



Washington
Department of
**FISH and
WILDLIFE**

Saving the Shrubsteppe

3-5th

Themes: Biodiversity, food webs, threatened landscapes

Location:

The lesson can be taught in the classroom. If you are able, take a field trip to the shrubsteppe! [Check out these places to explore.](#)

The final assessment can be done outside or inside.

Standards:

NGSS

[5-ESS3-1](#)

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

[5-LS2-1](#)

Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

CCSS

[ELA-LITERACY.W.5.3](#)

Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

[ELA-LITERACY.W.5.8](#)

Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

WA OSPI

[ESE 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.

Middle-school adaptation: This lesson can be adapted to teach middle-school students as well. Adaptations for middle school students are built-in to this lesson plan.

NGSS

[MS-LS2-3](#)

Develop a model to describe the cycling of matter and flow of energy among living and non-living parts of an ecosystem.

Materials:

pencil, paper, coloring supplies (optional), computer access, scissors, printer, shrubsteppe species cards, shrubsteppe poster.

Vocabulary:

English

Adaptation: A special skill which helps an animal survive.

Adaptations can be physical changes to the animal's body or behavioral changes in an animal or groups of animals.

Biodiversity: The full range of life in all its forms. This includes the habitats in which life occurs, the ways that species and habitats interact with each other, and the physical environment and the processes necessary for those interactions.

Obligate species: Species who require a specific ecosystem or type of food for survival.

Energy: Energy is another word for power. Energy makes things move. It makes machines work. Energy also makes living things grow.

Ecoregion: An area where ecosystems are generally similar in geology, landforms, soils, vegetation, climate, land use, wildlife, and water. Washington has nine ecoregions as shown in the map below.

Ecosystem: A community of organisms (living things) interacting with their surroundings. The term ecosystem can be used to describe areas that range in size. For example, a small puddle of water, your neighborhood, the Pacific Ocean, and planet Earth can all be considered ecosystems.

Food webs: The order in which organisms depend on each other for food. Every ecosystem, or community of living things, has an interconnected map of food webs.

Organism: Any living thing. This includes people, animals, plants, bacteria, and fungi.

Semi-arid: An ecosystem that gets enough water to support shrubs and grasses, but not trees.

Spanish

Adaptación: habilidad especial de los animales que les permite sobrevivir. Las adaptaciones pueden referirse a cambios físicos en el cuerpo o a cambios en la conducta del animal o de grupos de animales.

Biodiversidad: la amplia variedad de vida en todas sus formas. Incluye a los hábitats en los que se desarrolla la vida, las formas en las que las especies y los hábitats interactúan entre sí, junto con el entorno físico y los procesos necesarios para que ocurran dichas interacciones.

Especies obligadas: son especies que necesitan vivir en un ecosistema específico o un tipo de comida específico para sobrevivir.

Energía: la energía es otra palabra que se utiliza como sinónimo para designar fuerza. La energía hace que las cosas se muevan. Hace que las máquinas funcionen. La energía hace también que los seres vivos se desarrollen y crezcan.



Vocabulary Continued:

Ecorregión: área o región en donde los ecosistemas comparten características similares en cuanto a geología, accidentes geográficos, suelos, vegetación, condiciones climáticas, uso del suelo, vida silvestre y agua. Washington tiene nueve ecorregiones, como se muestra en el mapa a continuación.

Ecosistema: conjunto de organismos (seres vivos) que interactúan con el entorno. La palabra ecosistema se puede usar para designar áreas o regiones que varían en tamaño. Por ejemplo, un pequeño charco de agua, un vecindario, el Océano Pacífico o el planeta Tierra, todos se pueden considerar ecosistemas.

Cadena alimenticia: orden en el que los organismos dependen unos de otros para la alimentación. Cada ecosistema, o comunidad de seres vivos, tiene un mapa interconectado de cadenas alimenticias.

Organismo: todo ser vivo. Comprende a personas, animales, plantas, bacterias y hongos.

Semiárido: un ecosistema que dispone de la cantidad necesaria de agua para mantener la vida de arbustos y pastizales, pero no de árboles.

Objectives:

Students will...

1. Define the shrubsteppe ecosystem.
2. Identify producers, consumers, and decomposers in shrubsteppe environments.
3. Apply their knowledge of shrubsteppe organisms by creating food webs with their classmates and demonstrating how different species interact.
4. Produce a short piece of creative writing illustrating their "day in the shrubsteppe", including how humans are connected to the ecosystem.

Procedure:

Introduction to Shrubsteppe

Review vocabulary words ecosystem and ecoregion with students. What are the differences, what are the similarities? Open the [Washington Ecoregion map PDF](#) and ask students what ecoregion they live in. Tell them today we are going to look at an ecosystem in Washington called shrubsteppe. You can point out these ecoregions on the map (10- The Columbia Plateau).

As a class, watch [this introductory video](#) on shrubsteppe (she refers to it as sagesteppe and "desert") until 3:56.

Middle-School Adaption: Students 5th grade and above should watch the whole video. The rest of the video introduces threats to this ecosystem.

After the video, have a brief discussion about what the students learned. Guiding questions can include: What are characteristics of the shrubsteppe ecosystem? Why are the pygmy rabbit and greater sage-grouse unique in this ecosystem? What are roots of plants like (i.e., short, shallow or long, narrow)? What are some animals you saw in the video?

A virtual tour

This part of the lesson can be student-guided, or you can go through it with them. Students will "visit" the shrubsteppe in a virtual exhibit. [English](#) [Spanish](#)

Here, they will learn about some of the plants, animals, and people who call shrubsteppe home. The exhibit features questions throughout. You can have students either write down these questions, or ask them to recall questions when they are finished touring the exhibit. Questions include:

- Where do you think plants get their energy from?
 - Sun, water, soil-decomposers help put nutrients back into the soil.
- What other types of consumers exist?
 - Carnivores, omnivores, herbivores
- Why do you think there are so many wildflowers in the shrubsteppe?
- Is sagebrush a producer, consumer, or decomposer?
- Why do you think so many plants in the shrubsteppe look similar?
- Why do you think some animals are awake at night and some during the day?
- How do you think reptiles and amphibians survive cold winters in the shrubsteppe?
- Write down three things you learned about the shrubsteppe.

Student answers have no right or wrong answer, as this activity serves as an opportunity for students to start thinking about why plants and animals are adapted to certain lifestyles. If a student really needs a definitive answer, ask them to research it and bring their answer back to the class. This activity could also serve as an extension of the exhibit and each student could bring an answer back to class the next day/period.

Middle-school adaptation: Ask students to read this blog about shrubsteppe plant adaptations.

Energy transfer

Print out and cut up the [shrubsteppe species cards](#) from Pacific Northwest Laboratory. These cards include producers, consumers, and decomposers in the shrubsteppe. The cards state who eats whom and what role they play in the shrubsteppe. This activity can be done inside or outside.

Ask students to think about some food webs that may exist in the shrubsteppe. See if they can come up with any examples before you pass out the cards. After a brief discussion, pass out the cards. Each student should get one card. Tell students they are going to try and show how energy moves through the shrubsteppe ecosystem. After reading the description of their card, students must walk around and find links to complete their food web. For example, if one student is a black-tailed jackrabbit, another is a red-tailed hawk, a third is a Sandberg's bluegrass, and a fourth is soil bacteria, how might they link-up to show how energy moves? Once students have found links of three to six people, they are in a food web.

Give students 10-15 minutes to create a quick three-minute play that demonstrates to their classmates 1) what animal they are, 2) what they eat, 3) what eats them (if nothing, what happens when the animal dies?). Students' plays should not



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only tell the stories of their individual species, but also a story of the shrubsteppe ecosystem they live in. How do all of these organisms work together to create a healthy ecosystem?

After all students have shared their play with the class, watch the short film, [This Land is Part of Us](#). Ask students afterward what was most inspiring or interesting to them about the film.

Remote learning modification: pass out student cards virtually. You can send each student their organisms' characteristics by email. Or, post the PDF of organisms in a virtual classroom and let students choose, but tell them each organism can only be used once. From here, you can assign students to breakout rooms and see how their organisms match up. You may have to do a couple rounds of breakout rooms to get complete food webs. Rather than doing a play, students can come up with a short story to tell to the class.

Middle-school adaptation: give students the species cards and a copy of the shrubsteppe poster. Have students create ways that energy is transferred from sun and precipitation to organisms through a 10-species food web. Students can cut and glue out their food webs and draw connections between organisms. **Remote learning modification:** you can have students draw a shrubsteppe landscape and include species from the PDF virtually (using paint or other software). Or if they are able, they can print, cut, and share their energy transfers with the class.

My day in the shrubsteppe

Middle-school adaptation: Before the creative writing activity, ask students to read the short article, "[Why Care About American's Sagebrush?](#)" You can have students popcorn read the article or assign it as homework.

As a class: After reading the article discuss some reasons why shrubsteppe is important. Go to the [WDFW shrubsteppe conservation page](#) and scroll to where it says "conservation threats". Popcorn read through fire management and you can watch the video "Harvesting Sagebrush Seeds". After reading have students get into small groups (or breakout rooms) and brainstorm other ways they could help shrubsteppe ecosystems.

If you have the ability, we encourage you to [take students to a natural area](#) where they have the ability to explore the magic of the shrubsteppe for themselves. This experience will provide them the basis for "My day in the shrubsteppe". If you do not have this ability, students will imagine what their, "day in the shrubsteppe" could look like. This might mean watching more videos and looking at more photos of shrubsteppe.

Students will write a 3 to 5-page creative narrative explaining what their day in the shrubsteppe looks like. This should include the weather, clouds, any organisms they saw, what it smelled like, how the air felt, etc. Who were they with? How long were they there? What time of day did they visit? Encourage students to get as creative as possible. What about their real or imaginary trip was most memorable to them? What was most surprising?

How are humans connected to the shrubsteppe? In addition to their creative writing, students can draw or add photos of their experience.

For 5th graders and above. **Middle-school adaptation:** In addition to their real/imagined experience, students should also do some research on a shrubsteppe topic of their choice and include this issue in their essay. Some ideas include:

- Human impacts on shrubsteppe and how we can help.
- Climate change impacts on shrubsteppe and how we can help.
- How the shrubsteppe is important for both people and non-human organisms.
- How much biodiversity does the shrubsteppe have?
- Threats to shrubsteppe and how we can help.
- Ways people throughout the state can appreciate and help shrubsteppe ecosystems.
- How is shrubsteppe important to people culturally? Economically? Environmentally?

You could also have students submit their work, or create another piece of poetry to the shrubsteppe poetry journal. [Details can be found here.](#)



Idea: Show off your students' work! Share student projects from this lesson with WDFW.

Facebook: @WashingtonFishWildlife

Instagram: @TheWDFW

Twitter: @WDFW

#WildWashington #WildWa

Did you teach this lesson? [Give us your feedback.](#)



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Additional Resources

Supplemental activities (optional):

- [Sagebrush steppe poster](#)-Audubon Rockies
- [Shrubsteppe activities](#)- WDFW
- [Sagebrush and fire curriculum](#)- FireWorks
- [Pygmy rabbit activity book](#)- The Wildlife Society

Other resources:

- [Spotlight on the sagebrush steppe ecosystem](#)-Audubon Rockies
- [Sagebrush habitat cards](#)- Audubon Rockies
- [Pocket guide to sagebrush](#)- Sage Grouse Initiative
- [Teacher resources](#)- Wenatchee Naturalist
- [Common shrubs in shrubsteppe habitat](#)- Wenatchee Naturalist
- [Plants of the shrubsteppe](#)- Wenatchee Naturalist

More information:

- [Species at risk in shrubsteppe](#)- WDFW
- [Steppe Habitats](#)- Woodland Park Zoo
- [What about shrubsteppe?](#)- Pacific Northwest Laboratory
- [Washington shrubsteppe ecosystem](#)-Washington State University
- [Why has cheatgrass changed everything](#)-Wenatchee Naturalist
- [Road trip: Eastern Washington](#)-The Nature Conservancy

Videos:

- [Monitoring the Sagebrush Steppe](#)- National Park Service
- [The Strange Mating Ritual of the Greater Sage Grouse](#)- Oregon Public Broadcasting
- [The Vanishing Shrubsteppe](#)-BLM Oregon/Washington