



FireWorks Encyclopedia

Sagebrush Steppe Ecosystem Field Guide





Table of Contents

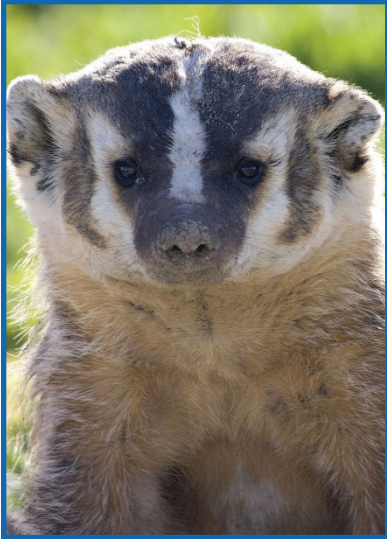
American Badger.....	1
Antelope Bitterbrush	2
Arrowleaf Balsamroot	3
Biological Soil Crust.....	5
Cheatgrass	6
Chokecherry	8
Coyote	9
Cutworms	10
Douglas Fir	12
Ferruginous Hawk	14
Fringed Sage	16
Golden Eagle.....	18
Great Basin Wildrye.....	20
Greater Sage-Grouse	21
Harvester Ant.....	23
Idaho Fescue.....	24
Indian Paintbrush.....	25
Juniper.....	26
Lupine.....	27
Mormon Cricket	29
Mountain-Mahogany.....	30
Mule Deer	32
Pinyon Pine	34
Ponderosa Pine	36
Prairie Falcon	38
Prairie Rattlesnake	40
Pronghorn.....	42



Pygmy Rabbit	44
Quaking Aspen	45
Rabbitbrush	47
Sagebrush	48
Sagebrush Sparrow	51
Scarlet Globemallow.....	53
Short-Horned Lizard (Horned Toad)	54
Sulphur-Flower Buckwheat.....	56
Tapertip Hawksbeard.....	57
Townsend's Ground Squirrel	58
Wheatgrass	60
Western Yarrow	62
Wild Onion.....	64



American Badger



Taxidea taxus

I am a fierce, short-legged mammal with thick fur. My short legs and flattened body can make me hard to see in the wild. I also have short ears and a short, furry tail.

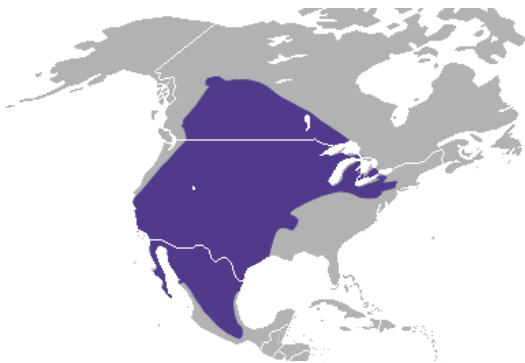
We American badgers are mostly brown, with grayish to redish fur on our back and sides. You may be able to identify me quickly by the

black and white black and white stripes on my face, including a white one that runs down the middle of my head to my nose. I like to think it makes me look like a race car, and I can move fast like one, too!

Where I Live

I live throughout the Western United States and Canada, as well as Northern Mexico.

I don't like things to be wet, so I usually live in dry, open grasslands and the sagebrush ecosystem. I can live at high elevations as well as sea level. I sometimes will live around trees, but there need to be open areas with grassy ground cover.



Let's Eat!

I am a predator that mostly eats meat. Favorite prey include ground squirrels, prairie dogs, and voles, so I am helpful for controlling rodent populations. I also eat insects and birds, and occasionally you can find me munching on grass.

Daily Life

I am a loner. I don't like a bunch of other badgers around to fight with. I spend most of the day sleeping. My favorite time to be out to hunt is at night.

You should see me dig a hole! My powerful front legs allow me to create tunnels fast. Called **burrows**, I connect several together to make my home. Where I sleep and give birth is called my **den**.

I don't really like winter very much. I will go out at night to eat when necessary, but I spend most of the winter in my den.

I am pretty good at hiding, but if you find me, **WATCH OUT!** I don't like people and I can be very aggressive if I feel threatened.



Fire!

I can usually run away from a fire. But after the fire is out, the hunting is great! I can move faster and catch more critters because they are easier to see. I will also build new burrows, if needed.

Learn More

American Badger: *Taxidea taxus*. BioKIDS. University of Michigan. <http://www.biokids.umich.edu>

American Badger. Washington NatureMapping Program. http://naturemappingfoundation.org/natmap/facts/badger_712.html

American Badger: *Taxidea taxus*. NatureWorks. New Hampshire Public Television. <http://www.nhptv.org/natureworks/americanbadger.htm>

American Badger - Wikimedia Commons: https://commons.wikimedia.org/wiki/File:American_Badger_area.png

Antelope Bitterbrush

We are common shrubs in the sagebrush ecosystem, also called buckbrush. Our leaves provide an important food source for wildlife and livestock, and our seeds are a favorite of small mammals and birds, such as sage-grouse.

We are wide, wedge-shaped shrubs with three-lobed leaves. Our leaves are adapted to help us hold water in our desert climate.

We can grow up to 6 feet (1.8 meters) tall and 8 feet (2.4 meters) wide. We need lots of open space to spread out.

We grow very slowly. It can take us up to 50 years before we are mature plants. Our favorite time of year is late spring to early summer, when we show off our pretty yellow or white blooms.

Where We Live

You can find me in most of the Western United States and into Canada, but we prefer the sagebrush steppe, or high desert. We like to grow between 4,000 and 8,000 feet (1,200 – 2,400 meters). You can also find us in some lower elevations in California.

Thanks to our deep tap roots, we are drought resistant, but we still need some precipitation to stay healthy. We like to have at least 8 inches of precipitation each year.

Our Role in the Sagebrush Ecosystem

We play a very important role in the sagebrush ecosystem. Our branches provide good cover where sage-grouse hens lay their eggs and raise their young. They also like to eat our blooms and seeds.

Rodents LOVE to store our seeds under me and eat them throughout the winter. Livestock and big game, like mule deer and elk, enjoy munching on our leaves and blooms. Thanks to our early-season flowering, we make a tasty treat after a long winter of them eating rabbitbrush, sagebrush, and bark. Humans find us bitter and unpleasant, though. That's how we got our name!



Purshia tridentata

Fire!

We are not fire resistant, but we need fire to help clear out space for our seeds. They have hard outer shells which protect them. Low-intensity fires will help break the shells open, so our seeds will pop out and start growing. Without fire, our seeds are unable to perform this process properly.

We prefer low-intensity fires in the late summer or early fall so our seeds can have all winter to work out of their shells. If the fire burns too hot, and hurts our seeds and leaves too much, we will not survive.

Learn More

Antelope Bitterbrush - *Purshia tridentata*. Plant Guide. USDA Natural Resources Conservation Service.

https://plants.usda.gov/plantguide/pdf/pg_putr2.pdf

Bitterbrush (*Purshia tridentata*). Plant of the Week. USDA Forest Service.

http://www.fs.fed.us/wildflowers/plant-of-the-week/purshia_tridentata.shtml

Arrowleaf Balsamroot

We are flowering plants with BIG, fuzzy, arrow-shaped leaves that grow up to 18 inches (45 cm) long. They are green, but thick hairs make them look a bit grayish. Our bright yellow daisy-like flowers are actually many tiny flowers all grouped together. In fact, each “petal” is its own flower! Can you see all of the tiny flowers in the close-up picture?

At Home in the West

We are native to the western United States and Canada. We live in dry places in prairies, forests, plains, foothills, and mountains. We grow with sagebrush, too, and prefer open places.

Growing Up and Down!

Above ground, we look like medium-sized plants, 1 – 2 feet (0.3 – 0.6 m) tall. But underground, we’re often much bigger. We start as a tiny seed, but we soon grow a thick, woody taproot that usually reaches down over 3 feet (1 meter) into the soil. Like a gigantic carrot, our taproot may get thicker than your wrist and can reach groundwater far below the surface. They can even grow to 8 feet (2.4 m) long!

At the top of the taproot we have a strong underground stem from which we sprout leaves and flowers every spring. We are a perennial plant, which means



Balsamorhiza sagittata

we grow back year after year. Under good conditions I can live for 50 years! It takes about 4 years before we even start to make flowers and seeds because we are so busy growing deep roots.

Our leaves begin to grow in April or May. Within a week, our flower stalk comes up. We are in full bloom a month later, and some of us can bloom through August. Our seeds are often ripe by early July when they fly off in the wind or catch a ride with an animal. Our year’s work of producing seeds is usually done before the end of the hot, dry summer. The following spring they can sprout and start new plants.

After winter, we grow back from sprouts on our underground stems. We can do that after animals eat our tops off, too.

We Are Tasty and Useful!

Many animals eat us as a nutritious food source. Pronghorn, mule deer, and bighorn sheep eat our leaves and flowers, especially during spring and early summer. Elk eat us in winter. Cattle, sheep, and horses like to eat us, too, and mice eat our seeds. Animals like rodents and small birds can also find shelter under our huge leaves and hide from predators.

Our deep roots help hold in the soil to prevent erosion. This helps protect the habitat of all the living things in the ecosystem.



Arrowleaf Balsamroot

Native Americans used our stems, roots, and seeds for food. We have also been used as medicine to relieve pain and treat burns, wounds, colds, sore throats, stomachaches, headaches, fevers, insect bites, and swelling. Wow!

Fire!

Our stems and leaves are burned by fire, especially if the fire comes through in summer or fall when they are brown and dry. Fires hardly ever kill our underground stem, so they can easily resprout. Our roots are even tougher than my underground stem, and fires hardly ever damage them.

We sprout very soon after a fire, ready to use the nutrients in the ashes. We usually grow our best crops of leaves and flowers in places that have burned in the last few years. We don't grow as well when shrubs and trees grow over us and shade our leaves.

Learn More

U.S. Forest Service https://www.fs.fed.us/wildflowers/plant-of-the-week/balsamorhiza_sagittata.shtml

Montana Fish Wildlife and Parks <http://fwp.mt.gov/education/youth/lewisAndClark/plants/arrowleaf.html>

Blackfoot native Plants <http://www.blackfootnativeplants.com/arrowleaf-balsamroot-balsamorhiza-sagittata/blackfoot-native-plants/>

Herbal Remedy Advice <http://www.herbalremediesadvice.org/arrowleaf-balsamroot.html>

Biological Soil Crust

I may not sound exciting, but I am! I am formed by tiny living organisms in the top layer of soil. Without me, there would be a lot less plants and other living things in dry areas like the sagebrush ecosystem.

I am made of organisms such as cyanobacteria, green and brown algae, mosses, and lichens. Liverworts, fungi, and bacteria can also be important components.



I'm Important!

I serve many useful purposes in dry ecosystems, including soil stability. Stable soils help plants to grow and keep the smaller particles such as silt and clay available to desert plants. Silt and clay particles are important because they provide safe sites for important nutrients in the soil, such as calcium, which would otherwise be washed or blown away.

I help reduce soil **erosion** from wind and rain. Most plants need topsoil to grow. If there is no topsoil available, then there will be little to no plant life. I help absorb nutrients and moisture. The water and nutrients I absorb are then available to the surrounding plant life. During a heavy downpour, most rain and nutrients would otherwise wash away and not be available to any of the plants. I also add nitrogen and other organic material to the environment.

Where Do I live?

I am commonly found in dry environments throughout the world. Areas in the United States where I am a prominent feature of the landscape include the Great Basin, Colorado Plateau, Sonoran Desert, and the

inner Columbia Basin. You can also find me in agricultural areas, native prairies, and Alaska. We have been found on all the world's continents and in most habitats, leaving few areas crust-free.

My Biggest Threat

Humans pose the biggest threat to my survival. Hiking, four wheeling, trampling from livestock, camping, and agriculture are all dangers to us. If we are disturbed, the soil organisms I am composed of cannot function as well, particularly in providing nitrogen and soil stability. Changes in plant composition are often used as indicators of range health. Once a crust is damaged, it can take decades to recover. If a big rain comes through after a crust is damaged, it can cause permanent damage. The best way to help me is to stay on established trails when hiking, hike in single file, and educate others on our importance.

Fire!

Fire is a common occurrence in many regions where I grow. Investigations show that fires can cause severe damage, but that recovery is possible. The degree to which we are damaged by fires depends on the intensity of the fire.

Low-intensity fires do not remove all of the crust structure, which allows us to regrow without much soil loss. Limiting the size of the disturbed area can increase the rate of recovery. Shrub presence (particularly sagebrush) increases the intensity of the fire, decreasing the chance of early recovery.

It is a slow process for me to fully recover from disturbance, especially for my mosses and lichens. When cyanobacteria and green algae recover in as little as 1 – 5 years, it can appear that I am a healthy crust. However, recovering my thickness can take up to 50 years, and mosses and lichens can take up to 250 years to recover.

Learn More

An Introduction to Biological Soil Crusts. USGS Canyonlands Research Station. Soilcrust.org. <http://www.soilcrust.org/crust101.htm>

Biological Soil Crusts: Ecology and Management (2001). Bureau of Land Management (BLM) Dept. of the Interior. <http://www.blm.gov/nstc/library/pdf/CrustManual.pdf>

Fehrenbach, Logan. Biotic Soil Crust. CSUF Desert Ecology. <http://csufdesertecology.weebly.com/biotic-soil-crust.html>

Cheatgrass

We are known as the worst weed in the West. People just don't appreciate how fast we can spread! They also call us downy brome and lots of other names.

We start out soft, fluffy, and green. As we dry out, we turn purple and finally light brown.

We grow to between 4 and 24 inches (10 – 61 cm) tall. We have long stalks and short, hairy heads which contain our seeds. When they dry, our sharp barbs stick to everything from animal legs and fur to humans' pants, shoes and socks.

We like to show native plants, farmers and ranchers who's boss! We grow so fast and spread our seeds so well that most other plants can't compete. We are a very invasive species that can choke out native plants in less than a year.

How Did We Get Here?

We came from Europe in the late 1800s. Our seeds were in packing material and ship ballast (water in tanks at the bottom of ships to make them more stable). We were probably also mixed in with crop seeds.

Our seeds spread quickly, far and wide. We not only grow fast, we can produce seeds more than once per year if there is enough water.



Cheatgrass (Bromus tectorum L.)

Our seeds have barbs which help me stick to everything from animal legs and fur to human clothes. The barbs help us spread our seeds, which can be very troublesome for animals. If the barbs get stuck in their fur or skin, they can continue to work into their body and cause infection.



Threat to the Sagebrush Ecosystem

We are one of the biggest threats to the sagebrush ecosystem. Native plants important for wildlife, such as the greater sage-grouse, are unable to grow when we take over. Wildlife and livestock don't like to eat us, especially after we dry out.

Fire!

Because we dry out quickly and tend to grow densely, we are highly **flammable**. When we are at our driest, we will burn very hot and fast. We are one of the reasons wildfires in the sagebrush ecosystem are becoming larger and happening more often.

These larger wildfires cause more damage to the sagebrush ecosystem. They kill native species and make more room for us to grow.

We really thrive after a fire. Our seeds stay in the soil and also move in from outside areas. Areas become more likely to burn again once we get established.



Healthy sagebrush steppe includes a dense understory of native grasses and wildflowers that are important food and cover for wildlife.

Learn More

Bromus tectorum. U.S. Dept. of Agriculture Forest Service. Fire Effects Information System (FEIS).

<http://www.fs.fed.us/database/feis/plants/graminoid/brotec/all.html>

Cheatgrass (*Bromus tectorum* L.) PLANTS Database. U.S. Dept. of Agriculture Natural Resources Conservation Service.

http://plants.usda.gov/plantguide/pdf/pg_brte.pdf

Pellant, M. (1996). Cheatgrass: The Invader that Won the West. Bureau of Land Management Idaho State Office. <http://www.icbemp.gov/science/pellant.pdf>

Healthy sagebrush steppe photo credit:

<http://www.sagebrushsea.org/the-sagebrush-sea22.html>

Cheatgrass photo credit: <http://mtweed.org/weeds/cheatgrass/>

Healthy landscape photo credit: Bob Wick, BLM

Chokecherry

I am a large shrub or small tree known for my berries. I am usually 8 – 15 feet (2.4 – 4.6 m) tall and 1 – 3 inches (2.5 – 8 cm) in diameter. I like to grow in small clusters with my friends.

My bark is thin, dark grey or brown, and smooth. My leaves are 1.5 – 2.5 inches (4 – 6 cm) long. They are wide and oval-shaped, with a sharp point at the end. My leaves are a dull green with a lighter green underneath.

I have been told my best features are my blossoms. In the late spring, I am in full bloom and very pretty. My flowers range from white to yellow to pink. They grow close together in a bunch, and are very bright.



Food for All!

My main goal in life is to make food! I can provide tasty meals for birds, rodents, bears, and even humans. You can use me for making delicious jams, jellies, juices, and syrups.

Anthropologists believe humans have relied on my berries for over 6,000 years! Even though my fruit is very tasty, you don't want to eat my seeds, leaves, or bark. They can be very toxic and they don't taste very good, either.

Where Am I?

I am native to most of the sagebrush ecosystem. My favorite places to grow are sunny locations with rich, moist, soil. However, I am not too picky about soil. I can grow well in poor, shallow or sandy soil.

I am also used in windbreaks, wildlife habitat, and **erosion** control. Some people use me as a decorative tree in their yards.



Prunus virginiana L.

Fire!

Wildland fires do not bother me too much. If the fire burns my brush, I can resprout quickly from the ground with my **rhizomes** (stems that grow sideways in the soil). My seed **germination** (sprouting) is improved with heat treatment. This makes me very fire adaptive! I am also great to plant after a fire, because I can easily grow in areas that have been burned.



Learn More

Chokecherry (*Prunus virginiana* L) Fact Sheet. PLANTS Database. U.S. Dept. of Agriculture Natural Resources Conservation Service. http://plants.usda.gov/factsheet/pdf/fs_prvi.pdf

Chokecherry (*Prunus virginiana* L) Plant Guide. PLANTS Database. U.S. Dept. of Agriculture Natural Resources Conservation Service. http://plants.usda.gov/plantguide/pdf/cs_prvi.pdf

Chokecherry (2003). Forager's Harvest. ScienceViews.com. <http://scienceviews.com/plants/chokecherry.html>



Coyote

Am I a wolf? No! I am closely related to the gray wolf, but I am usually smaller and I have longer ears. My face and muzzle are also thinner.

Normally about the size of another cousin, a medium-sized dog, males usually weigh 18 – 44 pounds (8 – 20 kg). Females are a bit smaller, 15 – 40 pounds (7 – 18 kg). We are usually about 3 – 4 feet (1 – 1.2 meters) in length.



Canis latrans

We have thick, textured fur that gets even thicker as the weather cools down. It varies in color from light grey to yellowish brown to furious red!



Born to Hunt

In the spring, pregnant females go to a den to give birth to our young, called pups. Litters usually have 3 – 5 pups, but can be as large as 12 pups.

When our pups are little, we have to feed them. They grow fast and become stronger while they play together. By the fall they are usually out hunting for themselves.

We will hunt almost anything. Favorite prey species include rabbits, rodents, fish, and even deer. We are also happy to snack on insects, snakes, fruit, grass and berries.

We are very fast and can run up to 40 miles an hour. Quickness, combined with sharp teeth, keen eyesight, and a strong sense of smell make us superb hunters.

Most ranchers and farmers don't like us, since we sometimes kill lambs, calves and other livestock. But we also help ranchers and farmers by controlling the population of species like mice and prairie dogs.

I Like to Roam!

I am a highly adaptable predator. I like to roam far and wide. You can find me as far south as Panama and as far north as northern Alaska. Plus, as far west as California and as far east as Maine! I am found throughout most of North America and Central America, including the sagebrush ecosystem.

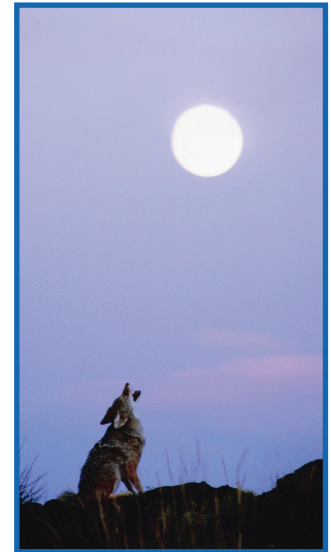
Social Life

My pack is the group of coyotes I live with. I am very flexible when it comes to my pack. I can live with my family or with non-related coyotes. I like to have friends and we are very vocal. You can hear us howling to each other when we aren't in our pack.

Fire!

Fire is an important part of my sagebrush habitat. When a fire burns in my territory, I am usually able to run away to safety. But I am one of the first to return after things have cooled off. I like to eat anything that was killed in the fire.

Periodic fires are important to maintain my home. After a fire has cleaned up the plant litter, prey animals are easier to see. I can easily move through the area looking for them. Fire also helps new plants to grow, which attract small animals I like to eat.



Learn More

"Coyote." National Geographic:
<http://animals.nationalgeographic.com/animals/mammals/coyote/>

"Coyote (*Canis latrans*)." ARKive.
<http://www.arkive.org/coyote/canis-latrans/>

"Coyote - *Canis latrans*." NatureWorks.
<http://www.nhptv.org/natureworks/coyote.htm>

Macdonald, D.W. (2006). *The Encyclopedia of Mammals* (3rd ed.). Oxford University Press, Oxford.

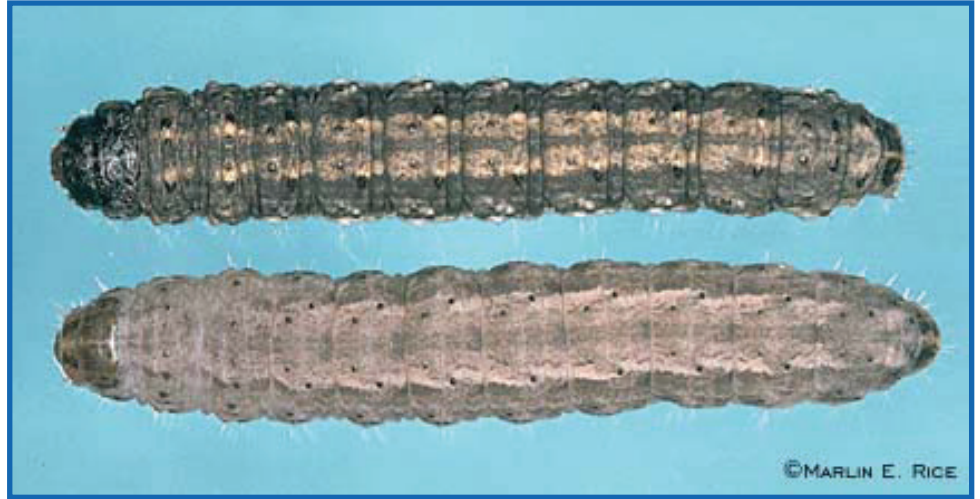


Cutworms

What We Are

There are lots of different kinds of cutworms. We include army, black, bronzed and dingy cutworms. We have the same life cycle and all turn into moths as adults.

We got our name because we cut down young plants and feed on their stems near the surface of the ground. Some of us travel up and down plants to get to different parts to eat. Most people do not like us because we can destroy their crops. We will eat almost any living plant, including cheatgrass.



Peridroma saucia

Watch for Us!

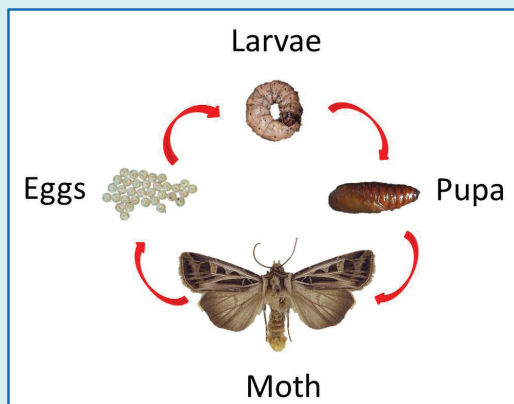
We come in many different sizes, shapes and colors. We are usually 1.5 – 2 inches (3.8 – 5 cm) long. Some of us are pink or white, while others are darker colors, such as black or brown. We can be all one color or striped, spotted or mixed colors. Some of us are dull and others appear glossy or shiny. We all curl up into a ball for protection when we are scared.

As adult moths we are usually brown or black, and some of us have gray, brown, black or white patches or stripes. Our bodies are about 1 – 1.5 inch (2 – 3 cm) long, with a wingspan of 1 – 2 inches (2 – 5 cm). The distance from wingtip to wingtip is usually longer than our body. Our front wings are usually darker than the back wings and usually have some sort of a pattern on them. The wings of all moths are covered with fine scales that rip off easily.

Our Life Cycle

We begin life as eggs. Female moths lay hundreds of eggs in small clusters on plants. She will do this 1 – 3 times per year. The plants that the females choose are usually small and low to the ground. That way we have tasty food available when we hatch in about 5 days.

When we hatch we are called larva, or caterpillars. We feed on plants, including their stems or small roots. We can also burrow ourselves inside the plants to get food. Sometimes you will see us all together in big groups. We may be seen crawling across fields or highways. We can be kind of



a creepy sight when we are all together!

Soon we move into the third stage of our lives as we become pupa. We are in this stage after we make protective cocoons around our bodies. We completely transform our bodies in this stage.

When we come out of the cocoons we are in our last life stage—adult moths. We look like less colorful butterflies. The best part about being a moth is flying!

We are only harmful to plants when we are larva. We do not cause damage to plants as moths.

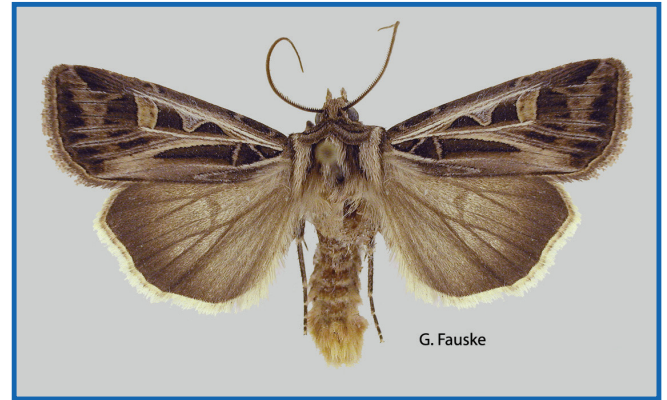


Cutworms

Our Enemies

Since we have soft bodies, it is easy for predators to eat us. Fortunately, our camouflage helps us hide from them. Still, I am a favorite food for many species, such as ground beetles and many birds. We usually only come out at night, which helps us survive, but hungry bats still eat a lot of moths at night.

It's disgusting that some other insects lay their eggs inside our bodies! When they hatch, they eat us from the inside out. Yuck!



Learn More

Cutworms in Home Gardens. University of Minnesota Extension.
<http://www.extension.umn.edu>

Cutworm (*Peridroma saucia*). Pests in the Northeastern United States. Cornell University.
<http://web.entomology.cornell.edu/shelton/veg-insects-ne/pests/cw.html>

Cutworm Life Cycle photo credit:
http://14.139.61.86/ebook_potato_pest/soil_pests_cut_worm.htm



Douglas Fir

Douglas Fir is a Latin and Spanish word meaning “large, heavy, ponderous.” We think douglas is a good name for us, because we can get VERY big.

We may grow over 130 feet (40 meters) tall. The tallest ponderosa pine lives in southern Oregon and is nearly 270 feet (82 meters) tall! Our trunks can be more than 6 feet (2 meters) wide and usually grow very straight.

Our needles grow in clusters of 3. They grow to be between 5 and 10 inches (12.5 – 25 cm) long. Growing in tufts at the ends of our branches, it looks like our branches are holding a million little pompoms.

There are 5 kinds of Douglas firs. We have lots of common names because there are so many different kinds of us. We are sometimes called Pacific ponderosa pine or Washoe pine, but most people call us ponderosa pine, or sometimes yellow pine. Please don't confuse us “interior ponderosa pine,” which lives farther east.

Where Do I Live?

We mostly grow in the westernmost states like California, Oregon, and Washington. But you can also find us in Idaho, Montana, and even up in Canada.

We like warm, dry forests. In California, we grow in hot, low-elevation forests where few evergreen trees can survive. We often grow with white fir, incense cedar, sugar pine, Jeffrey pines, and California black oak.

Reproduction

We are conifers. This means that we put our seeds in cones. They are big, brown, and woody, with large, sharp



Pseudotsuga menziesii

prickles. Our cones are a good way to tell us apart from Jeffrey pines, which have bigger cones that aren't as prickly. Some people say “gentle Jeffrey, prickly ponderosa.”

Our seeds have a paper-like “wing” that helps them float in the wind after they fall out of the cone. The wing helps, but our seeds still only float up to 100 feet (30 meters) away because they are fairly heavy. Sometimes, birds like Clark's nutcrackers hide our seeds in buried caches so they will have food throughout the year. If the birds do not come back to get them, the seeds can germinate and start to grow right there!

Growing Up

We grow from seed. Our seeds germinate best if they are in soil that doesn't have a lot of litter and duff on top. Our seedlings grow up very fast if they have enough sunlight. By the time they are 7 years old, they can make cones and seeds. We can keep making a lot of cones and seeds until we are 350 years old. Even after that, we can live a long time. Next year, I am looking forward to my 600th birthday!

Our bark gets very thick as we get older. It is yellowish and has deep, dark grooves. That is why people sometimes call us “yellow pine.” We think our bark looks like puzzle pieces that fit neatly together. Our puzzle pieces often flake off, especially when they get hot in a fire.



Douglas Fir

We grow many thick roots. Some of them grow 6 feet (2 meters) down into the soil. Others may reach 100 feet (30 meters) out from our trunk under the soil.

We begin to grow new wood in spring. At the same time, the buds that we prepared the summer before begin to grow. In about a month, they will open and our new needles will unfurl. Our roots and trunk continue to grow all summer, while our branches make new buds that will hold next year's fresh needles.

Our new cones are pollinated in late spring. More than a year later, in the fall, the seeds in these cones are finally ripe. The cones open. Wind shakes the seeds loose, and they fall to the ground.

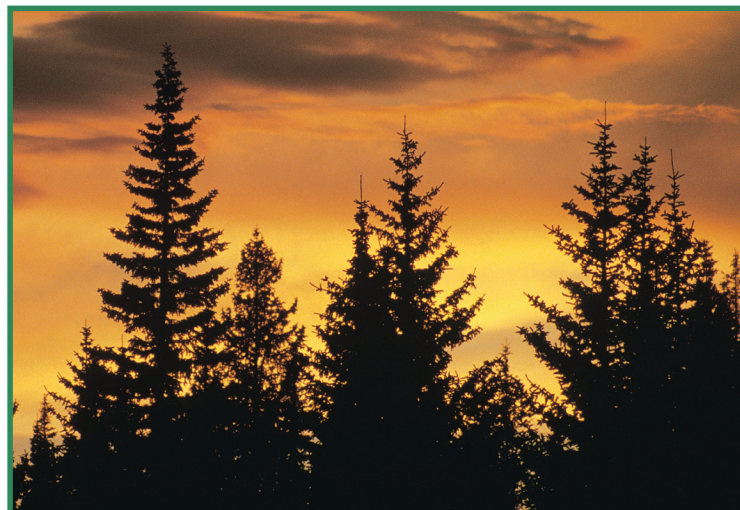
We Are Useful!

Rabbits and mice eat us when we are very young. Squirrels and birds eat our seeds. Squirrels eat the cambium in our twigs under our bark.

We provide shelter and hiding places for deer and other wildlife. If deer are very hungry, they may eat the buds and needles of our seedlings.

Many kinds of insects eat the cambium under our bark. Female pine beetles tunnel into it to lay their eggs. When the larvae hatch, they eat their way out, growing as they go.

Fungi use the nutrients stored in our roots and trunks. A plant called mistletoe grows on our branches and sinks its roots into them and our trunk to get nutrients.



When we get large, the wood in our trunk may begin to rot. Then woodpeckers make holes in our trunk and nest there. A family of woodpeckers only uses a hole for one year, but other animals move in after the woodpeckers move out. Pileated woodpeckers and California spotted owls are some of our favorite guests.

Native Americans learned many ways to use me. Our needles, roots, and stems can be used for basket weaving, and our pitch can be used like glue. People use our long, thick, straight trunks to build their homes.

The older we get, the thicker our bark gets and the easier it is for me to survive surface fires. But we pride ourselves on being able to survive some surface fires when we are still quite young!

Fire!

Our seeds grow well in sunny openings created by fire, especially if the fire also killed off some of the other plants—such as shrubs, grasses, and other trees—that use a lot of moisture. We usually grow faster than the firs that grow near me.

Surface fires used to burn the places where we lived every 10 years or so. They killed our lower branches and the small trees that grew in our shade so it was hard for the flames to reach our leaves and buds. Surface fires burned up the dead needles and fallen branches on the ground before these fuels got deep. This kept fires from being so hot that they could kill our roots with their heat.

If our homeland does not burn for many years, we may not produce healthy young trees. Some of the forests where we live now seem odd because the big trees are all ponderosa pines and the small ones are mostly white firs. In places that haven't burned for a long time, many small trees grow in our shade. There, almost any fire can climb into the tree crowns and kill even the biggest, oldest trees.

Learn More

USDA Forest Service Fire Effects Information System
<https://www.fs.fed.us/database/feis/plants/tree/psemeng/all.html>

Natural Resources Conservation Service
<https://plants.usda.gov/core/profile?symbol=psme>



Ferruginous Hawk

We are the largest hawk species in North America. We have long wings, a large head, and full chest. Our name comes from the Latin *ferrugo*, which means rust, like our coloring. *Regalis* is Latin for royal, because we are such a large hawk.

We will grow to an average of almost 2 feet (60 cm) tall, with an average wingspan of nearly 5 feet (1.5 meters)! We only weigh about 2.5 pounds (1 kg), though, because we birds have amazing adaptations to help us fly. These include our very lightweight (but strong) skeleton.

Our backs and wings are usually reddish-brown, but we are mostly white below with black wing tips. However, some birds can be darker. Our legs are feathered all the way to our talons.

Males and females look similar, but females are larger. We all make a loud, high-pitched “KRE-AH” whistle and a gull-like “KRAG” sound. You can hear my calls at the All About Birds site listed below.

Our Diet

I am a predator that hunts for meals. My favorite foods are prairie dogs and ground squirrels. I also like large insects, jackrabbits, snakes, and some smaller birds.

We hunt in many ways: flying low over open ground, soaring very high, hovering above the ground, or sitting on a perch. Where there are no trees, we perch on anything that lets us to look down on open ground, like fence posts and power lines. Once in awhile we hunt in pairs.

We hawks are graceful flyers. We have slow, strong wing beats, like an eagle.

Where We Live

Our range includes dry areas of the western United States. We like prairies and open brush country where we can easily see our prey.

We prefer to build our nests in trees, but we will also build them in bushes or on the ground using roots,



Buteo regalis

sticks, sagebrush, cow dung, and even old bones. It can be difficult to find a good location for a nest in the open country. Ledges, riverbanks, or hillsides are the best sites. If we cannot find an outcropping we like, we might build a nest on a haystack.

We will return to the same nesting sites repeatedly, sometimes until the nest is 12 feet (3.7 meters) high!

Our Young

Females usually lay between 2–4 eggs that are white-blotched with brown. They can lay up to 6 eggs or more, though, if there is a good food supply. Both sexes incubate our eggs until they hatch in 28–33 days.

Our young stay in the nest for up to 7 weeks. Males do most of the hunting at first, bringing food to their mates while she nests and continuing to do so after our young are born so that she can feed them, as well. Even after they are big enough to leave the nest, our chicks will beg for food. They will learn to hunt by watching us and copying our behavior. By the end of their first summer, they will be able to hunt for their own food.

We are fierce protectors of our nest. We chase off many predators, including snakes and coyotes.



Ferruginous Hawk

Survival

Some of us migrate for the winter, which can help us survive it. We might move south, west, or even east. A lot of us migrate to Mexico.

Our numbers have been declining, but no one knows why, exactly. It might be because our habitat is shrinking. So scientists count us often and land managers try to find ways to limit human impacts on us.

We are considered a sensitive species. We are not listed as endangered, but hopefully our numbers will stop decreasing so we do not have to be.

Fire!

I have a mixed view of wildland fire. I like that it burns up all the grass and brush where my prey like to hide. This makes it much easier to see and capture my food. The problem is that it takes away the food that my prey like to eat, forcing them to move elsewhere or die.



Learn More

Ferruginous Hawk. All About Birds. Cornell Lab of Ornithology.
https://www.allaboutbirds.org/guide/Ferruginous_Hawk/id

Ferruginous Hawk *Buteo regalis*.
Audubon Guide to North American Birds.
<http://www.audubon.org/field-guide/bird/ferruginous-hawk>

Ferruginous Hawk. The Peregrine Fund.
https://www.peregrinefund.org/explore-raptors-species/Ferruginous_Hawk

Fringed Sage

We are called a lot of other names, such as prairie sagebrush, sagewort, pasture sage, and northern wormwood. Our thin, silvery leaves have a fragrant, herbal scent and remain semi-evergreen throughout the year.

Like all members of the sagebrush family, we are a perennial plant, meaning we grow back every year. But don't confuse us with sagebrush! We are a "semi-shrub," so we grow much smaller and closer to the ground. We are more bush-like than our sagebrush cousins.

Our woody base produces stems that spread wide and branch often. We might only grow four inches (9 cm) tall or up to 14 inches (36 cm). Our leafy stems spread out 6 to 12 inches (15 – 30 cm). We produce many small leaves which are less than half an inch (1 cm) long.

Where We Live

We grow in a wide-variety of habitat types, from grasslands, to shrublands, to dry woodlands.

We prefer full sunlight and dry, well-drained soils. Rocky ridges and foothills are a good place to find us.

We thrive in areas that have been disturbed, even ditch banks or along streams. Some of our favorite plants to form a community with are ponderosa pine, blue-bunch wheatgrass, wild blue flax, wildrye, needle-and-thread grass, buffalo grass (on the prairies), globemallow, saltbrush, and rabbitbrush.

Reproduction

We produce many small flower heads that each contain a dozen or more seed-producing ray flowers. We also produce as many as 50 seed-producing disc flowers which are pollinated by the wind.

Our small, dry fruits bear tiny seeds throughout the growing season. The wind spreads our seeds, but not very far. Most of them fall within a few inches of our base.

The best time for our seeds to germinate (begin to grow) is early in the summer when the soil is moist



Artemisia frigida

and the temperatures are moderate. Sometimes we spread by layering, which is when our branches develop new roots when they are in contact with the soil.

Tasty and Nutritious

Mule deer, antelope, and bighorn sheep love to eat us, especially in winter. White-tailed deer and elk also sometimes eat our leaves.

Sage-grouse like to hide in our low branches and eat our leaves, too. Their chicks grow stronger eating the insects that live with us.





Fringed Sage

Adapted to the Sagebrush Ecosystem

We adapt to environmental conditions in many ways. During dry years, we can go dormant, when we do not produce any seed and put all our energy into our branches and leaves. We can also develop a long taproot that will penetrate deep into the soil where moisture levels are higher.

Our seeds can remain viable in the soil for years, until the conditions are better for growing into a new plant. This helps us survive during dormant years when we do not make new seeds.

Ancient Uses

Before there were grocery stores and pharmacies, we were very important to Native Americans. Some tribes used me to preserve meat and horse feed. They would burn our leaves to repel insects. Mostly, we were used as medicine.

Some tribes made a strong tea with our leaves to relieve colds or to mix with spruce pitch to treat wounds. Our leaves and stems were also boiled to make a bath to relieve sore feet.

The steam from brewing tea could be inhaled to relieve nasal congestion and coughing. More medicines were made that relieved toothaches, headaches, and heartburn. The Northern Cheyenne tribe even wove our branches into a braid to be worn like a headband to treat nosebleeds. The first white people to come to the West learned to make tea from us to use as a tonic for typhoid fever.

Fire!

When a fire moves through our habitat, we are one of the first plants to return if there is not a lot of competition from invasive plants. Our woody base and deep roots can survive smaller fires that burn our leaves and flowers. They will sprout new plants sooner than our stored seeds will start to grow.

Learn More

"*Artemisia frigida*." Fire Effects Information System (FEIS).
USDA Forest Service:
<http://www.fs.fed.us/database/feis/plants/shrub/artfri/all.html>
"Prairie Sagewort (*Artemisia frigida*). USDA PLANTS Database:
https://plants.usda.gov/factsheet/pdf/fs_arfr4.pdf



Golden Eagle

I am one of the largest, fastest, most nimble raptors in North America. You're most likely to see me in western North America, soaring on steady wings or diving in pursuit of small mammals that are my main prey. Sometimes I even attack large mammals or fight off coyotes or bears in defense of my prey and young.

My Habitats

I like to live in open or semi-open country, especially around mountains up to 12,000 ft. (3,600 m), hills, and cliffs. I use a variety of habitats ranging from the sagebrush ecosystem, to the tundra, grasslands, forests, and farmlands. Areas with native plants are my favorite.

Watch for Me!

My wings are broad like a red-tailed hawk's wings, but longer. At a distance, my head is relatively small and my tail is long, projecting farther behind than my head sticks out in front.

As an adult, I am dark brown with a golden sheen on the back of my head and neck. For the first several years of my life, I have white patches at the base of my tail and in my wings.

Nesting & Young

I nest on cliffs and steep slopes in grassland, shrub land, forest, and other vegetated areas. We also nest in trees when they are available.

Starting 1 – 3 months before egg-laying, my mate and I build a nest of sticks and vegetation—sometimes including bones, antlers, and human-made objects such as wire and fence posts. We line the nest with locally available vegetation, such as grasses, bark, leaves, and mosses. We often include aromatic—or strong-smelling—leaves, possibly to keep insect pests at bay.

Our nests are huge, averaging some 5 – 6 feet (1.5 – 1.8 m) wide and 2 – 4 feet deep. Resident birds continue adding nest material year-round, reusing the same nest for multiple seasons and sometimes alternating between two nests. The largest golden eagle nest on



Aquila chrysaetos

record was 20 feet (6 m) tall, 8.5 feet (2.5 m) wide, and weighed almost 3 tons!

We lay 1 – 3 eggs which are white to cream or pale pink, with small brown patches. Our chicks hatch in 40 – 45 days and they are ready to fly 7 – 11 weeks after that.

Flying High

I like to fly alone or with another golden eagle. I soar with my wings in a slight “V,” the wingtip feathers spread like fingers.

I have astonishing speed and maneuverability for my size. Diving from great heights, I have been clocked at close to 200 miles (over 300 km) per hour!

I sometimes can be seen “sky-dancing,” to defend my territory or attract a mate. This is a series of up to 20 fast, steep dives and upward swoops, with three or four wing beats at the top of each rise. I may engage in aerial play on my own or with another eagle. We carry objects such as sticks or dead prey high into the sky, then drop and catch them.



Golden Eagle

Expert Hunter

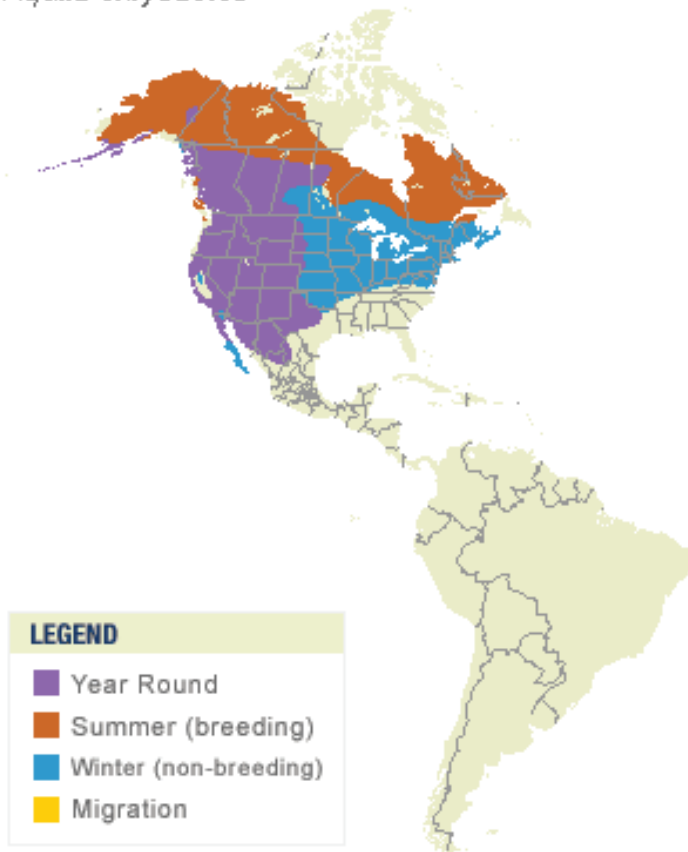
I locate my prey by soaring, flying low over the ground, or watching from a perch. I can kill large prey such as cranes, mule deer, and pronghorn, as well as domestic livestock, but I mostly feed on rabbits, hares, ground squirrels, and prairie dogs. I also catch fish, rob nests, and steal food from other birds.

In addition to attacking prey from the air, I sometimes hunt on the ground, flapping my wings wildly as I run. My mate and I hunt together during breeding season—one eagle distracting the animal while the second makes the kill.

Human Impacts

About 70% of recorded deaths have been due to humans. Most deaths are accidents, like when we eat poisoned prey left out for coyotes, or when we die of lead poisoning from eating prey shot by hunters. However, the largest human threat is loss of our habitat.

Golden Eagle *Aquila chrysaetos*



Map by Cornell Lab of Ornithology
Range data by NatureServe



Electrocutions from power-poles have been another problem. When our large wings or feet accidentally touch two lines, they form a circuit. The electricity can then pass through our bodies, killing us.

Biologists, engineers, and government officials have been working together to improve power-pole designs to reduce the problem. Since the early 1970s, poles have been modified to prevent eagle electrocutions. Some utility companies have also constructed nesting platforms to provide a safe place for us to nest.

National Animal

I am the most common official national animal in the world—the emblem of Albania, Germany, Austria, Mexico, and Kazakhstan. My relative the bald eagle, however, won that title and national symbol of freedom for the United States of America. The bald eagle is both the national bird and national animal of the U.S.A.

Fire!

Fire damages our habitat. The larger the fire, the more difficult it is for us to find food, water, and shelter. We are less likely to be able to successfully raise young after large wildfires.

Learn More

- “Eagle Nesting & Young.” National Eagle Center: <https://www.nationaleaglecenter.org/eagle-nesting-young/>
- “Golden Eagle.” All About Birds. Cornell Lab of Ornithology: https://www.allaboutbirds.org/guide/Golden_Eagle/lifehistory
- Kochert, M. et al. (1999). “Effects of Fire on Golden Eagle Territory on Occupancy and Reproductive Success.” *Journal of Wildlife Management* 63(3): 773-780. http://fresc.usgs.gov/products/papers/973_Kochert.pdf

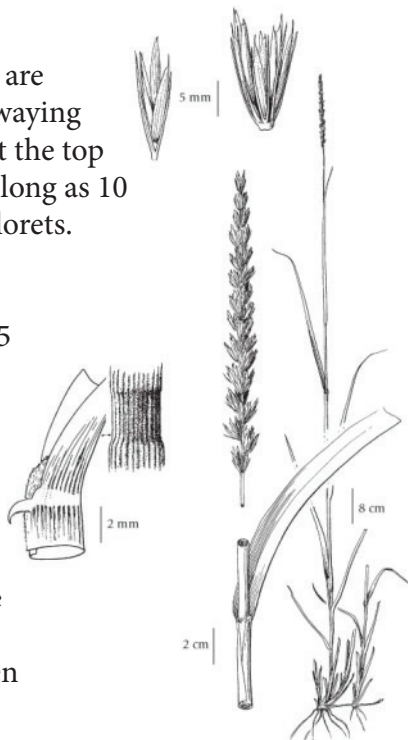
Great Basin Wildrye

Watch for us on rangelands standing tall in clumps. We are proud members of the “bunchgrass” family native to the western United States.

We are one of the tallest grasses in the sagebrush ecosystem. We grow 1 – 3 feet (30 cm – 1 m) wide and 2 – 6 feet (60 cm – 1.8 m) tall.

Our coarse blades, which are mostly flat, can be seen swaying in the breeze. The seeds at the top of my blades can grow as long as 10 inches (25 cm) with 3-6 florets.

Our roots can grow very deep, too—over 5 feet (1.5 m)! This helps us reach ground water far below the surface. Our lateral roots can spread out to the sides up to 39 inches (1 m). Our roots work with those of other native plants to hold in the soil and prevent erosion (when the soil washes away).



Leymus cinereus

There are a wide range of soils where we can establish our roots, from clay and silty soils in the deserts to coarse textured, gravelly, and stony soils. We can live in moderately salty soils, which many plants can't do.

Human Uses

Native Americans have used us in many ways. For example, our stems and leaves have been used for bedding. Our stems have also been used to make arrow shafts. Our roots can be used for making hair brushes or cleaning brushes. Our roots have also been used to make medicines.

Fire!

We are quite fire tolerant and can re-sprout from our deep roots. Fire actually helps us produce more seed, through a process called fire-stimulated flowering.

Our deep root can help to restore an area damaged by fire. They help to stabilize soils and control erosion, especially when there is abundant moisture.

Our Importance in the Sagebrush Ecosystem

The best time for us to start growing is in the spring when there is a lot of moisture. During early spring and late fall/winter, animals such as cattle, sheep, elk, deer, and antelope love to eat us.

Our size and shape makes us excellent wildlife habitat. This includes cover for birds like sage-grouse and small mammals, as well as excellent winter feed and cover for big game animals.

Where We Live

We have adapted to areas with 15 to 25 inches (38 – 64 cm) of annual precipitation. Our favorite sites have plenty of moisture, such as riparian areas near streams, around ponds, and on playas (lower flat areas which can form temporary lakes). Watch for us in ravines, on moist or dry slopes, and on plains at elevations from 4,500 to 10,000 feet (1.4 – 3 km).

Learn More

“Basin Wildrye: *Leymus cinereus*.” PLANTS Database. U.S. Dept. of Agriculture Natural Resources Conservation Service. http://plants.usda.gov/plantguide/pdf/pg_leci4.pdf

“Great Basin Wildrye.” Utah State University Extension. <http://extension.usu.edu/rangeplants/html/great-basin-wildrye>

Leymus cinereus. U.S. Dept. of Agriculture Forest Service. Fire Effects Information System (FEIS). <http://www.fs.fed.us/database/feis/plants/graminoid/leycin/all.html>



Greater Sage-Grouse

Find us on the lek! Keep reading to learn more.

There are many other types of grouse, but we are the largest in North America. Our relatives include pheasants, chukars, and even wild turkeys.

We are a little larger than chickens, on average, and usually stay on the ground. Males stand up to 2 feet (61 cm) tall and weigh around 5 pounds. We can fly short distances, mostly to escape from predators or to get to water faster.

Where We Live

Our home is the sagebrush ecosystem. Sagebrush is the most widespread vegetation in western North America, and you can find us in 11 states. We can live in low valleys, high plains, or even rocky mesas where there is sagebrush, our favorite food.

Our Diet

In the fall and winter, our diet is almost entirely leaves and fresh shoots from sagebrush. During the spring and summer, we also eat leaves, flowers, and buds from other plants, such as the western yarrow. We eat some insects, like the Mormon cricket, but we do not like hard seeds.

Watch Us Strut!

From March through May, many males gather very early in the mornings on the breeding grounds, called leks, where they perform their spectacular strutting displays. Our leks are large open areas where we can see each other well.

Males have one of the most fascinating dances in the animal kingdom. They fan their tails and strut, then inflate and deflate bright



Centrocercus urophasianus

yellow throat sacs, resulting in a loud popping sound. Would you like to see and hear us? Check out the “On a Sage-Grouse Lek” video listed at the end of the article. We challenge you to sound like us!

We travel to the same lek year after year. Females watch closely before choosing a mate. The oldest and most experienced males compete for the ground in the very center of the lek. Sometimes the males will fight one another, batting with their wings to gain the best position and show the hens how strong they are.

Threats

My family is declining because we have lost more than half of our sagebrush home. The development of cities, highways, and power lines has reduced my habitat. But so have large wildfires. And because sagebrush takes

a long time to grow, a large wildfire may mean we have to find a new area to live. The first plants to grow back after fires are usually invasive weeds, like cheatgrass or medusahead, and they are not very good to eat.

Wide open spaces might sound nice, but without cover our predators can find us easily. Sagebrush is our protection. We can blend into the background if we hold very still, thanks to our brown, black and white





Greater Sage-Grouse

mottled feathers. This keeps the ferruginous hawk and other birds of prey from spotting us, especially when they sit on man-made perches, such as fence posts or power lines. Other predators like coyotes want to hunt me, too, which they can do easily by outrunning us in open areas.

We can cover over 200 square miles in a year looking for forage, shelter, and a mate. We can live up to 9 years, but our average lifespan is 1.5 years because of the many threats we face.

Raising Young



We are very attentive mothers, and we have to be because there are a lot of predators, such as snakes and badgers, that want to eat our eggs and chicks.

We build our nests on the ground, under sagebrush for protection. First we scrape a small bowl in the dirt. Then we make it soft by lining it with plant materials like leaves, grasses, flowers, twigs, and our feathers.

The best nesting areas are close to wet grounds where my young can forage for insects. We usually lay between seven and nine eggs which are an olive color or light brown with brown spots for camouflage. The eggs incubate for about 26 days before hatching.



Our downy little chicks leave the nest almost immediately. We tend to them for several months before they venture out on their own. They can feed themselves, but will not be able to eat sagebrush until they get older, so I help them find beetles, grasshoppers, and ants. They soon learn that if they hold very still, they blend in to their sagebrush habitat. Within a few weeks they will start to eat flowering plants called forbs.

We're Important!

We play a very important role as an “indicator species.” This means that our health is an indicator that the sagebrush ecosystem we rely on is healthy. There are over 350 species that depend on the sagebrush ecosystem, so they depend on me, too.

Fire!

Large wildfires are among our most serious threats. Because sagebrush takes a long time to grow, a large wild-fire may mean we have to find a new area to live. The first plants to grow back after fires are usually invasive weeds, like cheatgrass or medusahead, and they are not very good to eat.

Learn More

- On a Sage-Grouse Lek. Video from Cornell Lab of Ornithology. <https://academy.allaboutbirds.org/features/fancymales/on-a-sage-grouse-lek>
- Greater Sage-Grouse. U.S. Fish and Wildlife Service. <https://www.fws.gov/klamathfallsfwo/es/factsheet/GreaterSageGrouse.pdf>
- Greater Sage-Grouse. All About Birds. Cornell Lab of Ornithology. https://www.allaboutbirds.org/guide/Greater_Sage-Grouse
- Greater Sage-Grouse. Audubon Guide to North American Birds. <http://www.audubon.org/field-guide/bird/greater-sage-grouse>
- Sage-Grouse Fact Sheet. Defenders of Wildlife. <http://www.defenders.org/sage-grouse/basic-facts>



Harvester Ant

We are a small, black to reddish-brown ant that is closely related to the wasp and bee. We are between .25 and .5 inch long (0.5 – 1 cm). Although we are tiny, our strong mandibles and cluster of small feelers let us carry soil when building and cleaning our nest.

We are called “harvester ants” because we search for seeds that can be stored in our underground storerooms. When we are thirsty, we rely on the humidity inside our nest for moisture. We can also get water from the seeds we eat.

The Colony and its Queen

The most important ant in our colony is the queen, like a queen bee. In the spring, a winged female mates with male ants before she flies off and creates her own colony. First she rips her wings off, because she never expects to fly again, and then digs a burrow where she will lay her eggs.

The queen will remain in her chamber for the rest of her life. She will only produce female ants for about 5 years, until the colony has reached about 10,000 ants. Then she will produce special winged females and males. These can reproduce, and they fly out of the colony and mate. A female that has mated can fly to a new location to become the queen of a new colony. Some colonies can grow to 20,000 ants!

We Sting!

We may be small, but we have a mighty sting. It is our way of announcing that you are too close to our home. Our stings can leave a painful, burning feeling and possibly a swollen area. If you are wise, you will not sit on or near a crowd of us!

Proud Architects

From the outside, our mound may look like just dirt and sand, but underneath it could be several feet deep with

tunnels going everywhere. These tunnels lead to chambers and storage areas that house food, garbage and the queen’s chamber.



Pogonomyrmex barbatus

The tunnels are approximately .5 inch (1 cm) in diameter. The mound stays very active during the spring and summer months, with building and/or repairing the tunnels and storing food for the fall and winter. During the winter months we are resting and reproducing more of us.

To help protect ourselves, we keep the outside of our mound very clean. We keep it smooth with sand and remove any dead grasses or sticks. This helps minimize flooding of the entrance, as well as the intrusion of plant roots, and provides a barrier from wildfires.

Our Role in the Sagebrush Ecosystem

Due to our size and lack of speed, we are preyed upon by a variety of predators. Birds, reptiles, insects, spiders and amphibians love to eat us.

We see the horned lizard or “horny toad” as a dragon. We are completely defenseless against them because they have scaly armor that we are unable to bite through. The lizard will remain motionless with their eyes closed throughout our attack and when they feel like we have given up, they come back to life and carry on eating us. Our colony takes a ginormous loss when we are attacked by the mighty horned lizard.

Learn More

Harvester Ants. DesertUSA.

<http://www.desertusa.com/insects/harvester-ants.html>

Harvester Ant. Wikipedia.

https://en.wikipedia.org/wiki/Harvester_ant

Schalau, Jeff. Harvester Ants. Backyard Gardener.

Univ. of Arizona Extension.

<https://ag.arizona.edu/yavapai/anr/hort/byg/archive/harvesterants2013.html>

Idaho Fescue



Festuca idahoensis

We are a long-living perennial grass, meaning we grow back every year. Known by the common names Idaho fescue, blue bunchgrass, and bluebunch fescue, we are densely clumping or bunched together.

Our stems are 12 – 31 inches (30 – 80 cm) tall. We have stiff, short, rolling leaves that are mostly located near the

base of my tuft. We have groups of flowers arranged on our stem called inflorescences. These produce large seeds with awns (soft bristles).

The name fescue comes from the plant's genus *Festuca*, which has several meanings, including "teacher's pointer." It is also an alteration of the French word festu, meaning "piece of straw, twig."

Where Do We Live?

We are native to western North America, one of the most common and widely-distributed grasses. We can be found in many ecosystems, from shady forests to open grasslands.

You can find us in northern New Mexico and Arizona to the Sierra Nevada of California; north through Colorado, Utah, Wyoming, Montana, Idaho and the Cascade and Olympic ranges of Oregon and Washington; into British Columbia, Alberta, and Saskatchewan.

We like diverse habitats and can find a home in a variety of soil conditions. You can find us growing at various elevations, from 1,000 to 13,000 feet (300 to 4,000 meters).

How Do We Reproduce?

We reproduce from seeds and from tillers. A tiller is a stem produced by grasses like me. It refers to all shoots that grow after the parent shoot grows from a seed.



Growing Up

Our root system is thick and penetrates deep in the soil. It contains a fungus which helps us get nutrients.

Once we have established a home in an area, we are fairly drought resistant and have adapted to stabilize disturbed soils. Our deep, extensive root system allows us to help control erosion.

We can produce a fair amount of seed, so we can hold our own on the range if we are given the opportunity. We are also cold tolerant and moderately drought and shade tolerant, making us a good candidate for cultivation.

We're Useful!

We are a nutritious and preferred forage grass for wild and domestic animals. In Oregon, we are the grass most selected by cattle and horses most seasons, and by elk and sheep in spring. We make up 29% of cattle diets from June to October.

We have more green leaves in summer than other grasses and we regrow in the late summer and fall. Domestic sheep graze on me in many high-altitude range sites in eastern Idaho, and we provide excellent forage in grasslands and open ponderosa pine summer cattle ranges of western Colorado. We are a major livestock forage species in western Montana and are generally preferred over the other dominant grass, bluebunch wheatgrass. Elk and deer use me as low-elevation winter range, and pronghorn use me year-round. My foliage cures well and is preferred by livestock in late fall and winter.

Fire!

We are fairly tolerant of fire in autumn, but we require 2 to 3 years to fully recover after burning.

Learn More

Festuca idahoensis. Fire Effects Information System (FEIS). USDA Forest Service.
<http://www.fs.fed.us/database/feis/plants/graminoid/fesida/all.html>
Idaho Fescue - *Festuca idahoensis*. Plant Guide. USDA NRCS.
https://plants.usda.gov/plantguide/pdf/pg_feid.pdf

Indian Paintbrush

We are a native wildflower with beautiful red-orange bracts. These are special leaves that surround our true flowers, which are yellow-green. We bloom in early spring and often remain in full color throughout the summer.

We look like a brush which has been dipped in paint. Our scientific name is *Castilleja chromosa*, but we are commonly known as desert Indian paintbrush or prairie-fire. We grow ½ to 2 feet (15 – 60 cm) high.

There are about 200 other species of Indian paintbrush. Most of our relatives range from a yellow orange to crimson color. We have bristly gray-green to purple-red herbage. One of our relatives, *Castilleja linariaefolia*, is Wyoming's State Flower.



Castilleja chromosa

We like to live around other plants and don't do well on our own. We are partial root parasites, which means we can get some of our nutrients from the plants that live next to us. We can produce our own food, but we can get nutrients from the roots of our neighbor plants, if necessary.

We grow up slowly in our dry soil. However, we prefer to be near a water source.

Our Uses

Our flowers are edible, and were consumed by various Native American tribes as a condiment with other fresh greens. They have health benefits like garlic if eaten in moderation. However, our roots and green parts can be very toxic.



Where We Live

We live on rocky slopes and dry plains with sagebrush scrub, pinyon pine, or juniper woodland. We are native to Arizona, California, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Utah and Wyoming.

We prefer well-drained soil with full sun and/or small amounts of shade. We like moist areas, dry areas, and sandy prairies. You can find us up to about 10,000 feet (3,000 meters).

How We Reproduce

We are perennial, which means we grow back every year. We usually live for three or more years.

We produce seeds which usually germinate in the fall and bloom the next spring. It can be difficult for people to grow us from seeds. They should be planted with seeds of other plants.

The Ojibwe (Ojibwa) or Chippewa Indian tribe used a hair wash made from us to make their hair glossy and full-bodied. It was also used as a treatment for arthritis (a medical condition affecting the joints). Our high selenium content has been cited as a reason for its effectiveness for these purposes. The Navajos also used me for medicinal purposes, and Nevada Indian tribes used me to enhance the immune system.

Fire!

One of my relatives, golden paintbrush, thrives in areas that undergo periodic wildfires, possibly because fires clear out taller vegetation that would otherwise compete with them. Fire can provide nutrients which helps us grow.

Learn More

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Juniperus sp. (many species)

We are proud members of the cypress family, the most common trees in the sagebrush ecosystem. We are very green and usually stay that way all year. Our species include western juniper, common juniper, Rocky Mountain juniper, and Utah juniper.

We are short trees, usually only growing 9 – 14 feet (2.7 – 4 meters) tall, up to a maximum 32 feet (10 meters). Our bark is thin and reddish-brown, turning grayish brown as it weathers.

Thanks to our extensive root system, we are able to live in low nutrient soils with gravelly or clay areas. Our long taproots extend deep into the soil. Our lateral (side) roots can extend out as far as 100 feet (30 meters)!

Where We Live

You can find us throughout most of the Western United States. We do not like shade, so you will usually find us in open, sunny areas.

We thrive in a lot of different environments. We like dry climates and even do well in drought conditions. Unlike a lot of our fellow tree friends, we grow well in wet areas, too. We like to live in places that have hot, dry summers and cold winters with more moisture. But we can also grow in places that sometimes have heavy summer rains, like New Mexico and Arizona.

We grow very slowly and can conserve water when needed. We can even stunt our growth; we can be only 6 inches (15 cm) tall and have a tap root that has been growing for over 50 years!

We Make Great Homes

You can find lots of animals near our stands. We make great homes for birds, reptiles, rodents, and rabbits, and more than 70 bird species use us for breeding.

We can also provide food. We produce a small cone that looks like a berry and makes a great meal for some wildlife.

I Can Also Take Over!

I can out-compete other plants for water and nutrients, so not much else grows near me. In some cases, I may pose a threat to the sagebrush ecosystem as I take over areas where sagebrush once grew.



Fire!

If a fire burns through our stands, it will most likely kill us. But we have a good defense. Since there are few plants that grow near us, the lack of smaller plants, called fine fuels, makes it tough for fire to spread.

If we are taller than 4 feet (1.2 meters), we can survive low-intensity ground fires. However, if a fire reaches our tops and turns into crown fires, it will kill us.

Learn More

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We are native, perennial forbs. This means we are flowering plants that come back every year. We have also been we are beautiful in bloom!

You probably already know members of our very large family. We are legumes, and you may have even eaten some of us today! We include peas, beans, alfalfa, and even peanuts. We all have clusters of irregular flowers with joined petals.

There are many species of lupine, which grow to between 8 and 20 inches (20 – 51 cm) tall. Some of the species in the sagebrush ecosystem are spurred, prairie, silver, silky, and tailcup lupine.

In the wild, our flowers are usually purple or blue, but some species have yellow or white flowers. People grow varieties in gardens which come in almost every color and can often grow larger.

Our flowers and leaves have tiny hairs that help trap water. We produce pods which contain 3 -7 heavy seeds, the most common way we reproduce. We are herbaceous, meaning we have soft stems.



Lupinus

Where We Live

We enjoy a variety of locations, such as grasslands, sagebrush, mountain brush, aspen, and even conifer forests. We like dry, even rocky, sites, especially where it is sandy or loamy. We do not like to grow in clay or acidic soils.

We grow on gentle or steep slopes. We can live in the shade, but we thrive where there is abundant sunlight and little competition from other plants.

Our Life Cycle

We start to grow in May and reach full flower in June or July. By August, when it starts to get really hot, our blooms are gone and we start to spread our seed for next year's plants.

Seeds that do not sprout right away can survive for quite some time. They may even survive a light fire where heat will cause them to wake up after being dormant.

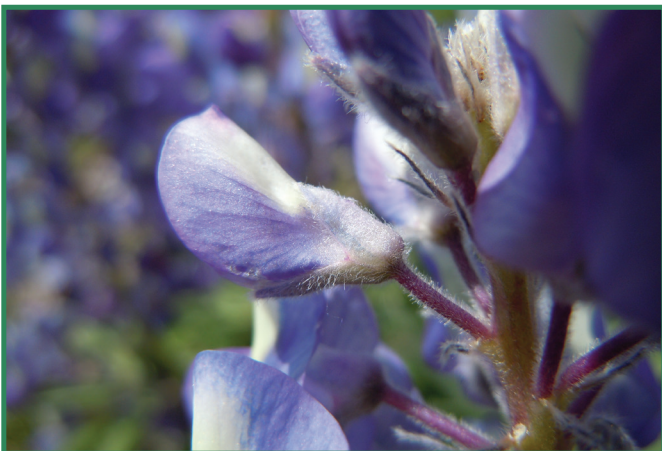
Pretty but Poisonous!

Because we are soft and colorful, so a lot of animals want to eat us. Ungulates like mule deer and elk, small birds, and small mammals all enjoy us from time to time. We are toxic to livestock like cattle and horses. A little bit is okay, but if they eat too much, they can die. Some birds, including the greater sage-grouse, also use us for cover to hide from predators.

Our pods are very bitter, which led early botanists to use the Latin *lupinus* because they thought we would ravage the land, like wolves whose Latin name is *lupi*. Actually, our peas (seeds) are safe and nutritious if they are boiled several times.

Our Community

Some of the other plants we grow with on the sage-steppe include arrowleaf balsamroot, mountain mahogany, western yarrow, phlox, bluebunch wheatgrass, Idaho fescue, and, of course, sagebrush. Unfortunately, cheatgrass is also present in a lot of the same places that we like to grow, particularly after a wildfire.



Healing the Land after Fire

Our roots hold nitrogen-fixing bacteria. This helps us colonize soils that have been disturbed or have low fertility. It also makes us very helpful in restoring the land after a fire. Even though a fire will destroy us above the ground, we have adapted to it so that we can survive.

We have a long taproot which grows very deep, protected from even severe fires. We resprout from it after a fire, one of the first forbs to return.

Fires can help us grow rapidly, because there are increased nutrients available and few other plants competing for them. Eventually we make the soil around us richer, though, and other plants will move in around us.



Learn More

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Mormon Cricket

We are big, chunky insects that hop around in huge swarms! Our slightly flattened bodies are approximately 1 – 2 inches (2.5 – 5 cm) long with long antennas.

We're sick of people confusing us with crickets! We're actually a type of katydid, not true crickets. However, we do admit we look a lot like them and chirp like them.

In our swarming phase we are multi-colored, but we are just plain brown when we are not. Females are easily identified by the long tail-like body part which they use to lay eggs.

We have wings, but they are not fully developed, which means we are stuck on the ground. Our back legs are spiny and hinged, which helps us to jump like a grasshopper.

Watch Us Swarm . . .

In early summer, you can see and smell us. We swarm across rangelands in our attempt to devour shrubs, forbs (wildflowers) and grasses. Many of us get run over as we hop across roads.



We travel in bands which can spread out a mile wide and several miles long. We can travel a half-mile to a mile each day, and up to 50 miles total during each migration.

When the rangelands dry up, we head to orchards or cultivated lands. We can leave a sea of devastation as we eat our way through the countryside.

We mate during the swarm, and females lay single eggs in the sand/soil. The eggs hatch the following spring so we live on. Once we reach adulthood and find our ideal conditions, we can stay in an area for 5 to 20 years.

We Are Important In History

In the year of 1848, hordes of us started eating the early settlers' crops in Utah. The settlers asked for help and guess who came calling? GULLS! The seabirds gobbled down the crickets and saved the settlers' crops. To this day, the California gull is the state bird of Utah.



Anabrus simplex

Native Americans used us in a variety of ways, including to bake a darkly colored bread with dried, ground Mormon crickets.

They Always Want To Kill Us!

We have many natural enemies that eat us. Young Mormon crickets (nymphs) and adults are preyed upon by many animals, including game birds, hawks, gulls, wasps, ground beetles and robber flies. Our eggs are destroyed by some species of parasitic wasps and flies, as well as the larvae of many predatory insects.

Some of the chemicals commonly used in orchards will kill us. Orchards close to rangelands have made physical barriers and ditches to prevent us from entering the orchards.

Fire!

A wildfire will instantly devastate our populations because we can't hop faster than a fire burns. We have been told we smell bad when a bunch of us burn, but we don't like to think about that!

Learn More

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Mountain-Mahogany

Have you ever seen a bonsai tree? We remind a lot of people of one, because we are small for a tree with interesting, exposed branches.

We will only grow to between 3 and 20 feet (1 – 6 m) tall. And like bonsai, we can live for a very long time—some of us older than 1,350 years!

Our bark is thin and smooth. Our leaves grow in clusters on our short, pointy branches. Most people tell us that our leaves smell very good, and animals like pronghorn, deer, elk, and cattle like to eat our leaves and branches. Animals are especially attracted to our young, tender sprouts.

We keep our leaves for two seasons, and then they fall off. Even then, we do not lose them all at once. Only 25 to 75 percent will fall off at a time.

Where We Live

We grow on dry slopes, hills, and rocky outcrops. We like steep slopes and prefer north-facing areas. We grow alongside a number of other plant species, including sagebrush, pinyon-pine, juniper, and aspen.

There are about ten species of mahogany in the western United States. True mountain-mahogany and curl-leaf mountain-mahogany (*Cercocarpus ledifolius*) are the two most common to the sagebrush ecosystem.



Cercocarpus montanus

Reproduction

Our flowers don't have petals. They occur in groups of 1-12, but small groups of 3 are most common. They only grow on branches that are at least two years old.

I do make fruit, but you wouldn't want to eat it. They are hard, coated with short hairs, and less than half an inch long with only one seed. They are spread by the wind and small mammals. A good breeze can carry them up to 450 feet (137 m) away. That is longer than a football field!

My flower and seed production are highest when there is more precipitation. It takes a lot of moisture for them to germinate (start to grow). Their coating is soft and thin, so they are not adapted to survive for long in the soil, unlike some other plants whose seeds can stay dormant for many years. It also means that they are not resistant to fire.

Once a seed does sprout, it still needs plenty of moisture. And the seedlings are very sensitive to frost and drought. Seedlings are most common in older groups of mahogany because they are protected from extreme temperatures.

Mountain-Mahogany

Our Roots

Our amazing root system helps us live in dry areas on rocky slopes. It starts with a tap root that might grow 5 feet (1.5 m) deep, depending on the soil conditions. Then there are the thick, sideways roots that help anchor us in the ground. In some cases, these roots grow out 9 feet (3 m).

We can grow new trees by sprouting from the top of our roots (the crown) and from underground stems called rhizomes. This happens most often when we are damaged.

Fire!

Our sprouts are taller and more abundant following a fire, as long as it did not burn too hot or too long. If animals eat most of this new growth after a fire, it can kill the whole tree.

Sometimes a fire will only burn our upper branches. Because our seeds are usually killed by even a light fire, there are not many seedlings after a fire. However, some seedlings may eventually grow from off-site seed sources.

Historically, mountain-mahogany areas have not had frequent fires. Bare ground and sparse grass and forb growth in most stands protect us from large fires. However, if invasive plants like cheatgrass move in, it increases our fire frequency and reduces our numbers. The more often the area burns, the harder it is for us to recolonize.

Even with my vigorous resprouting, fires typically reduce the number of trees in a mahogany stand. As fire frequency increases, the number of trees in the stand decreases. A lot of factors determine how well we do after a fire, including fire severity, seasonality, pre-fire site conditions, and post-fire site conditions.



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Mule Deer

What's the easiest way to know we are mule deer and not another deer species? Our ears! They are very large, like a mule's, which is how we got our name.

Sometimes people confuse us with our cousins the white-tailed deer, but there are a few ways to tell us apart. In addition to our large ears, we have larger bodies and our white tail is tipped with black. We also have a white patch on our rump and a black patch on our forehead between our eyes.

As you might expect, our huge ears help give us excellent hearing. That and our keen eyesight warn us of danger. We stand 1 meter tall at the shoulder, on average, and weigh between 100 and 250 pounds.

Bucks, Does and Fawns

Mule deer are very common throughout the western United States. Adult males are called bucks and have forked antlers. They shed these in mid-February, and then their next set of antlers begins to grow. Antlers are covered with velvety skin until fully formed, when the buck scrapes this layer off. Females are called does and do not have antlers. In late May or early June their babies—called fawns—are born. A doe often has twins after the first year of giving birth.

Fawns drink milk from their mother and begin following her around within a few weeks of being born.



Odocoileus hemionus

They have spots to help them blend into the underbrush and hide from predators. This camouflage and their lack of a strong scent help them stay safe during the day when their mother is gone.

Social Life

We are very social animals, and usually stay in family groups, called herds. Bucks older than one year often group together or remain by themselves. In late summer and fall, family groups mix to form larger herds for protection throughout the winter. We break into smaller groups again by the next summer.





Mule Deer

Survival in the Sagebrush Ecosystem

We have adapted to living in hot places like the desert by being active at night or during the early morning hours. We also have adapted to eating a wide variety of vegetation types in order to meet all of our nutritional needs.

We browse shrubs, trees and occasionally grasses and forbs. We like sagebrush, antelope bitterbrush, other shrubs and grasses. We are commonly seen browsing in open, shrubby areas between dusk and dawn.

We usually relax and sleep during the day. We are not picky about where we sleep. We make temporary “beds,” which are often just flattened areas of grass or leaves. If it is an area we use often, we will use our hooves to scratch a nest into the earth.

If you are lucky enough to see one of us moving quickly, we will not be running. Instead, we bound or bounce. This helps us move fast in rugged terrain.

Fire!

If a fire burns through our habitat, we bound away. We are quick enough to get away from most wild-fires, so it is very rare for us to get trapped.

If an area is completely burned, there will not be any food for us. We will move into other unburned areas for food. Fortunately, after 2-3 weeks, new shoots will be sprouting up in burned areas, and you will see us eating these fresh greens.



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Pinyon Pine

We are a group of evergreen trees with large, tasty nuts in our cones that wildlife and people love to eat! We can also cause trouble, as we explain below.

There are eight species of true pinyon pine tree, including the Colorado Pinyon and the single leaf pinyon. Just like all other pine trees, we have green needles, trunks with bark, and roots that grow sideways.

We are pretty short as far as trees go, and usually only grow to a maximum 30 feet (10 meters) tall. Christmas trees are about 2 meters tall, so we only grow as high as about 5 Christmas trees stacked on each other. Many other pines are 3 – 5 times taller than us!

Where We Live

We are found in the western United States, especially the Southwest and central West. We can grow anywhere, but we do best in soils with healthy biological components, such as bacteria and algae. This soil contains more nitrogen and does not wash away as easily.

We like to grow with juniper shrubs. It is very common for people to call us pinyon-juniper or “PJ” when we are growing together because the junipers grow underneath us and we grow above them.

We like the same type of environment as sagebrush, and grow quickly in areas where they grow. We usually grow at higher elevations than sagebrush, but we can move down and take over areas of sagebrush steppe. This is called encroachment, or taking over the habitat of other species. Many people do not like us because we encroach into sagebrush ecosystem areas with habitat for many important species, such as the greater sage-grouse.



Pinus edulis

Aw, Nuts!

Our seeds—called pine nuts—are very high in fat, calories, and nutrients. Wildlife such as birds and rodents love to eat us, and they are also good for animals that hibernate. The



more fat that hibernating animals eat, the better off they will be while they sleep through the winter.

Most humans think pinyon pine nuts are delicious, too. Many people collect and sell them.

Critters Love Us

Pinyon-juniper woodlands provide habitat and shelter for many species of wildlife. These include mule deer, white-tailed deer, pronghorn, desert bighorn sheep, elk, wild horses, mountain lions, and bears. Gray foxes, bobcats, coyotes, weasels, skunks, badgers, and ringtails search for prey here and live inside the low brush. Many species of birds and reptiles find food and shelter in and around us, as well.

Many of these smaller animals eat the seeds from our pinecones, and we are used for other types of food, too. Porcupines eat the inside of our bark. So do other critters like squirrels, rabbits and foxes. Bigger animals, such as deer and pronghorn, may eat our needles if there is no other food around. Even our pitch is used by bees to help them make their nests.

Pinyon Pine

Some Critters Like Us TOO Much

Insects are killing a lot of us. Some pine beetles eat our leaves and bark. Other beetles eat our cones.

We can get diseases that can destroy us, too. But if we can fend off insects and diseases, we can live up to 400 years!

We are Useful

For thousands of years, Native Americans used us for food, fuel, medicine and shelter. Today we are most often used for firewood, resins and fence posts. We are a smaller tree and usually shaped funny, so straight boards cannot be easily made from us.

Fire!

Since we have thin bark, we burn and die easily in fires. Some of the older pinyon pines may survive them, but most small pinyons die. The bigger the tree, the better chance we have for survival.

We count on birds and rodents to spread our seeds in the burned area after a fire. The pinyon jay and Clark's nutcracker are two birds that do a great job of spreading our seeds around. Rodents like squir-



rels store our nuts for winter hibernation. Some of the nuts will not be eaten and the seeds can grow into little trees, starting our cycle of life anew. We grow very slowly, so can take up to 100 years for a burned area to look like it did before a fire.

Sometimes fire managers will do prescribed burns to manage us. This is healthy for the landscape even though we do not like it much!

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Ponderosa Pine



Pinus ponderosa var. *pacifica*, var. *ponderosa*, and var. *washoensis*

We are evergreen trees with the scientific name *Pinus ponderosa*. Ponderosa is a Latin and Spanish word meaning “large, heavy, ponderous.” We think ponderosa is a good name for us, because we can get VERY big.

We may grow over 130 feet (40 meters) tall. The tallest ponderosa pine lives in southern Oregon

and is nearly 270 feet (82 meters) tall! Our trunks can be more than 6 feet (2 meters) wide and usually grow very straight.

Our needles grow in clusters of 3. They grow to be between 5 and 10 inches (12.5 – 25 cm) long. Growing in tufts at the ends of our branches, it looks like our branches are holding a million little pompoms.

There are 5 kinds of ponderosa pines. We have lots of common names because there are so many different kinds of us. We are sometimes called Pacific ponderosa pine or Washoe pine, but most people call us ponderosa pine, or sometimes yellow pine. Please don't confuse us “interior ponderosa pine,” which lives farther east.

Where We Live

We mostly grow in the westernmost states like California, Oregon, and Washington. But you can also find us in Idaho, Montana, and even up in Canada. We like warm, dry forests. In California, we grow in hot, low-elevation forests where few evergreen trees can survive. We often grow with white fir, incense cedar, sugar pine, Jeffrey pines, and California black oak.

Reproduction

We are conifers. This means that we put our seeds in cones. They are big, brown, and woody, with large, sharp prickles. Our cones are a good way to tell us apart from Jeffrey pines, which have bigger cones that aren't as prickly. Some people say “gentle Jeffrey, prickly ponderosa.”



Our seeds have a paper-like “wing” that helps them float in the wind after they fall out of the cone. The wing helps, but our seeds still only float up to 100 feet (30 meters) away because they are fairly heavy. Sometimes, birds like Clark's nutcrackers hide our seeds in buried caches so they will have food throughout the year.



If the birds do not come back to get them, the seeds can germinate and start to grow right there!

Growing Up

We grow from seed. Our seeds germinate best if they are in soil that doesn't have a lot of litter and duff on top.

Our seedlings grow up very fast if they have enough sunlight. By the time they are 7 years old, they can make cones and seeds. We can keep making a lot of cones and seeds until we are 350 years old. Even after that, we can live a long time. Next year, I am looking forward to my 600th birthday!

Our bark gets very thick as we get older. It is yellowish and has deep, dark grooves. That is why people sometimes call us “yellow pine.” We think our bark looks like puzzle pieces that fit neatly together. Our puzzle pieces often flake off, especially when they get hot in a fire.



Ponderosa Pine

We grow many thick roots. Some of them grow 6 feet (2 meters) down into the soil. Others may reach 100 feet (30 meters) out from our trunk under the soil.

We begin to grow new wood in spring. At the same time, the buds that we prepared the summer before begin to grow. In about a month, they will open and our new needles will unfurl. Our roots and trunk continue to grow all summer, while our branches make new buds that will hold next year's fresh needles.

Our new cones are pollinated in late spring. More than a year later, in the fall, the seeds in these cones are finally ripe. The cones open. Wind shakes the seeds loose, and they fall to the ground.

We Are Useful!

Rabbits and mice eat us when we are very young. Squirrels and birds eat our seeds. Squirrels eat the cambium in our twigs under our bark.

We provide shelter and hiding places for deer and other wildlife. If deer are very hungry, they may eat the buds and needles of our seedlings.

Many kinds of insects eat the cambium under our bark. Female pine beetles tunnel into it to lay their eggs. When the larvae hatch, they eat their way out, growing as they go.

Fungi use the nutrients stored in our roots and trunks. A plant called mistletoe grows on our branches and sinks its roots into them and our trunk to get nutrients. When we get large, the wood in our trunk may begin to rot. Then woodpeckers make holes in our trunk and nest there. A family of woodpeckers only uses a hole for one year, but other animals move in after the woodpeckers move out. Pileated woodpeckers and California spotted owls are some of our favorite guests.

Native Americans learned many ways to use me. Our needles, roots, and stems can be used for basket weaving, and our pitch can be used like glue. People use our long, thick, straight trunks to build their homes.

Fire!

The older we get, the thicker our bark gets and the easier it is for us to survive surface fires. But we pride ourselves on being able to survive some surface fires when we are still quite young!

Our seeds grow well in sunny openings created by fire, especially if the fire also killed off some of the other plants—such as shrubs, grasses, and other trees—that use a lot of moisture.

Surface fires used to burn the places where we lived every 10 years or so. They killed our lower branches and the small trees that grew in our shade so it was hard for the flames to reach our leaves and buds. Surface fires burned up the dead needles and fallen branches on the ground before these fuels got deep. This kept fires from being so hot that they could kill our roots with their heat.

If our homeland does not burn for many years, we may not produce healthy young trees. Some of the forests where we live now seem odd because the big trees are all ponderosa pines and the small ones are mostly white firs. In places that haven't burned for a long time, many small trees grow in our shade. There, almost any fire can climb into the tree crowns and kill even the biggest, oldest trees.



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Prairie Falcon

I am a medium-sized raptor—or bird of prey. Watch me fly fast and low, with powerful wing beats.

My wings are long and pointed. When I raise them, you can see dark patches in my "armpits." I have a pale brown back and a whitish chest with brown spots and bars. I sport a dark mustache mark on my face and dark ear patches.



Falco mexicanus

I like to hunt in fields, desert scrub, along lakeshores, and in feedlots, where I can find lots of prey.

I Love to Hunt!

I prey mainly on small mammals and medium-sized birds. I am an aerial forager, which means I like to look for food by swooping at a low angle to surprise prey on the ground. I also sometimes hunt from high above.

Where I Live

I inhabit grasslands, shrub-steppe, deserts, and other open areas of the West up to about 10,000 feet elevation. I nest on cliffs and often share them with ravens, golden eagles, and red-tailed hawks.

I think ground squirrels are especially tasty, but they hibernate during the winter, so I eat other small mammals and birds such as meadowlarks, chukars, pheasants, and quails. I will also hunt birds (and sometimes bats) in flight by chasing them or diving through flocks. Sometimes I eat lizards or insects, especially if my favorite foods are not available.

I like to perch on power poles, cliffs, and trees. I drop low from my perch and fly just above the vegetation. I fly fast with shallow, stiff wing beats.

Prairie Falcon
Falco mexicanus



Map by Cornell Lab of Ornithology
Range data by NatureServe

Raising Young

I like to nest on cliffs. I look for either ledges or old nests of other raptors or ravens. Most of my nesting sites are protected by rock overhangs on south-facing cliffs up to 500 feet (152 meters) high.

I nest in most areas from April to June. Females give birth to 3-6 eggs, which are white with brown spots and splotches.

Females are usually the ones that incubate the eggs. This lasts around 31 days, when the chicks hatch. My markings are similar in childhood as when I grow up, except they are more streaked instead of spotted or barred on my underparts.



Prairie Falcon

The nestling period is 38 – 40 days, and fledged young remain dependent on the parents for several more weeks. During the first half of the nestling period, the male does most of the hunting, but both sexes feed larger young.

I am highly territorial during the breeding season. I will attack intruding prairie falcons with frequent stoops, loud sounds, and tail chases.

Fire!

We adult raptors can usually escape from fire. Our eggs and young are usually safe on cliffs.

Fire can benefit our habitat by keeping the land open and improving our access to prey. However, fire can also reduce populations of some prey species, such as ground squirrels.



Learn More

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Prairie Rattlesnake

If you hear our rattle, **STAY AWAY!** The small “rattle” segment at the tip of our tails is used to ward off invaders. It is a very distinctive sound—like a baby rattle, but **A LOT** more threatening.

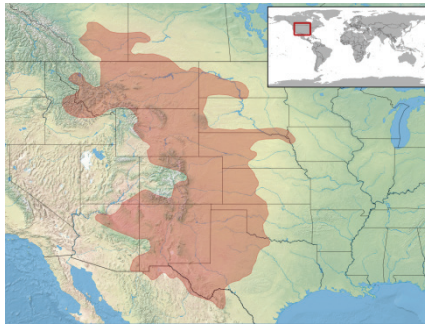
We usually grow up to 40 inches (88 cm) long, but the longest rattlesnake ever recorded was 59 inches—nearly 5 feet long!

We have diamond-shaped heads and dark-colored splotches with light-colored borders on our bodies. We can be olive green, grayish brown, tan, orange-brown, and even straw yellow.

Where We Live

We usually live in dry, rocky lands with some vegetation for cover, but we sometimes visit wetland areas, too. You can mostly find prairie rattlesnakes in the central western United States.

We build a den or burrow for our home. Sometimes we will take burrows that other animals, such as squirrels or rats, have made.



We’re “Cold-Blooded”

Like other reptiles, we are **ectothermic**, which means our body temperature depends on our environment. We warm up best when the ground is warm, and find shelter when it is too hot or too cold.

We survive cold winters by hibernating in our dens. Our body temperature cools way down and we don’t become active again until spring.



Crotalus viridis

Growing Up

Unlike 70 percent of snakes, our females do not lay eggs. They have between 4 and 25 “baby” snakes each time they reproduce. They give birth between August and October, when the ground could sometimes be too cold for the young to develop in eggs. It takes about 3 years for them to become adult snakes. We live 16 to 20 years, on average.

Amazing Adaptations

Many adaptations help us to survive. Our speed, powerful bite, fangs, and poisonous venom help me prey on animals like mice, ground squirrels, prairie dogs, rabbits, lizards, other snakes, and birds. Our long, narrow bodies help us hunt underground, too.

Our tongues are used to help us find our way and to understand our surroundings. We also use the “heat sensory pits” on our faces to help detect nearby warm-blooded animals. When our heat sensory pits tell us something warm is close, it could be our next meal!

Our vision is best suited for nighttime hunting, when many of my prey are active. I can detect movement about 40 feet away, but I see best up close.

Unfortunately, we are not quite fast enough to get away from other predators. Coyotes, hawks, ravens, eagles, badgers, and skunks are some of the animals that prey on us.



Prairie Rattlesnake

Shedding Our Skin

Our skin does not grow with us, but sheds as we grow larger; this process is called molting. We can molt up to four times a season. Each time we shed our skin, a new rattle is created. The older we get, the more rattles we have. My grandparents and great-grandparents have a lot of rattles!



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Pronghorn

When Europeans first saw us, some thought we were antelope, like the ones that live in Africa. Others thought we were goats. Our scientific name, *Antilocapra americana*, means “American antelope goat,” but we’re actually not a close relative of either goats or antelopes. We’re the last surviving species of a family of animals which has roamed North America for more than a million years!

Our fur coat is mostly reddish-brown to tan, but our stomach and rump are white. We have distinctive white markings on our face and neck.

All adult pronghorns have black horns. Males, like me, have horns that are usually 10 – 12 inches (25 – 31 cm) long, but some can reach 15 inches (38 cm). Females have much smaller spikes. The shape of our horns is very unique.

They are flattened from side to side and point straight up from the top of our heads before curving backward. They branch only once, with a little notch on the front that points forward. Some people call this a “prong.” Now you know where we got one of our names, although some people still call us antelope.

We are usually about 3 feet (1 meter) tall and 4.5 feet (1.4 meters) long. We weigh between 90 and 150 pounds, and we males are usually heavier.

Home, Home on the Range

We’re at home on the wide open spaces of grasslands and deserts, including the Great Plains and sagebrush ecosystem areas. We are native to the central parts of North America, ranging from southern Alberta and Saskatchewan in Canada, south to northern Mexico. We have one of the longest land migrations in the United States. We usually migrate over 40 miles (70 km) between our summer and winter ranges, but some of us migrate much further—as far as 200 miles (300 km), twice a year!



Antilocapra americana

You Can’t Catch Us!

Predators have to be extremely lucky to catch adult pronghorn. Mountain lions, wolves, coyotes and bobcats don’t have many places to hide on the treeless parts of the prairie, and that suits us just fine.

We like open, low-rolling plains, where the shrubs don’t grow too tall and predators can’t lurk over the side of a hill.

We have keen eyesight so we can spot predators up to 4 miles (6 km) away. We can also run like the wind, reaching speeds up to 60 miles (97 km) an hour. In fact, we’re the fastest land mammal in the Western Hemisphere, and we’re second only to the cheetah in the entire world. But unlike cheetahs, that can run fast for only short distances, we can go fast for miles. We can even run faster than humans when we are just three days old!

Because we’re so fast and can see so far, hunters have a hard time catching us. Long ago, people would set snares to trap me or try to drive a herd of us over a cliff like they did to the buffalo. They weren’t very successful; we can dodge and dart our way out of almost any trap!

Our Diet

We eat a wide variety of plants including forbs (wildflowers), grasses, shrubs, and even cactuses. Forbs such as scarlet globemallow make up much of our diet during the spring, summer, and fall. In the early spring we’ll eat the tender young shoots of grasses such as blue grama, Indian ricegrass, and needle-and-thread.



Pronghorn

Shrubs, like sagebrush and western snowberry, which stick out above the snow, are a good winter food when we can't find other foods. Many plants we find delicious are toxic to most other grazing animals. That's fine; it leaves more for us!

You may know that millions of bison roamed the West until they were almost wiped out in the 1800s. Well, equally large herds of pronghorns traveled with the bison, but there were only about 12,000 of us left in 1915. Scientists believe these vast buffalo herds helped the pronghorns by eating the prairie grasses, leaving the forbs to grow thicker and taller—creating the perfect salad bar for us. Fortunately, bison and pronghorn were protected, and today there are about a million pronghorn.

Our Families

We mate in the early fall or late summer. Males, called bucks, compete with each other for females, called does. They give birth to one or two fawns in late spring or early summer—usually twins, like my sister and me. Our mothers are very choosy about where to give birth. They pick spots where clumps of tall grasses, shrubs, and rocks can hide us.

When we are first born we try hard to be invisible. We have no scent. We lie perfectly still for hours at a time, and the color of our fur matches our surroundings. Our mothers stay away from our hiding spots for most of the day so she won't give us away. They feed us only a couple of times a day, just for a few minutes. Could you survive like that?

My twin and I were extremely fortunate that no predators found us during our first month of life. Adult pronghorns have no problem running from danger, but new-born fawns are easy to catch if predators find them. Predators, especially coyotes and eagles, kill about half of our fawns each year. Yikes!

I stayed with my mother for about a year before I went out on my own. But I didn't move out to be alone. We're social animals and hang out in a herd most of the time. You'll usually find us in loose herds of bucks and does from the end of breeding season through the winter. On winter range, our herds can reach 100 pronghorn.

We break up into smaller bands in the spring and summer. The does and fawns form bands called "nursery groups." Bucks wander alone or with a few other bucks.

Fences Can Be Deadly!

Fences give us big problems. We usually won't jump over a fence, even though we can usually do it if we try. Instead, we typically try to go underneath them. Scientists believe that is because we have lived so long in wide-open spaces; we never learned how to jump over a barrier. Some people have started building fences where the bottom wire is smooth instead of barbed. That way, we can squeeze under without hurting ourselves.

Fire!

Fires don't bother us much. We can usually just run away and leave the flames in our dust! Fires do affect our habitat, however. Burns are great places for me to find food. Grasses on new burns usually start growing earlier than on unburned prairie and the new sprouts are tender and delicious.

Even better, fires are hard on the shrubs that like to spread through the prairie, shading out the forbs we like to eat. These forbs grow and reproduce wonderfully for several years after a fire because they have more sunlight, water, and nutrients than before the fire. Burned areas with lots of prickly pear cactus are especially attractive to us. The flames singe off the spines, so we can easily chow down on those tasty succulent cactus pads. Yum!



Learn More

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Pygmy Rabbit

We are the smallest rabbit in North America. We also have small ears, large eyes, and soft fur, so a lot of people tell us we are one of the cutest animals on Earth.

Our females are a bit larger than the males, but still only grow up to 11 inches (28 cm) long. Full grown, we only weigh a pound (0.5 kg) or less.

We have whitish spots on the sides of our noses. Our tails are nearly hidden. For us to adapt to our surroundings and survive, we are able to change colors to slate gray in the winter and brownish in the summer.

We Love Sagebrush!

Our favorite place to live is among tall, dense sagebrush where we can dig our burrows. Not only does the sagebrush provide cover, but it is our most important source of food. In winter, it is 99% of our diet.

We are herbivores who love to eat plants. Tall grasses in the summertime are another important food source. We also eat forbs—flowering plants—when they are available. We like areas that have fairly deep, loose soils, but on occasion we use burrows that have been abandoned by other animals. In winter, we are able to tunnel through snow to travel and look for food. Other small animals like mice and ground squirrels use these tunnels, as well.

Unfortunately, we do not have nearly as much habitat as we used to in the sagebrush steppe. The area that we have been able to roam has been drastically reduced from 100 million acres to 7-8 million acres between Wyoming, Idaho, Nevada, Utah, Oregon, California, Washington and Montana.

Our Young

Our breeding season is shorter than other rabbits. We mate in spring and summer and have 4-8 kits in each litter. They are normally born between August and September in a nest inside the burrows.

We usually only live 3 – 5 years. Our short lifespan is partly because so many of us are eaten by predators.



Brachylagus idahoensis

Fire and Other Threats

Our homes are threatened by wildfires in some areas due to it burning so often. Sagebrush and rabbitbrush may not return if the fire is too severe and the area is overtaken by invasive species like cheatgrass. Other disturbances like oil and gas development and agriculture may cause a loss of habitat that makes it hard for us to survive.

Fortunately, when a wildfire approaches our homes we have a chance to escape due to the many tunnels and chambers that we have built in our burrows. Plus, we have multiple entrances which enable us to find different ways out! Usually the fires that burn in our habitat are fast-moving and pass over the top of us quickly. Staying underground during this time helps us survive.

Learn More

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Photo credit:

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Quaking Aspen

How could you possibly not notice me? I have found a way to draw attention to myself even in the slightest wind. I simply never stop moving. Even when everything around me is quiet—the grass unmoving, the air completely still—my leaves are trembling and making a gentle, rustling sound. I do that with a unique trick. Each leaf has a flat stem that shakes in response to the slightest breath of air.

Even if you haven't noticed my constant motion, you surely have noticed me in the fall, when my leaves become bright yellow against the dark green background of evergreen trees. I do that because I'm a deciduous tree, shedding my leaves in the fall and growing new ones each spring.

My trunk is slender and white. I grow 10 to 15 meters tall. Where the branches break off from my white trunk, they leave round, gray scars that look like big eyes.

My leaves are 4 to 7 centimeters long. They are almost round, but they have a pointy tip like a "spade" in a deck of playing cards.

Where Do I Live?

I am a circumboreal species. That means I live in northern lands all around the world. In the eastern United States, I am found at low elevations. On the prairies, you can find me in moist spots and north-facing hillsides. In the mountains, I form bright-green patches between dark-green patches of pine forest. I like cool, dry summers and snowy winters. I live best in places where the soil is moist.



Populus tremuloides

Botanical Fact

Quaking aspen is the most widely distributed tree species in North America. It occurs from Newfoundland in the east to Alaska in the west, and all the way south to Mexico. In Utah, Minnesota, and Wisconsin, quaking aspen covers more land than any other kind of forest.

Growing Up

A single aspen tree is not really separate from other aspens growing nearby. Underground, I am connected to many of my neighbors. In fact, aspens seldom grow from seed. We simply sprout from the root of another aspen tree.

A new aspen growing from roots, like me, is called a sucker. If a fire or avalanche comes by, our trunks may be broken off and look dead, but the next year our roots will produce thousands of suckers. Every sucker has the same genes as the parent tree. No doubt you have heard of identical twins or triplets. The aspen grove where I live is like identical "thousandtuplets." The special name for our patch of related trees is a clone.

Growing Points

I have growing points at the tips of my branches, in the buds that produce my leaves and flowers, in my root crown, and on my roots.

Quaking Aspen

Making Seeds

Even though I can sprout new trees from my roots, I work hard at seed production each year. In the spring, before my leaves come out, I produce long, slender catkins that hold my flowers. After the flowers are pollinated, I release them in cottony packages that can travel many miles on the wind. The seeds will live less than a month. That's a very short time to get settled in a moist, warm location free from other trees so I can begin growing. No wonder few seedlings survive!

Am I Useful?

Beaver, deer, elk, and grouse eat my bark, leaves, and buds. Many birds nest in my trunk and branches. I'm especially proud of the fact that all three kinds of bluebirds in the United States use me for nesting.

People use my wood and enjoy my colorful fall leaves, but I am most useful to them in a quiet way. I help the soil absorb water from rain and snow. I filter the water so it is clean, and store it in the soil.

What does fire do to me?

Most fires pass me by because of the moist locations where I live. When I do burn, fire usually kills my above-ground parts—leaves, branches, and trunk—but it rarely harms my roots. This gives me a chance to grow a new crop of suckers. How invigorating!



Life After Fire

Severe fires usually kill most of the conifer trees in a forest. The conifers have to reproduce from seed, but my huge root system gives me a head start in the new forest. My roots easily grab the moisture and nutrients needed to grow new suckers. They will come up by the thousands, and they'll be 1 to 2 meters tall within a year. I recover so quickly after fire that managers sometimes use prescribed fires to get more aspens on the landscape.



Learn More

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Rabbitbrush

True to our name, we are a favorite of rabbits. Species like pygmy rabbits munch on us and use us as shelter. In fact, many critters use me for food and shelter, like the greater sage-grouse, desert sparrow, and sagebrush vole. Birds, rodents, livestock, and big game love to eat my green leaves and flowers.

Members of the daisy family, our pretty yellow flowers and round shape make us easy to spot on the landscape. Our vivid blooms are also an important source of pollen and nectar for native insects. We are one of the few native plants blooming in late summer and early fall, so bees, butterflies, and other pollinators visit us often. We help them boost their food supplies for the long winter.

How We Grow

We are many species of native, perennial shrubs. This means we can survive winter and start growing the next spring. We are usually 1 to 5 feet (0.3 – 1.5 m) tall, with stems that start at our base. Our stems are pale green to gray, and most have felt-like hairs. Our leaves are green and narrow, often appearing twisted. Our flower heads are made up of 5 small, tube-like flowers arranged in a dense round cluster.



Ericameria nauseosa

Human Uses

Thanks to our deep roots and heavy, abundant seeds, we are very useful for erosion control and range restoration. Extremely tough plants, we can grow almost anywhere.

Native Americans found many uses for us, and continue to use us today. We can be used for weaving baskets, yellow dye, chewing gum, tea, cough syrup, and to treat chest pains.

Fire!

We thrive in burned areas, growing rapidly and helping to restore the soil. We are colony shrubs, which makes us well-suited for restoration of burned areas. Our seeds are spread by the wind, so we can travel long distances. You can find stands of me in burned areas, thanks to our seed spread.

We can also sprout new plants from our base. We thrive in poor conditions and can tolerate coarse, alkaline soils.

Our deep root systems establish quickly and we produce large quantities of leaf litter. This brings nutrients to the soil surface, helping neighbor plants to come back and grow.

Learn More

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We are important shrubs that dominate much of western North America. There are many species of sagebrush on roughly 165 million acres of potential habitat.

Big sagebrush (*Artemisia tridentata* and its subspecies) are the most common of all our species. Two of the most important big sagebrush species are described below, Basin Big Sagebrush (*Artemisia tridentata* subsp. *tridentata*) and Wyoming Big Sagebrush (*Artemisia tridentata* subsp. *Wyomingensis*).



family. Rather than depend on insect pollination under cold desert conditions, we depend on the wind. We produce massive amounts of pollen in the late summer and early fall.

There are hundreds of tiny flower heads on each stem of big sagebrush, and each head has 2–10 florets. Each flower only produces one tiny seed (about 1 mm in length), but each plant can produce thousands of them. Most of our flowers mature in late summer and our seeds mature in the fall. Our seeds are spread by wind or by animals that eat the seed heads.

Amazing Adaptations

Most of our species are evergreen (we mostly keep our leaves year-round). This is part of what makes us so successful. We are able to photosynthesize during winter months, growing slowly but steadily when most other woody plants are dormant. This gives us an edge over species that develop leaves later in the spring. However, a few of us are deciduous, meaning we lose our leaves in the winter. Some of us keep our leaves in wet years and drop them when it gets dry.

We produce early spring leaves that grow rapidly and are sometimes irregular in shape—exposing a large surface area to capture as much sunlight as possible. They grow upright to help reduce the heat load during summer months.

Our roots help us survive in our dry climate. We produce two kinds of roots, including a long taproot to reach moisture deep in the soil. We also have roots that spread out to the sides. These reach surface soil moisture, move water from lower to upper levels, and help us out-compete other plants. Fungi live with our roots and help us take in nutrients.

Reproduction

We belong to the sunflower family, *Asteraceae*, but we do not have showy flowers like most members of our

Seeds usually stay within 30 feet (9 meters) of the parent plant, although wind may carry them further. Seedlings are more likely to survive if they are able to germinate under mature sagebrush plants.

Important for Wildlife and Livestock

The sagebrush ecosystem is prized for its diversity of flowering plants, shrubs, and associated grasses. We grow where there is little rain, winters are harsh, and trees are restricted to streams or protected mountain slopes. We provide critically important habitat for a number of wildlife species as well as domestic animals. We provide rangeland for cattle and sheep in areas where they co-exist with wildlife such as greater sage-grouse, sage thrasher, sage sparrow, and pygmy rabbits. Large animals such as mule deer, Rocky Mountain elk, moose, black bear, pronghorn, mountain lions, coyotes, and gray wolves also share the broad expanses of sagebrush steppe with humans.

Sage-grouse and some other species like pygmy rabbits rely almost exclusively on sagebrush foliage as a food source through the winter. Our seeds have about 20% protein, and seed heads are important winter food for wildlife and livestock.

Spring is when our leaves are most bitter and we have the strongest smell. This makes us less tasty for insects

and other wildlife when we start producing flowers. As fall approaches, we become less bitter and our seed heads are better to eat.

How Much Remains?

Estimates of how much sagebrush habitat remains depends on the region. An estimated 50% has been lost in the Great Basin in the past 50 years. In California, recent reports suggest that as much as 90% of coastal sagebrush scrub has been lost.

Loss of habitat appears to be speeding up, especially because of more wildfires and urban expansion. Even so, with millions of acres remaining, we are not in danger of extinction, but there is growing concern about the fragmentation of our habitat (how it is broken up). Loss of migration routes and feeding grounds for wildlife are part of the problem.

Basin Big Sagebrush

We are the tallest sagebrush variety, growing 5–13 feet (1.5–4 m) tall. We have gray-green leaves and our crowns are irregular and rounded. We are very aromatic (strong smelling).

Where We Live

We are found from the southern Rocky Mountains of New Mexico, to the coastal ranges of Baja California,



to the northern Rockies of Canada. We are most often found on deep, well-drained soils in cool air valleys

Settlers in the 1800s found that basin big sagebrush indicated good soils, so most of my habitat was plowed under by the early 1900s. Some of us still remain along fences and roadsides.

Fire!

Fire will kill us, but our seeds let us return after a fire. We will not resprout.

In many basin big sagebrush communities, fire suppression and livestock grazing have led to changes in fire occurrence. Before, less fuel from dry annual plants may have limited the spread of fire. More annuals mean increased fuel, making it easier for fires to spread.

Burning in some big sagebrush communities can set the stage for repeated fires. Fire frequency can be as little as 5 years, not enough time for reproduction of big sagebrush. Repeated fires have removed big sagebrush from large areas of the West.



Wyoming Big Sagebrush

We grow on drier sites than basin or mountain big sagebrush. We have the rounded crown of basin big sagebrush, but we're shorter, 2 – 4 feet (0.6 – 1.2 m) tall.

Wyoming big sagebrush communities are important winter ranges for big game. Wild ungulates like pronghorn and elk prefer to browse on me. On the Idaho National Engineering Laboratory lands, for example, we comprise 90% of the diet of pronghorn from fall through spring. We are a crucial food for sage-grouse, and our community is critical habitat for them.

Left undisturbed, we can live a long time. In a community in southern Wyoming, we were 26 to 57 years of age; average age was 42 years. Plants in long-undis-

turbed communities of New Mexico typically reach 50 years of age. Our maximum lifespan may exceed 150 years.

Human Uses

Native Americans made tea from our leaves. They used it as a tonic, an antiseptic (to prevent infection), for treating colds, diarrhea, and sore eyes, and as a rinse to ward off ticks. Our seeds were eaten raw or made into meal. Our wood is extremely aromatic when burned, and the wood smoke was used to mask the effects of an encounter with a skunk.

European-American settlers occasionally used my branches for thatching roofs. My wood produces a very hot fire, and was used in mine smelters.

Fire!

Fire will kill us. We may be slow to establish after a fire, because of the relatively dry sites we normally occupy.

The recent increase in severe droughts has affected the health of native grasses. While we are amazingly resilient to climatic extremes, the shrublands in which we live are being replaced by invasive species like cheatgrass after fires. As a consequence of these changes, land managers are being called on to monitor sagebrush habitats and try to minimize impacts to humans and wildlife.

Learn More

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Sagebrush Sparrow



Artemisiospiza nevadensis

They don't call us sagebrush sparrows for no reason! My family and I love living in mature, old bunches of sagebrush.

We love the hot, dry areas that sagebrush grows in, and these bushes make a perfect home for us. Patchy sagebrush

areas are best, where we can still see the ground and have plenty of room to fly AND run around looking for food. We often run around on the ground in flocks.

We are small songbirds about the size of other sparrows. Our chests are white with a black spot in the middle. Our upperparts are gray-brown. There are light streaks on our wings. Our tails are long, narrow, and black, with thin white edges. We like to stick our tail straight up in the air and flip it up and down. Our heads are gray, with a white cheek stripe and black throat stripe below. Our eyes have white eye-rings and a white spot above and in front of the eye. We like to think we are beautiful and handsome little tweeters!

Where We Live

We are at home in areas of sagebrush ecosystem throughout the Western United States. We migrate south for the winter. It doesn't stay warm enough for us to stay up north from October to April, so we head south for warmer temperatures. We always come back in the spring to our sagebrush stands. We are kind of picky and really don't like living in other areas besides sagebrush.

The males of our family return to the same nesting territory each year, so it's important to our survival that we always have sagebrush. One of us was tracked by humans and he returned to the same sagebrush community 6 years in a row! If we absolutely have to, we will nest in saltbush, rabbitbrush, shadscale, and bitterbrush.

Females build our nests just off the ground in the sagebrush with twigs, sticks, weeds and sometimes animal hair. While females are working on the nests, the males sing at the top of their lungs while sitting on the top of the sagebrush. It's our way of saying to the other birds around that this bush is taken.

Raising Young

We usually have two sets of eggs per year. Each set most often has 3 or 4 bluish white or pale blue eggs. Some of them are spotted with brown, gray, or black. We sit on them for about two weeks. After hatching, both parents will take turns taking care of the chicks. About 2 weeks after our chicks hatch, they are ready to fly and they leave the nest. Sometimes we continue to feed them for 2 more weeks before we expect them to find all their food on their own.



Babies Love Bugs!

We eat mostly insects and seeds. Some of our favorite munchies are grasshoppers, beetles, leafhoppers, ants, and spiders. They are a good source of protein and we really love to feed them to our chicks.

When we aren't laying eggs and raising young, we usually eat seeds of weeds, grasses, and shrubs. But we won't eat cheatgrass seeds. Yuck!

Fire and Other Threats

One of the biggest things we fear is fire. When fire burns our sagebrush homes, it takes a long time for it to grow back and we have to find new homes. Invasive plants like cheatgrass are a big problem, too, because they burn so easily AND crowd out our habitat. We cannot find enough places to live and things to eat when that nasty cheatgrass takes over.



Sagebrush Sparrow

We are also threatened by anything else that destroys sagebrush, such as when humans move into our areas and destroy our habitat. We also fear when our habitat is changed into agriculture land to grow crops for humans and livestock.

Learn More

"Sagebrush Sparrow." All About Birds. Cornell Lab of Ornithology:
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Scarlet Globemallow

I am a forb, or flowering plant, with pretty reddish-orange flowers. My 1-inch (2-cm)-wide flowers are saucer-shaped, with 5 petals. A member of the large *Malvaceae* family of mallows, I start flowering in May.

I have grayish stems with dense, star-shaped hairs and alternately arranged leaves. My leaves are 1 to 2.5 inches (2–5 cm) long, palmately-shaped (like an open palm with fingers sticking out), and deeply cut, with 3–5 main wedge-shaped segments. The undersides of my leaves have gray hairs.

I am a perennial plant, which means I can live for many years. I grow 4 – 16 inches (10–40 cm) tall. I spread from creeping rootstalks called rhizomes. These spread underground and can produce new plants. My main taproot is thick and woody and may remain unbranched for 3 feet (90 cm) before it divides into lateral (sideways growing) roots.

I start growing in March and April, flowering mainly from May to July. My seeds mature unevenly between July and August. I produce about 500,000 seeds per pound. The seeds have hard seed coats.

Where Do I Live?

I am native to the Great Plains and western regions of North America. I grow in desert, semi-desert, prairies, grasslands, scrub, pinyon-juniper, and sagebrush plant communities. You can also find me on dry roadsides and slopes, and in disturbed areas.

I have adapted to a wide range of soil types from sandy to clay loams to gravelly. I am extremely drought tolerant. I love the sun, but I do not tolerate shade. I grow at elevations from 3,500 to 9,000 feet (1,000-3,000 m).



Sphaeralcea coccinea

I Am Important!

I provide important forage for animals and birds. Deer, pronghorn, bighorn sheep and small mammals like jack rabbits and prairie dogs graze on me, and birds eat my fruits. Livestock commonly eat me, especially when grasses are dormant. My flowers also attract large numbers of native bees.

I am rich in Vitamin A and I have been used for medicinal purposes. Blackfoot Indians chewed me and applied me as a paste to scalds, sores and burns as a cooling agent and for treating sore eyes. I have also had my leaves crushed to use as a compress to relieve skin irritations. The same crushed leaves can be used as a shoe liner for blistered feet.

Fire!

Fire may kill my tops, but I can survive or even increase my growth after I burn. After a fire, I seek out new areas to grow. I do well establishing disturbed areas such as areas burned by wildfires.

Learn More

Scarlet Globemallow. Plant Guide. USDA NRCS.
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Scarlet Globemallow. Utah State University Extension.
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Short-Horned Lizard (Horned Toad)

We are often called a “horned toad” because of our chubby, flattened shape and short nose. We really do look more like toads than lizards!

There are more than twelve species of horned lizards found in the deserts of North America. We all have spiky scales on our heads that look like horns. We have spikes on our backs and tails, as well.

We are not very big reptiles. An adult short-horned lizard is only about 4 inches (9 cm) long and will fit completely inside a human hand.

Where We Live

We like dry, rocky or sandy plains areas. We will also live in forested areas. The most important thing about where we live is loose soil, because we have to be able to bury ourselves. There have to be anthills nearby, too.

We like sunny weather, and you can usually find us out on nice days looking for ants. Our claws come in very handy, helping us dig and bury ourselves. We usually spend nights in burrows to stay warm.

We Love Insects!

Our main food source is ants. We like all sorts of ants! We will also eat grasshoppers, beetles, and spiders. We eat them by snapping our tongue out really fast and grabbing them. Then we bring our tongue back into our mouths and swallow our prey whole without chewing it. One of our favorite things to do is to sit and wait for insects to come to us.

Amazing Adaptations

Our coloring is camouflage that helps us blend in with the environment so **predators** have a hard time finding us. We can be yellowish, gray, or reddish-brown, depending on our species. Our undersides are white or light gray.

We have another adaptation to keep from getting eaten. Although we have sharp spikes, there are still



Phrynosoma hernandesi

plenty of hungry animals that will eat us. We have to watch out for hawks, roadrunners, snakes, lizards, dogs, wolves, and coyotes. However, we can blow up our bellies to make ourselves twice as big and our spikes more dangerous. We look like a spiky balloon!

The other cool thing that some of us can do is squirt blood out of our eyes. This shot of blood can go up to three feet, sending some predators running! Most of the time we will just try to avoid danger, but we will fight back if our life depends on it.

Our Young

Females make nests and then have anywhere from 6 – 40 live babies in July or August each year. The new-borns are only about 1 inch (2 cm) long.

Our adorable babies are able to take care of themselves within a few hours. They are not born with horns, which grow on them later in life. The horn really isn't a horn like the kind that grows on deer or elk. They are actually scales that look like horns. Our babies begin to crawl after one day.

Humans and Us

We make good pets, because we do not like to move around a lot. The sad part is that as more and more of us become pets, there are fewer of us in the wild. We will not live as long as a pet as we will in the wild.



Short-Horned Lizard (Horned Toad)



Fire!

We burrow when a fire comes near us to hide from it. Usually we are safe from fire, because dirt doesn't burn. Fire does not affect us as much as some wildlife, unless it burns up all of our food.

Learn More

Horned Lizards - Genus *Phrynosoma*. DesertUSA.
<http://www.desertusa.com/reptiles/horned-lizard.html>

Horned Lizard. Wikipedia. https://en.wikipedia.org/wiki/Horned_lizard

Horned Toad (Short-Horned Lizard). National Geographic.
<http://animals.nationalgeographic.com/animals/reptiles/horned-toad/>

Horned Lizard Photo Credit:
<http://www.summitpost.org/greater-short-horned-lizard/325925>



Sulphur-Flower Buckwheat



Eriogonum umbellatum

We are a **native**, low-growing, woody **perennial** from the buckwheat family. There are 30 different subspecies of us, and we all produce lots of flowers.

We grow between 4 inches and 2 feet (10 – 61 cm) tall and wide. We are anchored into the ground by a long taproot which helps us reach groundwater.

Our dense flowers and low growth can make us look like mats. Our flowers bloom from May to September. They vary from yellow to orange or reddish, but may turn rusty orange/red or cream with age.

Our leaves are mostly basal-shaped, oval and olive-green. They grow to about 1-inch (2 cm) long and are either hairless or soft and wooly. We grow in areas that receive from 8 to 18 inches of precipitation during the year and prefer to live out in open, dry rocky places.

Important for Wildlife

Many animals depend on me as a food source. Birds and small animals love my seeds. Deer and mountain sheep like to munch on my leaves. The insects that crawl around on me are a very important food source for sage grouse chicks. Cattle and horses are not fond of me because I am low in protein and do not provide them much substance.

We are an excellent flower for bees. They pollinate us as they collect nectar. They use it to produce a strong, dark honey. Also, 25-30 different insect species use me for their pollinator communities.

Bees are not the only flying creature that likes to rest on our stems and flowers. The beautiful lupine blue and Rocky Mountain dotted-blue butterflies enjoy our nectar, as well!

Human Uses

Native Americans used us to treat a variety of illnesses and diseases. A paste can be made from my flowers to soothe burns. The flowers and stems can be crushed into a powder and made into a tea to help with colds or stomach aches. The Paiute, Shoshone, Cheyenne, and Navajo are just a few of the tribes that used these flowers for medical purposes.

We can also be used for landscaping around your home. We require less water and can be placed in dry, sunny and windy areas. My low-growing positions are helpful for erosion control and environmental improvements. We hope to see you soon!

Learn More

Sulphur-Flower Buckwheat (*Eriogonum umbellatum*).
USDA Plant Guide.
http://plants.usda.gov/factsheet/pdf/fs_erum.pdf

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Tapertip Hawksbeard

We admit we have the weirdest name ever! But our bright yellow flowers will catch your eye—and attract pollinators like bees and butterflies.

We are a wildflower (forb) in the sunflower family. Dandelions are in the family, too, which explains why our petals look like dandelion petals, with saw-like tips.

Our leaves can grow 4 to 16 inches (10-40 cm) long and we can grow 10 to 33 inches (25-84 cm) tall.

Proud to Be an American

We are a native plant that is widespread throughout the western United States. We like dry sagebrush and mountain brush areas in the foothills and lower elevations of the mountains. Our favorite place to grow is next to big or mountain sagebrush and other wildflowers like arrowleaf balsamroot and Indian paintbrush.

Tasty and Nutritious

We are an excellent source of protein for wildlife, sheep, cattle, and horses. They love to eat us during the spring and summer, when our long leaves are in full growth. Our leaves contain about 30% crude protein, plus nutrients like calcium and phosphorus.

We are also an important food for sage-grouse hens when they are getting ready to lay eggs. After the young sage-grouse hatch, we are eaten along with the insects that are attracted to our flowers!

The Karok Indian Tribe in California peeled and ate our nutritious stems raw.



(Crepis acuminata)

Fire!

We produce a long taproot that can live through fire damage. We are a perennial plant and are able to stay green during the heat of the summer, which helps slow down a fire.

If we do burn, we are able to reproduce due to our yellowish or brownish seed that has slender white hairs at the tip.

Learn More

Herbaceous Plants of Utah Rangelands: A Field Guide (2013).
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"Tapertip Hawksbeard." Utah State University Extension:
<http://extension.usu.edu/rangeplants/htm/tapertip-hawksbeard>

"Tapertip Hawksbeard." USDA Plant Guide:
http://plants.usda.gov/plantguide/pdf/pg_crcac2.pdf





Townsend's Ground Squirrel

We are little squirrels with short tails. We are cream-colored underneath, with slightly pink bellies, but we are tan or dark gray on top. This helps us blend in with the environment, so it is harder for predators to find us. You might see us running across roads or highways.

We are mammals that only grow to between 6.5 and 10.7 inches (17 – 27 cm) long. Our front teeth are fairly large, though, for chewing plants and seeds.

Where We Live

There are 7 subspecies of us that live in southern Idaho, south-central Washington, eastern Oregon, western Utah, Nevada, and far eastern California. You will find us in low elevation areas near riverbanks, ridge tops, hillsides, and fields.

We live in underground burrows. These are tunnels which lead to comfortable rooms for shelter, protection from predators, and food storage. They are like the hallways and bedrooms in your home, but our burrows are usually built in sand, clay, dirt and silt in grassy areas.



Spermophilus townsendii

Pop! Pop, Pop!

We pop our heads up from underground all the time! And when we see a predator coming, we can pop back into our burrows to hide very quickly.

We usually pop out of our burrows as soon as the Sun rises, and are most active during the day. But we do not like a lot of hot Sun or wind, so we usually hide out in our tunnels during really sunny or windy days.

We hibernate every winter and come out of our burrows each spring. The longer we live in our burrow, the more tunnels, nests, and entrances we build.

Family Life

We are social critters that live together in colonies. Our family activities include searching for food, looking for danger, and playing. Although we live in large groups, we each have our own burrow, except when mothers have pups.

Males often leave the group they were born in and join a new one. We breed in late January and early February, so our babies are born in early spring. Each litter of babies usually has six to ten pups. Most of us live 3 to 5 years—if we don't get eaten!



Townsend's Ground Squirrel

We Try Not to Be Lunch!

There are a lot of predators that like to eat us. Badgers and coyotes think we are yummy treats. So do hawks and falcons. Even western rattlesnakes and gopher snakes like to eat us. Long ago, the Paiute Indians used to eat us, too!

We are always looking out for danger because we have so many enemies. We make a loud, shrill chirping noise when we see danger. This alerts others in the colony.

What WE Eat

We are not very picky eaters. We mostly enjoy plants and seeds, but once in a while, insects might get chomped down, too. Some of the plants we eat include western yarrow, bluegrass, wheatgrass, sagebrush, and even cheatgrass.

Fire!

When fire burns through our habitat, we can easily go down into our burrows to escape. After the fire passes over the top, we pop back up to see the damage.

After a fire, we may have to move to a new location to find food. If the fire burns up all of our food and hiding spots above the ground, it is easier for predators to find us. We do not like fire because of these reasons. Where it really becomes a problem is when there are fires year after year in our habitat. Then our food does not have a chance to regrow, so we either starve or move to other areas.

Moving can be difficult if the fires are large and have burned a lot of ground. Since we are such little critters, it can take us a long time to get to a new spot to find food. We are also in danger while we are moving because we are away from our burrows and have no place to hide from predators!



Learn More

Spermophilus townsendii. Fire Effects Information System database. USDA Forest Service.

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Spermophilus townsendii - Townsend's Ground Squirrel. EOL: Encyclopedia of Life. <http://eol.org/pages/128482/data>

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Wheatgrass

There are many members of our big, happy wheatgrass family. I am called bluebunch wheatgrass and my cousins include bearded, beardless, tall, and crested wheatgrass. Those might sound like silly names, but each describes our appearance.



I am called bluebunch because of my slightly bluish color. Bearded wheatgrass has shorter, hairy leaves. Tall wheatgrass, as you might have guessed, grows very tall—up to 10 feet (3 meters)! Most wheatgrasses are closer to my height: 1 – 4 feet (0.3 – 1.2 meters).

All the members of my family have things in common, and we also have our differences. We all spread seeds. Western wheatgrass also spreads by rhizomes (stems that grow sideways in the ground).

Where We Live

Our family has adapted to grow in a wide-range of places and climates all across North America. We can be found in high and low elevations. We like living in the sagebrush community. Some of us can tolerate drought, while others, such as tall wheatgrass, like places with more water.

Outside of the wildlands, we are planted as crops for cattle and sheep. You may even find a cousin of mine in the lawns in your neighborhood.



Pseudoroegneria sp. (many species)

Food and Shelter

I provide delicious and highly nutritious forage for many animals. My protein levels are highest in the spring, but decrease as my leaves dry out. I will continue to grow all summer and even into the fall when the conditions are good. Wildlife such as deer, elk, antelope, bighorn sheep, and livestock like our grassy leaves, while critters such as squirrels and birds enjoy our seeds.

I also provide shelter to small mammals and nesting birds. My tall grass blades make comforting shade, as well as cover from predators, such as eagles and hawks.

Other Uses

We are very useful for controlling erosion of the soil because of our extensive roots. Sometimes people plant us along ditch banks or in areas that are very windy. Engineers even figured out that high-quality particle-board can be made out of tall wheatgrass!

Fire!

Our family is accustomed to fire. We expect it at least every 20 years. We have evolved to survive it by protecting our buds with soil or even many layers of plant material. New sprouts will appear not long after a fire has burned the area. Only very intense fires will kill us. Most fires just burn our top leaves and leave our base and roots.



Wheatgrass

We can live a long time and eventually develop a lot of old, hard stubble that animals do not like to eat. Fires burn the hard stubble away and promote a lot of fresh new growth. Without a fire every few years, animals will look in different places to find food. Sometimes that takes them closer to highways and other dangerous places. We like to grow plenty of fresh food to keep them eating our leaves.

Crested wheatgrass has an advantage over invasive grasses like cheatgrass because it can grow in colder conditions. It makes an excellent competitor to cheatgrass after fires, especially ones that happen in the fall when the days are short and the nights get colder.

Learn More

Bluebunch Wheatgrass. USDA PLANTS Database.
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Bluebunch Wheatgrass. Utah State University Extension:
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Western Wheatgrass. USDA PLANTS Database.
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Western Yarrow



Achillea millefolium

We are a wildflower with a strong, sweet scent. We can grow up to 3 feet (1 meter) tall in some places, although most of us are smaller.

We are part of the sunflower family, *Asteraceae*. If you look closely at our flowers you will see that they are like little sunflowers. The flowers on yarrow heads are clusters of white petals. We look like miniature umbrellas with really long, straight handles.

Our leaves are thick and hairy and look like feathers. In fact, the scientific name of our species, "*millefolium*," means "thousand-leaved." Next time you are outside in the woods or desert, try to find us. Rub your fingers on our leaves and smell them. Decide for yourself whether you like our smell or not!



Where do you find us?

We are native to North America. We are located mostly in the Great Plains and the West, but we also grow into Canada.

We are tough enough to grow easily in really hot, sunny areas. We grow well in the shade, too. We can also grow in the dry sagebrush steppe environment. We like brush lands, grasslands, canyon bottoms, roadsides, farmers' fields and canal banks. We can grow almost anywhere!

Making More of Us

We do not make many of our own seeds during our first year because we are still baby plants. But the second and third years we produce a lot! We release our seeds into the wind when it is time to reproduce. The wind takes them and drops them all around and new yarrow plants come up soon.



Western Yarrow

Sometimes we can use our roots to come to the surface and grow new plants, too. These special kinds of roots are called rhizomes. Rhizomes can grow on top of the ground or just underneath the ground.

What Eats Me?

Many wild animals think we are really tasty. These include bighorn sheep, mule deer and pronghorn antelope. Sage-grouse babies love our tender shoots, as well, and depend on us for food.

We do have an odd taste that some animals do not like. I guess it is lucky that not all animals will eat us! A lot of insects like to eat us, though. Some of these include beetles, flies and leaf bugs. Some use us for food, and some for protection. Many insects are pollinators, so they help us reproduce.

Human Uses

Native Americans used us for helping stomachaches. They also used us to keep mosquitoes away and to help infected cuts. Our plant parts are still used today to help with healing. You can buy yarrow in some stores.

Fire!

We have chemicals in our bodies that do not easily burn. Our flowering heads and stems do not burn very well, for instance. We might survive a slow burn, but larger fires will kill us.

We are some of the first new plants to grow after a fire. The soil has more nutrients after a fire to help us grow. We can take over a burned area quickly by growing from seeds or by rhizomes.



Learn More

Achillea millefolium. Fire Effects Information System (FEIS). USDA Forest Service.

<http://www.fs.fed.us/database/feis/plants/forb/achmil/all.html>

Western Yarrow. Utah State Univ. Extension.

<http://extension.usu.edu/rangeplants/htm/western-yarrow>

Western Yarrow - *Achillea millefolium*. Plant Guide. USDA NRCS: https://plants.usda.gov/plantguide/pdf/pg_acmio.pdf

Western Yarrow photo:

<https://extension.usu.edu/rangeplants/htm/western-yarrow>



Wild Onion

If you're walking through the woods or across a field and suddenly think you've walked into the kitchen and someone is cooking, you may be in a patch of wild onions. Our whole plant smells just like the onions used in cooking.

There are about 50 species of wild onions in the Rocky Mountain area, and nearly 300 species in the world! Our genus (and the first word of all of our scientific names) is *Allium*, which really means "garlic." The garlic used in cooking is a close relative of ours.

Find Us Lots of Places

We can grow in lots of different places. Some species of wild onion like shady, moist homes, while others like it dry and sunny. Because of this, we can be found in prairies, forests, and the sagebrush ecosystem. Those of us that like moist places are very happy living near running streams and wet meadows. Come on outside and see if you can find us!

Growing Up—and Underground!

We can start growing from seed, but we can also make new onions without using flowers or seeds at all! We have growing points on our bulbs and roots. Some species of wild onions have growing points on underground stems called rhizomes, too, which can help us spread.

Our bulbs grow underground, just like roots. But they're not really roots. They're clusters of very special leaves—thick and moist, and white, not green. Green leaves capture sunlight and turn it into nutrients for plants. The white leaves of a bulb store nutrients, especially through the long winter. With all that stored energy, bulbs can begin growing early in spring and sprout from underground, even if all the leaves above ground have dried up, burned or been eaten.

At the end of summer, our bulb starts growing little bulb-lets at its base. Those are new bulbs, and they'll grow into new wild onion plants!

We start to grow in spring. Our flowers open in late spring or summer. We make seeds right away. By August, our stems and leaves may dry up and disappear. But like underground treasure, our bulbs wait for spring to send



up stems, leaves, and many types of beautiful flowers.

We Are Useful!

Many animals such as bears, elk, ground squirrels, and prairie dogs eat our bulbs. In early spring, animals like elk and deer graze on our leaves.

Native Americans cooked with us for thousands of years, as did Lewis and Clark as they traveled through the West 200 years ago. Even though we're delicious and nutritious, you'd better keep your cows away from us, unless you like onion-flavored milk!

Fire!

We can't handle a fire that's so hot it roasts our bulbs. But we can survive fires that just burn our stems and leaves. Don't let the soil wash away after the fire, though. If erosion uncovers our bulbs, we'll probably die.

If our tops burn off, it's no big deal. We can grow new leaves and flowers the next year. We don't go crazy with flowers after fire, though. We just grow slowly and steadily, making a few new plants every year.

Learn More

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"American Alliums." Pacific Bulb Society. <http://www.pacificbulbsociety.org/pbswiki/index.php/AmericanAlliums>

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