

# Riparian Ecology

## Helpful Facts and Information

- A riparian area is the green zone of vegetation that grows along the streambed and influences the entire stream ecosystem. Riparian areas are a combination of three areas:
  - Aquatic Area: The area of stream, lakes, and wetlands that is generally wet. These areas may be dry or puddled during warmer seasons but generally carry the majority of water flow.
  - Riparian Area: The terrestrial zone where vegetation connects to water flow, and influences flow and aquatic habitat. This area has moist soil, a diverse group of vegetation types, and wet nutrient rich soil.
  - Area of Influence: This is the transition between the riparian area and the upland vegetation. In the area of influence, you begin to notice the change in plant species and density.
- A healthy riparian influences the shape and flow of a stream as well as supporting all species that live in and around the stream. Riparian areas provide:
  - Food: A supportive and healthy riparian area provides food for aquatic species. Leaves that fall in the water feed macroinvertebrates, those macros provide a food source to fish.
  - Filtration: A healthy stream ecosystem needs cool, clean water. Without a healthy riparian area, streams would be overrun with mud and silt. The root structures of the vegetation filter water that is flowing down into the stream from the valley hills and Cascade Mountains. Without this structure, rivers and streams would flood with too much water during rain events causing a buildup of sediment and debris.
  - Structure: The structure of roots keep banks stable and prevent erosion. Once trees fall in the river, it influences the flow. It can slow down water creating a pool that juvenile fish use for shelter or adult fish use to rest and stay cool. Logs from trees provide shelter for maturing fish where they can feed off of the macros that feed on the logs surface. Vegetation in the stream creates complex habitats that support the complex life cycle of salmon. Not only do trees provide structure for fish, they provide structure for substrate. As water pushes substrate downstream, it collects in pools and behind logs. Without gravel, fish would not be able to spawn. As adult carcasses wash downstream, they collect on and around logs. These carcasses return vital nutrients to the stream, improving soil quality for vegetation and food for aquatic species.
  - Shade: Cool water carries oxygen that fish and aquatic animals need to survive. The riparian area provides shade to keep water as cool as possible.
- We can think of riparian areas as these big broad zones that cover miles of habitat along streams. We can also think about them as the small sections of vegetation that are right along a pool (slow water) or a riffle (fast water). The smaller edge habitats might not be as diverse and species rich but they play an

important role for small fish and macroinvertebrates as they provide shelter and food.

- The riparian area supports and is made up of many plant species that are first foods, medicine, materials, and are culturally significant for the people whose traditional homelands these are. (For September, we are on the traditional homelands of the Molalla. For November, we are on the traditional homelands of the Siuslaw. The southern Willamette valley is the traditional homelands of the Kalapuya. The descendants of these Tribes now make up the Confederated Tribes of Grand Ronde and Confederated Tribes of Siletz Indians.) The tending, harvest, and use of plants have and continues to have important roles in ceremonies, celebrations, and household use.
  - Willow and Hazel - Traditionally, many Tribes use fiber from willow and hazel to meet their needs for baskets, rope, fish traps, nets, cooking containers, water jugs, garments, plates, floor mats, and houses! Fire is and has been used by some Tribes, including the ancestral Tribes the Siletz, as a management technique to promote long, straight plant re-growth for harvest.
  - Cedar – Cedar has antifungal and antimicrobial properties which means it can help kill bacteria and not be decomposed (broken down) by fungus (mushrooms) as fast as other kinds of wood. Traditionally, many Tribes use the cedar for building conus and plank houses. The soft inner bark is used for making baskets and clothing resistant to rain and insects.

**Station Outline:** Station length varies depending on the class. Most stations are between 30 and 45 minutes.

### **Station Preparation**

1. The following guides are suggestions for different activities for MS and HS classes.
2. Think about areas you can have the students think critically about the role the riparian area is playing. You want students to be engaged throughout the station so find places where you can ask them questions about what they see and have them draw the conclusions.

### **Student Participation**

1. Welcome students to the station
2. Talk to students about what a riparian area is and the purpose it serves in the larger picture of watershed and stream health.
3. Give overview of first food and culturally significant plant species in the riparian area. Use above examples.
4. If you are particularly passionate about plant identification, you are encouraged to lead a nature walk and discuss the various species, their role in the riparian area, and how to identify them.
5. Be sure to consider walking time for your station, the Riparian group needs to be back in time to start rotations when the station ends.

### **Middle School Activity**

1. Before going into the riparian area, stand near the parking lot and ask students to close their eyes. Take 1 minute to take in all the senses, ask them to make a mental note of what they hear, what the air feels like, what does the ground feel like under their feet. After a minute, take the students to the learning area of the riparian zone.
2. Once you get farther in the forest, have students repeat the same activity. After 1 minute, discuss what they noticed and be specific about the differences. Draw connections to how the riparian area influences these differences. For example: trees provide a buffer between the roads and the river, we can't hear all the commotion of students and traffic in the forest. We mostly hear the sound of the river flowing and birds.
3. After reviewing the importance of the riparian area, have students find, collect or identify something that serves one of the roles listed above (filtration, food, shade, structure). Have the students answer the following questions (if they have worksheets, this is a good place to use them)
  - a. What do you notice about what you found? (Think of the shape, the smell, the texture, where you found it, etc)
  - b. What do you wonder about how this item serves one of the riparian roles or supports the riparian area? For example; is this a food source, can something eat this?
  - c. What does the item remind you of? (This can be something else they have seen today or something they see when they aren't near a stream.
4. After 5-10 minutes with the activity, bring the students back to have a discussion.

### **MS Discussion/Wrap Up**

1. Ask who wants to share back to the group about what they found. If students do not volunteer, pick 2-3, depending on time.
2. Discuss the similarities and differences between everything the students used as their items.
3. Discuss how these items might look different or serve a different purpose during the drier summer season

### **High School Activity**

1. Lead the group to an area of the riparian zone where there is access to both the vegetation and the stream.
2. Split the group up evenly into the following species groups: deer, salmon, crayfish, bird or prey
3. Each group will write down or discuss and remember how the riparian area they are in provides food, habitat, and shelter for their species.
4. Give students 10 to be thoughtful and reflective. Remind students that if they don't write the answers down, we will expect them to remember. And if they would rather draw a picture, that is fine too.

5. Bring the group back together and pick a group to share first. If time allows and students have the interest and energy for it, they can act out each of their answers.
6. After hearing from 2 or all of the groups, move onto the discussion.

### **HS Discussion/Wrap Up**

- How might each species interact together and how does the riparian area influence and support that relationship.
- How might human presence change what that relationship looks like?
- What signs do we see for how wildlife and humans use this area? How might those actions impact the stream and the water quality?
- Reflect on the interconnectedness of the in stream habitat. Ask students what connections they would think the water and riparian zones have. For example; “What do you think happens to the leaves of the riparian zone when they fall into the water?”