Riparian Ecosystems and Restoration of a Natural Area Grade 5*

Delta Ponds Park

Background: In 2012, The City of Eugene completed an eight-year restoration of the abandoned gravel pits known as Delta Ponds. This process transformed the deep-edged pits that were overgrown with invasive blackberries into ponds with sloping sides and wildlife-friendly trees and native plants. The restoration also re-connected the ponds to the Wilamette River, so that fresh water could circulate in a natural pattern and provide important side-channel habitat to young salmon, beavers, river ottters and more.

Along with wetlands, riparian habitats are some of the most diverse ecosystems in our area, and provide many similar benefits to the environment.

In 2013, Metro TV created a 7-minute video about Delta Ponds Park—share it with your students at: http://vimeo.com/28513274. Ask them to read the supplemental reading

Review key concepts from the video and reading either through discussion or the activity sheet:

- In the 1950s, Delta Ponds was valued for a natural resource. What was that resource and how was it used? (gravel beds; large pits were mined for gravel to be used in highways)

- Today, Delta Ponds is still valued as a natural resource. What kind of resource is it today, and how is it valuable to our community? (restored river side-channel habitat; home for wildlife, recreational value)

- Define these two terms: Side Channel Riparian Habitat
(side channel habitat is an offshoot of a river that is usually slower-moving and more shallow than the main river. Riparian habitat is an ecosystem that depends on slow moving rivers and side channels for fresh water.) Why are these two features important to humans? (flood control, natural water filtration, recreation)

- What type of human activities have helped the Delta Ponds over the years? (restoration) What types of human activities can still hurt Delta Ponds? (pollution)

- Why were people interested in changing the paths of smaller rivers and streams? How did this affect the main river? (people wanted to use land for development, logging, agriculture; main river was forced to carry more water so it ran faster, overflowed, eroded banks, water temperature changed)

- What types of human activities and changes can you see when you compare the two aerial photos of Delta Ponds? (side channels of the river removed, trees cut down, more houses and roads)

Oregon State Department of Education Standards by Design

Fifth grade goals:

SS.05.GE.07 Understand how physical environments are affected by human activities.

SS.05.GE.07.01 Understand how and why people alter the physical environment.

SS.05.GE.07.02 Describe how human activity can impact the environment.

SS.05.GE.08.02 Understand how the physical environment presents opportunities for economic and recreational activity.

* This lesson is designed to supplement the 5th Grade SPLASH! Curriculum on Ecosystems and Wetlands, or stand alone.

Grade 5 Unit
Ecosystems and Wetlands
Riparian Habitat Worksheet

After viewing the video about Delta Ponds and reading about helping riparian habitats, answer the following:

- In the 1950s, Delta Ponds was valued for a natural resource. What was that resource and how was it used?

- Today, Delta Ponds is also valued as a natural resource. What kind of resource is it today, and how is it valuable to our community?

- Define these two terms:

  Side Channel:

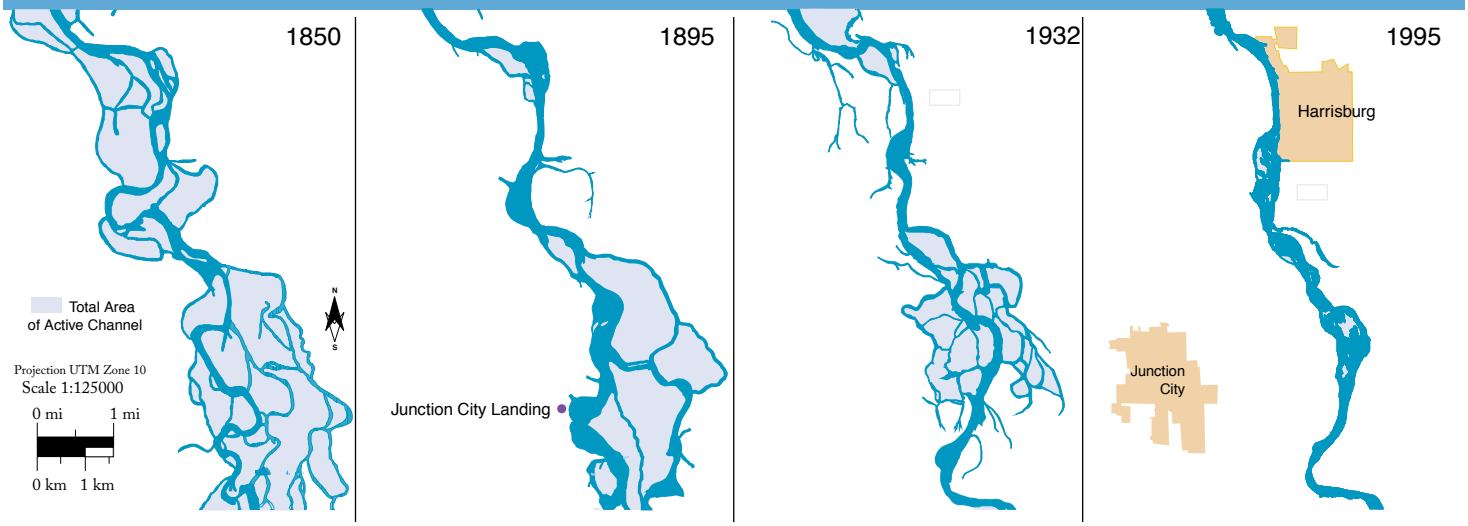
  Riparian Habitat:

  Why are these two features important to humans?

- What type of human activites have helped the Delta Ponds over the years?

- What types of human activities can hurt Delta Ponds?

History of Willamette River Channel Change



Compare these diagrams of changes in side channels near Junction City from 1850–1995. Why do you think people were interested in changing the smaller rivers and streams? How could this affect the main river?

Look carefully at the two aerial views below of Delta Ponds taken 27 years apart. What types of human activities and changes can you see when you compare the two photos?

SPLASH!
Stormwater Pollution: Learn and Share

5th Grade Unit
Ecosystems and Wetlands

Strategies for Helping Riparian Habitats*

Characteristics

Riparian habitats are those adjacent to rivers and streams or occurring on nearby floodplains and terraces. Riparian habitats are shaped and maintained through seasonal flooding and soil deposits. Floods can replenish nutrients and recharge groundwater. Riparian habitats occur along rivers and streams at all elevations, from valley bottom floodplains to alpine torrents. Riparian habitats also include springs, seasonal streams, and many low elevation floodplains confined by valleys.

Riparian habitats vary from sparsely vegetated areas to cottonwood gallery forests due to flood dynamics. Plant composition is influenced by elevation, stream gradient, floodplain width, and flooding events. Throughout most of the state, riparian vegetation is mostly dominated by deciduous trees and shrubs, such as bigleaf maple, alders, aspen, cottonwood, dogwood, willows and Oregon white ash. Conifers, such as pines and spruce, dominate some riparian woodlands at higher elevations. Shrub thickets in the Northern Basin are dominated by deciduous shrubs, such as several species of willow, birch, alder, and chokecherry. Riparian meadows are also found in the Northern Basin and Range and are dominated by grasses, sedges and rushes.

Conservation Overview

Riparian habitats often have high species diversity and are critical for wildlife. These habitats are important to species that prefer moist shrubby or forested habitats. Riparian areas provide essential wintering habitat and travel corridors for songbirds, mountain quail, white-tailed deer, and other wildlife. In arid areas such as the Blue Mountains and Columbia Plateau, riparian habitats can provide abundant insects, plants, and moisture throughout the year. Riparian meadows include natural spring habitats that are extremely important for a wide variety of species, including greater sage-grouse chicks and butterflies.

In addition to providing habitat for birds and other wildlife, riparian habitats have important ecological functions. Healthy riparian vegetation protects banks from erosion, influences in-channel aquatic habitats, maintains favorable water temperature for fish through shading, filters runoff, and provides nutrients. Riparian vegetation creates slow moving water and increases habitat variety in valley bottoms.

**Excerpted from the report on Oregon Conservation Strategy, February 2006*
Oregon Department of Fish and Wildlife 287

Riparian habitats have declined from historic levels and are now greatly reduced in area and connectivity, especially those in low-elevation areas and valley bottoms. Development, logging, road building, agriculture and pasture use have damaged some riparian habitat directly through decreased riparian vegetation, increased sedimentation, and reduced large wood in streams. Runoff containing fertilizers and other contaminants can further affect habitat.

Steps have been taken through Oregon's planning and regulatory framework to address some of these issues. Cooperative restoration projects (similar to the one at Delta Ponds) have benefited riparian-dependent species on forest and agricultural lands. In many cases, these efforts have focused on improving habitat quality in smaller, fish bearing streams. Limits to streamside development on private land have improved riparian health on both public and private lands.

Human Activity Changes Riparian Habitats

A high percentage of low-elevation and valley bottom riparian habitats have been lost. Riparian vegetation often is lost as habitat is converted to other uses. Development can restrict the natural ability of streams and riparian habitats to meander over time, limiting these habitats. Floodplains have been converted to other uses. Excessive removal of riparian vegetation can cause sedimentation that damages aquatic areas, loss of habitat complexity, and increased water temperatures that adversely affect aquatic habitat. Loss of streamside vegetation leads to bank erosion. Grazing and dam construction can degrade riparian habitats. Urban development has led to stream channelization and vegetation loss in some areas.

Residents of Eugene, Oregon drink some of the cleanest water in the country, according to national tests. The source of this drinking water is the McKenzie River, which originates in the Cascade Mountains and flows west, eventually emptying into the Willamette River. The quality of the river's water is largely due to the health of the surrounding watershed, which harbors a variety of fish and wildlife, including the Willamette Valley's wild chinook salmon.

An Example of Restoration on a Private Farm

Doug McDaniel remembers when the Wallowa River meandered naturally through his family's property and the river was defined by its rugged character and healthy habitat for fish and wildlife. Since then, significant stretches of the Wallowa River, a tributary of the Grande Ronde, were straightened and pushed aside to accommodate railways, roads and pasture for livestock. Changing a river's course was standard practice well into the 20th century but the effects were unknown or not considered until recently. The physical changes increased the riverbed's shape and water speed while overgrazing of streambanks and adjacent meadows led to less plant cover critical to maintaining the river's wildlife ecology.

Today, with technical and financial assistance from private, government and tribal partners, McDaniel is restoring approximately 2,550 feet of the Wallowa River on his property. Construction of an oxbow (a turn in the river) will recreate the river's historically winding path. The addition of rootwads and rocks to the new channel will reduce water flow and improve instream habitat for resident aquatic species such as steelhead and chinook. Restoring the river's surrounding wetland also is a priority. Improvements to riparian and meadow habitat will benefit many wildlife species that utilize this habitat for nesting, hiding cover, or winter forage.

Vocabulary Words:

groundwater
floodplains
gallery forest
deciduous
sedimentation