



SCIENCE

Human Impacts on the Environment: The Salmon Population in Oregon

ESSENTIAL UNDERSTANDINGS

- Since Time Immemorial
- History
- Lifeways

LEARNING OUTCOMES

Student will be able to:

- Show understanding of why salmon are essential to the traditional lifeways of Native Americans in Oregon.
- Identify the human impact on the environment, specifically the impact of dams on the salmon population in Oregon.
- Identify important contributions tribes are making to salmon restoration efforts in Oregon.

ESSENTIAL QUESTIONS

- Why are salmon important to Native American tribes in Oregon?
- How have hydroelectric dams and their use of natural resources (i.e. water) affected the environment and Earth's systems (i.e. salmon)?
- What are some tribes doing to help restore salmon habitat?

Overview

Native American people have lived in the area now known as Oregon since time immemorial. During the era of colonialism (beginning in the 1600s)-and even into the 21st century-non-Native people often portrayed the North American continent as a vast wilderness that was virtually unpopulated when they arrived. This could not be farther from the truth. In Oregon alone there were dozens of tribes, each with its own ancestral territory and rich cultural history. There was not a single region of Oregon that did not have an Indigenous tribe or band living within it.

Nothing was discovered or “untapped”, but instead well managed as Indigenous stewards of the land. Over time, the environment has been impacted by changes such as an increase in human population, and over consumption of natural resources (freshwater, minerals and energy). This lesson focuses on the impact of dams on the salmon population of Oregon.

The activity in this lesson will give students an essential understanding of why salmon are essential to the traditional lifeways of Native Americans in Oregon. It will also highlight the important contributions tribes are making to salmon restoration efforts in Oregon.



LOGISTICS

- Where does the activity take place?
In the classroom with a variety of whole class and partner work for engagement.
- How are the students organized?
 Whole class Teams: 3 – 5
 Pairs Individually

TIME REQUIRED

90 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. (Clarification Statement: Examples of the design process include examining human environmental impacts, assessing the kinds of solutions that are feasible, and designing and evaluating solutions that could reduce that impact. Examples of human impacts can include water usage (such as the withdrawal of water from streams and aquifers or the construction of dams and levees), land usage (such as urban development, agriculture, or the removal of wetlands), and pollution (such as of the air, water, or land).)

MS-ESS3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Background for teachers

When undertaking the study of the Native American people of Oregon, it is important to begin with their long history on the land. Indigenous people have lived in Oregon for thousands of years, in established communities, with established social structures, languages, and cultures. They were-and remain-deeply and inextricably connected to the land. Oral traditions of tribes include teachings that Indigenous people were created here and have existed here since time immemorial. From the Coast Range to the interior valleys to the Columbia Plateau and the Great Basin, tribal peoples maintain continuous and balanced relationships with the natural and physical environments in which they live. Oregon was-and is-Native American Country.

The ancestral territory of the nine federally recognized tribes in Oregon included all land in Oregon and, in the case of some tribes, extended into other current states bordering Oregon. Often, tribes had permanent or semi-permanent villages or settlements located in or near a core home territory, usually centered around a stable or predictable food source. From these "home bases," family groups or bands would range out to other parts of their territories to hunt and forage for food and trade with neighboring bands and tribes during different seasons of the year. The unique landforms, climate, and ecology of each tribe's ancestral territory profoundly shaped its lifeways and culture.

Despite overwhelming efforts to eradicate their people and culture, Oregon's Indigenous people persisted through a spirit of survivance and self-determination, holding on to their identity and heritage while forging a path into the future and refusing to be defined by the scars of past injustices. Today, Oregon has nine federally recognized Native American tribes. These tribes are sovereign nations and are recognized as such by both the U.S. government and the state of Oregon. Several of these tribes are confederations of multiple tribes that were removed



to the same reservation. Retaining *stewardship* over remnants of their ancestral homelands is key to the tribes' identity history, and future. The Native people in Oregon were and are stewards of the land, air and water and have always felt a responsibility to care for it.

Resources

Links to useful websites that add more detail or context

Oregon Department of Fish and Wildlife: Oregon Salmon
<https://www.dfw.state.or.us/species/fish/index.aspx#Salmon>

Northwest Power and Conservation Council: Indian Fishing
<https://www.nwcouncil.org/reports/columbia-river-history/indianfishing>

Tulalip News (Indian Country Today News Story)
<https://www.tulalipnews.com/wp/2013/08/20/eat-insanely-fresh-native-salmon-four-tribes-open-fishery-on-columbia-river/#:~:text=Eat%20Insanely%20Fresh%20Native%20Salmon%3A%20Four%20Tribes%20Open%20Fishery%20On%20Columbia%20River,-Posted%20on%20August&text=A%20tribal%20fisher%20loads%20fall,River%20near%20Hood%20River%2C%20Oregon.&text=Starting%20August%2019%2C%20fishers%20from,nets%20in%20the%20Columbia%20River.>

Warm Springs Fishery
<https://warmsprings-nsn.gov/program/fisheries-department/>

Oregon Public Broadcasting: First Salmon Ceremony
<https://watch.opb.org/video/oregon-field-guide-first-salmon-ceremony/>

Oregon Public Broadcasting: Tribal Fishing Tradition Runs Deep
<https://www.youtube.com/watch?v=yEKF8e0ndRU>

Columbia River Intertribal Fish Commission
<https://www.critfc.org/>

MATERIALS

What materials are needed for students to engage in this activity?

- **Slide Deck:** Human Impacts on the Environment: The Salmon Population in Oregon:
- Salmon and Native American Tribes in Oregon (one copy per student)
- Dam Removal: An Opportunity For Our Rivers (one copy per student)

SUPPLIES

- LCD projector or another type of computer projection device
- (Optional) If possible: Classroom access to laptops or devices that accommodate Pear Deck and Google Slides and Google Jamboard

Klamath River Dam Removal

<https://waterkeeper.org/magazines/volume-13-issue-1/klamath-river-dam-removal/>
Restoring the Klamath: What we are learning from the largest dam removal project in history
<https://www.internationalrivers.org/news/restoring-the-klamath-what-were-learning-from-the-largest-dam-removal-project-in-history/>

U.S. Fish and Wildlife: Dam Removal An Opportunity for Our Rivers
<https://www.fws.gov/southeast/pdf/fact-sheet/dam-removal.pdf>

Considerations for teachers

Assessment

- Students should be assessed both formatively and summatively. The formative assessment will consist of teacher observation of student participation in small-group and class discussion and critical analyses. The summative assessment will be student written responses to summative questions about their learning.

Practices

- Slide deck: You will need a projector to support instruction on salmon and Native American tribes in Oregon (unless conducting lesson through a virtual platform via comprehensive distance learning).
- The teacher must have an understanding of why salmon are essential to the traditional life-ways of Native Americans in Oregon as well as the important contributions tribes are making to salmon restoration efforts in Oregon.
- The teacher must have knowledge of the natural environment of Oregon.
- The teacher must be prepared to activate engagement strategies, such as think-pair-share and group discussion.

VOCABULARY

Dam – A barrier constructed to hold back water and raise its level, forming a reservoir used to generate electricity or as a water supply.

First Food – A type of food tribes in Oregon have depended on for thousands of years.

First Salmon Ceremony – This is a religious ceremony that occurs before open salmon fishing can begin each year.

Habitat – The natural home or environment of an animal, plant, or other organism.

Hydroelectric – Relating to the generation of electricity using flowing water (typically from a reservoir held behind a dam or other barrier) to drive a turbine that powers a generator.

Restoration – The act of returning something to a former owner, place or condition.



Learning targets

- I can understand why salmon are essential to the traditional lifeways of Native Americans in Oregon.
- I can discuss the impact of dams on the salmon population in Oregon.
- I can identify important contributions tribes are making to salmon restoration efforts in Oregon.

Activity 1

Human Impacts on the Environment: The Salmon Population in Oregon

Time: 90 minutes

Step 1:

Start **Google slide deck** (slide 1) titled: Human Impacts on the Environment: The Salmon Population in Oregon.

Say:

Today we will be learning about how humans can impact the environment, specifically the salmon population in Oregon.

Step 2:

Slide 2: Open the KWL chart on Google Jamboard by going to: https://jamboard.google.com/d/1qOLF-L1EdetqJv45CfbBAUyALdxm33Lybwov9Sfu_Uzl/viewer Using Google Jamboard (or your classroom white board or easel board), have students add a sticky note to the What I Know and What I Want to Know categories (color coordinated). At the end of the lesson, students can fill in the What I Learned category.

Step 3:

Slide 3: Prompt students to discuss the questions on the slide.

Say:

Why do you think dams have been utilized in the past and continue to be today? (Wait for student responses and discussion) They say: What kind of implications do you think this has on our ecosystems, and cultures (historically and currently today). You may lead this discussion in a whole class setting, or in pairs or groups (via in class or in a breakout session format through an online platform).

Step 4:

Slide 4: Dams and Their Impact on Earth's Systems - Read slide aloud to students (or ask for a student volunteer to read aloud).

Say:



Activity 1 (Continued)

Dams have been used extensively throughout the United States for a variety of purposes, including navigation, flood control, and power generation. While well-designed and properly managed dams can provide many benefits, they drastically alter natural river communities. The natural flow of water and sediment is impeded, and populations of native fish, mussels, and other aquatic animals are damaged. (source: U.S. Fish and Wildlife Service)

Step 5:

Slide 5: Dams and Their Impact Continued...- Read slide aloud to students (or ask for a student volunteer to read).

Say:

Dams can block or impede migration and have created deep pools of water that in some cases have inundated important spawning habitat or blocked access to it. Dams change the character of rivers, creating slow-moving warm water pools that are ideal for predators of salmon. Low water velocities in large reservoirs also can delay salmon migration and expose fish to higher water temperatures and disease. Some dams have fish ladders; however, they still impede the successful migration of salmon.

Step 6:

Slide 6: Why It Matters - Read slide aloud (or ask for a student volunteer to read) to students.

Say:

The land currently known as Oregon was fully inhabited by Indigenous groups since time immemorial. These groups were and are intimately connected to the land and water. In all likelihood, our school is located on the ancestral territory of a tribe in Oregon (say the name of the tribe or tribes if you know it). Salmon are a profound component of the Northwest's economy and identity. They

Activity 1 (Continued)

have been and continue to be a spiritual and cultural center of importance and meaning to tribes in Oregon since time immemorial. The possibility that wild salmon may become extinct indicates that our waterways are in such bad shape they can no longer support a species that has been in our rivers and streams for eons and once numbered in the millions. And ultimately, human health also is dependent on healthy rivers. Once a wild run is lost it will not return. Extinction is forever.

Step 7:

Slide 7: Dam removal - Read slide aloud (or ask for a student volunteer to read) to students.

Say:

The removal of dams restores a river's natural flow and helps to restore vegetation and habitat. By returning the natural flow of water and sediment, the salmon population as well as other aquatic animals can begin to be restored.

Step 8:

Slide 8: Advocacy for Salmon Restoration - Read slide aloud (or ask for a student volunteer to read) to students.

Say:

Through tireless advocacy efforts, the largest dam removal and salmon-restoration proposal was approved. Communities that depend on a healthy Klamath River for food, jobs, recreation and cultural survival have accomplished what once seemed impossible to most outside observers. With continued dedication, the world will witness the largest dam-removal and salmon restoration project in history by 2020. (Source: <https://waterkeeper.org/magazines/volume-13-issue-1/klamath-river-dam-removal/>)

Step 9:

Human Impacts on the Environment: The Salmon Population in Oregon

Activity 1 (Continued)

Slide 9: Check for Understanding - Ask students the question on the slide and monitor results through Pear Deck for assessment.

Say:

Which tribe in Oregon was involved in the advocacy efforts for the removal of (4) dams?

Step 10:

Slide 10: Which tribal seals reference salmon? Ask students the question and monitor results through Pear Deck for assessment.

Step 11:

Slide 11: National Geographic: Small Tribe Thinks Big About Their Ocean Space - Read aloud to students (or ask for a student volunteer to read).

Say:

The Indigenous people living on the southern Oregon coast have always understood that the ocean and its creatures must be respected. According to the tribal lore of the Confederated Tribes of Coos, Lower Umpqua and Siuslaw, Thunderbird was the chief of the ocean, and of all the ocean's creatures, salmon was most beloved. When the people treated salmon carelessly, by dropping it on the ground or burning it, Thunderbird became angry and created powerful storms. The people burned tobacco in their fires and pleaded with Thunderbird to go north.

Step 12:

Slide 12: Questions for Upcoming Video

Say:

We will be viewing a video of Jesse Beers of the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians. As you are watching the video think about the following questions: What do you notice? What do you wonder? Capture these thoughts by drawing and/or writing on a piece of paper.



Activity 1 (Continued)

Step 13:

Slide 13: Jesse Beers, Confederated Tribes of Coos, Lower Umpqua and Siuslaw - Begin video by clicking on the web link: <https://www.youtube.com/watch?v=gSwWEdlhiBg>

Step 14:

Slide 14: Reflection Question - Ask students the question, "How can we utilize Indigenous traditional ecological knowledge in order to have a meaningful impact on caring for the environment?" Monitor the responses through Pear Deck for assessment.

Say:

How can we utilize Indigenous traditional ecological knowledge in order to have a meaningful impact on caring for the environment?

Activity 2

Salmon Restoration Efforts

Time: 50 minutes (not including individual, asynchronous work to be completed by student)

Step 1:

Slide 15 from **Slide Deck**: First Salmon Ceremony: The Cultural Importance and Efforts to Restore the Salmon Population in Oregon - Read students the information below and then begin the video by clicking on this web link: <https://www.pbs.org/video/oregon-field-guide-first-salmon-ceremony/>

Say:

Draw or write as you are listening and watching the video. What do you notice or wonder about the life of salmon as it moves from the ocean to the rivers? What is unique about the life of the salmon? What challenges do the salmon have from human impacts on the environment?



Activity 2 (Continued)

Step 2:

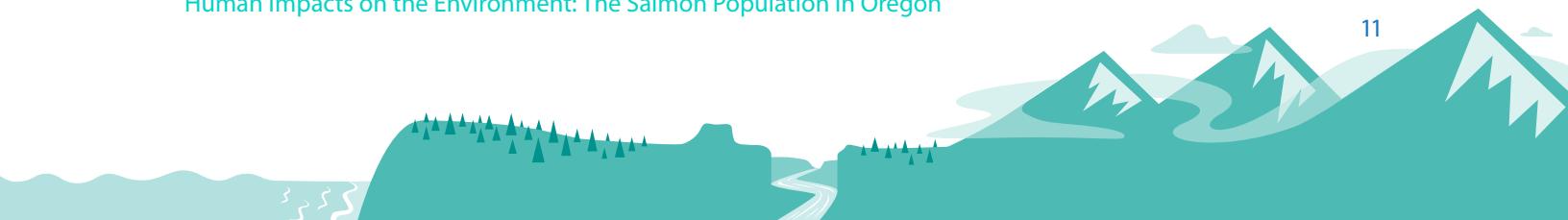
Slide 16: Reflection Questions - Pose questions to students as a whole class or have students work in small groups (or in virtual breakout sessions if undergoing distance learning) to answer the questions. Students can also write responses to the questions individually.

Step 3:

Slide 17: Read: Dam Removal: An Opportunity for Our Rivers-Have students individually read the handout: Dam Removal: An Opportunity for Our Rivers located at: <https://www.fws.gov/south-east/pdf/fact-sheet/dam-removal.pdf>

Step 4:

Slide 18: Construct an argument supported by evidence for how dams impact Earth's systems. Have students work on this individually, asynchronously as an assignment to submit to you within a reasonable time frame.



Activity 2 (Continued)

Reflection/closure

- Sum up the lesson by reviewing the learning targets. Refer back to the KWL chart that students provided thoughts on at the beginning of the lesson: https://jamboard.google.com/d/1qOLFL1E-detqJv45CfbBAUyALdxm33Lybwov9Sfu_Uzl/viewer and have them provide their thoughts on a sticky note or white board as to what they have learned.

Options/extensions

- As a class or individually, students can visit the Columbia River Intertribal Fish Commission (CRITFC) website at: <https://www.critfc.org/>. Have students review the site and report back to you in writing about what the purpose of the CRITFC is and what steps they are doing to assist in supporting the protection and restoration of Columbia River Basin salmon, lamprey, and sturgeon.
- Have students visit the Confederated Tribes of Warm Springs Fisheries Department website at: <https://warmsprings-nsn.gov/program/fisheries-department/>. They can discuss their findings with you in writing or report out to the class verbally on what the Confederated Tribes of Warm Springs is doing to protect and enhance fisheries habitat on the reservation and within the ceded territories.

We would like to extend our sincere gratitude and appreciation to Jesse Beers of the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians and Mercedes Jones of the Confederated Tribes of Grand Ronde for their assistance in the creation of this lesson as well as their many contributions to Indigenous education in Oregon.