



SCIENCE

Otter Worlds: Keystone Species in Culture and Environment

ESSENTIAL UNDERSTANDINGS

- History
- Lifeways

LEARNING OUTCOMES

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

- Explain trophic systems and the movement of energy through a food web between producers and consumers.
- Describe the role of keystone species in food webs and ecosystems.
- Describe the importance of sea otters and the interrelationship between sea otters and Tribal people in Oregon.
- Work with others to design and test a plan for reintroducing sea otters to the Oregon Coast.

ESSENTIAL QUESTIONS

- Why are sea otters important to the ecology of the Pacific Coast of North America?
- In what ways can human activity impact ecological systems and biodiversity?

LOGISTICS

- Where does the activity take place?
Classroom
- How are the students organized?
 - Whole class
 - Teams: 3 – 4
 - Pairs
 - Individually

TIME REQUIRED

Two hours

Overview

In this lesson, students will examine the role sea otters once played in Oregon coastal ecology and traditional Tribal culture. Students will explore the role of sea otters in ocean food chains, food webs, and trophic levels (position occupied in the food chain) to gain an understanding of the importance of sea otters and the impact of their local extinction on Tribal peoples. Students will then explore current efforts of the Confederated Tribes of Siletz Indians (and others) to restore sea otters to the Oregon Coast and will use an interactive online tool to design a sea otter reintroduction plan for the Oregon Coast.

Background for teachers

Sea otters are special. They are three times the size of their relative, the river otter, and live their entire lives in saltwater, making them marine mammals similar to seals, sea lions, dolphins, and whales. Sea otters protect themselves from the cold Pacific Ocean by having the densest fur that exists in nature and by having a very high metabolism (eating 25% or more of their body weight each day). This means that although sea otters are the smallest marine mammal, their constant foraging



in small areas on the nearshore sea floor (on invertebrates such as sea urchins, crabs, clams, sea stars, snails, mussels, and many others) makes them integral consumers in the coastal ecology of the Pacific Coast of North America. Sea otters are a keystone species for kelp forest ecosystems, where they feed on sea urchins, powerful primary consumers that can eat many pounds of kelp each day and decimate kelp forests if left unchecked by sea otter predation.

While sea urchins fill an important niche—in some coral reefs, for example, they maintain the balance between coral and algae—if their populations are not controlled by sea otters, sea stars, humans, or other predators, urchins can overeat *producer* species, scouring reefs and destroying kelp forests. The loss of kelp deprives other species of food and shelter, thus reducing biodiversity. Human life is increasingly impacted by coral reef and kelp forest loss due to the loss of habitat for fish and shellfish species we eat and by the loss of an important biological mechanism for capturing and sequestering planet-warming carbon dioxide.

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.

STANDARDS

Oregon science standards

MS-LS1-6 - Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.

MS-LS2-1 - Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS-ESS3-3 - Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

MS-ETS1-4 - Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Oregon social sciences standards¹

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*)

At one time there were thousands of sea otters along the Oregon Coast. Major features on the coast, such as Otter Rock, took their names from the plentiful sea otters living there. Today, except when single otters from Washington drift through, there are none.

The same adaptations that make sea otters ecologically unique also shape their relationship to humans: Everywhere sea otters live, humans value their uniquely soft fur. Oregon Tribal people hunted sea otters for their soft silky pelts, which were used in practical and ceremonial clothing. Otter-skin robes were rare and valuable enough to be a way for a person to demonstrate their wealth or to be part of the momentous gifts between two families to seal a marriage. Despite their huge value, archaeology at ancestral village sites demonstrates that Tribal ancestors kept their hunting to sustainable levels across millennia.

Beginning in the 1700s, Europeans and later Euro-Americans began exploring the Pacific Coast. They learned about the large numbers of sea otters, beavers, and other fur-bearing animals in the region and their value in the international fur market. Early explorers traded with the coastal Tribes for pelts and brought them back to their home countries, where they became a popular material for making clothing and accessories.

² From: O’Leary, M. (2016). Maintaining diversity with keystone species. In P. Pappas (Ed.), *From silt to salt: A multicultural teaching guide to Southcentral Alaska* (pp. 26–28). Published under Creative Commons License **CC BY-NC 3.0 US**. Used with permission.

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 access online resources and allow students to conduct research online in the classroom
- **“Sea Otter Turn-Based Game”** handout (one copy per group of three to four students)²
- **Supplies for the sea otter turn-based game** (if using; see handout above for supply list)
- **“Take a Virtual Dive in a Kelp Forest”** video from the California Academy of Sciences (run time: 3:18); available on YouTube <https://youtu.be/HGMvPqfcDok>
- **“Some Animals Are More Equal Than Others: Keystone Species and Trophic Cascades”** video from HHMI BioInteractive via Oregon Public Broadcasting (run time: 19:27); available at <https://opb.pbslearningmedia.org/resource/keystone-species-trophic-cascades/some-animals-are-more-equal-than-others-the-serengeti-rules/>)
- **“Sea Otter Reintroduction Habitat Study”** handout (one copy per group of three to four students)
- **“Oregon Sea Otter Reintroduction Plan”** handout (one copy per student)

People in China, Russia, England, Western Europe, and the Eastern United States wanted beaver hats and otter coats and shawls. Sea otter pelts were especially valuable to Euro-American merchants, who needed expensive goods that were popular in China to trade for tea, silk fabrics, and other luxury goods they could then sell in their home countries.

Several Euro-American companies, such as the Russian American Company, the Hudson Bay Company, the North West Company, and the Pacific Fur Company, established trading posts along the Pacific Coast to acquire fur pelts. Independent merchants also struck out from ports like Boston to voyage around the world for sea otter pelts. Collectively, these ventures were called the maritime fur trade. Although Indigenous peoples on the entire Pacific Coast had hunted, trapped, and traded for sea otter, beaver, and other fur-bearing animals since time immemorial, this economic boom induced both Euro-American and Indigenous hunters to kill far beyond sustainable levels, both in Oregon and all around the Pacific Rim. From the 1740s until an international agreement outlawed the practice in 1911, sea otters were killed by the thousands and disappeared from many of their habitats. As a result, there are no sea otters living along the Oregon Coast today.

Recognizing the ecological and cultural value of sea otters, the Confederated Tribes of Siletz Indians and others are collaborating on a plan to reintroduce sea otters to the Oregon Coast. The Tribe sup-

VOCABULARY

Apex predator – A predator at the top of a food chain that is not preyed upon by any other animal.

Biodiversity – The variety of life in a particular habitat or ecosystem. Ecological communities with higher *biodiversity* form more complex trophic paths.

Carnivore – A consumer in a food chain or web that eats primarily tissues (“meat”) of other organisms. Sometimes called *predators*.

Chemosynthesis – The synthesis of organic compounds by organisms using energy from reactions involving inorganic chemicals in the absence of sunlight.

Consumer – An organism in a food chain or food web that cannot manufacture its own food and thus must eat producers or other consumers. Can be herbivores, carnivores, or omnivores.

Detritivore – An organism that feeds on waste or dead organic material.

Ecological pyramid – A representation showing the relationship and flow of energy between different organisms and trophic levels in an ecosystem. In ecosystems where energy captured through photosynthesis enables organic life, the ecological pyramid illustrates the movement of solar energy through the trophic levels. Energy is lost at each change in trophic level, as transfers of energy between organisms are inefficient.

Food chain – The sequence of transfer of energy and matter in the form of food from organism to organism.

Food web – A system of interlocking and interconnected food chains.

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ports the main organization pursuing this initiative, the Elakha Alliance, which takes its name from the Chinuk Wawa trading language word for the sea otter, *elakha* (ee-LAK-uh). The alliance was formed in 2018 by Tribal, nonprofit, and conservation leaders with a shared vision of restoring a thriving sea otter population and a robust and resilient marine ecosystem on the Oregon Coast, for the benefit of current and future generations.

To prepare for this lesson teachers should:

1. Review all materials for the lesson.
2. Decide if you will incorporate the biodiversity turn-based game detailed in the “Sea Otter Turn-Based Game” handout (see “Materials”) and gather the required supplies.
3. Decide if and how you will assess students’ individual or group performance in lesson activities (see “Assessment” in the “Considerations for teachers” section).
4. Ensure students have access to all materials (printed and/or electronic) needed to participate in this lesson.
5. Prepare classroom audiovisual technology to display the PowerPoint slides and audiovisual materials to be reviewed together with students in class.
6. Write the lesson objectives and key vocabulary on a classroom writing surface.

VOCABULARY *(Continued)*

Herbivore – A consumer in a food chain or web that eats primarily plants.

Keystone species – An organism that is critical to the survival of other species. Without its keystone species, an ecosystem can change dramatically or even collapse.

Omnivore – A consumer in a food chain or web that eats both plants and animals.

Photosynthesis – The synthesis of organic compounds by organisms using energy from the sun.

Population density – The number of an organism within an area divided by the amount of area.

Predator – A consumer in a food chain or web that kills and eats other consumers.

Producer – An organism in a food chain that makes its own energy. Examples include plants, bacteria, algae, and phytoplankton.

Trophic level – A level or a position in a food chain, a food web, or an ecological pyramid. A food chain starts at trophic level 1 with primary producers such as plants. Herbivores are at level 2, and carnivores are at level 3 or higher, including apex predators at levels 4 and 5. In many ecosystems, there is more than one food chain for most organisms since many organisms eat more than one kind of food and/or are eaten by more than one predator species.

References

O’Leary, M. (2016). Maintaining diversity with keystone species. In P. Pappas (Ed.), *From silt to salt: A multicultural teaching guide to Southcentral Alaska* (pp. 26–28). Published under Creative Commons License CC BY-NC 3.0 US. Used with permission.

Oregon Coast Aquarium. (n.d.). *Diving into Oregon’s kelp forests*. <https://aquarium.org/wp-content/uploads/2022/05/Kelp-Forests-Teachers-Guide.pdf>

Tinker, M. T., Estes, J., Bodkin, J., Larson, S., Murray, M., & Hodder, J. (2022, January). *Oregon sea otter reintroduction feasibility study*. Elakha Alliance. <https://www.elakhaalliance.org/feasibility-study/>

Resources

- Confederated Tribes of Siletz Indians website: <https://www.ctsi.nsn.us/>
- Elakha Alliance website: <https://www.elakhaalliance.org/>
- Elakha Alliance video channel: <https://www.youtube.com/c/ElakhaAlliance>
- Monterey Bay Aquarium, Animals A–Z: Sea Otter: <https://www.montereybayaquarium.org/animals/animals-a-to-z/sea-otter>
- Oregon Sea Otter Population Model interactive online simulation: https://nhydra.shinyapps.io/ORSO_app/

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 (“Warm-Up”), have students brainstorm and discuss (verbally or in a chat box, white-board, or online document) responses to the provided prompts. 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 a web-conferencing or online meeting platform, the PowerPoint slides, and the steps and talking points in Activity 2 (“Sea Otters as Keystone Species”), provide a virtual lecture and class discussion on the importance of sea otters to the Pacific Coast ecology of North America and the history of human interactions with Pacific sea otter populations. Invite students to play the turn-based activity game at home with their families or friends.
3. Using a web-conferencing or online meeting platform and the steps provided in Activity 3 (“Sea Otter Reintroduction Plan”), prepare students to work in small groups or independently to prepare and write up a plan for restoring sea otters to the Oregon Coast. You may need to adapt the activity to make it visible and/or accessible for students to work on online and/or asynchronously. You can have students or groups present their work at the next online class meeting.

(Continued on next page)

- Siletz curriculum resources
 - Lifeways of Confederated Tribes of Siletz Indians People Prior to Arrival, Parts 1 and 2 (Grade 4)
 - Conservation and Restoration (Grade 6)

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 the turn-based game in Activity 2 (“Sea Otters as Keystone Species”) and otter restoration plan in Activity 3 (“Otter Restoration 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.

ADAPTIONS FOR DISTANCE LEARNING

(Continued)



4. Convene a final online class meeting to review and reflect on the lesson together (see steps in Activity 4, “Reflection”) and answer any remaining questions.

- 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.
- 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.

Learning targets

- I can explain trophic systems and the movement of energy through a food web between producers and consumers.
- I can describe the role of keystone species in food webs and ecosystems.
- I can describe the importance and interrelationship of sea otters to human life in Oregon.
- I can work with others to design and test a plan for reintroducing sea otters to the Oregon Coast.

Options/extensions

- Have students use the interactive Oregon Sea Otter Population Model simulation tool (see link in “Lesson resources”) to test their sea otter reintroduction plans and/or formulate and test hypotheses about how to increase the likelihood of successful reintroduction of sea otters by adjusting and reviewing the resulting graphs and maps.

- Have students research another example of a keystone species in Oregon and present its ecosystem and food web in a manner and medium of their choosing (e.g., art, poetry, narrative, model).
- Tell your students to imagine that they have been asked to teach a class of Oregon elementary students about sea otters. Challenge them to write a script or simple lesson plan for a 25-minute class or presentation that provides younger students with essential information about sea otters, including:
 - Basic facts about sea otters
 - Why sea otters are important to coastal ecosystems
 - How humans have viewed and used sea otters
 - What happened to sea otters on the Oregon Coast
 - What students can do to help bring sea otters back to Oregon

Appendix

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

- Slides_Otter Worlds.pptx
- Materials_Sea Otter Turn-Based Game.pdf
- Materials_Chapter 6_Habitat Suitability_Elakha Alliance Sea Otter Reintroduction Feasibility Study.pdf
- Materials_Oregon Sea Otter Reintroduction Plan.doc

Activity 1

Warm-Up

Time: 15 minutes

Overview

Students will activate their prior knowledge of ecological concepts and terminology through a thought experiment in which they conceive of themselves as part of a food web.

Step 1

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

Step 2

Using the following prompts, ask students to work in pairs to think about ways in which their community is rooted in an ecology or habitat and how they themselves are part of a food web.

- *What are some food webs you can think of in the world around you, maybe even on your own street or in your own home?*
 - Example:
 - Plants (producers, trophic level 1) grow around your house and in your garden; insects (herbivore consumers, trophic level 2) eat the plants; birds (carnivore consumers, trophic level 3) eat the insects; larger birds, cats, and raccoons (carnivore consumers, trophic level 4) prey on the smaller birds and/or their eggs; coyotes and mountain lions (carnivore consumers and apex predators, trophic level 5) prey on cats and raccoons.
- *What are the components of your “food web?”*
 - *What types of animals and plants do you eat?*
 - *Where do those animals and plants get their food?*

Activity 1 *(Continued)*

- *Where does your food come from?*
- *What types of people and organizations are involved in producing it for you?*
- *What might happen if you lost access to a source of food (e.g., if a grocery store closed or the cost to produce a certain food made it unaffordable)?*

Step 3

After a few minutes, invite a few students to share with the whole class what they discussed with their partners.

Step 4

Take any questions from students before moving on.

Activity 2

Sea Otters as Keystone Species

Time: 45 minutes

Overview

Students learn about the importance of sea otters to the ecology of the Pacific Coast of North America and the impact of past and present human activity on sea otter populations.

Step 1

Using slides 2–9 and information from the “Background for teachers” section above, deliver a “mini-teach” on food webs, trophic levels, the role of sea otters as a keystone species in the ecology of the Pacific Coast of North America, and the past and present history of human interactions with sea otters on the Oregon Coast. A suggested sequence with scripted language follows.

Slide 2

“Food chains and food webs” illustrates the concepts of food webs and food chains.

Step 2

Pause to discuss slide 2 with students. Ask them to think back to the warm-up activity and have them make connections between the concepts and definitions of food webs and food chains and where students fit as organisms in the “food webs” of their communities.

Say:

A food chain represents an integrated biological process through which organisms (called producers) capture energy and combine it with inorganic materials to manufacture food for themselves. Consumers are organisms that cannot manufacture their own food and thus eat producers or other consumers. Consumers that eat plants are called herbivores, while consumers that eat animals are called

Activity 2 (Continued)

carnivores or predators. Consumers are called omnivores if they eat both plants and animals. Detritivores are decomposers that feed on waste and dead matter, reconverting them to inorganic materials for plants to use. A food web is a representation of the network of overlapping and cross-cutting food chains. Ecological communities with higher biodiversity form more complex trophic paths.

Slide 3

“Trophic levels” illustrates the concepts of trophic levels and ecological pyramids.

Step 3

Pause to discuss slide 3 with students. Ask them to think what trophic level humans typically occupy in the habitats they live in.

Say:

The trophic level of an organism is the position it occupies in a food chain. A food chain starts at trophic level 1 with primary producers such as plants. Herbivores are at level 2, and carnivores are at level 3 or higher, including apex predators at levels 4 and 5. The trophic systems of ecosystems are often depicted as ecological pyramids. In ecosystems where energy captured through photosynthesis enables organic life, the ecological pyramid illustrates the movement of solar energy through the trophic levels.

Slides 4 and 5

“Otters in Oregon” and “Sea otter essential facts” provide more information on sea otters.

Step 4

Pause to discuss the sea otter information provided on slides 4 and 5 with students. Note that sea otters have been extinct in Oregon since around 1910.

Activity 2 (Continued)

Step 5

Ask students the following questions to activate what they already know or think about the ecological niche of sea otters. Record their ideas on a classroom writing surface (or have a student volunteer record them for you).

- *What trophic level do you think sea otters fall into in their ecological food web?*
- *What do sea otters eat, and what might eat them?*

Slide 6

“Sea otters and coastal ecology” provides key points and a link to a video that describes and illustrates the role of sea otters in the ecology and food web of kelp forest ecosystems.

Step 6

Pause to discuss with students the text presented on slide 6.

Step 7

Play the “Take a Virtual Dive in a Kelp Forest” video from the California Academy of Sciences (click image on slide 6 or use link provided in the “Materials” section).

Step 8

Debrief the video with students, answering any questions they may have and asking them to share key details that stood out or surprised them. Then ask the following questions to deepen their thinking and jot down a few of their responses on the classroom writing surface (or have a student volunteer record them for you).

- *What do you think would happen if sea otters were to disappear from their food chain/food web?*

Activity 2 (Continued)

- *What would happen to the animals both below and above them in their ecological pyramid?*
- *What might that do to the habitat the sea otters live in?*

Step 9

As time permits, select and engage students in one or both of the following activities to deepen their understanding of the concepts and terms of food chains/webs and ecological pyramids as they relate to sea otters.

- *Option 1* - Organize students into groups of three to four and invite them to play the biodiversity turn-based game using the instructions and materials detailed in the “Sea Otter Turn-Based Game” handout (see “Materials”). Debrief the activity with students using the prompts provided in the handout.
- *Option 2* - Play the “Some Animals Are More Equal Than Others: Keystone Species and Trophic Cascades” video from HHMI BioInteractive via Oregon Public Broadcasting (see link in the “Materials” section).

Step 10

Debrief the game and/or video with students, answering any questions they may have and inviting them to share what they think are the most important takeaways. Then share the following to reinforce and expand upon important terms and ideas.

Say:

Sea otters are integral consumers in the coastal ecology of the Pacific Coast of North America. They are particularly essential to kelp forest ecosystems, where they feed on sea urchins, powerful primary consumers that can eat large quantities of kelp each day. If sea urchin populations are not controlled by sea otters or other predators, they can over-consume and destroy kelp forests. The

Activity 2 (Continued)

loss of kelp deprives other species of food and shelter, reducing biodiversity and destabilizing the near-shore ecosystem. Ultimately, all life is impacted by the destruction of kelp forests since healthy kelp forests, like forests on land, capture and sequester planet-warming carbon dioxide.

Step 11

Answer any questions from students before moving on.

Slides 7 and 8

“Sea otters and humans” and “Sea otters and humans (continued)” provide historical information about the interaction between sea otters and humans in what is now called Oregon.

Step 12

Pause to discuss the information provided on slides 7 and 8 with students. Share the following to reinforce and expand upon important terms and ideas presented on the slides.

Say:

At one time there were thousands of sea otters along the Oregon Coast. But that’s not true today. Beginning in the 1700s, Europeans and later Euro-Americans began exploring the Pacific Coast. They learned about the large numbers of sea otters, beavers, and other fur-bearing animals in the region and their value in the international fur market. Early explorers traded with the coastal Tribes for pelts and brought them back to their home countries and cities, where they became a popular material for making clothing and accessories. People in China, Russia, England, Western Europe, and the Eastern United States wanted beaver hats and otter coats and shawls. Sea otter pelts were especially valuable to Euro-American merchants, who needed expensive goods that were popular in China to trade for tea, silk fabrics, and other luxury goods they could then sell in their home countries.

Activity 2 (Continued)

Several Euro-American companies, such as the Russian American Company, the Hudson Bay Company, the North West Company, and the Pacific Fur Company established trading posts along the Pacific Coast to acquire fur pelts to sell. Independent merchants also struck out from ports like Boston to voyage around the world for sea otter pelts. Collectively, these ventures were called the maritime fur trade. Although Indigenous peoples on the entire Pacific Coast had hunted, trapped, and traded for sea otter, beaver, and other fur-bearing animals since time immemorial, this economic boom induced both Euro-American and Indigenous hunters to kill far beyond sustainable levels both here in Oregon and all around the Pacific Rim. From the 1740s until an international agreement outlawed the practice in 1911, sea otters were killed by the thousands and disappeared from many of their habitats. As a result, there are no sea otters living along the Oregon Coast today.

Slide 9

“Cultural significance of sea otters.” Provide an introduction about the importance of sea otters to Native people and then show the following video to students: **Cultural Significance of Oregon’s Sea Otters.**

Say:

The loss of sea otters has had a devastating impact on the coastal ecology of kelp forests in Oregon and on the traditional culture of Native people. Native people also valued sea otter pelts, making them into practical and ceremonial clothing that could demonstrate wealth or serve as important gifts. But sea otters were more than just a “resource” to the Indigenous people living along the Oregon Coast. In this video, Peter Hatch, a member of the Confederated Tribes of Siletz Indians explains more about the importance of sea otters to Native people and the work that Native people, and others, are doing to try and restore sea otters to Oregon.

Activity 2 (Continued)

Slide 10

“Restoring sea otters to Oregon” provides information about the Elakha Alliance, a nonprofit organization that brings Tribes in Oregon and other partners together to work on restoring sea otters to the Oregon Coast.

Step 13

Pause to discuss the information provided on slide 10 with students. Share the following to reinforce and expand upon the text presented.

Say:

Recognizing the ecological and cultural value of sea otters for human life in Oregon, the Confederated Tribes of Siletz Indians and others are collaborating on a plan to reintroduce sea otters to the Oregon Coast. One such restoration initiative, the Elakha Alliance, takes its name from the Chinuk Wawa trading language word for the sea otter, elakha (ee-LAK-uh). The alliance was formed in 2018 by Tribal, nonprofit, and conservation leaders with a shared vision of restoring a thriving sea otter population and a robust and resilient marine ecosystem on the Oregon Coast for the benefit of current and future generations.

Step 14

Take any questions from students before moving on.

Activity 3

Sea Otter Reintroduction Plan

Time: 45 minutes

Overview

Students work in groups to use data and maps from a feasibility study to create a sea otter reintroduction plan for the Oregon Coast.

Step 1

Sort students into new groups of three to four, if you wish, or keep the same groups together but have them select a new reporter.

Step 2

Distribute copies of the “Sea Otter Reintroduction Habitat Study” (one copy per student group) and “Oregon Sea Otter Reintroduction Plan” (one copy per student) handouts.

Step 3

Review the activity background and instructions from the reintroduction plan handout. Students will work in their groups to review the information and maps provided in an excerpt from a sea otter reintroduction feasibility study sponsored by the Elakha Alliance. After working through questions on the handout, each group will identify a location on the Oregon Coast where they think an initial reintroduction of sea otters is most likely to be successful.

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 as work to be completed individually or in groups outside of class.

Activity 3 *(Continued)*

Step 5

When groups are finished, have their reporters briefly share details of the projects they designed with the whole class.

Step 6

Take any questions from students before moving on.

Activity 4 Reflection

Time: 15 minutes

Overview

Students reflect on what they learned in the lesson.

Step 1

Restate or point to the learning targets for the lesson and review with students. Ask if they have any questions about what they learned.

Step 2

Ask students to share with their groups what stood out or surprised them most in the lesson. Ask for volunteers to share their responses with the whole group.