indigenous riparian shrubs such as willow and red-osier dogwood
- › Making 'live wattle-fences' with cuttings when necessary
- › Pocketing plantings of riparian vegetation
- › Adding plant propagation material of site-appropriate species such as alder seeds



Planting native species in a riparian area is a great restoration activity for learning groups.

Photo: Stephanie Cottell

Introducing the Learning

Before introducing the restoration professional that will be facilitating this session, direct learners to the *Session 6: Riparian Restoration Workshop Learner's Guide* to review their learning responsibility for the day. For example, taking notes about vocabulary and their "Shout Out and Share!" element.



Activity 1: Bioengineering in the Watershed I

Bioengineering workshop classroom session with ecological restoration specialist (or they may want to present the whole day in the field).



Activity 2: Bioengineering in the Watershed II

Bioengineering workshop field session with ecological restoration specialist (ensure that field safety orientation is completed at the outset).

Closing the Session

Summarizing/Reflecting/Evaluating/Wrap-up: Have learners complete the following activities.



Activity 3: Wrap-up Activities

Your learners will have taken some time to decide how they want to share their learning in earlier sessions (see *Session 5: Watershed SOS Learner's Guide*). Though learners will be taking notes and thinking about their "Shout Out and Share!" component throughout the last two sessions, the final work and presentation of this element will probably need to happen after the "Riparian Restoration Workshop" session has been completed.

