# *A day on the Entiat River at Stormy Preserve: Riparian Ecosystem structures & functions*

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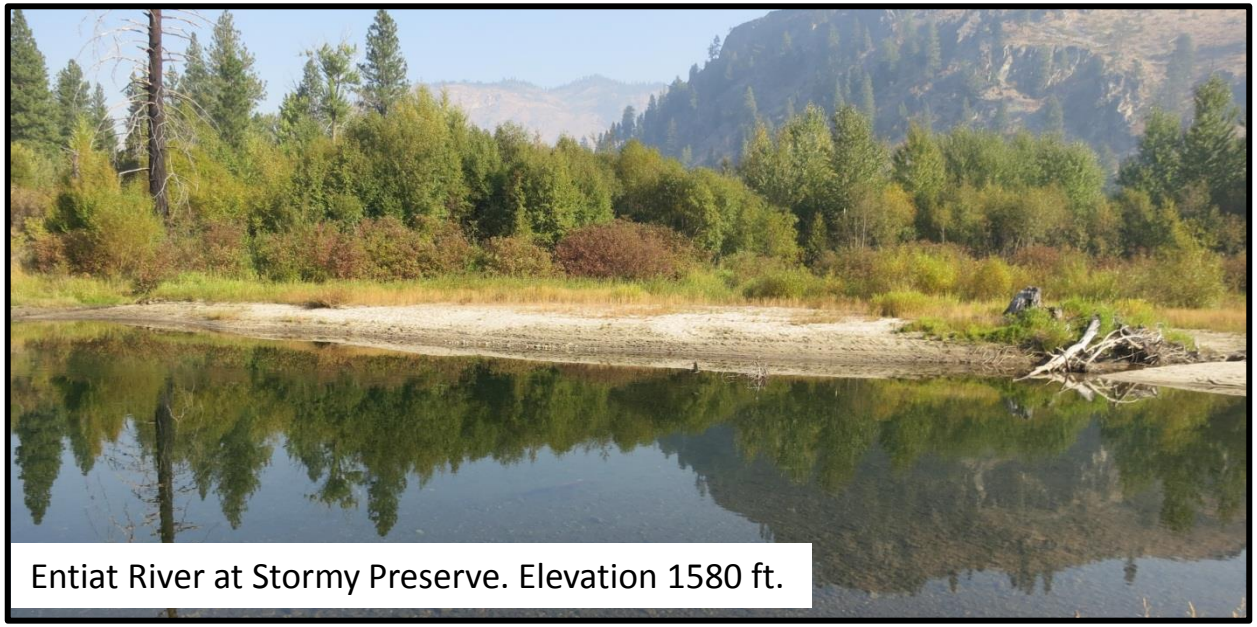
**The land along a river is a transition zone between upland and wetland plant communities.**

River water moves laterally as groundwater into riverbank soils, termed **riverine freshwater wetlands.**

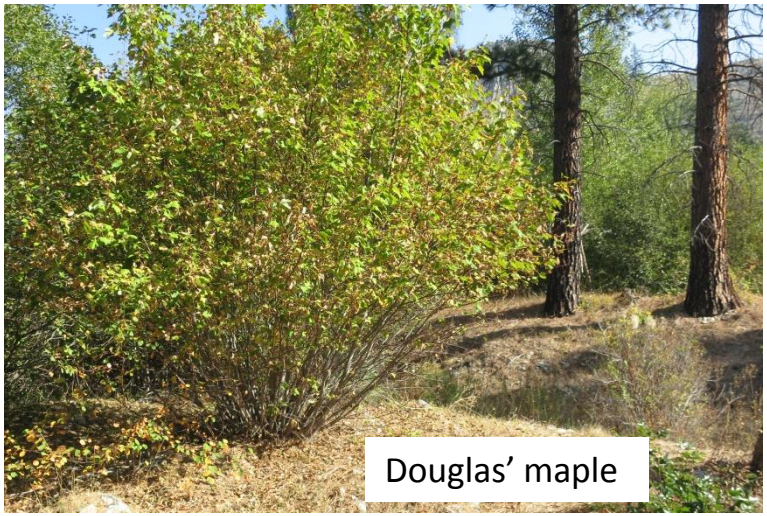


Entiat River at Stormy Preserve. Elevation 1580 ft.

This upland plant community is called the **low montane forest.** Ponderosa pine is the dominant tree species. All soil moisture comes from local precipitation (rain and snow)

This wetland plant community is called **riparian.** Black cottonwood is the dominant tree species. Soils are moist year-round, fed by river water inflow (groundwater).

# The shrub species are “clues” to the soil moisture conditions


Douglas’ maple


Oregon grape


snowbrush ceanothus

The upland soils in the <u>low montane forest</u>
Support drought-tolerant shrubs that are dependent upon seasonal precipitation.
< 20 inches/year


bitterbrush

Important winter food for mule deer

serviceberry

The shrub species are “clues” to the soil moisture conditions
Riparian shrubs are not limited by lack of water- they compete with one another for space and sunshine

black hawthorn

aspen

redoiser dogwood

black cottonwood

river birch

mountain alder

# Riparian plant communities support land animals


Fruits and berries feed birds and mammals.

Ripening times vary from June to September providing a consistent source of carbohydrates throughout summer

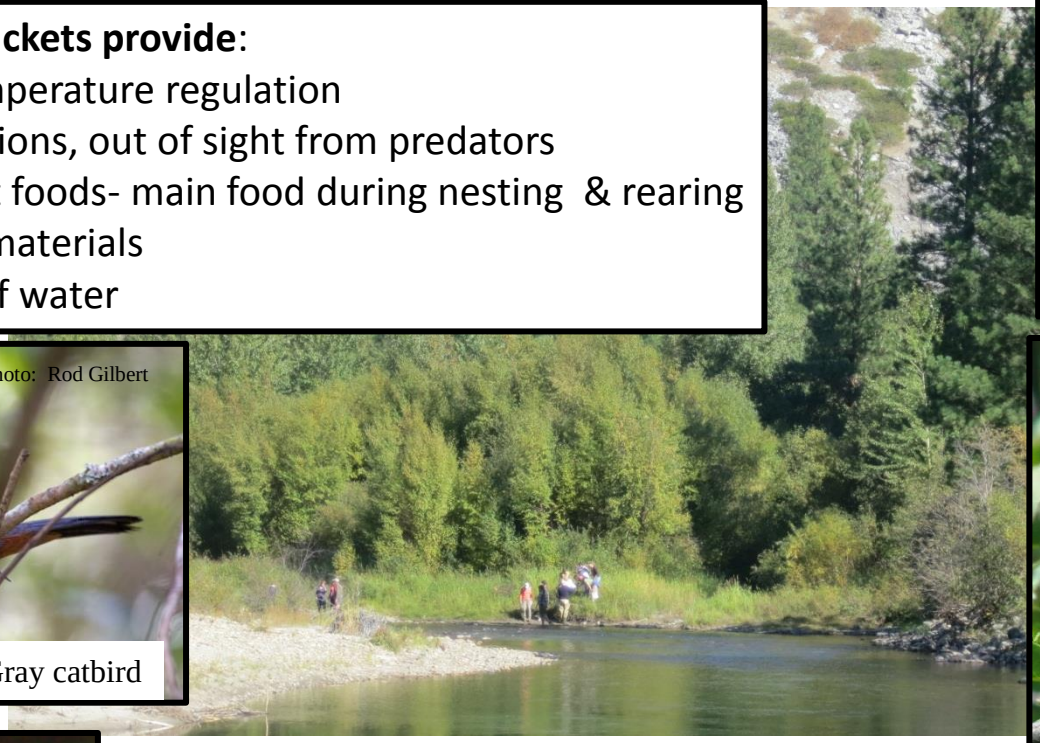
Insects feed on plant parts




# Neotropical migrant birds select Stormy Preserve **riparian** habitat each summer to nest and rear young.

**Riparian shrub thickets provide**:

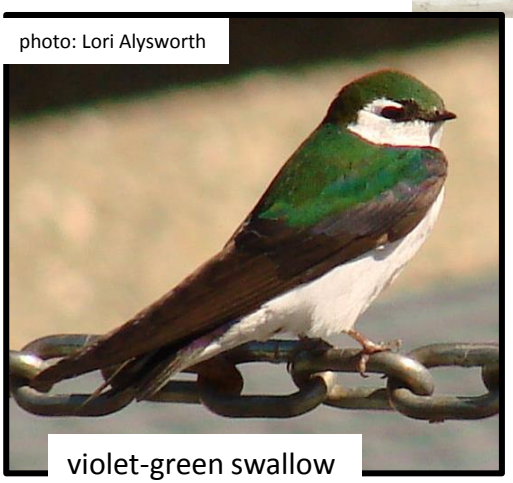
- Shade and temperature regulation
- Safe nest locations, out of sight from predators
- Plentiful insect foods- main food during nesting & rearing
- Nest building materials
- Close source of water




Song sparrow


Gray catbird


Western tanager




violet-green swallow

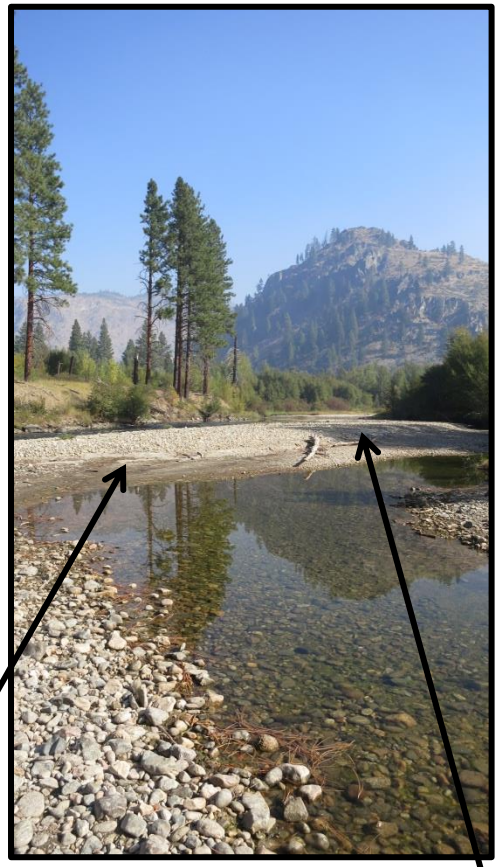

Yellow warbler


yellow-rumped warbler

# Stormy Preserve serves as wildlife habitat for mammals

Mammals leave behind tracks and scat that tell us about their activity, food & water sources, and seasonal presence in a habitat.

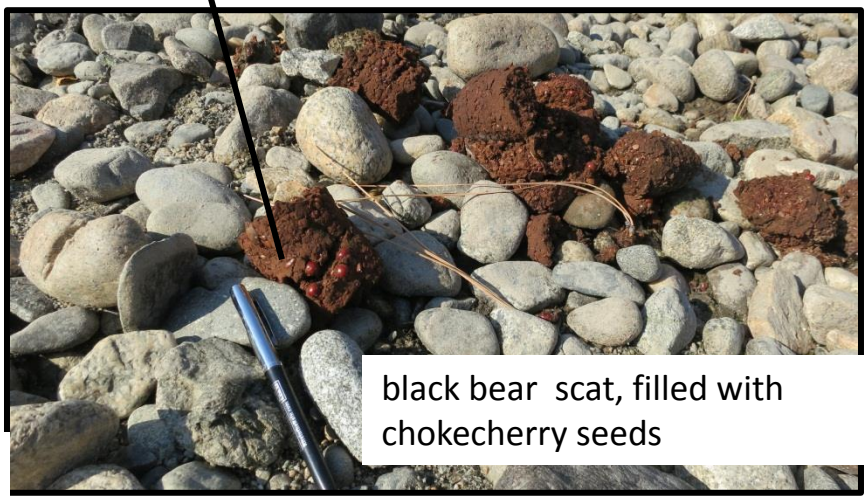
Photo: Rod Gilbert



A thatching ant colony – black bear food

ripe chokecherries, mid-August

black bear track in sand



black bear scat, filled with chokecherry seeds

# Stormy Preserve serves as wildlife habitat for mammals

Beaver cut shrub branches litter the sandy beach

Photo: Rod Gilbert

fresh raccoon prints, 10/5/12

a mound of sand, evidence of a western pocket gopher tunneling underground searching for plant roots to eat. In spring, when groundwater levels are high, pocket gophers are forced up and out of their burrows. Coyotes then find easy prey.

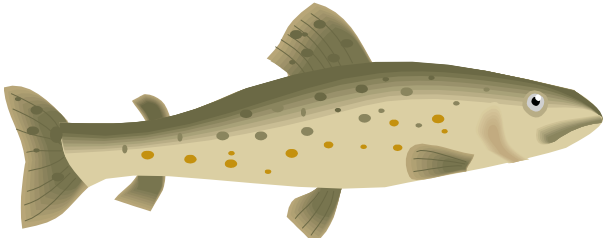
Beaver eat the inner living cambium layer of cottonwood, aspen, alder, birch, & willow.
Beaver cut shrubs and trees for building materials and to keep their ever-growing incisors sharp.

**Beavers are river architects**

# Riparian plant communities support aquatic animals

Decomposers like fungi, bacteria, and blue-green algae feed on tree & shrub leaves creating a “film” of nutrient-rich food for aquatic macroinvertebrates.

# Aquatic macroinvertebrates provide food for fish and birds.



# Fish then provide food for birds

bald eagles feed on decaying salmon carcasses in fall

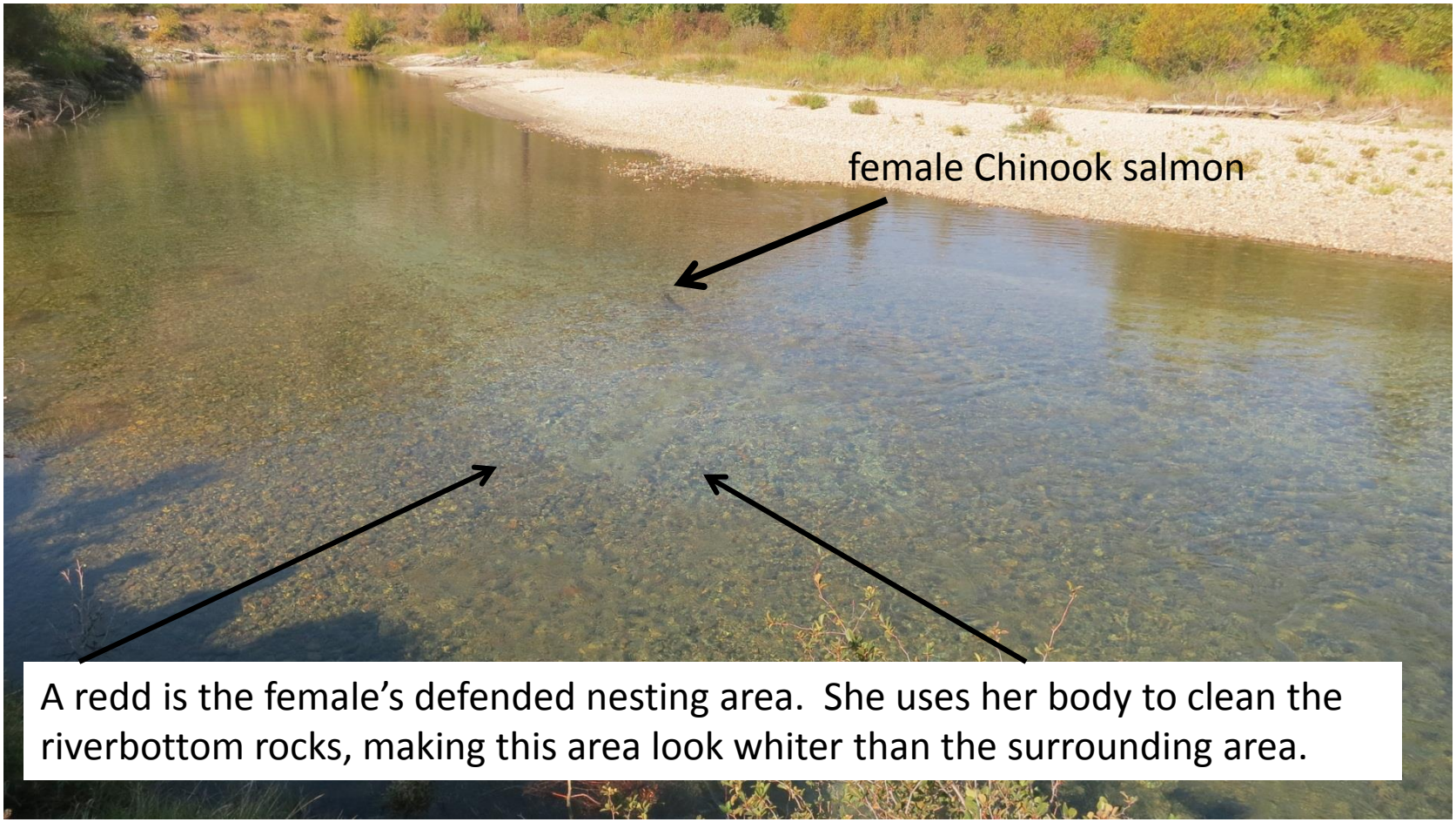
belted kingfisher female

Common merganser female

Fish-eating bird species documented feeding in the Entiat River at Stormy Preserve

photos by Rod Gilbert

# The Entiat River reach at Stormy Preserve is nesting habitat to several Chinook Salmon *redds*




A redd is the female's defended nesting area. She uses her body to clean the riverbottom rocks, making this area look whiter than the surrounding area.

# This Entiat River Reach provides needed structural features for salmon eggs and young fish

High mountain peaks where summer snow melt provides a continuous in-flow of cold clear water.

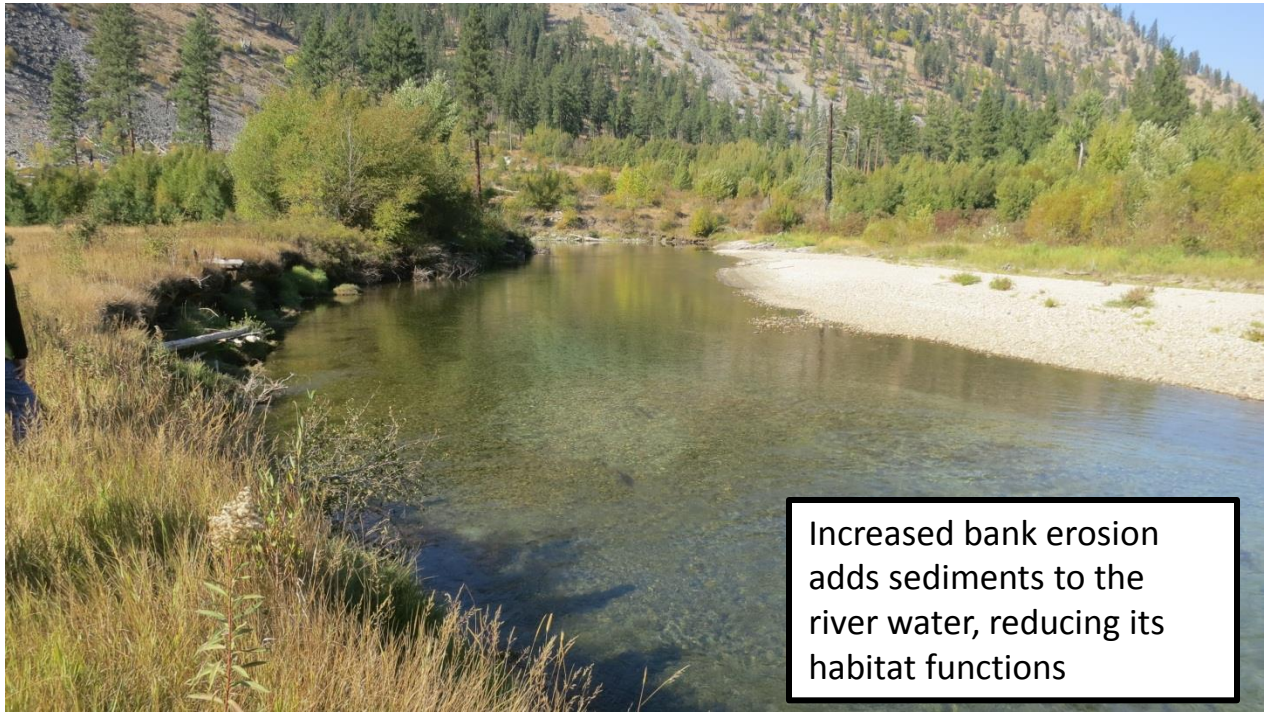
Shade from riparian plants to keep water temperature cool in order to have high dissolved oxygen.

Large woody debris and log jams that create quiet pools of water during high spring flows where young fish can rest

The right-sized gravel that will protect pea-sized eggs. Sand is too fine and larger rocks allow eggs to be swept away during high flows

# Large woody debris in the river decays and adds nutrients to the aquatic ecosystem

# Stormy Preserve's past land use history resulted in river banks susceptible to rapid erosion and down-cutting during high spring flows




Without the native riparian plants holding tight to riverbank soils, bank erosion results in steep-sided, receding shorlines.  One solution is to armor the shoreline with large woody debris.

Plan to visit Stormy Preserve to savor the Entiat Riparian Ecosystem each season of the year.