



UTAH Master Naturalist

Mountain Plants Field Book

Mark Larese-Casanova



UtahStateUniversity
COOPERATIVE EXTENSION



How to Use this Field Book:

The Utah Master Naturalist Mountain Plants Field Book is meant to provide you with an annotated look at some of the common, rare, and invasive plants of Utah's mountain ecosystems. This book provides photographic examples of each species along with useful information on the species' life history and ecology. When used along side a detailed field guide, this book will help you learn about plants during your mountain explorations. Have fun!

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Revised 2014- Minor corrections and additions were made to this edition.

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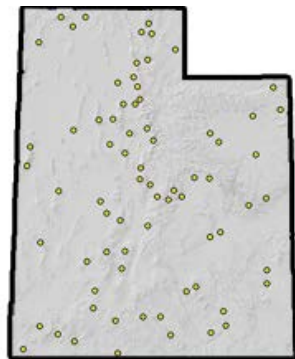
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Wheatgrass

Agropyron, Elymus, or Thinopyrum spp.



- Many species in Utah
- Generally cool season grasses
- Bunchgrasses or sod-forming
- Adapted to dry environments
- Good forage for wildlife



There are many species of wheatgrass in Utah. Some common, native species in the montane zones include bluebunch wheatgrass (*Pseudoroegneria spicata* or *Elymus spicatus*), western wheatgrass (*Pascopyrum* or *Elymus smithii*), and slender wheatgrass (*Elymus trachycaulus*). The most prevalent species at montane elevations is intermediate wheatgrass (*Thinopyrum intermedium*). Some wheatgrass species, such as bluebunch and slender, are perennial, cool-season bunchgrasses that grow in clumps that reproduce from seed and tillers. Others, such as western and intermediate wheatgrass, are cool-season perennials, which are rhizomatous, mat-forming, and can reproduce from seed. Bluebunch is an important forage species in Utah, but it is both preferred and used less than slender, western, and crested wheatgrass. It grows up to 3 feet tall, with deep roots that can reach over 4 feet, and can occur from 4,500 to 9,500 feet in Utah. Slender wheatgrass grows up to 4 feet tall, common from 5,000 to over 12,000 feet in elevation, but it is rarely abundant on the landscape. It is good forage for all livestock, and a fair to good forage for wildlife. Western wheatgrass grows up to 3 feet tall, is sod-forming and drought tolerant, and occurs from 4,200 to 7,500 feet in Utah. It is a fair to good forage for livestock and wildlife, and is a great re-establishment species for eroded sites because of its fibrous roots. Intermediate wheatgrass, although introduced, is a fairly good forage species that is also commonly planted for re-establishing disturbed and eroded sites. It grows best from 3,500 to 9,000 ft in elevation. Many wheatgrass species have a heavy endodermis, a waxy coating that allows them to survive in dry environments.

Bluegrass

Poa spp.



- Several species in Utah
- Sod-forming, used for lawns
- Not adapted to drought
- Good for restoring disturbed sites

The *Poa*, or bluegrass, genus, has multiple species in Utah including Kentucky bluegrass (*Poa pratensis*), mutton grass (*Poa fendleriana*), and sandberg bluegrass (*Poa secunda*). The most commonly known species, Kentucky bluegrass, grows from 1 to 3 ft tall. It was once thought to only be introduced from Europe, but recent research suggests that it is native to some mountains in the western US. It is considered fair to good forage for livestock and wildlife, but because of its shallow roots, it needs more water than most grasses and often dries out earlier than other valuable grass species. Because of its sod-forming qualities, it is the most common lawn grass in Utah.

Unlike Kentucky bluegrass, mutton grass, and sandberg bluegrass are bunchgrasses. Sandberg bluegrass grows up to 18 inches tall, reproduces from seed and tillers, and occurs on ridgetops, slopes, meadows, and open timberline. Being one of the first grasses to green-up in the spring and persist throughout the summer, it is considered a fair to good forage for livestock and wildlife. Mutton grass grows from 1 to 2 feet tall, growing on dry hillsides and slopes or spruce-fir and aspen forest edges from 3,000 to 12,000 ft in elevation. It is considered a good to excellent forage for livestock and a fair to good forage for wildlife species. Most bluegrass species make good re-establishment species for disturbed sites, but seeds of most species are not always readily available.

Needle and thread grass

Hesperostipa commata



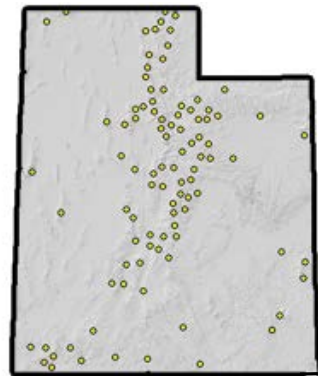
- Diverse species in Utah
- Generally grows 1 to 3 feet tall
- Drought tolerant
- Some used by Native Americans, with seeds ground into flour



Stipeae is an interesting tribe of grasses, with many species that have long awns. In Utah, there is the needle-and-thread grass (*Hesperostipa commata*), Indian ricegrass (*Stipa hymenoides*), and Columbia needlegrass (*Stipa nelsonii*). Needle and thread grows from 1 to over 3 ft tall, with 4 to 8 inch awns off the lemmas (seed-like) of each spikelet. It has a shallow root system, and can grow on dry sites from 3,500 to 10,000 ft in elevation. It is not used heavily by most species, but sheep and small mammals use it moderately, and it can be used somewhat in the spring by ungulates. Columbia needlegrass is found in the meadows and open woodlands of the foothills and mountain throughout Utah. It grows from 1 to 3 ft tall, with 1 to 2 inch awns coming from the spikelets of its narrow panicle. It is considered a fair forage species for livestock and wildlife. Both needle-and-thread and Columbia needlegrass have a very pointed callus (attachment point of their seed-like lemmas), which can work their way into the ears, eyes, nostrils, and the tongue of livestock and cause injuries. Indian ricegrass grows from 1 to 2.5 ft tall, producing a characteristic open-panicle type inflorescent (flowering structure), and can occur from 3,000 to 10,000 ft in elevation. It is the state grass of Utah, and several Native American tribes used the seeds to grind into flour. These species are drought tolerant, growing best on well-drained sandy soils, but they can occur on a moderate range of soils. These grasses reproduce mostly from seeds, but also from tillers after disturbance.

Brome grass

Bromus spp.



- Grows in open mountain slopes and meadows
- Reproduces through seeds and tillers
- Not well adapted to grazing
- Generally good forage
- Cheatgrass is a particularly invasive exotic grass

There are a few different brome species in Utah, some that are native and some that have been introduced from Europe. Some common native species include mountain brome (*Bromus carinatus* or *marginatus*) and nodding brome (*Bromus anomalus*), and introduced species include cheatgrass (*Bromus tectorum*) and smooth brome (*Bromus inermis*).

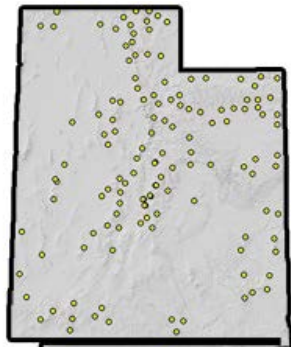
Mountain brome is a cool-season, perennial bunchgrass, growing from 1 to 4 feet tall. It grows on open slopes, grasslands, shrublands, dry to moist meadows, and open ponderosa pine, lodgepole pine, and quaking aspen forests from 5,500 to over 10,000 feet in Utah. Brome grass expands by vegetative tillers, forming large clumps around the parent plant, and they reproduce from seed. Flowers are wind pollinated, and seeds are dispersed by wind or by animal. They grow on a variety of clay, silty, or sandy soils, but prefer deep, well drained loamy sites. It is considered a fair to good forage for livestock and wildlife, and provides good cover for small birds and mammals. Heavy grazing can decrease the species because it is not adapted to such conditions. Smooth brome occurs from 4,000 to 10,000 feet, and considered one of the best introduced forage grasses, providing good forage for all livestock species and most wildlife species. It reproduces moderately from seed, but reproduces best vegetatively from rhizomes and tillers. Both introduced species are adapted to heavy grazing or disturbance, usually outcompeting native species afterward.

Larkspur

Delphinium bicolor (or *nuttallianum*)
and *D. occidentale*



- Common wildflower in open montane meadows
- Prefers moist soils
- Flowers have characteristic spur
- Browsed by wild ungulates, but toxic to livestock



There are two different species of larkspur in Utah, low larkspur (*D. bicolor* or *D. nuttallianum*) and tall larkspur (*D. occidentale*), which occur up to 10,000 feet in elevation. Low larkspur is up to 2 feet tall, flowering from May to July, and reproducing from seeds that mature from June to July. It occurs in open woods, hills, or meadows in the northern half of Utah, and it is most abundant on dry soils. Tall larkspur is from 2-6 feet tall, flowering from July to August, and reproducing from seeds that mature from August to September. It occurs in meadows, stream banks, open woods, and talus slopes throughout most of Utah, on soils that are typically moist or wet. Flowers for both species are usually dark blue or purple, rarely white or pink, with 1/2 inch spurs off the back of the flowers. This spur is adapted to restrict pollination to hummingbirds.

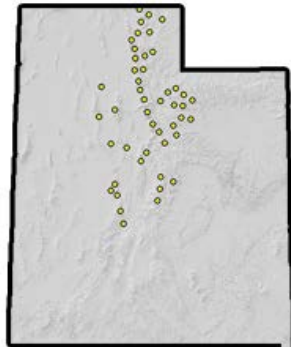
Both species are toxic, especially to cattle and horses, containing alkaloids that affect the nervous system, which can cause death from paralysis of breathing. The alkaloids are produced in the highest concentrations during the spring and early summer, and are highest in the seeds. Even though it is toxic, it can be tolerated in small amounts and is still fairly palatable to sheep and some wild ungulates during the fall and winter months when fewer alkaloids are produced. Larkspur is considered good cover for small non-game birds and mammals. Historically, Native Americans crushed this plant and applied it to their hair to control lice and other insects.

Glacier lily

Erythronium grandiflorum



- Relatively uncommon
- Grows on moist shaded slopes
- Often found near late spring snowbanks
- Bulbs often eaten by ungulates and small mammals



A member of the Liliaceae family, the glacier lily is 6 to 15 inches tall, with 1 to 5 flowering stems. It occurs on moist, north-facing slopes and in shaded areas from 5,000 to over 9,000 feet, in mountain brush, sagebrush, aspen, lodgepole pine, spruce-fir, and wet meadow communities. Late-lying snow banks are a common site for establishment, due to the increased moisture availability. Flowering from May to July, it has large, nodding, yellow flowers that are mainly pollinated by bees. The anthers of the flowers can be white, yellow, pink, red, or deep reddish-purple. It has a deep-seated bulb, known as the corm, which is often difficult to dig up. It produces a 3-angled capsule-like fruit, 1-2 inches long that is dispersed by wind or small animals. The glacier lily is also known as a dogtooth violet, adders tongue, fawn lily, and trout lily.

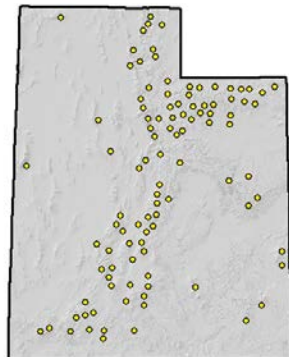
Glacier lilies provide fair to poor browse for livestock, and fair browse for small mammals, elk, and deer. Bears occasionally dig up the bulbs, ungulates and mountain goats commonly eats the pods, and small rodents have been known to cache the bulbs for the winter. Native Americans occasionally used the bulbs and leaves, raw or boiled, and the pods taste similar to green beans when boiled. Because it is a fairly rare species, it is more commonly used for the aesthetic value of its large showy flowers.

Wild geranium

Geranium fremontii, *richardsonii*,
& *viscosissimum*



- Flower color varies between species
- Deep taproots aid in collecting water
- Regenerates from rhizomes after fire
- Good forage for wildlife



Geraniums, meaning “crane flower”, get their name from their long-beaked fruit, which looks like a crane’s bill. There are three types of geranium in Utah’s mountains, Fremont geranium (*G. fremontii*), Richardson’s geranium (*G. richardsonii*), and sticky geranium (*G. viscosissimum*). Fremont geranium and Richardson’s geranium grow from 4 to 36 inches tall, with sticky geranium reaching 20 to 50 inches tall. Root systems are commonly fibrous, rhizomatous, and have a deep taproot to aid in water acquisition. If fire occurs, regeneration from underground rhizomes may occur. All geraniums flower from May to August, and are pollinated by bees and flower beetles. They produce mature fruits from August to September, and reproducing from seeds that have a spiral tail. This spiral tail helps to penetrate the seed into the soil. Fremont’s flowers are deep rose-purple, Richardson’s flowers are white to pink with purple veins, and sticky geranium’s flowers are pinkish-lavender to purplish, or seldom white. Fremont geranium is common on foothills, subalpine meadows, and ponderosa pine forests between 6,500 and 11,500 feet in elevation. Richardson’s geranium is the most common geranium in Utah, occurring in a variety of moist habitats including aspen–fir woodlands, forest openings, alpine zones, meadows, and riparian areas from 5,700 to 10,700 feet. Sticky geranium is found in drier, low elevation grasslands to montane forests and subalpine meadows up to about 9,000 feet in elevation.

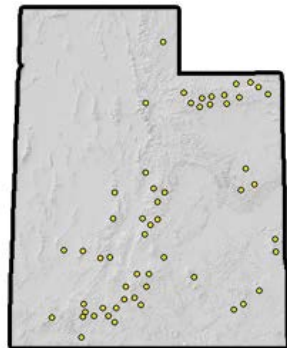
Geraniums are usually considered good forage for livestock, wild ungulates, and other small birds and mammals. The powdered roots stop external bleeding, and green crushed leaves can be applied to relieve pain and inflammation. The flowers and leaves of sticky geranium are edible, and can be added to salads.

Trailing daisy

Erigeron flagellaris



- Many species in Utah
- Wide elevational range
- Generally low-growing plants
- Difficult to differentiate between species



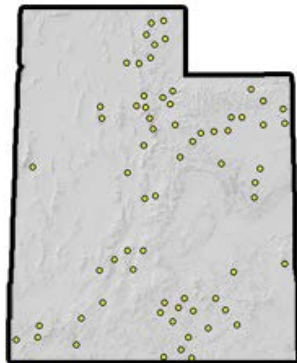
In Utah, there are 25 species of *Erigeron*, also known as daisies or fleabane, which are part of the sunflower family. They can range from low elevation valleys to high elevation alpine slopes. Trailing daisies can grow on soils ranging from clay to rocky and moist to dry, all depending upon the specific species. With so many species, all with similar characteristics, it can be very difficult to tell them apart. Species are usually differentiated from similar genera, such as Aster species, with their low growth form and significantly flowers with numerous rays. Plants can have single or multiple stems, with most species ranging from 4 to 30 inches tall. Plants flower from April to September. Each stem has multiple flower heads, from 1 to 2 inches in diameter, and are composed of both disk and ray flowers. The numerous disk flowers are tubular, each lacking a petal, and form a yellow or orange center. Ray flowers are extremely numerous, each with a narrow petal, and range in color from white, pink, purple, blue, and rarely yellow. Flower heads of some species can have up to 400 ray flowers, with around 70 to 100 for most species. Daisies reproduce from seed-like fruits that have numerous, fine bristles on top. Fleabane species were given their name because they could be burned to get rid of fleas and gnats. Many fleabane species have been used for medicinal purposes, helping with diabetes, cholera, and dysentery.

Goldenrod

Solidago spp.



- Found in a variety of habitats
- Often grows in disturbed sites
- Large clusters of yellow flowers
- Pollinated by bees
- Multiple medicinal uses



Solidago species, or goldenrods, are a genus in the sunflower family. They are found in a variety of habitats from low elevation meadows to alpine slopes, including both dry and wet soils. Plants tend to be most common in poorly managed areas, such as along roadsides. Similarly to other genera in the sunflower family, it is difficult to distinguish between different goldenrod species. Of the almost 100 species worldwide, about eleven species grow in the Rocky Mountains. Goldenrods are perennials, with some species reaching heights up to 6 feet. Flowering occurs from May to October, producing large clusters of yellow flowering heads, commonly growing on only 1 side of the branches. Once thought to cause hay fever, recent findings suggest that goldenrod pollen is too heavy to be wind pollinated, but is instead pollinated by bees. Goldenrod reproduce from seed-like fruits that have numerous, fine bristles on the top, as well as from rhizomes in some species.

Some goldenrod species are toxic to livestock, and are also not used heavily by wildlife. *Solidago* means to “make whole”, referring to their many medicinal properties, which include helping to ease weak bowels, bladder problems, colic pain, rheumatism, sore throats, headaches, colds, tooth aches, kidney stones, and ulcer pains. The leaves and roots can also be used to make an antiseptic lotion.

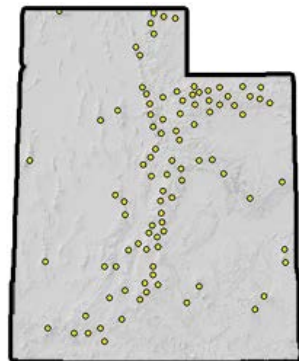
Rocky Mountain columbine

Aquilegia coerulea



© Joe Ford

- Common wildflower in meadows and forests
- Flower color varies between species
- Readily hybridizes
- Pollinated by hummingbirds, moths, and butterflies



Columbines are in the buttercup family (Ranunculaceae). *Aquilegia* comes from the Latin word for eagle, which refers to the flowers five, long-spurred petals that resemble eagle talons. There are a few different species of columbine found in Utah including the Rocky Mountain or Colorado blue columbine (*A. coerulea*), and the western or red columbine (*A. formosa*). The blue columbine reaches heights from 4 inches to 2 feet, flowering from June to August with blue and white flowers that are directed straight out from the stem. They are found in moist mountainous meadows and woodlands, especially in aspen groves. The red columbine reaches heights from 6 inches to 3 feet, flowering from May to August with red and yellow flowers that nod over and hang down. They are found in open woods, near seeps, and on stream banks from around 6,000 to 11,000 ft in elevation.

Columbine species are pollinated by hummingbirds, long-tongue moths, and butterflies. With few barriers to gene exchange, many species are able to easily hybridize when cultivated, resulting in many color variations. In a natural setting, specific pollinators keep the species separate. Overgrazing by livestock can cause columbines to become rare in areas where they were once abundant. Columbine was once used to help reduce diarrhea, aching joints, and venereal diseases. Indians used it to stop dizziness. However, large doses over long periods could be harmful.

Indian paintbrush

Castilleja spp.



- 14 species in Utah
- Highly hybridized
- Occurs from deserts to alpine
- Flowers are inconspicuous, surrounded by colorful bracts
- Some species are parasitic



Indian paintbrush is the common name for 14 separate *Castilleja* species in Utah, with some species that are considered very rare or endangered. High levels of hybridization and polyploidy is common within the genus, often making it difficult to tell different species apart. Indian paintbrush can be found on dry to wet sites from the plains and valleys to alpine slopes above timberline at over 11,000 feet in elevation. It grows best on sandy loam sites, but can occur on a large variety depending upon the species. Paintbrushes are less than 3 feet tall, depending upon moisture and nutrient availability, and they flower from April to September depending upon the species and elevation. Greenish yellow flowers occur as dense spikes at the top of unbranched stems, but are often hidden by more colorful bracts that are commonly mistaken for its flowers. Paintbrushes are often classified as either red or yellow, but various colors can occur including pink, white, purple, or orange. They reproduce from seed.

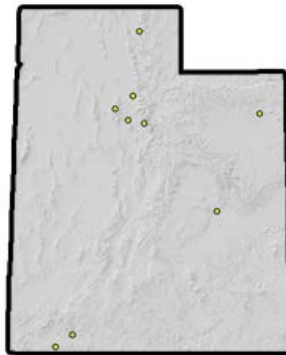
Most species are partially parasitic on plants such as sagebrush and grasses, establishing root connections to help provide water and nutrients. Because of these parasitic connections, cultivation of paintbrush species is extremely difficult. Paintbrushes are considered poor to fair forage for livestock, and fair as a wildlife forage species. Paintbrush flowers can be eaten, but soils with selenium can accumulate high levels making the paintbrush toxic. Indians used paintbrushes to invigorate their hair and make it glossy.

Beard tongue

Penstemon spp.



- Highly diverse in Utah
- Genus is thought to have originated in the Intermountain West
- Common from deserts to alpine
- Flower throughout the summer



Penstemon, or Beardtongue, species are part of the Figwort family. There are at least 60 *Penstemon* species throughout Utah, occurring from the sagebrush steppe to the alpine tundra and almost everywhere in between. Most *Penstemon* species have multiple stems, opposite leaves, and 5 joined petals. Different species can reach heights from less than 4 inches to as tall as 4 feet. Plants flower between May and August producing colorful flowers that have 5 stamens, one of which is sterile, known as the staminoid. This characteristic sterile stamen, which is caused when no anthers are present, is critical in identifying a *Penstemon* species from other similar species. Flowers of each individual species have traits specific to their pollinators, such as color and design. This genus has some of the most beautiful wildflowers, often blanketing the landscape in a colorful array of reds, pinks, whites, creams, violets, and blues.

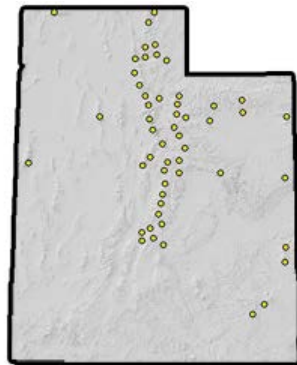
A few common Utah *Penstemon* species include Eaton penstemon (*P. eatonii*), whipple penstemon (*P. whippleanus*), and the Wasatch beardtongue (*P. cyananthus*). Eaton *Penstemon* grows up to 30 inches, has scarlet flowers, and is pollinated by hummingbirds. It occurs in sagebrush, mountain brush, and aspen communities. The whipple penstemon grows up to 28 inches, and has deep wine-lavender flowers, or rarely crème flowers with purple veins. It occurs in the montane zone, appearing on wooded slopes in the subalpine zone upward into the alpine zone. The Wasatch beardtongue grows up to 40 inches, and has blue-purple flowers, which are pollinated by bumblebees. It occurs from sagebrush hills to openings in mountain forests, often filling disturbed sites.

Jacob's ladder

Polemonium spp.



- Several species in Utah
- Prefer wet meadows and canyons
- Found mid-elevation to alpine
- Characteristic sticky leaves and skunky odor



Polemonium species are part of the phlox family. Plants in this genus flower from June to August, producing beautiful 5-petal wildflowers that come in different varieties of whites, pinks, blues or blueish-purples, with yellow or orange pollen that is commonly pollinated by bees. Their narrow leaves resemble overlapping ladders, which give rise to their common name. The plants from this genus all have a characteristic skunky odor, which originates from the sticky glandular hairs that cover most of the plant. Hikers that step on these plants can expect the odor to follow them for extended periods of time. This odor is used to protect against animal grazing in some species.

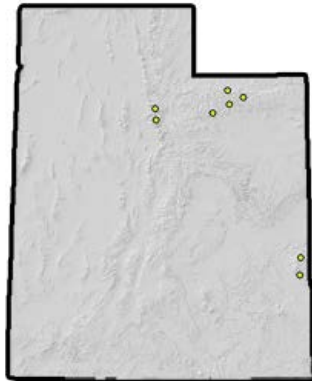
There are multiple species that occur in Utah, including leafy Jacob's ladder (*P. foliosissimum*), western Jacob's ladder (*P. occidentale*), and sky pilot (*P. viscosum*). The leafy Jacob's ladder and western Jacob's ladder are both tall species, reaching heights up to 3 feet tall, and occur in the wet meadows and canyons of the mid-elevation montane areas. The difference between the two species is that the western is single-stemmed, and the leafy is multi-stemmed. Sky pilot is a symbol of the alpine environment, occurring from 9,000 to 12,000 feet in elevation, especially in the Uinta Mountains on boulder fields and rocky peaks. Most *Polemonium* species provide little forage to livestock and wildlife. Phlox species have been heavily cultivated for flower gardens, where wild species have been selectively bred for a wide variety of colors and perfumes.

Alpine sunflower

Rydbergia (or *Hymenoxys*) *grandiflora*



- Found in high alpine areas above treeline
- Flowers almost always face east
- Stores energy for several years before flowering, and then dies
- Hairy stems reduce water loss and protect against cold and UV



A member of the sunflower family, this alpine species only occurs on dry, rocky, exposed ridges and meadows above timberline. It stores food for several years until it has sufficient nutrients and energy to blossom, producing seed-like fruits, and then it dies. *Grandiflora* means large flower, referring to its large, yellow, sunflower-like flowers, ranging from 2 to 4 inches in diameter. It is considered to have the largest and prettiest flowers of any in its genus. It flowers from June to August, producing almost perfectly symmetrical flowering heads that are made up of both ray and disk flowers. It is not uncommon to see thousands of flowering heads covering a ridge, with the majority facing towards the east, which is a far better indicator of east than moss on a tree indicating north. Facing east may be to protect it from the prevailing winds. Another name for this species is old-man-of-the-mountain, referring to the dense, white hairs on the stems and leaves. These hairs reduce water loss, trap heat, and protect the plant against ultra-violet radiation.

Plants of this genus are commonly poisonous to livestock, wildlife, and humans. Sheep will occasionally use some species of this genus as forage, but only when nothing better is available.

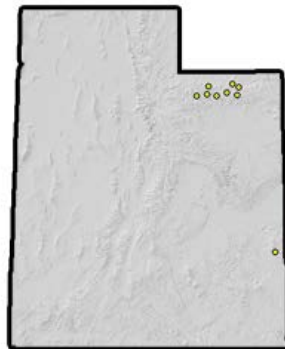
Arctic gentian

Gentiana algida



The arctic gentian is one of 11 gentian species that occur in Utah. With over 1,000 species within the Gentian family that exist throughout the world, Utah's 11 species are not particularly diverse. In Utah, the majority of gentian species are found from the montane zone to the alpine zone. They usually occur on moist to wet sites, including meadows and streambanks. The arctic gentian is no exception, but only occurs above timberline. Part of its scientific name, *algida*, means cold, referring to the extremely harsh climatic conditions of its alpine environment. It is one of Utah's most esteemed wildflowers, which flowers during the late-summer months. It's easily recognized tubular flowers are white, with blue or purple specks or splotches. Some other common Gentian species that occur in Utah's mountains include the mountain bog gentian (*Gentiana calycosa*), fringed gentian (*Gentianopsis detonsa*), and the northern gentian (*Gentiana amerella*).

- Relatively uncommon in Utah
- Found mostly in high alpine zones
- Prefers moist sites
- Flowers in late summer

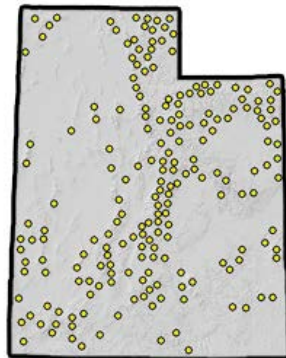


Silvery lupine

Lupinus argenteus



- Member of the Pea family
- Found in a variety of habitats and soil types
- Bacteria in root nodules fix N
- Generally poisonous to humans and wildlife



Silvery lupine, a member of the Pea family, is recognized as a lupine by its racemes of typical pea-like flowers. It occurs on the foothills and in open forests, and is found on a broad range of soil types. Flowering from June to August, it produces light to dark blue flowers, and short, hairy seed pods that mature from July to September. All stems meet at a branching caudex at the base of the root.

Lupine species were named after the wolf (*Canis lupis*) because it was once thought that lupine species robbed the soil. Instead, bacteria in the root nodules can fix atmospheric nitrogen, converting it to available nitrogen that actually enriches the soil. This is true for all members of the Pea family.

Silvery lupine has several alkaloids, which are concentrated in the seeds and young plants, making it poisonous to livestock, wildlife, and humans. Poisoning in silvery lupine causes weakness and muscular trembling. Even with the toxic alkaloids, it can sometimes be consumed in small amounts. It is considered a poor to fair forage species for livestock, and a fair to good forage for deer and elk. Lupine species commonly hybridize with related species, and therefore lead to a broad spectrum of different forms that can be hard to identify. Because of the alkaloids in many species of the pea family, it is unwise to eat any without knowing exactly if they are safe.

Western coneflower

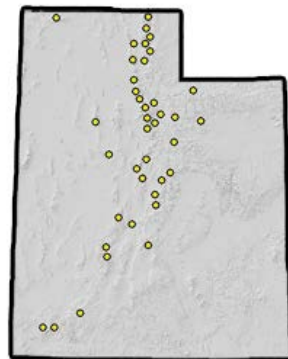
Rudbeckia occidentalis



Western coneflower is a common perennial in the meadows of canyons from 5,000 to 8,000 feet, especially near trails or areas overgrazed by livestock. It grows to heights between 3 and 6 feet tall, with a distinctive dark-brown or black flowering head at the end of each leafy stem. Unlike similar species of the sunflower family, the colorful ray flowers are lacking, leaving only the numerous disk flowers to make up the 1 to 2 inch cylindrical cone.

Flowering between July and August, western coneflowers provide considerable nectar and pollen, and are pollinated by bumblebees. Livestock and large herbivores will not usually eat this plant, so large patches may indicate overgrazing or soil disturbance.

- Common wildflower at mid-elevations
- Colorful ray flowers are lacking, unlike most coneflowers
- Important to native bees and other pollinators

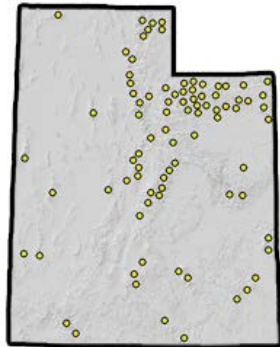


Yellow stonecrop

Amerosedum or *Sedum lanceolatum*



- Low-growing succulent
- Prefers rocky, gravel soil
- Waxy leaves and stem reduce water loss
- Store carbon dioxide to photosynthesize at night



Yellow stonecrop, also known as lance-leaved stonecrop, is a perennial herb that is part of a succulent family of plants. This particular species has numerous basal leaves that vary greatly in shape. Flowers resemble a bright yellow star, with five petals, eight to ten stamens, and five pistils. It is found on rocks or gravelly soil from sagebrush foothills to the subalpine zone. *Sedum*, from the Latin terms *sedere* or *sedo* meaning “to sit”, refers to the tendency of many species to grow low to the ground.

Recognizing plants of the genus *Sedum* is easy, but separating the species can be very difficult. A waxy coating on the stems and leaves helps reduce water loss, and some succulent plants can store carbon dioxide at night to use for photosynthesis during the day. This process is known as CAM photosynthesis, where the stomata on the leaf, which is used for carbon dioxide uptake, is closed during the day to reduce the amount of water lost during high temperatures. Many species can even go dormant for extended periods during drought conditions.

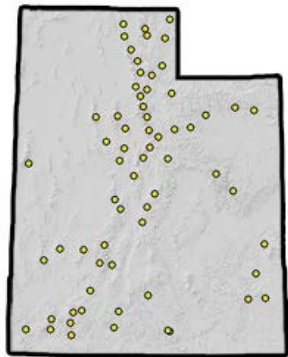
The young stems and fleshy leaves can be suitable to eat after they are cooked, but can also be eaten raw. *Sedum* species have been reported to be used for the treatment of wounds, colds, sore throats, ulcers, lung disorders, and diarrhea.

Big-toothed maple

Acer grandidentatum



- Common tall shrub at low montane elevations
- Reproduces by winged seeds and through layering or sprouting
- Recovers well after fires
- Important cover and food for wildlife



Big-toothed maple is a native, deciduous shrub that grows up to 50 feet tall. Growth form is dependent upon moisture availability, occurring with a single trunk or a combination of multiple trunks. Although it prefers moist, well-drained soils, it is relatively drought tolerant, and can grow on a variety of sites with a pH range from 6.0–8.0. Sites range from moist canyons and ravines, to dry, open slopes. In Utah, it occurs at elevations from 4,200–9,200 feet.

Big-toothed maple reproduces both sexually and vegetatively. Plants flower every 2-3 years in April or May, and are wind-pollinated. Seeds have low viability, produced in double-winged samaras, and are dispersed by wind and gravity from mid–August to early October. Vegetative reproduction occurs commonly through layering or sprouting, generally resprouting after fire or other disturbance.

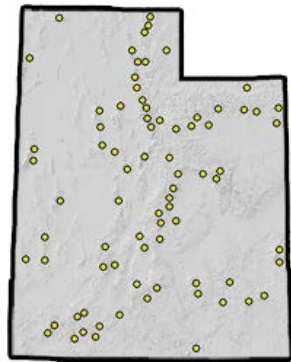
Big-toothed maple provides good cover for most wildlife and livestock species. It is consumed in small to moderate amounts, but is considered only a fair to poor nutritional browse. Other uses includes the production of sap that can be used for syrup and a good firewood that burns hot, and has great potential as a landscaping plant because of its high tolerance levels and beautiful leaf colorations in the fall.

Rocky Mountain maple

Acer glabrum



- Common tall shrub
- Prefers northern aspects at mid- to upper elevations
- Important winter forage for wildlife
- Extensive root system is important for stabilizing soils



Rocky Mountain maple is a native, deciduous, tall shrub, commonly 20-30 feet tall, but can reach heights up to 40 feet. It occurs from 5,000–12,700 feet in elevation, with optimum growth and establishment on northern aspects, and it is moderately shade, drought, and fire tolerant. It occurs on a variety of well-developed soils from silty loams to rocky soils, ranging from shallow to relatively deep, with pH's ranging from moderately acidic to slightly basic. Rocky Mountain maple requires soils high in calcium, magnesium, nitrogen, potassium, and phosphorus.

Individual plants can be monoecious or dioecious with flowers that grow in drooping clusters. Large seed crops are produced every 1–3 years, with seeds in winged samaras that are wind dispersed and require 6 months of chilled temperatures to germinate. After disturbance, vegetative reproduction through sprouting is common.

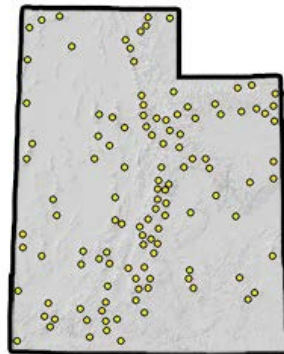
Rocky Mountain maple is a fair to poor browse for livestock, but a moderate to high value browse for wildlife, especially as winter forage for big game species such as deer and elk. It is also considered good cover for most wildlife species. Rocky Mountain maple is used as a landscaping plant, and, because of its extensive root system, is recommended as a revegetation species for sites such as degraded riparian areas or cut-slopes following road construction.

Wild currant

Ribes cereum



- Common in montane shrub communities
- Berries are important to wildlife
- Seed scarification from mild fires is necessary for germination
- Used to make jams and jellies



Wild currant, also known as wax currant, is found in open, coniferous forests, at forest edges, and in mountain shrub communities. It is a native, deciduous, non-rhizomatous shrub, about 2 to 5 feet tall, with numerous smooth branches and small, obscure 3 to 5 lobed leaves. It reproduces mainly by seed, flowering from May to July, with reddish berries ripening from July to August. Seed scarification from low-intensity fires is required for germination to occur. Its ability to sprout is considered weak and rare, usually only after low-severity fires. It occurs mainly on dry, open slopes, ridges, and rock outcrops with sandy or rocky soils at elevations from 5,000 to 13,000 feet. It can also occur on a variety of other substrates, including clay soils or even lava beds.

Wild currant is considered fair to poor browse for livestock, but fair to good browse for wildlife, most important in areas where better forage is not available. The berries are an important food for many species of birds, small mammals, and black bears. It is also considered good cover for small birds and mammals. It is an alternate host for white blister rust, which usually infests five-needle pines.

Historically, Native Americans ate the berries and used the plant extracts to alleviate stomachaches. The berries are currently used to make jams and jellies. Raw berries can help remove toxins from the body, but too many, without being accustomed to them, can cause an upset stomach.

Utah serviceberry

Amelanchier utahensis (or *alnifolia*)



Utah serviceberry is a deciduous, native shrub with single or clustered trunks that branch near the base. It grows from 2 to 15 feet tall, with a canopy that can spread up to 15 feet. It usually grows on dry, open, rocky slopes, in open woods, in canyons, or on brushy hillsides, at elevations ranging from 3,000 to 9,000 feet. Preferred sites have a mean precipitation from 15 to 20 inches, and moderate to well-drained soils with a 6.5–7.5 pH. The oldest, tallest, and densest stands grow on moist, northern exposures with deep soils. With its deep, spreading root system, serviceberry is drought tolerant once established. It can reproduce from seed, stolons, or sprouting from the root crown. It flowers from April to June, with mature purplish fruits by late August. Seeds require stratification to germinate, but seeds can remain viable for up to 25 years, with 90% viability after 10 years.

Serviceberry is considered a fair to excellent browse for livestock and other wildlife. It is highly palatable by most species, browse-tolerant, a preferred browse for mule deer and elk in some areas, and has been used for the revegetation of big game winter ranges. Utah serviceberry is a host for cedar-apple fungus, mostly effecting plants at low elevations, on steep slopes, on fine textured soils, and on northern exposures.

Native Americans and early settlers used the fresh and dried fruits for food and medicines, such as a mild laxative or to alleviate upset stomachs. The fruits have recently been used to make jams or pies. Their straight stems were used by Native Americans for arrow shafts and tepee stakes.

- Can live on open, dry slopes, but grows largest in moist soils
- Important browse for wild ungulates
- Fresh and dried berries are used in pies, jams, and medicines



Wild rose

Rosa woodsii var. *ultramontana*



- Common in a wide range of habitats, aspects, and soils
- Characteristic pink flowers
- Mostly reproduces by seed
- Grows in dense thickets
- Rose hips are high in Vitamin C



Wild rose, also known as Wood's rose, is a perennial, native shrub that usually grows in dense thickets. It prefers south-facing slopes or disturbed areas, but occurs on a variety of sites including dry slopes, stream banks, ravines, plateaus, open woodlands, roadsides, and canyons. It is adapted to a wide range of soil types, generally growing best on moderately fertile, well-drained clay loam, sandy loam, or sandy soils, with a pH of 5.6 to 7.0. It also has a broad range of climatic tolerance, ranging from 2,800–11,000 feet in elevation, inhabiting sites with over 10 inches of annual precipitation. Within 10 years of initial growth, it reaches its maximum height of 3 to 10 feet. It reproduces mainly by seed, but has also been known to regenerate vegetatively from the root crown. Plants are monoecious, flowering from May to August in Utah, and their pink flowers are pollinated by insects. They start to produce seeds between 2 to 5 years old, with seeds being produced inside orange-red rose hips. Seeds are mainly dispersed by birds and mammals, and can remain viable for over 16 years in the seed bank. Stratification or scarification is required for germination to occur.

Wild rose is tolerant of grazing and is considered poor to fair forage for livestock and good forage for wildlife, mostly during the growing season. It also provides good cover for a variety of birds and mammals, and nesting sites for some birds such as grouse. Native Americans used all parts of the plant for food or medicinal purposes. Seeds were used for muscle pains; a root and leaf tea cleansed the blood; a root drink was used for diarrhea, the flu, and also worms; and all parts were used in washing or dressing wounds. Rose hips are one of the best natural sources of vitamin C, and are often used in jellies and fruitcakes.

Elderberry

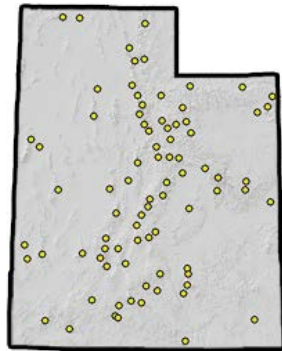
Sambucus cerulea



Blue elderberry is a short lived, shade intolerant shrub or small tree, usually 6 to 13 feet tall, but up to 20 feet. It prefers moist, well-drained sunny sites, usually occurring in the opening of moist forests or in moist openings within drier, open habitats. In Utah, it is found in riparian, sagebrush, and most forest communities. It grows on a variety of soils, ranging from gravelly to heavy clay loams. It reproduces mainly with seeds called nutlets, 3 to 5 of which are contained in each powdered blue-black berry. Seeds are produced yearly, dispersed by birds or small mammals that eat the fruits, and remain viable for up to 16 years.

It is grazing tolerant, considered fair browse for livestock, and good browse for most large herbivores such as deer. It provides nesting sites and an important food source for a variety of birds including bluebirds, magpies, the western tanager, the house finch, woodpeckers, grosbeaks, and grouse species. It also provides good cover for a variety of small mammals such as rabbits, squirrels, and foxes.

- Grows in moist open sites
- Reproduces by nutlet seeds dispersed by wildlife that eat the berries
- Important food source for wildlife
- Berries and stems used heavily by Native Americans



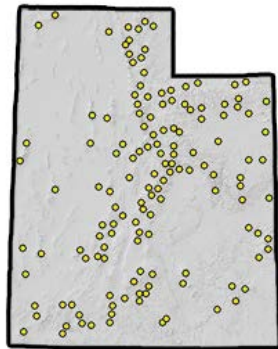
The fruit of the blue elderberry is frequently gathered for jellies, candy, pies, and sauces. Native Americans gathered the fruit of blue elderberries to cook, dry, or to eat raw. They used the flowers and leaves for medicinal purposes such as a poultice for dressing a wound. The hollow stems have also been made into flutes and blowguns. Other species in the genus, such as red elderberries, contain high levels of toxic compounds in the roots and stems.

Snowberry

Symphoricarpos oreophilus



- Very common montane shrub
- Generally low-growing over a wide range of elevations
- Seeds are dispersed by wildlife that eat the berries
- Important browse for wild ungulates



The mountain snowberry, or Utah snowberry, is a native, deciduous, montane shrub. It is very common, occurring in almost every mountain plant community in Utah. It is low growing, averaging 2 to 4 feet in height. It is found on all aspects from 4,000 to 10,500 feet in elevation. Sites range from moist to fairly dry, usually on sandy-loam to clay-loam soils that can be either acidic or basic. Snowberry reproduces by seed and also vegetatively. It flowers from May to July, producing white, berry-like fruits called drupes, which contain 2 seeds each. Seeds are dispersed by birds and mammals, and do not remain viable in the seed bank for extended periods of time like other shrub species. It also regenerates by rhizomes, but vegetative reproduction is less developed compared to most other snowberry species.

Because of its abundance and wide distribution, mountain snowberry is important forage on many mountain ranges. It is fair browse for sheep or goats in the winter or early spring, but highly unpalatable to livestock for most of the year. It is an important browse for large ungulates, such as deer or elk, from early spring until the fall, comprising over 20% of their summer diet in some aspen forests. The fruit is considered good forage for upland game birds and magpies. The snowberry also provides good cover for upland birds and small mammals.

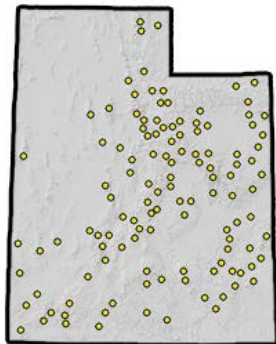
Native Americans made a tonic from the roots; an eyewash from the bark; and ground up every part to apply to burns, sores, and wounds. Consumption of large quantities of the fruit can cause vomiting or diarrhea. Because of the beautiful foliage and fruits, it is commonly grown as an ornamental species.

Mountain mahogany

Cercocarpus montanus (or *ledifolius*)



- Common tall shrubs found at mid-elevations
- Prefers dry slopes and hillsides
- Flowers are wind-pollinated, and seeds are wind-dispersed
- Important browse for wild herbivores



Cercocarpus montanus (true mountain mahogany) and *Cercocarpus ledifolius* (curlleaf mountain mahogany) are both tall shrubs or small trees. True mountain mahogany is deciduous and grows to 3–20 feet tall in areas with an average of 13 inches of annual precipitation, mostly on dry slopes, hills, ridges, mesas, desert foothills, and rocky outcrops from 4,600–9,200 feet in elevation. Curlleaf mountain mahogany is evergreen and can be 3–35 feet tall on sites averaging 12 inches of annual precipitation, growing in scattered patches and in extensive pure stands on dry, rocky, steep slopes up to 3,000 feet in elevation. The two species have been known to hybridize.

Mountain mahogany reproduces sexually and is monoecious, flowering from May to July, with flowers that are primarily wind pollinated. Seeds are produced in 0.2 to 0.4 inch achenes, which have 1 to 3 inch feathery tails (plumoses) attached to aid in wind dispersal. Small animals may also disperse some seeds. Seeds do not remain viable in the seed bank for extended periods of time.

Browse is considered good to excellent for all livestock and large herbivore wildlife species. Leaves may contain, cyanogenic glycoside, a toxic compound to livestock. It is highly palatable, and a highly preferred browse for deer, elk, pronghorn, and bighorn sheep. Many small mammals feed on the mahogany and use the habitat for cover, along with a variety of birds. Native Americans used the wood for tools, weapons, or for firewood, as well as the bark to make dyes. Medicinally, it was used to treat stomach problems or coughing.

Oak-leaf sumac

Rhus trilobata



- Common among shrub communities at low montane elevations
- Reproduces by seeds and sprouting
- Important winter cover and browse
- Berries have been used to make a lemonade-like drink



Oak-leaf sumac, also known as skunkbush sumac, is a deciduous, native shrub, growing between 2 and 12 feet tall, with an average of 4 feet. It is an associated species in ponderosa pine, Douglas-fir, limber pine, pinyon-juniper, and other shrub communities in Utah from 2,900–7,700 feet in elevation. It grows on dry, rocky hillsides, along streams, canyon bottoms, and in grassy flats and openings in woodland areas. Oak-leaf sumac is tolerant of most soils, preferring well-drained sites, with either deep soils or shallow gravelly soils. Soil pH is usually mildly alkaline, somewhere around 7.4.

Oak-leaf sumac reproduces both sexually and vegetatively, flowering April to May, but has relatively low seed production and seedling establishment. Small animals pollinate flowers and disperse the seeds. Vegetative regeneration is common, with plants readily sprouting from the root crown, but this usually requires some sort of disturbance.

Oak-leaf sumac is considered poor to fair browse for livestock and fair good browse for wildlife species. It is browsed by both large and small herbivores including deer, elk, sheep, pronghorn, rabbits, porcupines, and others. The fruits are an important winter food for song birds, grouse, and bears. It is fair to good cover for most birds and mammals.

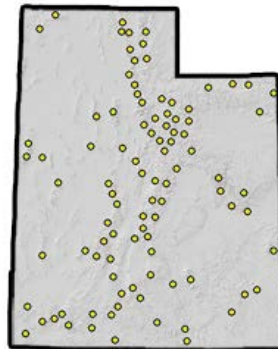
Native Americans used the berry-like fruit, which has a lemon flavor, for food (seasoning, dried, or pies), medicine (stomach ache, toothache, bleeding, head colds, poison ivy rashes), and to create a lemonade-like drink. The slender shoots were also used for basket weaving.

Creeping Oregon grape

Mahonia repens



- Common, low-growing, evergreen shrub
- Moderately tolerant of drought and disturbance
- Found mostly as groundcover in assorted forest types
- Seeds are important food for birds and other wildlife



Creeping Oregon grape is a perennial, evergreen, low shrub that is less than 12 inches tall. It is usually found on medium-textured, well-drained sandy soils, with a pH range from 4.6 to 7.6, and elevations from 3,600 to 9,800 feet in Utah. It occurs mostly in subalpine fir, Douglas-fir, white fir, blue spruce, Engelmann spruce, ponderosa pine, and lodgepole pine communities. Creeping Oregon grape reproduces commonly from both sexual and vegetative methods. It is a monoecious plant, flowering from May to June, with flowers that are pollinated by bees and butterflies. It produces blue-black berries in grape-like clusters, ripening from June to September, with 1-4 seeds per berry, and seeds are dispersed by birds and mammals. It has fibrous rhizomes, which are able to sprout without the stimulus of fire, and fibrous roots, which can reach up to 6 feet in depth for water acquisition.

Creeping Oregon grape is considered a stress tolerant plant that can tolerate shade, drought, and severe disturbances. It is considered good forage for most wildlife species, but poor forage for livestock. The berries are an important forage item for a variety of birds and black bears. Although it is considered an important forage plant for wildlife, it contains toxic alkaloids that make it unpalatable and slightly poisonous to livestock. It also provides good cover for small mammals and birds.

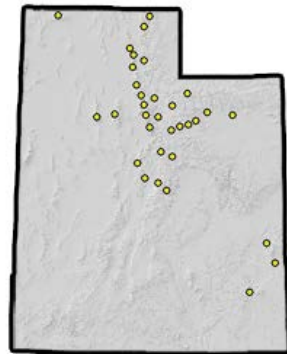
Native Americans used Creeping Oregon grape to cure dysentery, cure coughs, remove boils, stimulate the liver, help with kidney problems, and as a tonic for the weak or malnourished. The roots were most often used, but the leaves and berries also have some medicinal properties. The berries are juicy, and can be used in pies or jellies.

Wild raspberry

Rubus parviflorus



- Common mid-elevation shrub
- Prefers moist soils
- Berries are commonly eaten by a variety of wildlife
- Reproduces by seed, rhizomes, and sprouts



Wild raspberry, also known as thimbleberry, is a moderately shade-tolerant, deciduous shrub that grows up to 8 feet tall, with perennial stems that live 2-3 years. It occurs at elevations from 4,700 to 9,000 feet. Although it grows on a variety of soils types and pH levels, it grows best on loamy soils, and requires adequate soil moisture for good growth. Wild raspberry commonly grows on open, wooded hillsides, in subalpine meadows, and along stream banks and canyons.

Wild raspberry reproduces through seed, but also regenerates vegetatively, even in the absence of disturbance. It flowers from May to July, forming clusters of 2 to 7 white or pink flowers. Seeds that are contained in clusters of red berries, or drupelets, which are mostly dry at maturity. Seeds are dispersed by birds and mammals. Abundant seedling establishment typically occurs during the first year after disturbance. Vegetatively, it can reproduce through rhizomes, as well as sprouting from the roots and root crowns.

Wild raspberry is considered poor to fair browse for livestock and ungulates, depending on the site, but it is considered good forage for birds and small mammals. The berries are an important food item for a variety of birds, small mammals, and also black bears. It also provides good cover for these small birds and mammals.

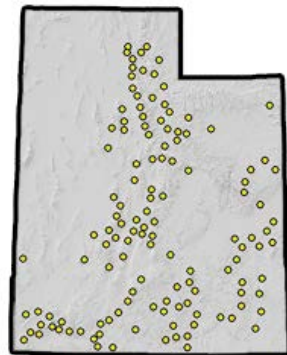
Native Americans ate the fruits both fresh and dried. They boiled the bark for soap, and boiled the leaves to make a tea to reduce the effects of a cold or flu. Leaves were also powdered and applied to burns to limit scarring. The fruits are often made into jelly.

Gambel oak

Quercus gambelii



- Common low-elevation montane shrub species
- Prefers warmer south-facing slopes
- Grows in clonal patches
- Extremely valuable cover and winter browse for wildlife
- Acorns are widely eaten by birds and mammals



Gambel oak is a shrub that occurs in patches as clones ranging from 3 to 60 feet tall. In Utah, it occurs between 5,500 to 7,800 feet in elevation, significantly limited or non-existent in the mountains of Cache and Box Elder Counties. It prefers southern facing slopes, occurring as a co-dominant with maples on north-facing slopes. Reproduction occurs both by seed and vegetatively. Gambel oak flowers from May to June, producing mature acorn seeds from September to early October if adequate moisture is available. Vegetative reproduction is usually more common than by seed- sprouting from adventitious buds on the lignotubers and also rhizomes- with thickets spreading an average of 4 inches per year. Their extensive root system helps provide soil stability and reduce erosion. Deep taproots and xeromorphic leaves make it drought tolerant.

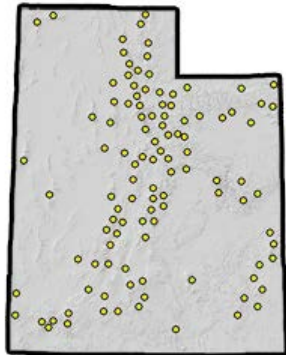
Gambel oak is a good source of firewood, because it produces little smoke and soot. It is considered a fair browse for livestock and a good browse for ungulates, especially during the winter, and the acorns provide a good food source for ungulates, larger bird species, and small mammals. Because it produces tannic and gallic acids, poisoning can occur in livestock if too much is consumed. It also provides good cover and habitat for most wildlife species. Native Americans used the acorns for food.

Chokecherry

Prunus virginiana var. *melanocarpa*



- Common tall flowering shrub found throughout wide elevations
- Shade tolerant edge species
- Important browse for wildlife
- Often used as an ornamental, and berries are widely consumed



Chokecherry is a native, deciduous, thicket-forming shrub or small tree usually 3 to 20 feet tall. It can grow in soils ranging from silty to sandy loams, with a very acidic to moderately alkaline pH, but it cannot grow in poorly drained or flooded soils. Chokecherry grows in riparian areas, mountain shrublands, spruce-fir forests, and aspen communities, ranging from 5,000 to 10,000 feet in elevation. It is shade tolerant, reaching its highest density near forest edges. Chokecherry reproduces both by seed and vegetatively. It flowers from May to June, with light red berries maturing in August, and is also rhizomatous, commonly sprouting vigorously.

Chokecherry is important forage for many wildlife species, with a significantly higher nutritional value than most western browse species. It is an important winter browse for deer, and the fruits are most important to birds. It is considered a poor to fair browse for livestock because of the high quantity of hydrocyanic acid and malic acid in the leaves.

Chokecherry is widely used as an ornamental, which provides food for birds in residential areas. Native Americans made a tea from the leaves and twigs to treat colds and rheumatism, as well as other medicinal purposes such as worms, bronchitis, fevers, diarrhea, and heart problems. Fruits are used to make wines, syrups, jellies, and jams.

Quaking aspen

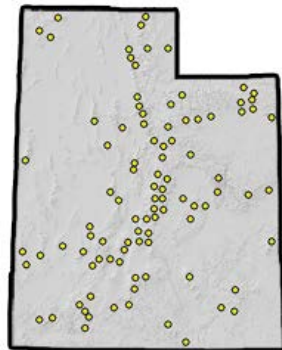
Populus tremuloides



Quaking aspen is a native deciduous tree that reaches heights up to 50 feet tall. It is the most widely distributed tree in North America, covering approximately 2.5 million acres in Utah alone. Quaking aspen grows on moist upland woods, wet to dry mountain slopes, high plateaus, mesas, parklands, moist valley bottoms, and along riparian areas from 1000 feet in elevation to treeline. It has widespread root systems, mostly comprised of shallow lateral roots that can branch out 100 feet, but with vertical sink roots that can reach up to 9 feet deep.

Aspen can regenerate by both seed and through suckering roots. As such, large stands of aspen can be single individuals. In fact, Pando, a single male aspen covering 106 acres of the Fishlake National Forest, was estimated to be the heaviest living organism on Earth. Because of their limited shade tolerance, more shade tolerant conifers can suppress their regeneration capabilities. On the other hand, aspen have adapted a tolerance to disturbance, allowing it to be the first tree species to establish after a disturbance. The age of aspen stands determine the usage by livestock and wildlife; younger stands providing better browse, and older stands providing better habitat and good cover. Beavers use aspen to build dams and lodges, and aspen provide good nesting sites for many bird species.

- Most widely distributed tree in North America
- Reproduces by seed, but more often clonally via roots
- Intolerant of shade
- Extremely important habitat for wildlife



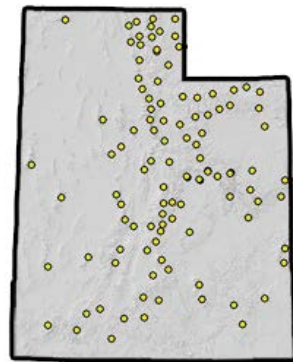
In Utah, aspen wood is rarely commercially logged, but can be used in the production of particleboard and pulp. The inner bark, which contains salicin (similar to aspirin), has been used as a tonic by herbalists to relieve headaches, stomach pain, liver problems, fevers, arthritis, colds, worms, urinary tract infections, and diarrhea.

Douglas-fir

Pseudotsuga menziesii



- Common lower montane forests
- Important mycorrhizal relationships
- Cones are pollinated and seeds are dispersed by wind
- Important winter cover and browse
- Heavily used for lumber



Douglas-fir is a native, coniferous, tree that usually grows 100–130 feet tall. In Utah, it grows at 5,000 to 10,000 feet in elevation. Root systems have extensive lateral roots reaching over 20 feet, with 5 foot tap roots, depending upon the specific site conditions. It can grow in a variety of communities, soils, aspects, and elevations, due to its ability to form mycorrhizal relationships with approximately 2,000 fungal associates. After 12–15 years of growth, it is able to reproduce by seed, producing cones with multiple 3-notched wings that are pollinated by wind. Each cone produces an average of 20 to 30 winged seeds, which are primarily wind and gravity dispersed.

Douglas-fir is considered a poor to fair browse for ungulates, most palatable to large herbivores when it is young. Small mammals and birds eat the seeds and use the trees for cover and nesting sites. In the winter, grouse rely on Douglas-fir, as well as other conifers, for roosting sites and food. Douglas-fir provides excellent hiding and thermal cover for many wildlife species such as ungulates, birds, and small mammals.

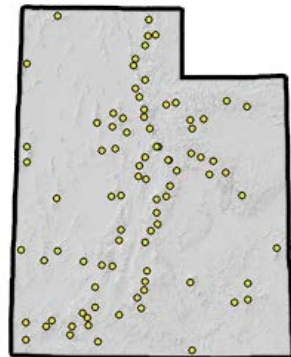
Douglas-fir wood is exceptionally valuable and strong; it is used for structural timber as well as poles, plywood, pulp, dimensional lumber, plywood, railroad ties, mine timbers, log cabins, posts and poles, fencing, and firewood. It is also one of the most popular Christmas tree species. There are many threats to Douglas-fir such as bark beetles and moths, budworm, rust fungi and root parasites, and dwarf mistletoe.

White fir

Abies concolor



- Common upper elevation tree
- Pyramidal growth limits snow loading on branches
- Reproduces by seed from persistent cones
- Good thermal cover for wildlife



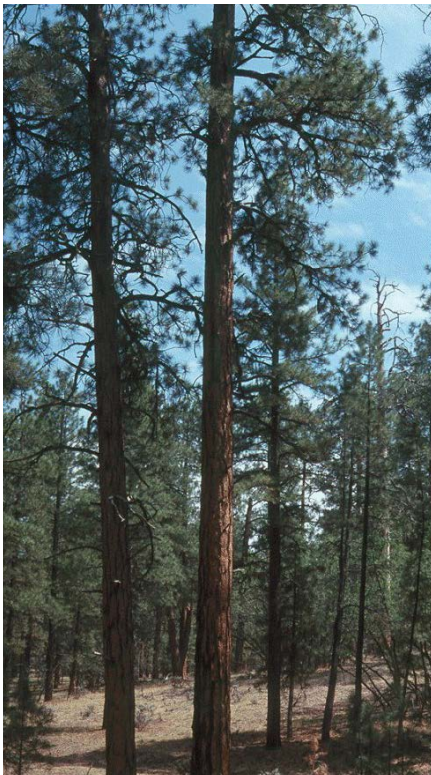
White fir is a native, coniferous tree, usually reaching heights up to 125 feet, and can live for 300 to 400 years. It is most common at higher elevations, but ranges from 5,000 to 9,200 feet in Utah. White fir grows best in full sun, but it is moderately shade-tolerant and can withstand decades of suppression underneath a closed canopy. Its narrow, pyramidal growth form reduces the amount of snow-loading on branches. Mycorrhizal associations are important for white fir, especially for establishment and early growth on poor sites. It reproduces only by seed, with 180 to 300 seeds per cone, and bearing cones from age 40 to 300. Seed dispersal is limited, mostly by wind, but seeds are only short-winged and travel shorter distances than most winged seeds.

White fir is considered poor browse for livestock and large wildlife species because it contains resins, terpenes, and other chemicals that upset the digestive tract. The seeds provide food for a variety of small mammals and birds. Although it is not a very valuable forage species, white fir provides good habitat and thermal cover for wildlife.

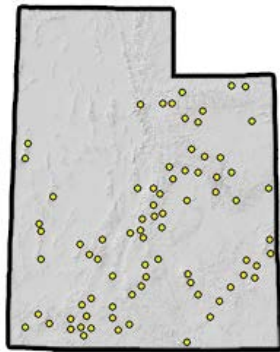
Native Americans used the needles to make tea or to burn as incense. Historically, white fir was undesirable for lumber, but recently it has become more valuable and used for construction framing, plywood, poles and pilings, and pulpwood. In the late 1980's, heavy mortality occurred in white fir from insects and diseases. Some of these threats include dwarf mistletoe, root diseases and fungi, and especially the fir engraver beetle.

Ponderosa pine

Pinus ponderosa var. *scopulorum*



- Most widespread pine in N Am
- More common in southern and central Utah
- Mid-elevation montane species
- Thick bark protects trees from fire
- Important for commercial timber



Interior ponderosa pine is the most widespread pine species in North America. In Utah, it is a native conifer to southern and central Utah, usually occupying relatively dry, nutrient-poor sites at elevations from 5,700 to 8,900 feet. It can reach heights over 160 feet, and trunk diameters of over 4 feet. Trees have a relatively open crown, living over 700 years. Needles are 3 to 7 inches long, and are usually in 3-needle fascicles. Ponderosa pine reproduces from winged-seeds, which are produced in 2 to 4 inch cones, and are pollinated and dispersed by wind. Mature bark is often 3 inches thick, helping to protect the tree from fire. It is considered tolerant of drought and understory fires, with fires usually only scorching and charring the bark. Recent fire suppression has led to increased mortality of mature trees, as a result of devastating crown fires. Ponderosa pine is a common residential shade tree throughout the state.

Ponderosa pine is a worthless browse species for livestock, causing abortions in pregnant cattle. It is also a poor browse for wild ungulates, used most often in the winter and spring if food is scarce. Seeds are a common food for birds and small mammals. However, it provides good habitat and thermal cover for a variety of wildlife species.

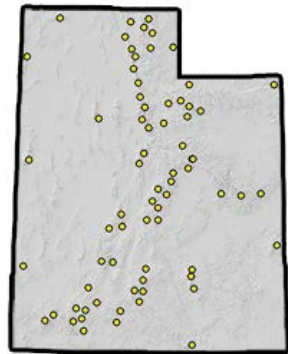
Native Americans used it for firewood, and the pitch for torches and glues. Ponderosa pine is an important commercial timber species, with high-quality wood used in furniture and cabinet making, and lower-quality wood used for construction. Common threats to the ponderosa pine include dwarf-mistletoe, mountain pine beetles, bark beetles, and various wood-decaying fungi such as red rot and western gall rust.

Limber pine

Pinus flexilis



- Long-lived native conifer
- Prefers steep, rocky, wind-swept ridges and summits
- Pine nuts are eaten by a variety of wildlife
- Clark's nutcracker is vital to seed dispersal



Limber pine is a slow growing, long-lived native tree, sometimes taking several hundred years to reach maturity, and often living over 1,000 years. Limber pines sometimes have irregular, krumholtz, or multi-stem growth forms, rarely reach over 50 feet tall, with trunks up to 6 feet in diameter. Limber pine typically occurs on steep, rocky, well-drained, windswept, and nutrient-poor sites on exposed ridges and summits; found from 6,000 to 11,600 feet in elevation in Utah. Limber pine reproduces entirely by seed, producing cylindrical cones with large seeds called pine nuts, which ripen from August to September. Seed dispersal relies entirely upon birds and small mammals, especially the Clark's nutcracker, which has a mutualistic relationship with the limber pine. Clark's nutcrackers obtain food from the seeds, but they also disperse and deposited them in soil caches where they are able to germinate and establish. Limber pine is considered drought, wind, and cold tolerant, but its thin bark does not protect it from fire.

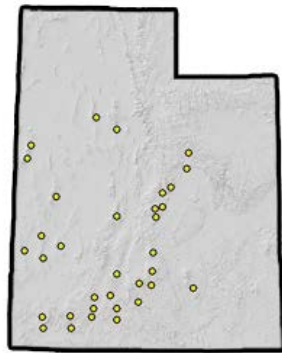
Its browse is poor forage for livestock and wildlife, but the highly nutritious pine nuts are cached by birds and small mammals to use during the winter. Other birds and mammals, such as bears, can also use these caches for food. The wood is rarely used for lumber and firewood because trees are gnarled and slow growing. It is related to the whitebark pine, and is susceptible to similar diseases and insect pests including white pine blister rust, dwarf mistletoe, mountain pine beetles, cone beetles, coneworms, budworms, and various other fungal diseases. White pine blister rust is a concern because it is an invasive species that continues to spread to new communities, even at higher elevations.

Bristlecone pine

Pinus longaeva



- Extremely long-lived, high-alpine conifer
- Grows on most inhospitable, rocky sites
- Dense wood can last for millennia after trees die
- Tree ring chronology is important in studying climates



The Great Basin bristlecone pine is found in montane, subalpine, and timberline communities, from 7,200 to 10,700 feet in elevation, and is commonly associated with limber pine. It is a native tree that is usually less than 30 feet tall, with thin bark and 1-inch needles, which are clumped into 5-needle fascicles. At high elevations, its growth form becomes more twisted and contorted, and can form a krummholz at timberline. Bristlecone pines are old trees, with some individuals reaching over 5,000 years old. It usually grows on sunny, steep, rocky slopes and ridges, which have limited water and nutrient availability, and frequently have desiccating winds. It is an extremely drought tolerant species, with a highly branched, shallow root system for water absorption and waxy needles to aid in water retention. Bristlecone pine is not fire or shade tolerant, so these adaptations to live on harsh sites result in reduced competition and limited fuel for fires. It reproduces only from seeds, which are wind-pollinated and mostly wind-dispersed. Seeds are usually produced yearly, even when trees are over 4,000 years old. Seedling germination and establishment is usually rare because of the dry, rocky, nutrient-poor soils.

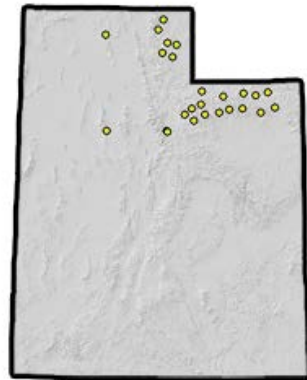
Bristlecone pine seeds are eaten by a variety of small birds, such as chickadees and mountain bluebirds. The bristlecone pine is considered a very valuable scientific species because it provides the longest, continual, climate-sensitive, tree-ring chronologies on the planet. Due to its growth form, the wood is not commercially important even though it is very hard, but was historically used in mine-shafts as structural timber. Great Basin bristlecone pine is susceptible to a variety of insects, parasites, and fungi including attacks from mountain pine beetles and white pine blister rust.

Lodgepole pine

Pinus contorta



- Common upper elevation species
- Early colonizer of disturbed sites
- Serotinous cones open only after fire
- Particularly shade-intolerant
- Victim of pine beetles and rust fungi



Lodgepole pine reaches heights ranging from 45–150 feet tall, with trunk diameters usually less than 30 inches. Lodgepole pines usually live between 150–200 years, and commonly have a tall, narrow growth form. It can occur from 6,000 to 11,000 feet in Utah, ranging from gentle slopes and basins to steep, rocky ridges. It reproduces by wind-pollinated seed. Serotinous cones are sealed shut, requiring high temperatures (113°–120°F) from moderate to severe fire to release the seeds. This keeps seeds safe until wildfire provides cleared soil for seedling establishment, and it is more common in even-aged stands that form after fire. Non-serotinous cones are not sealed, and have winged seeds that are wind dispersed, and are more common in multi-aged stands. Lodgepole pine is not shade tolerant, and cannot grow to maturity in the understory. Its root system commonly has a taproot and vertical sinkers from the lateral roots that provide stability and structural support. With limited production of fine roots, lodgepole pines rely heavily on mycorrhizal associations to obtain nutrients.

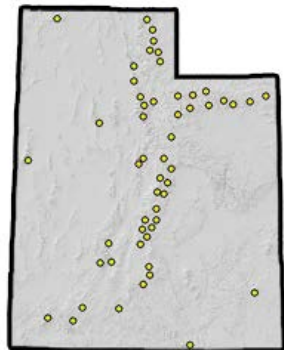
Small mammals, such as snowshoe hares and porcupines, commonly feed on the cambium. The seeds are an important food source for many birds and small mammals. Native Americans boiled the inner bark for food, used the gum on cuts or sores to promote healing, and made the needles into a tea that is high in vitamin A and C. The most important use of the long, straight trunks was for constructing tepees. It is currently harvested for several lumber products. Mountain pine beetle is the most destructive insect pest, but other threats include the pine engraver beetle, dwarf mistletoe, and a variety of stem rust fungi and root diseases.

Engelmann spruce

Picea engelmannii



- Common high-elevation forest species
- Often dwarfed and gnarled by cold, harsh winds
- Regenerates by layering near treeline
- Grouse feed extensively on buds



Engelmann spruce is one of the largest high-elevation conifers. Average heights range between 45 to 130 feet tall, depending on site quality and stocking density, but individuals can reach over 160 feet tall with trunk diameters of over 40 inches. Trees can live over 600 years, with average life spans ranging from 350 to 450 years. Engelmann spruce are found in some of the highest and coldest forests in Utah, with elevations ranging from 8,000 to over 11,500 feet, and characterized by long, cold, heavy snowpack winters and short, cool summers. Engelmann spruce reproduce mostly through wind-dispersed winged seeds. Seedling survival is highest in mineral soils with shade, cool temperatures, and adequate soil moisture. At timberline, vegetative regeneration through layering is common, due to the krummholz growth form in association with high winds. Engelmann spruce is generally not tolerant of fire, but fire provides sites for seedling regeneration.

Mature Engelmann spruce provides cover for large herbivores, but it is considered poor browse. It provides important forage for forest grouse species, which feed extensively on the buds and needles, especially in the winter. Engelmann spruce provides food, cover, and nesting sites for a variety of other birds and mammals.

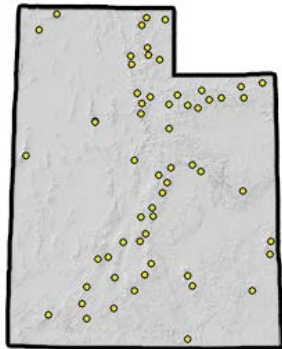
Native Americans peeled the bark into sheets that were used to make canoes, baskets, and roofs. They also used the gum to heal cuts and sores and the needles for incense and baths. A drink similar to root beer can be made from spruce root. Today, it is most commonly used as lumber in home construction. The most common biological threats are wood rotting fungi, spruce beetle, and dwarf mistletoe.

Subalpine fir

Abies lasiocarpa



- Common higher elevation forest species
- Characteristic blunted needles
- Shade tolerant and often grows among Engelmann spruce
- Important cover and food for wildlife



Subalpine fir is the smallest native fir species in the western US, and is commonly associated with Engelmann spruce. It is a short-branched evergreen, with an extremely narrow, dense crown, commonly reaching heights between 60 and 100 feet. Near treeline, it can form a short flag-like stem above a krummholz mat. In Utah, it occurs from 8,000 to 11,500 feet in elevation and is considered a climax species. It generally occurs on sites that have a short growing season caused by cold winters, heavy winter snowpacks, cool summers, and frequent summer frosts. Subalpine fir reproduces mostly by seed, flowering in June and producing winged seeds by October. Seeds are both wind pollinated and dispersed. At treeline, vegetative regeneration through layering can occur. Subalpine fir is shade tolerant, but it is not fire tolerant, and mortality can occur even with low-intensity fires.

Subalpine fir provides little browse for livestock and large herbivores, but young growth is occasionally utilized. Forest grouse rely heavily on the needles and buds as a food source, especially during the winter. Other small mammals and birds, such as chipmunks, pine siskins, squirrels, chickadees, nuthatches, and crossbills, store and feed heavily on the seeds in the fall. Subalpine fir also provides good habitat and cover for a variety of wildlife.

Native Americans used the species extensively including boiling the resin for antiseptics, and making a tea from the resin for colds and to cleanse the body. The wood is most commonly used as lumber in home construction. Subalpine fir is attacked by numerous pests including western spruce budworm, western balsam bark beetle, fir engraver beetle, and various wood-rotting fungi.

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