



Washington
Department of
**FISH and
WILDLIFE**

Fisheries for the Future

3-5 grade

Theme: Seafood Month, Sustainable Seafood

Field Location:

Remote learning modification: Lesson can be taught over Zoom or Google Classrooms. Cooking can be part of this lesson, but should be done with adult supervision.

In the classroom: Lesson can be taught indoors, or out. If you are able, you could take students on a trip to a fish market or harbor to learn more about local sustainable seafood. We encourage you to cook in the classroom with students if able.

Standards:

NGSS

5-ESS2-2

Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

5-ESS3-1.

Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

CCSS

CCSS.ELA-LITERACY.W.5.7

Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

Washington OSPI Standards

WA SSS3.5.1

Explain different strategies and approaches students and others could take in working alone and together to address local, regional, and global problems, and predict possible results of their actions.

WA ESE Standard 1

Standard 1: Ecological, Social, and Economic Systems

Students develop knowledge of the interconnections and interdependency of ecological, social, and economic systems. They demonstrate understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, tribal, and global levels.

Modifications, Adaptations:

For COVID-19 distance learning, or other remote learning modification, look for **Remote learning modifications** throughout the lesson plan.

Materials:

WDFW PowerPoint, intro to seafood worksheet, recipe booklets

Objectives:

Students will...

1. Define terms related to fisheries and sustainability.
2. Describe the potential effects of overfishing and illegal fishing.
3. Graph where the world's fresh and salt water exists.
4. Identify ways they can support sustainable fisheries in Washington.
5. Create a project with a partner highlighting one Washington fishery and steps communities can take to preserve the fishery.

Vocabulary:

Natural resource: Something provided by nature that humans use (e.g., fish, wildlife, water, trees, oil).

Fishery: A fishing effort centered on a particular region and/or a particular species (e.g., Columbia River coho salmon fishery).

Fishery Management: Natural resource agencies use the best available science to set rules or policies to protect fish populations while allowing for sustainable harvest.

Sustainable fishery: A fishery managed for today's needs without damaging the ability of the species to thrive and be available for future generations.

Maximum sustainable yield: The maximum catch that can be extracted from a fish or other population long term.

Total allowable catch/annual catch limit: The catch limit set by fisheries managers.

Overfishing: Removing fish species at a faster rate than they can reproduce.

Bycatch: When fishing practices catch marine animals like fish, birds, turtles or marine mammals unintentionally.

Aquaculture: The farming of plants and animals who live in the water.

Sustainability: Meeting the needs of the present without compromising the needs of future generations.

Procedure:

1) Where does seafood come from?

- Give students "seafood and you" activity sheet to fill out before class discussion. This sheet can be given as homework or you can allow time in class to fill out.

- Give students 3-5 minutes to discuss their answers with a partner, or **Remote learning modification:** Disperse up students into Zoom/Google Hangout breakout rooms.

- When all together again, review the sheet as a class and ask students to volunteer their answers. Try to make "Seafood" inclusive to food that comes from freshwater as well.

Remote learning modification: Teachers are encouraged to use Zoom polls to give a visualization to their classes' answers.



Procedure Continued:

- After discussion, [watch the movie on sustainable fishing](#) from the Marine Resource Council. Ask students to write down one thing they found interesting, one thing they would like to learn more about, and one thing they would want to share with a family member.
- After the movie, discuss as a class what the students learned. See if they can remember the following vocabulary terms by asking them:
 1. What is a fishery?
 2. What is bycatch?
 3. How do some fishers prevent bycatch?
 4. What does it mean to overfish?
 5. What are sustainable fisheries?
- Now have them answer the question: Do they know where their seafood comes from? If they don't, what steps would they need to take to find out?

2) Sustainable Fisheries

- Review the introduction to sustainable seafood PowerPoint with students. Make sure to keep presenter notes on. This will introduce students to the ocean, and the importance of the ocean for our life and our economies. After the third slide pause and [ask students to make a graph](#) that shows the distribution of water on Earth. (This can be done as an at-home assignment or in class). Students should cite their source. As a class, discuss their results.
 - Did graphs vary by source, were they similar?
 - Does this graph alter their perceptions of water? If so, how?
 - Looking at their graphs, why would it be important to protect the oceans?

Remote-learning modification: This part can be done over Zoom/Google Hangouts. Teachers can use polls for students to give answers and see how their graphs may compare with other students.

- Move on to the fourth slide and introduce how the oceans impact humans and review the concepts learned in the introductory video.
- The PowerPoint will talk about illegal fishing and will highlight how WDFW enforces fishing rules.
- Students will then get to watch a three-minute video about how WDFW scientists measure and estimate crab fisheries in Washington.
- The final slide will ask students to brainstorm ways that fisheries could be kept sustainable.

3) Washington Fisheries:

- Begin the Washington Fisheries PowerPoint. Ask students to brainstorm ways they and their families could help support sustainable fisheries. This slideshow highlights ways individuals can support sustainable fisheries either by harvesting or purchasing seafood throughout the state.
- Make sure presenter notes are on. This PowerPoint has two videos.

4) It takes a village to manage a sustainable fishery

- Go to the [WDFW commercial fishing website](#). Show students how to navigate the page. Divide students into partners or let them choose a partner to work with. Teams will choose one fishery they would like to research for a project. [Students can also use freshwater fisheries](#) if you do not live near the coast.

Remote learning modification: Students can do this project individually or with their family.

The project should answer the following questions:

- **Who manages the fishery?** *It may be managed by more than one agency.*
- **How do fishery managers use science to manage this fishery?**
- **What time of year is the fishery?** *There may be multiple times of year.*
- **Where is the fishery?** *There may be more than one place. Is one place more sustainable than another?*
- **How do people harvest the fishery?** *There may be more than one way. Is one way more sustainable than another?*
- **What are some popular recipes?** *Provide a couple, better yet try one out and document the process from market or harvest to table!*
- **What are specific ways members of your community can ensure the fishery stays sustainable? Who are the different members of your community who could help support sustainable fisheries?** *For example, merchants, restaurant owners, consumers, etc.*
- **What might be the outcome of these actions?**
- **How are people dependent on the ocean?**
- **Is the ocean dependent on people? If so, how? If not, why?**

Student projects can be done as a formal research paper, as a PowerPoint, a video or a combination of the three. Students should make sure to use various media in their project. Sources must be cited.

Supplemental Activities:

Have students...

- Research the role of aquaculture in sustainable fisheries. What are possible positive and negative effects? How might this affect commercial fishers?
- Research international treaties and organizations who work to protect oceanic fisheries and habitats. What actions do they take? What types of people do they work with and involve?
- Research how fishing has changed in the last 200, 100, 50 and even 10 years? Has emerging technology and changes in equipment affected fisheries? Why or why not?
- Create an art piece that shows the relationship between humans and the ocean (or lakes, or rivers).
- Think about who "owns" fisheries. People buy permits and licenses to harvest them, but does this mean ownership? Why or why not?



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Supplemental Activities continued:

- Create a project highlighting another way humans are connected to aquatic environments.
- Learn about other products made from sea or aquatic life that can be found in their community.
- Visit a fish market/restaurant/grocery store and ask if their fish is caught sustainably.
- Use localcatch.org and seafoodwatch.org to make a map of what sustainable seafood exists in their area.

Additional Resources : Regulations

- [Commercial fishing- WDFW](#)
- [Fishing regulations-WDFW](#)
- [Shellfish, kelp and seaweed harvest information-WDFW](#)
- [Seaweed harvesting-DNR](#)
- [Fishing and shellfishing basics-WDFW](#)
- [Freshwater fishing regulations-WDFW](#)

Places to Go

- [Shellfish beaches-WDFW](#)
- [Squid jigging basics-WDFW](#)
- [Freshwater fishing species-WDFW](#)
- [Fresh Catch blog-WDFW](#)
- [Local seafood in Bellingham-WDFW](#)

Buying Seafood

- [Where to buy local Seafood-WDFW](#)
- [Market analysis-The Nature Conservancy](#)
- [Sushi guide-Seafood Watch](#)
- [Consumer guides-Seafood Watch](#)
- [Fresh fish finder-Local Catch](#)
- [Ocean to table videos-Aquarium of the Pacific](#)

Other Educational resources

- [Educator resources-Seafood Watch](#)
- [Fish and kids-Marine Sustainability Council](#)
- [Teach and learn ocean sustainability-Marine Sustainability Council](#)
- [Fisheries resources-NOAA](#)
- [Ecosystem services-Pacific Shellfish Institute](#)
- [Overfishing graphic](#)
- [Fishing and seafood resources- Ocean Collective](#)
- [Educational webinars for distance learning-NOAA](#)
- [Sustainable seafood lesson-California Academy of Sciences](#)
- [Where is the Earth's Water?-USGS](#)
- [Sustainable Fisheries-UW](#)
- [Status of stocks-NOAA](#)

Sustainable Seafood Recipe Links:

We hope you take a look at the clam and oyster recipe booklets made by one of WDFW's fisheries biologists! Here are some other recipes you may want to check out to enjoy Washington's sustainable seafood.

[Washington Sea Grant](#)

[Olympia Seafood Company](#)

[Marine Sustainability Council](#)

[Seafood Watch](#)

[Barton Seaver](#)

[Aquarium of the Pacific](#)