SCIENCE

Caring for Our Lands

ESSENTIAL UNDERSTANDINGS

- **Tribal government**
- **Sovereignty**
- **History**
- **Lifeways**

LEARNING OUTCOMES

By the end of the lesson, students will be able to:

- **Describe how Siletz natural resource management practices have evolved over time.**
- **Describe the conservation and restoration efforts of the Confederated Tribes of Siletz Indians and how these efforts benefit the Tribal community, larger community, and environment.**
- **Apply design skills to create an environmental conservation plan.**

ESSENTIAL QUESTIONS

- **How does the natural world help people survive and thrive?**
- **What are the connections between Siletz people's ties to their ancestral homelands and current Tribal natural resource programs?**

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Overview

In this lesson, students will explore the values of environmental stewardship in the collective experience and contemporary work of the Confederated Tribes of Siletz Indians (CTSI). Students will first reflect on the importance of earth systems (geosphere, atmosphere, hydrosphere, biosphere) for human life and consider how different cultures understand the relationship between people and the environment. Students will then retrace some historical natural resource management practices of Native people from across western Oregon and learn about the current work of the Siletz Tribal Natural Resources Department to conserve and restore habitats within the ancestral territories of the bands who make up CTSI. Students will apply this learning by working in groups to create a plan for managing a stand of native Oregon oak under threat of encroachment by fir trees.

Background for teachers

Many animal species modify their surroundings to meet their needs. Beavers transform the hydrology and resiliency of surrounding environments. Sea stars play a crucial role in maintaining a healthy intertidal ecosystem by preventing mussel overpopulation. Humans are no exception. In securing

LOGISTICS

- **Where does the activity take place?** ***Classroom (virtual/distance learning option available)***
- **How are the students organized?**
  ☒ Whole class ☒ Teams: 3 – 4
  ☒ Pairs ☐ Individually

TIME REQUIRED

135 to 165 minutes

STANDARDS

Oregon science standards

MS-ESS3-3 - Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. *(Earth and Human Activity)*

Oregon math standards

Math 6.NSC - Compute fluently with multi-digit numbers and find common factors and multiples. *(The Number System)*

Oregon social sciences standards[1]

6.19 - Examine the historic and current contributions and relevance of Indigenous cultures. *(Historical Knowledge)*

Oregon English language arts standards

6.RI.7 - Integrate information presented in different media or formats as well as in words to develop a coherent understanding of a topic or issue. *(Reading Informational Text)*

6.SL.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly. *(Speaking and Listening)*

the materials essential for survival, humans' presence on the land alters the shape, appearance, and function of ecosystems. Different cultures have developed different understandings about the relationship of people to the natural world as well as different values about acceptable ways to treat the plants, animals, and land around us. These different values and philosophies can shape the impact of human activity on the wider world.

Ancestors of the Confederated Tribes of Siletz Indians come from many different Tribal bands whose homelands span what is now western Oregon and parts of northern California and southwest

[1] In 2018, the Oregon State Board of Education adopted grade-level social science standards for civics, geography, economics, financial literacy, history, historical thinking, and social science analysis. In February 2021, the board adopted new social science standards integrating ethnic studies into each of the social science domains and removed the co-identified multicultural standards. School districts may implement the 2021 social science standards beginning in March 2021. School districts are not required to implement the new standards until the 2026–27 school year. This lesson uses the 2021 version of the Oregon social sciences standards.

Washington. Over millennia, these peoples each developed ways of life that relied on an intimate understanding of the varied ecologies that they called home. As in many other Indigenous cultures, Native people across the region understood humans to be connected to the natural world—rather than seeing a separation between people and nature. Some Indigenous land management practices, like cultural burning, had profound impacts on the ecology of their homelands, playing a significant role in determining the types of plants and animals that survived in the environment. These practices were structured by a larger value system that emphasizes balance, sustainability, and avoiding waste, which allowed Native people to create thriving and resilient ecosystems that could support their societies.

When Euro-American settlers first encountered these ecologies in the mid-19th century, they often interpreted them as idyllic examples of undisturbed nature. As they began to colonize the region and force Native people away from the land, settlers brought with them a different understanding of the natural world. Settlers saw the land, waterways, and plant and animal populations in Oregon as "natural resources"—assets to be owned and controlled by individuals and "developed" to become more "productive." Industrial technologies and market capitalism enabled large-scale extraction of resources that radically transformed the ecologies of western Oregon

MATERIALS

- **PowerPoint presentation** (available in lesson materials; load the slides prior to the lesson to ensure they are displaying properly)
- **Classroom writing surface** (e.g., blackboard, whiteboard, chalkboard, chart paper and markers)
- **Classroom audiovisual technology** to display PowerPoint slides and videos
- **Classroom internet access** to enable groups of students to conduct research online in the classroom
- **STNRD Services and Projects Worksheet** handout (one copy per student)
- **Oak Stand Management Activity Packet** handout (one copy per group of three to four students)
- **"Cultural (prescribed) burn training, Oct. 16, 2021"** video from KLCC (run time: 7:00; available on YouTube at **https://www.youtube.com/watch?v=yTsxJJf5QQs**)

forests and waterways, while individual land ownership fractured complex ecosystems into individually managed units. To take just one example, fire suppression, urban development, farming, and fractured land ownership have reduced Oregon's oak savannah and upland prairie habitats in the Willamette Basin to less than 5 percent of their original range. Similar stories characterize many Native ecologies, from salmon fisheries to beaver and sea otter populations.

The exclusion of Native people from their homelands was a crucial part of this process. Confined to an ever-shrinking reservation on the Oregon Coast, Native people from western Oregon have had to struggle to access many of their traditional hunting and gathering areas as well as sacred places that connect them to traditional lifeways, cultural memories, and practices. Policies of assimilation have further eroded Indigenous ways of knowing—denigrating the expertise of Native people to care for the land, outlawing Indigenous land management and subsistence strategies like cultural burning or net fishing, and removing Indigenous children from their homes to be educated in boarding schools.

Despite all this, the people of the Confederated Tribes of Siletz Indians survived and persisted. Since restoration, the Tribe has worked to regain control or ownership of small parcels of land throughout its traditional homelands to help its members retain and regrow their connection to traditional lifeways and cultural practices. As part

VOCABULARY

Atmosphere – One of four main earth systems, comprising the envelope of gas that keeps the planet warm and provides oxygen for breathing and carbon dioxide for photosynthesis.

Biosphere – One of four main earth systems, comprising regions of the earth that can support life as well as the living things within them.

Ecological footprint – The impact of a person or community on the environment, expressed as the amount of land required to sustain their use of natural resources.

Geosphere – One of four main earth systems, comprising the interior and surface of the earth.

Hydrosphere – One of four main earth systems, comprising liquid water. (Water in ice form, such as exists at the earth's poles, is sometimes defined as a separate system, the "cryosphere.")

Indigenous land rights – The rights of Indigenous peoples to land, either individually or collectively. Land and resource-related rights are of fundamental importance to Indigenous people for cultural, spiritual, political, and economic reasons.

Natural resources – Land, water, living things, and materials or substances humans can use for subsistence, trade, and economic gain.

Oak savannah – Lightly forested grasslands where oaks are the dominant trees.

Sovereignty – The inherent authority of a nation to govern itself. Tribal sovereignty is the inherent right of a Tribal nation to create its own constitution, governance structure, and laws and to negotiate government-to-government treaties and other legal agreements with other sovereign nations.

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of this work, the Confederated Tribes of Siletz Indians has established and maintains the Siletz Tribal Natural Resources Department (STNRD). The STNRD integrates funding from multiple Tribal and external sources and works in collaboration with partner agencies to restore the health of Oregon's earth systems to benefit future generations. These initiatives include issuing firewood, hunting, and fishing permits; eradicating invasive species of plants and animals; restoring habitats; leading or contributing to projects aimed at restoring populations of "first-food" species including salmon, oysters, and lamprey; and working with agencies throughout the Northwest on environmental issues and the restoration of special places within the Siletz traditional homelands, such as Willamette Falls, the Portland Harbor Superfund Site, and the Siletz and Salmon River estuaries.

The STNRD applies both Siletz traditional ecological knowledge and Western scientific practices to provide a unique and innovative approach to environmental conservation and restoration on Tribally managed lands and beyond. As federal agencies and other land managers have slowly come to accept the importance of Indigenous knowledge, Tribal leaders and STNRD staff members have provided consultation and guidance to non-Native land managers throughout the region about the best way to build a healthy and resilient environment into the future.

VOCABULARY *(Continued)*

Stewardship – The careful and responsible management of something entrusted to one's care.

ADAPTIONS FOR DISTANCE LEARNING

The lesson is primarily structured around pair-shares and group work, but much of it can be adapted for distance or independent learning. A suggested sequence follows. Be sure all students have either print or electronic access to the materials described.

1. Hold a class meeting online and, using the PowerPoint slides and the steps in Activity 1 ("Humans and the natural world"), have students brainstorm and discuss (verbally or in a chat box, whiteboard, or online document) responses to the discussion prompts provided. Alternatively, you can post the prompts in your school's online classroom platform or an online document and have students respond to them asynchronously.
2. Using the PowerPoint slides and the steps, talking points, and discussion questions in Activity 2 ("Siletz natural resource stewardship"), provide a short unit on Siletz natural resource stewardship practices across time.

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To prepare for this lesson teachers should:

1. Review all materials for the lesson.
2. Decide if and how you will assess students' individual or group performance in lesson activities (see "Assessment" in the "Considerations for teachers" section).
3. Ensure students have access to all materials (printed and/or electronic) needed to participate in this lesson.
4. Prepare classroom audiovisual technology to display the PowerPoint slides and any other audiovisual materials to be reviewed together with students in class.
5. Write the lesson objectives and key vocabulary on a classroom writing surface.

References

Bull, B. (2021, October 19). Ancient Native American forest practices demonstrated in burn near Eugene. Oregon Public Broadcasting. **https://www.opb.org/article/2021/10/19/ancient-native-american-forest-practices-demonstrated-in-burn-near-eugene/**

Legacy Oaks Task Force and Prairie Task Force. (2008, February). Restoring Oregon white oak and Native prairie habitats in McDonald-Dunn Forest. **https://cf.forestry.oregonstate.edu/sites/default/files/Oak-Prairie_recommendations_Mar3-2008.pdf**

ADAPTIONS FOR DISTANCE LEARNING

(Continued)

3. Have students complete Activities 3 and 4 ("STNRD: Promoting wise use of CTSI Tribal natural resources" and "Oak stand management plan") in small groups working synchronously (e.g., via web conference breakout rooms) or asynchronously through your school's online classroom platform or another online document or collaboration tool. Alternatively, you can direct students to complete the activities independently or as homework. Ensure students have access to any information, documents, or links they need to complete the work. This may mean providing print or electronic copies of lesson materials and/or reformatting documents so students can work with them virtually.
4. Convene one or more follow-up online class meetings to review student group (or individual) work, debrief, reflect on the lesson (see steps in Activity 5, "Reflection"), and answer any remaining questions together.

Native American Rights Fund. (n.d.). Protect Tribal natural resources. **https://www.narf.org/our-work/protection-tribal-natural-resources/**

Pacific Birds Habitat Joint Venture. (2017). Prairie oaks and people: A conservation business plan to revitalize the prairie-oak habitats of the Pacific Northwest. **https://pacificbirds.org/wp-content/uploads/2017/10/Oak_Plan2017_v100517.pdf**

Rose, M. (2017, February). Columbia River fish weirs and wheels: Two divergent cultures. **https://www.confluenceproject.org/library-post/columbia-river-fish-weirs-and-wheels-two-divergent-cultures/**

Salmón, E. (2000, October). Kincentric ecology: Indigenous perceptions of the human-nature relationship. *Ecological Applications 10*(5): 1327–1332. **https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/1051-0761(2000)010%5B1327:KEIPOT%5D2.0.CO%3B2**

United States Forest Service. (n.d.). Success stories: Camas prairie restoration. **https://www.fs.usda.gov/detail/r6/fire-aviation/management/?cid=stelprdb5238525**

Willamette Partnership. (2020, March). Willamette Valley oak and prairie cooperative strategic action plan. **https://willamettepartnership.org/wp-content/uploads/2020/03/WV-Oak-and-Prairie-Cooperative-SAP-FINAL-3_2020-web.pdf**

Wilkinson, C. (2010). *The people are dancing again: The history of the Siletz Tribe of Western Oregon.* University of Washington Press.

Resources

- Confederated Tribes of Siletz Indians website
  - General information: **https://www.ctsi.nsn.us/**
  - Information on the Siletz Tribal Natural Resources Department: **https://www.ctsi.nsn.us/tribal-services/natural-resources/**
- Siletz curriculum resources
  - Tribal History/Shared History lessons

  - Lifeways of CTSI People Prior to Arrival, Parts 1 and 2 (Grade 4)
  - Keystone Species: Otters (Grade 6)
  - Termination (Grade 10)
  - Restoration (Grade 10)
  - Sovereignty and Tribal Government Today (Grade 10)
- OakBirdPop interactive online simulation: **https://aknw.shinyapps.io/oakbirdpop/**

Considerations for teachers

Assessment

Many activities in this lesson are built around student discussions in pairs or trios, in small groups, and with the whole class. Teachers can assess student learning by monitoring participation and engagement in these discussions. In addition, student-produced materials for Activities 3 ("STNRD: Promoting wise use of CTSI Tribal natural resources") and 4 ("Oak stand management plan") can be used as artifacts for formative or summative assessments of students' individual or group performance. You can review and assess them for accuracy, level of effort, and completion.

Practices

1. *Classroom discussion* – Large group, whole class discussion allows students to express their thoughts and hear the thoughts of others. For the instructor, this practice is a good way to take the pulse of the group and see what general themes emerge.

2. *Clear/Unclear window* – This technique can be used at the beginning or end of an assignment (or a significant segment of learning) to help students identify what they understand and what remains unclear to them. It can be used as both a brainstorming and an assessment technique and can be done as an individual or group exercise. Students draw a vertical line on a piece of paper, labeling the left side "Clear"

and the right side "Unclear." Students list the things they understand on the clear side and things they do not yet understand on the unclear side. If doing the activity as a class, the teacher can take on the role of recording the clear and unclear concepts on a classroom writing surface.

3. *Small group activities/discussions* – Small group activities allow students to share and analyze ideas with one, two, or three other people. This practice can be good for students who do not feel comfortable sharing their ideas with the whole class. The teacher should monitor group discussions to determine the degree to which students understand the concepts.

4. *Student group reporting and presentation* – When groups report what they have discussed or provide a brief presentation, it is important to have clear norms and expectations to ensure success. The teacher should be prepared to explain to the class how to listen respectfully when a classmate is reporting on group work. The teacher should also be prepared to help students gather their thoughts and explain main ideas if they are struggling to do so.

5. *Web research* – Reading information on a web page or website is different from reading it in a book or other printed text. Teachers should help students apply reading strategies that support learning from online text, including the skills of skimming, scanning, and using a web page or website's organization and navigation tools to locate specific information.

Learning targets

- I can describe how Siletz natural resource management practices have evolved over time.
- I can describe the conservation and restoration efforts of the Confederated Tribes of Siletz Indians and how these efforts benefit the Tribal community, larger community, and environment.
- I can apply design skills to create an environmental conservation plan.

Options/extensions

- Have students use the interactive OakBirdPop simulation tool (see link in "Resources") to explore, formulate, and test different hypotheses about the impacts that restoration actions will have on various bird populations in Oregon.
- Locate and make copies of (or share a link to) an online news article describing a local or statewide issue related to the environment and/or the use of natural resources—ideally one that involves Tribes as one of the multiple stakeholders. Have students read the article and engage in a discussion or "town hall" debate about the key issues and competing environmental, social, political, and economic interests at play. Potential topics or questions for debate might include:
    - *Should [a plant/animal species] be listed as threatened/endangered/protected?*
    - *What, if any, Oregon wilderness or scenic areas should be protected through the National Park Service or other federal, state, and Tribal conservation programs?*
    - *Should dams on the Columbia, Snake, and other major Oregon rivers be removed to restore wild native fish runs?*
    - *Should CTSI and other Tribal nations in Oregon adopt clean-power mandates, greenhouse gas limits, carbon taxes, or cap-and-trade programs?*

Appendix

Materials included in the electronic folder that support this lesson are:

- Slides_Caring for Our Lands.pptx
- Materials_STNRD Services and Projects Worksheet.doc
- Materials_Oak Stand Management Activity Packet.doc

Activity 1

Humans and the natural world

Time: 15 minutes

Overview

Students will reflect on what nature means to them, how earth's systems (biosphere, geosphere, hydrosphere, and atmosphere) support human life, and what responsibilities humans have to care for and protect those systems.

Step 1

Review the objectives and key vocabulary for the lesson with students.

Step 2

Ask students to think about a memorable experience they had in nature. Examples might include a walk or bike ride on a trail, a visit to the beach, a fishing or hunting trip, a camping trip with family, summer camp with a scouting or other youth organization, or a trip to a national park.

Step 3

Ask students to reflect on what they remember about the experience and/or record some thoughts in a journal or notebook. Suggested prompts include:

- *What did it feel like to be there?*
- *What types of animals and plants did you notice?*
- *What natural land and water features did you notice?*
- *What, if anything, did you notice about how humans were present? (e.g., were there any buildings? What were other people around you doing?)*

Activity 1 *(Continued)*

Step 4

Invite students to share their reflections with other students in pairs or trios. After a few minutes, invite a few students to share with the whole class what they discussed with their partners.

Step 5

Ask students to brainstorm and share ways that human life depends on the natural world (e.g., basic means of survival such as air, water, food, and shelter; useful materials for tools and trading that make life easier, more comfortable, and more enjoyable; opportunities for relaxation). Jot down their responses on a classroom writing surface.

Say:

Human life is not possible without healthy earth systems: the geosphere, hydrosphere, atmosphere, and biosphere. These systems supply the air we breathe, the water we drink, and the land we live on—which in turn supplies plants, animals, and materials that we eat or use to make things.

Step 6

Display the "Discussion prompt" slide (slide 2). Ask students to reflect on the prompt in silence for a few moments and then share their responses with their partner(s).

Say:

What responsibilities, if any, do humans have to care for and protect earth's systems?

Step 7

Point students back to the lesson vocabulary list and review the definition of "stewardship."

Activity 1 *(Continued)*

Step 8

Ask for a few student volunteers to describe what they think stewardship means in relation to how humans live in and interact with the natural world. Write their responses on the classroom writing surface.

Step 9

Prompt students to think more deeply about the idea of stewardship using such questions as:

- *What differences might there be in how different people and cultures think about stewardship of the natural world?*
- *Can views of stewardship change over time? What might cause people to think differently about how humans should care for and protect the natural world?*

Step 10

If students are having difficulty understanding different perspectives on stewardship, offer them an illustrative example, such as differing views on whether fires are helpful or harmful to forests or whether humans should be allowed to build in wetlands and floodplains.

Step 11

Summarize this activity and transition to the next by using or adapting the following script.

Say:

Humans' presence on the land has always altered the shape, appearance, and function of earth systems, but different cultures have different understandings about the relationship between people and nature as well different values about acceptable ways to interact with plants, animals, water, and land around us. As we'll see in this lesson, Native people in western Oregon, settlers, and more recent

Activity 1 *(Continued)*

arrivals to what is now western Oregon have contributed to land-use patterns and ecological footprints that impact human, plant, and animal life as we know it today. In the same way, our choices and ecological footprints will have consequences for the people, plants, and animals that will come after us.

Step 12

Take any questions from students before moving on.

Activity 2

Siletz stewardship

Time: 25 minutes

Overview

Students learn a brief history of the Siletz Tribes from time immemorial to the present day, with an emphasis on the Tribes' traditional and contemporary stewardship of natural resources.

Step 1

Display slide 3 ("Siletz homelands").

Say:

Ancestors of the Confederated Tribes of Siletz Indians come from many different Tribes and bands living in what is now western Oregon and parts of southwest Washington and northern California. These groups all developed land-management practices best suited to the ecologies they lived in to support their lives and cultures.

Step 2

Display slide 4 ("Siletz stewardship practices").

Say:

Depending on their location, Siletz people built weirs and traps in rivers and estuaries to catch fish, practiced controlled burning of grasslands to control brush and improve hunting, and tended fields or beds of certain food and fiber plants to ensure a more predictable supply of food and useful materials. These practices often had a major impact on the environment. Fire especially played a major role in determining the plant and animal populations of the region. But while Native people had a large impact on the environment, their land-management strategies created healthy and resilient ecosystems.

Activity 2 *(Continued)*

Step 3

Play the "Cultural (prescribed) burn training, Oct. 16, 2021" video from KLCC (see link in the "Materials" section).

Step 4

Ask students to share with a partner what surprised them or stood out for them in the video. Share the following talking points to confirm their understanding of the Indigenous stewardship practice of prescribed burning.

Say:

Oak savannahs are lightly forested grasslands where oaks are the dominant trees. Oak savannahs are a culturally important and threatened habitat in the Willamette Valley of Oregon. The homelands of Kalapuya peoples, these savannahs historically were maintained through intentional fires set by Native people to prevent the encroachment of other trees, maintain soil and plant health, and nurture the growth of plants and animals that supplied food, medicine, and useful materials. The controlled burns concentrated deer, making them easier to hunt; cleared underbrush from around oak and hazel trees to increase nut production; stimulated berry and root production, especially in camas prairies; enabled the gathering of insects, particularly grasshoppers; and pruned willow and hazel trees for basketry material. The burns also promoted deer and elk habitat and reduced the number of conifers and other brush that can quickly overtake open prairies and savannahs. People learned to start fires at carefully chosen points in the year to make sure that they would burn without being destructive. Today, CTSI Tribal members and natural resources staff still use controlled burns as a restoration tool and to maintain connections to traditional lifeways.

Beginning in the 1850s, Euro-American settlers converted the oak savannah to urban and agricultural land and outlawed the practice of controlled burning. As a result, the Willamette Basin now contains less than five percent of the original oak savannah and upland prairie habitats. This means Oregon is in danger of losing

Activity 2 *(Continued)*

one of its unique habitats and landscape features that make it a special place to live as well as a habitat for rare species of flowers, butterflies, and insects.

Step 5

Prompt students to a deeper level of understanding using the following talking points and prompt.

Say:

Like other Indigenous cultures, the Tribes and bands who make up today's Confederated Tribes of Siletz believe that humans are rooted in and inseparable from the natural world and that other living things are their relatives. That is a little different than modern American culture, which often sees a separation between nature and people. Let's think about how these different ways of thinking might change behavior with a more concrete example. Think about how people talk about environmental conservation today. Do most people seem to think of humans as part of the environment, or do they seem to think nature is a separate thing that must be protected from people? How might the way that you think about environmental conservation change depending on your view about the relationship between nature and people?

Step 6

Prompt students to think through the implications of these different views of the relationship between nature and people. The examples below can prompt the conversation:

- *Should conservation mean removing people from areas or changing the way people interact with environment?*
- *Should landowners be permitted to kill "nuisance" wildlife (for example, coyotes, bears, beavers, sea lions, or wolves)?*

Activity 2 *(Continued)*

Say:

Thank you for sharing! These are great examples of how views on the relationship between people and the natural world can impact the way that people act. In the case of Siletz people, their understanding of the world tended to act as a restraint on consumption and promoted conservation practices such as disassembling parts of fish weirs and traps when not in active use, rotating use of gathering sites to prevent over-harvesting, developing limits on fishing and gathering times, cultural expectations to share food, and taboos against waste or hoarding food. As a result, Siletz people across western Oregon were able to create thriving and resilient ecosystems that relied on the presence of human people to function and could support their cultures and societies.

Step 7

Display slide 5 ("Impacts of settlement").

Say:

Several aspects of Euro-American settlement drastically changed the relationships between Oregon's Indigenous peoples and their landscape. New diseases led to the death or disability of many Indigenous people. In some regions, like the Willamette Valley, more than 95 percent of the people who would have been tending the land died. From the early 1800s onward, fur traders trapped thousands of beavers and river otters to near extinction, which disrupted many waterways. Beginning in the mid-1850s, settlers coming to Oregon forced the different Tribes away from their lands onto a reservation at Siletz. Settlers brought cultural values and tools for interacting with the natural world that were different from those used by Indigenous people.

Step 8

Ask students what they think each picture on the slide represents and the impact it had on the Siletz Tribes and the earth systems of Oregon. If students need help, you can use the following talking points.

Activity 2 *(Continued)*

- *Barbed-wire fences:* Fences represent a different way of thinking about land ownership and responsibility than was familiar to Native people in western Oregon. For settlers, land was private—for an individual person or family's exclusive use—and could be sold at any time, as opposed to communally managed, in which all members of a family, village, band, or even other Tribes assumed responsibility for caring for a certain area. Settlers fenced off their private lands so that Siletz Tribes could no longer access fields, forests, and waterways to gather plant and animal foods. Siletz Tribes were moved to reservations far from their ancestral homelands on land that was difficult to farm or ranch.
- *Logs:* Settlers logged forests to clear land for farming, ranching, homesteading, and to make money. This reduced the ability of Siletz Tribes to use trees for shelter, food, and materials and also destroyed old-growth forest habitats. The government outlawed many traditional land-management techniques, such as cultural burning, which made the forest that remained more prone to larger-scale, catastrophic fires.
- *Cows:* Settlers brought non-native domesticated food animals such as cows, sheep, goats, pigs, and chickens with them. Free-ranging herds of cattle and sheep trampled grasslands and meadows and stripped them of native plants that Native people had relied on for food.
- *Wheat field:* Settlers cleared land to grow non-native species of food plants for their own use and commodity crops to sell at a profit or to feed to animals—reducing the acreage available to native plants and animals that played important roles in the lives of Indigenous people.
- *Dams:* Settlers built infrastructure such as dams, bridges, and roads that disrupted wildlife corridors, fish habitats, bird migration routes, and salmon runs. Along with over-fishing and destruction of riparian zones by logging, settlers managed to all but destroy one of the most productive fish runs on the entire planet within less than a century.

Activity 2 *(Continued)*

Step 9

Display slide 6 ("Conservation challenges").

Say:

These changes have been just as devastating for Siletz people, reducing access to much of their ancestral homelands as well as the ability to hunt, fish, and gather food in many of the places that have sustained them for generations. Even some of the sacred places that connected Siletz people to ancestral lifeways and cultural memories have been destroyed or are no longer accessible. The larger environmental disturbances that have reduced Oregon's earth systems' life-supporting capacities and compromised their natural resiliency are part of the same processes that removed Native people from their lands.

Step 10

Ask students why they think each challenge listed on the slide makes protecting and repairing Oregon's earth systems more difficult. If students need help, you can use the following talking points.

- *Fractured land ownership and uses:* This refers to the breaking up of land into smaller parcels owned by different people and groups who have differing land use interests and incentives. For example, one owner of a parcel of forest land might want to build a summer home on it, her neighbor might want to cut down and sell all the trees to fund her retirement, and another neighbor might want to sell his land to a trust to protect it from development. This can be a challenge for environmental conservation and restoration work that requires consent and support from multiple landowners, such as the restoration of fish habitat in a stream that crosses several private properties. It also makes it difficult to preserve the large contiguous areas that many species need to survive and thrive.

Activity 2 *(Continued)*

- *Pollution:* Certain kinds of harmful, human-created substances can poison the air, soil, and water for living things (including humans) for many years. These poisons can migrate and cause damage far from their sources, combine in unpredictable ways, and be complicated and expensive to clean up. Pollution can make eating traditional foods or gathering traditional materials dangerous for Native people, putting Indigenous communities at special risk.
- *Habitat loss:* Loss of habitat can endanger native or rare plant and animal species and cause them to go extinct. This loss can also be directly detrimental to humans, such as when filling in a wetlands area causes flooding of homes and businesses during the rainy season or diminishes or degrades recreational opportunities. Lost habitat can sometimes be restored, but it may not return to its original biodiversity due to the disappearance of native plants and animals.
- *Native species extinction:* Loss of native plants and animals diminishes biodiversity in an area and makes the remaining ecosystem more vulnerable to disease and other stressors. Non-native and introduced species can exploit the loss to take over spaces where native species have retreated or disappeared—often with negative consequences for the larger environment. Since all species are connected, the loss of one type of animal can transform the entire ecosystem (see the Keystone Species: Otter lesson).
- *Climate change:* Climate change can cause both habitat loss and native species extinction as earth systems are changed by a warming climate and native plants and animals that cannot adapt either die or are replaced by non-native species that can survive in the changed environment. Climate change can also work against human efforts to conserve and restore habitats. For example, humans might remove dams and restore fish habitat to bring back native salmon runs to a river or stream. However,

Activity 2 *(Continued)*

low water flows and rising water temperatures (which salmon, as a cold-water species, can't tolerate) caused by climate change-induced droughts and climate-warming may still prevent the salmon from returning.

Step 11

Ask students what they think about the challenges listed on the slide and what they and others can do to conserve and restore Oregon's earth systems. Do the challenges make the students feel discouraged, inspired, or both?

Step 12

Display slide 7 ("Siletz Tribal Natural Resources Department mission") and review with students, making a transition to the next section.

Say:

Despite the oppression and assaults on their cultures and lands, the people of the Confederated Tribes of Siletz Indians have survived and persisted. Since restoration, the Tribes have worked to regain control or ownership of parcels of land within their peoples' traditional homelands to help their members retain a connection to traditional lifeways and cultural practices, provide resources to support Tribal members, and steward resources for the benefit of future generations. In a moment, we'll explore in detail how the Siletz Tribal Natural Resources Department (STNRD) supports the Tribes in carrying out this work.

Step 13

Take any questions from students before moving on.

Activity 3

STNRD: Promoting wise use of CTSI Tribal natural resources

Time: 25 minutes

Overview

Students review a framework of natural resource services and activities and apply it to examine the STNRD web page to identify ways in which the Siletz Tribes control and manage their natural resources and promote wise use.

Step 1

Ask students what they know about how states and Tribal nations manage their natural resources. Then lead the students through a clear/unclear window exercise (see description in the "Considerations for teachers" section) to help them identify what they do and do not know about natural resource management. Guide them to understand the range of resource management, conservation, and restoration activities, tools, and rules that Tribes and states use and enforce.

Step 2

Distribute one copy of the "STNRD Services and Projects Worksheet" handout to each student.

Step 3

Display slide 8 ("Natural resource services").

Step 4

Review and discuss the handout and slide with students, explaining any unfamiliar words and reviewing the examples for each type of natural resource service and activity in the handout.

Activity 3 *(Continued)*

Say:

The handout and slide identify different types of activities and services that states and Tribes use to manage the lands, waters, plants, and animals under their jurisdiction and how their citizens and others access and use them. Not every state or Tribe always offers all of them; for example, CTSI does not currently provide services for or enforce rules regarding the use of farmland.

Step 5

Sort students into groups of three to five using your preferred method and have them identify a reporter who will summarize the group's work for the whole class.

Step 6

Support student groups to get online using classroom technology or their own devices and navigate to the **STNRD web page.**

Step 7

Invite students to go on a "treasure hunt" on the STNRD web page, looking for examples of different types of natural resources, activities, and services the department offers and writing down the names and a short description of each offering in the section(s) of the "STNRD Services and Projects Worksheet" where they best fit. Reassure students that they do not need to read or understand all information on the web page, as some programs and services have longer descriptions, more technical terms, and links to additional documents. Rather, students should skim or scan the web page and linked documents to look for labels, keywords, short descriptions, and other clues to get a general sense of what types of natural resource services are offered by the department and to whom. You might consider working through an example together with the whole class to model how the activity should be completed, reviewing an STNRD activity or service and placing and describing it in a row of the handout.

Activity 3 *(Continued)*

Step 8

Allow time for student groups to work on the activity. Walk around the classroom and monitor students as they work, ensuring they are on task and redirecting or answering questions if they are stuck or off task.

Step 9

When groups are finished (or have made satisfactory progress if time is short), have group reporters take turns summarizing examples their group found.

Step 10

Prompt students to think about what, if anything, they learned in their research on the STNRD that might be special or unique to how the Siletz Tribes steward their natural resources:

- *The state of Oregon and various Tribal nations in Oregon provide similar natural resource services and activities. What do you think makes the Siletz Tribes' offerings unique or different?*
- *How does maintaining its own natural resources department express CTSI Tribal identity and sovereignty?*

Step 11

Guide students to understand the ways in which the services and activities of the STNRD benefit Siletz members directly, are intended to respect the unique needs and experiences of the Siletz people, and are rooted in and support Siletz cultural values and aspirations. These services recognize and honor the unique identity of Tribal members as Siletz people, and thus also embody the collective identity of the Siletz Tribes and their sovereign rights and responsibilities to manage their affairs and resources to serve the health, welfare, and prosperity of their members as they see fit.

Activity 3 *(Continued)*

Say:

The federal government recognizes Indian Tribes as sovereign nations with the right to determine their own futures through programs like the Natural Resource Department. In exercising this self-determination, the Confederated Tribes of Siletz Indians seek to protect a distinctive Siletz cultural identity and restore, heal, and protect the lands, animals, and plants that their way of life depends on. As we have discussed, modern Tribal governments today use a mixture of scientific practices and traditional knowledge to care for Tribal lands. Tribes and Tribal knowledge can also play an important role in the restoration of lands not owned or managed by the Tribe. Tribal staff members and leaders often collaborate with other land managers to care for lands from all over western Oregon.

Step 12

Take any questions from students before moving on.

Activity 4

Oak stand management plan

Time: 60 – 90 minutes

Overview

Students work in groups to create a proposal to clear unwanted vegetation from a small parcel of oaks managed by CTSI.

Step 1

Sort students into new groups of three to four, if you wish.

Step 2

Distribute copies of the "Oak Stand Management Activity Packet" handout (one copy per student group).

Step 3

Review the activity scenario and instructions on the first page of the handout. Students will work in groups to review the information provided and prepare and present a proposal to use a mix of modern and traditional conservation and restoration tools to remove unwanted vegetation from a stand of native Oregon oaks managed by CTSI.

Step 4

Allow time for student groups to work on the activity and answer the questions in their handouts. Walk around the classroom and monitor students as they work, ensuring they are on task and redirecting or answering questions if they are stuck or off task. Depending on available time and student progress, you may decide to omit certain parts of the activity or assign them to be completed individually or in groups outside of class.

Activity 4 *(Continued)*

Step 5

When groups are finished, have them present the plans they created to the whole class.

Step 6

Take any questions from students before moving on.

Activity 5

Reflection

Time: 60 – 90 minutes

Overview

Students reflect on what they learned in the lesson.

Step 1

Review the learning targets for the lesson.

Step 2

Hold an informal debrief of what stood out to students in the lesson and why. This can be done as a pair-share or group discussion with a report-out or as a whole-class discussion.

Step 3

Take and answer any final questions students may have.

Step 4

Collect students' completed "STNRD Services and Projects Worksheet" and/or plans from the "Oak Stand Management Activity Packet" activity if using them for assessment purposes.