1: Introduction to Oregon's Forests
2: History of Forestry in the U.S. and Oregon
3: Changes in Oregon's Forestland
4: Oregon's Forest Resource
5: Who Owns Oregon's Forests?
6: Oregon's Federal Forestland
7: Interview a Forest Landowner
Section 1: Oregon’s Forest Heritage

1: Introduction to Oregon’s Forests

Overview

Students consider the truth of different statements about Oregon forests, and then use a booklet called Oregon Forest Facts to validate or refute each statement.

Time Considerations

Preparation: 15 minutes
Procedure: One 50-minute class period

Learning Objectives

Students will be able to:
• Use resources to validate or refute statements about Oregon’s forests.
• Articulate ways that Oregon’s forests are important to the state’s economic, environmental and social well-being.

Standards Connections

Next Generation Science Standards
• Performance Expectation – HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
• Science and Engineering Practice – 4. Analyzing and Interpreting Data: Evaluate the impact of new data on a working explanation and/or model of a proposed process or solution.

Common Core State Standards – English Language Arts
• RST.9-10.1: Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

Oregon Forest Literacy Program Concepts
• Theme 2, A.1. In Oregon’s development toward becoming a state, forests provided basic resources for Native Americans and settlers, jobs for a growing workforce, resources for building the nation and dollars for a new state economy.

• Theme 2, C.3. Forests influence the economic, social and cultural composition of both urban and rural communities.

Materials

• [Oregon Forest Facts](http://learnforests.org) (either one copy for each pair of students, or on-screen access), available at learnforests.org

• “Oregon Forests – True or False” student page

Background Information

One of our state’s greatest resources is its forestland, which represents nearly half of Oregon’s 61 million acres. Healthy forests provide the vital environmental, social and economic benefits our communities rely on. Some of the many forest benefits include:

• Clean air and water
• Wood, paper and other renewable, recyclable forest products
• Balanced and vigorous plant and animal communities
• Fish and wildlife habitat
• Recreation

It takes a collaborative effort of public, landowner and legislative support to maintain healthy forest ecosystems, a thriving forest sector economy, and a recreational playground.

Key Vocabulary

clearcutting
fire suppression*
forest sector
reforestation*
sustainable forest management*
timber harvest*

*included in Glossary

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Preparation

Make copies of the student page.

Procedure

1. Introduce the curriculum and the lesson by pointing out that throughout its history, forests have been a crucial component of Oregon’s environment and economy.
2. Give each pair of students a student page and allow them a few minutes to read the different statements and decide which they think are true and which false.
3. Provide copies of Oregon Forest Facts or direct students to the booklet online. Direct pairs to use the data provided in the booklet to either validate or refute each statement, citing the evidence they find.
4. As an entire class, discuss the students’ findings:
   - Which statements did you find to be true? Which were not true?
   - Did any of your findings surprise you?
   - What did you learn about Oregon’s forests from this exercise?
5. Ask the class, “From what you found, how would you say forests contribute to Oregon’s environmental, economic and social well-being?” List their responses on a class chart, such as this:

<table>
<thead>
<tr>
<th>Environmental Well-Being</th>
<th>Economic Well-being</th>
<th>Social Well-Being</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Assessment

Ask students to write a brief essay describing how forests contribute to Oregon’s environmental, economic and social well-being.

Extension Idea

Help students connect to Oregon’s forests by visiting one near you. See “Grades 9-12 Programs & Resources” on learnforests.org for a list of field programs around the state.
Possible Answers to “Oregon Forests – True or False?” Student Page

1. True. Nearly 50 percent of Oregon’s total acreage is forestland.
2. True. Oregon’s forestry sector employs tens of thousands of workers.
3. False. The amount of forestland acreage and the volume of wood growing in Oregon have remained about the same since the 1950s.
4. True. In 1971, the Oregon Forest Practices Act became the first law in the U.S. to regulate forest practices, ensure reforestation, and safeguard water, fish and wildlife habitat, soil and air.
5. False. Federal and state governments manage nearly twice as much acreage of forestland in Oregon as private landowners.
6. False. The majority of timber produced in Oregon comes from large private landowners.
7. True. The nation’s economy affects the number of new homes built – and thus, Oregon’s wood products sales.
8. True. Oregon is the top softwood lumber-producing state and the top plywood-producing state in the nation.
9. False. Oregon forests provide a wide range of products, including lumber, plywood, engineered wood products, paper and paper products, reconstituted wood products, posts, poles and timbers, etc.
11. True. Under the Oregon Forest Practices Act, forest landowners must replant within two years after harvest.
12. True. Fire suppression has led to the drier eastern and interior southwest Oregon forests growing very dense, and these forests are at risk for larger and hotter fires.
13. True. Under the Oregon Forest Practices Act, timber harvesting, road building and chemical use are restricted near waterways to protect fish habitat and water quality.
14. True. Millions of acres of Oregon forestland are certified under three major certification systems.
**Oregon Forests – True or False?**

First, for each statement, underline whether you think it is true or false. Then, look for evidence in *Oregon Forest Facts* to verify or refute each statement. Circle the correct answer based on your findings.

<table>
<thead>
<tr>
<th>True or False?</th>
<th>Statement</th>
<th>Supporting Evidence (and Page Number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T  F</td>
<td>1. About half of Oregon’s land area is forest.</td>
<td></td>
</tr>
<tr>
<td>T  F</td>
<td>2. The forest industry accounts for tens of thousands of jobs in Oregon.</td>
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</tr>
<tr>
<td>T  F</td>
<td>3. The amount of forestland in Oregon has shrunk dramatically since 1950.</td>
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</tr>
<tr>
<td>T  F</td>
<td>4. Oregon was the first state in the country to pass a law regulating forestry practices on all of its forestland.</td>
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</tr>
<tr>
<td>T  F</td>
<td>5. Private property owners control most of the forestland in Oregon.</td>
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<tr>
<td>T  F</td>
<td>6. Three-fourths of the timber harvested in Oregon comes from federal land.</td>
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<tr>
<td>T  F</td>
<td>7. When the U.S. economy slows, fewer new homes are built, which affects wood products sales in Oregon.</td>
<td></td>
</tr>
<tr>
<td>T  F</td>
<td>8. Oregon is one of the top lumber-producing states in the U.S.</td>
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</tr>
<tr>
<td>T  F</td>
<td>9. Wood from Oregon forests is used only for making paper and lumber.</td>
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</tr>
<tr>
<td>T  F</td>
<td>10. Forest owners in Oregon may clearcut (log all or most of the trees) on their own land without any restrictions.</td>
<td></td>
</tr>
<tr>
<td>T  F</td>
<td>11. Oregon landowners must replant forest trees after harvesting them.</td>
<td></td>
</tr>
<tr>
<td>T  F</td>
<td>12. Fire suppression (putting out wildland fires) has resulted in a greater fire risk for much of Oregon’s forests.</td>
<td></td>
</tr>
<tr>
<td>T  F</td>
<td>13. In Oregon, logging is restricted near waterways to protect fish and water quality.</td>
<td></td>
</tr>
<tr>
<td>T  F</td>
<td>14. Over 4 million acres of Oregon forest are certified by a sustainable forest certification system.</td>
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</tr>
</tbody>
</table>
2: History of Forestry in the U.S. and Oregon

Overview

Students explore the importance of forests in our nation’s and state’s history by reading about three key historical figures in forestry. They then research forest-related events and people in Oregon’s history to create an Oregon forestry timeline.

Time Considerations

Preparation: 15 minutes
Procedure: Two to four 50-minute class periods, plus time for student research

Learning Objectives

Students will be able to:

• Identify three key figures in the history of American forestry.
• Describe the main philosophical views that have helped shape forestry in the U.S. and in Oregon.
• Name important events and people in the history of Oregon forestry.

Standards Connections

Next Generation Science Standards

• Performance Expectation – HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
• Disciplinary Core Idea – HS-LS4.D: Humans depend on the living world for the resources and other benefits provided by biodiversity. But human activity is having adverse impacts on biodiversity through overpopulation, overexploitation, habitat destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that ecosystem functioning and productivity are maintained is essential to supporting and enhancing life on Earth. Sustaining biodiversity also aids humanity by preserving landscapes of recreational or inspirational value.
• Science and Engineering Practice – 6. Engaging in Argument from Evidence: Compare and evaluate competing arguments or design solutions in light of currently accepted explanations, new evidence, limitations (e.g., trade-offs), constraints, and ethical issues.
Common Core State Standards – ELA/Literacy

- RH.11-12.1. Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.
- WHST.9-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Oregon Forest Literacy Plan Concepts

- Theme 2, A.1. In Oregon’s development toward becoming a state, forests provided basic resources for Native Americans and settlers, jobs for a growing workforce, resources for building the nation and dollars for a new state economy.
- Theme 2, A.2. As multiple demands on forests increased, the practice of forest management evolved to conserve and preserve natural resources, and to improve society’s use of forestlands. Forest management incorporated scientific principles and an understanding of competing interests.
- Theme 2, A.3. Historical perspectives, which may include aesthetic, cultural, spiritual, economic and educational factors, form our understanding of forests and our personal connections to forests, and guide decisions to ensure forests for future generations.

Materials

- “Three Views on Forest Conservation” student page
- “Creating an Oregon Forest History Timeline” student page
- Optional resources for research:
Materials for making a physical timeline (such as index cards and string) or a virtual one (such as word processing, presentation, or spreadsheet application)

Background Information

A key influence in creating first the Oregon Territory and then the state of Oregon was the area’s abundant natural resources – in particular, its forests. Before settlement, native peoples valued the forests for their material and aesthetic qualities. They used wood to make implements for daily living, and many built their homes from wood. They gathered berries and other food in the forest’s edges and clearings. In some places they used fire, one of their most effective land management tools, to clear patches of ground for better hunting and gathering.

As European-American traders and settlers moved into the Pacific Northwest, the rich Douglas-fir timber on the west side of the Cascade Range attracted early lumber entrepreneurs. The logging of these forests and the manufacture and trade of wood products spurred the economic development of Oregon. Largely because of timber, Oregon grew from a string of frontier settlements to a vibrant economic community.

An early Oregon saying, “Timber is King,” acknowledged timber’s critical role as an economic engine that helped build cities, railroads, highways, ships and ports. Wealth derived from timber made possible civic and cultural institutions such as schools, libraries and symphony halls.

Unquestionably, all this economic development had environmental consequences, in Oregon and across America. In the course of building a modern society, forests were cut down, prairies were plowed under, rivers were dammed and wetlands were drained – all in the name of “progress.” Throughout our history, and even today, people have had differing views on the best way to manage our forest resources to ensure that they continue to provide their many environmental, economic, and social benefits.

There is a popular perception that the rich forests existing before European-American settlement have been lost or irretrievably damaged. However, the evidence shows that perception to be inaccurate. Today’s forests are of different ages and sizes than they were 100

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years ago, but the area covered by forest has increased considerably, largely because of the growth of forests and the development of modern fire suppression.

**Key Vocabulary**

forestry*

*included in Glossary

**Preparation**

Copy student pages. Identify potential resources for student research (see Materials for some possibilities).

**Procedure**

1. Lead a brief discussion to assess students’ understanding of Oregon’s historical connection to forests, asking questions such as:
   - How have forests shaped Oregon’s history?
   - How has Oregon’s history shaped forests?
   - In what ways do you think Oregon’s forests have changed over time?
   - How do you think our use and perception of forests have changed over time?
2. (Optional) Show either *The Greatest Good* or *The Wilderness Idea*, or have students read portions of *The USDA Forest Service: The First Century*.
3. Ask students what they think the term “conservation” means in relation to forests and other natural resources. Point out that just as they might have differing views about what it means, people in the past have also struggled with how to both use and sustain a resource such as forests.
4. Give students copies of the “Three Views on Forest Conservation” student page. Direct them to read about John Muir, Gifford Pinchot, and Aldo Leopold, three people who greatly influenced forest conservation in the United States.
5. Instruct students to use the questions listed on the student page to examine the reading in more detail. You may choose to have them discuss the questions in groups of four or as an entire class, or to write their responses to some or all of the questions as homework.
6. Introduce the idea that events and people in Oregon as well as the nation have shaped both Oregon’s forests and the field of forestry. Distribute the “Creating an Oregon Forestry History Timeline” student page. Explain that the groups' task is to create a timeline showing
different events and people in Oregon’s history and their significance to Oregon forests and forestry.

7. Provide research materials or access to the Internet, and allow time for students to research and create their timelines.

8. Invite groups to present their timelines to the class.

9. Discuss such questions as:
   - How has forestry developed over time in Oregon?
   - What people and events have been significant in Oregon’s forestry history?
   - How have Muir’s, Pinchot’s and Leopold’s views of conservation influenced forestry in Oregon?
   - What future events might impact Oregon’s forests? How might we minimize any negative impacts?

Assessment

Have students create a T-chart like the one below, adding evidence from their research.

<table>
<thead>
<tr>
<th>How have forests shaped Oregon’s history?</th>
<th>How has Oregon’s history shaped forests?</th>
</tr>
</thead>
</table>

Extension Ideas

- Have students read the following from *Forest Essays (Level 7-12)*, available at www.learnforests.org. Each of these one-page readings provides a historical perspective on Oregon’s forests. Challenge them to identify where each of the events described would fall on their timeline, and whether it represents a particular conservation philosophy.
  - *Community Members and School Kids Bring Back a Forest* [about the Tillamook Burn]
  - *Planting a Tree Could Change Your Life* [about Hoedads, members of a cooperative tree-planting group in Lane County, Oregon]
  - *1920s Logger Becomes Leader in Sustainable Forestry* [about Bill Hagenstein]
– How Oregon’s State Tree Got Its Name
– Monster Storm Wreaks Havoc [about the Great Coastal Gale of 2007]

• Invite students to write an essay on the following: Should the U.S. government have established national forests as a way to protect them, or would it have been better for private citizens to manage forests on their own? Encourage students to identify their stance and at least two reasons in the first paragraph, provide evidence to support their argument in the second paragraph, and summarize their proof and describe long-term consequences of their argument in the third paragraph.

• Explore the history of the Oregon & California Railroad (O&C) lands, Tillamook State Forest, or other local forestlands. What philosophies and perspectives were involved? How do history, legislation and jurisdiction impact them today?
Three Views on Forest Conservation

The history of forestry in the United States has been shaped by our nation’s changing ideas about forests. Three individuals from the late 1800s to early 1900s greatly influenced those ideas through their work and their writing. John Muir, Gifford Pinchot and Aldo Leopold each cared deeply about America’s forests. But they had differing views on the value of forests and how to “conserve” or maintain them.

John Muir

John Muir was born in Scotland in 1838, and immigrated to Wisconsin with his family when he was 11 years old. As a farm boy, he enjoyed inventing things, including a device he created to push himself out of bed in the mornings. Muir briefly studied natural sciences at the University of Wisconsin, but left school to study in what he called the “University of Wilderness.” He would take off to explore the natural world on foot while doing odd jobs to support himself.

In 1867, Muir was involved in a factory accident that nearly blinded him. When he recovered, he became even more devoted to learning about a world unchanged by humans or machines. He walked from Indiana to Florida, sailed to Cuba, New York, and Panama, and eventually made his way to California, where he continued his walking explorations in the Sierra Nevada mountains.

Starting in the 1870s, Muir became known for his newspaper articles and essays, in which he wrote in poetic and spiritual terms about the natural world. He believed that wilderness is important for its sheer beauty and for its ability to renew the spirit. He also believed that nature has value whether or not people can derive a direct benefit from it. For Muir, conservation meant leaving areas untouched by human hands.

Muir fought to preserve areas of pristine forest and keep them from human destruction. He wrote a series of essays pushing for the establishment of Yosemite National Park, which was eventually created in 1890. He also worked to create Grand Canyon and Sequoia National Parks. In 1892, he co-founded and became the first president of the Sierra Club, an environmental preservation organization.

Some quotes from Muir’s writings:

“Climb the mountains and get their good tidings. Nature’s peace will flow into you as sunshine into trees.”
"Everybody needs beauty as well as bread, places to play in and pray in, where nature may heal and give strength to body and soul alike."

“It took more than three thousand years to make some of the trees in these Western woods — trees that are still standing in perfect strength and beauty, waving and singing in the mighty forests of the Sierra. Through all the wonderful, eventful centuries since Christ’s time — and long before that — God has cared for these trees, saved them from drought, disease, avalanches, and a thousand straining, leveling tempests and floods; but he cannot save them from fools — only Uncle Sam can do that.”

Gifford Pinchot

Gifford Pinchot (PIN-show) was the first professionally trained forester in the United States. Born in 1865 in Simsbury, Connecticut, he was raised in an upper-class family of merchants, politicians and landowners. He traveled abroad regularly with his parents.

When he entered Yale University in 1885, Pinchot’s father suggested that he become a forester since he had always loved being in the woods. At that time, not a single American had made forestry a profession, and no university offered a degree or even a course in forestry. After graduation, Pinchot decided to study forestry in France, where he learned about selective cutting and other forest management techniques.

When he returned to the United States, he looked for ways to apply what he learned. He worked as a resident forester for George Vanderbilt’s Biltmore Forest Estate. In 1889, he became head of the U.S. Division of Forestry. In 1900, he founded the Society of American Foresters (SAF), a professional organization whose objectives were to bring high standards to the new field of forestry and to further the cause of forestry in the United States.

In 1905, he was named Chief Forester of the newly formed U.S. Forest Service under President Theodore Roosevelt. During Pinchot’s five years in that position, his aim was to protect the nation’s forests for their timber, but also for future generations. Under his leadership, the Forest Service grew from 60 national forests covering 56 million acres to 150 national forests covering 172 million acres.

For Pinchot, the term conservation meant the efficient use of natural resources, and he held a utilitarian or practical view of forests. He believed that forests are for people to use, but he also stressed their “wise use.” His view was that natural resources should be managed by considering the “greatest good” for the greatest number of people over time.
Some quotes from Pinchot’s writings:

“When the Gay Nineties [1890s] began, the common word for our forests was ‘inexhaustible.’ To waste timber was a virtue and not a crime. There would always be plenty of timber.”

“Conservation is the foresighted utilization, preservation and/or renewal of forests, waters, lands and minerals, for the greatest good of the greatest number for the longest time.”

“Without natural resources life itself is impossible. From birth to death, natural resources, transformed for human use, feed, clothe, shelter, and transport us. Upon them we depend for every material necessity, comfort, convenience, and protection in our lives. Without abundant resources prosperity is out of reach.”

Aldo Leopold
Aldo Leopold was born in 1887 in Burlington, Iowa. Growing up, he had a keen interest in the natural world and spent hours journaling about and sketching his surroundings. After graduating from the Yale Forest School in 1909, he pursued a career in forestry, working for more than 20 years with the U.S. Forest Service in New Mexico and Arizona.

In 1933, he published the very first textbook about wildlife management. Later that year he became a professor of game management at the University of Wisconsin. In 1935, he and his family began restoring a worn-out farm along the Wisconsin River, which further informed and inspired his understanding of the natural world.

Through his writings and teaching, Leopold advanced the idea of the “land ethic,” which places value on all living things as well as their interactions in the environment. To Leopold, the term conservation meant managing natural areas based on ecological principles – not just on economics.

In a sense, Leopold’s philosophy bridged Muir’s view that nature should be protected from people and Pinchot’s view that nature is primarily a source of resources for people. Leopold brought a new understanding of our interconnected relationship with the natural world at a time when technology increasingly separated people from it.

Leopold recorded his findings and thoughts in short essays, which were published the year after he died in 1949 as the book A Sand County Almanac and Sketches Here and There. His words inspired many conservationists in the 1950s and 1960s, and helped spur the environmental movement.
Some quotes from Leopold’s book:

“We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.”

“Civilization has so cluttered this elemental man-earth relationship with gadgets and middlemen that awareness of it is growing dim. We fancy that industry supports us, forgetting what supports industry.”

“Cease being intimidated by the argument that a right action is impossible because it does not yield maximum profits, or that a wrong action is to be condoned because it pays.”

Questions
1. Compare the three views of conservation held by Muir, Pinchot and Leopold. In what ways were they similar? In what ways were they different?

2. Choose one of the quotes to analyze more carefully. In your own words, what is this person saying about forests or natural resources? What does this quote tell you about the person’s beliefs about forests?

3. Name one way each person’s views helped define our nation’s current relationship with forests.

4. Each of these three people spent a lot of time outdoors and in nature. Do you think going outdoors is necessary to develop beliefs about the protection or use of the environment?
Creating a Timeline of Oregon Forestry History

Events

- Biscuit Fire
- Bull Run Reserve
- Civilian Conservation Corps (CCC) established
- Columbus Day Storm
- Transcontinental railroad complete
- Crater Lake National Park established
- Creation of “Smokey Bear”
- Endangered Species Act
- Lewis and Clark Expedition in Oregon
- Mt. St. Helens eruption
- National Environmental Protection Act
- National Forest Management Act
- Northern spotted owl listed as a threatened species
- Northwest Forest Plan
- O&C Railroad established
- The State of Oregon admitted to the Union
- Oregon Forest Practices Act
- Oregon’s first paper mill
- Oregon’s first sawmill
- The Homestead Act
- The Oregon Trail
- Tillamook Burn

People

- Margaret Stoughton Abell
- Francis Elliott
- William Greeley
- Franklin Hough
- Stephen Mather
- George Peavy
- Edward Schroeder
- TJ Starker
- Loren “Stub” Stewart
- Barbara Walker
- George Weyerhaeuser

Directions

1. Divide up the list of events and people above so that all the members of your group have about the same number to research.

2. For each, find out the following:
   - When did this event occur or when was this person’s greatest influence?
   - What was this event or who was this person? (Describe in one or two sentences.)
   - How did this event or person affect Oregon forests or forestry? (Describe the effect in one or two sentences.)
   - What sources did you use to learn about this event or person? (Cite the title, author, date and web page, if any, for each source.)
3. Write the information for each event or person on separate index cards or pages.
4. Sort all the cards or pages into chronological order.
5. Determine the earliest and the latest dates, and use these to decide on units of time for your timeline (1 year, 5 years, decades, etc.).
6. Decide how you will mark and label the dates and other information on your timeline frame.
7. Create the frame for your timeline, and then add the dates and other information for each event.
3: Changes in Oregon’s Forestland³

Overview

Students analyze land use changes in the Willamette Valley (or other area of the state), describing changes over time in ecosystem elements such as riparian vegetation and forest type, as well as changes in Oregon’s timber volume over time.

Time Considerations

Preparation: 15 minutes
Procedure: One 50-minute class period

Learning Objectives

Students will be able to:

- Evaluate maps of the same location at different time periods and analyze differences in land and ecosystem elements.
- Articulate several key findings from their map analysis.

Standards Connections

Next Generation Science Standards

- Performance Expectation – HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
- Disciplinary Core Idea – HS-LS2.C: Anthropogenic changes (induced by human activity) in the environment—including habitat destruction, pollution, introduction of invasive species, overexploitation, and climate change—can disrupt an ecosystem and threaten the survival of some species.

³ This lesson was adapted from “Willamette Valley Land Use” by Dr. Wynn Cudmore. Northwest Center for Sustainable Resources. Chemeketa Community College. Available at https://learnforests.org/sites/default/files/WillametteValleyLandUseChange.pdf.
• Science and Engineering Practice 4 – Analyzing and Interpreting Data: Analyze data using tools, technologies and/or models in order to make valid and reliable scientific claims or determine an optimal design solution.

Oregon Forest Literacy Plan Concepts
• Theme 2, A.1. In Oregon’s development toward becoming a state, forests provided basic resources for Native Americans and settlers, jobs for a growing workforce, resources for building the nation and dollars for a new state economy.
• Theme 2, A.3. Historical perspectives, which may include aesthetic, cultural, spiritual, economic and educational factors, aid our current understanding of Oregon forests and inform future generations about their use.
• Theme 2, B.3. Forests provide the opportunity to study ecosystems, conservation and natural resource management.

Materials
• “A View Across the Willamette Valley” teacher page
• “The Willamette Valley” student page
• “Willamette Valley Land Use Changes” student page
• “Western Oregon Timber Volume” teacher page
• Equipment for showing teacher pages

Key Vocabulary

board measure
development
*riparian
*timber volume
vegetation
urbanization
wetland
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*included in Glossary

Preparation

Make copies of the student pages. Set up equipment for showing teacher pages.
Background Information

More than a century of mapping, managing and measuring has yielded quite a bit of information about Oregon’s forests. Early maps provide a good general idea of what forests looked like around the end of the 19th century. From them, we know generally where logging, wildfire and other disturbances have occurred during the past 100 years, and we know much about patterns of regrowth in forest ecosystems. And with modern tools such as satellites, other remote imaging techniques and records from extensive on-the-ground mapping, we can gain an accurate and precise picture of what western Oregon forests look like today.

In 1900 the USGS published a map of Oregon that showed forested areas, classifying them according to the volume of timber per acre in board measure. In the mid-1990s, the Oregon Forest Industries Council (OFIC), a trade association representing more than 50 Oregon forest landowners and forest products manufacturing-related firms, set out to create a similar map of the western part of the state, utilizing information gathered at thousands of sampling plots on private and public lands combined with Landsat satellite data.

Comparing these two maps yields an interesting picture of how forests in western Oregon have changed during the past century from both human and natural influences. The two maps are snapshots in time of ever-changing forest conditions. The historic map does not represent a timeless or static state – it was drawn at a particular moment in a dynamic history. In the same way, the modern map captures conditions at the end of a century in which human influences have been significant across the whole landscape. One of those influences has been ongoing, conscious management of forests by public and private owners. The forests today do not look the same as the forests of 50 years ago, and 50 years hence they will look different still.

In other words, a forested landscape is something of a moving target. Comparing these two snapshots and analyzing the influences – human and natural – that shaped and continue to shape Oregon’s forests reveals a lot about the variability and resilience of forests in the Northwest.

It should be noted that past land managers made decisions based on the best information available to them, and in a cultural context that is different from today’s. Since we have the benefit of hindsight when looking at the consequences of those decisions, it is tempting to be

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judgmental of them. It is also tempting to embrace a nostalgic view of historic ecosystems as being inherently “good.” Past management practices left a footprint that is not necessarily “bad,” but is certainly different than it would have been had the ecosystems been left untended.

Procedure

1. Introduce the activity by showing students the images of the same view across the Willamette Valley in western Oregon at two different times: 1851 (top) and 1990 (bottom). Point out that the images show an area just north of present-day Eugene.
2. Ask students to identify differences and similarities between the two images (for example, the shape and path of the river, the presence or absence of plants (riparian vegetation) around the river) and the presence or absence of agriculture or other development.
3. Project the two maps from “The Willamette Valley” student page, as well as the legend, or provide student access to the maps and legend online.
4. Direct students to work in small groups to complete the “Willamette Valley Land Use Changes” student page by looking at the two maps and describing, first, changes they observe (or infer) between the images, and then any impacts they would predict from the images.
5. Have groups share some of their findings. See answers on page 19 for some of the possibilities.
6. Show students the two maps on the “Western Oregon Timber Volume” teacher page. Explain that BM (board measure) indicates the amount of timber present in an area of forestland. Discuss the differences between the two maps, and ask students how they might explain the changes they see.

Assessment

Use student responses to the “Willamette Land Use Changes” student page to assess their understanding of the lesson concepts.

Extension Idea

5 You may want to point out that foresters today express timber volume in board feet rather than board measure. Both a board foot and a board measure are the dimensions of a piece of lumber one inch thick, 12 inches wide, and 12 inches long, or its equivalent. However, the two are calculated using different formulas.
• Explore the three possible future scenarios for the Willamette Valley described in “Willamette Valley Land Use” by Dr. Wynn Cudmore (on pages 15-16, and depicted in the maps on pages 31-34). Available at learnforests.org.

• Using Google Earth or other aerial imagery, look for land use changes in your local area.

Possible Responses to the “Willamette Valley Land Use Changes” Student Page

Willamette River
From: Braided, highly complex river system with oxbows, back channels, sloughs, etc.; highly interactive with its floodplain
To: Channelized river lacking above complexity
Impacts: Some river habitats eliminated for aquatic species (e.g., salmon spawning and rearing habitat). Changes in flow patterns and proneness to flooding. Greater potential for impacts on human structures.

Wetlands
From: Extensive wetlands of many types associated with Willamette River
To: Most wetlands replaced with agricultural or urban lands
Impacts: Loss of water-quality improvement function of wetlands (e.g., filtration, absorption). Loss of wetland habitat. Increased proneness to flooding due to decreased water retention. More land made available for agriculture and urban use.

Riparian Vegetation
From: Extensive riparian vegetation along river
To: Only a narrow band of vegetation remains; conifers mostly removed
Impacts: Loss of habitat for riparian species. Increased water temperature with impacts on aquatic species. Impaired water quality due to loss of filtering function of riparian vegetation.

Urbanization
From: None – some Native American settlements
To: Cities, towns and rural residential development now occupies significant percentage of the landscape


Agriculture
From: None
To: Major land use for this area – grass seed, nursery stock, pasture, orchards

Native Prairie/Savanna
From: Major habitat represented
To: Minimal habitat remaining
Impacts: Habitat loss resulting in decline of native prairie/savanna species

Water Quality
From: High quality (inferred)
To: Poor quality
Impacts: Decline of susceptible aquatic species. Increasingly difficult and expensive to produce clean water for human uses.

Forests
From: Upland – savanna-like forests with oaks scattered among grasslands due to natural and human-set fires. Riparian (by the river) – extensive cottonwood/maple forests along the river.
To: Upland – dense forests, with Douglas-firs overtaking oaks, due to fire suppression. Riparian – large areas replaced with other land uses.
Impacts: Loss of prairie/savanna habitats

Fish and Wildlife Habitat
From: Extensive availability of a wide range of fish and wildlife habitats
To: Decreased availability of natural habitats
Impacts: Loss of natural biodiversity at genetic, species and ecosystem levels. Extinction of some endemic species. Increase in number of threatened and endangered species.
A View Across the Willamette Valley

Just north of present-day Eugene, 1851

View from the same location, 1990


The Willamette Valley

Land use: Pre-EuroAmerican Settlement


**Willamette Valley Land Use Changes**

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<thead>
<tr>
<th>Feature</th>
<th>Changes</th>
<th>Impacts</th>
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<tr>
<td>Willamette River</td>
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<td>Wetlands</td>
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<td>Riparian Vegetation</td>
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<td>Agriculture</td>
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<td>Native Prairie/Savanna</td>
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<td>Fish and Wildlife Habitat</td>
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</tbody>
</table>
**Western Oregon Timber Volume**

*Historic timber volume*

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1990s Timber Volume
4: Oregon’s Forest Resource

Overview

Students read (or listen to a brief teacher-prepared lecture) about Oregon’s forest heritage and then answer questions based on the information.

Time Considerations

Preparation: 15 minutes (more, if preparing lecture)
Procedure: One 50-minute class period

Learning Objectives

Students will be able to:

- Identify whether Oregon is losing forestland to other uses.
- Describe the Oregon Forest Practices Act.
- Explain how ecological, social and economic benefits of forests contribute to sustainability.

Standards Connections

Next Generation Science Standards

- Science and Engineering Practice – 8. Obtaining, Evaluating, and Communicating Information: Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Oregon Forest Literacy Plan Concepts

- Theme 1, C.2. Humans depend on and influence forest ecosystems and are themselves influenced by forest ecosystems.

Materials

- “Oregon’s Forest Heritage” student page
- “Oregon’s Forest Heritage – Questions” student page
•  *Rules to Live By*, available at learnforests.org (optional)

**Background Information**

See “Oregon’s Forest Heritage” student page.

**Key Vocabulary**

- canopy*
- conifer*
- ecology*
- economic value*
- forest*
- sustainability
- photosynthesis*

* included in Glossary

**Preparation**

Make copies of student pages or provide on-screen access to them. (As an alternative to students reading the “Oregon’s Forest Heritage” student page, you may choose to prepare a brief lecture based on the material.)

**Procedure**

1. Have students read the “Oregon’s Forest Heritage” student reading, or present a brief lecture based on the material.
2. Give students copies of the “Oregon’s Forest Heritage – Questions” student page, and allow time for them to answer the questions in pairs or groups.
3. (Optional) Explore the Oregon Forest Practices Act further by inviting students to read some or all of the *Rules to Live By* report, and to identify the key rules and benefits of the Act.

**Assessment**

Use student responses to “Oregon’s Forest Heritage – Questions” student page to assess their learning.
Possible Answers to “Oregon’s Forest Heritage – Questions” Student Page

1. They help cool and regulate the earth’s climate by removing carbon dioxide from the atmosphere.

2. The amount of forestland in Oregon has remained fairly constant, with about 8 percent loss due to human development.

3. Ecological value: They provide food, shelter and habitat for wildlife; stabilize soil and prevent erosion; regulate temperature and moisture; capture carbon dioxide to produce oxygen; and filter water. Social value: They provide places for people to relax, rejuvenate, find food and have fun, as well as raw materials for wood products. Economic value: They provide softwood lumber and tens of thousands of jobs.

4. Ecological, social and economic benefits are all considered when we talk about forest sustainability.

5. A set of laws and rules governing harvest practices and forest management operations in Oregon.

6. Lumber, door and window frames, fencing material, plywood, newsprint, printer and photocopy paper, egg cartons, food containers, glues, packing material, furniture, toys, playground equipment, pencil stock, cabinets, cosmetics, and more.

7. Individual consumer choices affect the demand for forest products – and, in turn, ecosystems and human communities – in Oregon and around the world.

8. Individual responses will vary.
Introduction

A forest is a living, complexly interrelated community of trees and associated plants and animals. Forests help provide the earth with oxygen necessary for life. Green plants take in energy from the sun and use that energy in their cells to transform water and carbon dioxide into oxygen and glucose, a carbon-based molecule. This process is called photosynthesis. High levels of carbon dioxide and other gases in the atmosphere contribute to global warming. Forests help cool and regulate the earth’s climate by removing carbon dioxide from the atmosphere. The carbon-based molecules that result from photosynthesis are stored in trees’ trunks, stems and leaves.

From the soil, trees take moisture and nutrients, and with the aid of sunlight, they grow wood and other natural products used by humans. Oregon’s forests are very diverse, ranging from mixed-species, old-growth trees in roadless wilderness areas to single-species, intensively managed industrial forests. To better understand forestry in Oregon, it is important to understand some of the basic facts that shape Oregon’s forests.

Oregon’s Forest Heritage

Of the 62 million acres of land in Oregon, some 30 million acres, or 47 percent, are classified as forestland. Over the past four centuries, the amount of forestland in the state has remained fairly constant, with about 1 percent having been lost to human development (agriculture, urban growth, highways, electric transmission lines and other infrastructure) since Europeans first visited the Northwest. While the amount of forestland has not changed considerably, its composition has changed, as much of the state’s virgin forests were harvested for timber during the 19th and 20th centuries.

Forest Sustainability

The ecological, social and economic benefits of forests are all important to Oregon’s citizens. Using our forests sustainably, so they continue to provide these important benefits far into the future.

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future, requires us to recognize the interdependent relationships among these various uses and
to acknowledge the need for balance among them.

- **Ecological Value**: The forest floor provides food, shelter and habitat for animals, from
  the simplest worm to the biggest bear. Tree roots help stabilize the soil and prevent
erosion. The top portion of the forest, called the “canopy,” helps regulate forest
temperature and moisture. Forests also capture carbon dioxide (a greenhouse gas),
produce oxygen and filter water to keep it clean. These are all important ecological
functions, also known as ecosystem services, of forests.

- **Social Value**: Forests provide places for people to relax, rejuvenate, seek food and have
  fun. Each year, thousands of Oregonians visit our forests to go hiking, biking, camping,
  hunting, fishing, foraging, off-roading and wildlife watching. Another reason forests are
  important to society is that they provide the raw materials for all the wood products
  that we use on a daily basis, such as housing, furniture, newspaper, books and
cardboard.

- **Economic Value**: Oregon harvests more conifers (cone-bearing evergreens) than any
  other state and is the leading producer of softwood lumber in the nation. Tens of
  thousands of people in Oregon earn a living by working directly with the state’s forest
  sector. Forestry is especially important to rural economies, with most forestry-related
  jobs located in communities outside the Portland metropolitan area.

**Oregon Forest Practices Act**

All private and state forestland is protected under the rules of the Oregon Forest Practices
Act (OFPA), the nation’s oldest and one of the most comprehensive sets of laws and rules
governing harvest practices and other forest management operations. Although US Forest
Service and Bureau of Land Management (BLM) lands are not regulated by the OFPA, these
federal agencies have agreed to meet or exceed many of its requirements. Oregon’s
landmark land use laws offer further protection by tightly restricting the conversion of
forests to other uses, attempting to ensure that future generations will have ample forest
resources.

OFPA includes laws that

- **Require Prompt Reforestation**. On average, more than 40 million new trees are
  planted each year in Oregon’s forests. Reforestation is required any time forest
density drops below established standards following harvest.
• **Require Written Plans.** The Oregon Department of Forestry must be notified of all harvesting operations and be provided site maps for review. In addition, some planned actions require that the landowner or timber operator submit a written plan that documents how the operation will meet the Oregon Forest Practices Act. In general, harvesting, road construction or other operations conducted near streams or wetlands require a written plan. ¹¹

• **Protect Water Resources.** To protect water resources in forests, particularly where fish and domestic water supplies are involved, harvest operations are restricted within a certain distance from the banks of streams and water bodies.

• **Protect Wildlife Habitat.** Landowners must be responsive to the nesting and feeding needs of a wide variety of forest wildlife. For example, they must ensure that snags (standing, dead trees), fallen logs or standing green trees are present to provide nesting sites and other habitat for many birds, mammals and other animals.

• **Limit Clearcuts.** Clearcutting is when most or all of the trees in an area are cut down. OFPA limits the size and location of clearcuts.

• **Regulate Road Construction and Maintenance.** Strict regulations govern the location, construction, maintenance and repair of roads on both state and private forestland. Roads must avoid marshes, meadows, drainage channels, riparian areas and, when possible, steep terrain.

**Oregon’s Wood Products**

Different types of trees lend themselves to different kinds of wood products. “Hardwood” broadleaf trees such as oak, cherry and walnut provide dense, durable wood – the kind commonly used to make flooring and furniture. “Softwood” cone- and needle-bearing trees such as pine, fir, spruce and cedar produce lumber that is less dense and lighter in weight. It is often used in construction and papermaking.

Beyond the “hardwood” and “softwood” distinction, the different characteristics of dozens of tree species, such as flexibility, straightness and tightness of grain, make for a wide range of applications.

Wood is a component in 5,000 different products, many of them not as easily recognizable as a baseball bat or table. While some products are made directly from hardwood or softwood lumber, many engineered wood products are made of combinations of sawdust, shavings and

http://blogs.oregonstate.edu/forestplanning.
other waste materials. A wide range of products comes from wood pulp and plant chemicals extracted from wood pulp.

Oregon’s wood and paper products are sold in all 50 states and some 40 foreign countries. They include lumber, door and window frames, fencing material, plywood, newsprint, printer and photocopy paper, egg cartons, food containers, glues, packing material, furniture, toys, playground equipment, pencil stock, cabinets, cosmetics, and more.

Wood Use in a Global Context

U.S. wood consumption per person has increased 40 percent since 1960. Much of this demand has been met by imports from around the world. Across the globe, about 50 percent of all forests have been converted to other land uses (compared with 33 percent in the U.S. and 8 percent in Oregon). Timber harvests in countries without strong forest practice laws often destroy critical habitat, such as tropical rainforests, and affect endangered species. Individual consumer choices help shape forests, ecosystems and communities, not only in Oregon, but across the United States and around the globe.

A Career in Forestry

A career in forestry or wood products offers an exciting chance to benefit people, the environment and the economy of Oregon. Forestry professionals are engaged in the practice of creating, managing, using and conserving forests and wood products in a sustainable manner to meet the needs, goals and values of forestland owners. They care for trees and other forest resources including soils, water and wildlife and make innovative products. Some people are drawn to forestry because they want to work in the outdoors. Many forest sector careers involve working in the forest, but there are other forest-related jobs that might surprise you: writing policy papers, managing timber investments, using satellite mapping technology, managing product quality and educating the public are just a few examples.

Types of job responsibilities among Oregon’s forest sector professionals include:

- Growing trees for wood products
- Managing water quality
- Protecting endangered wildlife
- Ensuring healthy forests
- Planning recreational uses
- Researching tree genetics
- Planning and supervising timber harvests
• Developing mill technologies
• Creating new wood products
• Researching global markets
• Producing renewable biomass energy
Oregon’s Forest Heritage – Questions

1. How do forests help combat global climate change?

2. Over the last four centuries, what percentage of forestland has Oregon lost?

3. How do Oregon’s forests contribute to the ecological, social and economic well-being of Oregon and beyond?

4. What factors are included when we talk about the sustainability of Oregon forests?

5. Describe the Oregon Forest Practices Act (OFPA).

6. What everyday products are made of wood or wood byproducts from Oregon trees?

7. How do consumer choices affect Oregon’s forests?

8. Which forest-related job responsibility sounds the most interesting to you?

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5: Who Owns Oregon’s Forests?

Overview

Students examine a map showing forest ownership in Oregon by ecoregion and identify differences in ownership and forest management challenges.

Time Considerations

Preparation: 15 minutes
Procedure: One 50-minute class period

Learning Objectives

Students will be able to:

- Compare the different ecoregions of Oregon in terms of patterns in forestland ownership.
- Identify challenges faced by forest owners in Oregon’s different ecoregions.
- Recognize the forest management objectives for different types of forest landowners.

Standards Connections

Next Generation Science Standards

- Disciplinary Core Idea – HS-LS4.D. Humans depend on the living world for the resources and other benefits provided by biodiversity. But human activity is having adverse impacts on biodiversity through overpopulation, overexploitation, habitat destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that ecosystem functioning and productivity are maintained is essential to supporting and enhancing life on Earth. Sustaining biodiversity also aids humanity by preserving landscapes of recreational or inspirational value.
- Science and Engineering Practice – 5. Using Mathematics and Computational Thinking: Use mathematical, computational, and/or algorithmic representations of phenomena or design solutions to describe and/or support claims and/or explanations.

Common Core State Standards – Mathematics

Oregon Forest Literacy Plan Concepts

- Theme 1, D.3. Many different forest types exist within a biome, typically named by their dominant tree species. Common forest types in Oregon include spruce-hemlock, Douglas-fir, ponderosa pine, mixed conifer and hardwood.
- Theme 3, A.3. Oregon forests are managed under private (e.g., industrial, family and tribal) and public (e.g., city, county, state and national) ownership. Each type of ownership may have different objectives for how to manage forests.
- Theme 3, A.4. Many forest landscapes are made up of a mix of ownerships, a variety of management objectives and a blend of forest ecosystems.

Materials

- Forest Fact Sheet: Who Owns Oregon’s Forests?, available at learnforests.org (optional)
- “Oregon’s Forest Landowners” student page
- “Who Owns the Forests?” student page
- Who Owns the Forests? interactive map, available at oregonforests.org (optional)
- Oregon’s Forests posters, available to order from learnforests.org
- "Oregon Ecoregion Conservation Strategy" overviews (available from Oregon Department of Fish and Wildlife at www.oregonconservationstrategy.org)
- Internet access
- Tracing graph paper

Background Information

Oregon contains more than 30 million acres of forestland and nearly half the state is forested. All that forestland is divided between tens of thousands of different landowners: federal, state and local governments, small businesses, large corporations, tribes, families and individuals.

By far the biggest single forest landowner is the federal government, which owns 60 percent of Oregon’s forestland. Most of the federal forestland is managed by two agencies: the US Forest Service and the Bureau of Land Management.

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Different landowners have different priorities when it comes to managing their forestland. Some grow timber to be harvested for wood products. Others focus on wildlife habitat. And many try to balance a mix of environmental and economic values.

In this lesson, students examine forestland ownership through the lens of Oregon’s ecoregions – portions of the state with similar climate and vegetation. Oregon’s diverse landscapes range from lush rainforests to deserts, contributing to diverse ecosystems that differ from one area to another. These differences, as well as the local history of human use, influence issues facing landowners. They also affect the way landowners perceive, value and manage their natural resources.

**Key Vocabulary**

- ecoregion
- federal government
- private ownership*
- state government
- tribal government

*included in Glossary

**Preparation**

Make copies of the student pages and of the “Oregon Ecoregion Conservation Strategy” overviews.

**Procedure**

1. Introduce the lesson by asking students who they think owns most of the forestland in Oregon: Is it owned by federal, state, or local governments; by tribal governments; by private companies; or by families or individuals? (They may remember, from Lesson 1, that approximately 60 percent of Oregon’s forestland is owned by the federal government.) You may want to show them *Forest Fact Sheet: Who Owns Oregon’s Forests?* as a basis of the discussion. What impact might the ownership of a particular tract of forestland have on how that land is managed or used?

2. Display the *Who Owns the Forests?* interactive map or student page, and ask students whether they notice any patterns. Point out that the location of forests – and forest ownership patterns – vary in different areas (ecoregions) of the state.

3. Explain that students will be looking at different ecoregions of Oregon to learn more about patterns of forestland ownership in the various regions, as well as the particular challenges
owners may face. Divide the class into eight groups, assigning each group one of the following ecoregions:

- Blue Mountains
- Coast Range
- Columbia Plateau
- East Cascades
- Klamath Mountains
- Northern Basin and Range
- West Cascades
- Willamette Valley

4. Give students copies of the “Oregon’s Forest Landowners” student page and the “Who Owns the Forests” student page or access to the online interactive map. In addition, give them copies of (or online access to) the Oregon’s Forests poster and the “Oregon Ecoregion Conservation Strategy” overview for their assigned ecoregion.

5. Allow time for groups to answer the questions on the student page using the other materials as resources. Provide sheets of tracing graph paper, and suggest that students may use them to help estimate area on the map.

6. After groups have answered the questions on the student page, ask them to present their findings to the class. Discuss the differences and similarities among the various ecoregions. For example:
   - Which ecoregion has the highest percentage of federally owned forestlands?
   - Where are privately owned forests – forests owned by industrial companies or by families and individuals – more prevalent?
   - What similar challenges do forest landowners face across the state? What are regional differences?

Assessment

Use the student responses on the student page to assess their understanding and learning.

Extension Idea

Compare and contrast ecoregions in the United States. Download a map of ecoregions (such as from the U.S. Environmental Protection Agency’s “Ecoregions of North America” web page at http://epa.gov). Have students research differences in the ecoregions and discuss why the differences are present. Create a visual key to compare their findings.
Oregon’s Forest Landowners

Ecoregion researched: ________________________________

1. Using the map on your ecoregion’s overview, draw the boundaries of your ecoregion on the Who Owns the Forests? map.

2. Looking at the Who Owns the Forests? map, what patterns of forest ownership do you notice in this ecoregion?

3. Estimate the percentage of forestland owned by each of the following in this ecoregion. In addition to your answer, explain the method you used to estimate it.

   a. The federal government (including Bureau of Land Management, National Park, and National Forest lands)
   
   b. Private industrial companies
   
   c. Families and individuals
   
   d. Tribal governments
   
   e. Oregon state government

4. Using the Oregon’s Forests poster, identify which forest types are most prevalent in this ecoregion. Why do you think these types are most prevalent here?

5. Using your ecoregion’s overview or other sources, identify possible challenges forest owners in this ecoregion face.
Who Owns the Forests?

Forestland ownership

- Federal Government
- Large Private
- Small Private
- State & Other Public
- Tribal
6: Oregon’s Federal Forestland

Overview

Students examine a report on federal forestland in Oregon and draw conclusions about the issues facing a large portion of Oregon forests.

Time Considerations

Preparation: 15 minutes
Procedure: One to two 50-minute class periods

Learning Objectives

Students will be able to:

• Summarize the content of a special report on the history, policies and issues shaping Oregon’s federally owned forest lands.
• Draw conclusions about Oregon’s federal forestlands.
• Make recommendations for resolving issues involving federal forestlands.

Standards Connections

Next Generation Science Standards

• Disciplinary Core Idea – HS-LS4.D. Humans depend on the living world for the resources and other benefits provided by biodiversity. But human activity is having adverse impacts on biodiversity through overpopulation, overexploitation, habitat destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that ecosystem functioning and productivity are maintained is essential to supporting and enhancing life on Earth. Sustaining biodiversity also aids humanity by preserving landscapes of recreational or inspirational value.
• Science and Engineering Practice – 8. Obtaining, Evaluating, and Communicating Information: Evaluate the validity and reliability of, and/or synthesize multiple claims, methods and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible.
Common Core State Standards – English Language Arts

- Reading Standards for Literacy in Science and Technical Subjects – RST.11-12.1: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

Oregon Forest Literacy Plan Concepts

- Theme 3, A.3. Oregon forests are managed under private (e.g., family and industrial) and public (e.g., state and federal) ownership. Each type of ownership may have different management objectives and may be subject to different laws and policies.
- Theme 3, A.4. Many forest landscapes are made up of a variety of ownerships, a mix of management objectives and a blend of forest ecosystems.

Materials

- Federal Forestland in Oregon: Coming to Terms with Active Forest Management of Federal Forestland, available at learnforests.org
- Highlighters (optional)

Background Information 14

The US Forest Service was established in 1905 by President Teddy Roosevelt, who set aside initial forest reserves of 60 million acres. By the time he left office in 1909, Roosevelt had designated 230 million acres of public lands and waters for conservation purposes, including national forests, parks, monuments and wildlife refuges.

In Oregon, the federal government manages more than 18 million acres (an area nearly equal to the entire state of South Carolina). Of that amount, 8.7 million acres are considered “reserved,” meaning they are managed primarily for non-economic values such as mature habitat and aesthetics. The other 9.6 million acres of federal forestland are classified as unreserved or multi-resource. For decades, these forests produced nearly 5 billion board feet of lumber each year. Since 1989, timber harvest on federal land has declined by 90 percent due to a shift in management emphasis and environmental litigation. Lack of management of these forests has produced some undesired consequences and remains a major issue.

Nearly 40 percent of federal forestland in Oregon is now classified at high-risk of uncharacteristically intense fire due to dense, unnaturally overcrowded and dying trees. This is especially true of federal forests east of the Cascades.

Collaborative efforts involving federal and state agencies, the forest sector, the conservation community and private forest landowners are resulting in innovative forest management solutions that are helping to restore the health of our federal forestland.

**Key Vocabulary**

- conservation*
- ecosystem service*
- federalism
- overstocked
- restoration

*included in Glossary

**Preparation**

- Make copies of the *Federal Forestland in Oregon* report, or provide students on-screen access.
- Look at the *Federal Forestland in Oregon* report and decide how you will divide it up among student groups. Depending on your class, you may have groups examine larger sections, such as “The Roots of Federal Forestland” on page 3, or smaller subheads such as “The Cost of Federal Forest Policy” on page 4. Be sure to include the graphs, tables and figures in the assignments.

**Procedure**

1. Introduce the lesson by asking students, based on the prior lesson, what issues they think may face our state’s federally owned forests.
2. Explain that the class will study a report on the status of Oregon’s federal forestlands. They will be responsible for reading a portion of the report and very briefly summarizing it for the class.
3. Hand out copies of the report *Federal Forestland in Oregon* or provide access to it on tablets or computers.
4. Divide the class into pairs and assign each a section of the report to read and summarize. Be sure to include the graphs, tables and figures in the assignments.
5. Encourage students to use a highlighter (either real or virtual) to mark the two or three key points of their assigned reading. They may also write in the margins or use virtual sticky...
notes to help them summarize their passage. Each pair must be able to report about their passage in two or three sentences.

6. After they have had time to prepare, step chronologically through the sections of the report with pairs sharing their summaries.

7. Assign a student to take notes and create a one-page summary of all the report sections in real time.

8. Lead a discussion about the report and its findings, asking such questions as:
   - What are the key points of the report as a whole?
   - What conclusions can you draw from the report?
   - What further information would you want to have?
   - What recommendations for our state’s federally owned forests might you make based on the report?

**Assessment**

Based on the information gathered from the report, have students write a letter to their congress member, newspaper editor or other influential person with their recommendation for managing Oregon’s federally owned forests. They should include data or evidence to back their recommendations.

**Extension Ideas**

- Research the differences among the various agencies charged with managing Oregon’s federally owned forests: the US Forest Service, Bureau of Land Management, National Park Service, and U.S. Fish and Wildlife Service. What is each agency’s mandate? How do their mandates differ? How are Wilderness Areas different from National Parks or National Forests? How do the different mandates determine how each forest is managed?

- Find out what proposed actions are currently being considered on federal lands in Oregon (by searching, for example, “draft environmental impact statement Oregon”). Get copies of the draft environmental impact statement describing the positive and negative effects of the proposal. Encourage students to research the issues involved and to submit a public comment.
7: Interview a Forest Landowner

Overview

Students interview forest landowners to learn about the choices individual owners make in managing their forests, as well as changes and challenges they face.

This lesson was adapted from “Who Owns America’s Forests?” Exploring Environmental Issues: Focus on Forests, Secondary Environmental Education Module. Project Learning Tree.

Time Considerations

Preparation: 15 minutes
Procedure: One to two 50-minute class periods

Learning Objectives

Students will be able to:

- Conduct an interview to explore choices, changes and challenges facing forest landowners.
- Make inferences about private forestland ownership in Oregon.
- Understand different objectives of forest landowners.

Standards Connections

New Generation Science Standards

- Disciplinary Core Idea – HS-LS4.D. Humans depend on the living world for the resources and other benefits provided by biodiversity. But human activity is having adverse impacts on biodiversity through overpopulation, overexploitation, habitat destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that ecosystem functioning and productivity are maintained is essential to supporting and enhancing life on Earth. Sustaining biodiversity also aids humanity by preserving landscapes of recreational or inspirational value.

Common Core State Standards – English Language Arts

- Speaking and Listening – SL.11-12.1.C: Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.
Oregon Forest Literacy Plan Concepts

• Theme 3, A.3. Oregon forests are managed under private (e.g., family and industrial) and public (e.g., state and federal) ownership. Each type of ownership may have different management objectives and may be subject to different laws and policies.

Materials

• “Forest Landowner Interview” student page (optional, see Procedure)

Background Information

In Oregon, 62,000 individuals own between 10 and 5,000 acres of forestland. Classified as “family forestlands,” these acres have often been handed down through generations.

Most of these landowners are not professional foresters; they are doctors, teachers, accountants and clergymen. They’re also quite possibly your neighbors. That’s because a lot of family forestland is located close to residential areas in the foothills just outside Oregon’s primary metropolitan areas.

The amount of timber coming from family forestlands varies greatly depending on demand in the market. Family forestlands accounted for about 12 percent of Oregon’s annual timber harvest in 2017. Yet not all family forestlands are managed for timber production. Family forest landowners also manage forests for recreational use, fish and wildlife habitat or just pure aesthetics.

A recent survey of family forest landowners indicated that they, like most Oregonians, desire to keep their property as forestland. But caring for the forest costs money. In many cases, family forest landowners use their land to earn a living. If the cost of regulation and management gets too expensive, they will turn to alternatives and, unfortunately, consider selling off the family forest for subdivisions, strip malls, vineyards or other development.


Key Vocabulary

regulation
resource

Preparation

- Decide whether students will conduct interviews individually in the community or as a group in class with a panel of landowners you invite. To find possible forest landowners in your area to interview, contact your local chapter of the Oregon Small Woodlands Association ([http://oswa.org](http://oswa.org)) or your local OSU Extension Forester ([http://extensionweb.forestry.oregonstate.edu/directory](http://extensionweb.forestry.oregonstate.edu/directory)) and ask for a Master Woodland Manager.
- You may choose to have students use the questions provided on the student page or develop their own. If they will be developing their own questions, allow extra time for them to do so.

Procedure

1. Introduce the lesson by asking students what they think they could learn from local forest landowners about what it is like to own forestland.
2. Explain that students will interview forest landowners to find out about the choices, changes, and challenges landowners face. Depending on what you have decided, these may be individual interviews students conduct in the community, or a group interview in class with a panel of landowners.
3. You may have students use the sample interview questions on the “Forest Landowner Interview” student page or have them develop a different set of questions based on their interests or on local issues. If developing questions, have each student prepare one to three possibilities and as a class choose the best ones.
4. Provide copies of the final interview questions to use in conducting the interviews and for taking notes.
5. After the interviews, lead a class discussion about the findings:
   - What did students learn from the interviews about either individual owners or the choices and challenges they face?
   - What confirmed students’ prior understanding about forestland ownership? What was a surprise to them?
   - From the interviews, what can students infer about private forestland ownership in this ecoregion? In the state?
Assessment

• Students write a response to one of the following prompts:
  o Based on what you learned from the interviews, what is the biggest challenge private forest landowners in our area face? Use specific examples from the interview to support your view.
  o Based on what you learned from the interviews, what were the goals/objectives of the landowner? Use specific examples from the interview to support your view.

Extension Idea

Compare Oregon forest landowners with those across the United States by looking at data from the National Woodland Owner Survey, which is conducted periodically by the US Forest Service. For more information see “National Woodland Owner Survey” (available at Forest Inventory and Assessment, http://www.fia.fs.fed.us).
Forest Landowner Interview\textsuperscript{16}

Forest Landowner’s Name:

1. Describe the forestland you own: Where is it located? What types of trees, water, resources and built structures does it have? What is the surrounding area like?

2. How long have you owned this land? How did you acquire it?

3. Why do you own this forestland? What do you value most about it?

4. How do you use this land?

5. How do you make decisions about managing this forestland?

6. What are the biggest challenges you face in managing this forestland?

7. How has this forestland changed over the past 10, 20 or 50 years? In what ways has it stayed the same?

8. What do you see happening to this land in the next 10, 20 or 50 years?

9. What are your hopes and dreams for this forestland?

10. What are your biggest concerns about the future of this land?