

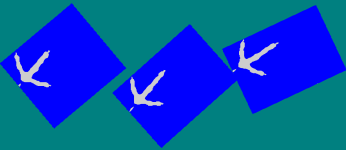


## Water Canyon Riparian Zone/Stream Health

Many plants grow in Water Canyon that do not grow naturally in other areas around Winnemucca. These plants rely on the water flowing in Water Canyon Creek for survival. The lush plant community growing along the creek is called a riparian zone. Notice the towering trees growing along the creek. These trees, mostly aspen and cottenwood, form the canopy layer of the riparian zone. Canopy trees provide vital shade for the other plants growing below and their roots play an important role in holding soil in place. In the layer beneath the canopy, look for willow and wild rose bushes. This layer is called the understory. On the floor you will find an abundance of native grasses and other small plants. Together this community of plants plays an essential role in keeping Water Canyon clean by preventing erosion and helps keep the water cool by providing shade for the aquatic life living in Water Canyon creek.



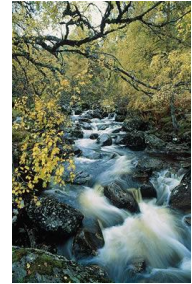
Riparian zone at Water Canyon



## Habitat Surveys: Focus on Riparian Zones

**Grade Level:** Elementary- Middle School

**Duration:** Minimum 5 days



**Purpose:** Riparian zones, the green ribbons of life found on the edges of streams and lakes, are valuable ecosystems. Students will learn about these important ecosystems by conducting actual field research and drawing conclusions from their data.

**Objectives:** Students will learn about habitats and will be able to identify the living and non-living elements that make up a habitat. Students will be able to conduct habitat surveys and collect field data. Finally, students will visit an actual riparian zone to compare that habitat to two other habitat sites.

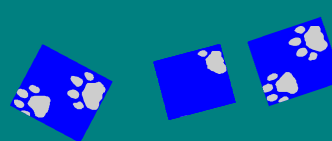
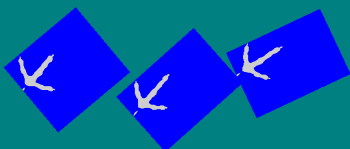
### **Nevada Department of Education State Standards:**

Organisms and Their Environment (Life Science Unifying Concept C): A variety of ecosystems and communities exist on Earth. Ecosystems are dynamic interactions of organisms and their environment. Ecosystems have distinct characteristics and components that allow certain organisms to thrive. Change in one or more components can affect the entire ecosystem.

**Materials:** butcher paper, marking pens, paper for recording observations, trowel or stick, photographic light meter or photosensitive paper, thermometer, small strip of paper, compass

**Teacher Information:** An ecosystem is a community of different species interacting with each other and with the chemical and physical factors making up its nonliving environment. It is a system of interrelationships among organisms, and between organisms and the physical environment. In this activity students will examine three different environments as they focus on sunlight, soil moisture, temperature, wind, plants, and animals in each environment. By comparing different environments, students will begin to consider how nonliving elements influence living elements in an ecosystem.

**Preparation:** Find three study sites that are somewhat different from each other in terms of sunlight, air temperature, soil moisture, wind, and number and types of plants and animals living there. If possible, select one site that is open, like a field or lawn; one that has trees; and one that contains water (ideally a riparian zone, such as Water Canyon). Plan to visit the sites on the same day, or at about the same time on different days. Using butcher paper and marking pens, prepare a large chart for compiling each team's data.



**Anticipatory Set:** Ask students to think of a place they enjoy visiting. This can be done quite effectively using a visualization exercise (closing eyes and mentally traveling to a favorite place). Ask them to think about these questions:

- What did you particularly enjoy about the place: Was it the people? The physical space?

What did you do?

- What living things made your place enjoyable?

Name any nonliving things that made your place enjoyable.

Help students see that any place has both living and nonliving parts that work together to make an ecosystem. Explain that students will investigate ecosystems at three different study sites to find out how living and nonliving elements affect each other.

**Developing the Lesson:** Divide the group into six teams. Each team will investigate and record observations of a different component of three different study sites. Give students instructions, a copy of the team chart, and materials described below. Later, teams will transfer their observations to the class data chart.

### **Team 1: Soil**

Ask this team to determine the soil moisture at the study sites. Students can use a trowel or stick to scrape the surface of the ground and to obtain a small sample of soil from underneath the surface. By feeling the soil, they should be able to tell whether it is wet, moist, or dry. They should examine the soil for other characteristics such as texture, color, and smell. They should also note plant material or organisms in the soil.

### **Team 2: Sunlight**

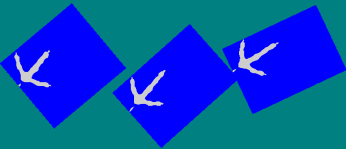
Ask this team to determine how much sunlight penetrates the ground at each study site. Students may determine light intensity at each site by using a photographic light meter or photosensitive paper. If these items are not available, they can use relative terms such as shady, dark, medium light, or bright.

### **Team 3: Wind**

Ask this team to use the small strip of paper to determine the wind movement at each site. One student can hold the paper away from the body, while the others observe whether it hangs straight down or blows at an angle. Ask students to use the compass to determine from which direction the wind seems to be blowing.

### **Team 4: Temperature**

Ask this team to measure each site's temperature at ground level, 1" deep in the soil, and at 1 yard above ground. If one site contains water, have the team measure the temperature at just above the water, at 1" deep, and at 1 yard above.



## Team 5: Plant life

Ask this team to observe the various kinds of plants at each site (large trees, small trees, shrubs, small plants, grasses, grasses). Suggest that students record the most common types of plants found in each location and that they note especially where each grows relative to the others.

## Team 6: Animal life

Ask this team to note the various kinds of animals at each site (insects, birds, reptiles, fish, etc.). Students should note evidence of animals such as scat, tracks, burrows, or leaves that have been chewed.

After teams have had sufficient time to investigate each location, have them all come together to present their findings and share what they have learned. Each team should listen to the reports of the other teams, and use the information to complete their team chart. Ask teams to enter their data on the large class chart you prepared. Use this chart as a basis for discussing differences between the locations and any interactions students observed among the elements. Ask the following questions:

- Which ecosystems had the greatest number of plants? Animals? Which has the least of each? How do you explain this difference?
- How are plants and animals the same at different sites? How are they different?
- Which has the wettest soil? The driest?
- Do plants seem to affect the light intensity, air temperature, and soil temperature in an area?
- How does water seem to influence the soil temperature, air temperature, and soil moisture?
- What relationship does light seem to have with air temperature? With soil moisture? With plants? Which of the six elements we studied seems most important for determining the character of the environment at each site? What makes you say so?

**Conclusion:** Discuss how the riparian zone differs from the other two zones. Ask students why this zone is such a valuable ecosystem? Why is the riparian zone so important to animals in the desert? Why are more plants and animals able to live here? Why is it important to protect riparian zones? Ask students if they noticed any evidence of human actions that affected the areas. Discuss the potential negative or non-negative impacts of this on the ecosystems.

**Evaluation:** Evaluate students by their ability to identify the living and non-living elements that make up a habitat. Observe students as they conduct habitat surveys and collect field data. Assess students' field research by evaluating their class presentation.

Source: Adapted by a lesson by Tonya and Richard Mandl

