



CreekFreaks

A project of the Izaak Walton League of America

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Module #9

Creek Freaks uses the Holding onto the Green Zone curriculum, developed by the Bureau of Land Management



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Introduction

The Izaak Walton League, founded in 1922, is one of the oldest and most respected conservation organizations in the nation. By taking a common-sense approach toward protecting our country's natural heritage, the League champions the motto "Defenders of soil, air, woods, waters, and wildlife." As new generations of conservationists are born, the League strives to educate youth about the importance of our nation's resources. The League's Creek Freaks program uses a curriculum called *Holding onto the Green Zone* which was developed by the Bureau of Land Management and the University of Wisconsin Cooperative Extension. Creek Freaks introduces youth to the importance of water quality, and intricate system of the riparian or "Green" zone.

The Izaak Walton League has partnered with OAR Northwest who will be delivering Creek Freaks curriculum during their Adventure Mississippi River trip. Adventure Mississippi River (AMR) blends real life adventure with technology to reach students both locally and beyond the Mississippi River watershed. AMR aims to inspire students to experience an adventure in their local environment, understand the potential environmental impacts of their actions, and engage in the rich history and diversity of species along the Mississippi River and its immense watershed.



Module #9

Holding onto the Green Zone Lesson: Wildlife

Wildlife is dependent on the riparian zone, but some creatures can actually shape the riparian zone. Take beavers for example. Beavers build dams which slow down the flow of water. This can be useful to other organisms and the riparian ecosystem but can also affect human uses of the area.

Background

Beavers are recognized for their potential to influence riparian systems in positive and negative ways. Dams built by beavers can improve water quality by trapping sediments behind dams and by reducing stream velocity. Beaver ponds can alter water chemistry by trapping nutrients and bacteria. The activities of beavers in the riparian zone can increase the diversity and abundance of birds, amphibians, reptiles, and mammals.

Facts about Beavers

- The beaver is North America's largest rodent.
- Adult beavers can be up to four feet long and weigh more than 60 pounds.
- They have webbed hind feet and a large, flat, nearly hairless tail.
- Beavers are mammals.
- They have dark brown fur on their backs and sides, and lighter brown fur on their chest and stomach.
- They mate for life when they are about three years old.
- A baby beaver is called a kit.
- Beavers only breed once a year, in the spring.
- Both parents care for the kits (usually one to four are born each year).
- Baby beavers can swim within twenty-four hours of birth.
- They live in colonies. A beaver colony includes a breeding male and female and their children.
- Beavers live in rivers, streams, and freshwater lakes near woodlands.
- Because of their webbed feet and rudder-like tails, they are excellent swimmers and divers.
- A beaver can swim underwater for half of a mile, and it can hold its breath for up to fifteen minutes.
- They eat the bark from trees and then they use the branches to build their lodges and dams.
- Beavers are considered to be a keystone species. A keystone species is a species that plays a critical role in maintaining the structure of an ecological community. Beavers are a keystone species because numerous species rely either partly or entirely on beaver ponds.
- Bears, wolves, dogs, and coyotes are predators to adult beavers and kits. Hawks, owls, and otters are also predators to only kits.
- Beavers can live to be about twenty years old.



Facts about Beaver Dams

- Beavers build lodges for shelter and for raising their young.
- Beavers need deep water to store their food for winter and for underwater access to the lodge.
- If the water is not deep enough, the beavers will build dams. The dams provide still, deep water to protect against predators and to float food and building materials to their lodges.
- Beavers work at night time to build and maintain their lodges and dams.
- To build a dam:
 - First, the beaver puts sticks and rocks on the fastest part of the stream bed.
 - Then, the initial row of sticks is surrounded by twigs, stones, and other materials.
 - To finish, mud is pushed up to the construction providing a water seal.
- To build a lodge:
 - First, the beaver digs into a stream bank where the tree roots add support.
 - Then, the same steps used to build a dam are used to build a lodge.
- It only takes a few days for a pair of beavers to build a dam.
- Beaver dams have both positive and negative effects on the environment. Some positive effects are: development of new wetlands, decreased erosion, increased biodiversity, drought protection, and more. Some negative effects are: causing flooding, and beavers sometimes chew through rare or valuable trees.
- A dam's role in the stream life cycle: wetland creation (beaver pond is shallow → beaver's abandon → water drains → wetland forms), meadows form (wetland dries out → becomes a meadow), riverine forests are made (meadow is colonized by riverine trees → beavers re-colonize), and the process starts again from the beginning.





Unit 2, Station 4, Activity 2— Wildlife in the Zone

Description: Learners will investigate some of the positive and negative effects of animal activities in the riparian zone.

Duration: 45 minutes

Setting: Indoor

Skills: Interpreting, constructing with media, modeling, reading, researching

Objectives: Learners will be able to list ways that domestic animals and wildlife, particularly beavers, affect the health of the GREEN Zone.

Materials:

- Poster board
- Poster paint
- Plastic containers (at least 10 cm deep)
- Glue
- Modeling clay
- Grab bag full of materials that might be used in the beaver dam building or diorama projects (include twigs, dried leaves and grass)
- Markers, crayons, pencils
- Books, field guides, and other printed material about beavers with pictures or diagrams of beaver dams and lodges
- Jar of water/sand mix (500 ml of water and $\frac{1}{4}$ cup of sand)

Advance preparation:

- Ask group members who choose to make beaver dioramas to bring in plastic containers (at least 10 cm deep) and a selection of dry plant materials such as twigs, leaves, and grasses.
- Purchase art supplies as needed.
- Ask school or public library staff to set aside books about beavers in a special collection for use by the group.



Photo Credit: National Geographic



Unit 2, Station 4, Activity 2 - Wildlife in the Zone

Land managers may find that animals affect the health of a riparian zone in both positive and negative ways. In this activity, you will study how one type of animal, the beaver, affects the GREEN Zone.

Beavers, like many other types of wildlife, are attracted to riparian zones for the food, water, and shelter found there. Beavers cut down trees in riparian zones to build dams, which slow the flow of water. Water spreads out behind the dams creating wetlands and ponds where the beavers can store food, build lodges, and move safely. The dams capture sediment, which helps to improve water quality downstream. Dams also reduce erosion by slowing the flow of streams. Over long periods of time, beaver activities can create wider, more productive riparian zones. In the short term, these changes sometimes conflict with human uses of the GREEN Zone.

Your team will need:

- Poster board
- Poster paint
- Plastic container (at least 10 cm deep)
- Modeling clay
- Glue
- Markers, crayons, pencils
- A grab bag of materials collected by your leader
- Small pitcher of water
- Print material on beavers, with pictures or diagrams of beaver dams and lodges
- Jar of water/sand mix (500 ml of water and $\frac{1}{4}$ cup of sand)

Directions

Your teacher will provide resources for you to read about beaver dams and how they are built. Then, try it yourself. Build a beaver dam model in a plastic container.

1. You will be supplied with a variety of materials for constructing your beaver dam. Choose the materials you think will work best to build the dam. Try to make it watertight.
2. Test your model by pouring water on one side of the dam while tilting the container. See if the dam stops the flow of water.
3. Shake the jar of water and sand. Then add the water/sand mixture to the pond side of your dam. Wait 10 minutes then tip the container to allow a slow stream of water to pour over the top of your dam. Does the water going over the dam appear cleaner than the water from your jar? Why?



Zone Notes - Wildlife in the Zone

- Why do beavers build dams in the riparian zone?
- Make a list of positive and negative impacts you think beavers might have in the riparian zone.
- What other large animals, wild or domestic, use the GREEN Zone? Make a list with your group. Describe changes in the zone that are caused by these animals.



Mississippi Application

- 1) The Mississippi River has 29 Lock and dam structures. Have students research the lock and dam system to see the similarities and differences between natural beaver dams and man-made dams. What positive and negative effects do both man-made and beaver dams have on humans and wildlife?

Extension Activity

- 1) Beavers are not the only creatures that have the ability to have a large impact on their surrounding habitat. Invasive species can significantly disrupt aquatic systems in a negative way. Have student compile a report of invasive species affecting the Mississippi. There is currently great concern about the spread of invasive species between the Great Lakes and the Mississippi. Have students research these invasive species and find out what is being done to prevent the species from spreading.



Photo Credit: USACE

For more information and for additional activities please visit www.creekfreaks.net/library to download the Holding onto the Green Zone Action Guide.