

Channel Islands

National Park Service
U.S. Department of the Interior

Channel Islands National Park



Interpretive Guide

Eastern Santa Cruz Island



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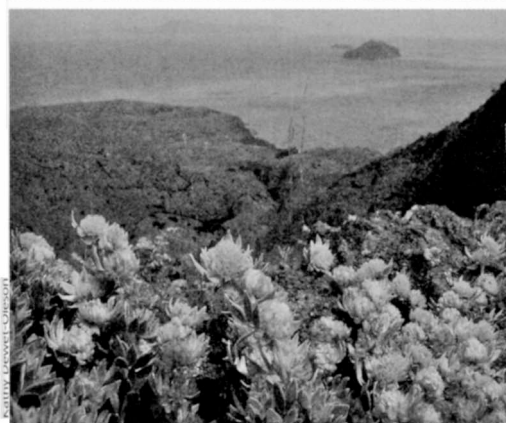
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Trail Guide 4

Scorpion Beach to Cavern Point



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Scorpion Ranch Area

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How To Use This Guide

The Trail Guide provides six interpretive stops along the one-mile walk from Scorpion Beach to Cavern Point.

The second part covers other areas throughout eastern Santa Cruz Island with in-depth descriptions.

We recommend that you begin with the Scorpion Beach to Cavern Point trail for a general overview of eastern Santa Cruz Island. Then, if there is still time, select another area to visit according to your interest and ability. For a more detailed hiking map, trail descriptions, mileage, and safety and resource protection information please see the "Hiking Eastern Santa Cruz Island" bulletin available at island bulletin boards.

Scorpion Canyon

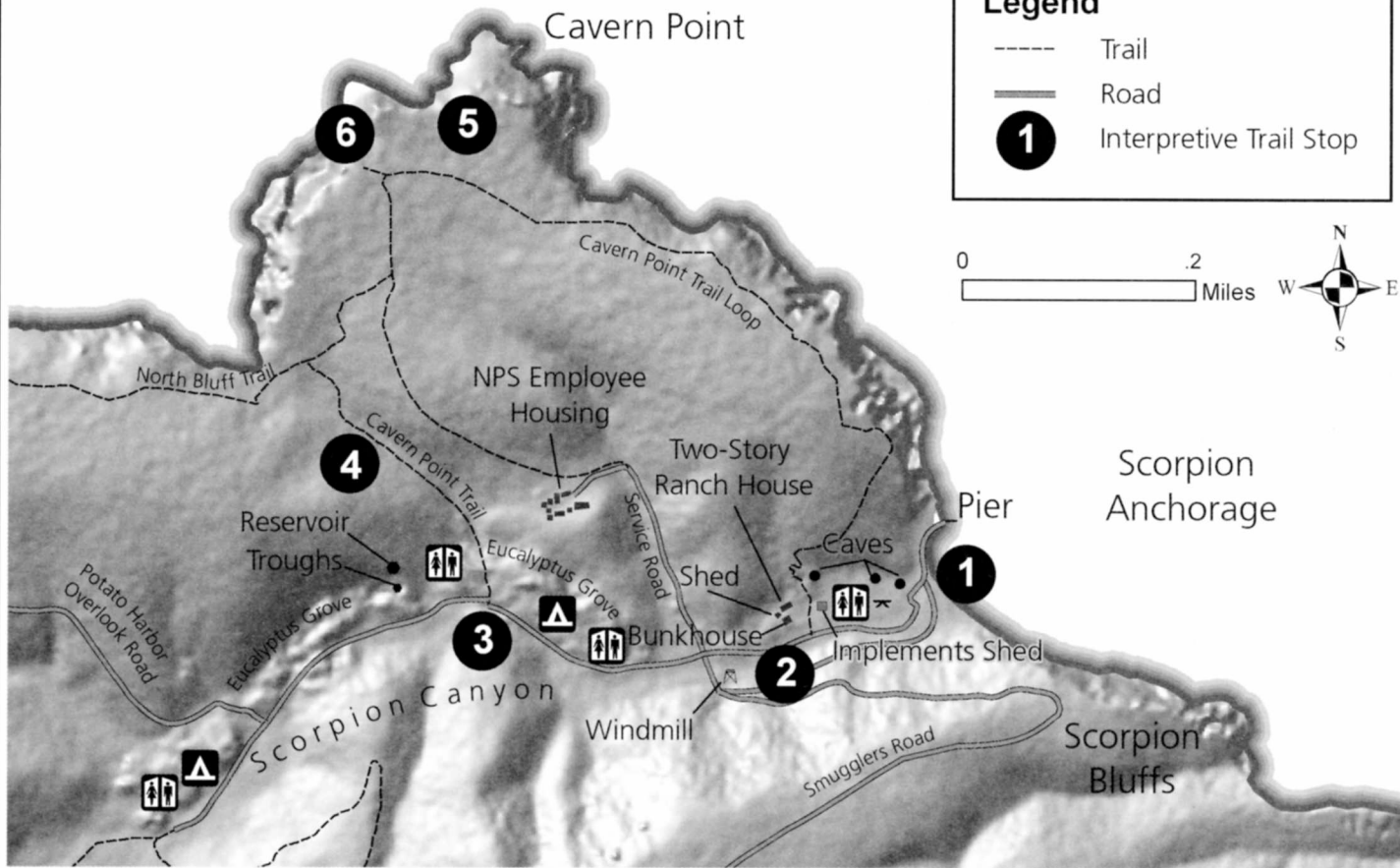
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Trail Stop
1Nowhere Else On Earth
Scorpion Beach

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Close to the mainland yet worlds apart, Santa Cruz Island, along with the other Channel Islands, is home to plants and animals that are found nowhere else on earth. Like on the Galapagos Islands of South America, isolation has allowed evolution to proceed independently on the islands, fostering the development of 145 endemic or unique species. Santa Cruz Island is host to 60 of these endemic species. Some, like the island jay, are found only on Santa Cruz.

Isolation also has played a major role in shaping human activities on the island. While the southern California coastal mainland has seen extensive development, the Channel Islands are undeveloped. The island's separation from the mainland by 25 miles of an often turbulent ocean has limited and directed human use and occupation for thousands of years. And it continues today, giving us a chance to see coastal southern California as it once was.

So step back in time and experience the island's isolation as you walk to Cavern Point. It's like nowhere else on earth.

P

reserving the Past

Scorpion Ranch Complex

Isolated and far behind the times as the island was, it was a demonstration of how a group living as we did could learn to make do with what we had.

—former ranch superintendent, Clifford McElrath, *On Santa Cruz Island*

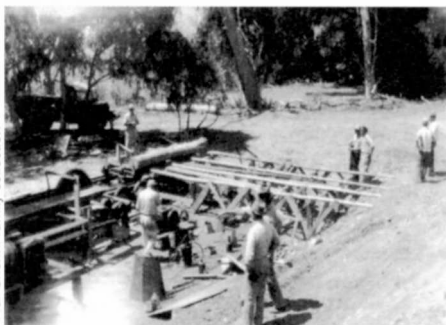
While the isolated island offered ranchers several advantages over the mainland, including no predators and the world's best fence (the ocean), it created special challenges as well. Supplying such a remote outpost was probably the biggest challenge. The transportation of supplies and stock onto and off the island was always an adventure—the distance to the mainland, rough seas, and expense made it very difficult. However, as former ranch superintendent Clifford McElrath wrote in his memoir *On Santa Cruz Island*, ranchers would adapt to the difficulties of isolated island life through self-reliance and by “learning to make do with what [they] had.” Pier Gherini, former owner of the eastern portion of the island, wrote a humorous story in “Island Rancho” about the self-reliance of Joe Griggs:

“Joe could do most anything, except write. An expert rider, huntsman, and general ranch worker, Joe also was a mechanical whiz. He once took a 1915 Waterloo Boy tractor that had been “mothballed” because the early workmen wouldn’t touch it, and used the parts to make a sawmill. The fact that we didn’t need a mill in no way detracted from the ingenuity and skill that went into its making. All of these people had one common characteristic. They knew and loved the Island. Each in his own way was rugged and self-reliant. They took its beauties and hardships in stride.”

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Unloading sheep, Scorpion pier, 1977.



Sawmill built by Joe Griggs, 1955.



Sawmill as it looks today (bottom, right).

Trail Stop
2continued

Scorpion Ranch Complex



Historic bunkhouse, ranch house, and grader at Scorpion Ranch.



Historic chapel in the central valley.

Although livestock ranching on Santa Cruz Island began in the 1850s, it was under the direction of Justinian Caire beginning around 1880 that a variety of agricultural and ranching endeavors were developed in an effort to create a self-sufficient operation on the island.

In *California's Channel Islands*, Marla Daily writes that, "Buildings including several ranch houses, bunkhouses, barns, wineries, a chapel, mess hall, blacksmith shop, and saddle shop were constructed. Wherever possible, native island materials were used. Kilns were built for the manufacture of bricks and limestone mortar. Stones were quarried and cut to shape on the island. A resident blacksmith forged wrought-iron fittings, railings, and hinges used on many of the buildings. Employees included masons, carpenters, dairymen, team drivers, vintners, a wagon maker, cobbler, butcher, seasonal grape pickers and sheep shearers, a sea captain and sailors to run the company's 60-foot schooner. Hay, vegetables, and over a dozen varieties of grapes were grown, in addition to almond, walnut and other fruit and ornamental trees. Sheep, cattle, horses, and pigs were raised."

Since the island was too large to manage from the one main ranch in the Central Valley, other facilities, or out-ranches like the one at Scorpion, were developed. Completed in 1887, the two-story Scorpion ranch house, and later, the wooden bunkhouse (ca 1914), were home to ranch hands who tended the flocks of sheep and cattle and the crop fields on the broad plateaus and rich black soils on this eastern end of the island. Known as the "granary of the island," the Scorpion and Smugglers ranches were the bases that supplied much of the food and hay for the island operation.

Sheep ranching for meat and wool by descendants of Justinian Caire, the Gherini family, continued on the eastern end of Santa Cruz Island between 1926 and 1984. The Gherini era ended in February 1997 when the National Park Service acquired the last interest from the family. Today, the National Park Service is preserving the historic area so visitors always will have the chance to remember and understand this unique part of the island's past.

Return of the Natives

Eucalyptus Grove/Cavern Point Trail Junction

The over 100-year-old blue gum eucalyptus grove that spreads out behind the ranch area was one of many groves that were planted throughout the island during the ranching era for use as windbreaks, fuel, and wharf piles. Fortunately, the spread of these non-native trees can be controlled. Many other non-native plants that reached the islands during the ranching period, however, are not as benign.

What was once an island covered with 80-90 percent shrubs and trees and 10-20 percent native grasslands, has been reduced largely to non-native, European grazing grasses and an assortment of weeds. Coastal sage-scrub, chaparral, oak scrub, oak woodland, and native

grasslands (both annuals and perennial) have given way to oats, bromes, fox-tails, thistles, mustard, and fennel. Today, nearly 25 percent of the plant species found on eastern Santa Cruz are introduced by humans, providing approximately 75 percent of the ground cover.

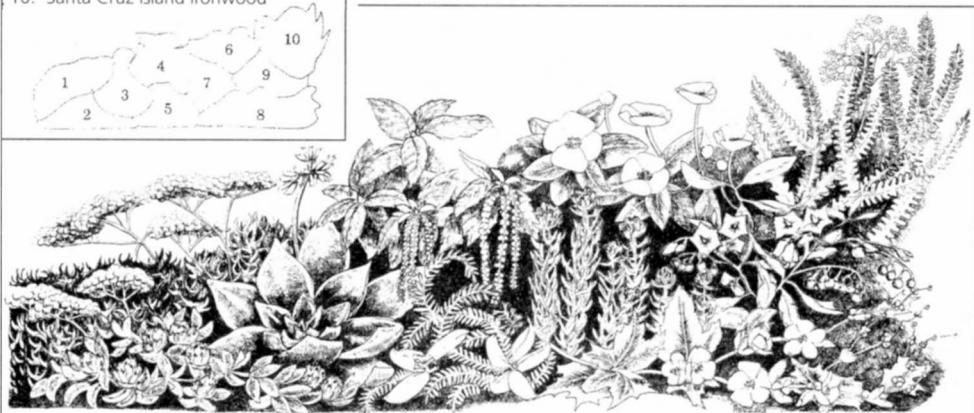
Native plants that developed in isolation often are vulnerable to competition from introduced or alien species. Many of these alien plants have evolved with grazing pressure, whereas the native island plants have not co-existed with grazers or browsers on the islands since the pygmy mammoths, nearly 12,000 years ago. With sheep, cattle, horses, and pigs grazing and browsing on the native vegetation and disturbing the soil, the alien plants spread rapidly, competing with the natives for limited soil and moisture. The non-natives eventually overwhelm the natives, which often have longer germination and growth cycles.

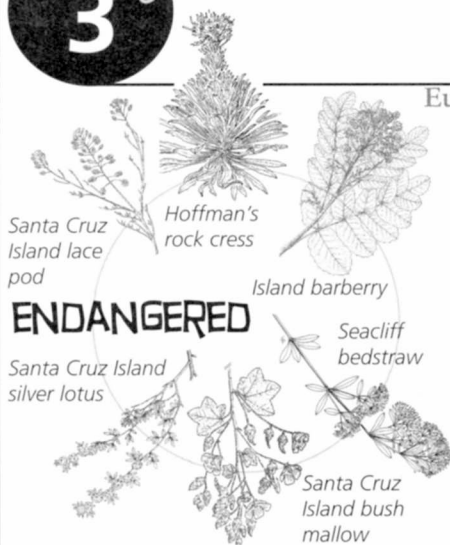
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Endemic Plants

Santa Cruz Island

1. Santa Cruz Island buckwheat
2. Santa Cruz Island silver lotus
3. Channel Islands live-forever
4. Island oak
5. San Miguel Island locoweed
6. Island bush poppy
7. Island paintbrush
8. Santa Cruz Island bush mallow
9. Northern island nightshade
10. Santa Cruz Island ironwood



Trail Stop
3

The restoration of the island's native vegetation is the goal of the National Park Service. Special focus is being placed on the plants that are endemic to the islands, those occurring only on the Channel Islands and nowhere else in the world. Eight of these occur only on Santa Cruz Island. Nine of these endemic plants are listed as endangered species. To ensure the survival of these unique species and encourage the recovery of the island's native vegetation, the National Park Service, along with The Nature Conservancy, is working towards the removal of non-native species. Over 9,000 sheep were removed from the eastern 6,200 acres of Santa Cruz between 1997 and 1999 (Sheep were eliminated by The Nature Conservancy from the rest of the island by the late 1980s.) Pigs were removed from the island by 2007 and weed control is currently underway.

One needs only to look at the recovery of vegetation, reduction of erosion, and the condition of archeological sites on San Miguel Island since the removal of sheep in the 1950s to envision what may eventually occur on Santa Cruz.

continued

Eucalyptus Grove/Cavern Point Junction



San Miguel Island in 1930 (top) and in 2000 (middle) from about the same angle. The island's native vegetation as it appears today above Cuyler Harbor (bottom).

Described as a "barren lump of sand" in the 1930s, San Miguel has undergone a remarkable recovery and now is densely vegetated with a diverse assemblage of native plants. In fifty years, we hope to write about the remarkable recovery and return of the native plants of Santa Cruz Island.

Geographical Isolation

Halfway up the Canyon

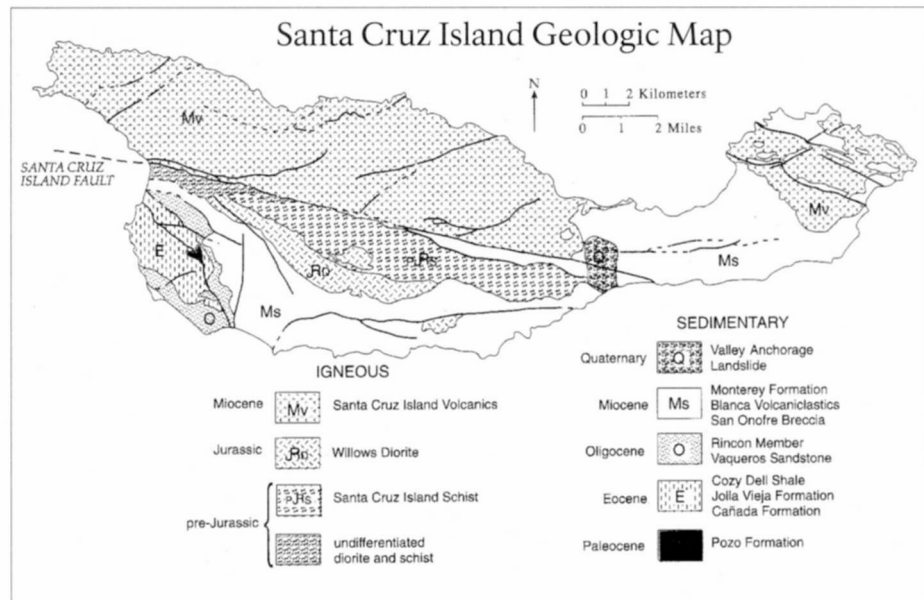
As you hike up to Cavern Point, take a moment and rest halfway up the canyon. As you have been hiking, you probably have noticed areas of bright white, chalky rock that have been exposed along the hillsides due to erosion. While this excessive erosion due to overgrazing is detrimental to the island's native vegetation, it does give us the chance to take a closer look at part of the island's complex geology.

This white layer is known as diatomaceous earth. It is derived from very small, single-cell sea plants called diatoms, which are made of silica (silicon dioxide). As these plants die, their silica skeletons settle into the various marine sediments at the bottom of the ocean, often en masse. It is from this

diatomaceous earth that the mineral chert is derived—some of the siliceous diatoms are dissolved by water and then later recrystallized as a dense hard form of rock. Chert fractures like glass and was used by the Chumash Indians for arrowheads, drill bits, and scraping and cutting tools. Chert on the islands has a light brown color owing to small amounts of iron impurities. Other impurities in chert give it a variety of colors that can be found throughout the world. The black variety is called flint and is colored by inclusions of organic matter. Jasper is the name given to the red-colored variety owing to inclusions of an iron oxide, hematite.

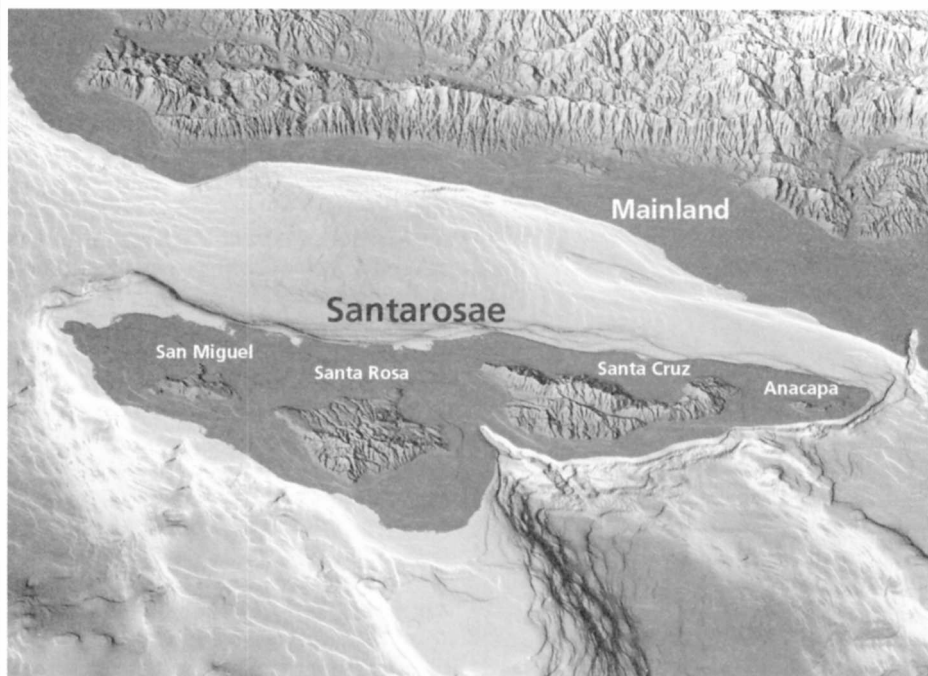
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Santa Cruz Island Geologic Map



continued

Halfway up the Canyon



Although never connected to the mainland by a land bridge, the four northern islands were once part of the Pleistocene 'superisland' known as Santarosae, nearly four times as large as the combined areas of the modern Channel Islands. The dark shaded area on the map depicts ancient coast of Santarosae and California around 20,000 years ago when sea level was 100 meters (approximately 350 feet) lower than it is today. As the ice sheets and glaciers melted and the sea level rose, only the highest parts of Santarosae remained as modern islands. (Adapted from a map by geologist Tom Rockwell)

Around 5 million years ago, compressional forces, caused by the ramming of Baja California into southern California, resulted in folding and faulting of these marine sediments and volcanic rocks (deposited between 15-30 million years ago) and the eventual uplift of the islands. These compressional forces are still ongoing, making this area geologically active today. Earthquakes are quite common. A major fault that runs through the center of the island has moved nearly 100 feet in the last 30,000 years, and all the islands continue to be uplifted.

Ever since these compressional forces caused the islands to emerge from the sea, they have been separated from the mainland. For decades, scientists assumed that the two were connected by a landbridge, but as bathymetric information (or topography) of the sea floor improved, it revealed that even during periods of lowest sea levels (about 17,000 years ago), the islands still remained isolated by at least four miles of ocean. It is this continuous geographical isolation that has shaped island life.

An Ideal Isolated Island Home

Cavern Point

A cool, salty mist fills the air as you approach Cavern Point. The ever-present western gulls and graceful pelicans often can be sighted soaring along the steep, rugged volcanic cliffs. These cliffs, their numerous caves, and the rest of Santa Cruz Island's coastline and neighboring islets are home to eleven different species of nesting seabirds and shorebirds, including ashy storm-petrels, Brandt's cormorants, Cassin's auklets, pigeon guillemots, and black oystercatchers.

Santa Cruz, the other Channel Islands, and all their associated islets and offshore rocks comprise one of the largest breeding centers on the west coast for sea birds and shore birds. Their isolation and freedom from predators and human disturbance, and the abundance of food in the cold, nutrient-rich ocean waters, make them an ideal place for marine birds to breed and rear their young.

This isolation and abundance of food also make the islands an ideal home for seals and sea lions. Watch for California sea lions and harbor seals swimming in the waters around Cavern Point and Potato Harbor. These two species rest and breed throughout Santa Cruz Island's shoreline.

But even the island's isolation could not protect these and other sea mammals from human predation. As early as the late 1700s fur hunters were exploiting sea otters, elephant seals, fur seals, and California sea lions for their fur, hides, and oil. This slaughter would continue until 1911, when the sea otter finally became the last sea mammal to receive legal protection.

Isolation also was not able to protect some species of sea birds from human impacts. The gathering of eggs, disturbance of rookeries, and pesticides all have been detrimental. The endangered California brown pelican, for example, once nested on Scorpion Rock, but human disturbance caused the entire colony to be abandoned by the 1930s.

In addition, during the 1960s, the pesticide DDT nearly caused the pelican to become extinct as a breeding species on the west coast of the United States. In 1970, on neighboring Anacapa Island, only 552 nesting attempts were made with just one chick surviving. On October 13, 1970, the brown pelican was listed as an endangered species.

Today, the gradual recovery of these species continues as their isolated island home is ensured protection within Channel Islands National Park. Through monitoring and restoration programs, the park and its partners are working to conserve critical nesting habitat and to protect the integrity of island and marine ecosystems that support 90 percent of the seabird populations in southern California.

On Santa Cruz, these efforts have focused on closing off public access to certain habitat critical sea caves and restoring seabird habitat on Scorpion and Orizaba Rocks. These rocks are important nesting islets for burrow-nesting seabirds. To restore seabird habitat on these islets, restoration efforts have included removing non-native vegetation, revegetation with native plants, installation of nest boxes, and closures to protect nesting seabirds.

Trail Stop 6

Channel Islands



A Window Into Their World

Southwest from Cavern Point

As you return from Cavern Point and head off to the right (southwest) you will see a change in rock type—from the darker volcanic rocks to a lighter, sedimentary deposit. Look carefully without digging or disturbing the area and soon you will see tiny fragments of broken shell glittering in the soil and a pile of shells falling out from the cliff edge. How did these shells get up here? Must be the ocean at work—or is it?

Archeologists identify this as a “midden,” a debris pile containing remnants of those societies who came before—the Chumash and their ancestors. This midden is just one of an estimated 3,000 prehistoric sites on Santa Cruz Island, ranging from small temporary camps to larger villages and dating back at least 7,500 years. At the time of European contact (Cabrillo’s voyage in 1542), at least 1,200 Chumash lived in 10 villages distributed around the island’s coast, including the largest historic island village, Swaxil, located near the Scorpion ranch.

These midden sites offer us a window into the Chumash world. By examining these sites, archeologists can piece together a picture of their ancient island life. The

Chumash were skilled crafts people and seafarers with a vast knowledge of the world around them and how to use it for their survival. The predominance of shells and fish bones within the midden reveal that although the islanders exploited terrestrial plant resources, such as acorns and cherries, they subsisted primarily on fish, shellfish, and other marine organisms. They often plied the channel in search of this rich variety of marine food, traveling in swift tomols (canoes) made of redwood or pine planks caulked with tar from natural seeps.

The midden also reveals that other items not available in this isolated island environment had to be obtained from villages on the mainland or other islands. One of the principal products manufactured and traded by the islanders was shell beads, which were the currency of trade in the Chumash area and throughout California. Chert microdrills were used to bore holes in pieces of Olivella snail shells to produce these beads. Not only did the islands have an abundance of Olivella shells, but, even more importantly, eastern Santa Cruz Island had considerable natural deposits of chert, a hard durable silica rock.

Taking from or disturbing of any archeological site or artifacts is a violation of state and federal law.

Help preserve 13,000 years of Native American Indian island culture and other cultural resources by respecting these sites.

continued**Southwest from Cavern Point**

Eastern Santa Cruz Island was the center for manufacturing chert microdrills, as this location had chert of the proper type and quality for such tools within coastal Chumash territory. One particular site contains evidence of the highest density of microdrill production in North America. Other sites on Santa Cruz have been labeled by archeologists as “bead factories,” with amazing amounts of discarded drills and bead debris.

Santa Cruz Island was not, unfortunately, isolated enough to protect the Chumash from the diseases the Spanish brought with them as they began colonizing California in the late 1700s. By the early

1800s, the island Chumash population had been devastated by measles and other introduced epidemics. The last of the Chumash islanders would leave their traditional island home in 1822.

Although much has been lost, enough remains to remind us of this unique part of the island’s past. These midden sites, along with today’s descendants of the island Chumash, give us a window into this ancient world and remind us on another level how important and sacred these isolated islands are.

Protecting the Islands

This is why Channel Islands National Park was established by Congress in 1980—to protect, preserve, and teach us about the islands’ unique past and fragile resources, including: the island Chumash and the ranchers who came after them; the native plants that are struggling to recover; the complicated geologic story; the pinnipeds, sea birds and shore birds that depend on these isolated islands for survival; and the wide variety of other natural and cultural resources not mentioned in this trail guide. By understanding these resources and the role isolation plays on these islands, we can avoid repeating the mistakes of the past and help preserve them for future generations to study and enjoy.

The National Park Service needs your help as well. We encourage you to explore and learn more about Santa Cruz Island and the rest of the Channel Islands. But don’t stop there. In recognizing the importance of these islands, take your awareness to the action level. Make every effort to safeguard—to preserve—the plants, animals, and artifacts found not only within this park, but throughout the world as well.



SCORPION RANCH AREA

Place Name

It is unclear how Scorpion was named; it may be the shape of the valley or the fact that there are small scorpions present.

Pier

Prior to the construction of the first pier at Scorpion Harbor, small boats, or “lighters,” were used to offload supplies. According to John Gherini in his book *Santa Cruz Island: A History of Conflict and Diversity*, “The freight was unloaded onto a pontoon, and a heavy rope ran from the schooner to a deadman on the beach. The crew working on the pontoon would guide it to shore as a team of horses on the beach would pull the lighter ashore.”

Eventually a pier was constructed in the center of the beach at Scorpion Harbor in the early 1930s, using the thick trunks of eucalyptus trees as pilings for the wharf. “With a pier in place,” states Gherini, “ranch hands herded the sheep (about 1,000 to 1,500 annually) onto the rickety wharf, through the wooden corrals and into the loading chute which hung precariously over the side of the pier. The sheep often leaped from the chute onto the boat which frequently moved with the surging currents. The boat, loaded with sheep, sailed for Santa Barbara with deckhands moving among the packed

sheep and lifting up the animals who had fallen to prevent them from suffocating. The trip ended at Stearns Wharf where the sheep were off-loaded. In later years, the boats cruised down to Port Hueneme in Ventura County, which was better equipped to handle livestock. From the mainland ports, the sheep were moved into waiting trucks and driven to the livestock yards and slaughtered for meat.”

After this first pier was destroyed by winter storms, Pier Gherini constructed a combination concrete and wood wharf in 1938 and, later, a steel pier was erected in 1966. Violent winter storms destroyed the wharves, no matter what the design. In summer 1999, the National Park Service took its turn at building a pier. . A concrete abutment was constructed on the shore and a military flatbed railroad car was laid down, connecting the new abutment to the historic concrete block. This pier has increased safety and accessibility on eastern Santa Cruz Island and has, so far, survived the winter storms.

Flooding in Scorpion Valley

The El Niño event of 1997-1998 had a devastating impact upon the Scorpion Ranch area. During the night of December 5, 1997, over 12 inches of rain fell on eastern Santa Cruz Island, sending over one billion gallons of



Scorpion Valley and the first wharf built at Scorpion Harbor in the 1930s.



water down the valley in which you are standing. Flood waters crested at almost four feet above the valley floor, inundating the area with mud and alluvial deposits over two feet thick. This torrent destroyed the campground and caused extensive damage to trails, property, and the structures in the historic ranch. The storms swept away the historic blacksmith shop, barn, and moved the

wooden bunkhouse (1914) 30 feet off its foundation.

Preservation work on the historic ranch features has been completed and the two-story ranch house is now open to the public as a visitor center.

Two-Story Ranch House

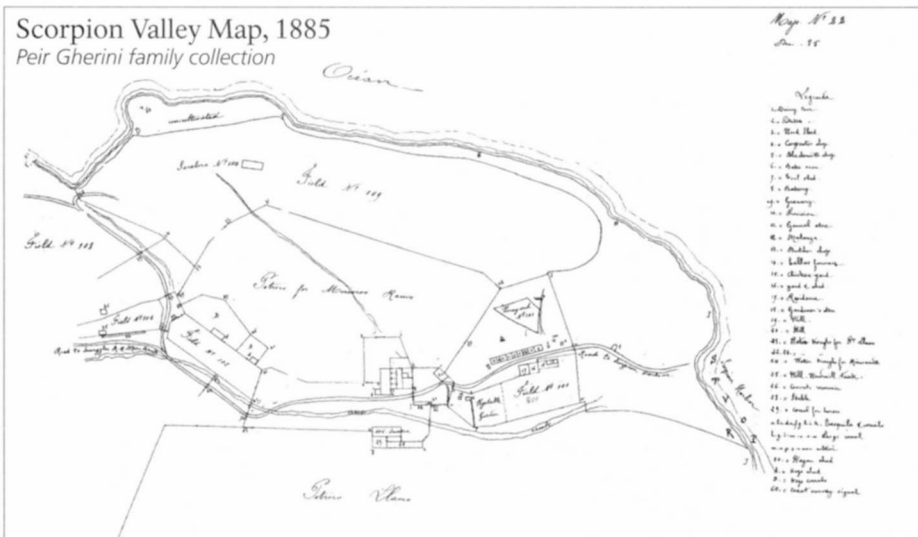
According to early unpublished maps and diaries researched by John Gherini in his book, the ranch at Scorpion was in full operation by 1885 with a work force of 8 to 12 men. Scorpion Ranch played a significant role in the development of Justinian Caire's island-wide enterprise:

"Early maps depict many buildings, sheds and other structures at the Scorpion ranch including a residence, wood sheds, carpenter shop, a blacksmith shop, baking ovens, wool sheds, a bakery, a granary, a general storage building, a *matanza*, a butcher shop, tallow furnaces, a garden store, barns, stables, corrals, a wagon shed, a chicken yard, wells, windmills, a water tank, water troughs, and a concrete reservoir. [and] vineyards and large vegetable gardens."

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Scorpion Valley Map, 1885

Peir Gherini family collection





Pier Gherini family collection

Scorpion Ranch house as it appeared in 1960.

The first reference to the still standing two-story ranch house was made in 1887, by the company foreman, when he wrote in his diary that there is “work on the attic of the new house.” Although often referred to as an “adobe,” ranch staff built this building of rubble masonry, using island rocks held together by a lime and cement mortar. Only part of the interior walls are constructed of adobe blocks. Gherini describes the bread oven as one of the most prominent features of this building:

“...located on the west end of the building in a small room... (the oven) was used to store flour, bake bread and keep the finished bread. Margaret Eaton (in *Diary of a Sea Captain's Wife*) observed that the large oven was made of white bricks and had a large iron door. With a four-foot-long wooden spatula, the cook put the loaves into the piping hot oven which could bake twenty-five loaves at a time.” Although this room is no longer used for bread making, it still has an important



role in providing the appropriate environmental conditions (temperature, light, access, etc.) for a maternity roost during the spring and summer for Townsend's big-eared bats. With the species in decline in general, and with recent documented loss of maternity colonies in California, maintenance of this colony and protection of the roost site at Scorpion is important for conservation of the species in California.

This historic ranch house has been rehabilitated with special efforts made to protect this roosting site. The downstairs is now open as a visitor center.

Bunkhouse



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The existing wooden bunkhouse dates from about 1914. After this building floated thirty feet downstream during the El Niño flood of 1997, an archeological test pit was excavated near the original northeast corner of the foundation. This test revealed a low masonry wall with thick lime plaster and a very solid, highly polished concrete floor. This floor is about eighteen inches below the present island ground surface. Review of the existing island records or literature did not reveal any mention of an earlier building.

However, three maps, dated 1876, 1885, and 1892, show a square structure in what appeared to be the same location. On the later two of these maps, this structure is labeled as a residence. None of the maps has a scale, but the 1892 map shows the existing two-story adobe building, which is slightly longer than 50 feet. If the

buildings are accurately shown to scale on this map, this older residence was 31 feet square. No other details of the structure were depicted on the map.

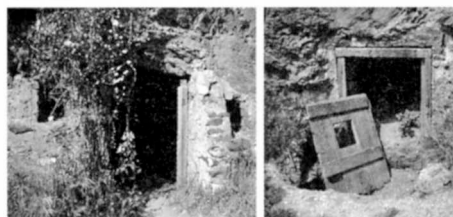
This building was likely the oldest ranch residence on the eastern end of the island. Archeological evidence indicates that it was constructed of adobe.

Storage Shed



This small shed is similar in construction to the 1914 bunkhouse and is believed to have been constructed at the same time. It houses a generator that was used to provide power to the ranch and was also used for storage. The building was extremely deteriorated due to termite damage and slumping of the hillside against the back wall. The National Park Service substantially rebuilt the shed in 1999.

Caves



According to Gherini, early island maps show that the volcanic caves within the ranch area were used as “dairy caves” to store dairy products. Prior to refrigeration, the caves offered the coolest place on the island for these items. Doors were often constructed at the entrance

way to protect the food from animals such as mice, foxes, ravens, and skunks. Today, Townsend’s big-eared bats sometimes roost in these small caves.

Outhouse



The small 2-hole outhouse dates to the late 19th century. Reroofing and repairs to the building have been done.

Implement Shed



Archeological excavations around and within this building revealed artifacts and materials that suggested that this may have been the location of the “forge” or blacksmith shop shown on an 1892 map. In addition to a distinct layer of ash that was discovered, the excavation also revealed other materials that easily could be associated with the craft of blacksmithing, including bits of charcoal, fused and oxidized metal, chunks of mixed ash, charcoal debris, several horse shoes, nails, and a pair of rusty pliers. Built sometime between 1885-1892, this shop is one of the oldest wood buildings on the east end of the island.

continued on next page

Despite being built on a small bench above the flood plain, years of flooding and deposition had caused the structure to tilt significantly to the south and by 1998 it was on the verge of collapse. Park staff stabilized the building and added a new roof to preserve it.

Today, this shop helps to remind us of the unique island ranching operation and the important role that blacksmiths played in it. With the nearest mainland blacksmith over 25 miles away, it was essential to have working shops on the island to repair the equipment, fix and sharpen tools, and shoe horses.

Meat Shed



Little is known about this small ranch structure. It may be the "slaughterhouse" depicted on a 1918 Santa Cruz Island Company drawing of Scorpion Ranch. It was used as a meat storage shed during the second half of the twentieth century. The building was in poor condition at the time of the 1997 flood and was further damaged by silt deposition around it from the flood event. In 2002, park staff removed the soil from the base of the building and stabilized it.

Eucalyptus Trees

Eucalyptus trees were planted in the 1880s for shade, fuel, pier pilings, and other building projects.

Scorpion Water System

The Scorpion Ranch area depended upon a water system, constructed in the 1880s, to provide water for the ranch operation. The system included three hand-dug wells



(approximately 30-35 feet in depth and lined with stone), a windmill and adjacent 3,000 gallon water tank (across the road but no longer there), a covered reservoir capable of storing 26,000 gallons (located on the hill next to the first campsite) and several concrete watering troughs. The water tank and reservoir were at the same elevation so one could overflow into the other.

Private Telephone System

Scorpion and Smugglers were part of a system of 10 out-ranches developed by Justinian Caire over the entire island. "Because of the widespread locations and the topographical separation of the areas of operation, Justinian Caire established the largest known private telephone system so that there could be communication from the outlying ranches to the Main Ranch. His workers took four years (1885-1888) to build the communication system. The company installed hand crank telephones powered by 1.5 volt batteries at different locations." (Gherini, p88) There were phones at both Scorpion and Smugglers and you can still see some of the telephone poles on the Montañon ridge.

FARM IMPLEMENTS

The farm implements on display throughout the Scorpion ranch historic area reveal a period in island history that is hard to imagine in today's technologically advanced world. A period of horse-drawn equipment such as plows, mowers, and hay balers. A period when repairs to this equipment along with the manufacturing of iron fittings, railings, hinges, and other materials were done by a resident blacksmith. A period of self-reliance—of homemade sawmills and other modified equipment that demonstrate how those living on the island adapted to the difficulties of isolated island life and, as former ranch superintendent Clifford McElrath states in *On Santa Cruz Island*, “learned to make do with what [they] had.”

Some of this equipment dates back to the Justinian Caire era that began in the early 1880s. At that time Caire started developing a large island agricultural community that “included the production of wine, wool, tallow, meat, and olives.” (John Gherini, *Santa Cruz Island: A History of Conflict and Diversity*, p. 84) One can well imagine that “the developments of an island rancho (covering 62,000 acres) presented a formidable logistical problem of transporting large quantities of supplies to and from the island located twenty miles off the coast of California.” (Gherini, p. 81)

By the 1890s, Caire raised over 50,000 sheep, harvested 150 acres of vineyards, and planted olive orchards, eucalyptus groves, and extensive gardens. By 1900 wagons, carts, horse hay rakes, hay presses, mowers, gang plows, breaking plows, cultivators, barley seeders, anvils, drills, harrows, windmills, water pumps, and other pieces of equipment were commonplace. Over a hundred horses provided the power to pull the equipment. Later, tractors such as the

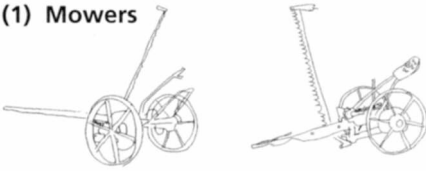
“Waterloo Boy” would replace the horses and provide the power to pull the equipment.

Caire's ranching agricultural enterprise featured ten sub ranches on the island. Scorpion and Smugglers, known as the granary, played an important part in this ranching system since the vast plateaus of the east end “supported a variety of crops such as wheat, corn, potatoes, beans, barley, and onions, besides hay and alfalfa.” (Gherini, p. 95) Ranch hands tended to flocks of sheep and to a small herd of cattle as well as performing the arduous task of building roads and rock walls. To make better use of the land for planting, “workers cleared the fields of rocks; then they piled the huge rocks into cairns which remain today as a monument to their labor.” (Gherini, p. 100) In one way or another, many of the farm implements on display helped in the establishment of a unique island rancho.

Ranching continued on the eastern end of Santa Cruz Island until 1984. Between 1926 and 1984, the Gherini family, descendants of Justinian Caire, operated a sheep ranch for meat and wool out of the Scorpion Ranch area. This era ended in February 1997 when the National Park Service acquired the last interest from the Gherini family. Today, the National Park Service is preserving this historic area so visitors always will have the chance to remember and understand this unique part of the island's past.

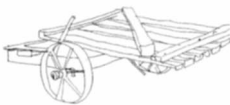
As you walk throughout this historic area use the map on the next page to locate the various farm implements. The numbers on the map mark the location of the farm implements described in this guide.

(1) Mowers



These mowers were horse-drawn and used to cut or mow hay. Often they featured mechanisms that lifted the cutter bar to clear rocks, stumps, or other obstructions. The Adriance, Platt and Co. (Poughkeepsie, N.Y.) mower was probably built in the mid 1910s. The International Harvester No. 9 mower was introduced in 1939 and was one of Harvester's last horse drawn styles. The John Deere No. 2 was introduced in the late 1910s and featured totally enclosed drive gears running in oil. An additional mower blade lies next to these mowers.

(2) Flat-Bed Wagon



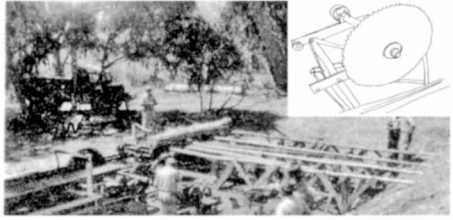
This wood flat-bed wagon was possibly a home-made trailer, constructed on the island. No other information is available.

(3) Gottfredson Truck



Only the chassis with metal seat, gas tank, and engine are left of this truck that was made in Canada. c. 1920s.

(4) Saw



According to Pier Gherini, former owner of the eastern portion of the island, this home-built saw apparatus was built by Joe Griggs in 1955. "Joe could do most anything, except write. An expert, rider, huntsman, and general ranch worker, Joe also was a mechanical whiz. He once took a 1918 Waterloo Boy tractor that had been "mothballed" because the early workmen wouldn't touch it and used the parts to make a sawmill. The fact that we didn't need a mill in no way detracted from the ingenuity and skill that went into its making." Today, one can clearly see the big circular saw blade mounted on end with a tractor engine and radiator mounted at the other end.

(5) Oliver 70



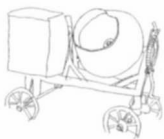
The Oliver 70 was built in 1946 (this model was built between 1937 and 1948). It has been modified to add a second smoke stack. It has a six-cylinder gasoline engine, six-speed transmission, electric lights and starter. Two Oliver tractors were used on the east end of the island. The Gherini family brought the first Oliver tractor to the island in 1954. A

How did the implements get to the island?

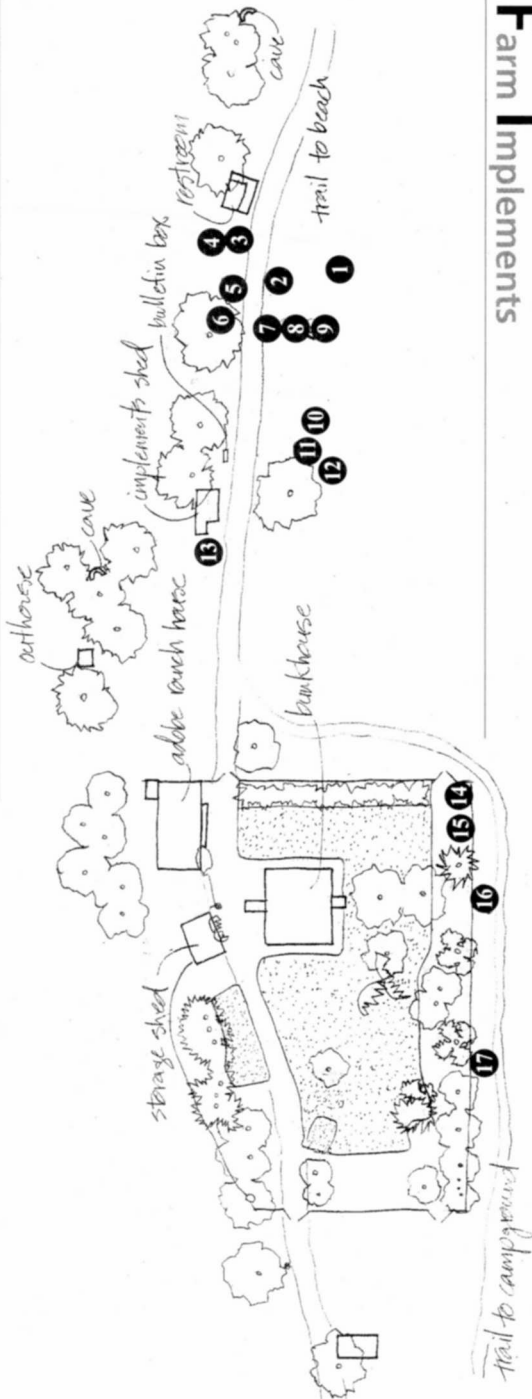
Transporting equipment and supplies across twenty miles of ocean presented difficult logistical problems. "The task of unloading at Scorpion Harbor could be difficult and potentially dangerous especially when unloading heavy equipment." (Gherini, p.199) The owners often used barges or lighters to off-load heavy equipment such as the Waterloo Boy in 1918 and the Caterpillar 30 in 1938. When off-loading the Caterpillar 30 it tipped over.

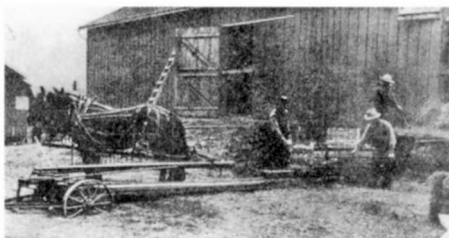
In another instance, in the 1950s, the Natco, a 42-foot boat owned by the Gherini family to haul supplies to the island, carried parts and new tracks for the Caterpillar 30. The Natco took on water several miles from the island and nearly sank. The Coast Guard came to the rescue and towed the Natco back to Santa Barbara. In 1975, "a pick-up truck was being off-loaded from the Hodge. The ocean surged around the cement pier, and as the boat's boom lifted the truck from the deck and swung it over to the pier, the boom snapped like a toothpick. The truck dropped into the ocean and became another island relic." (Gherini, p.200) Today, the National Park Service uses a landing craft to bring heavy equipment to the island.

second Oliver tractor came to the island in the 1960s. The Oliver was a versatile piece of equipment. It has a fly wheel that was used to run well pumps in times of emergency when engines (usually the reliable Briggs and Stratton) broke down. A large belt was attached to the fly wheel of the Oliver and the fly wheel of the pump.

**(6) Cement Mixer**

The cement mixer most likely was run by a small hit-and-miss engine, which would have been set in the box at the back of the mixer. This mixer was used by Pier Gherini and others to build the cement block for the pier in the late 1930s. Today, this block is part of the new pier built by the National Park Service in 1999.

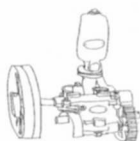
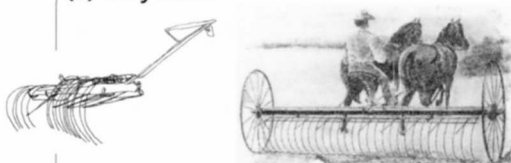


(7) Buffalo Hay Baler

Hay balers were first built in the 1850s. Except for the efforts of a few individuals, hay presses were given little attention for another two decades. Even then the development of hay presses came very slowly. The early balers such as this Buffalo were primarily designed for the needs of small farmers, requiring small capital outlay, besides the advantage of being a one or two-man operation. These balers were horse-powered. After a few hours of experience, a horse would walk the circle with ease. These units would eventually include toggle linkage, which greatly multiplied the pulling force exerted by the horses. According to John Gherini, this "Buffalo" baler is possibly the oldest farm implement on the island, dating to c.1900.

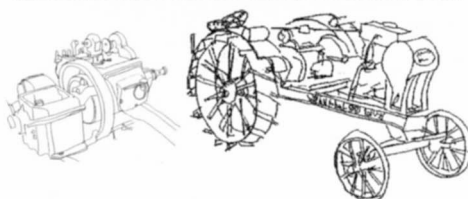
(8) Typhoon Water Pump

No information available.

**(9) Hay Rake**

Only a portion of the hay rake remains. The seat, mounted on the front of the frame, and the large metal wheels are

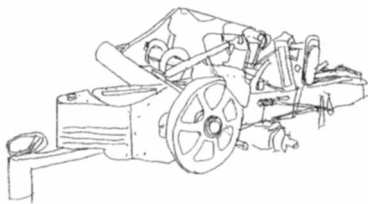
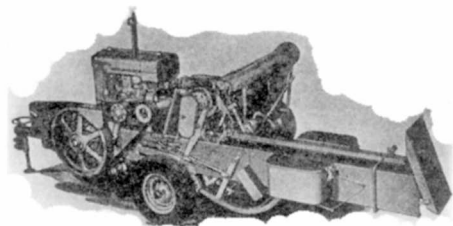
missing. Spare tines for the buck rake are also present. This hay rake with curved tines was pulled by horses and used to pile hay into windrows or clean up the field after haying. These rakes often had automatic dumping mechanisms that could be initiated by pressing a foot lever. One worker remembers operating the hay rake in the late 1930s when the horse spooked and caused the rake to overturn and bend the wheels, which had to be fixed at the blacksmith shop.

(10) Waterloo Boy Tractor

The Santa Cruz Island Company, owned by the Caire heirs, ordered two Waterloo Boy tractors on June 27, 1918 from W.L. Cleveland Co. of Los Angeles. Each tractor cost \$1,450 and one was delivered to Scorpion in 1918. Alonson Swain, island superintendent for the Santa Cruz Island Company, observed in his August 31, 1918, report that "the tractor at Scorpion is in function and actual plowing will commence today. It runs island farm equipment very nicely, but there is a lack of enthusiasm among our men." What remains today is the main chassis, the radiator, and possibly one of the front wheels. The two large back wheels were used as rip rap for the pier and are buried there today.

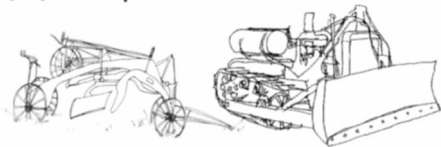
The “Waterloo Boy” is considered the alpha of the entire John Deere Tractor line as we know it today. The “Waterloo Boy” name was carried over to the tractors from the popular line of stationary engines produced by the Waterloo Gasoline Engine Company of Waterloo, Iowa. In 1918, the Deere Company purchased the Waterloo Company. Superintendent Swain observed in his May 3, 1918, report that “our leanings are a little bit inclined toward the Waterloo Boy—this tractor, by the way, has been taken over by the John Deere people, so it must amount to something.”

(11) International Harvester Hay Baler



Although belt-powered balers appeared in the early 1900s, all were stationary styles. Pick-up balers became a reality in 1940. The advent of these machines revolutionized hay harvesting, making it no longer necessary to handle loose hay. An example of these pick-up balers is this post World War II International Harvester. This baler was tractor-pulled with an automatic tie (twine, not wire). With a capacity of up to six bales per minute, this machine could bale up to ten tons of hay per hour.

(12) Caterpillar 30 Tractor and Grader



This tractor-pulled road grader probably dates back to the 1920s or early 1930s. The manufacturer is unknown. The grader came to the island in the late 1940s and was used first to build the airstrip, then for other jobs around the Smugglers Cove area. Graders of this type would have been used to level and smooth ground for roads (or airstrips).

The Caterpillar 30 tractor model on display had an interesting beginning on the island. In 1938, the Gherini family brought the tractor to the island via a tug boat from San Pedro, California. When the “cat” was being unloaded at the beach, one of the wood planks used to allow the tractor to be driven off the barge collapsed and the tractor tipped over. Through the use of ropes and block and tackle, a rope was run from the tractor to a rock (through the block and tackle) and then out to the tug, which pulled the heavy tractor back onto its tracks.

Thereafter, the tractor proved to be a significant piece of equipment in building and grading roads and constructing an earthen dam. Since the Caterpillar Company started using yellow as its standard color in 1931, this model was manufactured sometime thereafter. The bulldozer attachment is not original to the tractor. Additional spare parts can be seen scattered about, including a radiator.

(13) Blacksmith Implements

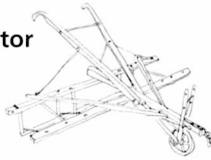
The foot-powered grindstone, Champion blower and Forge Co. press, vise, cement mounting block and anvil are all associated with the implement shed. For more information please see page 17 and the exhibits inside the shed.

(14) Pump Jack



This pump jack was manufactured by the Aeromotor Co. of Chicago and would have been powered by an electric motor. A pump jack converts the circular motion of the engine to an up-and-down motion for pumping water.

(15) Cultivator



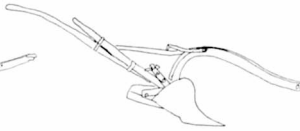
A cultivator or straight-knife (wood frame with square metal blades) was used to cut stalks off at ground level.

(16) Plows, Harrow, and Scraper

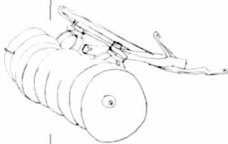
Plows were used to break or turn the earth before planting and, at first, were pulled by horse and then, later, by tractor. Within this area there are many different plows.



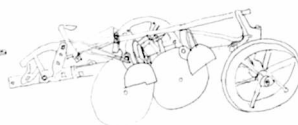
Small horse-drawn plow



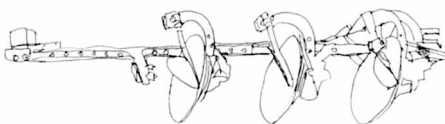
Horse-drawn, one-bottom plow



Eight-disc horse-drawn plow-bottom disk plow



Two-bottom disk plow



Four-bottom John Deere horse or tractor-drawn disk plow (with one disk missing)

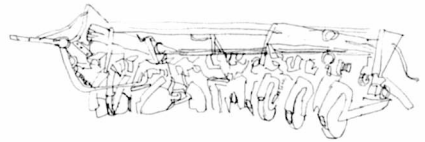


Early horse-drawn disk harrows were first featured in the 1890s. One type of harrow used here was the spike-toothed gang harrow. The spikes were diamond shaped and welded to the frames. These harrow sections were linked together and pulled behind a horse or tractor to smooth the ground and break up clods.



The horse-drawn Fresno-style scraper was made in Fresno, California, and hence, the name "Fresno-style." This bucket-type scraper was used to scrape a layer of dirt to smooth the ground.

(17) Van Brunt Seed Drill



This horse- or tractor-drawn seed drill or planter was built c.1920s to 1930s. The "VB" on the drill identifies this as part of the famous Van Brunt drill line, which first appeared in 1861 and was acquired by John Deere in 1911. These drills were used to plant seeds for crops such as grain, beets, beans, and barley for the horses.

The Van Brunt seeder contained elaborate mechanisms to plant seeds. The seeder contained a wooden seed box where the seeds were held; metal funnels which guided the seeds to the ground; disks which broke up the ground and metal chains that dragged on the ground after the seeds were laid down in order to drag dirt over them. The seeder was used to plants seeds in multiple rows at one time.

DRY STONE MASONRY STRUCTURES

Dry stone masonry structures (retaining walls, check dams, stone piles) are found throughout Santa Cruz Island. Over 200 of the structures are located on the east end of the island. These features were constructed by Italian stone masons and laborers between 1880 and 1900 for the Justinian Caire family, which owned the island. Although the work was probably carried out by both skilled stone masons and less skilled workers, as differences in quality can be detected in the various structures, the masonry involved has been examined by experts and has been judged as "good quality work, built to high standards."

Retaining Walls and Check Dams



Retaining walls were constructed for road support and erosion control. The early records of the various ranch foremen describe these projects. The stone retaining wall supporting the road out of Scorpion Valley towards Smugglers Cove is notable for its massive size, the large size and number of rocks used to build it, and the difficulty of constructing such a large structure in its steep hillside location. Walls are still visible today along the Scorpion and Smugglers stream beds and along the Cavern Point trail.

Check dams were built in the drainages leading into the developed valleys to slow the force and amount of water entering these valleys and to capture the eroding sediment. Evidence of flooding at Scorpion Ranch has been found as far

back as 1916; the dams and retaining walls were an effort to protect the ranch structures from flooding. Some of the best examples of these dams can be seen along the trail to Cavern Point.

Many of the retaining walls and check dams have deteriorated over time from erosion, flooding, and lack of maintenance. In an effort to preserve this slice of history, the National Park Service began repairing these dry stone structures in 1999. Nearly 100 retaining walls and check dams have been repaired during this period.

Stone Piles



"To make better use of the land, workers cleared the fields of rocks; then piled the huge rocks into cairns which remain today as a monument to their labor," wrote Gherini about the large rock piles that can be seen as one hikes along the road to Smugglers Cove. The "better use of the land" Gherini writes about is the planting of a variety of crops such as wheat, corn, potatoes, beans, barley, onions, hay, and alfalfa in these cleared fields between Scorpion and Smugglers. These crops supplied many of the food products and hay for the island operation and led to the east end of the island being known as the "granary."

SMUGGLERS COVE

Place Name

Smugglers Cove received its name from the widespread smuggling around the back side of the island by sea otter traders and others, known as *contrabandistas* during both the Spanish and Mexican years (1769-1848).

Road

Construction on the road between Scorpion Valley and Smugglers Cove began in 1892. This was not the original road, however. An older road had been built farther up Scorpion Canyon, but was determined to be unsatisfactory due to washouts from the rains. Parts of this road are still visible today.

According to Gherini, "In early June 1892, laborers began work on the new Scorpion road located on the side of the Scorpion Valley hill near the beach. The hill had large outcroppings of volcanic rock. The foreman described the work as 'lavora alla pietra' (work at the rock). This work continued until the end of November 1892 and involved as many as thirteen workers a day. Usually the daily work crew consisted of nine to ten workers. ...map 92, dated 1892, indicated for the first time that there was a road at this location leading out of the Scorpion Valley to Smugglers. The rock walls built to support the road were the largest rock walls built on the island. When Margaret



Eaton first observed the road-work in 1909 she quipped, '... Some stonemason who knew his business built that road.'

Oil Well

The remnants of the oil well visible from the road was drilled by Atlantic Richfield in 1966. This exploratory well yielded water instead of oil. Although the Gherinis would enter into a lease with Union Oil, the devastating Union Oil spill in January of 1969 off the coast of Santa Barbara mobilized the environmental movement against further oil exploration on the island.

Delphine's Grove

Delphine Caire, oldest child of Justinian Caire, was extremely fond of cultivating young trees, including the cypress grove (early 1900s) that is visible from the road. Although there was no water up in this area, the young trees survived and became known as "Delphine's Grove."

Ranch House



While Scorpion Ranch was the headquarters for the east end island operations, Smugglers Ranch served as an outpost for laborers who worked in the olive orchard and the vineyards located in Smugglers Valley. Although early maps show a residence at Smugglers as early as 1885, the building bears the date "1889." Like the two-story ranch house at Scorpion, the Smugglers ranch house often is referred to as an "adobe," despite its construction of both rock masonry and adobe. The quarry for the limestone used in the construction of the ranch house and other structures can be seen off the west corner of the house. According to Gherini, early maps show that the ranch facility consisted of "...a residence, a separate one-room building for the foreman, a cookery, a bake oven, a tool shed, a supply shed, a stable, a well, a hog corral, and water closets." The rehabilitation of this historic area is in progress.

Eucalyptus and Olive Groves

The eucalyptus trees around Smugglers Ranch were planted in 1887 under the direction of Justinian Caire. In addition, he had his laborers plant fig, walnut, plum, chestnut, orange, and acacia trees.

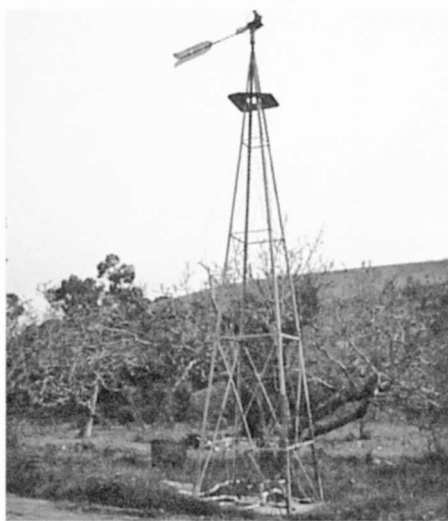
The olive grove was planted in the 1880s or 1890s and according to Gherini "...demonstrates Caire's intent to make maximum use of the island's resources."

"In 1885, the *Santa Barbara Daily Independent* reported that the olive industry was attracting attention and that California was the only state that had a suitable climate for olives. The newspaper article pointed out that olives did well in dry, rocky soil unusable for other crops or grazing animals. This helps explain why Caire planted olive trees on the island. The island company probably harvested and produced the fruit for both island consumption and occasional sales. The olive grove, which has been unattended for years, still remains at Smugglers."



Windmill and Well

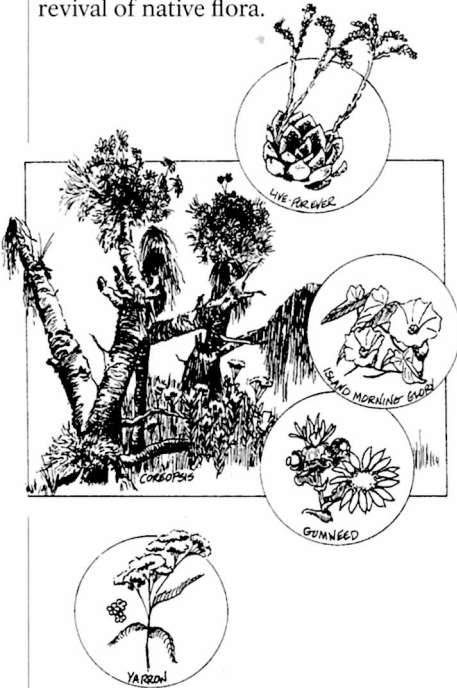
The windmill was constructed over a stone-lined well, which was probably constructed in the 1880s. Projecting stones form steps down into the well—a common European construction technique. In contrast, the three wells at Scorpion have no stone steps.



SCORPION BLUFFS

Living on the Edge

Before sheep, cattle, and pigs were introduced to the island, a lush plant community, including such plants as the island morning glory, island monkey flower, live-forever, island buckwheat, yarrow, coastal sagebrush, gumplant, and goldfields, covered the marine terraces upon which you now are standing. Once, huge stands of giant coreopsis blanketed the bluffs, emerging every spring from their summer dormancy with thick green foliage and bright, yellow flowers. But years of grazing left these plants literally living on the edge, growing only on the inaccessible ocean cliffs below you. On The Nature Conservancy portion of the island, where the sheep have been removed since 1985, the coreopsis and other plants have spread beyond the cliffs and established themselves in many parts of the island. With the removal of the sheep and pigs, we hope that the east end of the island will experience a similar revival of native flora.

**Mixing of Waters and the Diversity of Marine Life**

The Channel Islands lie within a large embayment known as the Southern California Bight—an area just below Point Conception where the California coastline turns sharply to the east. Within this area, the sea floor is comprised of canyons, banks, escarpments, sea mounts, and deep basins (the Santa Cruz Basin off the island's south coast is deeper than the Grand Canyon). Nutrient-rich waters upwelling from these depths mix and mingle with cool waters from the north (California Current) and warm southern waters (California Countercurrent), creating the Santa Barbara Gyre—a swirling eddy that circulates nutrients and supports a wealth of marine plants and animals, from giant kelp forests and blue whales to tiny crabs and plankton. Here, northern and southern species overlap, creating a transition zone between the Oregonian and Californian marine biogeographic provinces. Santa Cruz Island lies in the middle of this transition zone. The western half of the island harbors numerous northern species, while southern species are more common on this eastern end of the island.



Santa Cruz also serves as the meeting ground for sea birds and shore birds that rarely occur together, such as black oystercatchers from the north and American oystercatchers from the south. Both species, as well as hybrids between the two, have nested at Fraser Point on the island's west end. Other northern birds, such as pelagic cormorants and pigeon guillemots, overlap with additional southern species, such as Xantus' murrelets and California brown pelicans.

POTATO HARBOR

Diatomaceous Earth

As you follow the road to Potato Harbor, you will notice areas of bright white sedimentary rock that have been exposed on the hillsides due to erosion. This is the same rock type that is evident along the Cavern Point trail. It is known as diatomaceous earth. It is derived from very small single-cell sea plants called diatoms, which are made of silica (silicon dioxide). As these plants die, their silica skeletons settle down to the various marine sediments at the bottom of the ocean, often en masse. Diatomaceous earth is mined throughout the world for use in filters, such as pool filters, and as an insecticide.

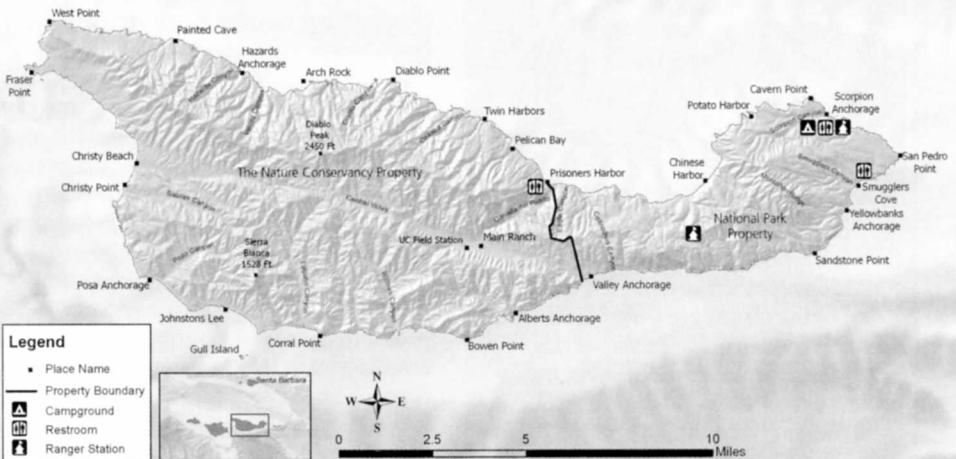
Please refer to page 9 for more information on diatomaceous earth.

The Rest of Santa Cruz Island

Once you have reached the overlook at Potato Harbor you can probably guess as to how this harbor received its name—its oval shape resembles that of a potato. From the overlook you also have a magnificent view to the west and the rest of Santa Cruz Island. Santa Cruz is the largest island off the west coast of the U.S. At 96 square miles, around 62,000 acres, it is about four-times the size of Manhattan. Over 75 percent of the island is owned by The Nature Conservancy, a private, non-profit organization, with similar goals as the National Park Service—the preservation of the islands' natural resources. The National Park Service and The Nature Conservancy work together to ensure the protection of these island resources.

continued on next page

Santa Cruz Island



The Giant Kelp Forest

From this vantage point, one also has the opportunity to gaze upon another part of the park—the marine environment. One nautical mile of water around each island in the park is part of Channel Islands National Park (six nautical miles around each island is part of Channel Islands National Marine Sanctuary).

Within this ocean realm below one may be able to see or hear California sea lions. These playful animals are often spotted just to the west of Potato Harbor, hauled-out on the rocks. Sea lions, along with a variety of other marine species, depend upon the extensive kelp forests that can be found around Santa Cruz and the other Channel Islands. While urban and industrial development has altered much of the southern California coastal mainland, the islands contain the most undisturbed stretches of coastline in this region, providing some of the best conditions for kelp forests and their inhabitants.



Kelp is a type of algae that, under ideal conditions (cold, nutrient-rich water), is one of the fastest growing plants on earth—it can grow 2 feet per day. This foliage provides food, shelter, and protection for over 800 different species—from foraging nudibranchs, to grazing snails, to fish seeking refuge, to whales seeking a plankton snack.

But we must not forget about ourselves. Not only do we feed upon some of the animals that depend upon the kelp forest, but those of us who eat ice cream, salad dressing, and even use tooth-paste are all using a little bit of kelp as well. Kelp is harvested for a natural ingredient called *algin*, which is used as a suspending, stabilizing, emulsifying, gel-producing, and film-forming additive in more than 70 commercial products. In addition, marine plants such as kelp provide the earth with 80 percent of its oxygen.

Despite these benefits, the kelp forest and its inhabitants are in jeopardy. Pollution and over-harvesting of marine species have completely altered the kelp forest ecosystem. Kelp forests in southern California today cover less than half the area they covered at the turn of the century.

Marine Protected Areas

However, with the establishment of Marine Protected Areas (MPAs), improved pollution controls and fishing regulations, transplantation of kelp, public education, and various research programs some of these problems have been corrected.

Within the park and sanctuary a network of MPAs provide a refuge for sea life and opportunities for recreation, education, and science. In 11 Marine Reserves (including the Scorpion Marine Reserve in the waters below you from Potato Harbor to Scorpion Rock), recreational fishing and commercial harvest are prohibited; limited fishing and harvest are allowed in two Marine Conservation Areas. The MPAs total 318 square miles, the largest such network off the continental United States and part of a larger effort throughout the world to conserve natural, historic, and cultural marine resources.

SCORPION CANYON

Scorpion Canyon

Volcanism

Above the canyon lies a layer of the Monterey Formation, a siliceous shale. Within the canyon, erosion has exposed the volcanic rocks lying underneath. These rocks reveal a fascinating story about the formation of the Channel Islands. Between 15-30 million years ago, lava flows and volcanoes covered much of the area that now comprises the northern Channel Islands and the western Santa Monica Mountains. In some places the lava accumulated to as much as 10,000 feet thick. A certain type of lava, pillow lava, found in some of these rocks is evidence that much of the volcanic action took place below the surface of the ocean. In other places, oyster shells and other marine fossils are found embedded in the lava. At times, the buildup of lava was great enough that volcanic islands formed. These islands probably were short lived and were eroded to below sea level after the volcanic action ceased.

The reason for these volcanic eruptions can be found within the magnetic particles in the rocks. As the rocks were cooling, magnetic particles within the rocks would have been set in line with the magnetic poles of the earth. However, magnetic measurements now taken in these same rocks show that they do not line up. In fact, they are off by about 100 degrees, with the oldest rocks showing the largest discrepancy. Geologists believe that when these rocks were formed, the platform on which the islands rest lined up in a north-south direction along the southern coast of California, with San Miguel Island's position lying just offshore from San Diego.

As the Pacific plate made contact with and began to slide past the North American plate, forming the San Andreas fault, this platform was rotated in a clockwise direction to its present east-west position.



timhaufphotography.com

As it rotated, the crust of the ocean thinned and the resulting reduction of pressure allowed molten magma to form and ascend from the mantle, erupting under the sea as lava.

Around 5 million years ago, compressional forces, caused by the ramming of Baja California into southern California, resulted in folding and faulting of these volcanic rocks, a variety of marine sediments, and the eventual uplift of the islands. For more information on the geologic story of the Channel Islands please refer to page 9.

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Native Plants

With the islands never being connected to the mainland, plants, seeds, and spores over millions of years were carried from the mainland by ocean currents, wind, birds, or in the fur of animals that reached the islands. Due to continuous isolation from the mainland, many plant communities on the islands are unique, including the absence of some common mainland species and the presence of many *island endemics* (a species that grows naturally only on one or more of the Channel Islands).

Since the Chumash did not practice agriculture, they used these native plants as a primary source of food and medicine. Native plants also provided important construction materials for canoes, houses, bows, arrows, nets, baskets, beds, clothing, footwear, ornaments, and a variety of other items used in daily life.

With the sheep and pigs now removed, many native plants are spreading beyond the steep canyon walls and cliffs where they remained protected from grazing for nearly 150 years and reestablishing themselves throughout the island. Take time to look carefully and you should see some of the following species.

Toyon

Also known as Christmas berry or California holly, this plant is an evergreen chaparral and coastal sage scrub species that grows on all of the larger islands and on the mainland as well. Due to sheep grazing and reduced fire frequency, toyons on the island are more tree-like than most found on the mainland. During the summer and fall the small flowers decorating the tips of the branches give way to clusters of bright red berries. During the winter, these berries provide an important food supply for birds.



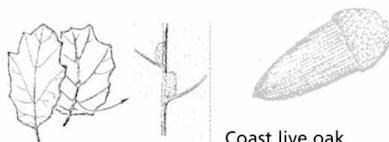
The Chumash ate toyon berries as well, roasting them or letting them wilt in the hot sun before eating. Toyon was also a valuable source of hardwood for manufacturing a variety of implements such as arrows, harpoons, fish spears, digging sticks, and gaming pieces. The Chumash often used heat or steam to shape and form objects made from toyon and other hardwoods. For example, bundles of toyon arrows were steamed in earth ovens to make the rods pliable; the shafts were then straightened and allowed to dry. After drying, the arrows were trimmed to the proper size, the points shaped and hardened in hot ashes, and feathers added.

Island Scrub Oak, Coast Live Oak, and Island Cherry

Island scrub oak is a short, thin-branched tree with flat, smooth-edged leaves that are rich green on the upper surface, and a dull gray underneath. Coast live oak is much taller and stouter than scrub oaks, with spiny-edged, cupped leaves and "hairy arm pits." Turn over one of the leaves and look for a small, fuzzy white patch where some of the side veins of the leaf join the central vein.



Island scrub oak



Coast live oak



The acorns from these oaks, along with those from seven other species that grow on Santa Cruz Island, were an important food source for the island Chumash and many other California Indian groups. Each fall acorns were gathered, hulled, dried, and stored in large granary baskets. When prepared, acorns were ground into meal, leached to remove the tannic acid and bitter flavor, and cooked into mush. Other seeds and herbs may have been added to enhance the (generally bland) flavor.

Although the island Chumash gathered acorns, oaks are less abundant on the islands than on the mainland. To increase their supply of acorns and other medicinal and food plants, the islanders engaged in trade or undertook gathering expeditions to the mainland. The island Chumash also compensated for the short supply of acorns by substituting other plant foods in their place. One important alternative was island cherry. Most often, island cherry grows as a large shrub. However, in deep, moist soils and sunshine it can grow to a forty-foot tree. This plant blooms from spring through early summer; when ripe, the fruit ranges in color from dark purple to black and is characterized by a large seed and pulpy flesh. In addition to eating the pulp, the pits were boiled in several changes of water to release the toxic chemicals. Then the pits were mashed to the consistency of refried beans.

Monkey Flower

Monkey flower is common in chaparral throughout California. Known as “sticky” monkey flower because the deep green leaves secrete a gluey substance, they bloom from January to May and were named for the monkey face that sometimes can be seen within the orange to



pale yellow flowers. A mainland species, endemic island species, and a hybrid between the two occur here on Santa Cruz Island. The island endemic species differs from the mainland species in the lack of sticky leaves and its bright red flowers. The hybrid produces peach or bronze-colored flowers. These plants are commonly seen on rock walls where the non-native animals could not reach.

Lemonade Berry

Lemonade berry is a shrub with thick, leathery leaves. The Chumash would steep the sticky, lemon-tasting berries in water to make juice, or they would suck on them like candy. One should be careful, however, since lemonade berry belongs to the same family as poison oak and can trigger a skin rash in those sensitive to it.



Santa Cruz Island Ironwood

Thousands of years ago the Channel Islands had a moister climate, as did much of southern California. Different plant communities and different animals, such as pygmy mammoths, existed on the islands. The Santa Cruz Island ironwood is a reminder of this earlier environment. Fossil evidence indicates that ironwoods once grew on the mainland as far north as Washington and as far east as Nevada.



Today the ironwood grows only on islands in locations where conditions approximate California's earlier, wetter climate. Small groves of these trees are often found on Santa Rosa and Santa Cruz Islands, where they grow mostly in north-facing canyons cooled by fog. In fact, fog is an important element in the ironwood's

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successful adaptation and survival. Moisture from fog collects on the leaves and drips down to the soil surrounding the trunk, thereby increasing the amount of water available to the tree. This also helps to sustain the other larger tree species on Santa Cruz and the other islands.

Ironwood has dark green, highly serrated, finger-like leaves and in summer produces many small white flowers.

Poison Oak

Poison oak grows on all of the Channel Islands except Santa Barbara Island, and is readily identified in spring as a three-leaved shrub or vine with bronze-green foliage. During late summer and fall the leaves turn a red or rust color, and white berries develop. **Poison oak can cause allergic reactions and rashes if it comes in contact with the skin. Please do not touch.** The Chumash used poison oak to treat warts, cankers, and skin cancer and to staunch blood flow.



Coastal Prickly Pear



The coastal prickly pear is a cactus that blooms in May and June, producing a shiny yellow flower with dense layers of petals. The plant's shallow root system spreads over a wide area to extract maximum moisture while its sharp spines reflect the sun and wind to help protect the plant from dehydration.

The spines also helped protect the plant

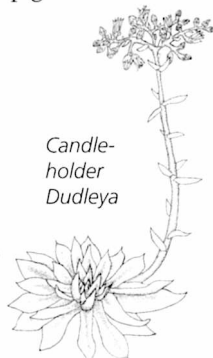
from cattle, sheep, and pigs, allowing it to spread into the overgrazed sage scrub and grasslands. At the request of rancher Edwin Stanton, agricultural scientists from UC Riverside introduced cochineal insects in an attempt to improve cattle-grazing conditions by controlling the native prickly pear. The cochineal insect appears as small, silvery white mounds on the cactus pads. These insects weaken and eventually kill the cactus by sucking sap from the plant. The cochineal greatly reduced the prickly pear stands, perhaps to below natural levels. This was one of the first successful biological control efforts in California.

The Chumash harvested the sweet prickly pear fruit and used its beet-red juice as a paint and dye. The long, sharp cactus thorns were used for decorative ear piercing and tattooing. Vertical and transverse lines were commonly tattooed on the cheeks and chin, although tattoo designs were applied also to the forehead, arms, and other parts of the body. To create a dark blue tattoo, the skin was pricked with a cactus thorn and the punctures rubbed with charcoal. When the wounds healed the pigment was sealed under the skin.

Dudleya (*Live Forever* or *Hens-and-chickens*)

Perhaps no plant is more versatile in adapting to different habitats than dudleya.

These low-growing, fleshy succulents coated with a waxy coating commonly grow on dry, rocky outcroppings like the walls of Scorpion Canyon. However, they also can be found on stabilized sand dunes, grasslands, and scrub habitats in conditions varying from full sun to shade. This adaptability is reflected in the

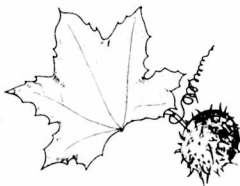


variety of dudleyas found on the Channel Islands, including three species on Santa Cruz Island.

On these canyon walls one can find candleholder and Greene's dudleya. These Channel Island endemics also occur on San Miguel and Santa Rosa Islands. The third dudleya species, Santa Cruz Island live-forever, occurs just on Santa Cruz Island and it grows only on the island's western tip.

Wild Cucumber

Another plant that evolved to deal with the dry conditions of southern California (average rainfall on Santa Cruz is approximately 19 inches) is the vine-like wild cucumber that often can be seen along the hillsides in the oak understory. This plant has an immense, poisonous, fleshy root or underground tuber that stores water and nutrients.

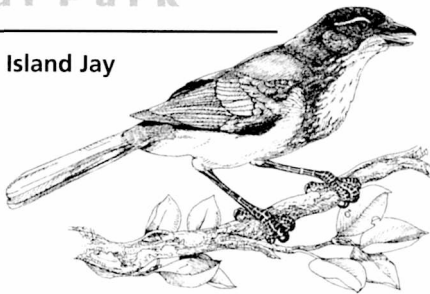


Wild cucumber is one of the very first flowers to bloom from January to June. The plant sprawls over trees, shrubs and the ground, leaving a tangle of dried stems and leaves by midsummer. In spring, however, the wild cucumber forms a large, egg-shaped, bright green fruit covered with big soft green prickles that turn hard and spiny as the fruit dries. Inside are several large black seeds. The Chumash made necklaces of these seeds, polishing them along their oiled bodies. They were used also as marbles by Chumash children.

Other Native Plant Species

Other plants to look for within the canyon include lupine, the endemic northern island hazardia, sticky snapdragon, white everlasting, and three species of buckwheat, all endemic to the Channel Islands.

Island Jay



The native vegetation found within Scorpion Canyon provides the perfect habitat for the endemic island jay. This vegetation begins about a mile up the canyon where it forks. Look carefully among the oak, cherry, and toyon trees for the jay, as it is often seen before it is heard in this area. The island jay is not found on any other island besides Santa Cruz. Its bright blue color, larger size (by one-third), and heavier bill distinguish it from its mainland counterpart and ancestor, the scrub jay.

This bird represents a case of island "gigantism." Lack of competition and predators has allowed this island species to exploit a much wider range of habitats and resources than mainland jays. On Santa Cruz, island jays range from oak woodlands and chaparral (where it behaves like the California thrasher, which does not occur on the island) into pine forests (where it replaces the absent Stellar's jay). They eat just about anything, including insects, reptiles, mice, and birds' eggs.

Island jays are monogamous and may stay with a mate for their entire lives. Each pair vigorously defends its territory of a few hectares and rarely leaves it. Both the male and the female help build nests three to forty feet high in trees and shrubs. They use small oak branches to form the cup of the nest, which the parents line with grass and small roots. Females incubate three to five eggs for about 20 days. While the female sits on

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the eggs, the male spends his time hunting and defending the nest from hawks, foxes, and other predators. Observations suggest that the more time parents spend near their nest, the higher their chances of defending against nest predators.

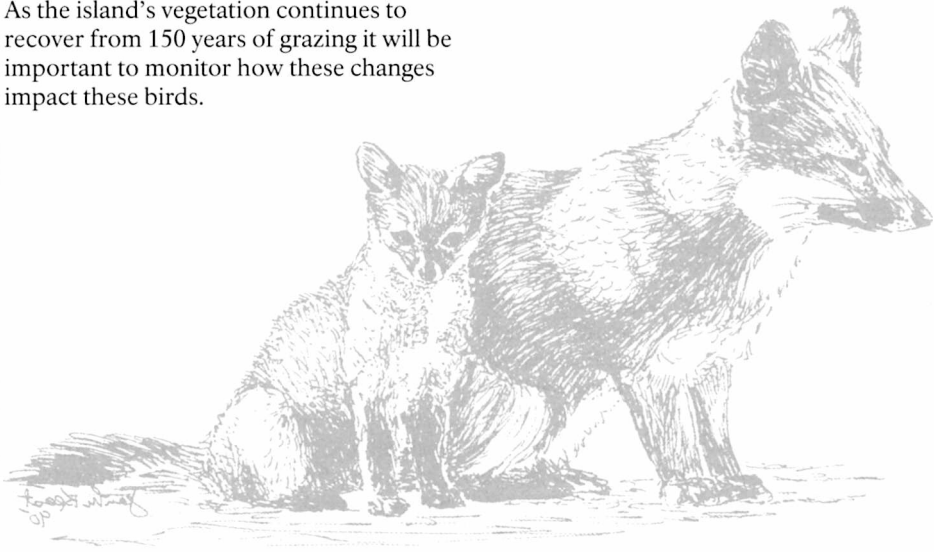
After the eggs hatch, both parents spend 23 days feeding, defending, and caring for their nestlings. This is a long period, and ongoing research indicates that only about one-third of the nests are successful in fledging young. However, if a jay can make it through the gauntlet of predators to live into their second year, it's likely to live for more than 20 years.

There is still have much to learn about the ecology and management of the island jay. This jay's tiny range and resulting small population size make it especially vulnerable to natural disasters such as a catastrophic fire, to disease such as West Nile Virus, and to habitat alteration due to climate change. Currently, research is being conducted on the jay's breeding biology, population status, diet, and disease monitoring. This work brings a better understanding of the needs and challenges facing this unique species. As the island's vegetation continues to recover from 150 years of grazing it will be important to monitor how these changes impact these birds.

Island Fox

Island foxes frequently are seen in Scorpion Canyon and around the campground area. The island fox (*Urocyon littoralis*) lives on six of the eight Channel Islands off the coast of southern California—San Miguel, Santa Rosa, Santa Cruz, Santa Catalina, San Nicolas, and San Clemente. Each island has its own subspecies, and they are found nowhere else in the world.

The island fox is the largest native mammal on the Channel Islands, but one of the smallest foxes in the world. They average from 12 to 13 inches in height, 23 to 27 inches in length (including tail), and three to four pounds in weight—about the size of a housecat. This is nearly 20 percent smaller than its closest relative, the mainland gray fox. Similar in appearance to the gray fox, the island fox has a gray back, rufous sides (reddish-brown) and white undersides. There are distinctive black, white and rufous markings on the face. Island foxes tend to have more rufous coloring than the gray fox and have two less tail vertebrae. Unlike nocturnal gray foxes, which hunt



at night to avoid predators, island foxes are active during daylight hours. As “generalist omnivores,” they eat almost all available foods on the islands, including fruits, vegetation, insects, mice, and crabs. Mating takes place in February and March with pupping usually in April or May. Average litter size is two. The adult males play an important role in the raising of young.

The fossil record for the island fox dates back at least 12,000 years. Since the northern Channel Islands were never connected to the mainland, scientists currently have two theories on how the fox arrived on the islands. However, due to the scant fossil history significant questions still remain on the exact mechanism of the initial arrival. One theory, is that the island fox’s ancestor, the gray fox, “rafted” to the islands on driftwood, propelled by a storm or currents. During the last ice age, 10–20,000 years ago, ocean levels were up to 400 feet lower than today, narrowing the channel between the islands and mainland to perhaps just four to five miles across and grouping the northern islands together into one large island we call Santarosae. The other theory is that gray foxes were transported by the native American’s that inhabited the islands. The foxes adapted to their new island home, evolving into a dwarf, or smaller, form of the gray fox. Environmental and ecological factors such as overcrowding, reduction in predators, food limitations and genetic variations could have climate warmed and ocean levels began to rise, canyons filled with seawater. Santarosae was divided into the islands of San Miguel, Santa Rosa, Santa Cruz, and Anacapa. Because of a lack of permanent freshwater, the island fox did not persist on Anacapa, but the other three northern islands had all the requirements for foxes.

Between 1994 and 1999, island foxes

almost disappeared on San Miguel, Santa Rosa and Santa Cruz Islands—predation by non-native golden eagles caused over a 90 percent decline in the population. By 2004, the island fox was listed as a federally endangered species.

A successful recovery effort coordinated by the park and The Nature Conservancy included captive breeding of island foxes, relocation of golden eagles, reestablishment of bald eagles, and the eradication of feral pigs. In all, 285 foxes were released over a nine-year period with the final pair set free in 2008. Today, with the population at close to pre-decline numbers, the recovery effort has been recognized as one of the quickest and most successful recoveries of an endangered species.

For more detailed information on this restoration program please see “Santa Cruz Island Restoration” on page 41.

Island Deer Mouse



Cathy Schwemm

The endemic island deer mouse is the only native terrestrial mammal found on all the Channel Islands. Each island has an endemic subspecies. It is slightly larger than its mainland relative. This seed-eaters are a very important part of the island ecosystem. It can be found in just about every island habitat and provides an important food source for foxes, hawks, and owls. The island deer mouse does carry hantavirus, however, and should be avoided.

PRISONERS HARBOR

Xaxas

The second largest historic Chumash village on Santa Cruz Island, *Xaxas* (hä' häs), was located at Prisoners Harbor and was occupied for over 3,000 years. It was a major port of trade and a departure point for cross-channel travel. At the time of European contact (Juan Rodríguez Cabrillo's voyage in 1542) the village was home to approximately 95–160 Chumash, including many high-ranking families, a powerful chief, and *tomol* (plank canoe) owners.

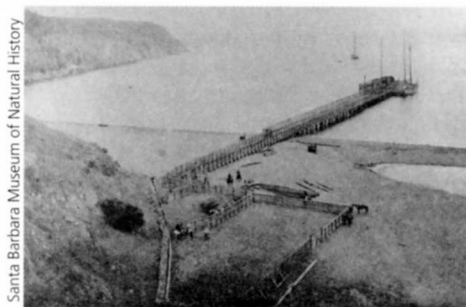
Xaxas appears to be the first place that Europeans set foot on Santa Cruz Island. During the land-and-sea expedition of Gaspar de Portolá in 1769, Father Francisco Palóu wrote that the Chumash at *Xaxas* welcomed the visitors “with demonstrations of great joy” and offered fish and helped with the water gathering. The newcomers gave them glass beads in return. The missionaries aboard the ship decided to go ashore to visit the village, where “they were well received and presented with fish, in return for which the Indians were given some strings of beads.” The priests returned to the ship and soon realized that they had left their staff at the village. They immediately gave it up as lost because it carried an iron cross and they believed that the Chumash would desire the metal. However, at daybreak an island dweller paddled his *tomol* to the ship and returned the staff with the cross. Climbing on board he delivered it to the priest and after being rewarded returned to the island. The island was subsequently called the Island of the Holy Cross (Santa Cruz) by the European explorers.

Although Chumash occupation of Santa Cruz Island ended in the early nineteenth century, many individuals who trace their ancestry to specific villages retain a lively interest in the preservation and

management of their heritage. Between three and ten thousand Chumash live in California today.

Place Name

The name “Prisoners Harbor” comes from an interesting historical incident in 1830. During this time the Mexican government intended to make California a penal colony. In February 1830 the *Maria Ester* brought about eighty prisoners from Acapulco to California. After being refused entry at the presidios in San Diego and Santa Barbara, Captain Andrew Christian Holmes decided that thirty of the worst convicts would be taken to Santa Cruz Island. The harbor where the prisoners were left with supplies was the island's main harbor and was subsequently called “Prisoners Harbor.” As to what happened to those prisoners, there are different accounts. Most accounts state that they somehow made it back to the mainland (possibly by building rafts and sailing across the channel to Carpinteria) and integrated into society. However, some accounts report that the prisoners did not survive the trip across the channel.

Pier

Santa Barbara Museum of Natural History

The building of the pier probably coincided with the expansion of the island sheep operation which occurred under the management of Dr. James Barron Shaw from 1853 to 1869. An 1869

photograph shows a substantial wharf at Prisoners Harbor. It was the first large wharf built in Santa Barbara County and was the artery through which essential goods and supplies have flowed to and from the island ever since.

Justinian Caire (island owner from 1880 to 1897) also realized the importance of Prisoners Harbor as the only good landing for supplies and set to work improving the small area known as La Playa (the beach) as the entrance gate to his island enterprises. To maintain the pier Caire imported a pile driver to the island and planted eucalyptus groves in the canyon for use as wharf pilings when the need arose. During a 1903 pier renovation, measurement of the pier was taken at 582 feet long.

The pier would continue to be modified and repaired until being destroyed during winter storms in 1942 to 1943. Shortly after, a new 360-foot pier was built to replace this destroyed pier. In 1966 the navy assumed responsibility for the maintenance and repair of the pier, renovating it in 1966 and again in 1993. After the transfer of 8,500 acres of eastern Santa Cruz Island from The Nature Conservancy to the National Park Service in 2000, the deteriorated pier was removed and replaced with a new pier in 2002.

Ranch Buildings and Structures



Prisoners Harbor was the gateway to the

Main Ranch in the island's central valley and the grazing and agricultural lands and out-ranches on the western portion of the island. Its facilities were of the utmost importance to the island's owners, as the shipping facility, entry point for visitors and warehouse location. By the 1860s a ranch had been established at Prisoners Harbor. The remaining buildings, structures and plantings are considered contributing resources within the Santa Cruz Island Ranching District, which has been determined eligible for listing in the National Register of Historic Places.

Warehouse



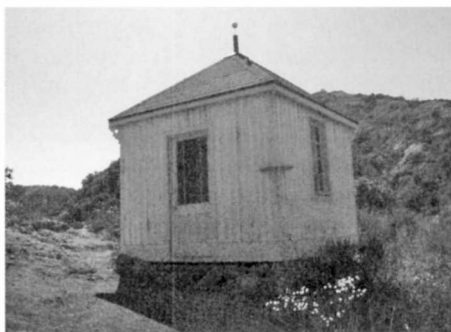
In 1887, using stone quarried and collected on the island and bricks manufactured on the island, Caire constructed a brick-faced, rubble and concrete double warehouse in which to store wool and wine awaiting shipment. A small-gauge rail system had been laid from a point behind the residence to the end of the pier, passing the doors of the warehouse, where goods could be loaded or unloaded from long, wide flatcars and carts. Incoming goods could be either unloaded into the warehouse or loaded onto wagons behind the house for the three-mile trip to the Main Ranch. The railway system was eventually dismantled, the job being taken over by trucks. In 2000 the central brick wall and the roof of the warehouse were repaired by the National Park Service.

Corrals and Scale House



The current cattle corrals were constructed in the mid-20th century as part of the transition from a sheep to a cattle operation. At this same time, the scale house was moved from its previous location next to the warehouse to where it stands today. Prior to the cattle corrals, sheep corrals were located between the warehouse and the pier.

Lookout



A lookout cabin, situated on the knoll above the harbor and reportedly predating the Caire ownership, provided a vantage point from which a watchman could spy incoming boats and relay the news by telephone to the Main Ranch. Margaret Holden Eaton, a former island resident, recalled that early in the century the French watchman regularly provided her fisherman husband with a large cup of fresh milk. Today, this lookout is owned and maintained by The Nature Conservancy and houses interpretive exhibits. Access is only by permit or guided tour.

Plantings and Fields

During the Caire era, the area at the mouth of the Cañada del Puerto was landscaped with grasses and trees planted in rows. Workers straightened the creek with the aid of stone retaining walls, diminishing the lagoon that had formed at the mouth of the drainage. Laborers planted more eucalyptus trees in a row behind the warehouse and sheep pens and stone pines near the foot of the pier. The rugged but picturesque Prisoners Harbor was molded into a welcoming scene for guests and workers. In some old photographs the site appears as a park with its large areas of green open space, trees growing in well-chosen places, and the stately Mediterranean residence with its carefully tended rose garden.

The low ridge directly to the east of the harbor, reached by a trail that continued to the east end, had adequate land for cultivation. At least three grain fields which marched up the hill in a southerly direction and were named, in order: Campo Primero, Campo Segundo and Campo Tercero (first, second, third).

Ranch House Complex



Although the ranch house was torn down in 1968 after it was damaged by a flood, historic plantings such as agave and pink ladies mark its former location. The stone and adobe six-room house at La Playa, constructed some time between 1857 and 1873 (but probably during the time of

Barron Shaw's ownership), was enlarged and remodeled by Caire's craftsmen into an elegant, ten-room residence. A second-story balcony, with island-made ornamental wrought iron rail faced the channel, and small decorative balconies in the same wrought iron pattern adorned the side windows and French doors framed in brick on the upper story. A garden stretched in front of the house surrounded by more wrought iron work. A separate kitchen building stood near the house for many years. The Caires either replaced or remodeled it into a more substantial gable-roofed building. A stone well with a windmill pumped water to a tank on the hill above the house. The stone well remains, although the water tank and windmill have disappeared.

Research shows that the only official post office on the northern Channel Islands may have been located in the ranch house. The Post Office Department commissioned Arthur J. Caire as postmaster of La Playa on March 28, 1895. It remained in service for eight years, closing on June 30, 1903.

A barn, which stood across the creek at the bottom of the hill on the east side of the valley, was used to store hay and alfalfa brought from the Campo Avuelo, Las Peras, Segundo and Tercero fields to the east. Photographs showed it with large rolling doors, a dormer with an opening, and a low vent cupola on the gable roof. The barns and other outbuildings burned or were razed.

Wetland

Prior to alterations in the late 1800s, Prisoners Harbor was home to the largest coastal floodplain wetland and stream channel on the northern islands. This rare habitat, comprised of a fresh water stream, coastal lagoon/wetland, and riparian woodland, provided respite from the long dry summers for a diverse array

of species including the island fox. The wetland most likely served as a resting and feeding stop for migratory birds and nesting habitat for resident waterfowl.

Over the past 150 years many changes were made to the area—the creek was rerouted and channelized; the wetland was filled in with rock and gravel; non-native plants such as eucalyptus, stone pines, and kikuyu grass were introduced; and a berm, buildings, roads, and corrals were constructed. These changes degraded the wetland ecology and compromised its effectiveness as a natural floodplain.

To restore the natural function and ecology of the wetland, the National Park Service and its partners removed fill from the wetland, reshaped the landscape to its former condition, and removed 250 feet of artificial berm to allow the wetland to flood naturally. In addition, non-native species such as eucalyptus were removed and native riparian and wetland species were planted.

The value of this project is significant as coastal wetlands in California are increasingly rare—over 90% have been eliminated. The restored wetland will provide important habitat for wildlife and native plants.

Santa Cruz Island Restoration

Close to the mainland yet worlds apart, Santa Cruz Island is home to plants and animals that are found nowhere else on Earth. Like the Galapagos Islands of South America, the Channel Islands exist in isolation, allowing evolution to proceed independently, fostering the development of 145 endemic, or unique, species. Santa Cruz Island is host to 60 of these endemic species. Some, like the island jay and the Santa Cruz Island silver lotus, are found only on Santa Cruz Island.

Unfortunately, this isolation has also made these species vulnerable to extinction. The melodic song of the Santa Barbara Island song sparrow and the crimson flower of the Santa Cruz Island monkey flower are no longer heard or seen within the park. The destruction of these species' habitats by non-native plants and animals has caused their extinction along with eight other rare and unique island species. Once found only on the Channel Islands, they have been lost forever.

To save 10 other island species, including the island fox, from the brink of extinction as well as to protect more than 2,000 significant archeological sites, the National Park Service and The Nature Conservancy embarked upon a multi-year program to restore Santa Cruz Island. This restoration program is part of the National Park Service mission, as mandated by Congress, to preserve unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. As owner of over 70 percent of Santa Cruz Island, it is the mission of The Nature Conservancy to preserve the plants and animals that represent the diversity of life on Earth by protecting the land and waters they need to survive.

The National Park Service, The Nature Conservancy, and natural and cultural resource experts identified non-native feral pigs and non-native fennel (an invasive weed) as the most significant disturbances to the island's sensitive resources. Both pigs and fennel cause major direct impacts to native plant communities, rare plant species, and archeological sites.

Pig rooting caused massive destruction of native species and resulted in bare ground that was easily eroded and colonized by invasive weeds, especially fennel. This

activity was a factor in the decline of nine island plant species listed as threatened or endangered by the U.S. Fish and Wildlife Service.

Pig rooting also damaged a large number of archeological sites on the island that are associated with the Chumash native people who occupied the island from at least 9,000 years ago until the early 1800s. The feral pigs rooted three feet deep at a number of sites, completely disturbing and desecrating these sacred sites and destroying their archeological value.

Moreover, feral pigs played a pivotal role in the catastrophic decline of island foxes. Piglets provided a year-round food source for golden eagles, allowing these formerly rare or occasional visitors to expand their range and establish a resident population on the island that then preyed on island foxes. Golden eagle predation placed the fox on the brink of extinction on Santa Cruz, Santa Rosa, and San Miguel Islands.

The consensus among numerous experts was that the eradication of feral pigs was the most important action that could be taken to protect and restore Santa Cruz Island. The National Park Service had tremendous success restoring other islands in the park through the removal of non-native animals. The eradication of European rabbits from Santa Barbara Island and sheep and burros from San Miguel Island resulted in tremendous natural recovery. Feral pigs were also eradicated from Santa Rosa Island in a similar program. Pig eradication began on Santa Cruz Island in 2005 and was completed in 2007.

Other management actions to initiate recovery of the island ecosystem were implemented. Golden eagles were captured and relocated to northeast California. A captive breeding program for island foxes was established to restore

a wild island fox population. The last captive bred island fox was released in 2008. Monitoring of the island fox population continues.

Also, native bald eagles were reestablished on the island. This predator disappeared in the 1950s due to DDT poisoning. Bald eagles eat fish, seabirds, and animal carcasses, not live foxes and are very territorial.

In 2006 this program paid off. For the first time in more than 50 years, two bald eagle chicks were hatched unaided from two

separate nests on Santa Cruz Island. Today the island is home to over 30 resident bald eagles.

This multi-year program to remove golden eagles, reestablish bald eagles, save island foxes, eradicate pigs, and control fennel has helped restore the balance to the naturally functioning ecosystem on Santa Cruz Island. Once restored, the island will offer one of the last opportunities to experience the nationally significant natural and cultural heritage of coastal southern California.

Before 1500

Foxes, native plants, and bald eagles live and thrive on Santa Cruz Island.

Before 1850

Humans introduce sheep and cattle.



1850s

Non-native pigs are brought to the island and become feral.



1950s

Bald eagles disappear from the islands due to hunting, egg collection, and pesticides.

1990s

Golden eagles establish nests on the island for the first time. They are attracted to and sustained by an unnatural year-round food source—non-native, feral piglets. They also hunt island foxes. There are no bald eagles to challenge the newcomers.



1994-2000

The fox population drops 95 percent, from approximately 1,500 animals in 1994 to less than 100 in 2000.

1997

Nine plants on Santa Cruz Island are listed as endangered or threatened.



Restoring Balance

Decades of human activity upset the island's natural systems, but recovery is underway

The plants, animals, and people that live on and visit Santa Cruz Island are linked together. The introduction of nonnative plants and animals has caused extinctions and endangered native species. The National Park Service and its partners are removing the nonnative species that have caused harm and restoring the missing pieces so the island's natural processes will work in balance again.

1997

Native plants and the island fox are at risk of disappearing. Vegetation is overgrazed and soil erosion is extensive. There are no bald eagles on the island.

1999

The last of the sheep are live-captured and removed from the island. Recovery of native plants begins. Live-capture and relocation of golden eagles begins.

2002

The Nature Conservancy and the National Park Service start a captive breeding program for the Santa Cruz Island fox. Between 2002 and 2007, over 80 foxes are born in captivity and released.

After 2008

The natural system is recovering: foxes, native plants, and bald eagles live and thrive on Santa Cruz Island.

2005-2008

For the first time, it is possible to plant endangered native plant species to establish new populations.



2007

Last of captive island foxes released into the wild. Wild population is over 300 animals and growing. The restoration project is bringing the island fox back from the brink of extinction.



2007

Over 40 golden eagles have been successfully relocated. Predation on island foxes is significantly reduced.

2005-2007

Non-native pigs are eliminated from Santa Cruz Island.

2004

Island fox is listed as an endangered species.

2002-2006

Bald eagles are re-established on Santa Cruz Island. In 2006, two pairs nest and the first chicks in over 50 years hatch on the island.





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