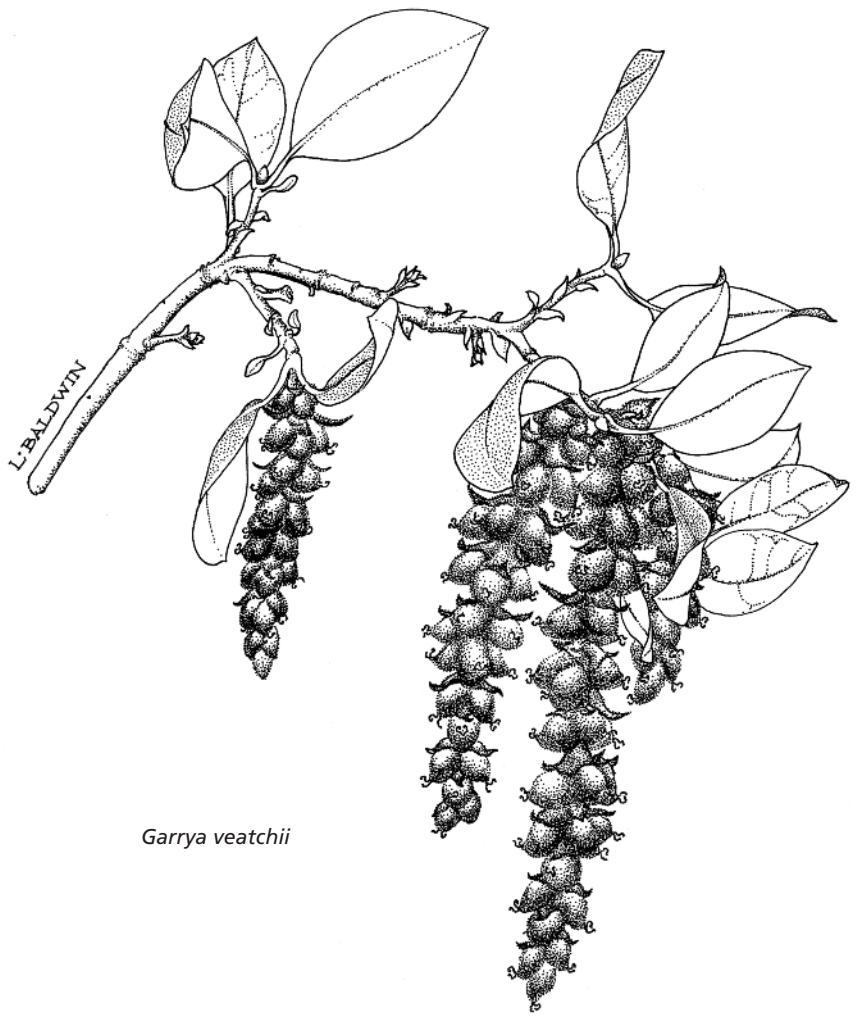
The Nature Conservancy

Protecting nature. Preserving life.®

Santa Cruz Island
Pelican Bay Trail Guide



Garrya veatchii

To reduce your impact on the landscape, please remember these guidelines:

Clean your shoes, clothing, and belongings before starting to hike to avoid introducing weeds, pest insects or plant and animal diseases.

No pets are allowed.

Stay on the trail.

Do not disturb or collect any plants or animals, or anything from archaeological sites.

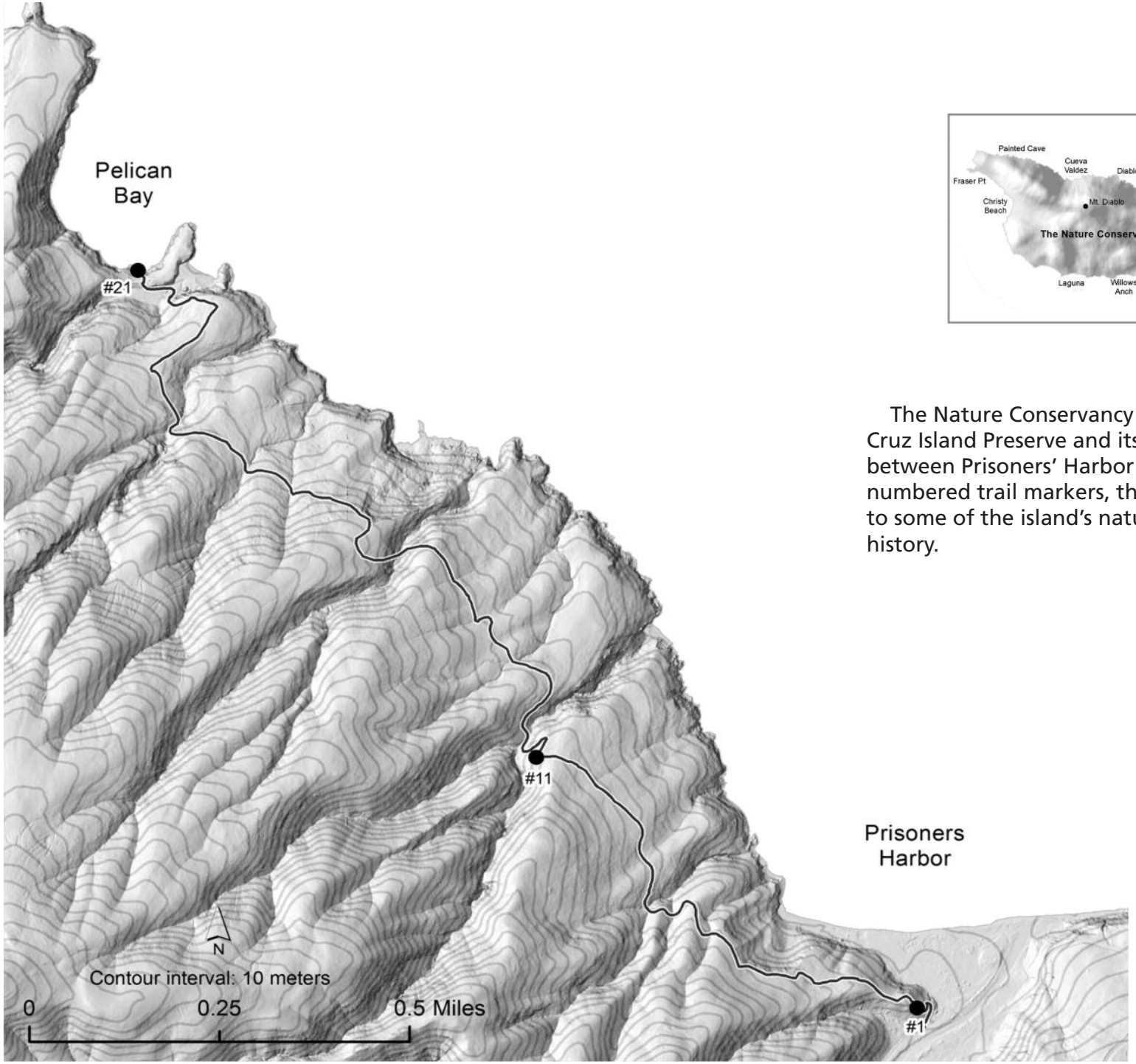
Pack out what you bring in.

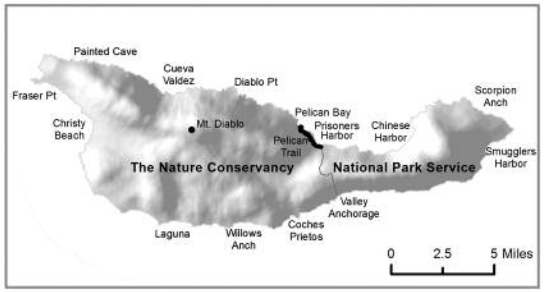
Before You Start—Some Background Information

The trail begins at Prisoners' Harbor, named for a group of about 40 convicts who in 1830 were abandoned there by the Mexican government. The prisoners fended for themselves for several months before reportedly building rafts and returning to the mainland. Prisoners' Harbor has been Santa Cruz Island's main point of entry ever since, offering protection from the prevailing northwest winds.

The trail ends at Pelican Bay, where from 1910 to 1937 Ira and Margaret Eaton ran a resort for vacationers and fishermen. The old resort is now gone, but Pelican Bay remains a popular anchorage.

Allow about 3 hours for the round trip hike.





The Nature Conservancy welcomes you to its Santa Cruz Island Preserve and its 2.1-mile trail that winds between Prisoners' Harbor and Pelican Bay. Keyed to numbered trail markers, this guide will introduce you to some of the island's natural features and human history.

Native Americans on Santa Cruz Island

More than a thousand Native Americans once lived on Santa Cruz Island, which they called *Limuw* (meaning "in the sea"). They were the Chumash people, whose region extended from what is today Morro Bay south to Malibu on the mainland and also included Santa Cruz, Santa Rosa, and San Miguel islands. A hunting-gathering-fishing people, the Chumash had a rich culture - including a complex religion, astronomy and music - and displayed extraordinary craftsmanship and seafaring skills. They established at least eleven villages on Santa Cruz Island. The island's natural resources provided food and materials for clothing, tools, and shelter. The Chumash also traded with people on the mainland for scarce or unavailable supplies, additional food, and raw materials such as deer bone and hides.

After the first Spanish explorers arrived in 1542, European diseases began to kill many of the Chumash. Those who survived saw their traditional culture give way to Spanish colonial culture and Christian beliefs. The last Chumash people were removed from the island by the early 1820s during the Mission period. Most of what we know about their history comes from archaeological findings, observations written by the Spanish, interviews by early anthropologists and from Chumash oral history.

Throughout this guide, we present examples of the ways the Chumash used plants on Santa Cruz Island. Much of this knowledge comes from research on mainland tribes and, although there are some plant species growing on the island that differ slightly from their mainland counterparts, they were probably used in similar ways.

An Overview of Land Ownership and Ranching History on Santa Cruz Island

In **1769**, all of California, including Santa Cruz Island, was claimed as property of the King of Spain.

In **1821**, California became part of the new Republic of Mexico, after Mexico's successful revolt against Spain.

In **1839**, the island was granted to Andres Castillero, its first private landowner, by the Mexican government.

In **1853**, sheep, cattle, and horses were brought to the island and ranching activities began under the supervision of Dr. James Barron Shaw. Pigs were also introduced in the 1850s.

Ranching continued under the ownership of William E. Barron, the Santa Cruz Island Company (which was originally formed by ten businessmen from San Francisco), Justinian Caire (who became the sole stockholder of the Santa Cruz Island Company by 1880), and his heirs.

In **1925**, the island was partitioned into seven parcels for the Caire family by court order.

In **1937**, the western 90% of the island was sold to Edwin Stanton, who at first continued sheep ranching, but then switched to cattle ranching. Edwin's son, Carey, continued the cattle ranching operation until his death in 1987.

In **1978**, The Nature Conservancy acquired a conservation easement on the Stanton portion of the island and began the removal of feral sheep, which was completed on the western 90% of the island in 1989.

In **1980**, Santa Cruz Island became part of Channel Islands National Park. The Park Service eventually acquired the eastern 10% of the island in the 1990s and removed the feral sheep from that portion by 2001.

Upon the death of Carey Stanton In 1987, The Nature Conservancy assumed ownership of the western 90% of the island and by 1989 rounded-up and removed all cattle from the island.

In **2000**, The Nature Conservancy conveyed 8,500 acres to the Park Service.

By the end of **2006**, removal of feral pigs on the entire island was accomplished by the Park Service and The Nature Conservancy.

Animals of Santa Cruz Island

The California Channel Islands were never connected to the mainland, and many animals that occur there, such as deer, rabbits, squirrels and gophers do not live on Santa Cruz Island. Santa Cruz Island is home to two species of salamanders, a chorus frog, three lizard species, two species of non-poisonous snakes, over 200 species of nesting or migratory birds, two species of mouse, the spotted skunk and the Santa Cruz Island fox. Some of these animals are unique (endemic) to either the Channel Islands or just to Santa Cruz Island. Some animals display the effects of long isolation from mainland populations: the island scrub-jay is larger than the mainland scrub-jay, while the island fox and the spotted skunk are smaller than their mainland relatives.

You may see two of the most notable Santa Cruz Island endemic animals during your hike along this trail: the island scrub-jay (*Aphelocoma insularis*) and Santa Cruz Island fox (*Urocyon littoralis santacruzae)*. The fox nearly became extinct in the 1990s, but restoration efforts have allowed its numbers to rebound to healthy levels today. Now some of the greatest threats faced by the island fox are diseases carried by dogs, for which the island fox has no immunity. In 1999, closely related Catalina Island foxes (*Urocyon littoralis catalinae*) contracted canine distemper from dogs or from racoons (introduced from the mainland), nearly causing the Catalina fox to go extinct. This is one reason why The Nature Conservancy and National Park Service do not allow pets on Santa Cruz Island or other islands of Channel Islands National Park.

Plants of Santa Cruz Island

Santa Cruz Island is the largest of the California Channel Islands and is the most diverse in terms of climate, geology, and biological resources. Santa Cruz Island's 96 square miles support at least 490 species, subspecies, or varieties of native plants along with more than 180 non-native plant taxa. Groups of plant species that commonly grow together are called vegetation communities. This trail winds through at least five such communities - grassland, coastal sage scrub, chaparral, oak woodland, and closed-cone pine forest. At least 16 plant communities have been described on this island.

Glossary

The following terms are used throughout the guide to identify the origin or historical status of the island's plants and animals:

Taxon (singular), Taxa (plural): a group of organisms sharing traits and considered to be a unit by scientists who classify organisms. The term is often used to include not only species but subspecies, varieties and hybrids.

Island Endemic: a species, subspecies, or variety that occurs naturally only on one or more of the California Channel Islands, but not on the mainland. Thirty-seven plant taxa are restricted to the California Channel Islands, and another 8 plant taxa are known only from Santa Cruz Island. The Santa Cruz Island fox and island scrub jay are found only on Santa Cruz Island.

Native: a species (taxon) living and reproducing within the range where it evolved or dispersed without the aid of humans.

Exotic or Non-native: a species (taxon) that has been introduced by humans to the island from mainland California or another part of the world.

Naturalized: a non-native species (taxon) that has become established in the wild and reproduces and spreads without human aid. Only some of the non-native species that are introduced to a new area become naturalized.

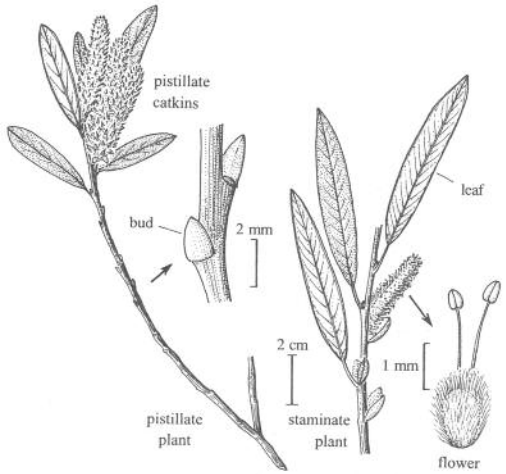
Invasive: A naturalized non-native species (plant, animal, fungus or micororganism) that spreads and suppresses native species, disrupts or dominates habitats or alters ecosystems. Invasive species can adversely affect the quality of habitat for native species and change the fundamental characteristic and function of ecosystems. Usually, only some of the naturalized species in an area are invasive.

Pampas grass (*Cortaderia selloana*) is an example of an invasive species common on the California central coast. Pampas grass, with its large showy flower plumes and large basal rosette of leaves, provides no food or shelter for native organisms, crowds out more beneficial plants and exacerbates fire risk. Pampas grass is being removed from Santa Cruz Island.

Look for numbered trail markers to identify stops. They run from 1 to 21 from Prisoners' Harbor to Pelican Bay

1.

From this overview, you can see the coastal wetland restoration project the National Park Service and The Nature Conservancy began in the fall of 2011. The stream that flows down Cañada del Puerto is the largest on the island and drains 13 square miles of the island's interior. The wetland habitat at the mouth of the canyon had been reduced by half in the late 1800s and early 1900s when former island owners filled it with rock and gravel and channelized the creek. In addition, non-native eucalyptus trees had proliferated and replaced oak woodlands, stands of willow trees, and other native plants. These changes had degraded the natural habitat for native species such as the Santa Cruz Island fox, the island scrub-jay, and migratory waterfowl. To restore the natural function and composition of the wetland, an artificial berm and fill materials were removed from the area and the landscape was reshaped to its former condition. The restoration project included earthmoving, the removal of hundreds of non-native trees, and the planting of thousands of individual native wetland plants that had been propagated and grown on the island.



Salix lasiolpis

2.

From here, you can look down into Cañada del Puerto, the canyon which drains the island's Central Valley. The tallest trees in the canyon bottom are non-native **eucalyptus**. Four species of eucalyptus were intentionally introduced to the island. They were some of the first timber trees to be planted on Santa Cruz Island, and several groves were present as early as 1885. Eucalyptus has proven to be invasive on the island and some groves are being removed so that native trees and shrubs can replace them. Other invasive non-native trees that are being eliminated from the island include **blackwood acacia** (*Acacia melanoxylon*) and **Italian stone pine** (*Pinus pinea*).

The riparian (streamside) vegetation on the Channel Islands has limited diversity compared to the adjacent mainland and is mostly comprised of several types of **willows** (*Salix* spp.), **mule fat** (*Baccharis salicifolia*) and occasionally **cottonwoods** (*Populus* spp.) and **big leaf maples** (*Acer macrophyllum*).

Since Prisoners' Harbor is one of the primary access points on the island for human visitors, many of the invasive, non-native plants that have been introduced to the island have first shown up there. Please check your shoes, clothing, and belongings (back pack, etc.) for "hitchhiking" seeds, plant parts, dried mud and insects to make sure that you are not contributing to the introduction and spread of invasive plants and animals on the island. Your help is greatly appreciated!

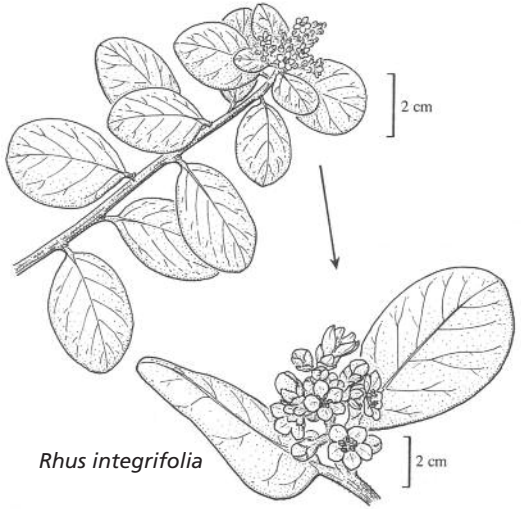
The Lookout perched above Prisoners' Harbor has been used since the nineteenth century to note the passage of ships moving between the Channel Islands and the mainland, some 22 miles distant. Now it functions as a visitor center and contains information about Santa Cruz Island.

Step into the visitor center to see a photographic exhibit of the island's wildflowers and animals, as well as a more detailed description of the island's history.

3.

In this area, you can see a good example of the **coastal sage scrub community**, which is characterized by low-growing, drought-resistant shrubs. **Coastal sagebrush** *(Artemisia californica),* the gray-green shrub along the trail, is one of the dominant plants of this vegetation type. Coastal sagebrush is in the sunflower family, and like the "true sages" *(Salvia* species) in the mint family, its foliage has a pungent fragrance. Gently rub some of the soft, thread-like leaves between your thumb and forefinger to release the scent.

A larger shrub with dark green, evergreen leaves that is also common in the coastal sage scrub can be seen along the trail at this point. Early settlers and Native Americans in southern California used the fruits of **lemonade berry** (*Rhus integrifolia*) to make an acidic drink similar to lemonade.



Rhus integrifolia

If you've hiked through coastal sage scrub on the mainland, you're probably familiar with **coyote brush** *(Baccharis pilularis).* The similar **Plummer's baccharis** *(Baccharis plummerae)* found here looks much like coyote brush, but the leaves are thinner and more elongated. Male and female flowers occur on separate plants. On windy days in the fall, masses of fluffy white fruits disperse from the female plants.

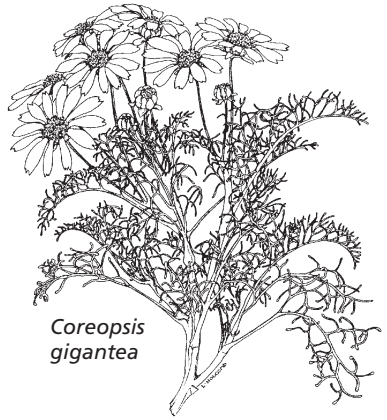
In early summer, the long, reddish-brown flower stalks of **island buckwheat** *(Eriogonum grande* ssp. *grande)* produce clusters of small cream-colored flowers. The dense green leaves at the base of the plant turn rusty red in late summer and are soft, white and fuzzy on the back. Two species of *Eriogonum* (one with two subspecies) grow on Santa Cruz Island, and all three taxa are endemic to the California Channel Islands.

In late summer and early fall, the native **California fuchsia** *(Epilobium canum)* produces bright reddish-orange funnel-shaped blooms. Hummingbirds frequently visit the plants when they're in bloom and jealously "guard" the flowers. The nectar contained in them provides an extremely important source of sugar for the hummingbirds, after the spring and summer flowers of other species of plants have dried up.


Epilobium canum spp. *angustifolium*

4.

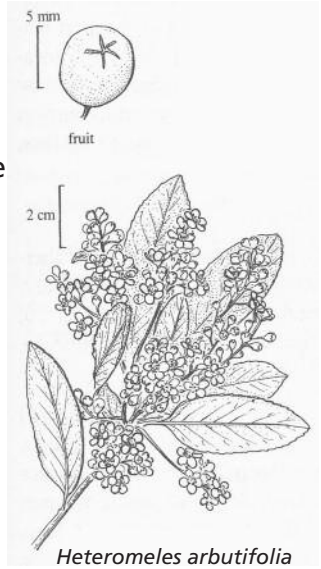
Look on the south side of the trail to see the native **giant coreopsis** *(Coreopsis gigantea).* For most of the year, all that can be seen is a dormant, leafless trunk growing out of the rocky soil. This apparently lifeless stalk gives no hint of the magnificence to come in March and April when green, feathery leaves sprout from the top and bundles of bright yellow, daisy-like flowers appear. Before sheep were introduced to Santa Cruz Island, huge stands of the giant coreopsis set the springtime hillsides ablaze with color. But years of grazing left the giant coreopsis growing only on inaccessible canyon walls and ocean cliffs. Since the late 1980s, when sheep were removed, these plants have been re-establishing in many parts of the island.


Coreopsis gigantea

Poison oak (*Toxicodendron diversilobum*) can also be seen in shady spots here. In the late winter and spring the leaves are bright green, but as summer leads to autumn, the leaves turn red and then drop off for the winter. Oils produced by this plant can cause severe skin rashes (contact dermatitis) in humans. Despite this, the sap was used medicinally by Native Americans who also used a black dye obtained from the sap in their basketry.


Toxicodendron diversilobum

5.



Heteromeles arbutifolia

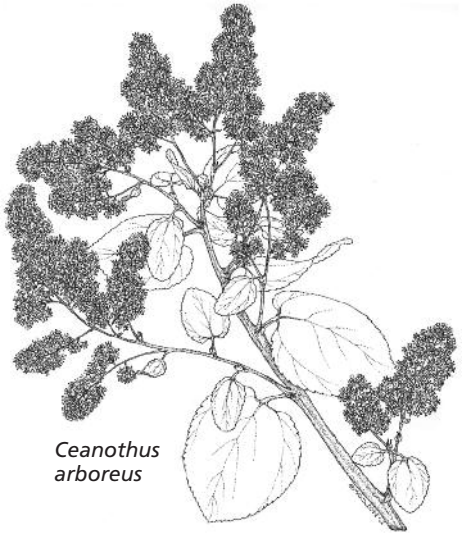
Look for **Christmas berry** or **toyon** (*Heteromeles arbutifolia*), which is an evergreen chaparral species and a popular garden plant in California. The white flowers that bloom in June and July develop into clusters of bright red berries in fall and winter. The Chumash people roasted toyon berries or let them wilt in the hot sun to volatize and remove the cyanide compounds from the berries before eating. Toyon branches were shaped into tools, fishhooks, harpoons, arrows, and structures. When burned, the hard, dry wood was ideal for smoking fish. The island toyon has not evolved into a separate species. Perhaps birds carry toyon seeds across the channel from the mainland, and in doing so break down the "genetic isolation" that might otherwise occur.

Summer holly (*Comarostaphylis diversifolia* spp *planifolia*) can also be seen along the trail here and looks very similar to toyon. As the name implies, summer holly fruits in the summer months, the opposite time of year from toyon. Both toyon and summer holly have white flowers, but the flowers of the two species have very different shapes. Toyon flowers are erect and have 5 distinct petals. The flowers of summer holly are pendulous and all of the petals are united into an urn-shaped corolla. To distinguish between the two species when the plants are not in flower, compare their bark. Toyon has whitish, relatively smooth bark, while summer holly's bark is reddish and peels off in long strips.

Fruits of both toyon and summer holly are eaten by island foxes, and provide nutritious food for them at different times of the year.

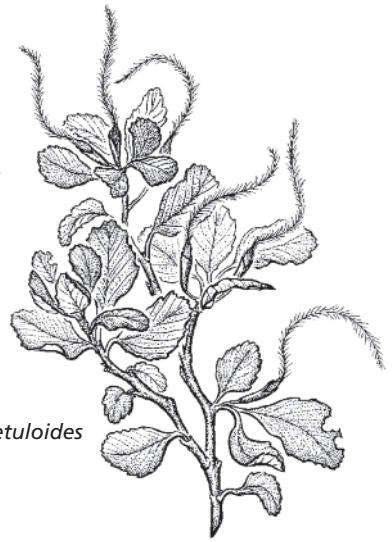
6.

The **island ceanothus** (*Ceanothus arboreus*) in this area typically blooms in March and April, bearing showy clusters of pale blue or violet flowers. The oval leaves of this California Islands endemic are much larger than those of most mainland species. It is the largest ceanothus in the world; individual shrubs of this species can grow to be over 20 feet tall.


Ceanothus arboreus

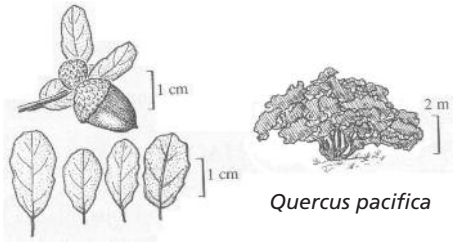
Native Americans had many uses for ceanothus. The stems of some species were used in basketry, seeds of several species were eaten, leaves and bark were used medicinally, and the fragrant flowers and unripe fruits were mashed to produce soap. The strong stems and branches were fashioned into digging sticks and poles. Early settlers in California made a tea from the leaves of many species of ceanothus.

Further along the trail you may see **island mountain mahogany** (*Cercocarpus betuloides* var. *blancheae*), which is common on the southern California mainland as well as Santa Cruz Island. In autumn the feathery "tails" attached to the fruits glisten in the sun giving the shrub a silvery incandescent glow.


Cercocarpus betuloides var. *blancheae*

7.

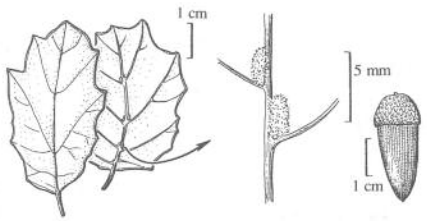
As you approach the **oak woodland** from the east**,** the trail passes two species of oaks. The first that you encounter is **island scrub oak** *(Quercus pacifica),* a short, thin-branched tree with flat, smooth-edged leaves that are rich green on the upper surface, and a dull gray underneath. The island scrub oak is only found on Santa Rosa, Santa Cruz, and Santa Catalina islands.



Quercus pacifica

You may also see "oak apples" attached to scrub oak branches. These structures (galls) are formed by the oak when insects lay eggs under the bark. The Chumash took fresh juice from oak galls, like those you may see inflating the branches into round sacs, and applied it to boils or infections. Scrub oak branches were used for making bows and arrow foreshafts.

As you continue walking to the west, the scrub oaks give way to a large grove of **coast live oaks** *(Quercus agrifolia).* Much taller and stouter than scrub oaks, coast live oaks have spiny-edged, cupped leaves and "hairy armpits". Turn over one of the leaves and look for small, fuzzy white patches where some of the side veins of the leaf join the central vein.



Quercus agrifolia

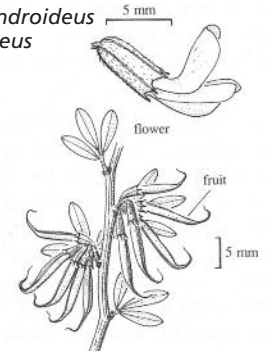
The Chumash favored coast live oak acorns over those of the other island species, first grinding them into meal with a mortar and pestle, then steeping them in water to leach out the poisonous, bitter-tasting tannins. Oak bark was used to tan animal hides and the ashes of burned green bark were soaked for an indigestion-soothing tea.

Acorns are also a favorite food for the Santa Cruz Island scrub-jay. Scrub-jays cache acorns by burying them in the ground for eating later. Sometimes the birds forget where all their acorns are hidden, and those unrecovered acorns can grow into oak trees. In this way the island scrub-jays help expand the range of oak forests.

The scattered understory plants and leaf litter of the oak woodland help stop erosion and hold moisture in the soil, which is gradually released during dry months. The understory of oak woodlands suffered great damage when feral pigs were abundant on the island.

When you walk out of the shady oak woodland, note the conspicuous change in vegetation.

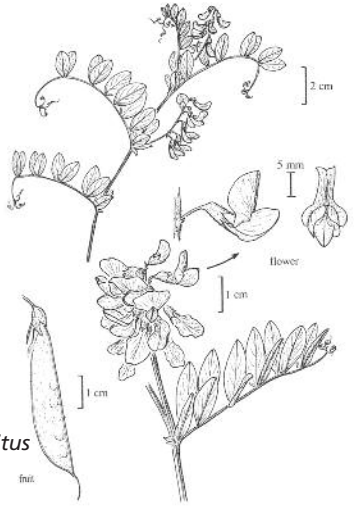
Acmispon dendroideus var. *dendroideus*



8.

Two members of the pea family are common in this open area. One of them is the island endemic **island deerweed** (*Acmispon dendroideus* var. *dendroideus*). Its small yellow flowers are present from January until July (and occasionally until October), turning orange and red after they've been pollinated. Some mainland varieties grow upright but not as woody or large; on the island, the deerweed can become an upright woody shrub.

Another pea family member in this area is the **wild sweet pea** (*Lathyrus vestitus* var. *vestitus*). This sprawling vine, which often climbs over surrounding plants, typically flowers between March and May (longer in wet years). The flowers are lavender to purple and turn a light golden brown color in age. Seeds of many species of *Lathyrus* are toxic if eaten in large quantities.



Lathyrus vestitus var. *vestitus*

9.

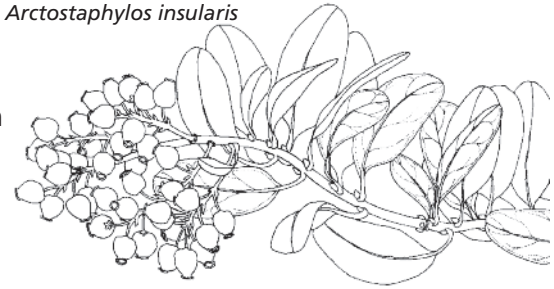

Stipa pulchra

Native **purple needle grass** (*Stipa pulchra*) is common on the ocean side of the trail. It is one of several California native perennial bunch grasses which has a well-developed root system and lives for many years. Most California grasslands are now dominated by invasive, non-native annual grasses, which only live for one season and have smaller root systems.

The purple flowers of native **blue dicks** (*Dichelostemma capitatum* ssp. *capitatum*) can be seen here in the springtime. The bulbs of blue dicks are very nutritious and were eaten by the Chumash people. This native grassland reduces erosion on this slope and helps reduce the sediments that would otherwise be washed into the marine environment downslope.

Off to the east, Chinese Harbor is visible, with strikingly different soil colors. The light-colored substrate is Monterey shale, which contrasts sharply with the much darker reddish soils produced by the Conejo volcanics in the western part of the island.

Arctostaphylos insularis



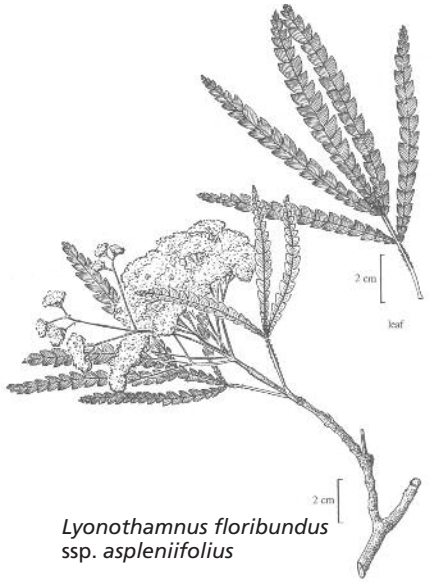
10.

Manzanita is Spanish for little apple, a reference to the plant's small, apple-shaped berries. **Island manzanita** *(Arctostaphylos insularis),* a common shrub in the chaparral community, is endemic to Santa Cruz Island. Smooth burgundy bark covers its crooked stems, peeling away as the plant ages. In winter, manzanita bears clusters of small, urn-shaped pink or white flowers. Island foxes depend on the plant's berries - look for them in the fox scat that you may encounter along the trail.

The Chumash dried and ground manzanita berries into flour that could be eaten as a dry powder or mixed with water to make a sweet cider.

Two other species of manzanita can also be found in this portion of the trail, if you look closely at individual shrubs. **McMinn's manzanita** (*Arctostaphylos viridissima*), with crowded, overlapping leaves and long white hairs on the twigs of its stems, is another species that is endemic to Santa Cruz Island. **Subcordate manzanita** (*Arctostaphylos crustacea* ssp. *subcordata*), with an enlarged root crown or burl, is endemic to Santa Rosa and Santa Cruz islands.

11.



Lyonothamnus floribundus ssp. *aspleniifolius*

Look across to the southwest side of the canyon to see a conspicuous grove of **Santa Cruz Island ironwood** *(Lyonothamnus floribundus* subsp. *aspleniifolius*). The species is endemic to four of the California Channel Islands, and this subspecies is found on just three of them: Santa Cruz, Santa Rosa and San Clemente. The fossil record indicates that island ironwood was previously widespread on the mainland, starting about 20 million years ago. It has been extinct on the mainland for about six million years and is now found naturally only on the islands, where it grows in small stands, often on steep, north-facing slopes. Santa Cruz Island ironwoods have dark green, fern-like leaves and in June and July, the trees produce large flowering clusters composed of many small white flowers. The trees may resist fire damage by shedding their gray and rust bark: as the bark catches fire it peels away from the trunk, diverting flames back to the ground and protecting the trees from what might otherwise be a deadly crown fire.

12.

In the canyon bottom, look for the perennial **canyon sunflower** *(Venegasia carpesioides),* with its large, spade-shaped leaves. In spring, the sunflower produces bright yellow flowers that continue to bloom for most of the summer.

Venegasia carpesioides

With its silvery foliage and stems, **northern island hazardia** (*Hazardia detonsa*) is a conspicuous shrub in the canyon bottom as well. It is found only on Santa Rosa, Santa Cruz, and Anacapa islands. When feral sheep were present on Santa Cruz, this shrub was heavily browsed and was found only on steep, inaccessible cliff faces. Now that sheep are gone, Northern island hazardia is much more widespread and its numbers have increased dramatically.

On the west side of the canyon bottom, look for a population of **Greene's live-forever** (*Dudleya greenei*). This species is found only on San Miguel, Santa Rosa, Santa Cruz, and Santa Catalina islands. Leaves of these low-growing, fleshy succulents have a waxy coating, which may help reflect sunlight and seal in stored moisture. The leaves of many species of *Dudleya* were eaten by Native Americans.


Dudleya greenei

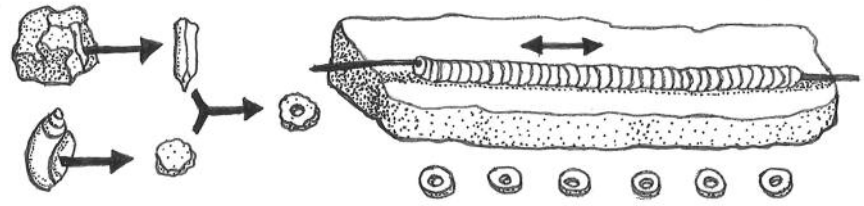
The rocks in this creek bed and on the cliff walls are Miocene volcanic rocks that are 23-5 million years old.

13.

From this point, you have a clear view of Chinese Harbor, a large cove named for the Chinese abalone fishermen who once worked there. Chinese laborers, brought to America to build the railroads, developed the abalone industry in the mid-19th century and set up camps on several of the California Channel Islands.

Chinese Harbor is also rich in the mineral chert, an important resource for the Santa Cruz Island Chumash. They fashioned chert into small blades and drills that were then used to make shell beads from shells of the olivella marine mollusk commonly called the **purple olive shell** (*Olivella biplicata*). These beads formed the currency of the Chumash's economic system. Santa Cruz Island is the only Channel Island where chert and olivella occur together, and thus Santa Cruz Island Chumash controlled the money-making process, giving them a trading advantage over mainland residents. Beads made by the Chumash have been found as far away as the Pueblo region in New Mexico.

On clear days you can see the coastline of Santa Barbara and Ventura County from here. Island Chumash depended on trade with mainland residents for meat from deer and other animals not found on the islands and the skins and bones needed to make tools. Shell-bead currency made by Island Chumash were often traded for these items. Using *tomols*, redwood plank canoes up to 30 feet long caulked with a mixture of pine pitch and tar from natural seeps on the mainland coast, they regularly made the 22 mile channel crossing.

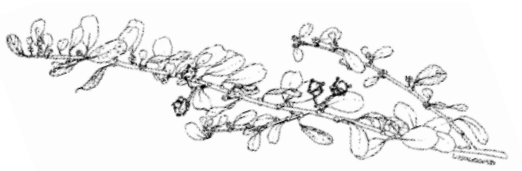


14.

Calystegia macrostegia ssp. *macrostegia*

Two more plants, each of which is endemic to several of the California Channel Islands, can be seen in this area. **Island morning-glory** (*Calystegia macrostegia* ssp. *macrostegia*) is perennial vine with strong stems that are up to 10 feet in length. It produces showy white flowers throughout much of the year and, with its widely-spreading, tough stems, can significantly reduce soil erosion in open rocky areas.

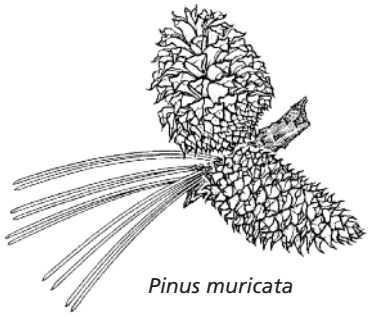
Island big-pod ceanothus (*Ceanothus megacarpus* ssp. *insularis*) typically produces clusters of fragrant white blossoms from December to April. Some bushes have so many flowers that they look like giant snowballs. Like many other island plants, the seedlings of this beautiful shrub were eaten by feral sheep. The plant greatly expanded its range after sheep were removed from the island. See text for marker #6 to learn about uses of ceanothus by the Native Americans.



Ceanothus megacarpus ssp. *insularis*

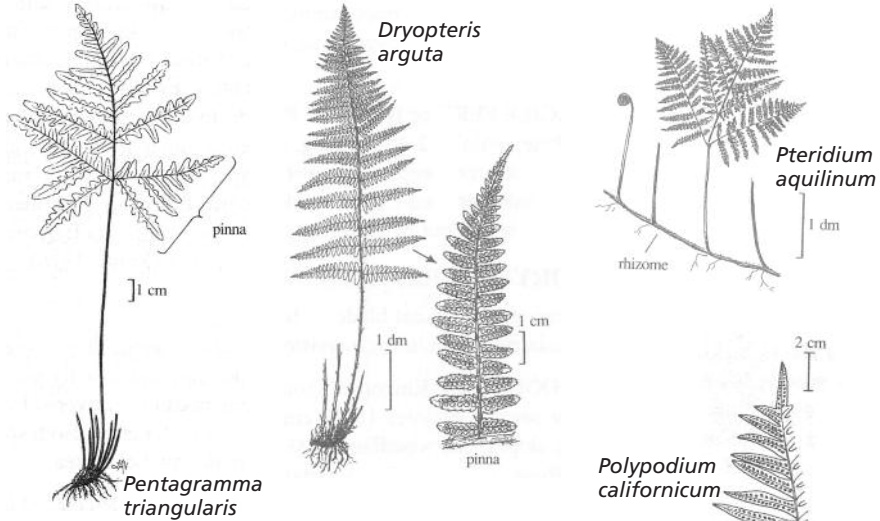
15.

The pines at this site are the **bishop pine** (*Pinus muricata*), the only pine native to Santa Cruz Island. They have two needles grouped in a cluster called a fascicle. Some of the pines in this stand bear prickly, asymmetric cones that lie close to the stem and were considered to be the same species as bishop pines that occur on the mainland. Other pines in this group with smooth, symmetric cones that stick out at right angles from the stem were considered to be a separate form of bishop pine and were often called the Santa Cruz Island pine. Sometimes you can see both types of cones on the same tree. Despite the difference in cone shape and orientation, these pines are now all considered to be just one species.



Pinus muricata

For many years, new pines were unable to survive because of overgrazing by sheep. After the sheep were removed, pine numbers on the island increased dramatically. A number of young pines can be seen growing in this area. The additional soil moisture provided by summer fogs is very important for the survival of these young trees since they haven't yet developed extensive root systems.



16.

The canopies of the trees above you help to create a cool, moist microclimate in the depths of this lush green canyon. Conditions in the canyon bottom are ideal for a variety of ferns - **goldback fern** (*Pentagramma triangularis*), **bracken fern** (*Pteridium aquilinum*), **California polypody fern** (*Polypodium californicum*), and **coastal wood fern** (*Dryopteris arguta*) - as well as for lichens and fungi.

The largest trees in this canyon are **island oaks** (*Quercus tomentella*). Island oaks are endemic to the California Islands, and can be recognized by their dark upright trunk and thick,

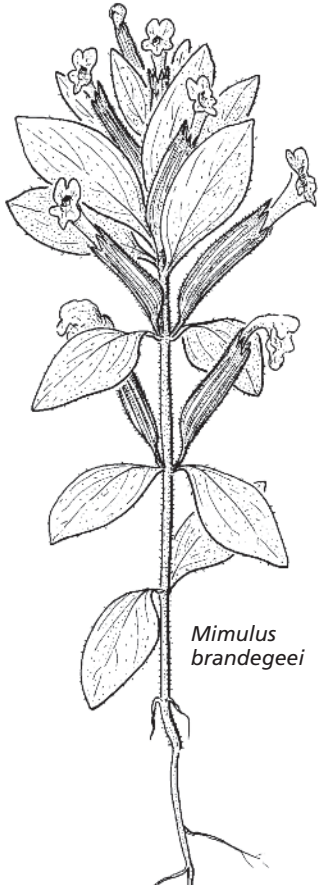
dark-green, ribbed leaves with a fuzzy, light green underside.

The large **lace lichens** (*Ramalina menziesii*)**,** sometimes called "**old man's beard**", that can be seen on the tree branches around you are very sensitive to air pollution and have dramatically declined in the Santa Barbara area on the mainland. As the human population has increased in Santa Barbara and air quality has suffered, the lace lichens have disappeared in the oak woodlands along the coast. They are still common in the interior valleys where fewer people live.

Look out for poison oak along the trail in this canyon!

17.

Monkey flower *(Mimulus aurantiacus)*, common in chaparral throughout coastal southern California, is one of the plants found in this area. Known as "sticky" monkey flower because the deep green leaves secrete a gluey substance, they bloom from April to September and were named for the monkey face that can sometimes be seen within the flower. Both the mainland monkey flower and an endemic Channel Island monkey flower (*Mimulus flemingii*) grow on Santa Cruz Island. You can tell them apart by the blossoms and leaves: the species that also grows on the mainland has orange to pale yellow flowers and sticky leaves, while the flowers of the island species are bright red and leaves are not sticky. A cross between the species produces peach or bronze-colored flowers.



Mimulus brandegeei

While these shrubby monkey flowers are common on the island, a tiny annual monkey flower that was only known from Santa Cruz Island (*Mimulus brandegeei*) was last seen in 1932 and is now presumed to be extinct.

Chamise *(Adenostoma fasciculatum)* is another plant often found in chaparral communities on the mainland. The word "chamise" is an Americanized version of a Spanish word that means brush or firewood. The plant is often called greasewood because the dry branches burn so readily and give off black smoke. Its evergreen, needle-like leaves form clusters along the branches. From April through June, tiny white rose-shaped flowers bloom in small, tight bundles. Chamise-leaf tea was given to women following childbirth and used to treat menstrual cramps.

18.

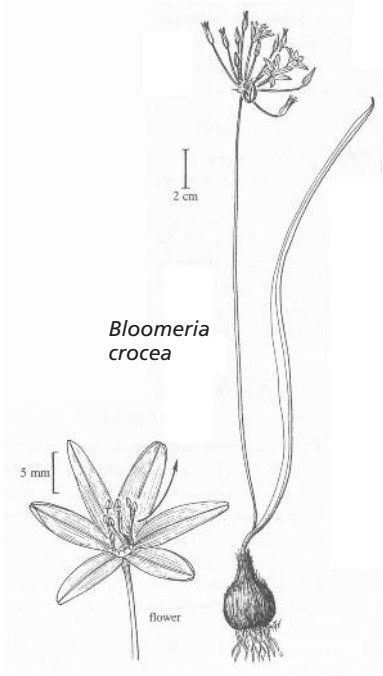
From this area, you can sometimes see **gray whales** *(Eschrichtius robustus)* as they migrate south in the fall to their tropical breeding lagoons or north in the spring to their Alaskan feeding areas. **Humpback** (*Megaptera novaeangliae*), **minke** (*Balaenoptera acutorostrata*) and **blue** whales (*Balaenoptera musculus*) also migrate through the Santa Barbara Channel. Several species of dolphin forage in these waters, and **harbor seals** *(Phoca vitulina)* and **California sea lions** *(Zalophus californianus)* haul out on the shorelines of the Channel Islands.

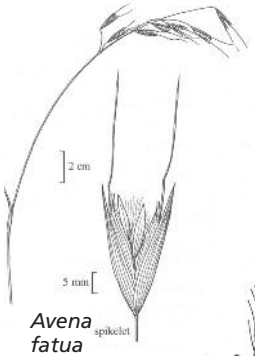
Seafood was the staple of the island Chumash diet and they netted, hooked, speared or trapped a variety of fish and marine mammals. Ground-up cactus was used to attract schools of smelt, which were scooped up in baskets. Abalone and shellfish were also harvested, and these shells are conspicuous in middens (shell dump heaps) around the island. The Chumash's dome-shaped huts sometimes featured supports made from the bones of beached whales.

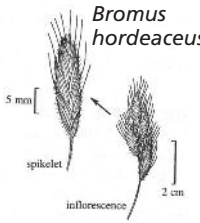
From here you can see Pelican Bay and the headland that defines its western edge.

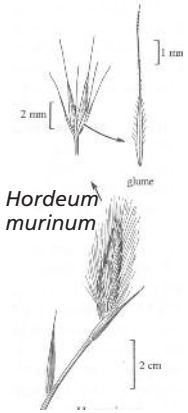
19.

You may see a few native perennial bunchgrasses such as **purple needle grass** (*Stipa pulchra*) in these grassy fields, and, in the springtime, **golden stars** (*Bloomeria crocea*) and other bulb plants. Native bunchgrasses have been severely damaged by heavy grazing or trampling on the California mainland, but are doing well in many areas on Santa Cruz Island, especially after cattle were removed.









In contrast to the perennial native bunchgrasses which live for many years, most of the grasses in this area are annual non-native species. The Spanish settlers who originally brought cattle to California inadvertently brought grass seeds in bedding and feed. These grasses became so well established that it would be impossible to remove them permanently from the state or from the island. Five of the most common introduced grasses are **wild oat** *(Avena fatua),* **red brome** *(Bromus madritensis* ssp. *rubens),* **soft chess** *(Bromus hordeaceus),* **rip-gut brome** *(Bromus diandrus),* and **foxtail** *(Hordeum murinum).* Rip-gut brome is especially able to withstand grazing pressure because bracts surrounding its seeds are lined with tiny barbs that deter grazing cattle. The seeds of many of these grasses spread by sticking to socks and shoes of hikers who inadvertently carry them to new locations where they are dislodged and later germinate.

In the grasslands you may see trails made by the Santa Cruz Island fox.

20.

Looking down into Tinker's Canyon below, you can see a large stand of eucalyptus trees. Although native to Australia, eucalyptus trees are now a familiar sight to Californians. Justinian Caire introduced four species of eucalyptus to Santa Cruz Island for use as windbreaks and as lumber for wharf pilings. These trees were planted in other parts of the island, and many have spread and established outside of the original groves. Their leaf litter inhibits growth of many other plants. Eucalyptus, and their thick litter layer, burn easily and increase the risk of catastrophic fire where they grow. Eucalyptus also draw large amounts of water when growing in drainages, making less water available to native willows and other native riparian plants used by wildlife.

This particular grove of eucalyptus was not present in the 1920s when this canyon was part of the Eaton Resort (see trail marker #21). See trail marker #2 for more information on the Island's eucalyptus trees.

21.

Pelican Bay. The crushed shell fragments scattered throughout this site and others on the island are part of a Chumash midden. In these middens, which occur around most village sites, archaeologists have found food remains such as bones and shells, tools such as mortars and pestles, basket fragments, and the remnants of fish hooks and bead-making equipment. Much of what we know about the lives and diets of the Chumash has been learned from studying middens. Re-

search is continuing, so please do not disturb this site.

Notice also the concrete stairs and other reminders of Ira and Margaret Eaton's popular resort. The Eaton Resort had a number of canvas tents and rustic wooden cabins on the peninsula on the east side of Pelican Bay where they could accommodate up to 100 people at a time. The resort operated at Pelican Bay from 1913 until 1937 under a lease agreement with the Santa Cruz Island Company. It became very popular with the "moving picture" industry of southern California and with the wealthy inhabitants of Montecito. Several movies were filmed on the north shore of Santa Cruz Island, including "Adam and Eve", "Battle of Hearts", "Male and Female", and

"Peter Pan". Some of the well-known visitors at the resort included John Barrymore, Cecil B. DeMille, William Farnum, Jack London, Theodore Roberts, and Gloria Swanson.

The trail ends here on the cliff at the ocean's edge. As you retrace your steps back to Prisoners' Harbor, enjoy the beauty of this natural area and take home memories of this unique slice of coastal Southern California.

Information about The Nature Conservancy's Santa Cruz Island Preserve can be found at: nature.org/sci

Information about The Nature Conservancy's Santa Cruz Island landing permit program can be found at: nature.org/cruzpermit

Information about Channel Islands National Park can be found at: nps.gov/chis

Recommended Reading

If you would like to learn more about Santa Cruz Island or other Channel Islands, we recommend the following publications.

Daily, Marla. 1994. *Santa Cruz Island Anthology*, 2nd edition. Santa Cruz Island Foundation Occasional Paper #1. Santa Cruz Island Foundation. Santa Barbara, CA.

Eaton, Margaret H. 1980. *Diary of a Sea Captain's Wife: Tales of Santa Cruz Island*. Janice Timbrook, editor. McNally & Loftin, Publishers. Santa Barbara, CA.

Fagan. Brian M. 1983. *Cruising Guide to California's Channel Islands*. 2nd edition. Western Marine Enterprises, Inc. Ventura, CA.

Junak, Steve, Tina Ayers, Randy Scott, Dieter Wilken and David Young. 1995. *A Flora of Santa Cruz Island*. Santa Barbara Botanic Garden. Santa Barbara, CA.

Schoenherr, Allan A., C. Robert Feldmeth and Michael J. Emerson. 1999. *Natural History of the Islands of California*. University of California Press. Berkeley, CA.

Timbrook, Jan. 2007. *Chumash Ethnobotany: Plant Knowledge Among the Chumash People of Southern California*. Santa Barbara Museum of Natural History. Santa Barbara, CA.

In addition to the publications above, the proceedings from eight California Islands Symposia are available in print and on line. Topics include geology, archeology, biology and history. http://science.nature.nps.gov/im/units/medn/symposia/index.cfm

Philbrick, Ralph. editor. 1967. *Proceedings of the Symposium on the Biology of the California Islands (1965)*. Santa Barbara Botanic Garden. Santa Barbara, CA.

Power, Dennis M. editor. 1980. *The California Islands: Proceedings of a Multidisciplinary Symposium (1978)*. Santa Barbara Museum of Natural History. Santa Barbara, CA.

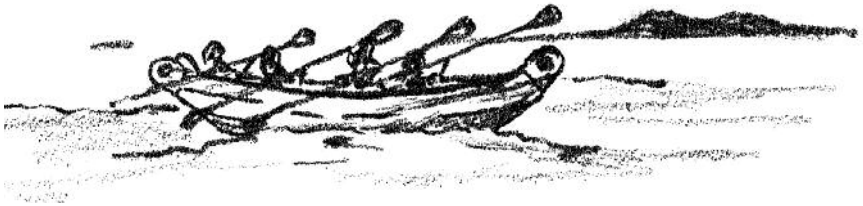
Hochberg, F.G., editor. 1993. *Third California Islands Symposium: Recent Advances in Research on the California Islands (1987)*. Santa Barbara Museum of Natural History. Santa Barbara, CA.

Halvorson, William L. and Gloria J. Maender, editors. 1994. *The Fourth California Islands Symposium: Update on the Status of Resources (1994)*. Santa Barbara Museum of Natural History. Santa Barbara, CA.

Browne, David R., Kathryn L. Mitchell and Henry W. Chaney. 2002. *Proceedings of the Fifth California Islands Symposium (1999)*. Santa Barbara Museum of Natural History. Santa Barbara, CA.

Garcelon, David K. and Catherin A. Schwemm. 2005. *Proceedings of the Sixth California Islands Symposium (2003)*. Institute for Wildlife Studies. Arcata, CA.

Damiani, Christine C. and David K. Garcelon. 2009. *Proceedings of the Seventh California Islands Symposium (2008)*. Institute for Wildlife Studies. Arcata, CA.



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The Nature Conservancy wishes to thank the following people and organizations assisting with the trail guide and trail signage: Steve Junak, members of The Nature Conservancy's Santa Cruz Island staff, Don Matsumoto, Island Packers, Marla Aufmuth, Charles Kestler, Rena Peek, Mindi Burrows, Annelies Lagerwerff, Martha Brown, Tara Reinertson, Karen Foster, Santa Barbara Botanic Garden, and all past and future volunteers. Funding for this trail guide was provided by The Nature Conservancy and the California State Coastal Conservancy.

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