

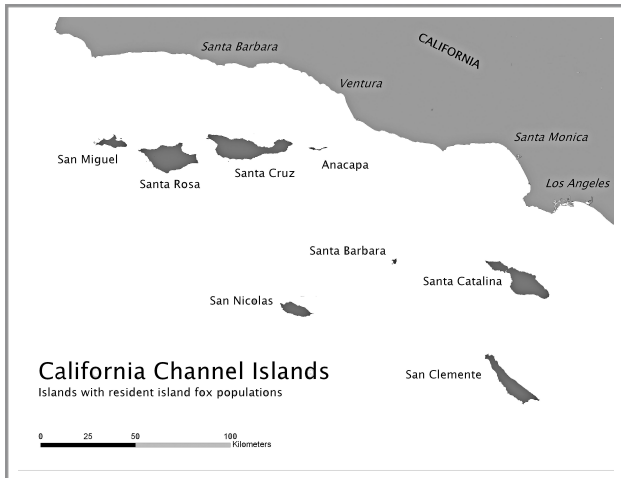
## Friends of the Island Fox

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### Fact Sheet: Island Fox (*Urocyon littoralis*)



**CLASSIFICATION:** Worldwide, there are 23 species of foxes (Family Canidae), in four genera. The genus *Urocyon* includes two species of North American foxes, the gray fox (*Urocyon cinereoargenteus*), and the island fox (*Urocyon littoralis*). Island foxes live only on the six largest of the eight California Channel Islands. The island fox is the only carnivore species that occurs only in California and nowhere else (endemic).

The island fox evolved from the gray fox. On each island, foxes have further evolved into separate subspecies. The island fox differs from its gray-fox ancestor in that all subspecies have less tail vertebrae and therefore shorter tails than their ancestor (about a

third the length of the body). Island foxes are 20%–30% smaller than gray foxes and their coloration is slightly more rufous. There are additional physical and genetic differences between the subspecies. The island subspecies are: San Miguel – *U. l. littoralis*, Santa Rosa – *U. l. santarosae*, Santa Cruz – *U. l. santacruzae*, Santa Catalina – *U. l. catalinae*, San Clemente – *U. l. clementae*, and San Nicolas – *U. l. dickeyi*.

**DESCRIPTION:** The island fox is the smallest fox species in North America. Adults stand 6.5 - 8 inches high at the shoulder and are 23-27 inches long (including the tail); similar in size to a Chihuahua. The island fox's legs and tail are relatively shorter, in comparison to the body, than in gray foxes. Adult island foxes weigh 2.5 to 6 pounds—males are slightly larger than females. On average, foxes are largest on Santa Catalina and smallest on Santa Cruz.

#### RECENT DISCOVERIES:

- While microchipped island foxes on Santa Cruz and Catalina are known to have lived 10–12 years, data from San Miguel and San Nicolas shows island foxes surviving 8 years. Lifespan may vary by island.
- Diet research is revealing some island foxes are eating unexpected insects—flies & ants—and marine resources, like beach hoppers (a small crustacean, erroneously called “sand fleas”). Further dietary investigation continues.
- *Staph* bacteria in the ear canals of island foxes on Catalina Island may contribute to an over-active immune system response to ear mites, which can lead to cancerous tumors. Natural microbes on the skin and in the body are important to health. FIF is funding research analysis of the microbiome of island foxes on the other five islands to understand how population declines might reduce the biodiversity of important microbes and impact island fox health.

**HABITAT:** The California Channel Islands are semi-arid; rainfall averages less than six inches per year, but differs between islands. Larger islands (Santa Cruz, Santa Catalina and San Clemente) have perennial streams which support riparian vegetation and tree species. Foxes are found in most habitats, but prefer shrubby or wooded areas such as chaparral, coastal scrub and oak woodlands. For a century, native island vegetation was heavily degraded by introduced grazing animals. The northern islands (San Miguel, Santa Rosa and Santa Cruz) and San Nicolas Island (in the south) have significant areas dominated by nonnative plant species: annual grasses and ice plant. Habitat restoration benefits island fox survival. The southern islands (Santa Catalina, San Clemente and San Nicolas) have year-round human residents and more impacts from development: roads, naval bases, and the city of Avalon.

**DIET:** Island foxes are omnivorous—eating both plants and animals. They are generalist predators, but eat a large amount of insects (especially, beetles and their larvae, crickets, and grasshoppers) and native fruit (toyon, manzanita, prickly pear cactus, etc.). Island foxes supplement their diet with deer mice, birds and eggs, lizards, snails, carrion, marine resources, and introduced species (earwigs, European snails, ice plant and Australian saltbush). Diet changes seasonally and with resource availability. On islands with the greatest native plant diversity, island foxes eat a higher percentage of fruit and have been found to survive better during periods of drought. San Miguel and San Nicolas Islands have the least native plant diversity, leaving foxes more dependent on introduced species. These populations tend to be impacted the greatest during extended drought.

**ADAPTATIONS:** Island and gray foxes (genus *Urocyon*), are genetically distinct from all other fox genera (like red foxes of genus *Vulpes*). Unusual among canines, island foxes have semi-protractile claws, which help them grip and climb. They can climb high into trees and up cliffsides. Despite their small size, they are nimble and can run with bursts of speed to catch prey. They have a relatively narrow muzzle for reaching into crevasses and excellent vision. Their sight is enhanced by dichromatic vision and nocturnally by a reflective tapetum, similar to gray foxes and domestic dogs. Evolving in an environment with limited resources, island foxes became a dwarf island species.

**REPRODUCTION AND GROWTH:** Pairs tend to mate for life. Breeding typically takes place February–March. Gestation is approximately 50–53 days. An average of two to three pups are born in late April. (In 2015, biologists noted pups on the southern islands being born as early as February. This may be a response to a warming winter climate.) Food availability, impacts litter size. A female with abundant resources may have up to five pups. A lack of resources on San Miguel from 2013-2016 resulted in virtually no reproduction islandwide or a lack of pup survival. Pups are born in simple dens under shrubs, downed trees or large rocks. The mother attends the pups in the den for the first weeks, while the male provides her with food. The pair raises the young together. Pups emerge from the den in early June and forage with both parents throughout the summer. From 2000 to 2008 captive breeding efforts were necessary to preserve endangered populations. During that time, captive-born pups released into the wild demonstrated an ability to breed in their first year. Usually females begin breeding in their second year. It is believed females are only in estrous for 40 hours, once a year, and only when a male is near by. Wild island foxes live approximately 8-12 years (ID microchip verified). Male pups tend to disperse a great distance from their parent's territory, while female pups may stay closer even as they reach adulthood. However, female mobility may occur on some islands.

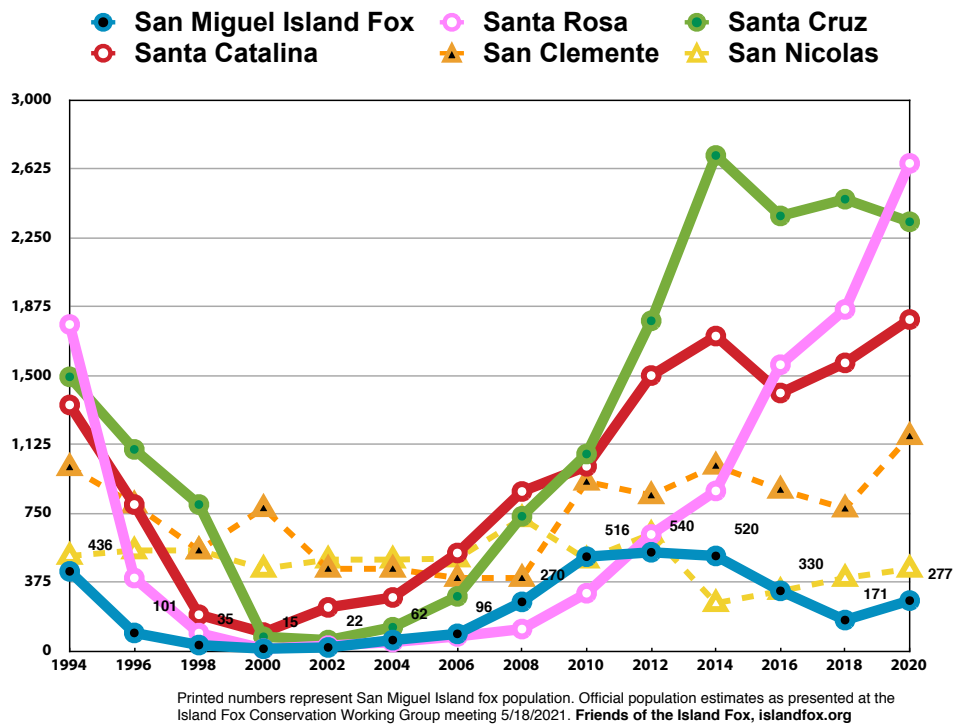
**BEHAVIOR:** Island foxes are active throughout a 24-hour period, including the middle of the day. Island foxes are territorial, but home range size is still being studied. Island foxes communicate through physical gestures and vocally with barks and yips. They also scent mark territory. Scat piles may be seen along roads, trails and other prominent locations. Island foxes evolved in the presence of the

Chumash people. Acceptance of humans varies; on islands where fox/human encounters remain positive, foxes have no fear of people. In areas like campgrounds island foxes can become bold.

STATUS: Island foxes on San Miguel, Santa Rosa, Santa Cruz and Santa Catalina were federally listed as Endangered from 2004–2016. The Catalina Island fox remains listed as Threatened by the US Fish & Wildlife Service. All island foxes are a California species of special concern. Predation by golden eagles was the primary cause of population decline on the northern islands (1994–2000). On Catalina, canine distemper virus killed over 90% of the island foxes (1998–2000). Recovery efforts included captive breeding (2001–2008), relocation of golden eagles, feral goats and sheep. Feral pigs and introduced deer and elk (all, golden eagle prey) were removed. Bald eagles and native vegetation were successfully reintroduced. Island fox populations are monitored via radio-tracking collars and annual counting. Individual island foxes are given identification microchips when first captured. A percentage of island foxes on each island are vaccinated annually for canine distemper and rabies. 40-60 individual foxes are radio collared on each island. Catalina foxes receive topical treatment for ear mites.

In 2020 all wild populations are stable. Biosecurity—the potential introduction of disease or nonnative animals—and drought impacts pose the greatest current threat to island foxes. Parasites (lice, ticks, intestinal worms) all increase with warmer island temperatures and less rainfall.

### Channel Island Fox Populations 1994-2020



CAPTIVE POPULATION (Total=6): Island foxes in captivity are all rescued and non-releasable. Five were pups from San Clemente Island abandoned during drought and rescued by the US Navy. A female with health issues was rescued from Catalina Island in 2020. Individuals can be seen at the Santa Barbara Zoo (2 brothers, b. 2016), CA Living Museum in Bakersfield (2 sisters, b. 2012), the Living Desert, Palm Springs (male, b. 2012), San Diego Zoo (female, b. 2020). Current CAFWS policy does not allow these captive island foxes to breed.

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