

Santa Cruz Island

Updated July 2016

Contact: Dr. Lotus A. Vermeer
lvermeer@ucsb.edu

Class Discussion Guide

Where is Santa Cruz Island?

Santa Cruz Island is located off the coast of southern California in the Channel Islands National Park. It is 19 miles from Ventura and 25 miles from Santa Barbara. At 96 square miles, it is the largest of the eight Channel Islands, as well as the most biologically diverse. The island supports 60 species found only in the Channel Islands. Twelve of those species—four animals and eight plants—exist only on Santa Cruz Island and nowhere else on Earth.

What was the goal of the Island Fox Recovery Project?

The Nature Conservancy, which owns 76 percent of Santa Cruz Island, and the National Park Service, which owns 24 percent, committed to saving the island fox and preserving the island's biological and cultural richness. The island is home to 10 federally listed species, including the Santa Cruz Island fox and nine rare plants.

What were the threats to Santa Cruz Island?

Feral pigs posed one of the biggest threats to Santa Cruz Island. Brought to the island as domestic farm animals in the 1800s, the pigs rooted up vegetation and disturbed the soils, which led to the destruction of ancient Chumash archaeological sites, caused widespread erosion and facilitated the spread of invasive weeds.

Their presence on the island also enabled golden eagles from the mainland to colonize Santa Cruz Island in the 1990s. Sustained by the year-round supply of feral piglets, the golden eagles also preyed upon the Santa Cruz Island fox, which had evolved over thousands of years without aerial predators. Within five years of their arrival, golden eagles had hunted the island fox to the brink of extinction.

When the U.S. Fish and Wildlife Service listed the Santa Cruz Island fox as an endangered species in 2004, fewer than 100 island foxes existed in the wild, down from about 1,500. Today, thanks to a multi-faceted restoration program, more than 1,500 foxes exist in the wild.

What was being done to save the Island fox and restore Santa Cruz Island?

The Nature Conservancy, the National Park Service, and several public and private partners engaged in a science-based program to recover the island fox and restore Santa Cruz Island's native habitat. The program involved five components: breeding island foxes in captivity and monitoring the wild population, relocating golden eagles to the mainland, re-establishing bald eagles on the island (which discouraged golden eagles from returning), eradicating feral pigs, and controlling invasive weeds. More details on each of the program's components can be found on www.nature.org/sci/ and www.chis.gov.

How many foxes were born in captivity? Were they all released into the wild?

The captive breeding program, which produced 85 pups since its implementation in 2002, was phased out in late 2007 due to the successful recovery of foxes in the wild. All captive foxes were released to the wild.

How are island foxes being monitored in the wild?

Scientists fit approximately 100 wild foxes with lightweight radio-collars to monitor their movement patterns and study how they interact with their habitat. Having a large proportion of the population collared allows us to closely track the survivorship and mortality rates and quickly adjust our management actions if necessary. Since 2004, when the island fox was declared an endangered species, the island fox population has increased more twelvefold on Santa Cruz Island—from fewer than 100 to more than 1,500 today.

How long have island foxes been on Santa Cruz Island?

The island fox is a descendant of the much larger mainland gray fox. The first foxes probably found their island home approximately 18,000 years ago by floating from the mainland on debris after a storm. The land mass where they landed—called Santarosae, about five to seven miles off the coast — consisted of what we now call Anacapa, San Miguel, Santa Rosa and Santa Cruz Islands. As sea levels rose, separating the northern Channel Islands, genetically distinct subspecies evolved on three of the islands—San Miguel, Santa Rosa and Santa Cruz.

Despite weighing less than five pounds, the island fox has remained Santa Cruz Island's top carnivore for thousands of years.

Why were feral pigs eradicated on Santa Cruz Island?

The Nature Conservancy and the National Park Service began eradicating pigs in 2005 to prevent the extinction of 10 unique and endangered species whose existence was imperiled by non-native feral pigs.

Feral pigs were perpetuating a disastrous ripple effect on Santa Cruz Island. Not only did the pigs disturb ancient archaeological sites, destroy native habitat and facilitate the spread of invasive weeds, they served as a year-round food source for golden eagles, which had pushed the island fox population to the brink of extinction.

How were feral pigs eradicated from Santa Cruz Island?

A highly skilled, professional hunting firm was contracted to eradicate the feral pigs from Santa Cruz Island. The firm specializes in island eradications and has successfully removed destructive, non-native species from the Great Barrier Reef Island off New Zealand, and Lord Howe Island off Australia. The firm has also been consulted on eradication efforts to preserve the rare biological diversity of the Galapagos Islands off South America.

To facilitate the eradication, 27.5 miles of fencing were constructed to divide Santa Cruz Island into five zones. The eradication firm systematically removed feral pigs from each zone through the use of aerial hunting, humane traps, and ground hunting with tracking dogs.

Neither snare traps nor poisons were used. Hunters used lead-free bullets and followed euthanasia guidelines set forth by the American Medical Veterinary Association. The dogs were used for tracking only, and they underwent aversion training to avoid foxes and other island wildlife, such as skunks and birds.

How long did the eradication program take?

The eradication program began in April 2005. The hunters completed their work in July 2006 ahead of schedule, eradicating 5,036 pigs. Monitoring for remaining pigs continued for over a year before the program officially concluded, and the island was declared pig-free in August 2007.

Why did the feral pigs have to be eradicated? Why weren't they returned to the mainland or controlled through the use of contraception?

Over a period of many years, scientists with The Nature Conservancy, the National Park Service, universities and other public and private organizations researched, analyzed and publicly aired alternative strategies for negating the damage caused by feral pigs.

Moving feral pigs to the mainland was not an option. The State of California prohibited the relocation of pigs from Santa Cruz Island to the mainland because of their potential to spread disease to domestic livestock.

Neither contraceptives nor chemical sterilants could have eliminated or substantially reduced the population of feral pigs on Santa Cruz Island. Feral pigs have a very high reproductive rate, which results in rapid population growth. No contraceptive is 100 percent effective, and all contraceptives require multiple and regular dosing of the same animal to be effective. Even when properly and regularly applied (a practical impossibility, given the island's rugged landscape), a percentage of the animals treated with the contraceptive would have still been able to reproduce. Moreover, contraception did not address the immediate needs of removing all of the feral pigs because of habitat destruction and the loss of unique species and archaeological sites.

What happened to the pigs after they were killed?

The pig carcasses decayed naturally and were recycled into the island ecosystem. Carcasses near watercourses were removed and placed under cover. The pig carcasses could not be sold or donated for public consumption because they were not government inspected and certified.

In the past, recreational hunters were called in to hunt pigs on the island. Why didn't local recreational hunters do this job?

During the past century, private landowners undertook various efforts to rid the island of feral pigs. But the extremely rugged terrain of Santa Cruz Island, along with the pigs' rapid reproduction rate, foiled their attempts. Meanwhile, time was running out for the island fox and nine unique plant species.

Of the 20-plus contractors who responded to The National Park Service's and The Nature Conservancy's request for proposals to eradicate the feral pigs, the firm selected was the most advanced and experienced, having successfully completed complex eradication programs on other islands.

How much did the eradication cost?

The entire eradication program cost approximately \$5 million. The National Park Service committed \$2.6 million in public funding toward the eradication, and The Nature Conservancy committed \$2.4 million in private funding.

What will happen now that the pigs are gone?

The island's native vegetation has shown remarkable signs of rapid recovery—just as it did following the removal of 36,000 feral sheep from Santa Cruz Island in the 1980s.

Efforts to monitor for golden eagles continue. With no pigs, there will be little food remaining on the island to sustain a golden eagle population.

How many golden eagles were relocated to the mainland? How many remain?

Since 1999, The Nature Conservancy and the National Park Service have captured 44 golden eagles, including 32 adults, sub-adults and juveniles, and 12 nestlings born in island nests, and relocated them to the eastern side of the Sierra Nevada Mountains. A number were fitted with radio transmitters. None have returned. Efforts continue to monitor the island for golden eagles and relocate them as necessary.

Will golden eagles have to be killed to save the island fox?

We (TNC and NPS) do not support the lethal take of golden eagles in the northern Channel Islands. We will continue to make every effort to live capture golden eagles and relocate them to the mainland.

Why are bald eagles being re-established on Santa Cruz Island?

Bald eagles disappeared from the Channel Islands by 1960, when high concentrations of DDT in their ocean-based food supply rendered their eggs too thin to hatch.

The National Park Service launched a five-year program to re-establish bald eagles in the northern Channel Islands in 2002. The program, which has introduced 61 birds to Santa Cruz Island, is funded by a court settlement against companies that discharged DDT and PCBs into the ocean off the southern California coast from the late 1940s to the early 1970s.

The program reached a milestone in 2006, when two bald eagle chicks hatched unaided on Santa Cruz Island for the first time in more than 50 years.

Bald eagles reach sexual maturity around the age of five, so scientists expect to see more nests in the near future. Once they reach sexual maturity, bald eagles become fiercely territorial, which is expected to help deter golden eagles from returning to nest on Santa Cruz Island.

Do bald eagles eat island foxes?

Bald eagles feed primarily on fish and carrion. They co-existed with island foxes for thousands of years before succumbing to DDT poisoning in the 1960s.

Who is involved in the efforts to save the island fox and restore Santa Cruz Island? What exactly is their relationship and who ultimately is in charge?

Saving the island fox—and preserving Santa Cruz Island’s flora, fauna and cultural resources—is a cooperative effort involving many partners.

The island’s two landowners—The Nature Conservancy and the National Park Service—co-manage Santa Cruz Island as one ecological unit and are responsible for preserving its biological and cultural heritage. To achieve this goal, The Conservancy and the Park Service partnered with several organizations to conduct research and implement various aspects of the restoration program. These organizations include the Institute for Wildlife Studies, the University of California Natural Reserve System, the Santa Cruz Island Foundation, the Santa Barbara Museum of Natural History and the Santa Barbara Botanic Garden.

The U.S. Fish and Wildlife Service administers the Endangered Species Act. Shortly after it listed four subspecies of island fox as endangered in March 2004, the Service appointed an advisory group to guide the fox recovery program. The group was composed of leading experts from various

public and private organizations, including scientists from academic institutions, The Nature Conservancy and the National Park Service.

Did the restoration program work?

The restoration project on Santa Cruz Island has reached thresholds of success in fox recovery, bald eagle re-establishment and habitat recovery. The island has staged a dramatic comeback. The endangered island fox population has now recovered and is one of the fastest endangered species recovery programs in U.S. history; bald eagles are hatching in the wild; and native vegetation is recovering. Since feral pigs have been removed, we are seeing lots of oak regeneration and native plants are rebounding.

These encouraging developments have been in the making for the last 30 years, a process that began in 1978, when The Nature Conservancy signed a conservation agreement with the island’s previous owner and set out to remove tens of thousands of feral sheep that pushed the island to the edge of biological collapse.

Today, survival of Santa Cruz Island’s biological diversity is bright.

