

EVERGREEN CONIFER TREES

Evergreen trees build rich forest communities where many species of plants and animals thrive. They offer many gifts including shade, shelter, food, medicine, beauty and a place of refuge, and are powerful players in our environment through creating wind and rain, holding groundwater and keeping streams flowing.



What is an evergreen conifer? "Ever-green" trees keep their leaves all year long. A "conifer" is a tree that has cones. You might know a few evergreen conifers, such as Douglas fir, cedar, and spruce. These trees are common in the Pacific Northwest. If you are looking down from an airplane, the land resembles a green blanket of trees from the slopes of the Cascade Mountains to the beaches of the Pacific Ocean. Evergreen conifers are commonly found from the far Northern hemisphere all the way into southern South America.

TREE WORDS TO KNOW

These useful vocabulary words are in bold green in the text below:

Anti-microbial: Having the ability to kill or stop the growth of microorganisms.

Bracts: Small structures in a cone or a flower.

Buttressing: Sloping and stabilizing, as in the wide base of a tree.

Chlorophyll: The green substance in plants that absorbs light so the plant can make food in the process of photosynthesis.

Electrolytes: Essential minerals like sodium, calcium, and potassium that help in many body functions.

Essential oils: Strong smelling oils that plants make and store in tiny sacs in their leaves, flowers, stems, bark, wood, and roots.

Genus: A category in taxonomy (naming and classifying closely related plants and animals). Genus is more general than a species and more specific than a family.

Ovule: The part of the conifer female cone that will become the seed once fertilized.

Photosynthesis: The process plants use to make their own sugary food in their leaves from sunlight, water, and nutrients.

Pitch: The tacky glue-like substance from trees, also sometimes called resin.

Resilient: Being able to adjust or recover from change or challenges.

Species: The more specific part of a scientific name listed after genus.

Stomata: Small slits, like little mouths, in the stems and leaves of a plant that allow movement of gases, such as oxygen and carbon dioxide.

Understory: A layer of plants underneath the main canopy of trees.

Whorls: An arrangement of leaves or branches coming from a single point and forming a circular pattern around a stem or trunk.

WHY ARE EVERGREEN CONIFERS SO RESILIENT?

Resilience means being tough and adaptable to challenges. In the plant world, evergreen conifers get the medal of honor for resilience. They have been on our planet for 300 million years and were the main source of food for plant-eating dinosaurs! It is a wonder how they have survived through so many drastic changes in our environment. Ice ages have come and gone, land has formed and receded, and many species have emerged and gone extinct, yet evergreen conifers have remained. They continue to thrive in some of the world's harshest environments including wind-beaten coasts, snow-capped mountains, and burned areas. How do they do it?

Food All Year Long: Trees need food just like we do. They make their own sugary food through a process called **photosynthesis**. While deciduous trees lose their leaves and go into hibernation during the cold season, evergreen conifers keep their leaves all year long and make food whenever there is sunshine and it is warm enough.



Triangle Shape: Think about the shape of an evergreen. Most are pointed at the top in a triangular shape. Why do you think that is? You guessed it! This shape helps shed heavy snow and rain. Try sheltering under an evergreen in a rainstorm!

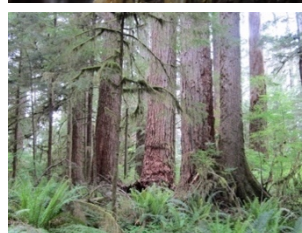
Super Cool Supercooling: Leaf cell walls break open and die in very cold temperatures. Many evergreen conifers avoid this through a process called supercooling. Water inside the cells stays in liquid form instead of forming ice crystals in below-freezing temperatures. The ice is not able to crystallize because there are no tiny particles inside the cells or any rough surfaces on the cell walls for it to adhere to.



Thick, Waxy Leaves: The leaves of conifer trees have a waxy waterproof surface and act like the tree's raincoat. The **stomata** lie deep within the leaves rather than on the surface like many other plant leaves and help to conserve water. Bands of stomata can be seen as white lines on the underside of many conifer leaves.



Making Medicine: When a tree is injured, it makes and releases **pitch** (also called resin) to cover its wound and to speed up the healing process. Pitch is like an antibiotic cream that wards off bacteria, viruses, and fungi that cause disease. It also acts like an insect repellent because it repels bugs that might attack it.



Working Together: Evergreen conifer trees in a forest can communicate with each other by sending scent messages through the air. These scents can warn neighboring trees of invading insects or diseases and even attract predators to eat the insects. Trees also connect through underground root and fungal networks, sharing food and medicine with other trees that need help.

HOW DO EVERGREEN CONIFERS REPRODUCE?

Unlike flowering plants that depend on insects or animals to carry pollen and help with reproduction, the pollen from conifer trees is distributed or spread by the wind. Why? Because when conifers first evolved on the planet, there were no flying insects!

All conifers have two kinds of cones: male and female. Male cones have pollen and female cones have seeds (and are often woody). Both male and female cones are usually on the same tree except for yew and some junipers, which have separate male and female trees.

Pollen cones (male) are small and short-lived. In the spring, they may give the tree a golden appearance. If you look closely at each pollen cone, you will notice hundreds of tiny pollen sacs. When the weather is dry and there is wind for travel, the sacs open up and the pollen is blown away (sometimes covering your car or surfaces of water with a fine golden dust).

Seed cones (female) have scales that are arranged in spirals around a central axis. The whole cone can be sealed up with wax and resin to repel water when it is wet in the springtime, and to hold water when it is dry in the summer. Seed cones usually become woody when they are mature, except for juniper and yew, which stay berry-like. Seed cones contain ovules, each with an egg, that can become a seed if fertilized by pollen. When the seeds are fully developed, the scales will open up and release the seeds. Some pine tree cones will stay on the tree for as long as 50 years and only open during the heat of a fire!



Seeds are shaped to fly a distance from the mother tree in the wind or to attract hungry birds or other animals who will carry them away. Evergreen tree seeds can lie dormant on the ground for years until the soil and light conditions are right for growth. Each seed contains everything it needs to get a good start on life, including a baby root, stem, a few leaves, and food to nourish its early growth. Only a small percentage of seeds find the right conditions to grow into trees, so it is worth the tree's effort to produce a huge number of seeds!

ARE EVERGREEN CONIFERS EDIBLE?

In late spring, tiny buds at the tips of evergreen tree branches swell and open into tender lime-green needles that some people call “forest candy.” This citrusy-tasting new growth is rich in nutrients, such as Vitamin C, minerals, **electrolytes**, and **chlorophyll**, that can give you energy and help support your immune system. True firs (several species under the genus *Abies*), Douglas fir (not a true fir), hemlock, redwood, and spruce all have edible tips. The young shoots of cedar and juniper are too strong tasting and are not eaten. **Yew needles are toxic and should never be eaten.** It’s important to know your trees before harvesting them for food!

Evergreen Tree Tip Tea

Harvest young tree tips when they are limey-green and tender, usually in April through June. They can be eaten straight as a trail snack, put into salads, or brewed for tea. Tips can be preserved in the refrigerator for several days, or in the freezer for up to a year. Older needles can also be dried and made into tea. Use a basket or a food dehydrator to dry them.



- **Sun Tea:** Add a large handful of evergreen tree tips for each quart of water to a glass container with a lid. Cover and let it sit in the sun for several hours to overnight. Strain and serve chilled.
- **Hot Tea:** Use the same amount of tips as with sun tea, but pour boiled water over them in a pot, cover with a lid and let them steep for 15 minutes. Strain and serve hot. This tea will taste stronger than the sun tea.
- **Tree Tip Lemonade:** Add 1–2 cups of tips in a large jar or pitcher with 6 cups of water. Cover and let steep in the sun or a warm place for 4–6 hours. Strain out tips. Add the juice of 3 lemons or about ¼ cup of lemon juice and 2–3 tablespoons of honey (dissolved in hot water). Mix and serve over ice.
- **Evergreen Tree Tea:** Mix equal parts dried Douglas fir (or other edible tree needles) with rose hips. Steep 10–15 minutes. This tea is a winter favorite and helps to fight colds.



Conifer Pollen

Conifer pollen is also edible and has a rich flavor similar to bee pollen. It is generally high in vitamins, minerals, amino acids, and antioxidants (cell protecting substances). In China, pine pollen has been valued as a food and medicine for thousands of years. Harvesters gather pollen cones when the cones are just beginning to open. The pollen can be sifted and stored in the freezer or preserved by placing the entire cones in honey. You can add pollen to smoothies or baked goods.

ARE TREES MEDICINE?

Have you walked through a forest on a hot day and smelled the fragrance of the trees? Or have you scratched and sniffed a cedar leaf and noticed the strong scent? Many plants, including evergreen conifers, make aromatic (strong smelling) compounds called **essential oils** that are stored in tiny sacs in their leaves, flowers, stems, bark, wood, and roots. These oils help to repel insects, fight diseases, act as messengers to plants and animals, and offer protection from extreme conditions like sun, wind, and dampness.

Our ancestors have used aromatic plants to improve their lives since ancient times including for flavoring food, medicine, insect repellent, and providing pleasant smells in incense and perfume. Burning dried aromatic plants will even help to disinfect and purify the air (this is called smudging). *What is your favorite smelling plant? How do you use aromatic plants in your life?*

EVERGREEN CONIFER ESSENTIAL OILS

Steam distillation is the most common method to extract essential oils. Steam is passed through plant material in a closed container, which breaks open the essential oil sacs and captures the oil. This steam is then cooled, separating the oil from the water. It takes a lot of plant material to make essential oils. For conifers, it may take 50–100 pounds of leaves to make just one pound of essential oil!

When you use essential oils, you generally only need a couple of drops because they are so strong. Essential oils are valuable remedies for helping us to stay healthy. They can improve circulation, fight infections, ease pain, refresh us when we are tired, and calm us when we are stressed. You might notice essential oils in many familiar items including body care products like soaps, lotions, hair care, and bath salts, room sprays and perfumes, and medicines for coughs and colds like chest rubs. You can purchase evergreen tree essential oils at many natural products stores, herb shops, and farmers markets. Make sure to get **pure** essential oils instead of fragrance oils, as they contain artificial ingredients.



TREE MEDICINE RECIPES

Facial Steam

Place one handful of fresh finely-chopped or dried evergreen tree leaves in a bowl. Using cedar is good for coughs and colds because it helps to fight infection and stimulates immune function. Pour boiled water over the herbs until the bowl is half full. Put your face over the steaming herbs at a comfortable distance and cover your head with a towel. Breath deep! Try steaming for at least 5 minutes. Pour more hot water in if necessary. Try several steams a day if you are really sick. You can also add a drop or two of essential oil like fir, spruce, eucalyptus, or peppermint for added support.



Forest Bathing Salts

These salts smell like being in the forest! Begin drying evergreen conifer tree leaves at least a week in advance as they take a long time to dry. Gather fallen branches or carefully prune branches from trees and dry in baskets or paper bags. You can speed up the process by using a food dehydrator. Salts, such as Pacific sea salt and New Zealand salt, can be purchased in bulk at the grocery store. Epsom salts are also commonly available and are especially helpful for sore muscles. If you cannot find evergreen conifer oils, lavender, grapefruit, or sweet orange will also work well.

1 part dried leaves or needles from evergreen conifers

1 part sea salts and/or Epsom salts

Baking soda (1 T per cup of combined leaves and salts)

Evergreen conifer essential oils (about 10 drops total per cup of mixed leaves and salts)

Cut or pull the dried tree leaves/needles off the branches. Cut large leaves like cedar and pine into smaller pieces. Mix all the ingredients in a bowl. Place about $\frac{1}{2}$ to $\frac{2}{3}$ cup in a muslin or organza bag. Four by six-inch bags are a good size for bath teas. Place your filled cloth bag in a plastic bag to preserve the fragrance. Place the entire cloth bag in the bath and squeeze to dissolve salts. You can also do a foot soak in a big bowl or bucket!

Cedar Oat Bath

This simple recipe is especially soothing for irritated skin. Oats soothe dry, itchy skin while cedar stimulates immunity and fights infection.

1 part dried cedar leaf

1 part oat flour or powdered rolled oats

Essential oil of cedar, spruce, pine, or fir (10–15 drops per cup mixed cedar oat blend)

Cut dried cedar leaves so that the pieces are about $\frac{1}{2}$ inch or smaller. In a bowl, mix half dried cedar and half oat flour. Add 10–15 drops of essential oil per cup of mix and stir well. Place $\frac{1}{2}$ cup of mix into a muslin bag and tie. Place in a glass jar or plastic bag to retain scent. Place the whole bag in the bath and squeeze to release the oat flour. The bath water will become “milky” and the cedar will infuse into the hot water. You can rub the bag on your skin like a loofah.



PITCH: NATURE'S TOPICAL ANTIBIOTIC AND IMMUNE BOOSTER

When trees get a wound, they cover it with pitch. This acts like a band-aid, helps to fight off infections, and may drown beetles and other insects that try to burrow in their bark or wood. People have used evergreen conifer pitch as incense, a fire starter, and to heal wounds since ancient times. If you get a cut, scrape, or insect bite, you can dab a little sap onto it to speed up the healing process. Put a little soft leaf like red huckleberry or a band-aid on top of it so the sap stays on your wound and does not rub off on your clothes. If you need to remove pitch from your skin, rub a little oil or hand sanitizer to dissolve it.

MEET THE EVERGREEN CONIFER TREES

There are 630 species of conifers around the world with 25 species just in Washington State. In the following pages you will find descriptions, stories, and uses for some of the most common trees in the Pacific Northwest. For other, less common trees, see the tree guides in the Additional Resources section.

THE CEDAR OR CYPRESS FAMILY

Trees from the cypress family, including cedars and junipers, have scale-like leaves. Male and female cones generally grow on the same tree, and the seed cones are leathery or woody. Cedars and junipers create an abundance of aromatic oils that protect them from diseases and insect invasions. They are valued for their strong and long-lasting wood, medicinal properties, and fragrance.

WESTERN RED CEDAR – *Thuja plicata*

Cedar is a tall evergreen tree with a wide, **buttressing** base and a trunk with gray to cinnamon-red bark. Greenish-yellow leaves are flat with opposite scales. Branches often swoop upward at the tip in a J-shape. Simple round pollen cones appear in spring or summer and give the tree a golden appearance. Cedar seed cones have 8–12 scales, are about ½ inch long, and are shaped like rosebuds. The largest cedar trees are up to 19 feet in diameter and 200 feet tall. Some of the oldest trees are thought to be over 1,000 years old. Cedar prefers wet, misty forests and is very common on the west side of the Cascade Mountains, which run from Northern California up into Southeast Alaska.

In one Salish story, a young woman asked to be the most beautiful thing in the world and was transformed into a cedar tree. Salish names for Western red cedar include “Long Life Giver,” “Tree of Life,” and “Grandmother.” All parts of cedar are highly valued by Northwest Coastal Native Peoples, including the wood, bark, roots, branches, and leaves. Cedar provides for people from birth to death. The inner bark is prized for its durability, flexibility, and water resistance. Soft fibers have been used for diapers, clothing, mats, napkins, and towels. Native weavers create ornate baskets and hats from narrow strands of cedar bark. Branches and long roots are traditionally made into rope, fish traps, binding material, and baskets. Trunks are made into grand longhouses, swift and rot-resistant canoes, and art including welcome poles. Protocols (customs or cultural guidelines) for when and where to harvest, as well as how to honor the tree, are practiced. If done correctly, the tree continues to thrive. You might notice missing strips of bark that may be new or very old when you are walking in the woods. Note that harvesting cedar bark is an important cultural practice reserved solely for Indigenous communities.



Cedar can fight harmful microorganisms and boost our immune system. It is used in many ways such as infusing it in oil, salve and creams, baths, and incense. To harvest cedar leaves, carefully prune small fan-like branches here and there on the tree so you do not leave a visible impact. You can also look for fallen branches after a windstorm. The leaves can be harvested any time of year but seem strongest in late summer to early fall when the weather is warm and aromatic oil content is the highest. The leaves can be used fresh or dried. To dry the leaves, bundle several small branches with a rubber band then hang them, or put them in baskets in a dry room with good ventilation. Keep them whole to retain the fragrant oils and then crush them just before you use them. Store in a paper bag or glass jar. See the Tree Medicine section for recipes with cedar including respiratory steams, bath salts, and cedar oat baths.

Grandmother Cedar Tree

This abbreviated Coast Salish story is from Lower Elwha Klallam storyteller Roger Fernandes:

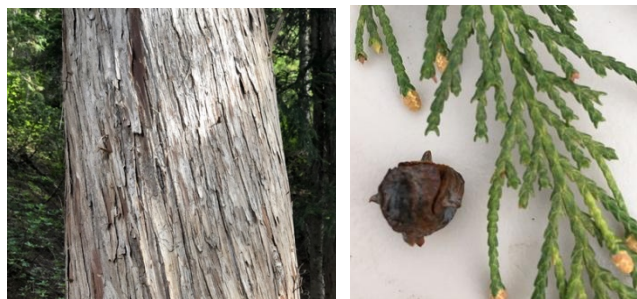
A long time ago there was a tall and strong Grandma Cedar Tree. One day, a little tree, who was her grandson, began to grow next to her. She happily watched him grow and grow. She was also able to protect him from the wind, the hot summer sun, and the hungry deer. When he was lonely, she called the birds to his branches to keep him company. So, he grew healthy and strong until he was bigger than his grandma.

Grandma was getting very old, and she needed protection and care. Grandson Cedar was able to protect Grandmother from the strong wind, the hot sun, and the hungry deer. He was also able to call the birds to her branches when she missed her old tree friends. One day she said, "Grandson, don't worry about me. I am old now. Take care of yourself. Do not worry about me anymore." But he said, "Grandma, when I was little you protected me from the strong wind, the summer's hot sun, and the hungry deer. And when I was lonely, you called the birds to me so I would have company. Grandma, you did all these things for me, and now I will do them for you."

And so, Grandson Cedar Tree took care of his beloved Grandmother Cedar Tree. And that is all.

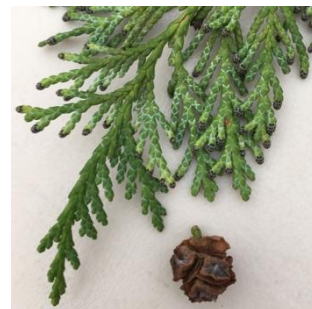
YELLOW CEDAR – *Callitropsis nootkatensis*

Yellow cedar thrives in the mountains between 2,500– 6,000 feet above sea level. It grows in forest areas and along rocky cliffs. Yellow cedar has grayish soft bark and the wood is a beautiful yellow color. Branches are long and drooping, making the tree look like a fancy dancer with long fringe. Yellow cedar can live to be 1,500 years old and grow over 160 feet tall! The flexible branches remain strong in snow or intense mountain wind. Yellow cedar is used medicinally in many of the same ways as Western red cedar. The wood of yellow cedar is hard, light, and strong and is prized for making canoe paddles, baskets, dishes, tools, clothing, and many other things.



PORT ORFORD CEDAR – *Chamaecyparis lawsoniana*

Wild Port Orford cedar only grows along the coast of southern Oregon and northern California, but there are over 200 horticultural varieties (non-wild) that are commonly found in yards, parks, and public spaces. Branches are feathery looking and flat. Port Orford cedar wood is highly prized because of its strength and resistance to rot and insects. It has been used for boatbuilding and many other purposes.



SEASIDE JUNIPER – *Juniperus maritima*

Seaside juniper is a small, gnarled tree with scale-like leaves and shaggy bark. It thrives in dry soil along cliffs around the Salish Sea. Unlike other cypress family trees, male and female cones grow on separate trees. Male pollen cones are small and golden. The female cones are small, round, blue-green, and waxy. The leaves and the female cones have a strong, spicy smell when crushed and are used as a seasoning for meat and other dishes. The dried leaves and berries are burned as a cleansing and disinfecting incense.



THE PINACEAE FAMILY

Members of the pine or Pinaceae family include pines, spruces, hemlocks, true firs, and Douglas fir. One easy way to know if a native tree is a member of this family is that all of these trees have needles (as opposed to scales, like the western red cedar), and dry, scaly cones. Larch is also in the pine family and has needle-like leaves, but it loses them in winter and is not an evergreen tree.

PINES

The word “Pinus” stems from the Latin word meaning “resin.” There is nothing like the smell of pine resin incense, or the scent of Ponderosa pine in the high desert after a rainstorm. If you are lucky, you may find a tree that is dripping golden pitch—a substance that has been sought after for ages. Pines can be ancient. There is a pine tree in California that is 4,600 years old!

One of the easiest ways to identify different types of pines is by looking at their needle-like leaves. The needles emerge from a brown base right off the stem and grow in clusters of two to five. Lodgepole and shore pine have two needles per bundle, while western white pine has five needles per bundle.

Many pine trees are dependent on fire for reproduction. Cones take two years to reach maturity and can stay tightly closed on a tree for many years until the heat from a fire causes them to open. Even if a tree is killed in the fire, the cones on the top branches will open and seeds will land on the ashes, which provide an ideal condition for them to grow in. You may notice dense forests of pine growing in the years following a forest fire.

WESTERN WHITE PINE – *Pinus monticola*

White pine is a majestic tree with a sparse crown that grows between sea level and 5,000 feet. Look for it in forests where there has been a disturbance like fire or logging, or along the edges of bogs or prairies. The branches grow in **whorls** around the trunk. Feathery long needles are a blue-grey-green color. Western white pine has checkered bark and can grow up to 200 feet tall.



White pine was once very common in wet forests, but bark beetles, white pine fungal disease, logging, and wildfires have made it rare. A disease called white pine blister rust was introduced in Vancouver, B.C. in 1910 and quickly spread east, devastating vast pine forests throughout the Northwest. From the 1930s to the 1960s, the federal government hired thousands of people to poison other plants that host white pine blister rust such as currants and gooseberries. Tragically, this strategy did not save the pine trees and resulted in devastated currant and gooseberry populations. Efforts are now focused on finding pine trees that are naturally resistant to disease.

White pine is prized as a medicine for clearing lung congestion, fighting infections, and stimulating our immune system. The resin, bark, and leaves are all rich in healing essential oils. Native Americans have long chewed the pitch as a gum or sucked it to reduce coughing. The pitch can be diluted in oil or salve, and used as a chest rub. Young leaves and dried bark are also made into tea and cough syrup.

SHORE PINE AND LODGEPOLE PINE – *Pinus contorta*

Shore pine and lodgepole pine are two forms of the same species. They can be difficult to tell apart, but lodgepole pine (*Pinus contorta* subspecies *latifolia*) tends to grow inland, in the mountains, and in dry prairie areas, whereas shore pine (*Pinus contorta* subspecies *contorta*) thrives in the harsh conditions along the coast including sandy bluffs, rocky cliffs, and boggy areas with infertile soil. Molded by harsh winds and terrain, it may look like a huge bonsai tree with heavy limbs and a rounded top, or all the branches may be bent away from the prevailing winds.



Both trees have short stiff needles (about 1½–2 inches) bundled in pairs. The seed cones are also about two inches. They are curved at the base, prickly, and point away from the tip of the branch. Mature cones can stay on the tree for 20 years or more and are most likely to open during the heat of a fire. Pollen cones appear reddish and grow in clusters.



Native Americans on the east side of the Cascade Mountains have long used lodgepole pine to make houses and tipis because it is slender, straight, and lightweight. Shore pine tends to make a lot of pitch, which is prized as a chewing gum and for healing wounds and fighting infections.

HEMLOCKS

Hemlock trees are known for short needles and droopy tops and branches. Needles have rounded wooden pegs at the base. Regional varieties include Western hemlock, which grows at low elevations, and mountain hemlock. Mountain hemlock needles are all the same length and grow in clusters. Cones are 1 to 3 inches long.

WESTERN HEMLOCK – *Tsuga heterophylla*

Hemlock is known as a “climax species” in Northwest forests because it grows in full shade and outlives other trees that are dependent on sunlight. If untouched by humans or natural disasters, our forests would be dark woodlands of giant hemlock—the stable, final stage of forest growth. Hemlock bark is silvery brown and furrowed, but not as deeply furrowed as Douglas fir. It has a distinctive drooping top and feathery drooping branches. Leaves are different lengths and are arranged randomly along branches. Cones are only an inch long. Each seed has a wing that can fly half a mile in the wind.

Hemlock spring tips are tender and delicious. Coast Salish Peoples have boiled the leaves and bark for tuberculosis, rheumatic fever, and hemorrhage. The inner bark has been used in springtime as food called “bark bread” that is high in sugars, starches, and immune stimulating properties. The bark is used to create a reddish-brown dye that makes fishnets invisible to fish. Hemlock branches are traditionally used to collect herring eggs. Many people think the hemlock tree is poisonous, but this is because it is confused with “poison hemlock,” which is an entirely different plant in the carrot family.

Why Hemlock has a Bent Top

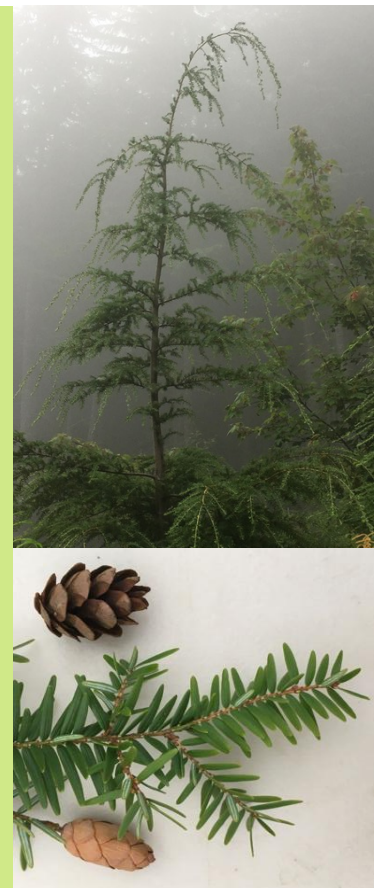
This common Salish story has many versions. In one version Hemlock pushes to the front of the line to get the biggest cones because he is so big and tall. The Creator reprimands his bullying by sending him to the end of the line.

A long time ago the Creator was giving out cones to all the evergreen conifer trees with needles. The pines, true firs, hemlocks, and Douglas fir were all there, and they were told to line up. Western hemlock was not paying attention; he was playing off on his own. By the time he realized it was time to line up, he was last in line, and he got the smallest cones. He learned a powerful lesson that day. See the bent top? He still hangs his head with humility.

Having humility means that we are always learning and growing. Rather than defending ourselves or needing to be “right”, we can acknowledge that we make mistakes and be willing to learn new perspectives and skills. Through being humble, we grow wiser and build healthy relationships with others.

Questions to ponder....

- What is a situation when I was able to practice humility?
- When have I seen others practice humility? What did that look like?
- How can humility help me to learn and grow in my life right now?



SPRUCES

The easiest way to identify a spruce is by touching the needles. If they are sharp, you know it is a spruce! Twigs are warty where old leaves have fallen off. Cones feel papery. The trunk bark has loose scales or plates that are shaped like potato chips. Sitka spruce is common toward the coast while Engelman spruce is more common in the mountains. White spruce and black spruce grow in Alaska, and blue spruce grows in the Rocky Mountains.

SITKA SPRUCE – *Picea sitchensis*

Sitka spruces grow in wet coastal forests from Oregon to Alaska. Along the rocky coastline, they take the form of contorted, bending sculptures molded by the wind and rain. They seldom grow in higher elevations or dry climates. Leaves are sharp at the tip but are flat and do not roll in your fingers like other spruce leaves.



Salish weavers have long gathered pliable straight spruce roots, split them, and woven them into intricate watertight baskets and rain hats. Roots have also been heated, pounded, and made into cordage. The pitch is called “spruce gum” and is used for sore throats and coughs. It has also been used as a glue, sealer, and waterproofing substance. Spruce wood is light, stiff, and very strong. It was used for making airplanes in World War I and World War II. It is also highly resonant and is used to make musical instruments.

This spruce tree growing at Lake Quinault in Washington State is the largest in the world. It is about 1,000 years old, 191 feet tall, and has a 59-foot circumference! How many people with your arm span would it take to wrap around this tree?

TRUE FIRS

True firs have several characteristics that help us identify them. Cones point upward like birds perched on branches and grow toward the top of mature trees. Bark on younger trees is often smooth with blisters that contain pitch. Cones don’t fall off the trees intact—the scales come apart once the seeds ripen. Look for scales under the tree instead of whole cones. Fir branch sprays (single small parts of branches) often appear flat. Leaves on different firs grow in distinctive patterns:

- Grand fir: flat needles grow in horizontal rows
- Noble fir: needles are shaped like hockey sticks, point upward, have white lines above and below
- Pacific silver fir: flat needles grow flat with top needles pointing toward the tip of the branch
- Subalpine fir: needles curve upward and have white lines above and below

Grand fir is common in lower elevation forests while noble fir, Pacific silver fir, and subalpine fir are more common in the mountains. All true firs are valued for similar purposes, including being skin-regenerating, immune-stimulating, and anti-microbial.

GRAND FIR – *Abies grandis*

Grand fir is a beautiful low to mid-elevation forest tree with branches that grow in regular whorls. Needles are flat, grow in two distinct horizontal rows, are shiny deep green on top, and have two white lines on the underside. If you look closely, you can see a notch on the tip of the leaf. Young bark has resin blisters, but older bark becomes brownish-grey and ridged. The bark is purple when sliced and is used by Coast Salish People to make a purple dye. Upward-pointing cones grow at the top of the tree and are about four inches tall with green to reddish smooth scales.



Native Americans use grand fir bark and pitch for healing the skin and clearing lung infections. The pitch makes an excellent waterproof finish for canoe paddles and wooden tools. The whole tree forms a nice shelter from rain. The wood is soft and is made into paper.

NOBLE FIR – *Abies procera*

Noble fir is a favorite Christmas tree with silvery leaves and sparse, strong branches. The trunk is gray and smooth with resin blisters, and becomes furrowed as it gets older. Dense strong needles point upward like a hairbrush. Look for two silver bands on the top and on the bottom of the needles, giving them a silvery appearance. The upward facing cones are four to eight inches tall and barrel-shaped on fully-grown trees. They have **bracts** between each scale.



Like other firs, noble fir needles, bark, and resin are used to build immunity, fight infection, and heal wounds. The dried needles make a tasty tea and are also great for adding to bath teas.

OTHER PINE FAMILY TREES

Douglas fir and larch are also in the pine family. Larch, also called tamarack, is unique among conifers because it loses its leaves in winter. You may notice its bright yellow leaves if you are passing through the mountains in autumn. Their needles on older twigs grow in clusters from woody pegs.

DOUGLAS FIR – *Pseudotsuga menziesii*

Douglas fir is one of the most common and well-known trees in the Pacific Northwest. It is the second tallest tree in the world after the California redwood and can grow to be over 1,000 years old! The older bark is cinnamon-brown colored and becomes deeply furrowed, making it the “grooviest tree in the forest.” The bark can grow as thick as 12 inches and is hearty enough to survive most wildfires. The leaves are all the same length and are pointed at the tip but are not sharp. They are spirally arranged all around the branch like a bottlebrush. Limbs near the treetop sweep upward like arms reaching up toward the sky with the top of the tree pointing straight up. Seed cones are about two to three inches long and have three-pronged bracts that stick out beyond the scales, resembling the back feet and tail of a mouse.

How Mice Got Stuck in Douglas Fir Cones

This common Salish story is told by many Native people in the Pacific Northwest. It teaches us that Douglas fir has a special ability to survive forest fires. Once you see the little mice in the cones, you will never forget how to identify the tree!

A long time ago there was a great forest fire that swept through this area. All of the animals were running to escape. The poor little mice could not run fast enough so they asked the strong and tall Douglas fir for help. Douglas fir invited the mice to climb up its trunk and hide in its cones. Douglas fir has thick bark, and it was able to survive the heat of the flames. The mice are still in the cones. Can you see their little hind feet and tails sticking out from beneath the scales?



Douglas fir needles have a pleasant fragrance that smells like pine and citrus. The young spring tips can be eaten straight or made into a refreshing tea for promoting energy and warding off hunger and thirst. Some people call the tea "Nature's Gatorade." Older needles are too tough to eat but can be dried and made into tea. Douglas fir needles can also be used on the skin because they contain vitamins and other nutrients that promote skin health and wound healing. The needles are finely chopped and infused in oil that can be made into body oil, lotion, lip balm, or salve. They are also be dried and used in baths.

Douglas fir makes a lot of pitch. You will see it where the trees have been injured from lightning, losing branches, being scraped, or being attacked by insects. It has the consistency of honey at first but becomes very hard as it ages. The liquid pitch can be placed directly on wounds or insect bites to speed up healing. Pitch is also used as a fire starter, incense, and for waterproofing.



Activity: Sitting with Douglas Fir

Find a Douglas fir tree to sit around. Notice the thick, groovy bark of the tree, protecting it from fire and other damage. Look closely at its needles. Can you see a thick, waxy coating? Scratch the needles. What do you smell? Can you find pitch covering any injuries on the tree? Look closely at the cones and see if you can find the three-pointed bracts sticking out of each scale that resembles the tail and hind feet of a mouse. What else do you notice? Douglas fir is resilient. It can adapt to very hot or cold temperatures and harsh terrain like rocky ocean cliffs, dry mountain slopes, or wet forests.

Questions to ponder....

What helps me to adapt in challenging situations? (sleep, good food, time with family or friends, cultural activities)

How can I protect myself when I am in a challenging situation?

What can plants teach me about being resilient in times of change?

TAXACEAE FAMILY

PACIFIC YEW – *Taxus brevifolia*

Yew is a shrubby little evergreen tree that grows up to 50 feet tall in the understory of deep forests. The bark is shaggy, comes off in strips, and is often several colors including gray, brown, and orange. Deep green needles grow horizontally in two opposite rows. They are pointed at the tip but are not sharp like spruce. New twigs remain bright green for a whole year. The female seed resembles red huckleberry in shape, color, and size. Birds and other animals eat them. Female and male cones grow on separate trees.

Yew grows slowly and the wood is very dense, yet pliable (bendable). It is called “bow plant” in many Native American languages and has been made into fish hooks, paddles, digging sticks, spoons, and many other things. Native Americans have sustainably harvested and used yew for medicine for many generations. In the 1990s, scientists discovered that yew contains a powerful compound called Taxol which can inhibit the growth of breast and ovarian cancer cells. Drug companies bought and claimed the rights to all the yew trees in national forests and used them to create cancer drugs. People from Warm Springs were actually jailed for harvesting yew in their traditional territory. By the year 2000, those drug companies discovered how to artificially produce the drug—releasing pressure off this powerful little tree. Because of overharvesting, it will take decades for yew trees to return to their former population.

CAUTION: Yew needles, bark, and branches are toxic and should not be eaten or drunk as tea. Only experienced gatherers should harvest the bark.

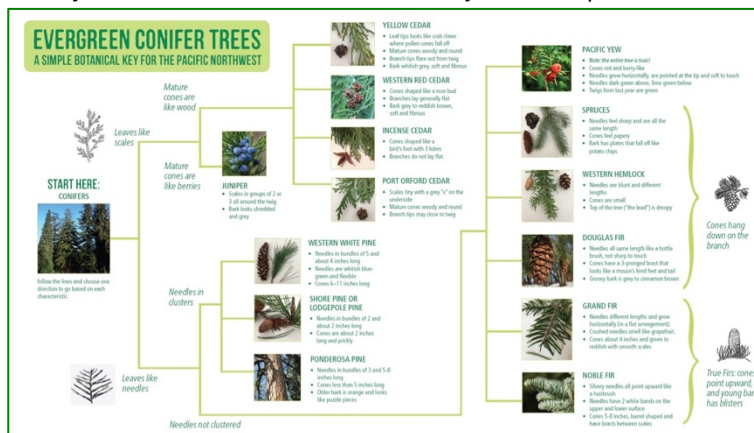


TOOLS TO HELP YOU IDENTIFY EVERGREEN CONIFER TREES

Tree Key Explanation

Once you have met some individual trees using just your own senses, it can be fun to figure out its name including genus and species. This helps you to learn all sorts of facts, history, ecological relationships, and human uses for that tree. A tree identification key is included in this toolkit to assist you in this process.

To use the key, start on the left hand side and choose a direction to follow based on the characteristics of the tree. Inspect the branches and leaves (what we usually call needles). Are the leaves like scales or needles? Follow the line that has the correct answer and continue along until you arrive at a single species.



Lifecycle Cards

The tree lifecycle cards can be helpful as you work to identify trees in your neighborhood. What part of the lifecycle is the tree in now? Can you find pollen cones or seed cones on the tree? Is pollen drifting through the air and tickling your nose? Are there woody cones on the ground? You can also test your knowledge by cutting up the lifecycle cards into separate pieces and then working to rematch the pieces together by tree. Remember to first mark the name on the back of each piece so you can check your answers.

MORE ACTIVITIES!

Evergreen Conifer Speed Research: Want to become a Douglas fir or Western red cedar expert? It's amazing how much you can learn with just 10 or 15 minutes of online research. *What is special about the tree? How is it valued by people and other animals? Does it have any special qualities or ecological relationships?* Now, who can you teach about this amazing tree?

Watch The Teachings of the Tree People: Video on the life and teachings of Skokomish elder, Bruce Miller. <https://vimeo.com/64099709>

Learn Why Pine Cones Open and Close: Check out this experiment you can do at home: <http://parentingchaos.com/why-do-pine-cones-open-and-close/>

Listen to Tree Songs: Play the song *C is for Conifers* by They Might be Giants or play this YouTube music video: <https://www.youtube.com/watch?v=FijQbZeIGNc>

Additional Resources

Northwest Conifers Website: <http://nwconifers.com/info/overview.htm>

Coloring pages: <http://www.supercoloring.com/coloring-pages/trees-leaves/fir-tree>

Forest Fast Breaks: short videos on forest management, tree biology, wildlife, wood products, etc.

https://www.youtube.com/playlist?list=PLS8kydnMHQ9k8teSRSMGqLYn3fOqZjV_8

Recipes on cooking and medicine making with conifers: <https://www.growforagecookferment.com/conifer-needle-recipes/>

Starflower Habitat Education Activities: https://www.wnps.org/education/resources/documents/K-5_Q&E/2nd_grade/2-2b.pdf

Blog on Douglas fir: <https://heartofthewestcoast.com/2012/01/26/douglas-fir-trees/>

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