



Riparian Repair

This activity center is part of the **Water Protection** theme.

What's the purpose of this activity?

Students will be introduced to the components that are necessary for riparian zone function, with a strong focus on plants. Students will come to understand how important a healthy, plant-filled riparian zone is to all watersheds. They will see there are many plant and animal interactions amid the *Ribbon of Life*. Students will also be introduced to the thought process behind stewardship and shoreline restoration so they can become great waterfront stewards themselves.

Key messages:

- A vegetated riparian zone, rich in plant diversity, protects water quality, provides habitat, improves watershed health, and increases biodiversity overall. Littoral zones are vital as well.
- Healthy riparian plant communities filter and buffer shoreline runoff, pollution, and reduce erosion along the water's edge.
- Riparian and littoral zone flora provides food and habitat to wildlife.
- Riparian zone plants need to be protected by humans, yet they are often damaged by lack of understanding.
- Waterfront Stewards understand waterfront creatures. They protect the riparian and littoral zones and set a great stewardship example, by leaving waterfront plants and habitat unharmed.

Materials:

- Six 2x4 planks with a groove down the middle these are your '250 feet of shoreline'.

- Photo collages depicting excellent and poor 'Shoreline Sharing' practice (front and back).
- Shoreline restoration and design ideals (front and back) can be left out on the teaching table.
- How plants benefit water graphics (front and back).
- *Who Loves Water?* pie graph depicting waterfront users and demands. Wildlife examples on the back.
- Riparian Zone graphics (front and back).
- Shoreline Sharing example cards representing:
 - ✓ human water use
 - ✓ plants that love water
 - ✓ common animals & habitat found along water
 - ✓ elements to leave undisturbed – woody debris and existing rocks
- Living examples of key riparian plant species in containers (see species list at end of document).

Activity Set Up:

1. Set up plant examples and educational graphics on one table. This will be the teaching table.
2. Place two 2x4 slats along the front of the other two tables for the game.
3. Use two slats for demonstration. Place healthy shoreline cards and unhealthy shoreline cards as you wish. Don't tell them your opinion on health. Leave them up. These are an example.
4. Place the remaining cards graphic-up on the table along with the remaining yellow wooden slats. Each shoreline should only hold 6 cards.

What will I be doing?

At the beginning of the day you will ensure that the set-up has been completed and that you have all of the materials necessary to run the station. For each rotation you will be monitoring the students' success in creating

a healthy, fair riparian zone. The goal is to get the students to understand that using waterfront areas takes great responsibility and requires balanced thought. After interpreting the Riparian Zone and Water Sharing graphics, start by creating working groups and allow them to develop their shorelines independently using the many cards. After each group has accomplished the task of creating their shorelines, initiate a discussion, lining up their creations side by side, to see what all of their shorelines would look like together, and if they like what they see. Is it a balanced water body? Has fair thought been put towards all of the riparian users? How many creatures could be there? Discuss. Then explain the importance of the riparian zone, how it should be shared by all creatures, and the role plants hold. The ideal *Super Steward* shoreline should only have a human activity area of about 25% of the total shoreline (on average 250 feet nowadays) this would be 2 cards or less. Play again and allow them to change or repair their shorelines. Line them up again. Discuss.

1. Introduce topic. Use graphics: Riparian zone. Water Sharing. Human/Plant/Animal/Water.
2. Divide students into groups. Allow them to 'manage' their shorelines as a group without any guidance.
3. Place all of the shorelines side by side. Discuss creativity and ask for reasoning. Take a look at how the shorelines appear together. Is this balanced for all creatures? How do the creatures they have chosen use water? The cards can be interpreted in many ways.
4. If the group initially creates a 25% human use shoreline with 75% for other creatures, they get commended ... this is good! Very thoughtful.
5. Explain then to the students that the objective of the activity is to manage their shorelines in a fair and thoughtful manner for all riparian creatures.
6. Teach them about shoreline stewardship, riparian plants and roots, how other animals use the riparian zone. Show them the plant examples. Use the props.
7. Ask them how they could repair what they have created on their shoreline if it is required. Let them play again. Discuss and interpret again.

Questions to ask Students:

Q: Where do you spend time by the water? Why do you love spending time by water? When you spend time by water are you on the land or in the water? How do you get to the water? Do you eat anything from the water? Do we raise babies in the water?!

Q: What is the Riparian Zone in a watershed?

A: The riparian zone is also known as the 'Ribbon of Life'. They are the **areas where land and water meet** and they hold an astounding amount of plant and animal diversity. They slow and store nutrients, and therefore protect water quality. Riparian zones are the supermarkets, highways, and nurseries for many creatures.

Q: Why are plants along shorelines important?

A: Vegetation along shorelines act like eyelashes for the watershed. They reduce erosion from waves and boat action. They slow runoff from land and reduce pollution. They provide food and shelter at the water's edge for creatures. The sun hitting the water's edge is littoral.

Q: What types of animals would rely on shoreline vegetation for food and shelter?

A: All kinds of fish, amphibians, reptiles, mammals, insects and birds. **One third** of Ontario's mammals and **half** of Ontario's bird, fish and plant species depend on wetland habitat for survival. For example, like amphibians, Dragonflies lay their eggs in water and the larvae live submerged until they are ready to crawl onto shoreline vegetation to dry out in the sun, crack open and fly. But remember! All living creatures rely on water to survive (humans will die after 5 days without water). We all need access to healthy water.

Q: Besides plants, how can I ensure that a shoreline stays healthy?

A: Don't clean an entire shoreline. Leave the 'weeds', woody debris and existing rocks on shore and in the shallow water. Woody debris can collect soil and become 'Nursery Logs' and provide animal habitat. Turtles love basking in the sun on floating logs. Rocks and rock clusters are great reptile habitat. If you would like a swimming access point, keep it small.

Q: How can I repair a damaged shoreline?

A: Lead by example. If you know anyone who lives along the water, take a look and see how much of the waterfront is taken up for human activity. Make note of how you would repair it towards fair balance. Volunteer for shoreline restoration projects on a planting day, or for a local native plant sale. Learn how to plant a tree or shrub. Look closely at shoreline plants. How do they grow? (can use the shoreline restoration examples here)

Q: How can I learn more about the riparian zone?

A: Sit quietly and study a planted shoreline. Look deep into the plants. Who is using them for habitat, food, and fun? Note what you see. Wear a mask when you go swimming so you can see underwater. Get a pail and a net and count and identify the creatures you catch. Get a wetland field guide. Meet your riparian pals!

Additional Background Information:

Riparian Zone Facts

- Healthy riparian areas are natural, vegetated buffers that protect streams and rivers from upland impacts. They include natural vegetation, including fallen trees, branches and washed-up logs, and natural rocks or pebbles that run along any length of shoreline.
- Riparian zone boundaries can be as fluid as water, as they change with fluctuating water levels. In communities they are designated using high-water levels.
- Natural shoreline buffers maintain water quality through reducing erosion, filtering sedimentation, slowing the flow of water, taking in excess nutrients and, to a degree, processing contaminants that might otherwise enter the water unchecked. A planted shoreline acts like our eyelashes, keeping sediment and irritants out of the watershed.
- Riparian zones hold the highest amount of biodiversity within ecosystems.
- Shoreline plants can provide suitable habitat for all developmental cycles of many wildlife, particularly, amphibians, reptiles, fish and macroinvertebrates. Most North America animals depend on riparian zones for survival. Shoreline plants provide shelter so shy wildlife can drink water and bathe safely.
- Dead trees, logs and branches are very important to keep in the riparian zone, as are rocks. Woody debris can grow new plants! Sandy beaches provide little habitat for wildlife. Plant communities, along with natural debris, provide protection and movement corridors for a wide variety of aquatic, avian and terrestrial fauna. It is especially valuable to highly sensitive creatures, like reptiles.
- Riparian areas contribute to regulating water temperature through shading and softening the effects of temperature and wind fluctuations.
- Wetlands, which contain open water for all or

part of the year, are often found within riparian areas. Animals need open water in the winter.

- Productive fish communities require food that has been produced on land (ie. insects and their young).
- Besides improving water quality, plants also improve air quality.
- Riparian zones are full of living things that are highly capable of adapting. Adaptation keeps animal species healthy and encourages healthy species evolution.
- A planted riparian zone can reduce or even eliminate the need to mow a lawn.
- You can protect a riparian zone by minimizing traffic through the planted areas and maintaining natural forest covering and debris.
- Removing shoreline vegetation can throw silt onto fish spawning beds, increase pollution through way of runoff, and increase risk of flooding.

Clean Up Procedures:

At the end of the day make sure all items for the presentation are cleaned up and ensure that the cards and laminates are separated and ready for the next day. Leave the site as you found it for the next day's volunteers.



Plants that love water: **Trees:** Willows, cedars, red maple, white birch, black spruce, **Shrubs:** Alders, sweetgale, steplebush, leatherleaf, Labrador tea, cranberry, chokeberry, elderberry, **Herbs:** Swamp milkweed, blue-flag iris, ferns, marsh marigold, Joe-pye weed, boneset, orchids, **Emergents** (plants that have their feet in the water): Sweetflag, cattail, royal fern, rushes, sedges, cardinal flower, water arum, bogbean,