



WILD CLASSROOM

TEACHING TOOLS ABOUT

GRASS- LANDS

OF THE NORTHERN GREAT PLAINS

EDUCATOR'S RESOURCE GUIDE



Educational materials developed in support of the One Square Foot Initiative
and the PBS documentary *My Garden of a Thousand Bees* on PBS.



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WILD CLASSROOM

WWF's Wild Classroom connects educators and parents with the tools and resources they need to help kids explore and understand the world around them. Visit wildclassroom.org to choose from a growing library of animal- and nature-related teacher's guides, fact sheets, and activity plans that you can use to enhance your science, writing, art, and other lessons.

GRASSLANDS of the Northern Great Plains

What first comes to mind when you think of grasslands? Grass? If so, you're not wrong—there is a lot of grass in grasslands. But grasslands are so much more than just grass. Together with the grass exists a rich landscape full of life, supporting others both within and outside of its ecosystem. Let's take a closer look at what's beyond the grass and why we should all support our local grassland and its inhabitants.

What is a grassland?

A grassland is a landscape that is impacted by extreme weather events such as drought, heavy snow, and fire, making it difficult for trees to grow in great numbers, so it instead has grass, grasslike plants, shrubs, and wildflowers.

- The vegetation in grasslands grows close to the soil and can keep growing even after being nibbled on by animals. In fact, many grassland plants grow better when they've been grazed upon.
- In different areas of the world, a grassland can also be known as a prairie, savanna, rangeland, or steppe.
- Grasslands first appeared millions of years ago due to extreme shifts in climate, and they continue to be shaped by wind, wildfire, and the seasonal migrations of animals.



Soapweed Yucca plant in the grasslands of Nebraska, Northern Great Plains.



Where can you find grasslands?

Grasslands are found in areas all over the world, on every continent except Antarctica.

- Since grasslands don't receive enough rain to have trees like a forest, but aren't as dry as a desert, they're often found between forests and deserts.
- There are two primary types of grassland: temperate and tropical. Temperate grasslands are typically found north of the equator and are known for having very cold winters and warm summers. Tropical grasslands, like those found in Africa and Australia, are warm year-round.
- The United States has a large grassland ecosystem known as the Great Plains that stretches from Montana and North Dakota in the north down to Texas and New Mexico in the south. The northern section of this grassland, the Northern Great Plains, is 180 million acres of vast, intact grassland that crosses Montana, Wyoming, Nebraska, North Dakota, and South Dakota, and reaches into parts of Canada. The Northern Great Plains is one of the world's only remaining temperate grasslands.

Who and what live in the grasslands of the Northern Great Plains?

The biodiversity found in grasslands extends well beyond grass and other plants; these regions are home to a variety of species, including mammals, insects, and birds.

- The unique ability of the grasses to continue growing while being eaten allows grasslands to support large numbers of grazing animals. In turn, by grazing, these animals are allowing new growth of the plants, which helps keep them healthy. In the United States, large grazing wildlife such as bison and pronghorn are found primarily in the vast openness of the Great Plains.
- Grassland predators prey on the grazers and burrowers. One of the fiercest predators of the Northern Great Plains is the black-footed ferret, which depends on prairie dogs and their burrows for food and shelter. Other predators found there are the swift fox and the coyote.
- Bees and butterflies are some of the most familiar grassland residents; there's a good chance you've seen some near you! These hardworking pollinators are often found near wildflowers that are native to the area, as they rely on them for food.
- Grasslands are home to a variety of distinctive bird species, such as the greater sage-grouse and prairie chickens in the Northern Great Plains. Both birds are known for their signature mating dances, while songbirds, like the Sprague's pipit, provide the soundtrack for this bustling ecosystem.
- Around the world, millions of people live either in or near a grassland. In the Northern Great Plains of the United States, the majority of the region is owned by ranchers and their families. Native American nations are also key landholders, managing roughly 9 million acres of the region.



Why are the grasslands of the Northern Great Plains and their species important?

Grasslands provide many benefits, not only to the countless species that rely on them for habitat but also to people everywhere.

- *The ground*—The rich soil found in grasslands can absorb lots of water and save it for later, which is helpful given that grasslands don't receive much rain. The absorbent soil allows precipitation to seep deep underground, filtering the water as it travels downstream. This helps prevent pollutants and sediments, such as soil runoff and fertilizers, from entering water reservoirs that people and wildlife drink from. Every year, trillions of gallons of rainfall and snowmelt pour into the grasslands of the Northern Great Plains. One acre of intact, unplowed, healthy grassland can store thousands of gallons of water, later benefiting plants, people, and wildlife.
- Now to where grasslands get their name—*the grass*. The grasses are resilient and continue growing while being eaten by wildlife, which allows them to play a role in maintaining the health of the surrounding areas, including the soil. In a well-balanced system, grassland growth and grazing activities work together, allowing the vegetation to remain healthy and the ground to absorb more water. In addition, the roots of these grasses can reach as far as 10–15 feet underground and are able to store massive amounts of carbon. Carbon is an element found in nature and living things but can contribute to climate change when released in large amounts (such as when fossil fuels are burned to generate energy and when grasslands are plowed up).
- *Wildflowers* are a critical component of grassland habitats for many wildlife species, providing necessary food and rest stops for pollinators like bees, birds, and butterflies. A significant amount of the food we eat is thanks to the work of these pollinators. As these animals land on plants, either they will intentionally gather pollen from the plant for nourishment or the plants will stick pollen to their bodies (something the plants have evolved to do) as the animals are feeding on nectar—or both. As these pollinators travel from one plant to the next, the pollen gets dispersed and fertilizes the other plant(s), allowing them to grow vegetables and fruits. There are countless intertwining food webs that are built upon a foundation of healthy soil, grasses, and wildflowers, so without them, many other species would not survive.



Herd of bison at the Fort Belknap Indian Reservation located in north central Montana.



Why are the Northern Great Plains in trouble, and **when** did this trouble start?

Grasslands are fragile ecosystems; changes to the landscape can cause chain reactions that negatively impact many species. Some of these changes have been occurring for centuries; others are beginning only now, as the world becomes more populated and resources become scarce. The United States alone has lost over 33 million acres of grassland and wildflower habitats just since 2009.

- **Agriculture:** In the late 1800s, European settlers began converting North America's grasslands into agricultural fields. Iconic wildlife, such as bison, were nearly driven to extinction in an effort to control Native Americans, who were the traditional landowners of this region. To this day, these grasslands are threatened by plow-up and extreme weather associated with climate change. To keep up with human demand, habitats around the world are being cleared to make room to grow crops. Some grasslands are particularly at risk because their rich soil makes them well-suited for farming.
 - In some parts of the world, livestock grazing isn't compatible with wild spaces. However, in the Northern Great Plains, sustainable ranching that mimics the grazing effects of wild grazers like bison is helping keep the land healthy. Grasslands must be grazed to remain healthy, and ranching operations often keep grasslands from being plowed.
 - In addition, many large agricultural operations use pesticides and fertilizers, which can kill native vegetation and contaminate the local waterways. Giving more priority to the financial gain of agriculture than to the preservation of wildlife and wild places can lead to practices that destroy habitats, pollute the ground and water, and degrade ecosystems, which can lead to even more problems for the wildlife in the area as well as the people.
- **Development:** What were once vast areas of open wilderness now have more and more infrastructure, like roads and fencing, being built. These structures not only fragment grassland habitats but also allow industry the ability to move in and tap into the grasslands' resources. Developers have taken interest in areas like the Northern Great Plains to obtain energy. This can be in the form of both renewable energy, such as what is generated by wind turbines, and nonrenewable energy, like fossil fuels that are extracted from the ground. Each industry has unique impacts on the landscape and its inhabitants.
- **Climate change:** As climate patterns around the world continue to change, regions everywhere are feeling the effects, and grasslands are no exception. Changes in rainfall impact the soil's health and in turn the health of the grasses and wildflowers, and of all the species that depend on them. Migrating and breeding seasons for many animals rely on environmental cues, so an unstable climate results in unstable survival of these species.



What is WWF doing to help?

WWF is committed to raising awareness of the natural value of grasslands and the critical need for wildflower habitats. As with any conservation effort, it takes the actions of many to make a real difference; the more people who are involved, the better chance we have of restoring grasslands and providing for pollinators.

- WWF has joined forces with fellow conservation organizations, leaders in public land management, and brands such as Air Wick that are dedicated to connecting people with nature in order to preserve grasslands so these areas can continue to provide for species and people. WWF and Air Wick have teamed up on a plan to reseed 1 billion square feet of wildflower habitats in the Northern Great Plains over the next three years. These wildflowers will help rebuild an ecosystem that is critical to the food we eat, the water we drink, and the air we breathe.
- In addition, WWF works with local communities to make sure grassland biodiversity is protected and the area's natural resources are being used sustainably. These conservation strategies aim to protect intact grasslands and restore degraded grasslands in order to provide habitats for species, while also continuing to support the people who depend on the area for income.

How can you help?

- **Plant native wildflowers:** Learn which wildflowers are native to your area and provide for your local pollinators! Native wildflowers are best suited to feed the pollinators that have co-evolved with them. Remember, it's important to plant a variety of flowers that bloom at different times throughout the season so pollinators always have a food source when they are active. It all begins with one square foot! For tips on which wildflowers to plant in your region, visit our [website](#) or see the accompanying Wildflower Guide handout.
- **Provide bee-nesting habitat:** In addition to planting wildflowers, find a corner of your yard, park, or garden and leave it messy with leaves, taller grass, and/or hard-packed soil to provide a place for nesting bees to build their nests. These essential pollinators are mostly solitary—nesting bees are primarily hardworking single moms providing nectar and pollen for a few eggs at a time. They nest in the ground and need a safe place to lay their eggs. You could also gather some old wood, thick branches, or fallen tree bark to create a safe space for carpenter bees, who rely on wood to burrow and nest.



Red-Belted Bumble Bee, Nebraska, Northern Great Plains.



- **Avoid pesticides:** Many pesticides used on plants make every part of the plant (including the nectar and pollen) toxic to pollinators. Avoid spraying, or use organic agents instead.
- **Don't waste food:** The pressure placed on the food industry has caused grassland habitats to be lost to agriculture. Take personal responsibility in the way you treat food by saving your leftovers and taking only as much food as you will realistically eat. If everybody makes an effort to reduce the amount of food that ends up in the garbage, agriculture will put less pressure on grasslands and their unique biodiversity will bounce back.

● Relevant vocabulary to accompany teaching material

- **Abiotic:** not derived from living things
- **Adaptation:** changes in a plant or animal that make it better equipped to survive under the conditions of its environment
- **Agriculture:** the process of farming soil, producing crops, and raising livestock
- **Biodiversity:** all the different kinds of life you will find in one area, including animals, plants, fungi, bacteria, and genetic material
- **Biotic:** relating to or as a result of living things
- **Climate change:** a change in climate over time due to natural causes or human activity
- **Ecosystem:** the living (plants, animals, other organisms) and nonliving (air, water, soil) components of an area that interact with each other in an interconnected way
- **Ecosystem services:** benefits obtained from ecosystems
- **Grassland:** a landscape that has too little rain for trees to grow in great numbers but instead has grass, grasslike plants, and shrubs that grow close to the soil
- **Habitat:** a natural environment in which plants and animals live, breed, and get their food, water, and shelter
- **Habitat loss:** the disappearance of natural environments (required for plants' and animals' survival) due to harvesting for human consumption and/or clearing to make way for agriculture, housing, roads, pipelines, and other forms of industrial development
- **Interdependence:** the reliance all living things have on each other in order to survive
- **Pollination:** the transfer of pollen from male plant parts to female plant parts, resulting in fertilization, fruits, and seeds
- **Species:** a group of organisms that are able to interbreed and produce viable offspring
- **Sustainable:** of, relating to, or being a method of harvesting or using a natural resource so that the resource is not depleted or permanently damaged; effective and innovative in efficiently using natural resources and ensuring their continued supply
- **Urbanization:** a shift from rural to urban; the creation of cities and towns



References and Resources

- Web story: [3 Things You Can Do to Help Your Local Pollinators](#)
- Web story: [One Square Foot](#)
- Video: [Northern Great Plains](#)
- Web story: [Grasslands](#)
- Film: [My Garden of a Thousand Bees](#)

Reach out to HHMI Tangled Bank Studios to hold a class screening of the film [My Garden of a Thousand Bees](#). For more fun classroom activities with a focus on wild species and conservation, visit wildclassroom.org.



Male greater sage-grouse dances for a female as part of the mating ritual. Montana, Northern Great Plains.