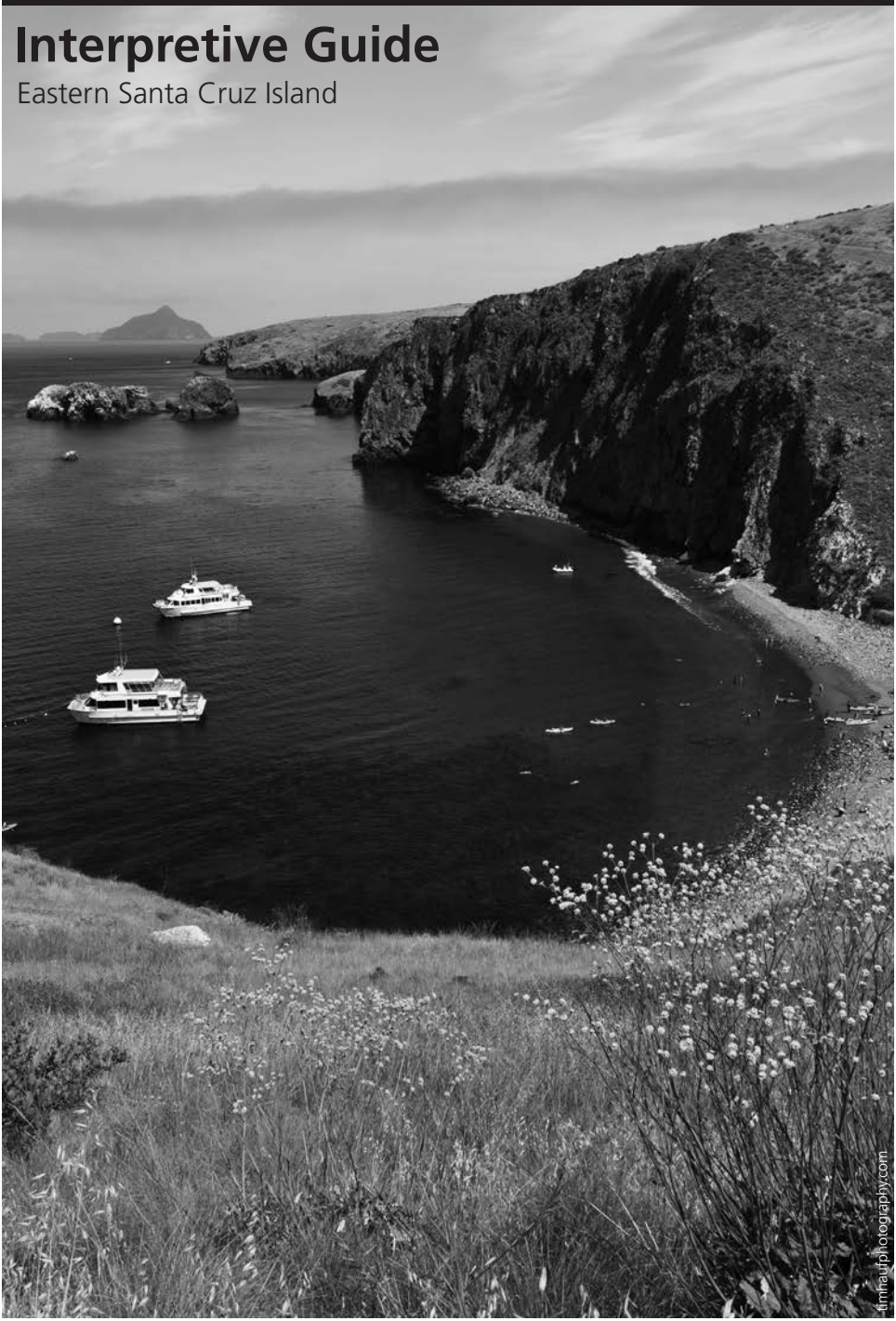
National Park Service
U.S. Department of the Interior

Channel Islands National Park

Interpretive Guide

Eastern Santa Cruz Island



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Scorpion Anchorage Beach to Cavern Point

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Prisoners Harbor Beach to Harbor Overlook

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How to Use This Guide

We recommend that you begin with one of the "Trail Guide" sections that provides interpretive stops along either the one-mile walk from Scorpion Anchorage Beach to Cavern Point or along the .5-mile walk from Prisoners Harbor Beach to the harbor overlook. This will give you a general overview of the island. Then, if there is still time, use the "Other Points of Interest" section to select another area to visit.

Also, please note that many of the topics covered in both sections are applicable to any island location.

For a more detailed hiking map, trail descriptions, and safety and resource protection information please see the "Hiking Eastern Santa Cruz Island" map and guide available at island welcome signs.

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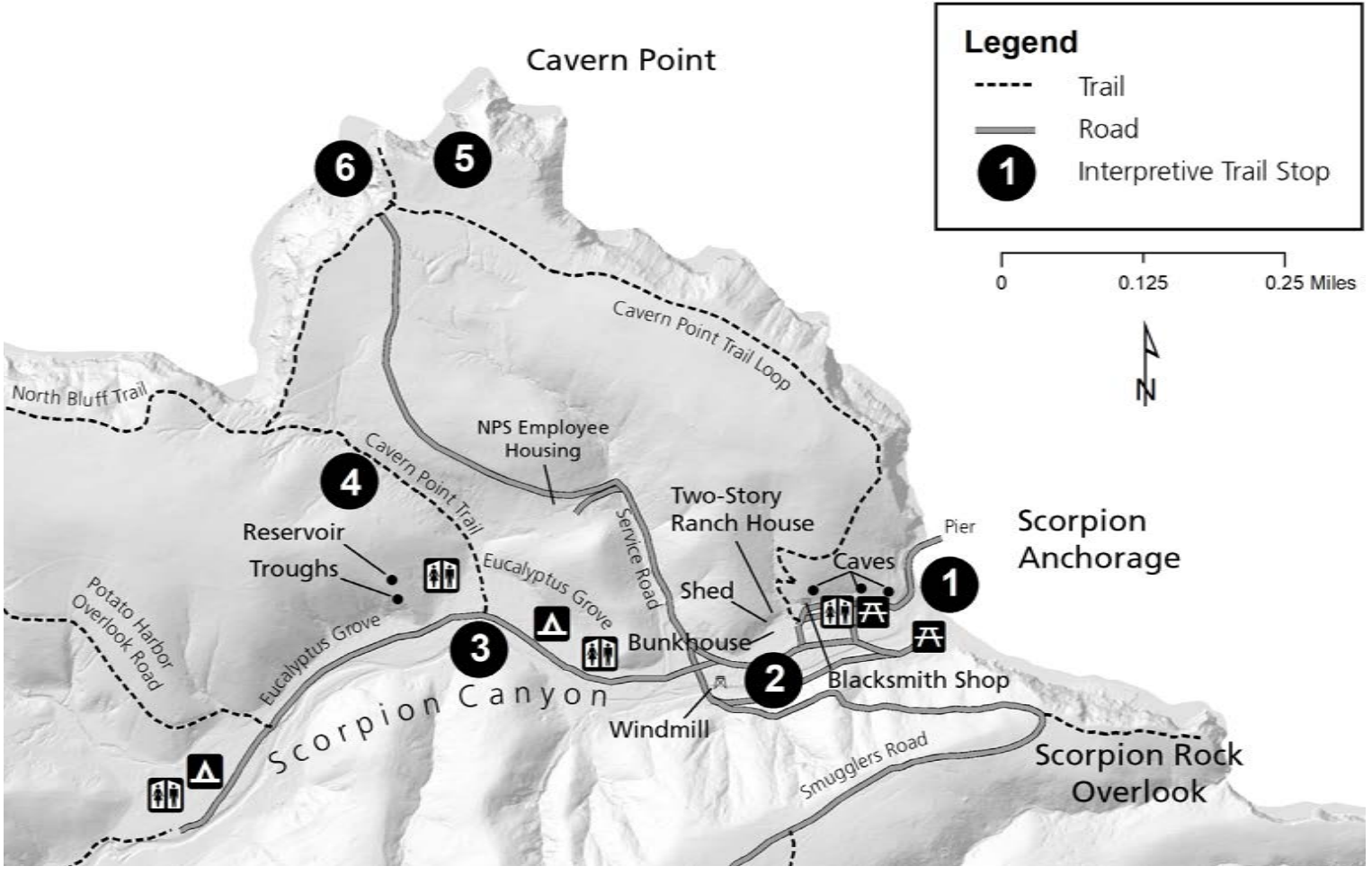
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Cavern Point Trail Loop
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Trail Stop 1

Nowhere Else on Earth

Location: Scorpion Anchorage 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.

Trail Stop 2

Preserving the Past

Location: 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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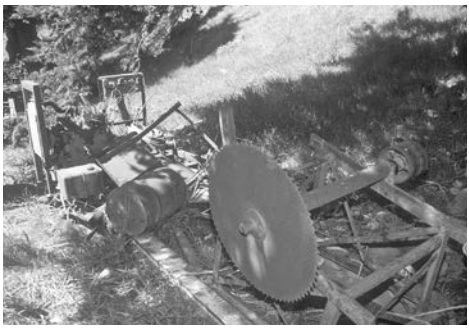
Pier Gherini family collection

Unloading sheep, Scorpion pier, 1977.

Pier Gherini family collection

Sawmill built by Joe Griggs, 1955.



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Sawmill as it looks today (bottom, right).

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

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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.

Trail Stop 3

Return of the Natives

Location: 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 nonnative 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 coastal sage-scrub, chaparral, oak scrub, oak woodland, and native grasslands (both annuals and perennial) has given way to nonnative, European grazing grasses and an assortment of weeds, including oats, bromes, fox-tails, thistles, mustard, and fennel. Today, nearly 25 percent of the plant species found on eastern Santa Cruz Island are introduced, 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 nonnatives eventually overwhelm the natives, which often have longer germination and growth cycles.

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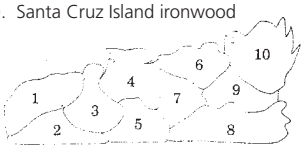
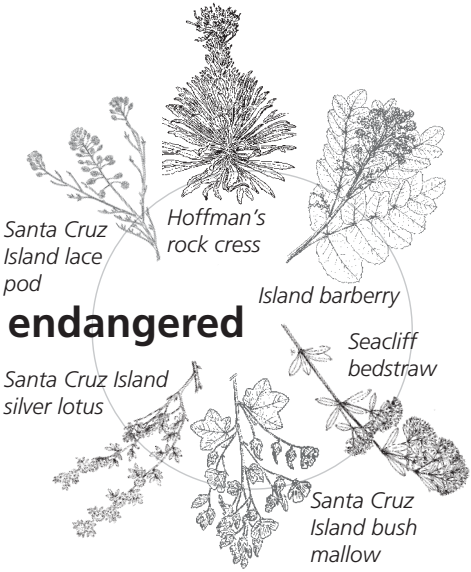
Endemic Plants

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





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).

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 currently 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 nonnative species. Over 9,000 sheep were removed from the eastern 6,200 acres of Santa Cruz Island 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 Island. Described as a "barren lump of sand" in the 1870s, San Miguel Island 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.

Trail Stop 4

Geographical Isolation

Location: 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 enmasse. 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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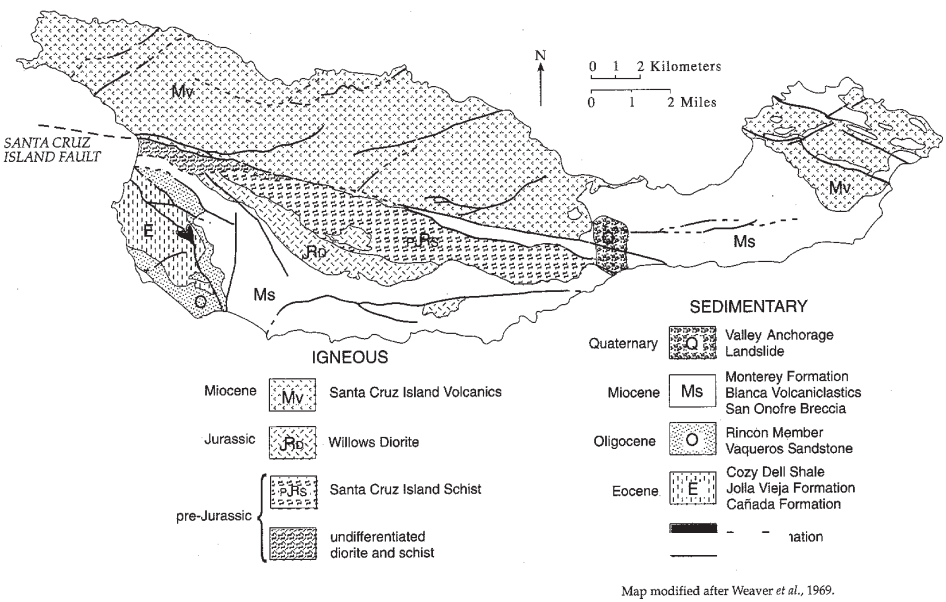
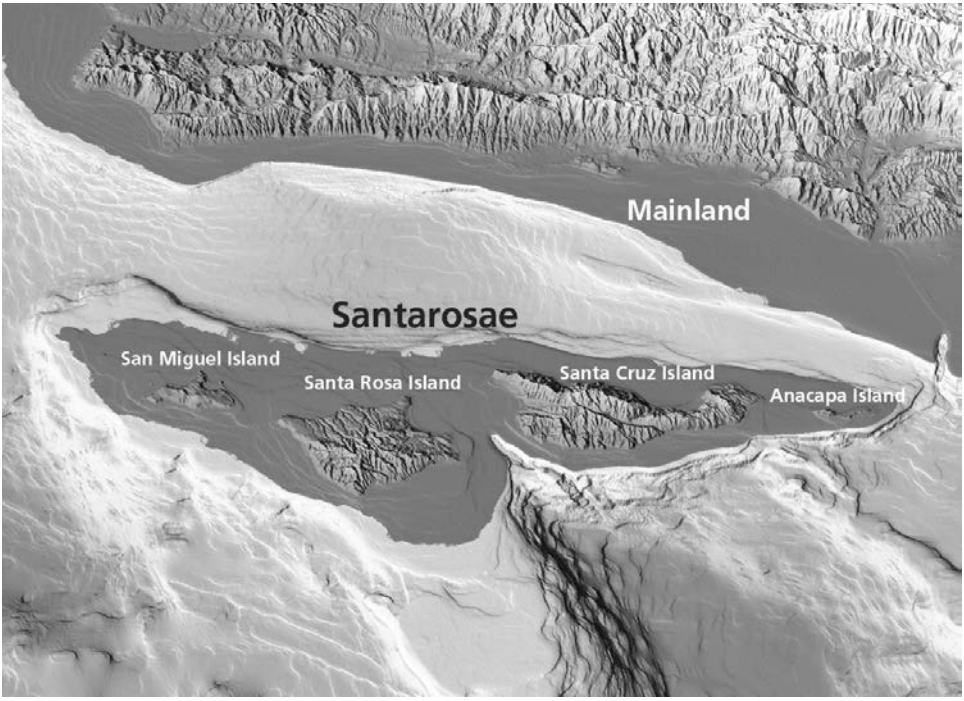
Santa Cruz Island Geologic Map



Map modified after Weaver *et al.*, 1969.



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 five 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.

Trail Stop 5

An Ideal Isolated Home

Location: 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 twelve different species of nesting seabirds and shorebirds, including ashy storm-petrels, Brandt's cormorants, Cassin's auklets, pigeon guillemots, and black oystercatchers.

Santa Cruz Island, 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 Island, 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 nonnative vegetation, revegetation with native plants, installation of nest boxes, and closures to protect nesting seabirds.

Trail Stop 6

A Window Into Their World

Location: 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 also had considerable natural deposits of chert, a hard durable silica rock.

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

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

The archeological sites around the Channel Islands are a testament to the importance of the Chumash and other American Indians. Archeological sites are sacred to Chumash peoples today, are protected by federal law, and are a vital nonrenewable scientific resource. Please help us in protecting and preserving this rich part of California's heritage.

Island 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.

Ancient Ocean Pathways Lead the Chumash Home

Peter Howorth

In 1976, the Chumash Brotherhood of the *Tomol* built and paddled the *tomol*, *Helek* (Peregrine Falcon), from San Miguel Island to Santa Rosa Island, and finally to Santa Cruz Island. This historic ocean voyage, the first since the mid-1800s, brought the Chumash back to their island home and sustained their traditional way life.

Then in 1997, a group of Chumash built the traditional style *tomol*, *'Elye'wun* (Swordfish), the first to be owned by the Chumash in 150 years, and paddled her from the mainland to Santa Cruz Island in 2001, completing the island circle begun by *Helek*.

Members of the Chumash community continue to celebrate their heritage and culture through annual *tomol* crossings to Santa Cruz Island. These journeys are an affirmation of tradition, which contemporary Chumash regard as a gift to their ancestors and children.

Centuries ago, the *tomol* was used to connect different island Chumash groups with each other and the mainland. Today, it links past generations of Chumash with the present-day Chumash community.

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* (p. 103), "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 flatbed railroad car was laid down, connecting the new abutment to the historic concrete block. Unfortunately, this too was damaged by winter storms in 2015. In 2016, the flatbed railcar was replaced with an elevated aluminum gangway. This is a short-term solution as the park expects to construct a new pier in 2019.

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

Pier Gherini family collection

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, 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." (Gherini, p. 97)

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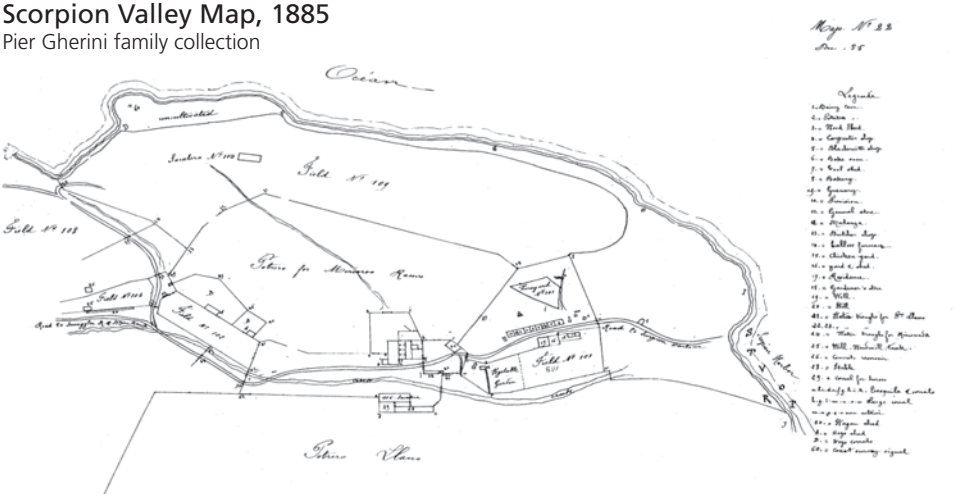
Scorpion Valley Map, 1885
Pier Gherini family collection



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

timhaufphotography.com

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 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 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.

Blacksmith Shop

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, p. 88) 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 early1880s. At that time Caire started developing a large island agricultural community that "included the production of wine, wool, tallow, meat, and olives." (Gherini, 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)

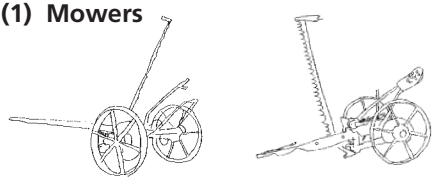
By the 1890s, Caire raised over 50,000 sheep, harvested 150 acres of vineyards, and planted olive orchards, eucalyptus groves, and extensive gardens. By 1900 wagons, carts, horse hay rakes, hay presses, mowers, gang plows, breaking plows, cultivators, barley seeders, anvils, drills, harrows, windmills, 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.

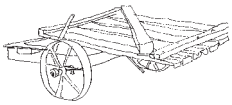
As you walk throughout this historic area use the map on the next page to locate the various farm implements. The numbers on the map mark the location of the farm implements described in this guide.

(1) Mowers



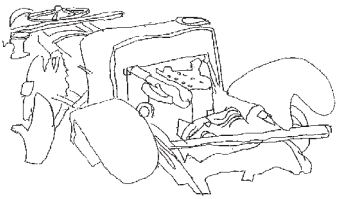
These mowers were horse-drawn and used to cut or mow hay. Often they featured mechanisms that lifted the cutter bar to clear rocks, stumps, or other obstructions. The Adriance, Platt and Co. (Poughkeepsie, N.Y.) mower was probably built in the mid 1910s. The International Harvester No. 9 mower was introduced 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



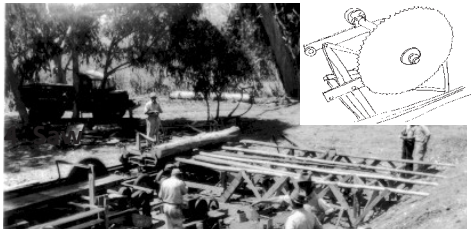
This wood flat-bed wagon was possibly a home-made trailer, constructed on the island. No other information is available.

(3) Gottfredson Truck



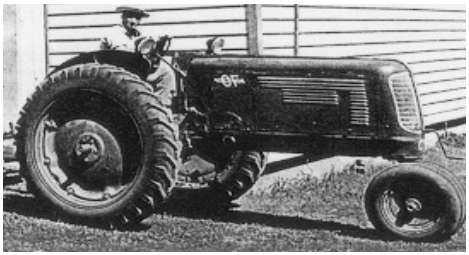
Only the chassis with metal seat, gas tank, and engine are left of this truck that was made in Canada. c. 1920s.

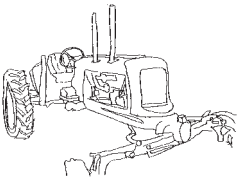
(4) Saw



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



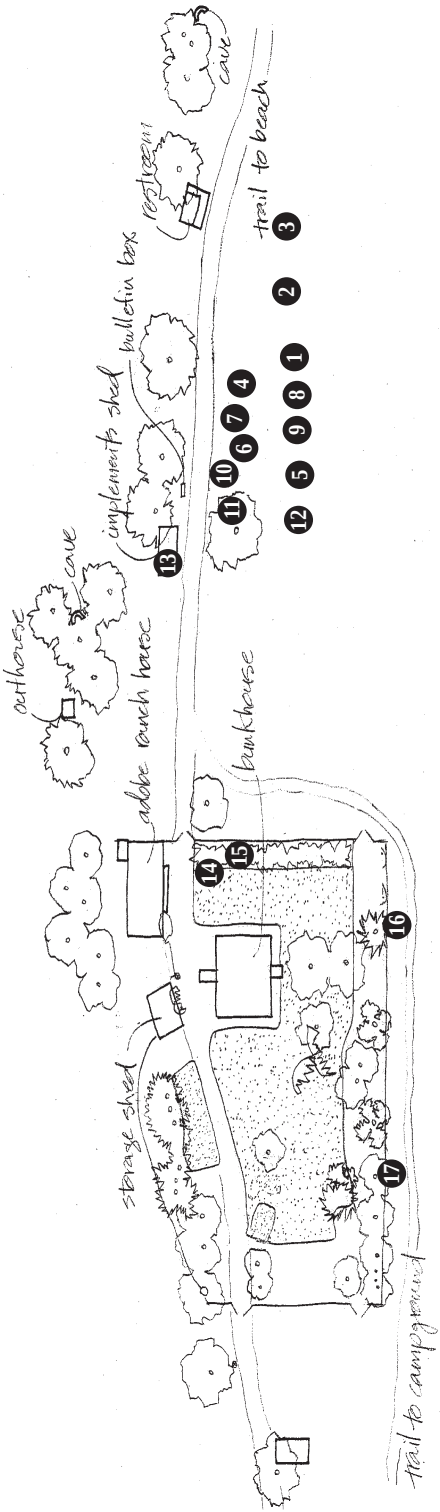


The Oliver 70 was built in 1946 (this model was built between 1937 and 1948). It has been modified to add a second smoke stack. It has a six-cylinder gasoline engine, six-speed transmission, electric lights and starter. Two Oliver tractors were used on the east end of the island.

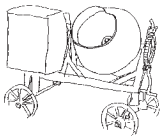
How did the implements get to the island?

Transporting equipment and supplies across 20 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.



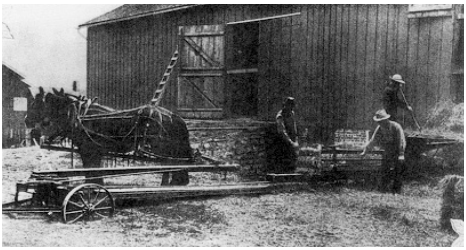
The Gherini family brought the first Oliver tractor to the island in 1954. A second Oliver tractor came to the island in the 1960s. The Oliver was a versatile piece of equipment. It has a fly wheel that was used to run well pumps in times of emergency when engines (usually the reliable Briggs and Stratton) broke down. A large belt was attached to the fly wheel of the Oliver and the fly wheel of the pump.

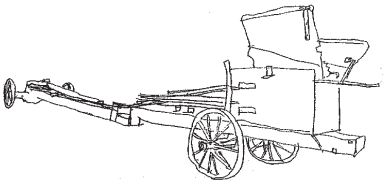


(6) Cement Mixer

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.

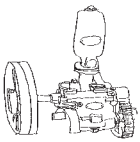
(7) Buffalo Hay Baler





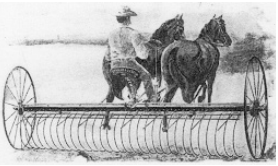
Hay balers were first built in the 1850s. Except for the efforts of a few individuals, hay presses were given little attention for another two decades. Even then the development of hay presses came very slowly. The early balers such as this Buffalo were primarily designed for the needs of small farmers, 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.

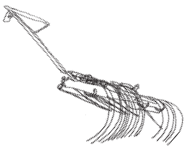
(8) Typhoon Water Pump



No information available.

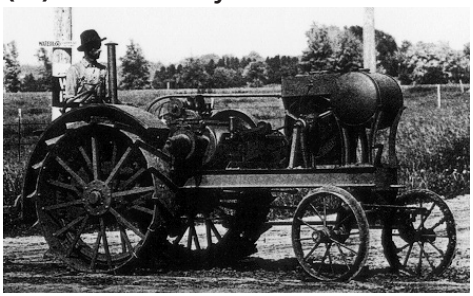
(9) Hay Rake

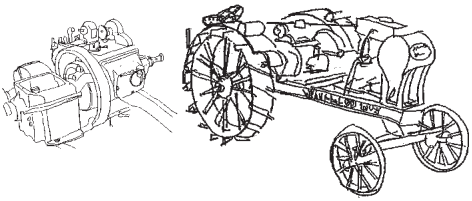




Only a portion of the hay rake remains. The seat, mounted on the front of the frame, and the large metal wheels are missing. Spare tines for the buck rake are also present. This hay rake with curved tines was pulled by horses and used to pile hay into windrows or clean up the field after haying. These 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 the rake to overturn and bend the wheels, which had to be fixed at the blacksmith shop.

(10) Waterloo Boy Tractor



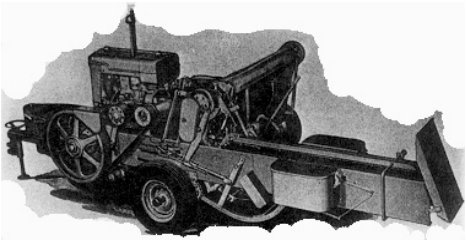


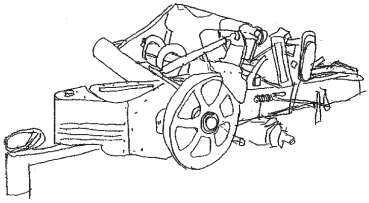
The Santa Cruz Island Company, owned by the Caire heirs, ordered two Waterloo Boy tractors on June 27, 1918 from W.L. Cleveland Co. of Los Angeles. Each tractor cost $1,450 and one was delivered to Scorpion in 1918. Alonson Swain, island superintendent for the Santa Cruz Island Company, observed in his 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."

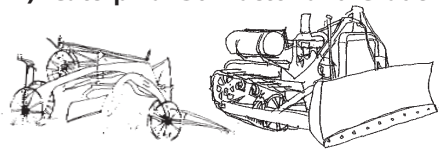
(11) International Harvester Hay Baler





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).

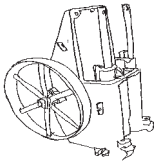
The Caterpillar 30 tractor model on display had an interesting beginning on the island. In 1938, the Gherini family brought the tractor to the island via a tug boat from San Pedro, California. When the "cat" was being unloaded at the beach, one of the wood planks used to allow the tractor to be driven 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

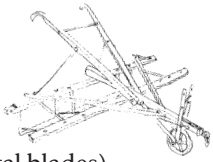
The foot-powered grindstone, Champion blower and Forge Co. press, vise, cement mounting block and anvil are all associated with the implement shed. For more information please see page 17 and the exhibits inside the shed.

(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.

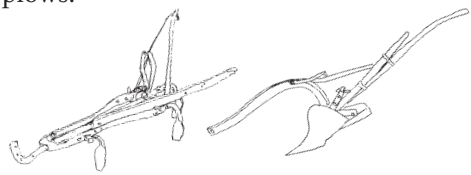
(15) Cultivator



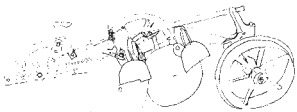
A cultivator or straight-knife (wood frame with square metal blades) was used to cut stalks off at ground level.

(16) Plows, Harrow, and Scraper

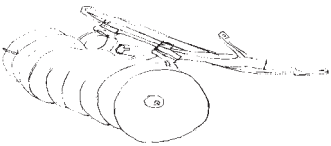
Plows were used to break or turn the earth before planting and, at first, were pulled by horse and then, later, by tractor. Within this area there are many different plows.



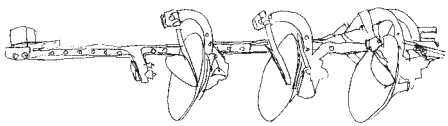
Small horse-drawn plow



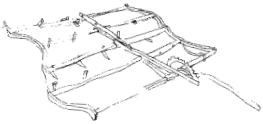
Two-bottom disk plow



Eight-disc horse-drawn plow-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, number and large size 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

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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

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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

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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 ranch house was completed in 2012.

Eucalyptus and Olive Groves

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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

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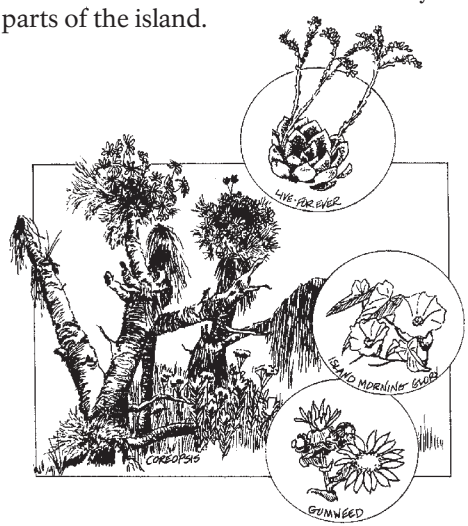
The windmill was constructed over a stone-lined well, which was probably constructed in the 1880s. Projecting stones form steps down into the well—a common European construction technique. In contrast, the three wells at Scorpion have no stone steps.

Scorpion Rock Overlook

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. With the removal of the sheep and pigs by 2007, the coreopsis and other plants have slowly spread beyond the cliffs and started to establish themselves in many parts of the island.



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 Island also serves as the meeting ground for seabirds 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 Scripps's 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 enmasse. 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

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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 here you also have a magnificent view to the west and the rest of the island. Santa Cruz Island is the largest island off the west coast of the United States. 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.

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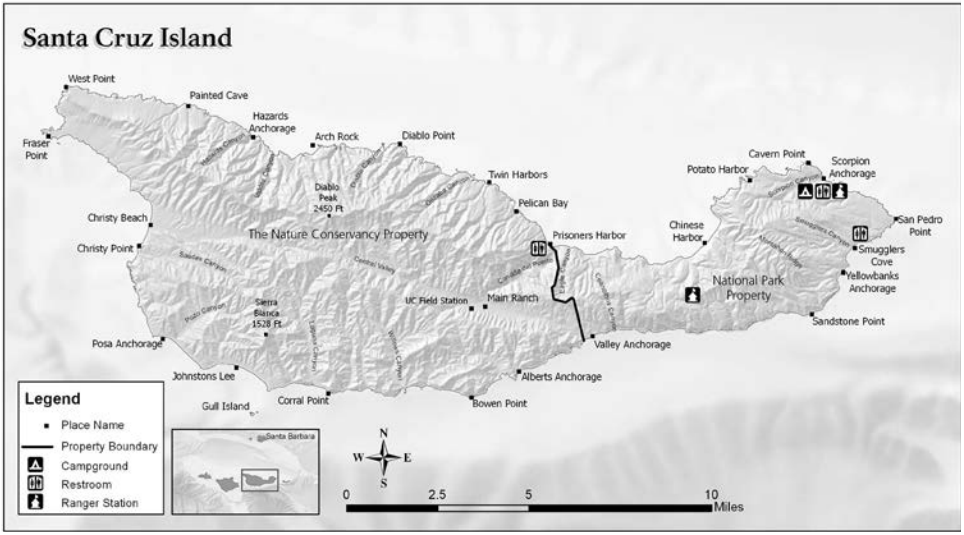

The Giant Kelp Forest

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 Island and the other Channel Islands. While urban and industrial development has altered much of the southern California mainland coast, 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 two 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 also 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

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.

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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. 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 five 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, 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

Island scrub oak is a thin-branched shrub with flat, smooth-edged leaves that are rich green on the upper surface, and a dull gray underneath. Coast live oak is a tall, stout tree, with spiny-edged, cupped leaves and "hairy armpits." 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.

The acorns from these oaks, along with those from seven other species that grow

Coast live oak

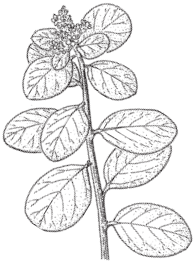
on Santa Cruz Island, were an important food source for the island Chumash and many other California Indians. Each fall acorns were gathered, hulled, dried, and stored in large granary baskets. When prepared, acorns were ground into meal, leached to remove the tannic acid and bitter flavor, and cooked 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 nonnative 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 remnant 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 successful adaptation and

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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 Island 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-leafed 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.

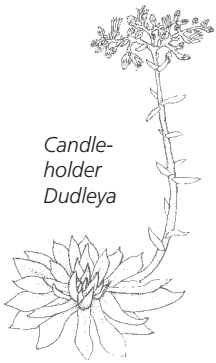
Coastal Prickly Pear

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 deyhydration.

The spines also helped protect the plant from cattle, sheep, and pigs, allowing it to spread into the overgrazed sage scrub and grasslands. Beginning in 1940 at the request of island owner 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)

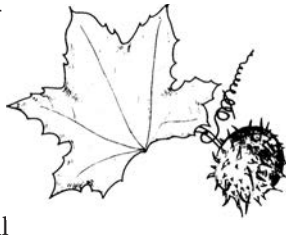


Candle-holder Dudleya

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.

Terrestrial Animals

The number of different animal species found on the Channel Islands, defined as species diversity, is small compared to what would likely be found on a mainland area of similar size. The level of species diversity on islands reflects the challenges to a species of first arriving and then of adapting to unique island conditions.

Consequently, the ecology of islands is often simpler, but the relationships between species are more important and the persisting animals (and plants) are often different than what might be found in mainland habitats.

For example, the park islands support only four native terrestrial mammals—the island fox, island deer mouse, harvest mouse, and island spotted skunk. The island fox, deer mouse, and spotted skunk have all evolved into unique species found only on the Channel Islands. In addition, the island fox and island deer mouse have evolved into a separate sub-species on each island.

The number of reptile and amphibian species is likewise low and includes four lizards, one salamander, one frog, and two non-venomous snakes. None of these species is found on all of the islands, and no island supports all the species.

For example, the island night lizard, a threatened species found nowhere else in the world, occurs on only three islands, one within the park (Santa Barbara Island) and two owned by the US Navy outside park boundaries.

What follows is a short description of some of the native terrestrial animals that can be found on Santa Cruz Island.

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Santa Cruz Island Fox

Tim Coonan

Island foxes frequently are seen in Scorpion Canyon and around the campground area. The island fox 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. The island fox was delisted as an endangered species in 2016 and has been recognized as one of the quickest and most succesful recoveries of an endangered species. Monitoring of the island fox population continues. For more information on this restoration program please see "Santa Cruz Island Restoration" on page 45.

Santa Cruz 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. The island deer mouse does carry hantavirus, however, and should be avoided.

This nocturnal creature can be found in just about every island habitat and is a very important part of the island ecosystem, providing an important food source for foxes, hawks, and owls. Research has shown that island deer mouse population densities are higher than anywhere else in the world. However, population dynamics on different islands vary in response to numerous factors, including predator diversity, vegetation community structure, and climate. For example, monitoring data show that deer mouse densities on San Miguel Island are strongly limited by the endangered island fox, whereas on Santa Barbara Island, where there are no foxes, mouse densities are much more variable.

In addition, research has revealed that rainfall is a strong driver of deer mouse population dynamics. High winter rainfall encourages plant growth that provides food resources, while drought reduces plant growth and limits mouse productivity. However, abundant winter rain combined with cold temperatures may actually increase winter mortality and reduce the number of mice that survive from fall to spring.

Food selection of the island deer mouse is dependent on both habitat and season. In the spring, it feeds heavily on larvae from lepidopterans (moths and butterflies) and other insects. In the fall seeds become a major food source and are stored in caches for use during the winter.

The island deer mouse breeding season occurs during the spring and summer months with generally two litters produced. Due to the diverse habitat of the Channel Islands, nesting is found in the natural cover of the landscape. The deer mouse will nest alone on most occasions but will sometimes nest with a deer mouse of the opposite sex.

Island Spotted Skunk

The island spotted skunk is endemic to the two largest Channel Islands, Santa

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Cruz and Santa Rosa. Unlike the island fox and the island deer mouse, island spotted skunk shows little differentiation between the two islands (slightly longer on Santa Rosa Island) as well as the mainland subspecies, suggesting recent colonization.

In recent times the species was limited in numbers. However, the island spotted skunk populations on both islands began increasing in the late 1990s, coincident with the decline in island foxes caused by golden eagle predation. As the only two terrestrial carnivores on the islands, skunks and foxes are natural competitors.

Habitat preferences are similar to those reported for the mainland subspecies. On Santa Rosa Island, it prefers rocky canyon slopes, cactus patches, chaparral, coastal sage scrub, open woodland, other scrub-grassland communities, and riparian habitat along streams.

The island spotted skunk is nocturnal with activity beginning at dusk, peaking during the early evening, and then continuing intermittently until dawn.

It is carnivorous, consuming island deer mice and insects along with occasional lizards. Jerusalem crickets are the most frequent prey, but other prey includes grasshoppers, crickets, beetles, caterpillars, earwigs, and ants. Seasonally available fruits and berries are collected as well.

The island spotted skunk mates in September and October and, following delayed implantation and 210 to 310 days of gestation, gives birth in April and May to two to six babies. It nests in cavities, burrows, and other natural crevices. Dens are constructed in roots and earth under shrubs, cavities in rocks, open grassy areas, road cuts, human-made structures, and trunks and roots of oaks. Individuals use several dens distributed throughout their home range; some dens are used by two or more individuals either sequentially, or for females, simultaneously.

Island Fence Lizard

timhaufphotography.com

The island fence lizard is endemic to the Channel Islands National Park's three northerly islands, Santa Cruz, Santa Rosa, and San Miguel. Although it is a distinct subspecies, it is physically similar in appearance to various mainland subspecies of the western fence lizard, which is one of the most common lizards in California. This species is sometimes called the "blue belly lizard," due to the vivid blue coloration seen on the abdomen of the adult male of the species.

The island fence lizard prefers open sunny areas, including stream banks, beach driftwood, grassy hillsides, and human settlements. It can be seen in the early morning, sunning on rocks, logs, and fences; the latter giving rise to its common name.

The island fence lizard eats small invertebrates such as crickets, spiders, ticks, and scorpions, and, occasionally, small lizards.

It mates in the spring. The female lays one to three clutches numbering from three to 17 eggs from April to July. The eggs hatch in about 60 days, from July to September.

Southern Alligator Lizard

Kathy deWet-Oleson

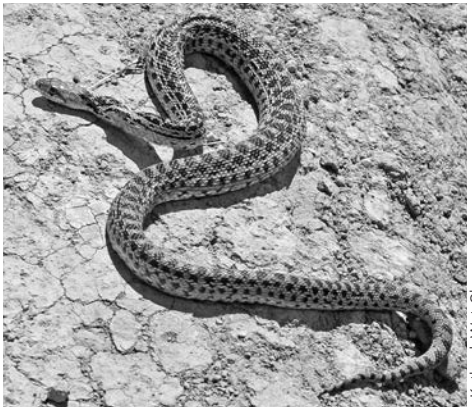
The southern alligator lizard is found on San Miguel, Santa Rosa, and Santa Cruz Islands in the national park as well as throughout California.

Preferred habitat for the alligator lizard includes grassland, open forest and chaparral, and oak woodlands. Individuals can be found under rocks, logs, boards, trash, and other surface cover. However, the alligator lizard does not typically bask in the sun out in the open or on top of a rock like many other lizard species.

The alligator lizard is carnivorous, feeding on various invertebrate species and, occasionally, on small, young mammals and birds. During the cold winter months it hibernates in underground dens, emerging in early spring.

Mating occurs between April and May with five to 20 eggs laid between May and July. Eggs are placed in rock crevices or burrows of rodents and hatch after 11 weeks. The alligator lizard reaches its maturity in about 18 months and can live as long as 15 years.

Santa Cruz Island Gopher Snake



Kathy deWet-Oleson

This endemic snake is found only on Santa Cruz and Santa Rosa Islands. It is a dwarf subspecies rarely exceeding three feet in length. By contrast, the Pacific gopher snake, its mainland cousin, can reach seven feet in length.

The Santa Cruz Island gopher snake is a habitat generalist and can be found in all vegetation associations. But it is most common in open areas such as grasslands, dry streambeds, and oak and chaparral woodlands.

Due to the more limited fauna of the islands, the Santa Cruz Island gopher snake has a less varied diet than other subspecies of gopher snakes. Its diet includes mice, lizards, birds' eggs, and nestlings. A powerful constrictor, the gopher snake kills prey by suffocating them in body coils or by pressing the animals against the walls of their underground burrows.

In spring, juveniles and adults emerge from rodent burrows or rock fissures, where they hibernate during the colder months of fall and winter. Adults reproduce in May with females depositing clutches (generally four to six eggs) from late June through July and hatchlings emerge in September and October.

continued on next page

Channel Islands Slender Salamander

Charles Drost

This salamander is found on Santa Cruz, San Miguel, Santa Rosa, and Anacapa Islands and is the only endemic amphibian found on any of the California islands. This secretive creature occurs in grassland, coastal sage scrub, chaparral, riparian, oak woodland, and pine forest communities. It has been found under rocks and logs, especially near streams. Dense populations have been found in open areas near the ocean.

This salamander is lungless. This means it breathes through its skin, requiring it to live in damp environments on land, not in water, and to move about on the ground only during times of high humidity. However, the cool marine climate of the Channel Islands, including summer fog, provides enough moisture for this species to be active all year.

This salamander uses a projectile tongue to capture prey, which include small invertebrates (earthworms and small slugs), a variety of terrestrial arthropods (sowbugs and millipedes), and insects (springtails, aphids, caterpillars, small beetles, beetle larvae, and ants).

Thirteen to 20 eggs are laid while the female is below ground during late fall and winter. Hatchlings emerge during winter and early spring. The adults and young animals migrate to the surface during the early rains in the fall and winter. The timing of this cycle is highly dependent on weather and varies greatly between wet and dry years.

Baja California Treefrog

This frog is found on Santa Cruz, Santa Rosa and Santa Catalina Islands. It is the only native frog known to inhabit the Channel Islands. However, the tree frog is probably the most abundant frog found in California as well as in the western United States. It utilizes a wide variety of habitats, including stream channels, forest, woodland, chaparral, grassland, pastures, desert streams and oases, and urban areas.

The Baja California treefrog can change color based on the air temperature and humidity, reducing the likelihood that it will become a meal for predators. Its diet consists of invertebrates, which are located by vision and then caught using its large, sticky tongue. Tadpoles are suspension feeders, eating a variety of prey including algae, bacteria, protozoa, and organic and inorganic debris.

Breeding and egg laying occur between November and July, with females laying on average between 400 to 750 eggs in small, loose, irregular clusters of 10 to 80 eggs each. Tadpoles metamorphose in about two to two and one-half months, generally from June to late August. In summer there are often large congregations of new metamorphs along the banks of breeding pools. Metamorphosed juveniles leave their birth pond soon after transformation, dispersing into adult habitats.

Townsends Big-eared Bat

While this bat species is found on the mainland, on the Channel Islands it occurs only on Santa Cruz Island. The species was first observed in 1939 on Santa Cruz Island in a historic two-story ranch house at Prisoners Harbor, which hosted a large maternity colony of over 300 individuals. In 1974, this structure was removed and no bats were recorded on the island until 1991 when a colony was discovered roosting in the bakery of the historic Scorpion Ranch. The bakery's ideal combination of temperature, humidity, and light make it a perfect roosting site. Occasionally, the bats also use the rock caves in the Scorpion area. Because habitat loss and human disturbances have caused the decline of colonies in Caifornia, this maternity roost is an important site for species conservation and is one of only two or three known to exist south of Point Conception.

Between March and June females form a nesting roost and give birth to usually one pup a year between May and July. Within three weeks the young bats are able to fly and after two months they leave the nursery roost. Radio-tracking has shown that the Scorpion bats forage up to five kilometers away to feed on moths and other insects among the native oak and ironwood forests on the north-facing slopes of Scorpion Canyon, returning to the bakery roost each morning. During the winter, the bats disperse throughout the island.

Other Terrestrial Animals

Scott Altenbach
J.N. Stuart
timhaufphotography.com
Marshal Hedin

The western harvest is the smallest of the rodent species found in the park. It occurs only on Santa Cruz Island within the park, as well as on Santa Catalina and San Clemente Islands. The species may have been inadvertently introduced to Santa Cruz Island by American Indians.

The side-blotched lizard is found on both Anacapa and Santa Cruz Islands in the park, as well on Santa Catalina and San Clemente Islands. It is a smallish lizard with males having different colored throats—yellow, orange, or blue. Each color is indicative of a unique mating strategy.

Of all the Channel Islands, only Santa Cruz Island harbors the black-bellied slender salamander. This species also occurs on the mainland. It is believed to have reached the island at least four million years ago.

The elusive western yellow-bellied racer is found in grassland and coastal sage scrub plant communities. It averages about three feet in length and feeds mainly on small vertebrates and large insects.

Please visit our website at nps.gov.chis for more information on these and other island species.

Prisoners Harbor Trail Guide

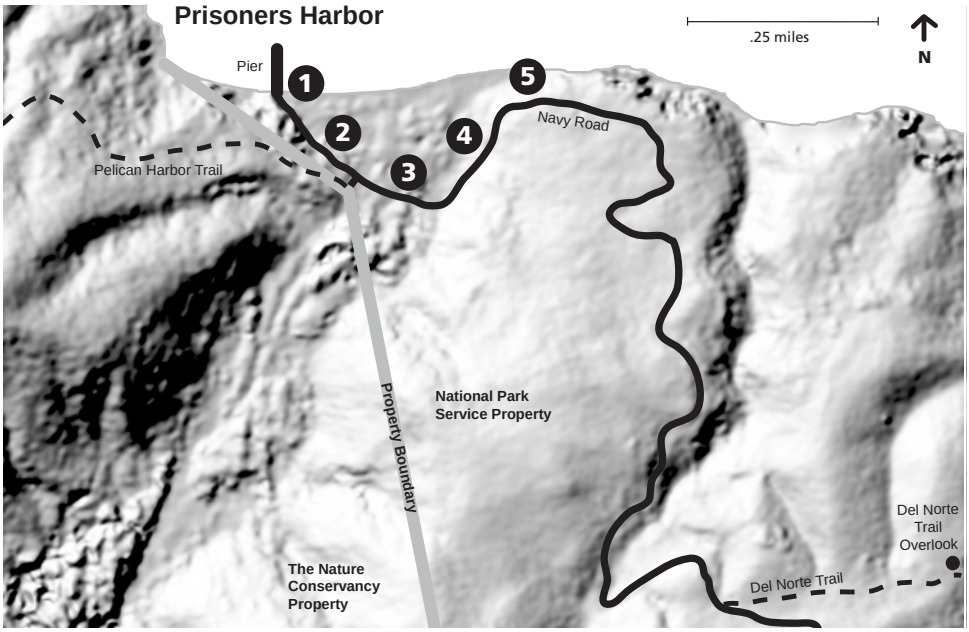
This trail guide provides five interpretive stops along the short .5-mile round-trip walk from Prisoners Harbor Beach to the harbor overlook. This will give you a general overview of the area. Then, if there is still time, use the "Other Points of Interest" section for Prisoners Harbor to select another area to learn even more. Also, please note that many of the topics covered in both sections are applicable to any island location.

For a more detailed hiking map, trail descriptions, and safety and resource protection information please see the "Hiking Eastern Santa Cruz Island" map and guide available at island welcome signs.

You may hike unescorted throughout the 24% of Santa Cruz Island that is owned and managed by the National Park Service, this includes the areas accessed by dirt roads to the east of Prisoners Harbor.

One hike option is to continue along the Navy Road past the last interpretive stop to an overlook of the northeast coast. Follow the Navy Road 1 mile to the Del Norte Trail junction and then follow the trail for another .25 to the Del Norte Trail overlook. This hike is 3-miles round-trip from Prisoners Harbor.

Visitors who are escorted by Island Packer staff or possess trail permits authorized by The Nature Conservancy (TNC) may access the Prisoners Harbor to Pelican Trail which is part of TNC property. No other hiking is allowed on the TNC property. You must stay on the designated trail system when hiking the Prisoners Harber to Pelican trail. No off-trail hiking is allowed.



Trail Stop 1

Nowhere Else on Earth

Location: Prisoners Harbor Beach

timhaufphotography.com

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.

Trail Stop 2

Preserving the Past

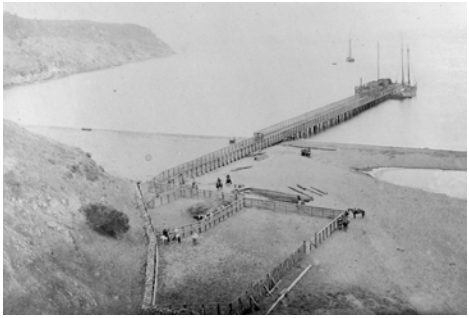
Location: Prisoners Harbor Ranch Complex

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*

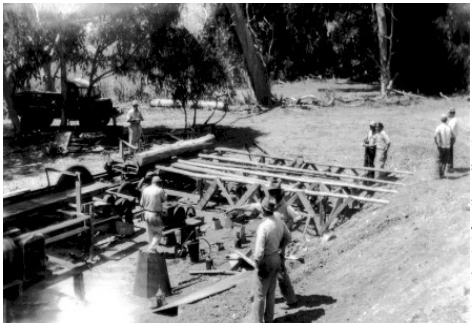
While the isolated island offered ranchers several advantages over the mainland, including no predators and the world's best fence (the ocean), it created special challenges as well. Supplying such a remote outpost was probably the biggest challenge. The transportation of supplies and stock onto and 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."



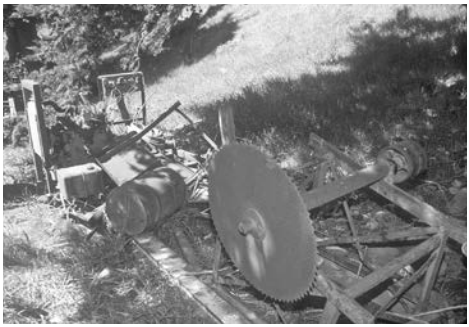
Santa Barbara Museum of Natural History

Prisoners Harbor pier and corrals, 1869.



Pier Gherini family collection

Sawmill built by Joe Griggs, 1955.



timhaufphotography.com

Sawmill as it looks today (bottom, right).

Santa Barbara Museum of Natural History

Historic Prisoners Harbor around 1892.

timhaufphotography.com

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 Prisoners, were developed. Justinian Caire realized the importance of Prisoner's Harbor as the only good landing for goods, and set to work improving the small area known as La Playa (the beach) as the entrance gate to his island enterprises. Its facilities were of the utmost importance to the island's owners as the shipping facility, entry point for visitors, and warehouse location. Please see the Prisoners Harbor points of interest section (pages 52-57) for more information about the historical features in the area.

Ranching by descendants of Justinian Caire, the Gherini family, continued on the eastern end of the island between 1926 and 1984. The Gherini era ended in February 1997 when the National Park Service acquired the last interest from the family. Ranching also continued on the rest of the island until 1987 when the Nature Conservancy acquired the property. In 2000, the Nature Conservancy donated 8,500 acres of its holdings, including the Prisoners Harbor area, to the National Park Service.

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.

Trail Stop 3

Return of the Natives

Location: Cañada Del Puerto

The over 100-year-old blue gum eucalyptus grove in the Prisoners Harbor area was one of many groves that were planted throughout the island during the ranching era for use as windbreaks, fuel, and wharf piles. Many other nonnative plants that reached the islands during the ranching period, however, are not as benign.

What was once an island covered with coastal sage-scrub, chaparral, oak scrub, oak woodland, and native grasslands (both annuals and perennial) has given way to nonnative, European grazing grasses and an assortment of weeds, including oats, bromes, fox-tails, thistles, mustard, and fennel. Today, nearly 25 percent of the plant species found on eastern Santa Cruz Island are introduced, providing approximately 75 percent of the ground cover.

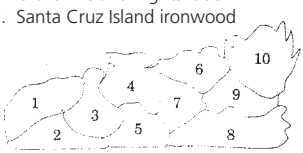
Native plants that developed in isolation often are vulnerable to competition from introduced or alien species. Many of these alien plants have evolved with grazing pressure, whereas the native island plants have not co-existed with grazers or browsers on the islands since the pygmy mammoths, nearly 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 nonnatives eventually overwhelm the natives, which often have longer germination and growth cycles.

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

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



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 nonnative species. Over 9,000 sheep were removed from the eastern 6,200 acres of Santa Cruz Island 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.

In 2011, work began here at Prisoners Harbor to restore the largest coastal wetland on the Channel Islands. Island ranchers reduced this wetland habitat by more than 50 percent when they filled it with gravel, rerouted and channelized the creek, and planted eucalyptus and other nonnative trees and plants. Restoring the westland included excavating thousands of cubic yards of fill and reshaping the landscape to allow the wetland to flood naturally. In addition, nonnative trees and plants were removed and replaced with native vegetation. Learn more about this wetland restoration project on page 55 and by visiting the signs around the wetland area.

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 all of Santa Cruz Island. Described as a "barren lump of sand" in the 1870s, San Miguel Island 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.

The Prisoners Harbor wetland, the largest coastal weland on the Channel Islands, has beem completely restored. See more pictures on page 55.

timhaufphotography.com

Brad Sillasen

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).

Trail Stop 4

Geographical Isolation

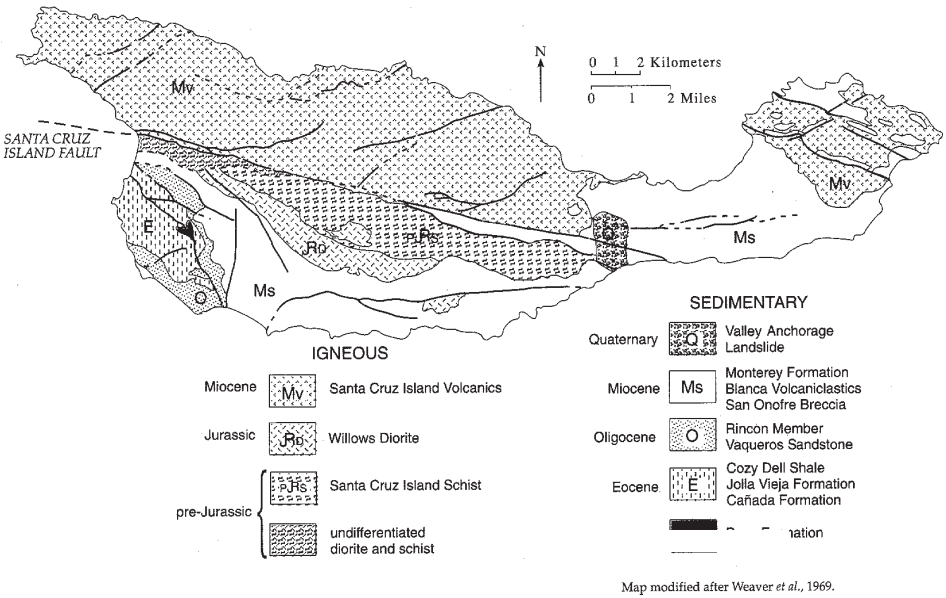
Location: Halfway to the Overlook

As you hike up to the overlook, take a moment and rest halfway up. Near this location two different rock types converge—Monterey shale and Santa Cruz Island volcanics. To the east is Monterey shale— a white to beige, fine, silica-rich rock made up of sediment washed out to sea from the mainland, reworked volcanic deposits, and shells and skeletons of marine organisms. These particles were laid down in layers underwater 7–16 million years ago.

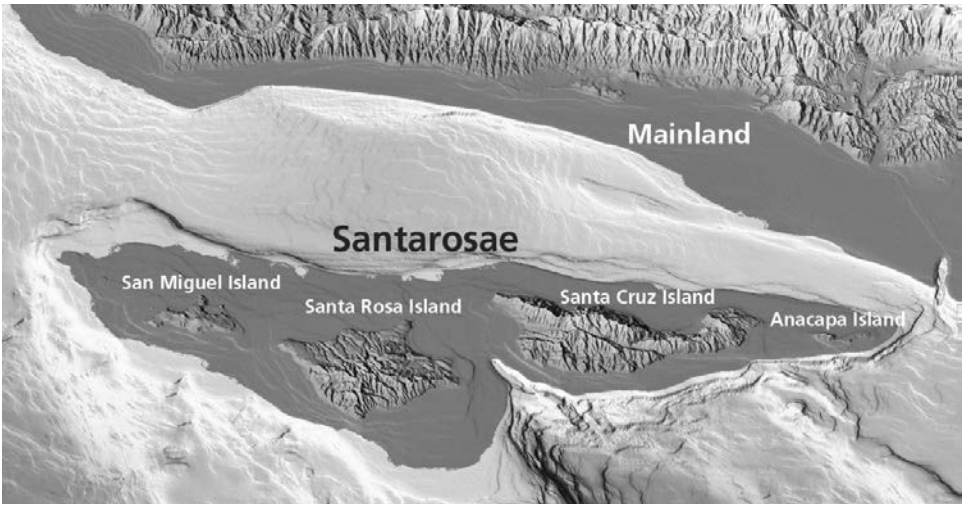
To the west (the area you have been hiking on) lies the Santa Cruz Island volcanics, composed primarily of andesite, a dark-colored, fine-grained rock. These rocks reveal a fascinating story about the formation of the Channel Islands. Between 15-30 million years ago, lava flows and volcanoes covered 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

Santa Cruz Island Geologic Map



Map modified after Weaver *et al.*, 1969.



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)

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. 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 five 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 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.

Trail Stop 5

A Window Into Their World

Location: Prisoners Harbor Overlook

As you reach the overlook, turn around and take in the view of Prisoners Harbor. 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 is just one of an estimated 3,000 archeological 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 archeological 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.

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

The archeological sites around the Channel Islands are a testament to the importance of the Chumash and other American Indians. Archeological sites are sacred to Chumash peoples today, are protected by federal law, and are a vital nonrenewable scientific resource. Please help us in protecting and preserving this rich part of California's heritage.

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.

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; and the wide variety of other natural and cultural resources not mentioned in this 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.

Ancient Ocean Pathways Lead the Chumash Home

Peter Howorth

In 1976, the Chumash Brotherhood of the *Tomol* built and paddled the *tomol*, *Helek* (Peregrine Falcon), from San Miguel Island to Santa Rosa Island, and finally to Santa Cruz Island. This historic ocean voyage, the first since the mid-1800s, brought the Chumash back to their island home and sustained their traditional way life.

Then in 1997, a group of Chumash built the traditional style *tomol*, *'Elye'wun* (Swordfish), the first to be owned by the Chumash in 150 years, and paddled her from the mainland to Santa Cruz Island in 2001, completing the island circle begun by *Helek*.

Members of the Chumash community continue to celebrate their heritage and culture through annual *tomol* crossings to Santa Cruz Island. These journeys are an affirmation of tradition, which contemporary Chumash regard as a gift to their ancestors and children.

Centuries ago, the *tomol* was used to connect different island Chumash groups with each other and the mainland. Today, it links past generations of Chumash with the present-day Chumash community.

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 19th century, many individuals who trace their ancestry to specific villages retain a lively interest in the preservation and management of their heritage.

Place Name

The name "Prisoners Harbor" comes from an interesting historical incident in 1830. During this time the Mexican government used Alta California as a place of exile for convicts. 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.

Ranch Buildings and Structures

Santa Barbara Museum of Natural History

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. Today, the buildings, structures, and plantings that remain are part of Santa Cruz Island Ranching District,

which is eligible for listing in the National Register of Historic Places.

Pier

Santa Barbara Museum of Natural History

The building of the original 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 (an island investor from 1869 to 1880 and the sole owner beginning in the 1880s) 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, the pier was measured at 582 feet long.

During the Stanton era (1937–1987), 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.

Warehouse

timhaufphotography.com

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.

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Corrals and Scale House

The current corrals and scale house are near the location of the harbor's earliest corrals constructed in the 1860s. As the ranch transitioned from sheep to cattle in the 1940s under the Stantons, new corrals were built across the road on the filled-in wetland. When the wetland was restored in 2011, the scale house was returned to its earlier location and a small corral was constructed of materials salvaged from the old corrals.

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

Santa Barbara Historical Society

Although the ranch house was torn down in 1960 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, 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

Coastal wetlands in California are increasingly rare—over 90 percent have been eliminated. Prior to alterations in the late 1800s, the Prisoners Harbor wetland was the largest wetland on the Channel Islands and provided a variety of habitats (open water, marsh, riparian, and woodland) for native plants and wildlife.

Ranchers reduced this wetland habitat by more than 50 percent when they filled it with gravel, rerouted and channelized the creek, and planted eucalyptus and other nonnative trees and plants.

The process of reviving the wetland's natural function and ecology on nearly 50 acres of land began in 2011. Thousands of cubic yards of fill were excavated and the landscape was reshaped to allow the wetland to flood naturally. In addition, nonnative trees and plants were removed and replaced with native vegetation.

The return of the wetland not only increases the diversity and abundance of plants and animals, it also helps protect archeological resources and historic structures from erosion and flooding and provides visitors the opportunity to experience, enjoy, and learn about a natural wetland ecosystem.

Top: wetland and wildlife, date unkown. Middle: filling in the wetland,1890s. Middle: wetland filled in with corrals, early 2000s. Bottom: restored wetland, 2013.

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 nonnative 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 nonnative feral pigs as the most significant disturbance to the island's sensitive resources. Pigs 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, disturbing 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 success restoring other islands in the park through the removal of nonnative 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 live 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. The island fox was delisted as an endangered species in 2016 and has been recognized as one of the quickest and most succesful recoveries of an endangered species. 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, hunting, collecting, and intentional 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, and eradicate pigs 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.

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.

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
Golen 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.

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.

Landbirds

Channel Islands National Park provides habitat for a diverse avifauna that is similar to yet distinct from the adjacent mainland. Species common as breeders on the adjacent mainland, such as the wrentit, oak titmouse, California thrasher, and California towhee, are absent from the park islands. Also there are a number of species that occur commonly on the adjacent mainland, such as the turkey vulture and American crow that are rarely observed on park islands.

Nine of the 60 species of landbirds that have nested on the park islands are represented by endemic species or subspecies—forms that are found on the islands and nowhere else. A few of these endemics are found on only one of the park islands like the island scrubjay (Santa Cruz Island) while the others like the island loggerhead shrike are found on two or more of the islands.

The island endemics tend to be either grayer or darker in color than the similar species on the mainland. The darker color of island birds may be due to the darkness of the vegetation and the abundance of fog as compared to the mainland. The grayer color of others may be due to the fact that some birds developed first on the southern islands that have more open environments and then expanded their range to the northern islands.

Due to the lack of competitors, many island birds, including these endemic subspecies, occupy more habitats than similar birds do on the mainland and therefore, more different kinds of food are available. This may be why bill size is longer and/or heavier in the island endemic birds. They also have longer and heavier tarsi (long bones in the lower leg of birds) that might be a result of a greater variety of perches used.

What follows below is a short description of the island endemic birds that can be found on Santa Cruz Island. Please visit our website (www.nps.gov/chis) for more information and for a complete list of birds that occur in the park.

Island Jay

timhaufphotography.com

The native vegetation found around Prisoners Harbor provides the perfect habitat for the endemic island jay. Look carefully among the willow, oak, 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, 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 Steller'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 the eggs, the male spends his time hunting and defending the nest from hawks, foxes, and other predators.

After the eggs hatch, both parents spend 23 days feeding, defending, and caring for their nestlings. 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 Loggerhead Shrike

timhaufphotography.com

This bird is a year-round resident of both Santa Rosa and Santa Cruz Islands and on some years it can be seen on San Miguel and Anacapa Islands. It is also on Santa Catalina.

It only differs slightly from the San Clemente loggerhead shrike, a federally listed endangered bird. Differences can be found in the DNA and the call is distinctive. Like many island endemics, the island loggerhead shrike is darker in color and its bills is longer than the mainland bird. However, the length of the wings is shorter.

The loggerhead shrike prefers open habitat with scattered trees and shrubs or fences where it can perch. It feeds on a variety of items depending on what is available, and the males frequently impale their food on fences or twigs.

Its nests are concealed in tall shrubs such as lemonade berry, toyon, and island cherry, and generally it has one brood of babies a year.

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Allens Hummingbird

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This endemic subspecies is commonly found year-round on Santa Cruz Island as well as all other park islands except Santa Barbara Island where it is a very rare fall transient. The mainland subspecies occurs regularly as a transient on all islands except Santa Barbara Island, where it is only rarely seen.

Like the mainland subspecies this hummingbird has rufous-colored sides, a rounded tail. However, it has a longer bill and wings. This subspecies expanded its range in the 20th century to the Los Angeles area.

Channel Islands Pacific-slope Flycatcher

This subspecies is a summer resident on Santa Rosa, Santa Cruz, and Anacapa Islands. Mainland subspecies are fairly common spring and fall transients on all of the park islands. When seen in the summer it is almost certain to be the endemic subspecies.

The Channel Islands Pacific-slope flycatcher is considered a subspecies, but some ornithologists think that it should be a separate species. This subspecies is grayer, has a longer bill, longer tarsi, longer toes, longer wings, and a longer tail length than the mainland subspecies. There are also voice and genetic differences between those found on the islands and on the mainland.

Like most flycatchers, this bird is an insect eater and can be seen flying out to get insects and then returning to its perch. It also gets some of its insect food by gleaning trees and shrubs. In addition, this bird is a cavity nester and migrates for the winter, probably to Mexico.

Horned Lark

Andreas Trepte

The horned lark is a ground subspecies found in the grasslands and is a common or abundant year-round resident of all park islands except Anacapa Island where it is a rare transient. There is no mainland subspecies on the islands.

The island subspecies shows all of the characteristics typical of change on the island birds, including darker color; a longer, broader bill; longer tarsi; and longer toes. It also has shorter wings and tail and some streaking below. Food consists of seeds and insects.

Orange-crowned Warbler

Brad Sillasen

This island subspecies is a resident on all the park islands. The non-endemic mainland bird can be seen during the fall and spring on all of the islands as it migrates through.

The color of the endemic subspecies is darker and more heavily streaked with olive below. It also has a longer bill, longer tarsi, longer toes, shorter wing length, and different song. It tends to nest off the ground in oak trees, lemonade berry shrubs, and coreopsis plants, while the mainland bird is generally a ground nester.

This subspecies can also be found on a few places on the Palos Verdes Peninsula and on Point Loma in addition to the islands. It is thought that these birds developed their unique characteristics on the islands and then expanded their range to the mainland. On the mainland this species exists in isolation from the other subspecies of orange-crowned warblers. Those that breed on the islands now, however, remain on the islands all year.

Channel Island Song Sparrow

Brad Sillasen

This bird is a year-round resident on all Channel Islands except Santa Barbara Island where it was a former year-round resident. It tends to be grayer than the mainland species. It prefers dense shrubby vegetation and tends to build heavier nests and locate them on the leeward side of a shrub because of the winds.

Santa Cruz Island Rufous-crowned Sparrow

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This subspecies is found year-round on Santa Cruz Island as well as West and Middle Anacapa. It is darker in color, has a heavier bill, longer tarsi, and heavier toes than the mainland subspecies which has not been seen on the park islands.

It favors coastal-bluff, coastal sage and open coyote-brush scrub habitat. Recent studies have indicated population increases as this habitat recovers from grazing. These birds are both ground nesters and ground feeders.

Parting Shots

timhaufphotography.com

Island fox

Wm. B. Dewey

Scorpion Ranch

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Cavern Point

Peter Howorth

Chumash *tomol* paddlers

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2017, 4th edition
Written and designed by Derek Lohuis
Contributions by John Gherini and Dewey Livingston

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