



Balancing Act

Outdoor Activity

Time Requirement: 15 to 30-minutes
Trail Used: Castle Lake Viewpoint Trail
Location: Castle Lake Viewpoint

The purpose of this activity is to demonstrate the challenges associated in land use planning when multiple private, state, and federal agencies are involved. Controversy can erupt when agencies with different missions try to find consensus. Environmental issues often breed strong opinions that are rooted in personal and scientific beliefs. Sharp criticism and intense opinions by 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 must make critical decisions that can alienate some groups, or make compromises that may not fully please everyone.

Goal:

- 1) To work in small groups to find solutions to complex problems faced by the manager of Mount St. Helens National Volcanic Monument.

Objectives:

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

Washington Essential Academic Learning Requirements

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.
- Describe how humans can cause changes in the environment that affect the livability of the environment to humans.

2.2.5 Evolution of Scientific Ideas

Understand that scientific comprehension of systems increases through inquiry.

- Describe how results of scientific inquiry may change our understanding of the systems of the natural and constructed world.

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.

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.

- Identify parts of a system and how the parts go together.
- 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.

1.3.1 Nature of Force

Understand forces in terms of strength and direction.

- Compare the strength of one force to the strength of another force.

1.3.4 Processes and Interactions in the Earth's system

Know processes that change the surface of the Earth.

- Describe how weathering and erosion 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.

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 how an organism's ability to survive is affected by change in an ecosystem.

Balancing Act

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 interpretive sign facing Mount St. Helens.

State Route (SR) 504 Facts:

- | |
|--|
| <ul style="list-style-type: none">• Before the 1980 eruption, SR 504 went through the valley bottom and accessed Spirit Lake. 22 miles of the highway were destroyed during the May 18, 1980 eruption. |
| <ul style="list-style-type: none">• SR 504 was rebuilt at a cost to taxpayers of 180 million dollars. It was built above the valley floor to protect eruptive features and due to erosion in the valley. |

1) Do you think the highway was reconstructed in the right location or should it have been built along the bottom of the valley? _____

New Road Proposal Facts:

- | |
|---|
| <ul style="list-style-type: none">• The Monument needs a budget of 4 million dollars, but has only 1.2 million dollars. It cannot maintain existing facilities, the visitor center on the nearby ridge closed due to a lack of funding and structural damage. |
| <ul style="list-style-type: none">• Visitation to one county in the Monument has significantly increased since SR 504 was re-built. |
| <ul style="list-style-type: none">• Visitation in two counties was high before SR 504 was re-built, but declined 50% since it opened. |
| <ul style="list-style-type: none">• Commissioners from all three counties want to increase tourism by building a road across the valley in front of the volcano to provide summer access to the counties where visitation declined. |
| <ul style="list-style-type: none">• The proposed road location lies in a massive flood plain and in a research area where major scientific discoveries have been made. The road would access sites open 6 months/year. |

2) List what you think are good and bad things about the proposal to build the new road.

Good	Bad

Conclusion:

Based on your list of good and bad, explain why you think the road should or should not be built.

Stop 2: Stop at the interpretive sign facing Castle Lake.

Sediment Facts	North Fork of Toutle River
May 18, 1980 Eruption	<ul style="list-style-type: none"> • Landslide buried 14 miles of river under 150-250 feet of rock. • Mudflow deposited ___ million cubic yards of sediment and rock
Erosion	<ul style="list-style-type: none"> • River reforms, canyon forms, unstable river channel shifts back & forth. • Sediment creates flooding hazards to downstream communities & blocks ocean-bound ships in the Columbia River. • 10% of landslide eroded. • Sediment load 10 times higher than before eruption.
Sediment Retention Structure (SRS)	<ul style="list-style-type: none"> • Located outside of Monument • 250 million cubic yards of sediment trapped, cleaner water flows around it in a spillway.

1) The \$65 million dollar SRS opened in 1989. It was supposed to collect sediment until the year 2035, but was almost full by 2008. Circle the best solution to this problem.

- Make the SRS taller so that it can continue to trap sediment.
- Do nothing. The SRS should continue to trap some sediment.
- Remove the SRS so the river can run wild.

Explain why you chose this solution to the problem. _____

Salmon Facts	North Fork of Toutle River	South Fork of Toutle River
Pre-eruption Fish	<ul style="list-style-type: none"> • Coho Salmon & Steelhead Trout 	<ul style="list-style-type: none"> • Coho Salmon & Steelhead Trout
Erosion	<ul style="list-style-type: none"> • Unstable river channel shifts back & forth. • 10% of landslide eroded. • Sediment load 10 times higher than before eruption. 	<ul style="list-style-type: none"> • Mudflow deposits eroded quickly • River channel stabilized & water clears. • Trees grow along channel. Shade lowers water temperatures.
Salmon Status	<ul style="list-style-type: none"> • No fish ladder around SRS. • Fish are collected, transported & released in streams above SRS. • A few fish have spawned in the streams above the SRS. • Salmon habitat is poor above SRS Water is murky & warm. 	<ul style="list-style-type: none"> • No SRS • Salmon recovery well underway. • Salmon habitat is good. Stable channel with exposed cobbles for spawning. Shade from trees lower water temperatures.

2) The fish collection station must be closed several days a week to remove debris. A small barrier in the SRS spillway prevents fish from moving up river naturally. Should money be spent to remove the barrier? _____

Conclusion: (Circle your answer:)

- A. I think money should be spent to make the SRS taller and to remove the barrier so fish can swim up stream naturally.
- B. I do not think money should be spent to make the SRS taller or to remove the fish barrier.
- C. I have reached a different conclusion that I will explain below:

Stop 3: Stop at the interpretive sign facing west to Elk Rock.

Management Facts:	Federal	State	Weyerhaeuser
Acres Impacted Lateral Blast	<ul style="list-style-type: none"> • 71,000 	<ul style="list-style-type: none"> • 11,000 	<ul style="list-style-type: none"> • 68,000
Acres logged	<ul style="list-style-type: none"> • 22,000 Gifford Pinchot National Forest 	<ul style="list-style-type: none"> • 11,000 • Land on opposite side of valley 	<ul style="list-style-type: none"> • 68,000 * • Land above highway • *Some land sold to create Monument
Acres Preserved	<ul style="list-style-type: none"> • 49,000 blast zone included in 110,000 acre Monument 	<ul style="list-style-type: none"> • 0 	<ul style="list-style-type: none"> • 0

1) Some people think leaving the blown down forest was wasteful. The trees should have been harvested for human use. Others believe it is an amazing feature and that not enough was preserved. What do you think?

Reforestation Facts:	Federal	State	Weyerhaeuser
Acres Replanted	<ul style="list-style-type: none"> • 22,000 Gifford Pinchot National Forest • 49,000 preserved in Monument 	<ul style="list-style-type: none"> • 11,000 • Land on opposite side of valley 	<ul style="list-style-type: none"> • 68,000 * • Land above highway • *Some land sold to create Monument
Mission	<ul style="list-style-type: none"> • Monument: allow natural processes to occur. Research, recreation, education 	<ul style="list-style-type: none"> • Multiple Use • Recreation, wildlife, watershed, fire, harvesting & replanting forests 	<ul style="list-style-type: none"> • To grow & harvest trees to produce paper & wood products.
Biologic Diversity	<ul style="list-style-type: none"> • 5 eruptive events, 5 unique ecosystems • Ground-breaking geologic & biologic lessons research 	<ul style="list-style-type: none"> • Less diverse. • Primarily two tree species planted 	<ul style="list-style-type: none"> • Less diverse. • Primarily two tree species planted

2) When some visitors see greener replanted areas they wonder why trees weren't planted in the Monument. Explain why trees should or shouldn't have been planted in the Monument?

Recreation Facts:	Federal	State	Weyerhaeuser
Mission	<ul style="list-style-type: none"> • Monument: allow natural processes to occur. Research, recreation, education 	<ul style="list-style-type: none"> • Multiple Use • Recreation, wildlife, watershed, fire, harvesting & replanting forests 	<ul style="list-style-type: none"> • To grow & harvest trees to produce paper & wood products.
Recreation Use	<ul style="list-style-type: none"> • 230 miles hiking trails No off-trail travel • Backcountry camping • No campgrounds • Fishing, except in Spirit Lake • Limited hunting, some areas closed • Horseback trails on green forest trails. 	<ul style="list-style-type: none"> • Hunting, fishing, & motorized use. • No trails. 	<ul style="list-style-type: none"> • Hunting & Fishing • No trails. • No motorized use due to vandalism, dumping & theft

3) People from nearby towns want the Monument regulations to be changed. They want lodges and campgrounds to be re-built, and areas re-opened to hunting, fishing, and horseback, motorcycle and snowmobile riding. Should the Monument mission be changed?

Conclusion:

Circle your answer:

- A. I think managers balanced the desires of the public with the Monument Mission.
- B. I think managers did not balance the desires of the public with the Monument Mission.

If I would have been around for the creation of the Monument, I would have..._____

Instructional Sequence for 'Balancing Act'

Before Exiting the Bus:

- 1) This activity can be conducted in several ways depending on your time constraints and the size of your group. Divide your students into three groups and designate a student leader(s) for each group.

If time is limited, explain that each group will be stationed beside one of the three interpretive signs along the 150 foot long loop trail. Assign one of the three topics to each group and explain that they will be examining real issues faced by the Monument Manager. The students will have 15 minutes to review, debate, and formulate solutions to their issue. Return to the trailhead or bus and have each student leader(s) present their issue and solutions to the entire class.

If time is not limited, rotate the students between all three stations and have the groups review and debate each of the three issues.

- 2) Explain that the students will need to examine each issue from different perspectives, and that the "case facts" for each issue will provide information critical to finding solutions to the problems. Emphasize that these are complex issues that may produce strong reactions.
- 3) 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 'Land Use Planning' worksheet. Inform each student that walking off trail is strictly prohibited (\$100 fine). Note: If the weather is truly horrendous conduct this activity on the bus.

On the Trail:

- 1) Have group #1 stop at the first interpretive sign/viewing area (facing the volcano) on the left side of the trail. Inform the group that they will review, debate and find solutions to a proposal to build a road across the valley in front of the volcano. Read aloud the 'State Route 504 Facts' then read aloud the questions. Ask for opinions and encourage debate.
- 2) Continue down trail and have group #2 stop at the second interpretive sign facing Castle Lake. Inform the group that they will review, debate, and find solutions to what to do about erosion at Mount St. Helens. Read aloud the 'Sediment and Salmon Facts' then read aloud the questions. Ask for opinions and encourage debate.
- 3) Continue down trail and have group #3 stop at the third interpretive sign facing Elk Rock. Inform the group that they will review, debate, and find solutions to issues related to the land use planning. Read aloud the 'case facts' then read aloud the questions. Ask for opinions and encourage debate.
- 4) Walk back and forth between groups to make sure each group is on task. Encourage different perspectives and group participation. After 15 to 20 minutes, rotate the groups between stations or return them to the bus and have the group leaders present their groups opinion on the issue.