

last two centuries. He estimated that 95 percent of the diet consisted of the carcasses of cattle, domestic sheep, ground squirrels (*Spermophilus beecheyi*), mule deer, and horses. Although cattle may be the most available food within the range of the condor, deer appear to be preferred (Koford 1953, Wilbur 1972, Meretsky and Snyder 1992). California condors appear to feed only one to three days per week, but the frequency of adult feeding is variable and may show seasonal differences (U.S. Fish and Wildlife Service 1995a).

Depending upon weather conditions and the hunger of the bird, a California condor may spend most of its time perched at a roost. California condors often use traditional roosting sites near important foraging grounds (U.S. Fish and Wildlife Service 1984). Although California condors usually remain at roosts until mid-morning, and generally return in mid- to late afternoon, it is not unusual for a bird to stay perched throughout the day. While at a roost, condors devote considerable time to preening and other maintenance activities. Roosts may also serve some social function, as it is common for two or more condors to roost together and to leave a roost together (U.S. Fish and Wildlife Service 1984). Cliffs and tall conifers, including dead snags, are generally used as roost sites in nesting areas. Although most roost sites are near nesting or foraging areas, scattered roost sites are located throughout the range. There may be adaptive as well as traditional reasons for California condors to continue to occupy a number of widely separated roosts, such as reducing food competition between breeding and non-breeding birds (U.S. Fish and Wildlife Service 1984).

Condor censusing efforts through the years have varied in intensity and accuracy. This has led to conflicting estimates of historical abundance, but all have indicated an ever-declining California condor population. Koford (1953) estimated a population of about 60 individuals in the late 1930s through the mid-1940s, apparently based on flock size. A field study by Eben and Ian McMillan in the early 1960s suggested a population of about 40 individuals, again based in part on the validity of Koford's estimates of flock size (Miller et al. 1965). An annual October California condor survey was begun in 1965 (Mallette and Borneman 1966) and continued for 16 years. Its results supported an estimate of 50 to 60 California condors in the late 1960s (Sibley 1969, Mallette 1970). Wilbur (1980) continued the survey efforts into the 1970s and concurred with the

interpretations of the earlier October surveys. He further estimated that by 1978 the population had dropped to 25 to 30 individuals.

In 1981, the Service, in cooperation with California Polytechnic State University at San Luis Obispo, began census efforts based on individual identifications of birds through flight photography (Snyder and Johnson 1985). Minimum summer counts from these photo-censusing efforts showed a steady decline from an estimated minimum of 21 wild condors in 1982, 19 individuals in 1983, 15 individuals in 1984, and 9 individuals in 1985. Although the overall condor population increased slightly after 1982 as a result of double clutching, the wild population continued to decline. By the end of 1986, all but two California condors were captured for safe keeping and genetic security (U.S. Fish and Wildlife Service 1995a).

On April 19, 1987, the last wild condor was captured and taken to the San Diego Wild Animal Park (SDWAP). Beginning with the first successful captive breeding of California condors in 1988, the total population has increased annually and now stands at 103 individuals, including 90 in the captive flock and 13 in the wild (U.S. Fish and Wildlife Service 1995a).

Causes of the California condor population decline have probably been numerous and variable through time (U.S. Fish and Wildlife Service 1984). However, despite decades of research, it is not known with certainty which mortality factors have been dominant in the overall decline of the species. Relatively few dead condors have been found, and definitive conclusions on the causes of death were made in only a small portion of these cases (Miller et al. 1965, Wilbur 1978, Snyder and Snyder 1989). Poisoning, shooting, egg and specimen collecting, collisions with man-made structures, and loss of habitat have contributed to the decline of the species (U.S. Fish and Wildlife Service 1984).

3. Recovery Efforts. The primary recovery objective as stated in the California Condor Recovery Plan (Plan) (U.S. Fish and Wildlife Service 1995a), is to reclassify the condor to threatened status. The minimum criterion for reclassification to threatened is the maintenance of at least two non-captive populations and one captive population. These populations must (1) each number at least 150 individuals, (2) each contain at least 15 breeding pairs and (3) be reproductively self-sustaining and have a positive rate of population growth. The non-captive populations also must (4) be spatially disjunct and

non-interacting, and (5) contain individuals descended from each of the 14 founders. When these five conditions are met, the species should be reclassified to threatened status.

The recovery strategy to meet this goal is focused on increasing reproduction in captivity to provide condors for release, and the release of condors to the wild. (U.S. Fish and Wildlife Service 1995a).

a. Captive Breeding. The years 1983 and 1984 were critical in formation of the captive California condor flock at the SDWAP and Los Angeles Zoo (LAZ). In 1983, two chicks and four eggs were brought in from the wild. The chicks went to the LAZ, and the eggs were hatched successfully at the San Diego Zoo (SDZ). Three of the chicks were taken to the SDWAP and one to the LAZ to be reared. In 1984, one chick and eight eggs were taken from the wild. The chick went to the LAZ and six of the eight eggs were successfully hatched at SDZ. Five of the chicks went to the LAZ and one went to the SDWAP to be reared. In 1985, two eggs were taken from the wild and hatched successfully, one at the SDZ and the other at the SDWAP. Both of these chicks were taken to the LAZ to be reared. In 1986, the last egg was brought in from the wild and hatched at the SDWAP, where it was kept for rearing. By 1986, only one pair of condors existed in the wild and the last free-flying condor was captured on April 19, 1987, bringing the captive population to 27. The first successful breeding in captivity occurred in 1988, when a chick was produced at the SDWAP by a pair of wild-caught condors. Four more chicks were produced in 1989. The number of chicks produced by captive condors continues to increase annually and the captive population has grown from the original 27 in 1987 to 90 in 1995, with 13 additional captive-reared condors that are now in the wild. In 1993, the captive breeding program was expanded to include a facility at The Peregrine Fund—s World Center for Birds of Prey (WCBP) in Boise, Idaho (U.S. Fish and Wildlife Service 1995a).

b. Releases. In October 1986, the California Condor Recovery Team (Team) recommended that criteria be satisfied before a release of captive-bred California condors could take place. These included having three actively breeding pairs of condors, three chicks behaviorally suitable for release, and retaining at least five offspring from each breeding pair contributing to the release. The Team added a provision to the third criterion to retain a minimum of seven progeny in captivity for founders that were not reproductively