Lesson 2-2: Riparian Zones

Time of Lesson: 1 hour

Rationale: The purpose of this lesson is to define what a riparian zone is and link its importance for fish and other animals, and humans, and the ecosystem in general.

Instructional Objectives: Student can define what a riparian zone is and list the reasons why riparian zones are important. Students can list negative impacts to riparian zones.

Strategies and Activities: Brainstorming on what a riparian zone is and use Handouts and PowerPoint presentations to present concepts.

Materials:

- SMARTboard PowerPoint presentation: *Riparian Zones*
- Handout: *Worksheet 2c - Riparian Areas*
- Handout: *Map of the Nechako Watershed*
- Paper and markers

Student Assessment:

- Observation and participation in class and small group activities.
- Ability to identify where a riparian zone is on a landscape.
- Understanding of the features and importance of riparian zones.

LESSON PLAN

Review (5 minutes)

Review the definition of a riparian zone from the last lesson and where a riparian zone is within a watershed. Provide Handout *Worksheet 2c - Riparian Areas* as a review of what a riparian zone is. You can refer to this worksheet throughout the lesson.

Key Points

Riparian zone is the land immediately adjacent a lake or river. The soil in a riparian zone is influenced from the water of the lake or river and is composed of moist to saturated soils.

Riparian zones follow along the entire length of any creek or river in a watershed, or surround lakes and wetlands. The width of a riparian zone depends on the size of the river or lake (wider for larger rivers, narrower for creeks).

Water-loving plant species live within riparian zones.

Activity (25 minutes)

Display on the SMARTboard the PowerPoint presentation *Riparian Zones*. Flip through the first four slides that show images.

Ask

What do all these photographs show? *The riparian zone of different rivers of different sizes.*

Continue with the slideshow. Stop where necessary to discuss. There a several slides that have a lot of information on them that outlines why riparian zones are important.

- Riparian zones are important because they connect the water with the land, and host a wide range of plant and animal life.
- They keep water cool and clean. Along the edge of the water where it is shallow, trees and vegetation provide shade and moderate the water temperature during warmer weather. This prevents algae growth.
- They connect different ecosystems, transport/circulate nutrients, and allow wildlife to travel between different habitats.

The slideshow continues and presents several concepts of ecosystems and connections between plants, animals and water within the riparian zone.

Plants play a huge part in the riparian zone.

- adapted to wet conditions and can tolerate periodic flooding
- moderate the temperature in the water
- roots and plants provide stability and strength
- leaves, twigs, and needles provide nutrients to aquatic invertebrates, which in turn nourish fish
- large trees that have fallen into water, help slow down the energy of flowing water, protect stream banks, and create pools and hiding places for fish

Animals benefit from a healthy riparian zone because:

- birds and mammals help to disperse the seeds of shrubs and trees
- invertebrates, molluscs (slugs and snails), and worms help to break down plant and animal matter, making it more readily available as nutrients to other organisms
- salmon fulfill a unique role by connecting the ocean, freshwater, and the land during the course of their life cycle (which begins and ends in stream corridors)
- complex predator-prey relationships that help maintaining a healthy balance among populations
- habitat for a huge array of animals (80% of wildlife depend on this area in whole or in part)

Humans benefit from riparian zones because:

- fertile and productive for agriculture
- reduce energy during floods
- good often flat locations to build towns, industry and transportation routes
- store and trap sediments and contaminants
- scenic areas to live, walk or recreate.

Activity (25 minutes)

Distribute craft supplies including paper and markers. Have the students illustrate a healthy riparian zone. Have them be detailed in the:

- varying height of plants and number of different type of plants (water loving)
- as many animal species as they can think would live in a riparian zone
- different aquatic species and organisms in the water (fish, invertebrates, detritus (rotting plant matter).

Display art work in classroom or in hallway outside classroom. If time permits, have classroom discussion on each person's work, or split into smaller groups and have students share their work with each other.

Closure (5 minutes)

Review what makes a riparian zone healthy.

Riparian Areas

The **riparian zone** is the area of land adjacent to streams, rivers, lakes and wetlands, where the vegetation and soils are strongly influenced by the presence of water.

Riparian areas are important for plants, animals, humans, water quality and overall watershed health. Riparian zones connect the land with water.

A healthy riparian zone:

Has a diversity of plants to the banks of the water that provide shade to the water

Has a diversity of animals living within it

Is wider than the length of a school bus

A healthy riparian zone will:

Reduce energy during floods

Provide habitat for animals (birds, mammals, insects, fish, reptiles, invertebrates)

Store nutrients and contaminants

Provide structure and stability to river banks

Filter and reduce energy of overland flow

Regulate water temperature

Provide corridors for animals to travel

Be an area of increased biodiversity

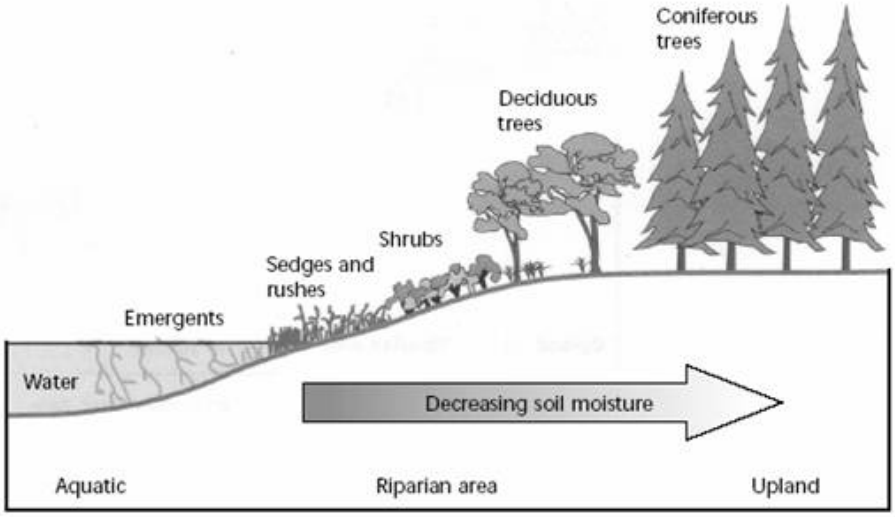

FIGURE 1 *Illustration of the moisture gradient in a typical riparian ecosystem (from Stevens et al. 1995:2).*

Impacts of Land Use in Riparian Zones

People have long relied on riparian zones for the abundant food, water, and material resources they supply. Riparian areas are often flat making it easier to build roads, farms, and towns in them. Therefore, many riparian areas have been built on for different ***land uses*** *(eg. agriculture).*

Land use and development in riparian zones comes at a price! Impacts from development of riparian areas include:

- *contamination and pollution of water*
- *loss of vegetation and biodiversity*
- *increased erosion of river banks leading to altered river habitat*
- *increased water temperature*
- *ability for invasive species to grow*

Below list 3 different land uses that occur along the Nechako River. Tick if they are beneficial (positive) or detrimental (negative) to riparian health.

Land Use Practices	**Positive**	**Negative**
_____	❑	❑
_____	❑	❑
_____	❑	❑

GRADE: _____ TEACHER: _____

Feedback Form for Unit 2 - Lesson 2-2

Please fill in the information below. If you have additional comments, please make them directly in the lesson plan. Please feel free to email me any immediate concerns: michelle@mrconcepts.ca.

Background Information:

Was there enough information provided to conduct the lesson successfully?
Yes or No

If no, what additional information and/or resources would be useful for this lesson?

Activities:

Were the activities engaging to the students? Yes or No

Was the timeline of the activities a good estimate?
Too Long ____ Too Short ____ Just Right ____

Any comments?

Worksheets:

Were the worksheet(s) effective in teaching and/or reviewing the lesson material?
Yes or No

Was the answer key helpful? Yes or No

Additional Resources:

If used, were the resources suggested or provided for this lesson useful? Yes or No

What else would you suggest be needed for this lesson?