



## **Natural or Unnatural?**

### **Outdoor Activity**

Time Requirement:	45-minutes to 1 hour to walk trail and review issues Homework to generate solutions and/or classroom time to debate issues.
Trail Used:	Birth of a Lake Trail
Location:	Coldwater Lake recreation Area

The purpose of this activity is to demonstrate that there are not black and white answers to complex questions. Mount St. Helens demonstrates there are shades of gray, and that there are numerous challenges associated in problem-solving. Environmental issues often breed strong opinions that polarize user groups. Sharp criticism and intense opinions by various interest groups can leave federal land managers in difficult situations. When faced with meeting the agency mission and balancing the desires of the public, federal land managers frequently make critical decisions that can alienate some groups, or make compromises that may not fully please everyone. Controversial issues are even more challenging when multiple private landowners and organizations, and state and federal agencies with different missions are involved.

**Goal:** To work in small groups to find solutions to complex problems faced by the manager of Mount St. Helens National Volcanic Monument.

**Objectives:** The student will:

- 1) use the scientific process to deduce a reasonable explanation.
- 2) apply knowledge acquired during the activity.
- 3) compare, contrast and sort observations.
- 4) reach a conclusion and be able to support it with evidence in writing.

### **Washington Essential Academic Learning Requirements**

#### 1.2.1 Structure of Physical Earth/Space and Living Systems

Analyze how the parts of a system go together and how these parts depend on each other.

- Describe the effect on a system when an input in the system is changed.

#### 1.2.4 Components and Patterns of Earth Systems

Understand the Earth’s systems include a mostly solid interior, landforms, bodies of water, and an atmosphere.

- Identify and describe various landmasses, bodies of water, and landforms.

#### 1.3.4 Processes and Interactions in the Earth’s system

Know processes that change the surface of the Earth.

- Describe how earthquakes, landslides, and volcanic eruptions change the surface of the Earth.

#### 1.3.8 Life Processes and the Flow of Matter and Energy.

Understand that living things need constant energy and matter.

- Identify sources of energy and matter used by animals to grow and sustain life.
- Explain how plants and animals obtain food.

### 1.3.9 Biologic Evolution

Understand that plant and animal species change over time.

- Recognize and tell how some kinds of plants and animals survive well, some survive less well, and some cannot survive at all in particular environments, and provide examples.

### 1.3.10 Interdependence of Life

Understand that an organism's ability to survive is influenced by the organism's behavior and the ecosystem in which it lives.

- Describe the characteristics of organisms that allow them to survive in an ecosystem.
- Describe how an organism's ability to survive is affected by change in an ecosystem.

### 2.1.3 Limitations of Science and Technology

Understand how to construct a reasonable explanation using evidence.

- Generate a scientific conclusion including supporting data from an investigation.

### 2.2.5 Evolution of Scientific Ideas

Understand that scientific comprehension of systems increases through inquiry.

- Describe how scientific inquiry results in facts, unexpected findings, ideas, evidence, and explanations.

### 3.2.4 Environmental and Resource Issues

Understand how humans depend on the natural environment and can cause changes in the environment that affect humans' ability to survive.

- Describe the effects of humans on an ecosystem.

# Natural or Unnatural?

## Outdoor Activity

**Monument Mission:** Mount St. Helens National Volcanic Monument was established to allow natural processes to occur without human intervention. The mission is to provide research, recreation and educational opportunities for the public.

**Directions:** Land managers have to make hard decisions that balance the mission and desires of the public. Use the 'case facts' for each stop and evidence at the site to answer the questions.

**Stop 1:** Start at the 'Birth of a Lake Trailhead' and walk to the end of the boardwalk trail.

### Fish Facts:

<ul style="list-style-type: none"><li>• Coldwater Lake formed after the 1980 eruption when a Coldwater Creek was blocked by the landslide. A healthy lake ecosystem, without fish, developed naturally in the lake.</li></ul>
<ul style="list-style-type: none"><li>• Fishing was very popular at nearby Spirit Lake before the eruption. Spirit Lake is now located within a research area, where fishing is prohibited.</li></ul>
<ul style="list-style-type: none"><li>• In 1989, 30,000 rainbow trout were stocked in Coldwater Lake. Some of these rainbow trout swam out of Coldwater Lake and went up a river and creek, and into Castle Lake—another lake created by the landslide that was not stocked.</li></ul>
<ul style="list-style-type: none"><li>• In the 1990's, scientists discovered that cutthroat trout survived the eruption in Coldwater Creek above the lake. Cutthroat trout colonized Coldwater Lake, inner-bred with rainbow trout, and created a hybrid species called "cut-bows".</li></ul>

1) List what you think is good and bad about stocking Coldwater Lake with fish.

Good	Bad

a) Based on your list of good and bad, do you think the lake should have been stocked with fish?

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## Recreation Facts:

<ul style="list-style-type: none"><li>Boating on Spirit Lake with canoes, sailboats, and powerboats was very popular at Spirit Lake before the eruption. Spirit Lake is now in a research area and these activities are prohibited.</li></ul>
<ul style="list-style-type: none"><li>Non-motorized boating (no gasoline powered motors) is allowed in Coldwater Lake. Fishing is limited to 3 locations along the lakeshore to protect plant life.</li></ul>
<ul style="list-style-type: none"><li>Forest Service facilities at Spirit Lake included: campgrounds, picnic area, bathrooms, boat launching facilities, trails, and a ranger station.</li></ul>
<ul style="list-style-type: none"><li>Parking lots, a fish cleaning station, boat launching area, picnic area, trails, and bathrooms were constructed at Coldwater Lake to replace facilities that use to be at Spirit Lake. The construction of facilities permanently altered natural processes at this site.</li></ul>

2) List what you think is good and bad about building facilities at Coldwater Lake.

Good	Bad

a) Do you think enough facilities were constructed at Coldwater Lake to replace those lost at Spirit Lake? \_\_\_\_\_

**Conclusion:** Circle your answer and state your opinion why you chose your answer

A. I think managers made the right decisions, balancing the Monument Mission with the desires of the public.

B. I think manager's made the wrong decisions, and did not balance the Monument Mission with the desires of the public.

Why? \_\_\_\_\_

**Stop 2:** Walk back to the paved trail and turn right. Walk until you find an odd-shaped conifer tree.

- 3) Deer and elk usually don't eat conifer trees. They taste bad and lack nutrients. This odd-shaped conifer tree has been eaten by deer and elk. Circle the answer that explains why deer and elk are eating these foods.
- a. There is not enough food available for deer and elk.
  - b. Deer and elk populations are too large.
  - c. Both a. and b.

**Elk Herd Facts:**

<ul style="list-style-type: none"><li>• The May 18, 1980 lateral blast created habitats that allowed elk to thrive, but over time the quality and quantity of plants and grasses that elk prefer to eat have declined.</li></ul>
<ul style="list-style-type: none"><li>• The Mount St. Helens elk herd contains 12,500 animals—2,500 more than the land can support.</li></ul>
<ul style="list-style-type: none"><li>• Between 100 to 200 elk died of starvation during severe winters in 1998, 2004 and 2008.</li></ul>
<ul style="list-style-type: none"><li>• Starvation deaths angered and saddened the public, but dead elk help complete food chains by creating food for scavengers like coyotes, bald eagles, and wolverines (endangered species).</li></ul>
<ul style="list-style-type: none"><li>• Washington Fish and Wildlife officials fed elk in areas outside of the Monument during the winters of 2007 and 2008. Feeding elk prevents death, but also maintains the size of the herd at a level the land can not support.</li></ul>

4) List what you think is good and bad about feeding elk.

Good	Bad

a) Based on your list of good and bad, do you think the elk herd should be fed?

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## Elk Management Facts:

<ul style="list-style-type: none"><li>• The Washington Department of Fish and Wildlife establish the number of elk to be killed each hunting season. Hunting is popular and successful on private and state lands next to the Monument</li></ul>
<ul style="list-style-type: none"><li>• Hunting is prohibited in parts of the Monument. Some elk retreat to restricted areas during hunting season and leave when it ends.</li></ul>
<ul style="list-style-type: none"><li>• The Washington Department of Fish and Wildlife have also trapped and relocated elk to areas with declining populations.</li></ul>
<ul style="list-style-type: none"><li>• A 2,744 acre elk refuge next to the Monument provides critical winter/spring forage when the animals are stressed, but is not large enough to prevent deaths from starvation.</li></ul>

5) What do you think is the best way to manage the elk herd? Should the elk population be managed or should nature take its own course?

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a) Mountain lions tend to kill weak, old, or young elk. Human hunters tend to kill large, healthy elk. How do you think these different hunting styles affect the long-term health of the elk herd?

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**Conclusion:** Circle your answer:

A. I think managers made the good decisions that balanced the needs of elk, different missions, and the desires of the public.

B. I think the manager's made poor decisions that did not balance the needs of elk, different missions, or the desires of the public.

I think this because \_\_\_\_\_

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## Instructional Sequence for 'Natural or Unnatural'

**Before Exiting the Bus:** This activity can be conducted in several ways depending on time constraints, size of group, or educational focus.

*If your group is larger than 40:*

- Divide your groups in half. Have ½ the group start at the "Birth of a Lake" trailhead and the other half walk the trail in reverse (follow the sidewalk on the left side of the bathroom to the trail) and answer the questions in reverse order.

*If time is limited:*

- Select the most relevant issue and conduct one of them instead of both of them. OR
- Divide your class into two groups and assign one issue to each group and have the students provide you with detailed response at a later date.

- 1) Make sure that students are dressed appropriately for the weather conditions before they exit the bus. Explain that each student will need a pencil, a clipboard or notebook to write on, and a copy of the 'Natural or Unnatural' worksheet. **Hiking in this area is a privilege. Student behavior will determine if future groups will be able to use this site. Off trail travel and the collection of rocks, plants, and wood is strictly prohibited (\$100 fine).**
- 2) Explain that the students will be examining controversial issues faced by the land managers in or around the Monument. They will be provided with 'case facts' critical to each issue. Emphasize that these are complex issues that may produce strong reactions, so they will need to examine each issue from different perspectives in order to formulate a balanced opinion,

### **On the Trail:**

- 1) Start at the 'Birth of a Lake Trailhead' and walk to the end of the boardwalk trail that passes over the surface of the lake. Read out loud the directions and the case facts to each question. Try to stimulate debate over the stocking of fish and development of recreational facilities. Allow 15 minutes to answer the questions and to reach a conclusion.
- 2) Walk back to the paved trail and turn right. Walk until you find an odd-shaped conifer tree like ones in the pictures below.



- 3) Read out loud the case facts to each question. Try to stimulate debate over the feeding of the elk herd and management of the elk herd. Allow 15 minutes to answer the questions and to reach a conclusion.
- 4) Continue on the trail to the parking lot. Use great caution once you reach the parking lot—students may try to dash across the parking lot to the bus without looking out for on-coming traffic. Consider stationing several adults in key locations to ensure student safety. Review the issues and answers when you return to school.