



enac

**Environmental
Nature Center**



Plant Communities Guide

Second Edition, Summer 2010





Plant Communities of California

The factors that determine where and how a particular plant species grows are:

Weather (precipitation, temperature, wind)

Climate (elevation, humidity, sunlight, heating effects, evaporation rates)

Substrate (rock, shallow, sandy, loamy, or muddy soil)

Local Effects (fire, soil creep, frozen winter soil, disturbances from burrowing animals, and human activities)

With its exceptional range of these factors, California has more species than any other state in the U.S., as well as the greatest number of endemic (existing nowhere else) species. The ENC showcases representative plants from 15 of California's numerous plant communities.

***You are responsible for being aware of and observing the ENC Code.
Please... Stay within the established and marked trail boundaries.***



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What is Native?

Native plants are ones that have evolved in place, over thousands of years, before humans introduced plants from other places. Because they are adapted to the weather, climate, soil conditions, and local effects, native plants require no irrigation or fertilization, and are resistant to most pests and diseases. They are vigorous and hardy. Because they evolved together, a natural balance exists among the plants, animals, and microorganisms of a native ecological community. The different species thrive where they are suited; they keep each other in check, preserving the balance. *All of the plants growing at the ENC are native to California.*

Closed Cone Pine Forest

This Central California coastal community is home to the Monterey, Bishop, and Knobcone Pines, all of which need extreme heat for their cones to open and release their seeds. While the Monterey Pine cones may open during hot, dry weather, the other trees' cones will not open without the more intense heat of a fire. Following a Closed Cone Pine Forest fire, there is a massive release of seeds, which sprout in the scorched earth in soil recently enriched by ash.



Bishop Pine

Pinus muricata

This evergreen conifer grows from 40 to 80 feet tall, with a trunk diameter of 1 to 3 feet. At the ENC the Bishop Pine is conical, but on windswept cliffs it is asymmetrical. The dull green needles are 4 inches long, in bundles of two. The gray bark is thick and furrowed, with dark, purplish-brown scales. Because its stalkless, egg-shaped cones have prickly scales, this tree is also known as Pricklecone Pine. The shiny, 4- to 6-inch cones are clustered in rings of 3 to 5. As with all pines, the seeds are edible. Native Americans ate the pine nuts, used pine roots in basketry, burned the wood for firewood, and utilized pine resin as glue and for waterproofing. On low coastal terraces, this tree's roots help to stabilize sand.

Monterey Cypress

Callitropsis macrocarpa

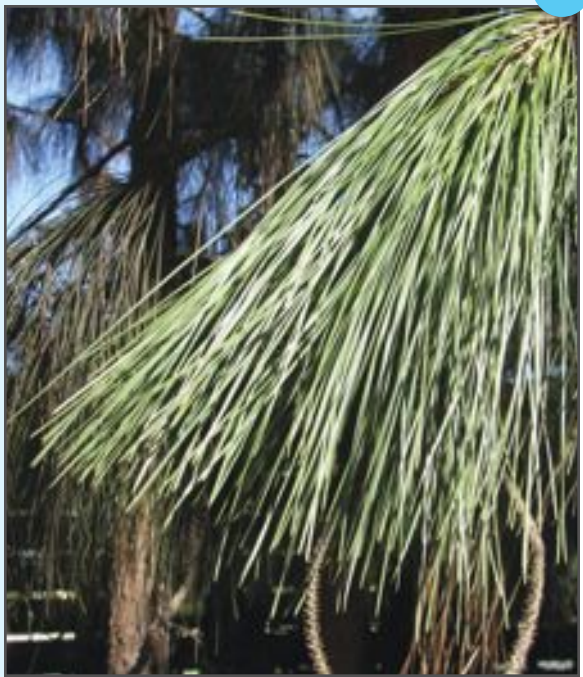
This evergreen conifer grows from 40 to 80 feet tall. Its crown is straight and narrow when young, becoming broad and spreading as it matures. In windswept areas, the tree grows asymmetrically. The bark is gray, rough, and fibrous, and the leaves are scale-like, blunt-tipped, and crowded tightly on the twig in opposite pairs (resulting in a square twig). Cones are brown and nearly round, 1 to 1.5 inches in diameter. Native Americans used an extract of the needles to treat rheumatism.



Monterey Pine

Pinus radiata

This evergreen conifer grows from 50 to 90 feet tall, with a trunk diameter of 1 to 3 feet. The bright green needles are 3 to 6 inches long, in clusters of three. The bark is dark reddish-brown and deeply furrowed. The tan or cinnamon cones are ovoid, 3 to 5 inches long, and asymmetrically set on the branch in rings of 3 to 5. Several birds and small mammals eat the pine nuts, and the insects that are harbored by the Monterey Pine provide food for several forest birds. Nesting Chestnut-Backed Chickadees (*Poecile rufescens*) obtain almost 80% of their insect diet from foraging in Monterey Pines!



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Other plants to look for in this community:

California Blackberry (*Rubus ursinus*), California Wild Rose (*Rosa californica*), Fuschia-flowered Gooseberry (*Ribes speciosum*), Seaside Daisy (*Erigeron glaucus*), Wood Strawberry (*Fragaria vesca*).

Riparian Woodland

Riparian Woodland
Plant Community

This is the habitat found along freshwater streams and rivers within other plant communities. The vegetation varies, depending upon climate and elevation. The ENC stream is run by a pump that recirculates the water, thus conserving resources. This area is representative of an Arroyo Riparian Community.



Arroyo Willow *Salix lasiolepis*

This deciduous, thicket-forming shrub or small tree can grow up to 30 feet tall. The light-colored bark is smooth; the slender, erect, branches form a narrow, irregular crown. Leaves are leathery and narrow. Male and female flowers are 1- to 2-inch catkins which grow on separate trees, blooming in January and February. The scientific name means “shaggy scale” and refers to the white hairs on the scales of the flowers. The bark was used by Native Americans to alleviate headaches, while the twigs were used in basket-weaving,

thatching, making fishing poles, and as firewood. Among the most desirable plants for songbirds and butterflies, *Salix* species are host plants for several butterfly species, including the Western Tiger Swallowtail (*Papilio rutulus*), Lorquin’s Admiral (*Limenitis lorquini*), Mourning Cloak (*Nymphalis antiopa*) Viceroy (*Limenitis archippus*), and several Hairstreaks (*Theclinae*).



California Blackberry *Rubus ursinus*

This deciduous, thorny shrub grows in dense, impenetrable thickets. Its white, 5-petaled flowers grow in clusters of 2 to 15.

Native Americans ate the berries fresh or dried, and brewed the leaves and root bark to make tea. This shrub attracts Black-headed Grosbeaks (*Pheucticus melanocephalus*).

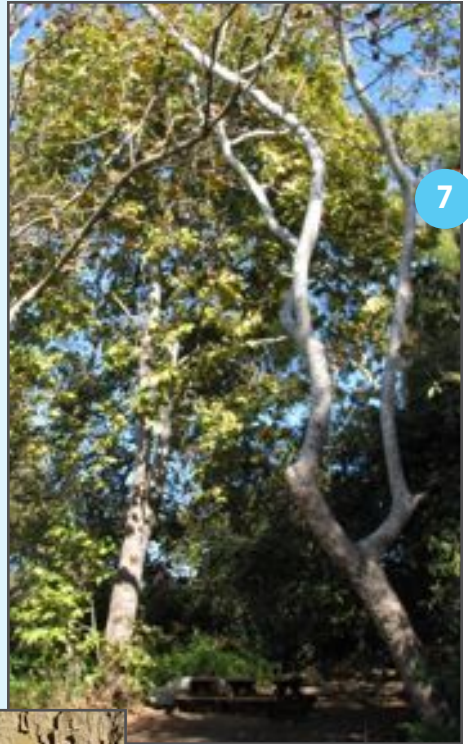


Mule Fat *Baccharis salicifolia*

This is a semi-deciduous, thicket-forming shrub with sticky foliage. It bears flat-topped clusters of small, fuzzy, off-white flowers. Native Americans roasted and ate the young shoots. They also boiled the leaves to make poultices for wounds, insect bites, and to prevent baldness. They used the wood to make arrows and fire-making drills. *Baccharis* flowers are a favorite nectar source for many butterflies.

Sycamore *Platanus racemosa*

This deciduous tree often grows to 90 feet tall. Its stout trunk is usually twisted and leaning, with smooth, whitish bark peeling in reddish-brown flakes, creating a mottled effect. Its star-shaped, yellowish-green leaves grow up to 10 inches wide and are divided into 3 to 5 deep, pointed lobes. Its flowers are small, in 2 to 7 ball-like clusters on slender stalks near the ends of the branches. Flowers are followed by 1-inch fruiting balls which fall apart in winter, releasing small, seed-like nutlets. Native Americans used Sycamore wood for dwellings and bowls (Sycamore is the Chumash word for bowl!). They brewed the bark for tea. Hummingbirds weave the downy undersides of these leaves into their nests. The Sycamore is a host plant to the Western Tiger Swallowtail. The larvae of the Sycamore Borer Moth (*Synanthedon respiciens*) feed on the bark, causing the mottled appearance in most mature trees. They do not usually cause harm to the tree. Look for their “frass” (caterpillar excrement) around the base of our large sycamore trees.



Other plants to look for in this community:

Cattail (*Typha* spp.), Coast Live Oak (*Quercus agrifolia*), Fremont Cottonwood (*Populus fremontii*), Rushes (*Juncus*), Sedges (*Carex* spp.), White Alder (*Alnus rhombifolia*).

Redwood Forest



This is a temperate rainforest with an annual rainfall of 60 to 140 inches, and an additional 12 inches of fog drip. Before 1850, old-growth Redwood Forest covered more than 2 million acres along the California and Oregon coastline, but by 1920, nearly all of the original Redwood Forest had been destroyed by logging. Some of this land has been replanted, but these second- and third-growth forests are only about 100 years old (Coast Redwoods can live over 2,000 years). Today, fewer than 5% of the old-growth Coast Redwoods remain. Preservation efforts led to the formation of Redwood National and State Parks, which contain over 100,000 acres of Redwood Forest, protecting most, but not all, of the remaining old-growth Coast Redwoods. The Redwood Forest exists today only along the northern/central coast of California and the southern coast of Oregon.

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Coast Redwood

Sequoia sempervirens

These evergreen conifers are the tallest trees in the world. They may grow over 350 feet high, with a diameter up to 25 feet. Coast Redwoods may live over 2,000 years, with an average tree age of 600 years. The tallest living tree ever found is a Coast Redwood nicknamed “Hyperion” in Redwood National Park. It is 378 feet tall and 26 feet in diameter. The exact location of the tree has not been revealed to the public for fear that human traffic would upset the tree’s ecosystem.

Unlike most other conifers, the base of the Coast Redwood is capable of resprouting. The tree has a conical crown. The leaves are bluer in tone than those of the Giant Sequoia and

are more needlelike. These needles are flat, soft, pointed, 1/2- to 1-inch long, two-ranked, and arranged in flat sprays. The cinnamon-colored bark of the trunk is very thick and it is resistant to fire, insects and decay. The wood is similar to that of the Giant Sequoia, but more even-grained. The cone is about the size and shape of a large grape, and the seeds are tiny—there are 120,000 seeds in a pound! Native Americans used fallen redwoods to make houses, furniture, boxes, dugout canoes, and fishing tools. They used the soft bark to weave baskets and to make clothing.

Douglas Iris *Iris douglasiana*

This perennial herb grows in 2- to 4-foot wide clumps. Tufts of 1- to 2-foot, sword-shaped, dark, evergreen leaves surround a flowering stalk of the same height. Several showy, 3-inch, blue-violet iris blossoms emerge from leafy bracts atop the stalks, blooming in the spring. Leaves were used by Native Americans to obtain fibers for thread, twine, and rope for fishing nets and for snares for catching deer, birds, and other game. Babies were often wrapped in the leaves to retard perspiration and prevent dehydration.



Redwood Sorrel *Oxalis oregana*

This herbaceous perennial grows in carpets on the floor of Coastal Redwood forests. With three heart-shaped leaflets on each leaf, Redwood Sorrel resembles a shamrock. The white or pink, 5-petaled flowers bloom February to December. Native Americans chewed the sour-tasting stems (which contain oxalic acid) and used an extract of the entire plant as a wash to treat rheumatism.

Photo courtesy Gerald and Buff Corsi © California Academy of Sciences.



Other plants to look for in this community:

California Huckleberry (*Vaccinium ovatum*), Douglas Fir (*Pseudotsuga menziesii*), Hedge Nettle (*Stachys ajugoides*), Western Azalea (*Rhododendron* spp.), Western Sword Fern (*Polystichum munitum*).

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Tanbark Oak *Lithocarpus densiflorus*

This evergreen tree is not a true oak (it is a close relative), but its hard, acorn-like nuts, toothed, leathery leaves, and overall appearance have earned it its common name. A slow growing tree, it can reach 120 feet at maturity, with a trunk diameter of 7 feet. The bark is thick and fissured. Brownish-green female flowers sit at the base of an erect, yellowish-white male flower (catkin), blooming June–October. Fruit follow in the fall in the form of acorns—capped nuts growing in clusters. The nut kernels are quite bitter, although squirrels eat them. Native Americans ground the acorns into flour. Due to the high tannin content, these nuts store well, but require extensive preparation to make them palatable.



Wax Myrtle *Morella californica*

California Wax Myrtle is a tree-like, dense, evergreen shrub that can grow to 25 feet in height. This aromatic shrub has glossy, dark-green, narrow leaves. Male and female flowers are found on different branches of the same tree in the spring. The waxy covering of the leaves and fruit can be melted off with boiling water and used to make fragrant-burning candles. The flowers attract butterflies and many species of birds feed on the purple berries in the summer and early fall.



Mixed Evergreen Forest



The Mixed Evergreen Forest is filled with leafy trees and a few conifers. Found mostly in the northern coastal mountains of California, this plant community extends down to the central coastal mountains. The temperatures within the Mixed Evergreen Forest are mild, although not as mild as in the nearby redwood forest. Annual rainfall averages around 45 inches. Many of the plants of the Mixed Evergreen Forest are also found in the Yellow Pine Forest and the Redwood Forest.

Black Oak *Quercus kelloggii*

10 This deciduous tree reaches 30 to 80 feet at maturity, and can live up to 500 years. It has deeply lobed, 4- to 8-inch leaves, and produces large 1.5-inch acorns. The crown is rounded, but irregular. Oaks (*Quercus* spp.) are the single most important plant genus used by wildlife for food and cover in California forests and rangeland. Oaks provide shelter and food for many bird species. The leaves are used as nesting material, and the branches and holes provide nest sites. Oaks are home to spiders and insects year round, providing food for insectivorous birds, while the seeds (acorns) are the staple food of Acorn Woodpeckers (*Melanerpes formicivorus*), which store the seeds in holes they have drilled. The wood is used for making cabinets, furniture, high-grade lumber, pallets, and industrial timbers. California Native Americans preferred Black Oak acorns to those of other species for making acorn meal.

California Bay Laurel *Umbellularia californica*

This pungently aromatic, evergreen tree reaches 40 to 80 feet at maturity. Its form varies considerably, depending on its habitat (broad-crowned in the open, narrow in the shade, and a thicket-forming shrub in windswept areas). The trunk is short and typically forks into several large, spreading branches. The bark is greenish to reddish-brown. The narrow, lance-shaped leaves are dark green and leathery. Yellow-green flowers appear 6 to 10 per stem, from December to May. They are followed by greenish, 1-inch, olive-like fruits that ripen to dark purple. Cahuilla Native Americans placed wet bay leaves in their nostrils to treat headaches and colds. They ate the nuts and brewed the leaves into tea to cure stomachaches. They also used the leaves as an insecticide.

Other plants to look for in this community:

Big Leaf Maple (*Acer macrophyllum*), California Coffeeberry (*Rhamnus californica*), Canyon Live Oak (*Quercus chrysolepis*), Coulter Pine (*Pinus coulteri*), Incense Cedar (*Calocedrus decurrens*), Madrone (*Arbutus menziesii*), Toyon (*Heteromeles arbutifolia*).



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Yellow Pine Forest



This plant community is quite common in the mountains of California, with the component species depending upon elevation (4,000 to 9,000 feet). Jeffrey Pines grow in the highest and driest regions. Ponderosa Pines grow over the entire range. The Yellow Pine Forest was added to the ENC in 1998-99.



Bitter Cherry *Prunus emarginata*

This shrub forms thickets 25 feet tall and 5 to 12 feet wide. The gray bark gives off a cherry fragrance when bruised, while the white flowers that appear in July have an almond-like fragrance. Leaves, bark, and fruit (small red berries) are extremely bitter. Inedible by humans, the fruit is eaten by many songbirds and mammals. Deer and livestock browse the foliage. *Photo courtesy © 2003 Michael Charters.*

Columbine *Aquilegia formosa*

This perennial, erect herb has delicate, lobed foliage. Its spurred, yellow-and-red flower hangs at the end of a long stem. Native Americans used the flowers as condiments, ate the nectar as candy, and used an extract of the roots to treat various stomach disorders, including ulcers. The seeds are poisonous. The showy flowers attract hummingbirds, which serve as their primary pollinators.



Giant Sequoia *Sequoiadendron giganteum*

These evergreen conifers are the most massive trees in the world, while the related Coast Redwoods are the tallest. Giant Sequoias may grow up to 250 feet high and may live over 2,500 years! A count of annual rings on stumps has verified ages as great as 2,300 years, but some living trees are believed to be close to 4,000 years old. The largest of these ever found

is "The General Sherman Tree," located in Sequoia & Kings Canyon National Park. It is 275 feet tall with a diameter of 36.4 feet!

The leaves of the giant sequoia are scale-like and lie close to the branches. Like the Coast Redwood, this tree has reddish bark that is soft, spongy and resistant to fire,

insects and rot. In large trees, the bark can reach a thickness of 2 feet. The wood is light, coarse-grained, and highly resistant to insects and fire. The cone is about two inches long and the seeds are small—there are 91,000 seeds in a pound! This tree is native only to a narrow belt within the cool Sierra Nevada forest zone. Most of the Giant Sequoia groves are included within the National Park System or are otherwise under government protection. Native Americans used fallen Sequoias to make structures, tools, and dugout canoes. They used the soft bark for baskets and clothing.



Incense Cedar *Calocedrus decurrens*

This resinous, evergreen conifer grows 60 to 120 feet tall. Its tapered trunk has thick, deeply furrowed, reddish-brown bark with shredded ridges. Foliage is bright green with 1-inch, oblong cones at the ends of the leafy stalks. Native Americans used the green branches for deodorant, the limbs to make bows, and the wood to build dwellings. Incense Cedar is the leading wood used in making pencils.



Jeffrey Pine *Pinus jeffreyi*

This evergreen conifer is the rugged pine most often seen clinging to stark, granite domes in the Sierra Nevada Mountains. Its mature height ranges from 65 to 190 feet. It has reddish, furrowed bark that smells like vanilla, blue green needles, and cones with spines that point down.



Ponderosa Pine *Pinus ponderosa*

This evergreen conifer has a mature height of 50 to 225 feet. Its bark is yellowish-orange, is divided into light-colored plates, and smells like resin. The needles are yellow-green and the cones, which are smaller than those of the Jeffrey Pine, have spines that point outward. There are no Ponderosa Pines at the ENC yet.

Photo courtesy Walter Knight © California Academy of Sciences.

Other plants to look for in this community:

Black Oak (*Quercus kelloggii*), California Flannelbush (*Fremontodendron californicum*), Canyon Live Oak (*Quercus chrysolepis*), Greenleaf Manzanita (*Arctostaphylos patula*), Mountain Buckbrush (*Ceanothus integerrimus*).



Freshwater Marsh

This aquatic community of emersed (partially submerged) plants is found throughout California where there is permanent standing water. Marshes or “wetlands” include the margins of lakes and ponds, ditches, and some extensive shallow marshes such as in the Great Central Valley. Wetlands soak up and filter polluted runoff from urban and industrial areas, thereby protecting streams, ponds and rivers. Wetlands also provide flood protection by absorbing excess runoff during heavy rains. 90% of California’s wetlands have been eradicated by human activity.



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Arrow Weed *Pluchea sericea*

This evergreen bush grows to a height of 5 feet. It has silver-gray leaves and lavender flowers. Native Americans used its long, straight stems to make shafts for arrows. They used stems and leaves for thatch, and used an extract of the leaves to treat stomachaches. *Photo courtesy Tommy Stoughton, USFS.*

Cattail *Typha* spp.

These stout-stemmed perennials grow 3 to 6 feet high, forming dense stands in shallow water. The leaves are long and strap-shaped. Cylindrical, brown, flowering spikes persist through autumn before becoming a downy mass of white. Native Americans ate the fruit, young flowers, stalks and roots, raw or cooked. They used the roots to heal bleeding wounds and the leaves to

Other plants to look for in this community:

Alders (*Alnus* spp.), Cottonwoods (*Populus* spp.), Willows (*Salix* spp.).

make floor mats and thatched roofs. Cattails provide nesting sites for water birds, and several bird species eat cattail seeds.



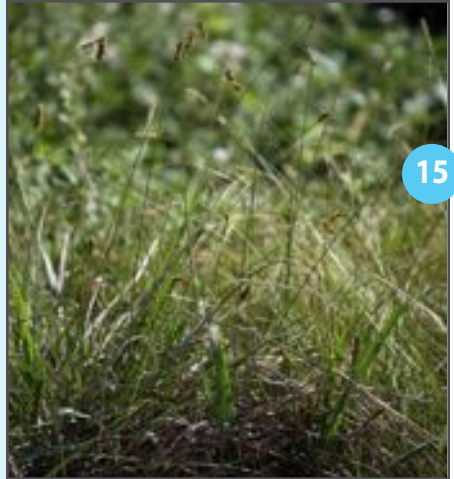
Sedge *Carex obnupta*

This grass-like perennial forms large clumps with long, stout rhizomes, which are horizontal, underground stems. Native Americans used roots and shoots of many sedges and rushes for basketry.

Photo courtesy © 2008 Steve Matson.

Tule *Scirpus* spp.

This perennial, grass-like herb has 1- to 2-inch wide leaves, with reddish-brown, straw-colored flowers that bloom April through August. Native Americans ground the sweet roots into flour, ate the seeds raw or in mush, and used the pollen to make cakes. They wove the stalks into bedding and roofing, and made canoes by binding the stems together, and then grouping the bundles.



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Channel Islands Flora



The Channel Islands are located off the coast of Southern California along the Santa Barbara Channel. Each of the 8 islands (San Miguel, Santa Cruz, Santa Rosa, Anacapa, Santa Barbara, Santa Catalina, San Nicolas and San Clemente Island) has its own flora, which are often quite different from the species found on the mainland. In fact, there are over 100 species that are unique to the Channel Islands, growing nowhere else on Earth! This plant community grows under conditions similar to Coastal Sage Scrub— high humidity, but only 15 to 20 inches of annual rainfall.

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Catalina Ironwood

Lyonothamnus floribundus floribundus

This species of ironwood tree is endemic to (occurs only on) Catalina Island. It was present on the mainland 6 to 19 million years ago, but it is extinct there now. It can grow to 50 feet in height, and has the conical shape of a redwood, but it is not a conifer. Its fibrous, gray bark peels in strips to reveal new, reddish-brown bark beneath. The shiny green leaves are fernlike, and 3 to 6 inches long; the 1/3-inch flowers are white with yellowish centers, occurring in large flat-topped terminal clusters. Fruits are small, dry, brown capsules that ripen in late summer and persist through the winter. Only a small percentage of

ironwood seeds are viable, and most reproduction is achieved clonally. Seeds taste like peanuts and can be ground into flour. Native Americans used this extremely hard wood to make tools.



Other plants to look for in this community:

Island Mountain Lilac (*Ceanothus arboreus*), Island Mountain Mahogany (*Cercocarpus betuloides*, var. *blancheae*), Island Oak (*Quercus tomentella*), Island Sagebrush (*Artemisia nesiotica*), San Clemente Island Bush Mallow (*Malacothamnus clementinus*), Santa Cruz Island Buckwheat (*Eriogonum arborescens*).

Catalina Island Cherry

Prunus ilicifolia ssp. *Lyoni*

This evergreen shrub or small tree can grow to 45 feet in height. It has a broad crown of spreading branches. Small, white flowers bloom in May and June, followed in autumn by 1/2- to 1-inch, dark purple cherries. After careful preparation that included grinding and soaking, the Tongva (Gabrielino) Native Americans ate the thin layer of meat of this cherry and ground the pits for flour. This plant is a host plant for the Western Tiger Swallowtail, Pale Swallowtail (*Papilio eurymedon*), California Hairstreak (*Satyrium californica*), Variable Checkerspot (*Euphydryas chalcedona*), and Lorquin's Admiral butterflies. The cherries attract robins, finches, towhees and other birds.



Island Mallow

Lavatera assurgentiflora

This 6- to 10-foot tall, bushy, evergreen shrub is native to the Channel Islands. It has large, glossy, maple-like leaves and showy, hollyhock-like flowers. The flowers are white to rose-colored with darker veins. Native Americans ate its fruit raw and its leaves boiled. Butterflies and hummingbirds feed on the nectar of this plant and finches eat its seeds.



Torrey Pine

Pinus torreyana

The Torrey pine is the rarest pine in the U.S. — only about several thousand trees exist. This pine is probably the remnant of an ancient, coastal forest, which has been reduced in size during the drying period of the last ten thousand years. A large part of the mainland grove north of San Diego is within Torrey Pines State Park, while the other 2000 trees grow in a single grove on Santa Rosa Island, 175 miles away. This sprawling evergreen grows to 70 feet and has 7- to 13-inch long needles that grow in bundles of 5. The ovoid cones are 5 inches long. Native Americans chewed the resin to soothe sore throats and they made tea from the young needles.



Northern Oak Woodland



The Northern Oak, Foothill (Central) Oak and Southern Oak Woodlands overlap, and pockets of one community may be found within another, depending on climate, weather, and other local effects. The Northern Oak Woodland is found from San Francisco northward. This grassy woodland community is cooler and more coastal than the others, and receives more rain (25 to 40 inches annually). Oregon Oak, Black Oak and Big Leaf Maple characterize this community.



Big Leaf Maple

Acer macrophyllum

This deciduous, 30- to 70-foot tall shade tree has a rounded crown of spreading or drooping branches. Its 1-foot wide leaves are the largest of any maple. These shiny, green leaves turn yellow or orange in autumn. Yellow flowers up to 6 inches long cluster at twig ends in spring, followed by paired fruit with long, winged seeds. Maple syrup can be made from the sap, and maple flowers are sweet and edible. Native Americans used the wood to make dishes and paddles, and used the inner bark for baskets and ropes. This tree provides shelter and nesting spots for many bird species. It provides good insect foraging for warblers and other birds, while its seeds and flowers are eaten by grosbeaks, goldfinches and Pine Siskins (*Carduelis pinus*).



California Buckeye

Aesculus californica

This 15- to 30-foot deciduous tree has a broad, round crown, and smooth, gray bark. It has dark-green, palmately compound leaves with 4 to 7 leaflets, and tiny, fragrant white flowers that grow in spikes, attracting hummingbirds. It loses its leaves by mid-summer, revealing 2-inch round fruit. Native Americans used the seeds as fish



poison — thrown into ponds, the pulverized nuts would stupefy fish, making them float to the surface for easy netting. The young shoots were used to make fire-making drills.

Oregon Oak

Quercus garryana

This deciduous tree with a broad, rounded crown, and light-colored, scaly bark, can grow to 70 feet. Its trunk divides into wide, spreading branches. Its leathery leaves are green on top, dull beneath, and are oblong with round lobes. Flowers are drooping catkins that grow at the branch tips, blooming April to June. Acorns appear August to December. *Quercus* species are host to many butterfly species, including several Hairstreaks, Duskywings (*Erynnis* spp.) and the California Sister (*Adelpha californica*).

Photo courtesy © 2008 Keir Morse.



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Other plants to look for in this community:

Black Oak (*Quercus kelloggii*), Blue Eyed Grass (*Sisyrinchium bellum*), Mountain Mahogany (*Cercocarpus betuloides*), Western Redbud (*Cercis occidentalis*).

Foothill Woodland

You may have driven through this plant community on your way to visit Sequoia and Kings Canyon National Park. This woodland community covers a wide area of California, including the foothills of both coastal and Sierra mountains. Rainfall is about 20 inches annually. The dominant trees of this community are Blue Oak, Coast Live Oak, Interior Live Oak and Gray Pine.



California Coffeeberry

Rhamnus californica

This evergreen shrub grows up to 15 feet tall. Its small, green flowers are followed by 1/4- to 1/2-inch berries, which turn from green, to red, to black, when ripe. Native Americans used the berries in teas drunk to offset the digestive effects of an acorn diet, but its laxative effect is so severe that it is considered toxic. These berries are an important food

source for native birds.

Coffeeberry is a host plant for the Pale Swallowtail butterfly.



Gray Pine

Pinus sabiniana

Also called Foothill Pine, this evergreen conifer grows quickly to 45 feet in 15 years, and can reach 75 feet in 200 years. It has a crooked trunk that branches to many secondary trunks, forming a broad, open, and irregular crown. The bark is dark gray and roughly fissured, and the 8- to 12-inch gray-green needles are bundled in threes.



The 6- to 10-inch light-brown cones contain large, winged seeds, Native Americans used the seeds as beads, and used the root fibers to make baskets.

Western Redbud *Cercis occidentalis*

This large, deciduous shrub has small, heart-shaped leaves and many branches spreading from the base. In full bloom, the plant is covered with clusters of small, pea-like, reddish-purple flowers. Native Americans used bark extracts to treat diarrhea and dysentery. They made baskets from the shredded bark, and made bows, fence posts, and tool handles from the wood. Pollination is by bumble bees (*Bombus* spp.) and Orchard Mason bees (*Osmia lignaria*). This plant attracts hummingbirds with its nectar and goldfinches with its seeds.

Other plants to look for in this community:

Buck Brush (*Ceanothus spinosus*), Currant (*Ribes* spp.), Interior Live Oak (*Quercus wislizeni*), Lupines (*Lupinus* spp.), Manzanita (*Arctostaphylos manzanita*), Valley Oak (*Quercus lobata*).

Southern Oak Woodland



This oak woodland is found in the interior regions of Southern California, where it is hot and dry (annual rainfall is less than 20 inches, temperatures can be in the 90s, and the community is in the path of powerful seasonal winds). Engelmann Oak, Coast Live Oak and California Walnut make up the core of this community.



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Other plants to look for in this community:

Coast Live Oak (*Quercus agrifolia*), California Coffeeberry (*Rhamnus californica*), Coyote Brush (*Baccharis pilularis* ssp. *Consanguinea*), Redberry (*Rhamnus tomentella*), Squaw Bush (*Rhus trilobata*), Sugar Bush (*Rhus ovata*).

California Black Walnut

Juglans californica

This deciduous tree grows from 20 to 40 feet tall. It forks into several trunks near the ground, giving it an overall “V” shape. Its 10-inch, pinnately compound leaves have 9 to 15 narrow leaflets, 1 to 3 inches long. The male flowers are yellow, 2- to 3-inch long catkins from last year’s twigs, while the tiny female flowers grow on small spikes at the ends of the current year’s twigs. The fruit is a 1-inch walnut. While some native stands remain in urban Los Angeles and Orange County, California Black Walnut habitat is threatened by development and overgrazing. Cahuilla Native Americans ate the nuts and used the hulls to make a dye for their baskets. They also decorated the nutshells and used them as dice. The nuts are eaten by several species of native birds, including Black-headed Grosbeaks, towhees, finches, titmice and thrashers.

Englemann Oak *Quercus engelmannii*

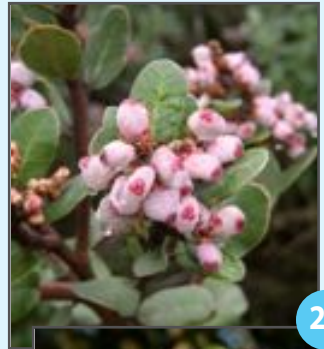
This evergreen tree may be drought-deciduous during the hot, dry local summers. It can grow to 60 feet in height with a single, short, crooked trunk and large, twisted, spreading limbs that form a sparse crown. The bark is gray and scaly, and the 2-inch, elliptical leaves are dull gray-green above, and greener below. The male flowers are 2- to 4-inch long, drooping, yellow catkins, while the tiny female flower is inconspicuous. Acorns are 1-inch long with half the nut enclosed by a deep, scaly cap. Acorns were the staple diet of many Native Americans. Oaks provide shelter and nesting sites for wildlife, as well as food in the form of insects and nuts.

Photo courtesy © 2001 Tom Annese.



Lemonadeberry *Rhus integrifolia*

This evergreen, aromatic, thicket-forming shrub grows up to 15 feet tall. It has simple, elliptical, leathery, 2-inch leaves, and 1/4-inch pinkish-white flowers that are clustered at the ends of the twigs. The 1/2-inch elliptical, berry-like fruit is dark red, hairy and covered with a white, resinous, sour secretion. Native Americans dried, soaked, and heated the berries, producing a drink that tastes like pink lemonade. The Cahuilla Native Americans made a tea from the leaves to treat coughs and colds. They smoked the leaves and used the stems in basketry. The fruit attracts thrushes, quail, finches and flickers.



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Poison Oak *Toxicodendron diversilobum*

Poison Oak grows as a 2- to 6-foot shrub, or as a large, climbing, vine. The leaf is divided into three scalloped leaflets. The leaves are bright green in early spring, but turn dark red in the fall. Not actually an oak, this shrub is a close relative of Poison Ivy. Both plants secrete an oil (urushiol) that causes a severe allergic reaction in most people, with blistering and itching of the skin. A helpful way to avoid this plant is to remember the rhyme, "leaves of three, let it be!" Native Americans used Poison Oak to make fire-making drills.



Chaparral



Chaparral is a Spanish word meaning “where the scrub oak grow.” This plant community is found in semi-arid areas such as the dry slopes and ridges of the Coastal Ranges from Shasta County south, and below the Yellow Pine Forest on the western slopes of the Sierra Nevada Mountains. It can be found in the Southern California mountains, as well. Chaparral is scrubland which exists on rocky, shallow soils overlaying a subsoil that is clay or rock that commonly holds moisture. Chaparral is adapted to a particular fire regime. Too much fire (increased frequency) will destroy a Chaparral ecosystem.



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Chamise *Adenostoma fasciculatum*

One of the most abundant shrubs in Southern California, this 6- to 10-foot spreading evergreen has tiny, needlelike leaves, clustered on shoots along the main branches, and small white flowers clustered at the ends of the branches. Chamise is well adapted to fire. It helps fuel fires with its flammable resins and sloughed-off bark and branches. While it can reproduce from seed, Chamise is also able to re-sprout quickly from the root crown, which allows it to outpace its competitors after a fire. In addition, Chamise releases toxins into the soil that inhibit growth of other plants.

Native Americans used this plant in remedies



for colds, snakebite, and convulsions. Koso people from the Eastern Sierras used this tough plant for arrow points, and the Luiseno people of southern California used it for the arrow foreshaft. Stands of Chamise are nearly impenetrable, and provide cover and food for deer.

Flannel Bush *Fremontodendron mexicanum*

This 15-foot evergreen, thicket-forming shrub has fuzzy, gray-green leaves and 3-inch, bright yellow flowers that bloom March - August. Native Americans brewed a remedy for sore throats from the roots. Flannel Bush is a federally listed endangered species, with only about 100 plants remaining in only two sites (in San Diego County and Baja California).

Yucca *Hesperoyucca whipplei*

An evergreen with 2- to 3-foot needle-sharp leaves growing in a stemless cluster, this yucca plant gets its name from its 10- to 15-foot flower spike that sport hundreds of small, creamy yellow flowers along its upper half. Native Americans made soap from the roots, and used fibers from the leaves to weave rope, nets, and baskets. They made flour from the seeds, and ate the flower stalks roasted. The flowers and fruits are eaten by many birds and small mammals, as well as by mule deer. The symbiotic relationship between this yucca and its moth pollinators has been studied extensively. In Orange County, Yucca relies solely on the Yucca Moth (*Tegeticula maculata*) for pollination. The female moth carries pollen from one plant to another, where she deposits her eggs in the plant's seedpods, covering them with pollen. When the caterpillars emerge, they consume some of the plant's seeds, then bury themselves in the ground, emerging a year later as moths, and the cycle continues.



Toyon

Heteromeles arbutifolia

Hollywood was named for this native California “holly,” which is actually a member of the rose family. This evergreen shrub grows 6 to 8 feet high and 4 to 5 feet wide. Also known as “Christmasberry,” Toyon has leathery, dark-green leaves and a profusion of clustered, white flowers followed by bright red berries. The berries remain on the branches most of the winter, providing an important food source for birds. Native Americans used the roots and stems of this plant as soap, and made a blue dye from the berries. They cooked and ate the fruits, and used a tea made from the bark to treat stomachaches. Toyon is a host plant for the Variable Checkerspot butterfly.



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Other plants to look for in this community:

Chaparral Mallow (*Malacothamnus fasciculatus*), Heart Leaf Penstemon (*Keckiella cordifolia*), Hoary Leaved Ceanothus (*Ceanothus crassifolius*), Laurel Sumac (*Malosma laurina*), Scrub Oak (*Quercus berberidifolia*), Tecate Cypress (*Callitropsis forbesii*), Woolly Blue Curls (*Trichostema lanatum*).

Valley Grassland



Native grasslands are composed of perennial bunch grasses, herbs and wildflowers. The California Poppy grows here, along with Blue-Eyed Grass, lupines and many plants from the aster family. This habitat is found in the Great Central Valley and the low hot valleys of the inner Coast Ranges such as Antelope Valley, ascending to about 4,000 feet in the Tehachapi Mountains and eastern San Diego County.

The ecology of California's grasslands has been catastrophically altered by many factors—over-grazing, the introduction of annual grasses, erosion, herbicides/pesticides/fertilizers, irrigation, mass killing-off of indigenous fauna, mono-culture, logging, road-building, residential development, and the “control” of fire and natural drainage. Of all of these, over-grazing has done the most damage. In the early 19th century, California's native grasses covered more than 22 million

26 acres. Before the intrusion of non-native annual grasses, the spaces between individual plants were filled with wildflowers and bulbs, which grew, bloomed and fell dormant on their own schedules, creating an ever-changing carpet of extraordinary beauty. Of the original grasslands in California, only about 1% remain. The majority has been developed or is covered with non-native, invasive plant species.



Other plants to look for in this community:

Asters (*Asteraceae* family), Beavertail Cactus (*Opuntia basilaris*), Lupines (*Lupinus* spp.), Mulefat (*Baccharis salicifolia*), Saltbush (*Atriplex* spp.), Soap Plant (*Chlorogalum* spp.).

Blue-Eyed Grass *Sisyrinchium bellum*

This grass-like perennial belongs to the iris family. Star-shaped, violet-blue flowers atop 12-inch stems attract hummingbirds, butterflies, and bees. Individual flowers last only one day, but they are produced in great quantities February to June. This plant is evergreen, but will go drought-deciduous.

Bunch Grasses

As the name implies, bunch grasses are grasses that grow in clumps or tufts, rather than forming a sod or mat. There are many species of native California bunch grasses, including Deergrass (*Muhlenbergia rigens*, right), Purple Needle Grass (*Nassella pulchra*) and Coast Range Melic (*Melica imperfecta*). Some species are as small as 9 inches across, while others are as broad as 6 or more feet!

Bunch grasses stay green for most, or all, of the year. Their deep roots and underground stems help these grasses survive fires. They are also important in preventing erosion. Many types live as long as 200 years. Bunch grasses are host plants to Skippers (*Hesperiidae*).

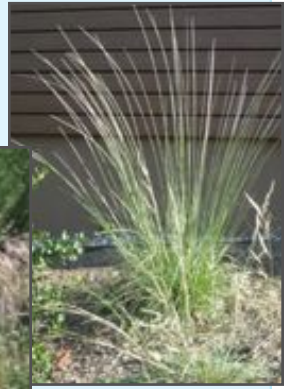
California Poppy

Eschscholzia californica

This is California's state flower. A perennial wildflower with 1- to 3-inch, orange flowers, California Poppies blanket the hillsides March-May. Long, narrow seedpods open abruptly, scattering the seeds some distance. Native Americans boiled and ate the flowers and leaves, and the women used the pollen from the flower as a cosmetic. The leaves were used to relieve toothaches, and as a mild sedative for babies (extract from the California Poppy also acts as a mild sedative when smoked. The effect is far milder than that of opium, which contains a different class of alkaloids). The leaves were also used to heal the navels of newborn babies.

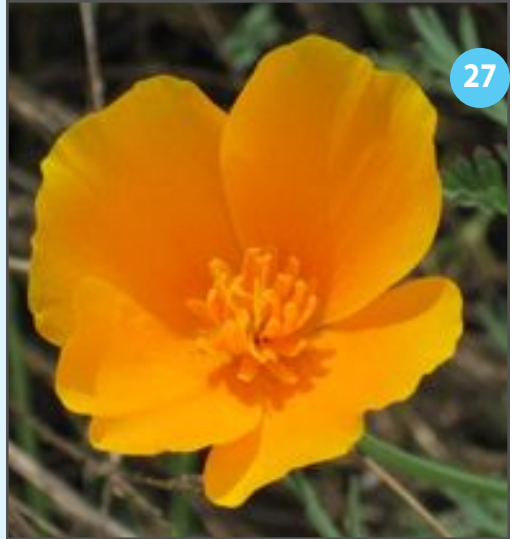
Yarrow *Achillea millefolium*

This perennial herb sports flat-topped clusters of small, whitish summer flowers atop gray-green, leafy stems. Native Americans steeped Yarrow leaves in hot water to prepare a potion used to decrease bleeding from wounds. Yarrow is undesirable in cow pastures because eating it makes cows produce bitter-tasting milk. The foliage repels insects, while the flowers attract ladybugs, bees and butterflies.



above Deergrass

left Purple Three-Awn Grass (*Aristida purpurea*)



Coastal Sage Scrub



This is a plant community typical of Southern California's coastal bluffs and canyons. Coastal Sage Scrub is considered by many to be the most endangered plant community in the United States. It has extremely high levels of species diversity and endemism, and it contains a number of endangered species, including the California Gnatcatcher. Coastal Sage Scrub is located on highly valued, coastal real estate and is threatened by development. It is characterized by drought-adapted shrubs. Only 10 to 20 inches of rain falls annually, and that drains quickly through the dry, rocky or gravelly soil.



Black Sage

Salvia mellifera

This 3- to 6-foot evergreen shrub has small, closely spaced whorls of pale blue flowers that bloom March to July. Foliage and flowers are both fragrant. Native Americans used the dark brown, oblong seeds for food and tea, and used the leaves to flavor food. Many bird species eat the seeds as well as the insects that are attracted to the Black Sage, while its flowers provide nectar to hummingbirds, butterflies and honeybees.



Other plants to look for in this community:

Bladderpod (*Isomeris arborea*), California Buckwheat (*Eriogonum fasciculatum*), California Sunflower (*Helianthus californicus*), Coastal Cholla (*Cylindropuntia prolifera*), Coyote Brush (*Baccharis pilularis* ssp. *Consanguinea*), Deerweed (*Lotus scoparius*), Elderberry (*Sambucus mexicana*), Lemonadeberry (*Rhus integrifolia*), Liveforever (*Dudleya* spp.), Monkey Flower (*Mimulus cardinalis*), White Sage (*Salvia apiana*).

California Sagebrush

Artemisia californica

This drought-deciduous perennial is a member of the sunflower family. It is a stout, woody, rounded shrub, 4 to 5 feet high, with narrow, 3/4- to 3-inch long, aromatic grey leaves. Its tiny yellow-green to pink flowers bloom from summer to late fall. Native Americans used this plant's oil as an insect repellent, as incense, and they brewed a tea from it to treat sore throats and fever. Women drank a concoction of this plant to alleviate the effects of menopause. Sagebrush provides cover for birds. It is the preferred nesting plant for the endangered California Gnatcatcher (*Polioptila californica*). As these birds forage for insects through the scrub, they wave their tails and the resins from sagebrush stick to their feathers giving them a resinous smell. It is also a host plant for the American Lady butterfly (*Vanessa virginiens*).



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Prickly Pear

Opuntia occidentalis

This cactus grows either erect or spreading. It is woody, with large, fleshy, spiny pads. Flowers are normally yellow, blooming mostly May-June, followed by prickly, red, barrel-shaped fruits. Native Americans ate the fruits dried, raw, or made into syrup. They ground the seeds into flour. The plant was used as a poultice for wounds, while the needles were used as tools.



Coastal Strand



Coastal Strand is the area just above sea level that gets daily salt spray. Sandy beaches and dunes do not hold much water, and they have an excess of sea salt. In response to these conditions, plants in this community have deep roots, lie low to the ground, and have leaves that hold moisture. As a result of invasive, exotic plants and human activity, there are only a few pristine areas of Coastal Strand remaining in California.



Beach Primrose *Camissonia cheiranthifolia*

This low-growing, herbaceous perennial grows in dense silver-green mats on the surface of the sand. It forms carpets of 1- to 2-inch, bright yellow flowers April - August. Beach Primrose is pollinated only by native bumblebees (*Bombus* spp.). Strong winds bend the flowers downwind, but these large bees approach upwind for greater flight stability.

Dune Buckwheat

Eriogonum parvifolium

This low, spreading, evergreen perennial is endemic to California. It has approximately 1/2-inch leaves and tiny flowers (pink, yellow or cream colored) that grow in ball-like clusters. This is an important host plant for a number of pollinating insects, and it is the *only* host plant of the endangered El Segundo Blue butterfly (*Euphilotes battoides allyni*).



Saltgrass *Distichlis spicata*

This perennial grass is found all across North America. Along the Atlantic coast it grows in salt marshes and salt flats, but farther west it is also found inland. In California, native Saltgrass thrives in forest, woodland and scrub habitats, as well as in salt marshes and coastal strand. Saltgrass has a spiky appearance, with 3- to 5-inch, erect, pointed leaves growing along 12- to 18-inch stems. New plants often produce a star-like pattern on bare ground as rhizomes radiate away from the mother plant, but eventually it creates dense stands. Saltgrass grows easily in salty and alkaline soils, where the leaves become encrusted with salt excreted from salt glands. Native Americans collected this salt to use as flavoring for food. This stiff, coarse grass is poor forage for grazing animals. Ducks feed on the seeds, while geese, fish, and some crustaceans graze on the foliage. However, this plant is probably more important to wildlife as a provider of cover and shelter than as a provider of food. It is, however, an important food source for the larvae of the Wandering Skipper butterfly (*Panoquina errans*).

Photo courtesy © 2006 Louis-M. Landry.



Other plants to look for in this community:

Bush Lupine (*Lupinus albifrons*), Coastal Sagewort (*Artemisia pycnocephala*), Coulter's Saltbush (*Atriplex coulteri*), Dwarf Coyote Bush (*Baccharis pilularis* ssp. *Pilularis*), Sand Verbena (*Abronia latifolia*).

Creosote Bush Scrub (Desert)



This desert plant community is found at the lower elevations (below 3,500 feet) in southeastern California. Plant leaves and roots have adapted to withstand intense solar radiation and both extreme cold and extreme heat. Annual rainfall is typically less than 7 inches. Dominated by Creosote Bush, this desert community presents showy, seasonal displays of wildflowers in wet years. This region is very fragile. Where non-native annual grasses have been introduced (and spread), fires can sweep through. Paths worn into the soil by travelers at the turn of the century can still be seen today.



Creosote Bush

Larrea tridentata

This drought-tolerant, evergreen shrub grows to 6 feet tall and 8 feet wide. A distinct odor and the sheen on the small, dark leaves are due to a varnish-like coating. This coating keeps the leaves from drying out and also discourages grazing animals. Only one insect eats these leaves—the tiny Creosote Bush Grasshopper (*Boottettix argentatus*)—which spends most of its life on the Creosote Bush. The plant's bright yellow, 5-petaled flowers bloom in winter and spring. When there is ample summer rain, Creosote Bush successfully reproduces sexually, by seed. However, it achieves its status as one of the most stable members of desert communities by reproducing asexually, by cloning. In extreme drought conditions, old branches and roots die back, and when rains return, sprouts originating near the outside of the root crown replace the branches. These clones gradually expand to form rings many meters in diameter. In 1980, scientists discovered a giant, very ancient clone of a Creosote Bush in California's Mojave Desert that they estimated to be between 11,000 and 12,000 years old!



Native Americans used this plant to treat colds, stomach cramps and constipation, and to induce vomiting, draw out poisons, and promote healing of

wounds. They used it to prevent infection, aid circulation, eradicate dandruff, and to eliminate body odor. Many desert animals, including reptiles, amphibians, jackrabbits, kangaroo rats, desert tortoises and kit foxes use Creosote Bush for food, cover, perching, and for digging dens in soil that has been stabilized by its roots.



Jojoba

Simmondsia chinensis

This gray-green shrub is deciduous with persistent leaves, and grows in 4- to 10-foot mounds. Male and female flowers grow on separate plants, but both are greenish-yellow and fairly inconspicuous. The male plants produce pollen, which is carried by the wind to nearby female plants, which then produce green, acorn-like fruits. Native Americans used Jojoba nuts for soaps, cooking oil and hair care. They brewed the seeds to make a coffee-like drink, and for treating poison ivy, constipation, sores, wounds, colds, cancer, and kidney malfunction. Jojoba seeds are rich in oil that is similar to sperm whale oil, and Jojoba became commercially important after the ban on whale hunting in 1972. This oil is actually a wax that has been used in the production of electrical insulation, phonograph records, varnishes, shampoos, and pharmaceuticals. Jojoba nuts are eaten by many animals, including squirrels, rabbits, and large birds. However, only one animal, Bailey's Pocket Mouse (*Chaetodipus baileyi*), is known to be able to digest the wax. Mule deer, javelina, desert bighorn sheep, jackrabbits, and domestic livestock eat the foliage.



Other plants to look for in this community:

Blue Palo Verde (*Cercidium floridum*), California Fan Palm (*Washingtonia filifera*), Desert Encelia (*Encelia farinosa*), Desert Willow (*Chilopsis linearis*), Hedgehog Cactus (*Echinocereus engelmanni*), Ocotillo (*Fouquieria splendens*).

[more...](#)

Creosote Bush Scrub (Desert) *continued*



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Mesquite

Prosopis glandulosa

This deciduous tree can grow to 20 feet tall. It has a spreading crown and drooping branches with feathery, bright-green foliage and twigs with 2-inch thorns. Tiny, yellow-green, fragrant flowers grow in dense spikes February–September. The fruit is a long, straight, yellowish pod. Native Americans used all parts of this plant—they ground the seed to make porridge, and roasted and ate the flowers. They used the roots and bark to make baskets, the branches for firewood, and the sap as glue and as a salve for wounds and sores. Quail and other wildlife eat Mesquite seeds while deer, peccaries, and jackrabbits eat the pods and leaves. This plant attracts butterflies and is a larval host to the Reikert’s Blue butterfly (*Echinargus isola*) and the Long-tailed Skipper (*Urbanus proteus*).

Bibliography and Suggested Books

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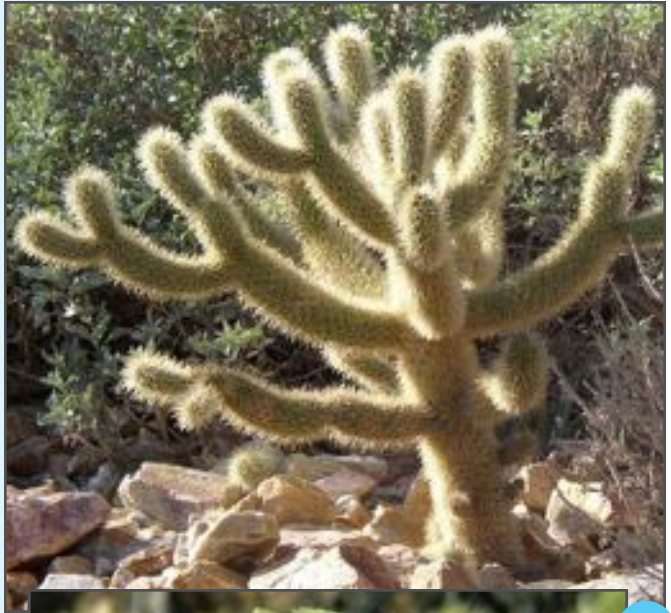
Schoenherr, Allan A., C. Robert Feldmeth, and Michael J. Emerson. 2003. *California Natural History Guides, 61: Natural History of the Islands of California*. Berkeley: University of California Press.

Dale, Nancy. 2000. *Flowering Plants of The Santa Monica Mountains*. Los Angeles: California Native Plant Society Press.

Teddybear Cholla

Cylindropuntia bigelovii

This is an upright, single-trunked cactus, native to California, Arizona and northwestern Mexico. Its name comes from its deceptively “soft and fuzzy” appearance, which is actually due to its being completely covered with pale, 1-inch, barbed spines. This cactus grows to 6 feet in height. Its lower branches tend to fall off, and the upper branches are nearly horizontal. Yellow, 1-inch flowers emerge at the tips of the stems in the spring, followed by 1-inch, yellow-green fruits which are usually sterile. This plant reproduces primarily from dropped stems which take root and grow into new (cloned) plants. Fallen stems may stick to the hair of animals and be carried some distance. Desert Woodrats (*Neotoma lepida*) gather these stems around their burrows as defense against predators.



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Suggested Websites:

California Native Plant Society <http://cnps.org/>

Calflora <http://www.calflora.org/>



6 Riparian Woodland



12 Yellow Pine Forest



16 Channel Island Flora



18 Northern Oak Woodland



10 Mixed Evergreen Forest



8 Redwood Forest



20 Foothill Woodland



28 Coastal Sage Scrub



30 Coastal Strand



22 Southern Oak Woodland



26 Valley Grassland



4 Closed Cone Pine Forest



20 Foothill Woodland



24 Chaparral



32 Creosote Bush Scrub

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