

# Erosion and Riparian Zones

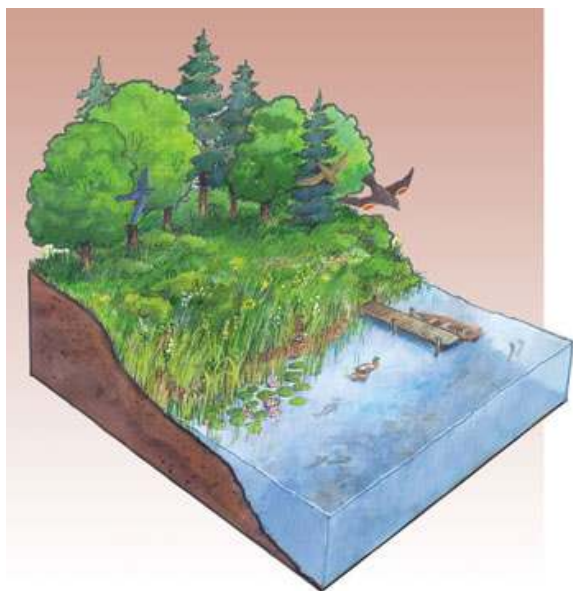
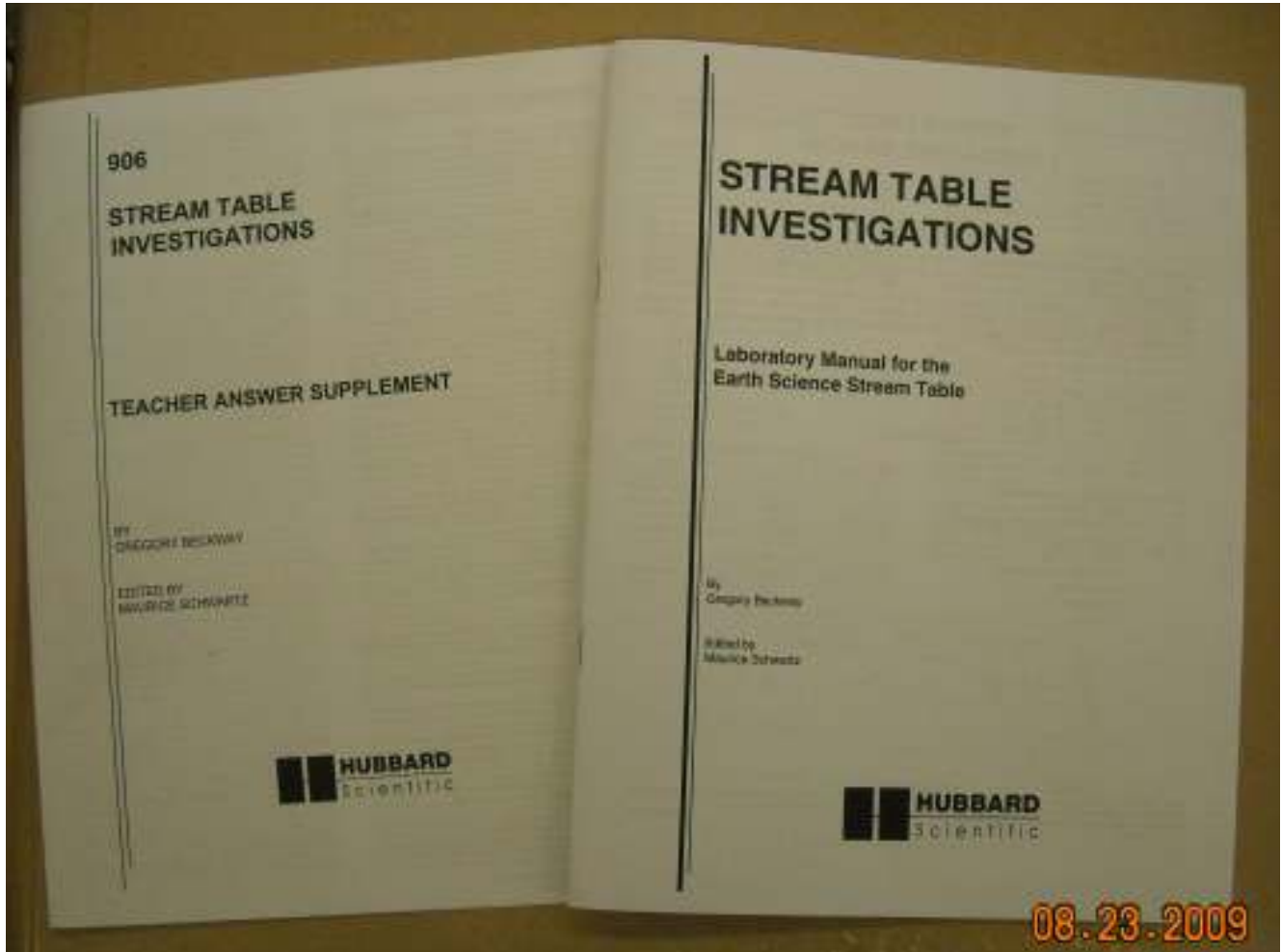


Figure 10



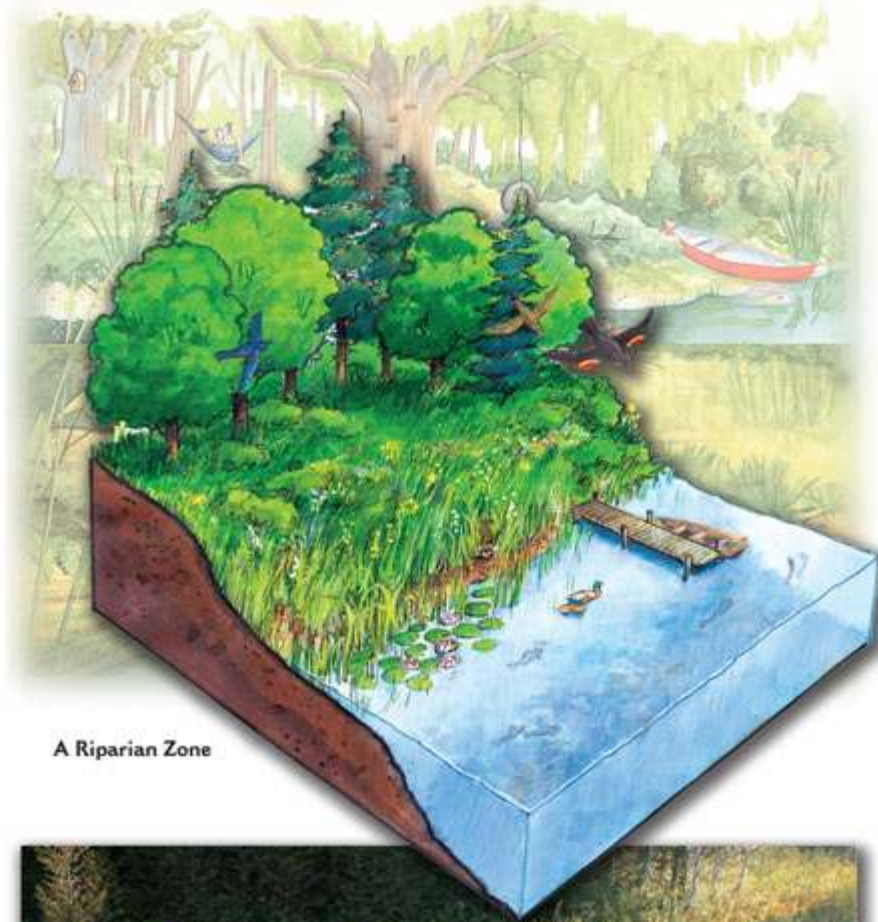
<b><u>Item</u></b>	<b><u>Number of</u></b>
Stream Table	1
Stream Table Use Booklet	1



# Station 12- Erosion and Riparian Zones

## Introduction

A riparian zone is an area around a stream or another watercourse which has distinctive vegetation and other characteristics which separate it from the land beyond the riparian zone.



A Riparian Zone



<http://www.dfo-mpo.gc.ca/regions/central/pub/habitat-on/04-eng.htm>

Riparian zones contribute a number of important things to the natural environment, with many conservation groups promoting the maintenance and restoration of riparian zones for the benefit of the environment in their regions.

The word “riparian” comes from the Latin *ripa*, which means “bank,” referencing the fact that the riparian zone begins at the banks of the river. The width of a riparian zone varies, depending on prevailing conditions in the region and the amount of human interference which has occurred, and the zone can include wetlands as well as solid ground. You may hear a riparian zone referred to as a riparian forest, riparian buffer, or riparian habitat, depending on regional word use.

Spotting a riparian zone is usually very easy, as a healthy riparian zone appears as a ribbon of green along the banks of the river. It often hosts an assortment of trees along with other plants which like moist environments, and in a healthy environment, the plants will be extremely diverse. The environment of the riparian zone is also friendly for an assortment of wildlife like birds, butterflies, bees, and so forth, and sometimes larger animals will make their homes in a riparian zone as well.

A number of important functions are performed by riparian zones. One of the most important is erosion control; riparian zones prevent erosion, with native plants sending deep roots into the soil to keep it from crumbling and washing away. The plants also act as pollutant traps, reducing the amount of runoff which enters the water, and they snag sediment, ensuring that the sediment isn't washed out to sea.

Having a well-stocked riparian zone also helps to control the ambient temperature, keeping temperatures moderate around the water instead of allowing radical fluctuations. Many native species rely on relatively stable temperatures, because this is what they have evolved to live with, so they appreciate the temperature regulation offered by the riparian zone. The habitat offered by the riparian zone is also important, especially for species which are being pressured by human populations.

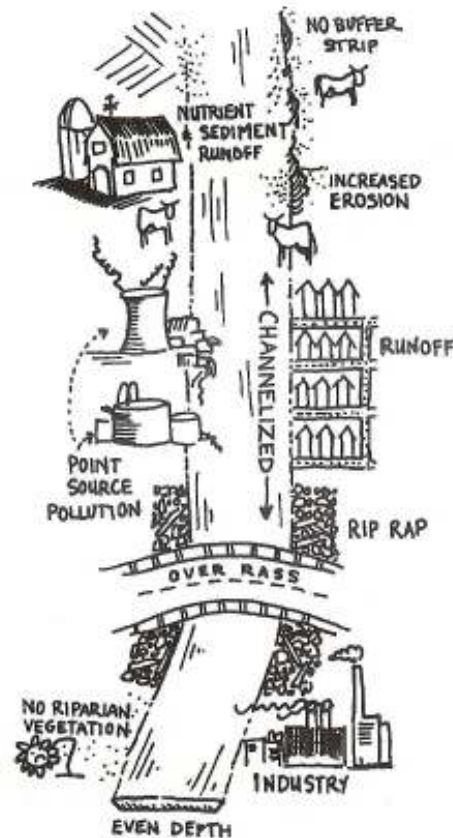
<http://www.wisegeek.com/what-is-a-riparian-zone.htm>

## RIPARIAN HABITAT

HEALTHY

vs.

UNHEALTHY

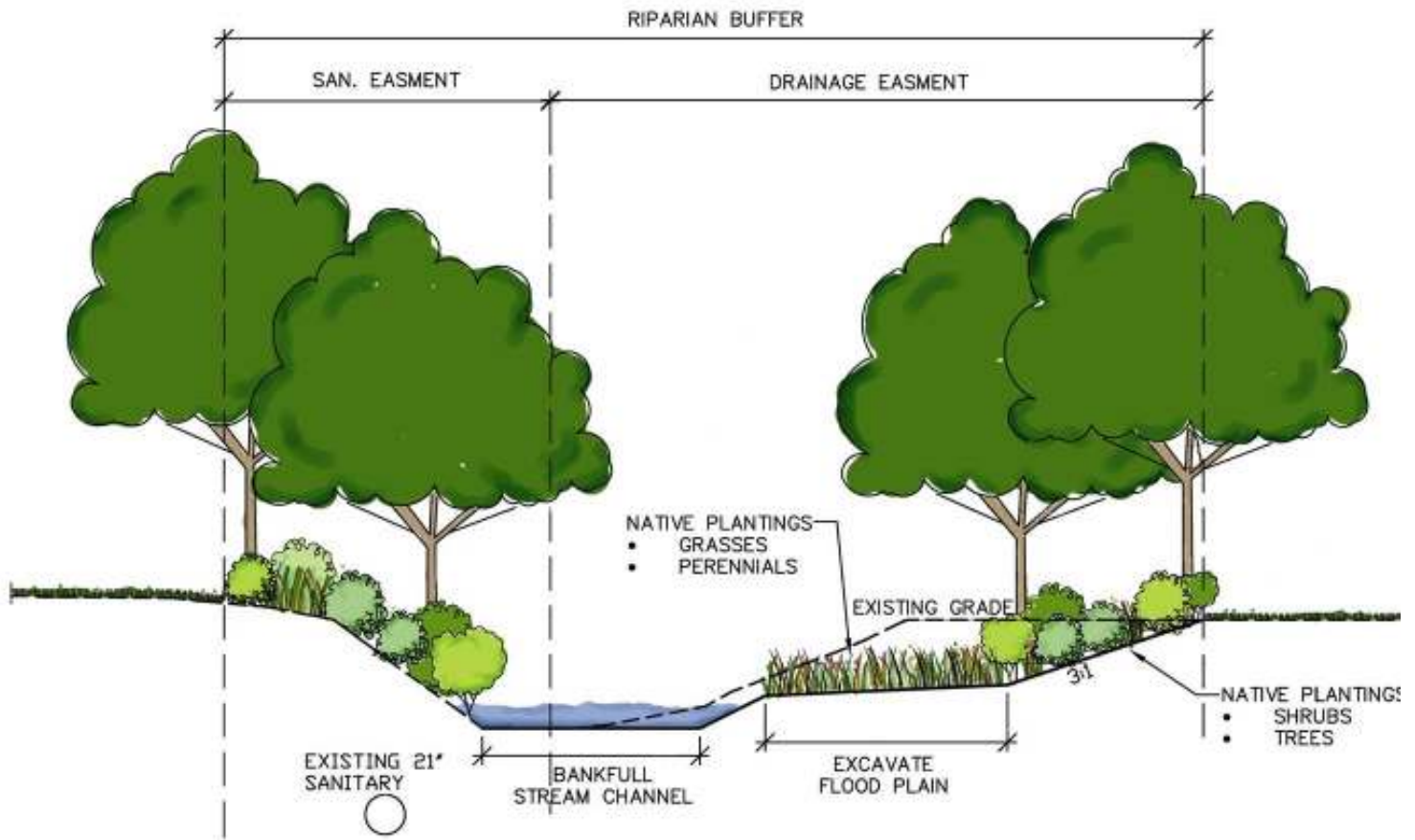


### Soil erosion

We need soil to grow food, vegetation and important food crops. In addition, land and soil provide shelter, protection, recreational opportunities, aesthetics, clothes, and medicines. Unfortunately, soil is taken for granted. It is estimated that 24 billion tons of precious topsoil are lost each year because of ineffective management practices. Research indicated that soil eroded from areas undergoing development can be as much as 500 times greater than in rural areas.

The consequences of soil erosion are many- loss of productive agriculture land in rural areas and silt clogged streams and lakes. Soil is a land treasure, it must be wisely managed. Good conservation practices will insure a productive land for this and future generations.

Most of Indiana has fertile soil and a favorable climate which help produce a variety of crops and animals. About 75 percent of Indiana land is farmed, but that number is being reduced as land is transformed into housing and business developments.



[http://www.modul-stufen-konzept.ch/bilder/oekomor/oeko-f\\_abb1\\_e.jpg](http://www.modul-stufen-konzept.ch/bilder/oekomor/oeko-f_abb1_e.jpg)

### **The Value of Riparian Vegetation**

Stream or river banks are riparian areas, and the plants that grow there are called riparian vegetation. Riparian vegetation is extremely important because of the many functions it serves.

### **Bank stabilization and water quality protection**

The roots of riparian trees and shrubs help hold streambanks in place, preventing erosion. Riparian vegetation also traps sediment and pollutants, helping keep the water clean.

### **Food chain support**

Salmon and trout, during the freshwater stage of their life cycle, eat mainly aquatic insects. Aquatic insects spend most of their life in water. They feed on leaves and woody material such as logs, stumps and branches that fall into the water from streambanks. Standing riparian vegetation is habitat for other insects that sometimes drop into the water, providing another food source for fish.

### **Thermal cover**

Riparian vegetation shields streams and rivers from summer and winter temperature extremes that may be very stressful, or even fatal, to fish and other aquatic life. The cover of leaves and branches brings welcome shade, ensuring that the stream temperature remains cool in the summer and moderate in the winter. Cooler, shaded streams have less algae and are able to hold more dissolved oxygen, which fish need to breathe.

### **Flood control**

During high stream flows, riparian vegetation slows and dissipates floodwaters. This prevents erosion that damages fish spawning areas and aquatic insect habitats.

## **Fish habitat**

As dying or uprooted trees fall into the stream, their trunks, root wads, and branches slow the flow of water. Large snags create fish habitat by forming pools and riffles in the stream. Riffles are shallow gravelly sections of the stream where water runs faster. Many of the aquatic insects that salmon eat live in riffles. Salmon also require riffles for spawning. They use pools for resting, rearing and refuge from summer drought and winter cold.

## **Wildlife habitat**

Over 80 percent of all wildlife species in western Washington use riparian areas during some part of their life cycle. Riparian vegetation provides food, nesting, and hiding places for these animals. Unfortunately, forested riparian areas account for the smallest percentage of forest land in Washington.

Riparian vegetation is essential for maintaining high water quality in streams, rivers, lakes, and along shorelines. However, riparian vegetation remains relatively unprotected from poor agricultural practices, residential and commercial construction, landscaping, and logging.

<http://www.kingcounty.gov/environment/animalsAndPlants/salmon-and-trout/riparian-vegetation.aspx>

## **Benefits of riparian zones**

Maintaining or developing an attractive riparian zone can:

- Increase your property value
- Reduce property loss from excessive erosion
- Protect water quality
- Enhance wildlife habitat
- Contribute to the natural beauty of the land
- Dissipate noise from reservoir traffic, roads, and nearby properties
- Reduce maintenance time and related costs
- Provide privacy
- Screen unsightly views
- Enhance scenic views.

## **Benefits of native plants**

Native plants have evolved under local conditions. They are tolerant of drought and extreme temperatures, and they are naturally resistant to pests and diseases. After they become established, native plants usually require much less physical effort to maintain than lawns. They can reduce or eliminate the need for lawn mowers, trimmers, and other gasoline-powered equipment. Native plants are also less costly to maintain because they generally don't need the fertilizers and pesticides that turf grass and other non-native species may require.

Waterfront vegetation enhances habitat for wildlife and increases opportunities for wildlife viewing. Native plants along waterways provide food and shelter for a variety of insects, amphibians, reptiles, songbirds, mammals and fish.

## **Riparian Plant Benefits**

- Roots prevent erosion and undercutting of banks.
- Branches, stems, and leaves absorb the impact of raindrops.
- Ground cover (decaying leaves and low-growing vegetation) slows runoff, increasing absorption.

Native vegetation also helps to prevent the establishment and spread of exotics (non-native plants). Native riparian plants protect the streambank and shoreline from the erosive forces of moving water. The deep, extensive root structure of native grasses, shrubs, and trees prevents erosion and undercutting of banks.

The branches, stems and leaves of these plants absorb the impact of raindrops. Decaying leaves and low-growing vegetation form a ground cover that further lessens the erosive force of raindrop impact. This ground cover slows runoff, increasing the amount of water that is absorbed into the soil and then released slowly into the stream, reservoir, groundwater or atmosphere. The water that is absorbed may contain nutrients, pesticides, and other pollutants that will eventually be taken

up by plants or broken down over time. By slowing runoff, trapping sediments, and increasing absorption, these plants act as a living filter to protect water quality.

### **Activity suggestions before visiting the Nature Park**

- Have students list places in the county that they see erosion
- Make a list of those factors that cause erosion
- Have students go home and write down 5 products that have links to soil
- Research the components of topsoil and how it's formed
- Walk through your school's grounds. Make lists of areas that are properly and improperly managed
- Work with the stream table to show the effects of erosion, stream flow, vegetative effect on the flow of erosion and quality of water when it flows through a riparian zone verses when not

### **Activity suggestions during your visit to the Nature Park**

- Take pictures of areas at the Nature Park that show riparian zones, soil erosion and soils that are managed properly. List characteristics of pictured areas.
- List living things in the Nature Park are dependent on soil for survival

### **Activity suggestions after visiting the Nature Park**

- Study practices that farmers use to protect their soil (crop rotation, no till, zero-till farming, shelterbelts (also referred to as wind-breaks), green cover crops such as alfalfa or other legumes, terraces, riparian buffers, strip-cropping and tile-drainage
- Work again with the stream table to show the effects of erosion, stream flow, vegetative effect on the flow of erosion and quality of water when it flows through a riparian zone verses when not
- Interview farmers, gardeners, agronomists, and landscape specialists to collect data and information about soils conservation practices that have been used over the years.
- Study pictures of riparian zones and have students explain why they are important.

### **Resources in the travelling trunk**

- Stream table
- Stream table use booklet

### **On-Line Resources**

Soil and Water Conservation Districts, <http://iaswcd.org/>

National Weather Service Advanced Hydrologic Prediction Service,

<http://www.crh.noaa.gov/ahps2/hydrograph.php?wfo=ind&gage=crwi3&view=1,1,1,1,1,1,1,1>

Build a stream table, <http://urbanext.illinois.edu/rivers/buildst.cfm>

Evaluation of Riparian Buffer Zones using GIS and Remote Sensing to Target Watershed Restoration Efforts, <http://igs.indiana.edu/Survey/projects/riparianBuffers/index.cfm>

The values of the riparian zone, <http://www.nynrm.sa.gov.au/Portals/5/pdf/LandAndSoil/30.pdf>