California Condor Recovery Plan

CALIFORNIA CONDOR

RECOVERY

PLAN

Prepared by the
California Condor Recovery Team
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Team Members

Sanford R. Wilbur, Leader, U.S. Fish and Wildlife Service
DeLoy Esplin, U.S. Forest Service
Robert D. Mallette, California Department of Fish and Game
John C. Borneman, National Audubon Society
William H. Radtkey, U.S. Bureau of Land Management

Approved: Lynn A. Greenwalt
Name

Director, U.S. Fish and Wildlife Service
Title

2/26/80
Date

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LITERATURE CITATIONS SHOULD READ AS FOLLOWS:

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SANFORD R. WILBUR, DELOY ESPLIN, ROBERT D. MALLETTE, JOHN C. BORNEMAN, WILLIAM H. RADTKEY.

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CALIFORNIA CONDOR RECOVERY PLAN

PART I
INTRODUCTION

The California condor (*Gymnogyps californianus*) has been the subject of considerable study over the years, and much information is now available concerning its life history, behavior, and habitat requirements. This information has been used to formulate a number of recommendations for preservation and management of the species (Koford 1953, Miller et al. 1965, Mallette 1970, Carrier 1971, Verner 1978, Wilbur 1978), many of which have been implemented. Actions taken to date apparently slowed the decline of the species, but were not adequate to reverse the downward trend. This plan attempts to identify all condor needs, and proposes orderly and comprehensive action to meet these needs. It is a revision of a plan originally prepared by the California Condor Recovery Team in 1974.

Former Status

Within historic times, California condors occurred along the Pacific Coast from British Columbia south to northern Baja California, Mexico. Fossil evidence places this species or a closely related one in various locations across the southern United States east to Florida. Known historic nesting range extends from Monterey and San Benito counties, California, south into Baja California. However, condors were year-long residents northward into Oregon and Washington, and probably nested there (Wilbur 1973).

Gymnogyps vultures apparently reached their peak in both numbers and distribution during the Pleistocene period, then declined, probably in response to changes in climate and food supply. The condor has not been abundant within historic times, but was widespread and regularly seen in the Ninteenth and early Twentieth Centuries. Major nesting areas are known to have existed in Monterey, San Luis Obispo, Santa Barbara, and Ventura counties, with other nest sites well distributed in other areas. No estimates of the total condor population are

available prior to the 1940's when Koford (1953:17) estimated that there were approximately 60 condors. The population size at that time was apparently underestimated (Wilbur 1978), but Koford's study did document that the species had become decidedly rare. The estimate of 50-60 condors in 1970 (Wilbur et al. 1972) was thought to represent a significant decrease in numbers compared to the 1950's.

Current Status

Approximately 25 to 30 condors now exist, occupying a wishbone-shaped range in the mountains of central California from Santa Clara and Fresno counties south to Ventura and Los Angeles counties (Figure 1). They apparently occur in two subpopulations that have their own nesting, roosting, and feeding areas, and that seldom intermix (Wilbur 1978). Most of the condors are in the Sespe-Sierra population area, which includes the southern and eastern portions of the range. The Coast Range population occupies the western arm of the range, and includes less than ten condors.

Survival of immature condors is very high, but production since 1968 has averaged less than two young annually. This has not been adequate to balance mortality, and the population is declining steadily.

Current Habitat

Sespe-Sierra Population

Fresno County - Fresno County is at the usual northern end of the range of Sespe-Sierra condors, although in some years condors forage on into Madera County, and stragglers are sometimes reported even farther north. No condor nesting is known in this county. Summer roosts may occur in the Sierra Nevada in Sierra and Sequoia National Forests, but none have yet been found. The main use by condors is for feeding in spring and summer (April-August). Approximately 61,000 ha (150,000 acres) of rangeland are considered condor foraging habitat.

Total importance of Fresno County to condors is unknown. It is suspected to be an overflow area, used most often in years when food is scarce and condors must forage farther north than usual. However, there may be a small group of condors that visit the county each

summer, roosting in the national forests.

Tulare County - Of the 1.2 million ha (3 million acres) of land in Tulare County, approximately 300,000 ha (750,000 acres) in a north-south band through the center of the county are used by condors. About 100,000 ha (250,000 acres) are grassland and open woodland regularly used for feeding; the remaining area is not continuous condor habitat, but contains scattered roosts, small and irregularly used feeding areas, and condor flight paths between food and roosts. The feeding area is located at the eastern edge of the San Joaquin Valley at elevations between 150 m (500 feet) and 610 m (2,000 feet) above sea level; roosting areas are in the adjacent foothills between approximately 610 m and 2,500 m (2,000 to 8,000 feet) elevation. Most of the feeding area is located on private lands, while the majority of roosting terrain is on federal, state, and Indian Reservation lands.

The county is a historical condor use area, and condors were present and "frequently seen" by earliest white settlers in the Sequoia Park region in 1856 (Fry 1926). It is now the main summer use area for a majority of the Sespe-Sierra condor population, with condors arriving from the south in March and April, and reaching a peak in July and August. Most are gone again by October; however, there are many winter records, and the species has nested in the county at least once.

This is not considered an urban county, and human population growth is expected to be relatively slow (Shumway 1971, Tulare County Planning Department 1972). However, the adjacent counties of Kern and Fresno are both expected to grow quickly and considerably, and it appears likely that Tulare County will feel the pressure of human demand for more recreation and for more intensified or expanded crop production. Also, forest resources in the county undoubtedly will continue to be utilized at a high level.

Expected land changes will probably reduce the area of condor feeding habitat through loss of rangeland, by decreased amounts of available food, and by increased disturbance. Increased timber harvest and intensified recreation have potential for making some roosting areas unuseable

and others unattractive to condors. However, the majority of lands regularly used by condors are included in that area the Tulare County Planning Department (1972) considers best for open space. It is possible that, with proper planning and subsequent management, adverse impacts on the confor can be kept minimal, while still achieving county goals for agriculture, recreation, and other resource use and conservation.

Kern County - Over 340,000 ha (350,000 acres) in eastern and southern Kern County are used regularly by condors. (Additionally, rangeland in the western portion of the county is used by the small population of condors in the Coast Range Mountains). Habitat in the county serves the condor in three ways: 1) as a fall and winter roosting and feeding area; 2) as summer habitat for nonbreeding condors; and 3) as feeding area for condors nesting in nearby parts of Ventura and Los Angeles counties. Because of this diversity of use, condors occur regularly in the county during every month of the year. In fall and winter, over 75 percent of the condor population may be there.

Unlike the situation in Tulare County where public lands play a major part in condor preservation, most Kern County lands of importance to the condors are privately owned. There are roosts on national forest land, but other roosts and essentially all feeding areas are private. Also, roosts and feeding areas are intermingled in such a way that use of one is dependent on the condition of the other.

There is still much rangeland in Kern County and sizeable livestock industry. However, the human population of the county is increasing substantially each year, and additional demand for living space, recreational opportunities, and food producing acreage can be expected to render some areas less useable for condors. Already a number of mountain recreational-residential subdivisions have replaced livestock on once important condor feeding areas in the Tehachapi Mountains. Also, although livestock numbers in portions of Kern County have increased in recent years, trends in better range sanitation and disease prevention, and conversions to seasonal stocker cattle rather than yearlong cow-calf operations, may be leading to a decrease in available condor food.

As former condor feeding areas in Ventura and Los Angeles counties are modified by human population growth, food in southwestern Kern County is becoming increasingly important to condors nesting in Los Padres National Forest. Preservation and management of condor habitat in Kern County involves both retention of food supply for breeding birds, and maintenance of roosts and feeding areas for non-breeding condors.

Los Angeles County - Only a small portion of Los Angeles County is used regularly by condors, but that portion is important as a nesting area, and as a flyway between nesting and feeding areas. A small amount of feeding area occurs near the Ventura County line both north and south of State Highway 126.

Ventura County - Most of Ventura County is used by condors. The north half of the county, included within the Los Padres National Forest, contains most of the known condor nest sites and many important roosting areas. Although increasing urbanization and accompanying developments have replaced livestock raising over much of the County, the remaining open lands are extremely important as foraging areas for nesting condors.

Rapid urbanization of Ventura County will continue to create problems for condors. Open rangeland and livestock, already scarce in the county, will become even scarcer. Opportunity for condors to find food close to nesting areas will become less, which in turn may result in further decreases in breeding activity. Although condor preservation is a high priority on the Los Padres National Forest, there are likely to be more and greater conflicts between condor needs and human desires for recreational opportunities and other facilities. Expanding petroleum operations, development of other mineral resources, and desire to develop water sources within the Sespe-Piru region all threaten the security of the area. Regulations needed to restrict these latter developments are legally and administratively complicated, but responsible condor management is impossible without them.

Coast Range Population

The Coast Range Mountains once supported a large number of condors, and there were several major nesting areas in Monterey, San Luis Obispo, and Santa Barbara Counties. Wanton shooting, and egg and specimen collecting in the late 1800's and early 1900's apparently combined to almost eradicate local populations, and now there are less than ten condors in the entire Coast Range area. However, a portion of this small population has nested successfully recently, and there appears to be sufficient nesting, roosting, and feeding terrain for a larger number of condors. It is possible that continued protection of birds and key habitat will result in increased numbers in the future. Chances of the condor population suffering a disastrous and irreversible setback can be reduced by maintaining several viable subgroups of condors not dependent on the same habitat or influenced by the same events.

There is currently no indication that food or feeding habitat are in any way limiting the Coast Range condor population. Vast acreages are only sparsely settled and support a yearlong livestock economy. While human population in the region will continue to increase, and more intensive use will be made of certain lands, such changes should have only limited impact on the condors in the near future.

Reasons for Decline

Decline of the California condor population in historic times occurred because the delicate natural balance between natality and mortality was upset. Use of condors for ceremonial purposes by the earliest Indian arrivals in North America began the change. The first Europeans to arrive in the early 1800's in the range of the condor reported shooting some of them. As settlement of the Pacific Coast region continued, more were shot and their eggs were collected. Some died from poisons and steel traps set out for predators (Fry 1926, Koford 1953:130-131, Miller et al. 1965:36-37), and civilization in many forms crowded them out of portions of their range. Sporadic mortality over a period of years was apparently enough to start a downward trend in the condor population, but major shooting losses and egg collecting near the end

of the Nineteenth Century accelerated that decline. A minimum of 288 condors and 71 eggs are known to have been removed from the population between 1792 and 1976 (Wilbur 1978). At least 111 birds and 49 eggs were taken between 1881 and 1910 alone, and in a single two-year period (1897-98) at least 20 condors and 7 eggs were taken. Apparently many more were shot out of curiosity, maliciousness, or mistaken belief that condors were harmful to people or livestock. Taken together, this mortality (in a population unused to any noticeable loss) far exceeded the low productivity of the species. Had it not been for protective measures during the years after 1925, the condor might already be extinct. However, in spite of complete legal protection for the birds and their eggs, man-caused losses continued at a high enough rate that the condor population continued to gradually decline. Today, continuing losses of habitat and low reproduction (probably resulting from the combined effects of certain chemical pesticides, food shortage, and low numbers of breeding age birds) interact to keep the condor on the verge of extinction.

Life History and Population Dynamics

Condors acquire adult plumage at approximately six years of age, and have never been known to breed while in immature plumage. However, it is not known if six-year-old birds are successful breeders, or if they require additional years to attain reproductive efficiency. Once reproducing, the average pair of condors nests every other year, laying one egg per clutch. The long interval between nestings is partially a response to the extra-long reproductive cycle. Paired birds are observed courting as early as October in some years, and finally lay their eggs between February and May. Incubation requires approximately 50 days, after which the chick remains in the nest for about five months. For several months after fledging, the young bird is still completely dependent on the parents for food. This juvenile dependency period may extend well into the following calendar year, precluding a new nesting

cycle.*

Breeding adults and younger immature condors stay near nesting areas yearlong, foraging for food (carcasses of livestock, deer, and occasionally other animals) in nearby grassland areas. Older immatures and other nonbreeding condors leave the vicinity of nest sites in March and April, and migrate north to traditional summer and fall roosting areas, returning south again in late fall.

In many wildlife species, a large percentage of individuals are capable of reproducing and adding to the size of the population. Because of the long period of sexual immaturity and the low productivity of individual pairs, total annual reproduction was low even when the population was large. Of the estimated 30 condors now in existence, perhaps 20 are of breeding age. Assuming an even sex ratio, no superannuated members of the population, and free interchange of all condors throughout the range of the species, a maximum of 10 breeding pairs could be formed. Because of probable inequities in sex, age, and distribution, 5 to 8 pairs seem more likely. With condors nesting regularly every second year, 3 or 4 pairs would be breeding in an average year. Assuming at least occasional nest failure, highest annual production is likely to be 2 or 3 birds. At that rate, an average annual survival rate of 90 percent or more is necessary to maintain a stable population. Such a high rate of survival was sustained through the early 1970's, but it is not now being maintained because of increasing losses of old-aged birds. Also, production in recent years has not approached the theoretical level, so the present imbalance between natality and mortality is even more severe than expected.

Habitat Requirements

The California condor has three basic habitat needs: adequate nesting sites, roosting sites, and feeding habitat with adequate food. These

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* Condors may sometimes nest successfully in consecutive years if young are able to attain independence at an earlier than usual age. An abundant local food supply, and absense of competition at food between the young bird and older, more dominant condors are the apparent requirements (Wilbur 1978).

must be available to each subpopulation of condors, and geographically and seasonally located to fit traditional condor use patterns.

Nesting areas - Condors nest in various types of caves, crevices, and potholes in isolated areas of the Coast and Transverse Ranges. (At least one nesting occurred in the Sierra Nevada in Tulare County, but this was apparently an unusual occurrence.) No nest is built, the single egg being laid on the bare or sand-covered cave floor. Judging from historical records, suitable locations were found scattered throughout the coastal mountains. Many of these sites are now unused because of man-related disturbance or because condors no longer occur in the vicinity.

In the past 15 years condors have nested in San Luis Obispo County, in the Sespe-Piru area of Ventura and Los Angeles counties, and in Santa Barbara County. The Sespe-Piru has had the most use because of abundant nest sites and the largest local condor population. Sibley (1969) wrote: "The importance of the Sespe-Piru area to condor survival cannot be overstated. This has been the major center for the condor population at least since 1960. It contains most of the nesting sites and winter roosts. It is a unique area not duplicated elsewhere in the condor's present or past range. Adequate reproduction can be assured only by avoiding adverse modifications of this area." This is still true, but the Sespe-Piru area has suffered in recent years from incursions for petroleum development and reduction in adjacent foraging habitat. If it is to continue as an important condor area, activities in and around it must be rigorously controlled.

While other areas have either fewer birds or fewer nest sites, their preservation is important to supplement Sespe-Piru production. Their potential for adding birds to the population may now be as good as the Sespe-Piru because local food supplies are more dependable, and threats of development and habitat modification are not as great.

Basic requirements for nest sites are described below.

1. Nest sites must be protected from human encroachment. Human disturbance normally will not cause condors to abandon their nests, in the sense that they will fly from nest sites and not return. In fact, some nests have been repeatedly disturbed and have been successful (Koford 1953, Sibley 1969). Nevertheless, human disturbance discourages

condors from nesting in otherwise suitable habitat, and may cause nest failure.

Sibley (1969) found a correlation between the location of recently used condor nest sites and the location and magnitude of human activity. Even though apparently usable sites existed elsewhere (either historically used sites, or ones with characteristics similar to recently active nests), he calculated the following minimum distances of nests from various disturbances and habitat modifications:

a. Lightly-used dirt roads - 1.3 km (0.8 mile) when the site was unshielded from sight and sound of the road, occasionally closer (0.8 km, 0.5 mile) when completely shielded.
b. Regularly used dirt roads - 2 km (1.2 miles) when unshielded, closest shielded about 1.2 km (0.7 mile).
c. Paved road - 3.5 km (2.2 miles).
d. Oil wells - 3.7 km (2.3 miles) when nest was in view of the well, 2 km (1.2 miles) when shielded from sight and most sound.

Both regularity and magnitude of disturbance are involved in discouraging condor nesting, as nests may be located closer to lightly-used roads than to regular travel routes or oil well operations. Condors have nested very near intermittently used foot trails. The greater the disturbance, either in frequency or noise level, the less likely condors are to nest nearby.

Nest failure due to human disturbance has occurred. Sibley (1967) cited two examples of egg breakage caused when a condor was frightened by intruders. In a third instance the surprised bird leaped forward, carrying the egg with it some distance, but the egg did not break. That similar losses are possible as a result of people approaching nests, dynamite blasts, sonic booms or other disturbances is suggested by other observations. For example, Sibley (1969) saw a sleeping condor flush violently from a pothole following a sonic boom. Ames and Mersereau (1964) record several instances of egg loss from osprey nests when the birds were flushed by passing motorboats, and knocked eggs from the nest during their rapid departure. Discussing peregrine falcon egg loss, Hagar (1969) noted "evidence that a missing egg or eggs had been knocked off a poor shelf by an incubating bird flushing directly and hurriedly

from the nest: Egg loss in heron, ibis, and seabird colonies has been observed when a spontaneous sound like a gunshot triggered the rapid exodus of adults (A.H. Morgan, pers. communication). The more prevalent such disturbances are in condor nesting habitat, the less likely it is that nests will be successful.

2. There must be an adequate, dependable food supply near a nest site if condors are to be encouraged to stay in the area to breed, and if nestlings are to survive and mature at the proper rate. In some cases, supplemental feeding is desirable to augment food available through natural loss of livestock and wild animals.

Roosting areas - California condors have traditional roosting sites that are used year after year. A typical site has rock cliffs, dead conifer snags or both, and is located in an isolated, or at least semi-secluded area. Condors apparently will tolerate more disturbance at a roost than at a nest. One roost is within 1 km (0.6 mile) of radio towers, a fire lookout, and summer homes. Although situated close to these developments, the roost trees are seldom approached closely. There may be a limit to tolerable disturbance at roosting sites. This is suggested by the lack of recent condor roosting use on the southwestern portion of Hopper Ridge in the Sespe Condor Sanctuary. This area, used by condors for roosting between 1939 and 1946, now has a large cluster of oil wells less than 1 km distant. Reduction, if not complete prevention, of disturbance near roosts appears desirable, as does maintenance of a good food supply within daily foraging distance. The fact that condors have occupied the same scattered roosts for many years seems adequate justification for preserving as many as possible of those remaining. There may be adaptive as well as traditional reasons for condors to continue to occupy a number of widely separated roosts, such as reducing food competition between breeding and non-breeding birds.

Food and feeding habitat - Detailed discussion of condor food habits, feeding behavior, and food availability are included in Koford (1953: 55-72) and Wilbur (1978:24-34).

While the condor is not as ungainly on and near the ground as it is portrayed in popular literature, it does require fairly open grassland habitat for feeding. This ensures easy takeoff and approach, and makes food finding easier for this species that apparently depends on sight rather than smell for locating its food. The condor eats only dead animals. Historically, this probably included deer, elk, pronghorn, whales, sea lions, and smaller mammals. Becasue of availability, cattle are now the primary food source, but other animals are eaten when available. Condors require an average of about 1 kg (2 pounds) of food per day, but this is normally obtained in larger amounts at irregular time intervals. Condors sometimes cannot feed for several days in succession, when inclement weather inhibits flying or impairs visibility of food. This is a natural situation that the species has endured for centuries, and the condor has undoubtedly adapted to "feast or famine" conditions. Hatch (1970) experimentally starved turkey vultures for over ten days with no loss of vigor or reduction in body temperature. His conclusion that "turkey vultures thus can easily endure short periods of unfavorable weather by simply waiting" can undoubtedly be applied equally well to the condor's feeding situation.

Assuming a food requirement of approximately 1 kg daily per condor, a population of 30 condors would require 11,000 kg of food per year, or 210 kg per week. Condors do not need to find their food every day, and they can forage some distance to find it. At first glance there would appear to be no food supply problem for the 30 birds now existing, or for a substantial increase. However, the total range of the species is not available to all condors either seasonally or geographically. Breeding condors must obtain most of their yearlong food supply within approximately 50 km (30 miles) of the nesting area. Also, a large share of carcasses are never available to condors because (1) they occur in locations inaccessible to condors, (2) they are burned or removed by landowners, or (3) they are eaten by other scavengers. Food in summer throughout the condor range is scarce, and it appears that food shortages in the vicinity of the Sespe-Piru nesting area may already have inhibited nesting activity there (Wilbur 1978).

Basic food requirements are as follows.

1. A substantial, readily accessible food supply must occur within 50 km of nesting areas at all times of year. Lack of food nearby may inhibit breeding activity and result in few birds nesting, and may impair survival of nestling and early flight-stage condors. A good food supply may result in increased breeding by individual pairs.

2. Food must be available seasonally in outlying portions of the condor range, especially near known roosting areas. This will permit condors to continue to make long-established seasonal movements which are undoubtedly of adaptive value to the population. For instance, migration of older nonbreeders out of nesting areas in spring reduces food competition with breeding birds and those juvenile condors that do not feed successfully in a large group (i.e., those low on the "peck order"). Also, keeping condors dispersed reduces the chances of the condor population being decimated by either natural or man-induced catastrophe.

Condors usually do not feed as close to roads, residences, and other areas of regular human use as do turkey vultures, golden eagles, and ravens. Food is most likely to be used by condors when located in areas of minimal disturbance.

Mortality Factors

California condors have no regular natural enemies and, judging from zoo records of condors living to be 30 to 45 years of age, they normally have a long life. The majority of former causes of mortality--egg and skin collecting, collecting for quills, Indian ceremonial use, and capturing for sport--are no longer operable. But condors do occasionally die from other than natural causes. With such a small population with such a low replacement potential, survival of every bird and success of every nesting is important. The potential for loss from any source must be reduced to the lowest level possible.

Poisoning - There appears to be no basis for the hearsay reports of hundreds or thousands of condors dying from strychnine-poisoned baits during the latter part of the Nineteenth Century (Harris 1941), Koford 1953). However, strychnine-poisoned carcasses set out for coyote control

are implicated in at least two cases of condor sickness. Of the four condors involved in these two instances, one died. There may be hazard involved in other poisons used in animal control, such as sodium monofluoroacetate ("Compound 1080") and thallium, but no certain losses can be attributed to them.

Use of animal control toxicants within the range of the condor has become more restricted and better controlled in recent years. Nevertheless, because every condor is important to the condor population, continuing efforts should be made to decrease the use of all poisons within the condor range, and to devise techniques for poisoning control that have even less potential for affecting condors. All animal control should be discouraged in condor congregation areas during those times of year that condors are present. The possibility of sublethal poisoning affecting reproduction should be investigated further.

Shooting - Mortality resulting from the actions of malicious and ignorant shooters has been one of the main drains on the condor population since European man reached the Pacific Coast. The magnitude of the problem probably increased following the advent of the high-powered rifle in the 1890's, and continued only slightly abated until recent years. One condor is known to have died as a result of shooting as recently as 1976 (Wilbur 1978).

Accidents - Koford (1953:131) cited records of two condors with broken wings resulting from flying into objects. In 1966 a condor was killed by hitting a powerline. All three were immature birds, which are not as adept at flying and landing as are adult birds. Death resulting from collisons with manmade objects is unusual, but is at least partially preventable through carefully planned placement of powerlines, towers, and other facilities within the condor range, particularly in areas frequently inhabited by young birds.

Productivity Considerations

Recent declines in production are only partially explainable in terms of low numbers of breeding aged birds or lack of sufficient habitat. Disturbance of breeding birds and shortage of food near nesting areas may be locally important, but enhanced protection of nest areas and

provision of regular food have not resulted in increased production. Recent findings of DDE residues in condor eggshells with apparently related eggshell thinning (Kiff et al. 1979) suggest a greater impact from environmental contaminants than was previously suspected. All of these relationships require additional study.

Preservation Efforts

The California condor was protected by the State of California as early as 1901. The law was nonspecific, merely prohibiting the taking of any nongame bird, or its eggs or nest without a permit. In 1908, one man was fined $50 for shooting a condor. In 1917, an illegally-captured condor was confiscated, but there was no prosecution. In general, the early nongame laws were ignored, and over 50 condors were known killed and 30 condor eggs taken after 1901.

Real concern began to be expressed for the condor in the 1930's. At the urging of Robert O. Easton and others, the U.S. Forest Service in 1937 established the Sisquoc Condor Sanctuary, 485 ha in Santa Barbara County that included an important condor roost and bathing pool. Following field studies by Carl B. Koford between 1939 and 1946, a sanctuary was established in 1947 in the Los Padres National Forest in Ventura County. Originally about 14,000 ha, the Sespe Condor Sanctuary was enlarged to include approximately 21,450 ha in 1951. Public Land Order 695 withdrew a portion of the area from appropriation under public land laws and prohibited entry into areas most critical to the condor. These two sanctuaries remain under the administration of the U.S. Forest Service. The Sisquoc Condor Sanctuary is closed to all entry; the Sespe Condor Sanctuary is closed except for two access corridors that allow hikers and horseback riders to pass through the area.

The first specific legal mention of the California condor came in 1953. Section 1179.5 of the California Fish and Game Code stated: "It is unlawful to take any condor at any time or in any manner. No provision of this code or any other law shall be construed to authorize the issuance of a permit to take any condor and no such permit heretofore issued shall have any force or effect for any purpose on and after January 15,

1954." The condor was retained in this "fully protected" status, with no authority to issue any type of permit for trapping or handling, until 1971. Then the Fish and Game Code was amended (Stats. 1970, Ch.1036) to allow issuance of permits for collecting fully protected species when necessary for scientific purposes.

A National Audubon Society-sponsored field survey in 1963-64 resulted in the hiring of a NAS "condor naturalist" in 1965. That same year, the U.S. Fish and Wildlife Service initiated the Endangered Wildlife Research Program, and a research biologist was assigned to study the condor in 1966. Both NAS and FWS positions have been occupied since. The U.S. Forest Service employed a condor biologist from 1968 through 1973, whose job it was to prepare a comprehensive condor habitat management plan for the national forests. Cooperation and assistance from other agencies has been organized through the Forest Service Condor Advisory Committee and the California Condor Recovery Team (and its predecessors, the Condor Survey Committee and Condor Technical Committee).

The California condor was recognized by the federal government as "endangered" in 1967, but the first specific federal legal protection did not occur until 1972 when the U.S. Migratory Bird Treaty with Mexico was amended to include vultures and certain other families of birds. The passage of the Endangered Species Act of 1973 (Public Law 93-205) made the taking of any endangered species a violation of federal law.

An important outgrowth of Federal endangered species legislation was the concept of "critical habitat". According to Section 7(a) of the Endangered Species Act of 1973, as amended, "each Federal agency shall, ... insure that any action authorized, funded, or carried out by such agency...does not jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat as such species which is determined by the Secretary (of Interior) ... to be critical". "Critical habitat" (Section 3(5) (A)) has been determined for the California condor (Appendix I), and all Federal agencies are required to consult (50 CFR Part 402) with the Fish and Wildlife Service any time their activities may effect the species.

The following have been accomplished since the implementation of the original California Condor Recovery Plan:

1. Provision of Adequate Nesting Conditions.

a. The U.S. Forest Service has continued to restrict all motorized activity and blasting with 2.4 km (1.5 miles) of condor nest sites, and has limited all human use within 0.8 km (0.5 mile) of nests except in Piru Gorge and in the West Big Pine area. On March 3, 1975 the courts upheld a Forest Service-Department of Interior decision to deny a permit for road access to an oil drilling site near a condor nest site (U.S. Royalty Oil Corporation suit).

b. A road passing close to a condor nesting area in San Luis Obispo County was closed to motor vehicles.

c. Public use closures of the Sisquoc and Sespe Condor Sanctuaries have been maintained, and patrol and posting have continued.

d. Private lands within the Sespe Condor Sanctuary (Green Cabins, Squaw Flat, and Coldwater Canyon) have been acquired, and are now administered by the Forest Service.

e. Supplemental feeding near nesting areas is in effect.

f. Research on nesting requirements and problems is ongoing. The California Department of Fish and Game and U.S. Fish and Wildlfie Service have funded an ongoing study by Janet Hamber (Santa Barbara Museum of Natural History) of condor nesting in Santa Barbara County.

g. Analysis of condor eggshells and specimens indicates that chemical contamination (particularly from DDE) may have adversely affected condor reproduction, but more study is needed.

h. Critical habitat for the condor has been designated.

2. Provision of Adequate Roosting Conditions.

a. The Forest Service closed the Mt. Pinos-Mt. Abel trail to motor vehicles.

b. The U.S. Bureau of Land Management reserved public lands at Blue Ridge, Tulare County, for condor habitat.

c. Critical habitat for the condor was designated.

3. Provision of Food and Feeding Habitat.

a. Contacts were made with planning departments in Kern and Tulare Counties regarding condor needs. Both departments have information on the condor included in their planning documents.

b. The Hopper Ranch, Ventura County, was acquired and is now administered as the Hopper Mountain National Wildlife Refuge. Personnel have been assigned to manage the supplemental feeding program on the Refuge and in adjacent parts of the Sespe Condor Sanctuary.

c. Critical habitat for the condor has been designated.

4. Preventing Condor Mortality.

Studies by Dirk Van Vuren of firearms use in the Mt. Pinos and Pine Mountain-Reyes Peak areas of Los Padres National Forest resulted in a Condor Recovery Team recommendation for a firearms closure at Mt. Pinos during the condor use season. The Team also recommended a firearms closure in Piru Gorge. The Forest Service has been evaluating these proposals.

5. Monitoring the Population.

a. Periodic surveys of the population have been carried out, but no adequate census or index has been developed.

b. Attempts to locate condors in formerly occupied habitat in Baja California, Mexico, have been fruitless.

6. Education.

a. Newsletters and various popular and technical publications have been prepared and distributed, and numerous programs and training sessions have been given.

b. "Topatopa", the condor at the Los Angeles Zoo, has been placed on public display.

7. "Contingency Planning".

The Recovery Team prepared a proposal for captive propagation and accelerated research. A panel appointed by the National Audubon Society and the American Ornithologists' Union made similar recommendations. On February 23, 1979, the Director of Fish and Wildlife Service approved both captive propagation and accelerated research as additions to the Condor Recovery Plan.

PART II

RECOVERY PLAN OBJECTIVES AND RATIONALE

The primary objective of all California condor management is to stop the decline of the species and increase the population to a secure level. To do this, mortality must be reduced to the lowest level possible; productivity must be increased markedly; and adequate nesting, roosting, and feeding habitat must be retained for each condor subpopulation, including habitat to allow for future growth and expansion of each subpopulation. Reestablishment of condors in currently unoccupied habitat will help compensate for population declines due to habitat losses in the current breeding range.

Management of the condor is even more complicated than that required to preserve many other endangered species. Extremely low productivity even under ideal conditions means very slow response to management. Results are measurable only over long periods of time. Condors range over thousands of square miles of both public and private lands, a habit that introduces a variety of protection and management problems and involves a number of governmental and private organizations and landowners. The species' need for large areas of semi-secluded habitat brings it into conflict with many other potential land users.

One of the greatest problems in condor management is the lack of precise data concerning the needs of the species. Despite considerable research, it is sometimes impossible to concretely justify recommendations or give positive answers to questions regarding the impact of certain actions or developments. For example, it is not always possible to say whether a certain oil development, logging operation, public use facility, or new roadway will definitely impair the condors' chances for survival. Because field biology is at best an inexact science, more precise data may never become available. This is unfortunate in an age when many conflicting demands are made on the land and its resources, and when men desire precise answers to precise questions. Nevertheless, the condor is endangered now and time is critical. If the condor is to be preserved, action must be taken now on the basis of the best information

currently available. Whenever possible, questions of unknown but possible conflict with the condor should be decided conservatively in favor of the condor.

Several points may be made in support of, and defense of, the following plans:

1. The likelihood of preserving the condor decreases as the birds are forced into less and less traditional circumstances of feeding, roosting, nesting, and migratory behavior. Implementation of all items in this plan will result in the best chance for condor survival.

2. Condor preservation is generally in harmony with a number of other public benefits, including: preservation of open space, natural scenery, and wilderness; provision of outdoor recreation under proper controls; protection and propagation of wildlife; maintenance of air quality; and protection of watersheds and water quality (Bishop 1972). Perpetuation of farm and rangeland agriculture, and long range planning of urban and industrial growth are also in the public interest (Snyder 1966). Many apparent conflicts between condor preservation and alternative land uses can be resolved by adequate planning of land use and development.

3. Most condor management involves holding the land as is, with no major modifications or degradations. The option to use condor habitat for other purposes at some later date is always available should the condor become extinct despite recovery efforts, land use restrictions be found unnecessary or modifiable, or some national or international need take precedence over condor preservation. Certain uses have been deferred, but the potential has not been lost.

The action plan outlined on the following pages may not arrest the decline of the California condor population. Condors might continue to decline if numbers have already fallen below that "minimum population density" (Leopold 1933) needed to sustain the species, or if some so far unidentified limiting factor continues to operate against it. On the other hand, completion of proposed research may suggest additional preservation methods. The Plan should be considered open-ended, and subject to regular review and possible revision.

In preparation of this revised Recovery Plan, five documents were of primary importance: 1) the original Condor Recovery Plan (California Condor Recovery Team 1974); 2) a draft "contingency plan" (California Condor Recovery Team 1977) that included detailed justification, discussion, and comment on captive propagation and new research; 3) an evaluation of the condor recovery effort by an American Ornithologists' Union-National Audubon Society panel (Ricklefs 1978); 4) a similar review for the U.S. Forest Service (Verner 1978); and 5) recommendations by a U.S. Fish and Wildlife Service task force (1979).

CALIFORNIA CONDOR RECOVERY PLAN OUTLINE

OBJECTIVE: To maintain a self-sustaining population of California condors in currently occupied habitat; through captive propagation and release of captive-reared birds, establish at least one additional self-sustaining condor population within the historical range of the species. The minimum goal should be 100 birds in the wild, with production equalling or exceeding mortality.

1. Provide adequate conditions for existing populations of condors.
    11. Provide adequate nesting conditions for each subpopulation of condors.
        111. Prevent disturbance and human interference at nest sites.
            1111. Prohibit motorized activity and blasting within the vicinity of nest sites.
                11111. Close to all motorized activity and blasting the area within 2.4 km (1.5 miles) radius of nest sites.
                11112. Acquire privately-owned land in condor nesting areas.
                111121. Acquire Matilija parcels.
                111122. Acquire Indian Creek parcel.
                111123. Acquire Sespe Hot Springs parcels.
                111124. Acquire Pothole parcel.
                111125. Acquire Coldwater parcel.
                111126. Acquire San Cayetano parcels.
                111127. Acquire Oak Flat-Sycamore parcels.
                111128. Acquire Kerr Springs parcel.
                111129. Acquire Ten Sycamore and Cottrell Flat parcels.
                11113. Restrict additional developments, activities, and environmental modifications within nesting areas.
            1112. Restrict all human use within 0.8 km (0.5 mile) of nest sites.

11121. Maintain public use closures in Sespe and Sisquoc Condor Sanctuaries.

11122. Refrain from locating future roads, trails, camps, etc., within 0.8 km (0.5 mile) of nest sites.

11123. Close Piru Creek Canyon between Frenchman Flat and Ellis Apiary to all public use.

11124. Patrol and increase posting and publicity to ensure compliance with regulations.

1113. Prohibit all aircraft activity in the airspace extending to 915 meters (3,000 feet) elevation over condor nesting terrain.

11131. Provide legal and administrative restriction against air activity.

11132. Maintain liason with military and civilian aircraft operators, to gain acceptance of a compliance with regulations.

1114. Extinguish wildfires and manage controlled fires within condor nesting areas so as to cause minimum disturbance and provide maximum benefit for condors.

112. Maintain a suitable food supply near condor nest areas.

113. Continue research into increasing productivity and otherwise improving population wellbeing.

12. Provide adequate roosting habitat for each subpopulation of condors.

121. Limit human activity in the Mt. Pinos-Mt. Abel area by restricting further development in the area.

122. Close to additional development the roost area at Blue Ridge, Tulare County, by acquiring or otherwise preserving private lands, and administering the critical habitat area for condors.

123. Preserve roosting areas in the El Paso Creek watershed, Tejon Ranch, Kern County.

124. Relocate Hardluck Campground, Los Padres National Forest, at least 1.6 km (1 mile) from a known condor roost.

125. Develop management plans for other roosts as discovered.

13. Provide optimum food and feeding habitat.

131. Encourage open space preservation and a continuing livestock economy throughout the condor range.

132. Preserve key feeding areas near nests and roosts.

1321. Preserve summer feeding area rangelands between Lake Kaweah and Springville, Tulare County.

1322. Preserve Glennville-Woody rangeland areas, Kern County, as late summer feeding habitat.

1323. Preserve key feeding areas on the Tejon Ranch, Kern County, for yearlong use by breeding condors and fall-winter use by nonbreeders.

1324. Manage Hopper Mountain National Wildlife Refuge as a condor feeding area and protective buffer for the Sespe Condor Sanctuary.

13241. Acquire mineral rights to eastern portion of Refuge.

13242. Continue supplemental feeding and protective management.

13243. Identify eastern portion of Refuge as essential habitat.

133. Encourage land managers to leave dead livestock on the range where available to condors.

134. Provide supplemental feed for the condor population as necessary.

1341. Continue and expand the supplemental feeding program to improve condor breeding conditions in the Sespe-Piru area.

1342. Evaluate the need for additional supplemental feeding in other areas.

14. Reduce condor mortality.

141. Minimize animal control programs that leave poisoned meat baits or toxicant-killed animals in areas frequented by condors.

142. Patrol key congregation areas to reduce potential for shooting losses.

143. Maintain existing firearms closures in the Sespe Condor Sanctuary and adjacent areas.

144. Establish firearms closures in key congregation areas.

1441. Close a portion of the Mt. Pinos area to all firearms use July 1 to September 15 each year.

1442. Close Piru Creek nest and roost area to firearms all year.

145. Evaluate the need for a firearms closure near roost and nest sites in the Bluff Camp-Big Pine Mountain area, Los Padres National Forest.

146. Investigate the effects of environmental contaminants on condor survival and reproduction.

1461. Sample condor food items for contamination.

1462. Sample contaminant levels in any condors or condor materials found.

1463. Investigate air pollution levels in the Sespe-Piru area.

1464. Investigate metabolism of chemicals in captive vultures.

1465. Determine the effects of various poisons and pollutants on captive vultures.

15. Monitor condor populations to determine success of management and wellbeing of the population.

151. Develop a reliable measure of population numbers, distribution, and production.

152. Continue surveys of condor population.

1521. Continue surveillance of known condor nest areas.

1522. Continue mid-October cooperative condor survey.

1523. Continue to collect and analyze condor observations from cooperators.

153. Develop and carry out radiotelemetry studies of the condor population.

16. Conduct a widespread conservation-education and public information program.

2. Establish and maintain new populations of California condors.

21. Continue Andean condor research to develop breeding and release techniques.

211. Continue Andean condor production at Patuxent Wildlife Research Center.

212. Establish captive-reared Andean condors in the wild environment in South America.

22. Develop a California condor captive propagation program.

221. Capture condors from the wild to begin captive propagation.

222. Breed California condors in captivity and produce young for release to the wild.

23. Provide habitat for captive-reared California condors to be established in the wild.

231. Survey potential habitat and select reestablishment areas.

232. Preserve selected habitat until and after condors are available for release there.

24. Use captive-reared California condors to establish new wild populations.

241. Release captive-reared condors to selected habitat.

242. Protect released birds with patrol, law enforcement, and education.

243. Conduct research on released birds to judge the success of the program.

PROGRAMS TO PROVIDE ADEQUATE CONDITIONS FOR EXISTING POPULATIONS OF CONDORS.

Activity 1 - Prohibit motorized activity and blasting within the vicinity of condor nest sites (Plan Section 1111).

Background: All recently-used condor nests are located in the Los Padres National Forest. All are within designated critical habitat, and all are covered by the U.S. Forest Service management directive that prohibits motorized activity and blasting within 2.4 km (1.5 miles) of nest sites.

The Sespe-Piru area in Ventura and Los Angeles counties encompasses the main nesting and roosting habitat of condors in the southern part of the species' range. Many nest and roost sites have been identified, and many other potential sites are available. A portion of the area is included in the Sespe Condor Sanctuary. Much of the area is currently (1979) classified by the Forest Service as Sespe-Frazier Rare II Area 5002, scheduled for further study for possible wilderness classification between now and 1983. Until a final decision is made on wilderness classification, the Forest Service will not make changes in management that would significantly alter its current roadless character. Since the Secretary of the Interior through the Bureau of Land Management is responsible for oil, gas, and mineral leasing on all Federal property, the Sespe Condor Sanctuary was closed in 1970 by the Secretary to all oil and gas leasing "until further notice". The Secretary also closed the entire Sespe-Piru area to (1) sale or free use of mineral material, (2) prospecting permits, (3) perference right leases, (4) offerings for competitive leases, and (5) non-competitive leases for leasable minerals on any land currently subject to the 1920 Mineral Leasing Act or 1947 Materials Sale Act.

Potential problems for condors within the Sespe-Piru area are oil, gas, and mineral developments; geothermal development at Sespe Hot Springs; and water impoundments or stream modifications of Sespe Creek or Piru Creek.

Other nest sites are in (1) Matilija Canyon, Ventura County; (2) in and near the San Rafael Wilderness, Santa Barbara County; and (3) in central San Luis Obispo County. In addition to the sites in the San Rafael Wilderness, one site is within the Santa Lucia Wilderness; one

is in an area proposed for wilderness designation (Rare II Area 5124A, Madulce-Buckhorn); and the others are in areas designated for further study under Rare II (5110, Machesna Mountain; 5129, Matilija). Current problems outside the Sespe-Piru appear limited to development of private lands within critical habitat.

Recommended Action:

1. All private lands within nesting areas should be acquired so that all management decisions rest with the government. See Figures 2 and 3 for location and acreages.

2. The Forest Service should continue their management guideline of prohibiting all motorized activity and blasting within 2.4 km of nest sites.

3. Lands within the Sespe Condor Sanctuary inadvertently left out of the original critical habitat description should be added -

San Bernardino Meridian, T4N, R20W, sec. 3, 4.
T5N, R19W, sec. 7, 8, 17, 18, 19.
T5N, R20W, N½ and SW¼ sec. 25;
sec.31, 32; W½ sec. 36.

4. All requests for new developments or activities, or for changes in current operations within condor nesting areas should be fully reviewed and evaluated before permits are granted or projects authorized.

Responsibilities:

Forest Service - lead agency for land acquisition, to request help from other organizations as needed; continue to administer the Sespe and Sisquoc Condor Sanctuary closures and other nest site closures; bring proposals affecting critical habitat to attention of other agencies, cooperate in evaluation of impacts.

Fish and Wildlife Service - Section 7 consultations; complete critical habitat listing; assist with land acquisition as requested by Forest Service, as funds and personnel permit.

Other organizations - assist as required.

Timetable: Most activities are of an ongoing or intermittent nature, to be handled as the need arises. The land acquisition dates given in Part III of this plan are dependent on availability of funds and may

vary considerably. Because of proximity to important condor areas, or because of possible future use conflicts, four areas (Matilija, Indian Creek, Pothole, and Sespe Hot Springs) should be acquired as soon as possible. All others are on much lower priority.

Activity 2 - Restrict all human use within 0.8 km (0.5 mile) of condor nest sites (Plan Section 1112).

Background: Intermittent foot and horseback travel do not seem as detrimental to condor use and occupancy of a nest area as do motorized activity or blasting. Nevertheless, keeping all activity well away from condor nest sites is desirable to prevent inadvertent disturbance. The Forest Service has closed trails and roads and relocated campsites to restrict human use in nesting areas, and maintains the Sisquoc and Sespe Condor Sanctuaries as inviolate refuges for condors (except for access corridors to allow backcountry users to pass through the area). The Los Padres National Forest has issued a forest supplement (Title 2600, Item 2633.4, March 1979) that nest sites will not be visited or their locations disclosed except on a "need to know" basis. All nest sites are within critical habitat.

Recommended Action:

1. Forest Service continue closures of Sespe and Sisquoc Sanctuaries, and continue policy of discouraging all use within 0.8 km of condor nest sites.

2. Forest Service continue regular patrol of Sespe Condor Sanctuary, and evaluate need for increased patrol and posting in major use seasons and areas.

3. Forest Service close all public access in Piru Creek between Frenchman Flat and Ellis Apiary because of proximity to condor nest sites.

4. All proposed changes in public use within critical habitat be fully evaluated before actions are taken.

Responsibility: Forest Service, in cooperation with other agencies.

Timetable: Most actions are of an ongoing or intermittent basis. The Forest Service is currently (1979) preparing an environmental assessment report on the proposed Piru Creek closure.

Activity 3 - Prohibit all aircraft activity in the airspace extending to 915 meters (3,000 feet) elevation over condor nesting terrain (Plan Section 1113).

Background: Low-flying military and civilian aircraft are thought to pose problems for condors by disturbing them at nest and roost sites. A California State law (Fish and Game Code 10501.5) prohibits low level flights over the Sespe Condor Sanctuary, and both civilian and military flight charts show some of the nesting areas as locations to avoid or maintain 3,000 foot terrain clearance. Airspace to 3,000 feet is included in critical habitat designations. Nevertheless, low level flights continue to occur.

Recommendations:

1. In light of critical habitat designation, re-contact military departments and encourage them to issue new directives prohibiting (rather than advising against) low level flight over condor nesting areas.

2. Similarly, encourage the Federal Aviation Administration to change designation of nest areas on civilian flight charts from "requested" to "prohibited" low level flights.

3. Update procedures for reporting aircraft violations.

Responsibilities:

Fish and Wildlife Service - contact military and FAA to strengthen compliance with Section 7 of Endangered Species Act; Section 7 consultations; cooperate with Forest Service and Department of Fish and Game reporting aircraft violations.

Forest Service - coordinate reporting of aircraft infractions.

Department of Fish and Game - prosecute violations of Fish and Game Code.

National Audubon Society - cooperate by reporting aircraft infractions.

Timetable: After initial contacts and updating of reporting procedures, activities will be intermittent as required.

Activity 4 - Extinguish wildfires and manage controlled fires within condor nesting areas so as to cause minimum disturbance and provide maximum benefit for condors (Plan Section 1114).

Background: Much of the condor nesting area is vegetated with dense brush that is subject to wildfire at any time. The most likely period for fires is during the hot, dry summer and fall, from July until the first general rains (usually in November or December). This is the time of year when newly-hatched condors are at the nest site and incapable of sustained flight, so there is some potential for loss of nestlings from fire, heat, or smoke. Condors capable of flight can escape from the fire area, but they could collide with fire suppression aircraft or be injured by falling fire retardent.

There are also two possible indirect impacts of fire on condors. The dense brush now occurring around condor nesting areas serves as a deterrent to human trespass and limits disturbance to nesting activities. On the other hand, fire resulting in the opening up of dense stands of brush might lead to increased populations of deer and small mammals, thereby increasing the likelihood of condors finding food close to nesting areas. Controlled burning as it is being practiced on other forest lands might prove beneficial to condors if carefully planned and implemented.

Recommended Actions:

1. Los Padres National Forest should prepare a fire management plan for the condor nesting areas, including general guidelines for all firefighting activities in condor nesting habitat. Among the guidelines to be considered: (a) suppression aircraft should maintain at least 200 foot clearance over ridges except when actually making drops (this to reduce potential for collision with condors); (b) if condors appear in retardent drop zones, drops should be delayed until condors have moved away; and (c) no retardent drops should be made on stands of bigcone Douglas fir or on cliff faces, both favored condor roost sites.

2. Suppression actions for all fires in condor nesting habitat should be worked out at the time between fire suppression personnel and condor biologists. A condor biologist should be an integral member of planning teams for all fires.

3. Plans for controlled burning within condor habitat should be developed in consultation with condor biologists.

Responsibilities:

Forest Service - preparation of fire management plan; actual fire suppression activities.

Fish and Wildlife Service, California Department of Fish and Game, and National Audubon Society - assist in developing management plans; serve as advisors and consultants when fires occur.

Timetable: After initial plan preparation, activities are of an intermittent nature as required.

Activity 5 - Managing Mt. Pinos area for condor roosting (Plan Sections 121 and 1441).

Background: The mountain ridge including Mt. Pinos, Sawmill Mountain, Grouse Mountain, and Mt. Abel (Kern and Ventura counties) has long been used as a condor summer roost (mainly from early July to mid-September). It has been designated as critical habitat. Food is occasionally found in the mountains in the form of carcasses and offal left from deer hunting, but mainly the birds roost overnight in the coniferous forest near the summits and forage over the open rangelands to the north and east.

Considerable human activity occurs in the area now, including camping, hiking, hunting, sightseeing, and condor watching. The summit of Mt. Pinos has been designated by the Forest Service as a condor observation site, and people are encouraged to look for condors there during the summer months. With the exception of firearms use, most of the current activity is not considered detrimental and might continue without harm to the condors if overall management of the area remains oriented toward the condor and scenic enjoyment. However, major changes in use (e.g., commercial activities, logging, mining) might have adverse effects on the birds.

There is considerable use of firearms in the Pinos-Abel area during the condor use period. Some is legitimate deer hunting activity that sometimes results in food for condors, but few deer are actually taken in most years, and target shooting and "frustration shooting" caused by low hunter success seem to be the major activities. Because roosting and flying condors are well within shooting range, firearms use poses a real threat to condor survival.

Recommended Actions:

1. Any proposed changes in character or magnitude of human activity within critical habitat in the Mt. Pinos area should be fully evaluated before changes are permitted.

2. The critical habitat area should be closed to all firearms use during the main condor use season (July 1 to September 15).

3. The roost area should be conspicuously posted and regularly patrolled during the condor use period, to enforce firearms closures and to detect any other problem situations.

Responsibilities:

Forest Service - bring proposals affecting critical habitat to attention of other agencies, cooperate in evaluation of impacts; develop plans for minimizing conflicts between condors and users; cooperate in patrol and posting of area.

Department of Fish and Game - cooperate in minimizing conflicts between condors and users; patrol area to enforce condor protection measures; work with other agencies in evaluating environmental impacts.

Fish and Wildlife Service - Section 7 consultations; cooperate in management planning and development of management plans.

National Audubon Society - cooperate in environmental evaluations; conduct educational activities in area.

Timetable: The Forest Service is currently (1979) beginning an environmental assessment of the proposed Mt. Pinos management plans. After initial decisions are made and posting completed, activities will be on a periodic, recurring basis.

Activity 6 - Blue Ridge, Tulare County, condor roost preservation and management (Plan Section 122 and 142, part).

Background: The Blue Ridge roost area is the best documented and apparently the most frequently used of the condor summer roosts in the Sierra Nevada. Condors roost overnight regularly from June through September, with some use earlier and later in the year. During the day, condors forage in the grassland areas to the west of Blue Ridge.

The Blue Ridge condors have lived with human activity for many years, with a fire tower, television and other elctronic equipment, and summer homes within 1 km of the roost trees. However, there is circumstantial

evidence that human use has reached the maximum levels possible without adversely affecting condor use of the area, and additional uses and developments are being proposed. Control of additional activity is essential if the roost is to remain useable.

The roost area is included as critical habitat, and the U.S. Bureau of Land Management has reserved public lands in the area for condor management.

Recommended Actions:

1. Acquire privately-owned lands in the Blue Ridge area, administer area as a condor refuge.

2. Develop a preservation and management plan for the area.

3. Regularly patrol the area during the summer season (June 1-September 30) to monitor use, shooting activity, and trespass.

Responsibilities:

Fish and Wildlife Service - acquire land, in cooperation with Bureau of Land Management; manage area in cooperation with other agencies; monitor condor use, assist with patrol; Section 7 consultations.

Bureau of Land Management - cooperate in land acquisition, management planning, and monitoring of condor use.

California Department of Fish and Game - law enforcement, cooperate developing management plans.

Timetable: Fish and Wildlife Service is currently (1979) appraising private lands, lands to be acquired as funds are available.

Activity 7 - Preservation of condor feeding and roosting habitat on the Tejon Ranch, Kern County (Plan Sections 123 and 1323).

Background: The Tejon Ranch has long been known as an important feeding area for condors breeding in the Sespe-Piru area, and for non-breeding condors during the fall and winter months (October-March). Because much of the former condor feeding area south of the Sespe-Piru area has been lost to urbanization, the Tejon Ranch has become even more important.

Management of the Ranch to date has been favorable for condors. Public use has been limited, a yearlong livestock operation has provided considerable condor food, and a well-managed deer hunt has added more food in

fall and winter. Recent modifications of land use around the Ranch property have emphasized the importance of the Ranch and the need for management arrangements that will insure long-term stability of that habitat for condors.

Condors roost mainly in the coniferous forest areas along Winters Ridge and in the upper portion of El Paso Canyon. Bear Canyon appears to be the most frequented roost area, although condors are regularly seen roosting elsewhere in the El Paso Creek drainage area. Dead and dying conifers in a relatively undisturbed setting are the key requirements in the maintenance of this roost area.

Condors forage throughout the open lands of the Tejon Ranch, and feed wherever animal carcasses are available. Maintaining enough cattle and deer to provide a regular yearlong food supply in a relatively undisturbed environment are the requirements for maintaining this feeding area.

Portions of the Tejon Ranch have been designated as critical habitat.

Recommended Actions:

1. Through longterm lease, easement, fee purchase, or other means, obtain administrative rights to the central upland portions of the Tejon Ranch.

2. Develop condor management plans for the area, and administer to benefit the condor.

3. Continue to monitor condor activity in the Ranch area, to judge effectiveness of administration and to develop new programs as necessary.

Responsibilities:

Fish and Wildlife Service - lead agency for preservation, management planning, administration, and condor monitoring.

Department of Fish and Game - cooperator in planning administration, and monitoring.

National Audubon Society - cooperation in planning and monitoring.

Timetable: The Fish and Wildlife Service is currently (1979) working with the Tejon Ranch to identify those areas most important to the condor, and to determine the best preservation measures. A specific timetable and estimate of costs will result from this cooperation.

Activity 8 - Protection of condor roost near Hardluck Campground, Los Padres National Forest (Plan Section 124).

Background: When the original Condor Recovery Plan was prepared, it was not known that condors were regularly roosting near the Hardluck Campground. This regular use was first discovered in 1976. Public use in the area has been relatively light to date, but there is considerable shooting at the present campground (which could pose a threat to condors), and additional recreational facilities are being planned in the area. The Forest Service has analyzed the effects of various alternatives for development and use in the Hardluck area of Piru Canyon.

Recommended Action:

1. Relocate the road and camping facilities in the Hardluck area at least 1.6 km north of the condor roost rocks.

2. Extend the northeast boundary of the Sespe-Piru critical habitat area to include the Hardluck and White Mountain roost areas:

San Bernardino Meridian, T6N R18W, Sec. 3-6.
T6N R19W, Sec. 1-4.
T7N R18W, Sec. 28-34.
T7N R19W, Sec. 25-28, 33-36.

3. Monitor public use and condor activity in the area to see if additional management is needed.

Responsibilities:

Forest Service - relocate road and camp, monitor public use.

Fish and Wildlife Service - consider designation of critical habitat, monitor condor use.

Timetable: After initial designation of critical habitat and relocation of public use facilities, use of the area will be monitored on a regular basis along with other condor use areas.

Activity 9 - Develop management plans for condor roosts as they are discovered (Plan Section 125).

Background: Several intermittently used condor roosts are known, and it is possible that there are regularly-used roosts that have not yet been located. In 1973 the Sequoia National Forest employed several students to search for summer roosts, but none were found. Janet A. Hamber,

Santa Barbara Museum of Natural History, has surveyed Santa Barbara County for additional roosts or nests, but has so far been unsuccessful in finding any. Sierra National Forest personnel have routinely searched for roosts, again with no success. No additional specific searches for roosts appear warrented at this time.

Recommended Action: If new information becomes available concerning condor roosts, investigations should be made and preservation and management action taken if warranted.

Responsibility: Information should be provided to the Fish and Wildlife Service, who will in turn work with the affected organizations.

Timetable: As required.

Activity 10 - Encourage open-space preservation and a continuing livestock economy through the condor range. Preserve summer and fall feeding areas in Tulare and Kern Counties (Plan Sections 131, 1321, and 1322).

Background: Condors require a yearlong supply of animal carcasses in a semi-isolated environment within about 50 km of established roost and nest sites. There has been a substantial decrease in the amount of food and foraging area due to urbanization, the spread of farm and fruit crops, and a decrease in livestock numbers particularly in summer. This decrease in feeding area is particularly noticeable near the Sespe-Piru nesting area, but is occurring to some extent throughout the condors' range.

In addition to the Tejon Ranch, two other areas (Lake Kaweah to Springville, Tulare County; Glennville-Woody area, Kern County) receive considerable use by condors because of their proximity to seasonal roosts and flight lanes. These areas have been designated as critical habitat.

Recommended Actions:

1. Official contact should be made with boards of supervisors, planning departments, and other governmental agencies in counties with condor foraging habitat. The recovery effort should be fully explained, as should the critical habitat concept. Laws and regulations that may affect the condor either adversely or positively should be researched.

2. Regular communication should be maintained with governing bodies in each county, to keep informed of developments affecting the

condor and to communicate information on status of the condor and the recovery effort.

3. Regular communication should be maintained with conservation/preservation groups, cattlemen's associations, schools, etc., to keep the public aware of the condors' needs.

4. Problems affecting the condor should be handled as they arise.

Responsibilities:

Fish and Wildlife Service - In cooperation with California Department of Fish and Game, develop and maintain governmental contracts; Section 7 consultations; cooperate in the general educational effort; cooperate in land acquisition or other management programming if the need arises.

Department of Fish and Game - Cooperate in developing and maintaining government contacts, evaluating environmental impacts, etc.

Others - Cooperate within fields of responsibility and interest.

Timetable: Governmental and other contacts will be made or reestablished during the first year. After that, activities will be on an ongoing, periodic basis.

Activity 11 - Manage the Hopper Mountain National Wildlife Refuge as a condor feeding area and protective buffer for the Sespe Condor Sanctuary. Maintain a suitable food supply near condor nest areas. Expand the supplemental feeding program to improve condor breeding conditions in the Sespe-Piru area (Plan Sections 112, 1324, and 1341).

Background: The decrease in condor food and foraging habitat near the Sespe-Piru nesting area prompted the development of a supplemental feeding program. Surface rights to the Hopper (or Percy) Ranch were acquired in 1974 and the area was designated as the Hopper Mountain National Wildlife Refuge, to be administered as a condor feeding area and a protective buffer for the Sespe Condor Sanctuary. Unfortunately, petroleum development activities started on the Refuge immediately, and half the area is now unsuitable for condor feeding. The value of the area as a buffer for the Sanctuary is threatened by expanding oil activity.

Condors forage over a wide area, but the activity patterns of individual birds are apparently well-defined and limited. Feeding at

several sites around the Sespe-Piru nesting area is necessary if all potential breeding pairs and all young birds using this area are to benefit from the feeding program.

Recommended Actions:

1. Acquire the mineral rights to the eastern half of the Hopper Mountain National Wildlife Refuge, and continue to manage as a condor feeding area.

2. Consider the east half of the Hopper Mountain National Wildlife Refuge as critical habitat: San Bernardino Meridian, T4N R19W, sections 2 and 3.

3. Using a variety of sites on the Hopper Mountain National Wildlife Refuge, in the Sespe Condor Sanctuary, and possibly at other locations in the Sespe-Piru area, continue supplemental feeding from November 1 to May 31 each year. If condors stay in the area throughout the summer, feeding should continue. If there is no use by condors at feeding sites for any 30-day period after May 1, feeding should be suspended until November 1 when condors might be expected to return from summer roosts (or until condors begin to appear regularly in the feeding areas, if earlier than November 1). Use of sites should be continuously monitored with automated cameras, and experiments should continue on the best placement of carcasses to ensure condor use.

4. Continue to monitor food supply around other condor nesting areas, initiate supplemental feeding programs if deemed desirable at any time.

Responsibilities:

Fish and Wildlife Service - acquire mineral rights to Hopper Mountain National Wildlife Refuge; consider the designation of critical habitat; administer refuge and supplemental feeding program; monitor food supply at other nest areas.

Department of Fish and Game - provide support services for supplemental feeding (space and electricity for food storage freezer, assist in acquiring food); serve as advisor on refuge management.

Forest Service - serve as refuge advisor; provide fire suppression services for refuge.

National Audubon Society - assist with supplemental feeding as needed.

Timetable: 1979-80, acquire mineral rights and designate critical habitat; other programs ongoing.

Activity 12 - Encourage land managers to leave dead livestock on the range where it is available to condors; evaluate need for supplemental feeding outside condor nesting areas (Plan Sections 133, 1342).

Background: There are apparently no major condor food problems outside nesting areas, but much potential food is probably unavailable because ranchers dispose of it before condors locate it. Also, land uses are changing steadily and food shortages may develop in specific locations at certain seasons.

There are currently no regulations that prohibit leaving carcasses for condors in open rangeland away from human habitation, but land managers need to be encouraged to do so.

Recommended Actions:

1. Through regular contact with individual ranchers and livestock associations, inform land managers of condor needs and encourage them to make dead stock more available to condors.

2. Continue to monitor condor use patterns and land use, initiate additional supplemental feeding programs if desirable at any time.

Responsibilities:

National Audubon Society - In cooperation with other field workers, make land manager contacts.

Fish and Wildlife Service - In cooperation with other field workers, continue to monitor condor use and food supply; initiate supplemental feeding as necessary.

Forest Service and Bureau of Land Management - Encourage permittees with cattle on public lands within the condor range to leave dead stock for condors.

Timetable: Contacts will be made and maintained during routine field work.

Activity 13 - Discourage animal control programs that leave poisoned meat baits or toxicant-killed animals in areas frequented by condors (Plan Section 141).

Background: There is considerable anecdotal and hearsay information on the effects of animal control programs on condors, and a few certain

instances of sickness or death caused by poisons. Chlorinated hydrocarbon residues may have adversely affected reproductive performance. Considerably more research is needed on the effects of various poisons and chemicals (Plan Section 146), but enough is known to suggest that certain animal control programs should be limited within the condor range.

Recommended Actions:

1. Determine the types and locations of control activities in operation or proposed within condor habitat.

2. If potential problems are discovered, correct them.

3. Continue to monitor control activities within the condor range.

Responsibilities:

Fish and Wildlife Service - prepare report on current activities, work with other wildlife and regulatory agencies to alleviate problems.

All cooperators - coordinate work as needed to monitor control programs and bring about necessary restrictions.

Timetable: Compile current control activities report, 1980. Action beyond that dependent on findings during compilation.

Activity 14 - Adequately control firearms use within the condor range (Plan Sections 142, 143, 144, and 145).

Background: In the past, shooting has been one of the major causes of condor mortality. Despite full legal protection and considerable educational activity, some shooting loss continues to occur, with one condor known killed as recently as 1976. Firearms closures in and around the Sespe Condor Sanctuary have been in effect since 1972, and additional closures have been recommended by the Recovery Team for the Piru Creek and Mt. Pinos areas. It may be desirable to restrict firearms use in an area of Santa Barbara County where considerable human use occurs near nest and roost sites.

Condors are susceptible to shooting where they congregate close to human activity areas. Total firearms closures are seldom warranted, but regular patrol, posting, and continuing public education may help reduce the potential for shooting losses.

Recommended Actions:

1. Extend current firearms restrictions in the Sespe Condor Sanctuary and vicinity.

2. Curtail use of firearms in Piru Gorge between Frenchman Flat and Ellis Apiary all year, and in the Mt. Pinos critical habitat area from July 1 to September 15.

3. Evaluate the need for firearms restrictions in the Bluff Camp-Big Pine Mountain area, Los Padres National Forest.

4. Develop and implement a formal program of patrol and posting of key condor use areas.

Responsibilities:

Forest Service - extend Sespe Condor Sanctuary firearms closure; lead agency in firearms closures for Piru Creek and Mt. Pinos; cooperate in evaluation of Santa Barbara County firearms situation; responsible for patrol and posting of Condor Sanctuary.

Department of Fish and Game - in cooperation with Fish and Wildlife Service enforcement personnel, develop and implement a law enforcement program.

Fish and Wildlife Service - evaluate need for firearms restrictions in Santa Barbara County; law enforcement personnel in cooperation with Department of Fish and Game develop and implement a law enforcement program.

Timetable: The Forest Service is currently (1979) preparing environmental assessments of the proposed firearms restrictions at Piru Creek and Mt. Pinos. A law enforcement plan and an evaluation of the Santa Barbara firearms situation should be prepared by 1981, after which patrol and law enforcement activities will be ongoing each year at appropriate locations and seasons.

Activity 15 - Investigate the effects of environmental contaminants on condor survival and reproduction (Plan Section 146).

Background: Condors have been poisoned by eating strychnine-treated meat, and chlorinated hydrocarbon residues (particularly DDE) have been found in condors and their eggshells. Other environmental contaminants (including Compound 1080, diethylstilbestrol, and photochemical smog)

have been suggested as possibly adversely affecting the condors. Because a number of these contaminants may cause either death or reduced reproductive performance, a thorough investigation of their potential is desirable.

Recommended Actions:

1. Collect samples of potential condor food from various parts of the condor range, analyze them for presence of environmental comtaminants. Initially, up to one dozen samples of muscle tissue from mule deer and domestic livestock should be analyzed for chlorinated hydrocarbons, PCBs, "1080", lead, and mercury. Similar sampling should be done every five years, unless analyses show problem areas that should be monitored on a more frequent basis.

2. Routinely analyze for contaminants any condors, or surrogate species, eggshells, or other material found.

3. Using captive turkey vultures or black vultures as a surrogate species, investigate the metabolism of various chemicals in the cathartid system, to determine storage and voiding mechanisms.

4. Using captive turkey vultures or black vultures, determine the effects of various poisons and pollutants (strychnine, "1080", diethylstilbestrol, chlorinated hydrocarbons) on survival and reproduction.

5. Because air pollutant levels are suspected to be high in the Sespe-Piru area, monitor the types and levels of pollutants there.

Responsibilities:

Fish and Wildlife Service - collect and analyze food items; analyze condors and condor materials as available; perform or contract for studies of metabolism, effects of contaminants, and air pollution.

Department of Fish and Game - cooperate in collection and analysis of materials.

National Audubon Society - cooperate in collection of food items.

Timetable: Initial analysis of food items and surrogate species, 1980, and at five-year intervals thereafter. Studies of effects of chemicals to be performed or contracted 1980-1985, as funds and personnel are available.

Activity 16 - Monitor condor populations to determine success of management, and wellbeing of the population (Plan Section 15).

Background: Data compiled about the condor population should show population trends and give some measure of success of the recovery effort. Several survey techniques have been used in past years, including an October survey, nesting area surveys, and analysis of reports from cooperating observers. None of these has proven fully satisfactory. Nevertheless, taken together they can continue to provide general trend information until better techniques are devised.

Recommended Actions:

1. Continue the mid-October survey, a two-day count to be held between October 15-20. Every third year (next in 1981 and 1984), 50 stations will be manned by approximately 115 observers; in the intervening years, 18 stations will be manned by approximately 40 obervers. Counting and analysis procedures will remain as in previous years.

2. Continue to solicit and collect condor observations throughout the year from cooperators in all parts of condor habitat. Periodically analyze the accumulated records to detect changes in numbers and distribution.

3. Each winter and spring, check all condor nesting areas for evidence of condor breeding activity. Each general location identified on condor nesting area maps should be checked a minimum of three times each month from December through June. If occupied nests are located, condor activity should be monitored regularly through the breeding cycle.

4. Develop and carry out a two-year study of condor movements and activity patterns, using radio transmitters and auxilliary markers. Test use of marked birds in "capture-recapture" studies of population size.

5. Continue to investigate methods of more adequately monitoring the condor population.

Responsibilities:

Fish and Wildlife Service - radiotelemetry studies; coordinate condor nesting area surveillance, condor observation network, and small October surveys; continue to investigate survey procedures.

Department of Fish and Game - coordinate large October survey, cooperate with all survey endeavors.

Forest Service - provide personnel for October surveys; provide funds or personnel to help with nest surveillance; cooperate by reporting condor observations.

National Audubon Society - assist with radiotelemetry studies, provide assistance and partial funding for other surveys.

Bureau of Land Management - cooperate by reporting condor observations, participate in surveys as possible.

Timetable: Develop telemetry program, 1980; obtain permits and trap condors fall and winter 1980-81, monitor for next two years. Other surveys and nest surveillance annually as scheduled, or periodically as information is available.

Activity 17 - Conduct a widespread conservation-education and public information program (Plan Section 16).

Background: Although difficult to measure, education may have played as important a part in reducing condor mortality as has legal and administrative protection. The educational effort to date has included organized talks and field trips, regular field contacts with the public, descriptive and informational posting and signing designation of three public condor observation sites, and dissemination of press releases and printed literature. The National Audubon Society has had an educator working on the condor project since 1965. The Forest Service, California Department of Fish and Game, and Fish and Wildlife Service have also participated in the educational effort. The program has been worthwhile, but could be improved by development of a more formal program with regional and seasonal objectives.

Recommended Actions:

1. Develop and implement an annual program of indoor presentations and field trips for schools, service clubs, conservation/nature study organizations, etc., that extends to all counties within the condor range. Number of presentations in each area should be based on the importance of the county to the condor, and should be planned seasonally when condors are using the area. Advantage should be taken of opportunities to present information about the condor and the recovery effort

at international, national, and regional gatherings.

2. Visit public observation areas (Mt. Pinos, Grapevine, Dough Flat) on a regular basis during principal use periods to disseminate information and help with bird identification.

3. Each year hold training sessions for personnel from the Forest Service (including fire lookouts), California Department of Fish and Game, and other agencies to teach condor identification and reporting procedures, and to keep field personnel up to date on recent events effecting the condors.

4. Continue to distribute a quarterly condor newsletter, with popular accounts of recent condor recovery activities.

5. Prepare and distribute news releases and also technical, semi-technical, and popular reports on the condor as information is available and when warranted. Cooperate with individuals and organizations preparing information.

6. Develop a collection of black-and-white prints, color slides, and 16 mm movie film of condors, condor habitat, and condor recovery activities for use by cooperating agencies, news media, and others.

Responsibilities:

Fish and Wildlife Service - coordinate educational activities, including developing visual materials; with National Audubon Society, hold agency training sessions and public briefings; cooperate in other education activities.

National Audubon Society - prepare and distribute quarterly newsletter; lead agency for indoor presentations and field trips; with Fish and Wildlife Service hold agency training sessions and public briefings.

Other agencies - cooperate in all educational activities within areas of responsibility.

Timetable: After initial planning, work will be on a regular, recurring basis, with annual and regional objectives.

PROGRAMS TO ESTABLISH NEW POPULATIONS OF CONDORS.

Activity 18 - Continue Andean condor research to develop breeding and release techniques (Plan Section 21).

Background: In anticipation that captive propagation might someday be used to assist in preserving the California condor, Andean condors of various ages were captured in northern Argentina in 1966 and brought to the Patuxent Wildlife Research Center, Laurel, Maryland. Holding facility design and construction, and captive management procedures were tested during the next 13 years. First breeding occurred in 1971 with pairs becoming productive as they reached sexual maturity, laying eggs each year including three double clutches. The four pairs at Patuxent laid a total of 21 eggs between 1971 and 1978, hatching 11 chicks and rearing eight to flight stage.

A chief criticism of captive propagation for California condors is that it is uncertain that captive-reared birds could be successfully released to the wild to begin new populations. Limited studies with captive-reared turkey vultures and black vultures have suggested some procedures to be used for releasing California condors. Additional information can be gained by releasing captive-reared Andean condors to the wild in South America to test procedures and assess survival and adaptability in the wild.

Plans are to continue management of the captive flock of Andean condors at Patuxent until propagation and release techniques are perfected.

Recommended Actions:

1. Continue to breed Andean condors in captivity until methods of handling and holding are well understood, and until condors are no longer needed for release studies (probably 1990).

2. To develop techniques for establishing captive-reared California condors in the wild, release captive-reared Andean condors into the wild in South America. Develop a program of releasing various ages and group sizes until captive-reared birds have been released successfully, then periodically monitor until captive birds have reached reproductive status (or until it is certain that the release program has been unsuccessful).

Responsibilities: Fish and Wildlife Service, at Patuxent Wildlife Research Center and through contracts to other parties and organizations.

Timetable: Andean condor breeding program is underway. A program for initial releases in South America is currently (1979) being developed by the University of Wisconsin (Dr. Stanley Temple); pending permit approval and funding, releases are planned for Peru in 1980. Future releases and monitoring of released birds will be scheduled after the initial releases are made and evaluated.

Activity 19 - Develop a California condor captive propagation program (Plan Section 22).

Background: Despite preservation measures taken to date and additional measures proposed in the California Condor Recovery Plan, it seems unlikely that the California condor population can maintain itself without a major increase in recruitment. The only logical way to significantly increase the number of birds being added to the population appears to be to take some condors into captivity and increase their reproductive capacity by assuming the artificial hatching of eggs and/or care of chicks. Then the adults can produce more eggs. Young produced in captivity would either be used as additional captive breeders or released to the wild to start new populations or supplement existing populations.

California condors have not bred in captivity, but considerable success with the Andean condor provides a sound basis for believing that such a program can be successful.

Recommended Actions:

1. Provide facilities to hold California condors when captured. Condors might initially be held in a community enclosure, but each pair should have a roofed enclosure similar to those occupied by Andean condors at the Patuxent Wildlife Research Center: dimensions approximately 40' x 40' x 17' high, to allow limited flight; visual isolation from other pairs; elevated perches; water supply for drinking and bathing; and simulated cliff structure (nest box) for nesting and roosting.

2. Using bow (clap) nets (preferred method) or cannon net traps (alternative method) at locations baited with animal carcasses, capture nine condors for captive breeding. Nine condors (five females and four males) would be captured, which along with the male currently in captivity, would be used to establish five pairs. The trapping would be done over a two-year period, during cooler seasons to reduce heat stress on the trapped birds, and as far from current breeding pairs as possible. Sex determination would be by the best method available at the time of trapping (studies of sex determination are currently underway, and it is anticipated that new information will be available soon). A veterinarian would be present at each capture operation. Not more than 2 or 3 condors would be captured simultaneously, so that handling time of individuals could be kept minimal and each bird would receive maximum attention.

Condors would be removed from the traps immediately upon cature, hooded, and placed in darkened holding pens. After they had become calm, they would be sexed and then transported to a propagation facility or (if an unneeded sex) released back to the wild. Take-apart pens about 12 x 12 x 7 ft. would allow individual condors to spread their wings and exercise, but would not allow them to gain sufficient momentum within the pen to injure themselves. Panels of 1-inch, 21-gauge poultry wire fastened to electrical conduit could be joined together to make the pens. All but one side should be covered with burlap, allowing some air circulation to the bird. The burlap can also be moistened to reduce interior temperatures, if necessary. The temperature inside the pens should be monitored and not allowed to exceed 95° F. Human activity around the pens should be restricted.

3. At the propagation stations, hold the condors in captivity until they reach sexual maturity and form pairs. Using techniques already developed for handling Andean condors, the future refinements of techniques, maintain the birds in reproductive status until reestablishment programs are completed.

Responsibilities:

Fish and Wildlife Service - lead agency for all trapping, handling, and propagation activities; contract for and supervise captive programs at non-government facilities; fund initial propagation facilities; obtain Federal and State permits for capture and possession of condors for research and breeding purposes.

Department of Fish and Game - issue State permits for capture and holding of condors; assist with trapping operations and advise on all aspects of the program; keep California Fish and Game Commission fully informed of pertinent developments in the California condor recovery effort and authorized work under State permits.

Propagation Facilities - day to day administration of captive breeding program, under supervision of Fish and Wildlife Service.

Timetable: In 1980, begin development of holding facilities and capture equipment; obtain necessary permits, and finalize trapping and handling plans by April 1980. Condor trapping would then be planned for the period between September 1980 and March 1983. Condors would be kept in captive breeding programs until the birds are no longer needed (estimated 2020).

Activity 20 - Provide habitat for captive-reared California condors to be established in the wild (Plan Section 23).

Background: If the California condor captive propagation program is successful, then the next step will be to establish captive-reared birds in the wild. Among the establishment alternatives are: (1) integrate captive-reared birds with existing wild populations in the Sespe-Piru area and/or Coast Ranges; (2) if wild populations become extinct, reestablish populations in currently-occupied habitat; and (3) establish captive-reared birds in habitat formerly (prior to 1920) occupied by condors. Studies of Andean condors will provide information on actual release and management techniques. Attempts at reestablishment are many years away (probably at least 20 years), and major changes in habitat can be expected before reestablishment occurs. It is important to identify potential release habitat now, and make sure that it is still available when we have birds to release.

Recommended Actions:

1. Survey the states occupied by condors in the recent past (Oregon, Washington, California, possibly Arizona), identify areas that are or could be developed into suitable condor habitat. By determining land ownership, trends in development and population growth, possible limiting factors, etc., select areas for reestablishment.

2. Make whatever arrangements are necessary to ensure that habitat is available when captive-reared birds are available for release. This may include land acquisition, long-term leases, or management agreements; improvement of the habitat by developing artificial nest sites, improving food supply, etc.; or other land management methods.

Responsibilities:

Fish and Wildlife Service - survey potential habitat, prepare recommendations for release areas.

All agencies - cooperate as necessary to preserve and maintain present and potential habitat.

Timetable: Field surveys and development of plans, 1982-1985; activities and timetable beyond that dependent on initial findings.

Activity 21 - Use captive-reared California condors to establish new populations or enlarge existing populations (Plan Section 24).

Background: The ultimate intent of captive breeding of California condors is to establish new populations or increase existing populations of condors in the wild. Following experimental work with Andean condors, and when captive-reared California condors are available, attempts will be made to establish and maintain condors in previously selected suitable habitat.

Recommended Actions:

1. Using techniques developed with Andean condors, release captive-reared California condors to the wild.

2. Develop and implement a protection and management program for the new population(s).

3. Conduct research on the released birds to judge the success of the program.

Responsibilities: U.S. Fish and Wildlife Service lead agency, others cooperating in various aspects of the program. Details to be decided later.

Timetable: To be developed following Andean condor release studies.

PART III

SCHEDULE OF PRIORITIES, RESPONSIBILITIES AND COSTS

A. LAND PRESERVATION

Group Priority	Name of Action	Plan Designation	Responsibility Lead	Responsibility Cooperators	Target Date	Estimated Costs Year 1	Estimated Costs Year 2	Estimated Costs Year 3	Estimated Costs Remaining
1.	Teton Ranch Preservation	123, 1323	FWS	NAS, DFG	1981	8,500,000 FWS	1,500,000 FWS	-	-
2.	Secure Hooper Mountain NWR Mineral Rights	13241	FWS	-	1980	250,000 FWS	-	-	-
3.	Acquire Matilija Property	111121	FS	-	1980	310,000 FS	-	-	-
4.	Acquire Blue Ridge Property	122	FWS	BLM	1983	75,000 FWS	75,000FWS	75,000 FWS	75,000 FWS
5.	Acquire Pothole	111124	DFG	FS	1980	40,000 DFG	-	-	-
6.	Acquire Indian Creek Parcel	111122	FS	FS	1982	-	-	225,000 FS	-
7.	Acquire Sespe Hot Springs	111123	FS	FS	1982	-	-	240,000 FS	-
8.	Secure Habitat For New Populations	232	FWS	BLM, FS, DFG, NAS	Not established	-	-	-	Unknown
9.	Acquire Remainder of Coldwater Area	111125	FS	-	1985	-	-	-	179,500 FS
10.	Acquire San Cayetano Parcels	111126	FS	-	1985	-	-	-	38,000 FS
11.	Acquire Oakflat-Sycamore Parcels	111127	FS	-	1990	-	-	-	150,000 FS
12.	Acquire Kerr Spring Parcel	111128	FS	-	1995	-	-	-	170,000 FS
13.	Acquire Ten Sycamore and Cottrell Flat Parcels	111129	FS	-	1995	-	-	-	180,000 FS

B. INVESTIGATIONS

1.	Andean Condor Propagation	211	FWS		1990	6,000 FWS	7,000 FWS	3,000 FWS	75,000 FWS
2.	California Condor Propagation	22	FWS	NAS, Contact (FWS)	2020	73,000 FWS	65,000 FWS 5,000 NAS	20,000 FWS	*
3.	Radiotelemetry	153	FWS	NAS, DFG	1982	35,000 FWS 15,000 NAS	20,000 FWS 15,000 NAS	20,000 FWS 15,000 NAS	-

B. INVESTIGATIONS (CONTINUED)

4.	Sample Food Items for Contamination	1461	FWS	NAS, DFG	1980 initial	65,000 FWS	-	-	***
5.	Investigate Metabolism in Captive Vultures	1464	FWS	contract	1982	10,000 FWS	10,000FWS	10,000 FWS	-
6.	Determine Effects of Poisons and Pullutants on Captive Vultures	1465	FWS	contract	1982	10,000 FWS	10,000 FWS	10,000 FWS	-
7.	Release Andean Condors in South America	212	FWS	contractor	1980 initial phase	87,500 FWS	50,000 FWS	***	***
8.	Surveillance of Condor Nesting Areas	1521	FWS	NAS	Ongoing	38,000 FWS 15,000 NAS 10,000 BLM 10,000 FS 5,000 DFG	40,000 FWS 15,000 NAS 10,000 BLM 10,000 FS 5,000 DFG	40,000 FWS 15,000 NAS 10,000 BLM 10,000 FS 5,000 DFG	*
9.	Research to Improve Productivity and Survival	113	FWS	NAS	Ongoing	8,000 FWS 6,000 NAS	8,000 FWS 6,000 NAS	8,000 FWS 6,000 NAS	***
10.	Mid-October Co-op Condor Survey	1522	DFG-FWS	NAS FS, BLM	Ongoing	3,500 FWS 1,000 DFG 1,000 NAS 1,000 FS	4,500 FWS 2,000 DFG 2,000 NAS 2,000 FS	3,500 FWS 1,000 DFG 1,000 NAS 2,000 FS	*
11.	Collect and Analyze Cooperator Records	1523	FWS	NAS, DFG, FS	Ongoing	3,500 FWS 1,500 NAS	3,500 FWS 1,500 NAS	3,500 FWS 1,500 NAS	*
12.	Determine Contaminants in Condor Specimens	1462	FWS	-	Ongoing	**	**	**	**
13.	Select Areas for Population Establishment	231	FWS	-	1985 initial phase	-	-	15,000 FWS	25,000 FWS
14.	Evaluate Need for Fire-arms Control, Santa Barbara Area	145	FWS	FS	1981	1500 FWS	1500 FWS	-	-
15.	Investigate Air Pollution in Sespe-Piru area	1463	FWS	contractor	1981	10,000 FWS	5,000 FWS	-	-
16.	Evaluate Need for Added Supplemental Feeding	1342	FWS	-	Ongoing	**	**	**	**
17.	Establish Captive Rear California Condors in the Wild	24	FWS	NAS, DFG	2020	-	-	-	***

C. MANAGEMENT - ADMINISTRATIVE

1.	Designate critical habitat, Hopper Mtn. NWR, etc.	13243	FWS	-	1980	1,000 FWS	-	-	-
2.	Close Piru Gorge to Public Use	11123, 1442	FS	-	1980	2,000 FS	-	-	-
3.	Restrict Firearms Use at Mt. Pinos	1441	FS	-	1981	2,000 FS	1,000 FS	-	-
4.	Continue Condor Feeding Program	112, 13242, 1341	FWS	DFG,NAS	Ongoing	18,000 FWS 1,000 FS	18,000 FWS 1,000 FS	20,000 FWS 1,500 FS	*
5.	Relocate Hardluck Campground	124	FS	-	1980	1,000 FS	-	-	-
6.	Improve Aircraft Restrictions in Nesting Areas	1113	FWS-FS	DFG	1980	1,500 FWS	**	**	**
7.	Continue to Administer and Patrol Sespe Condor Sanctuary	11121, 11124, 11122, 143	FS	-	Ongoing	15,000 FS	15,000 FS	15,000 FS	*
8.	Conduct Conservation Education and Public Information Program	16	FWS-NAS	DFG,FS	Ongoing	35,000 NAS 7,500 FWS	40,000 NAS 7,500 FWS	40,000 NAS 7,500 FWS	*
9.	Develop a Fire Management Program for Condor Nesting Areas	1114 part	FS	FWS, NAS	1981	2,000 FS	1,000 FS	-	-
10.	Minimize Animal Control in Condor Habitat	141	FWS-DFG	-	Ongoing	2,000 FWS	2,000 FWS	**	**
11.	Patrol Condor Congregation Areas	142	DFG	FWS	Ongoing	3,000 DFG 3,000 FWS	3,000 DFG 3,000 FWS	3,000 DFG 3,000 FWS	*
12.	Continue to Evaluate Condor Feeding Areas to Determine Needs	131, 1321, 1322, and 133	FWS	NAS, DFG	Ongoing	**	**	**	**
13.	Continuing Administration of Condor Programs as Needs Arise	11113, 11132, 121, 125, 1114 part	FWS, FS	DFG, NAS	Ongoing	16,000 FWS 2,000 DFG 3,000 FS 2,500 NAS	17,000 FWS 2,000 DFG 3,000 FS 5,000 NAS	17,000 FWS 2,000 DFG 3,000 FS 5,000 NAS	*

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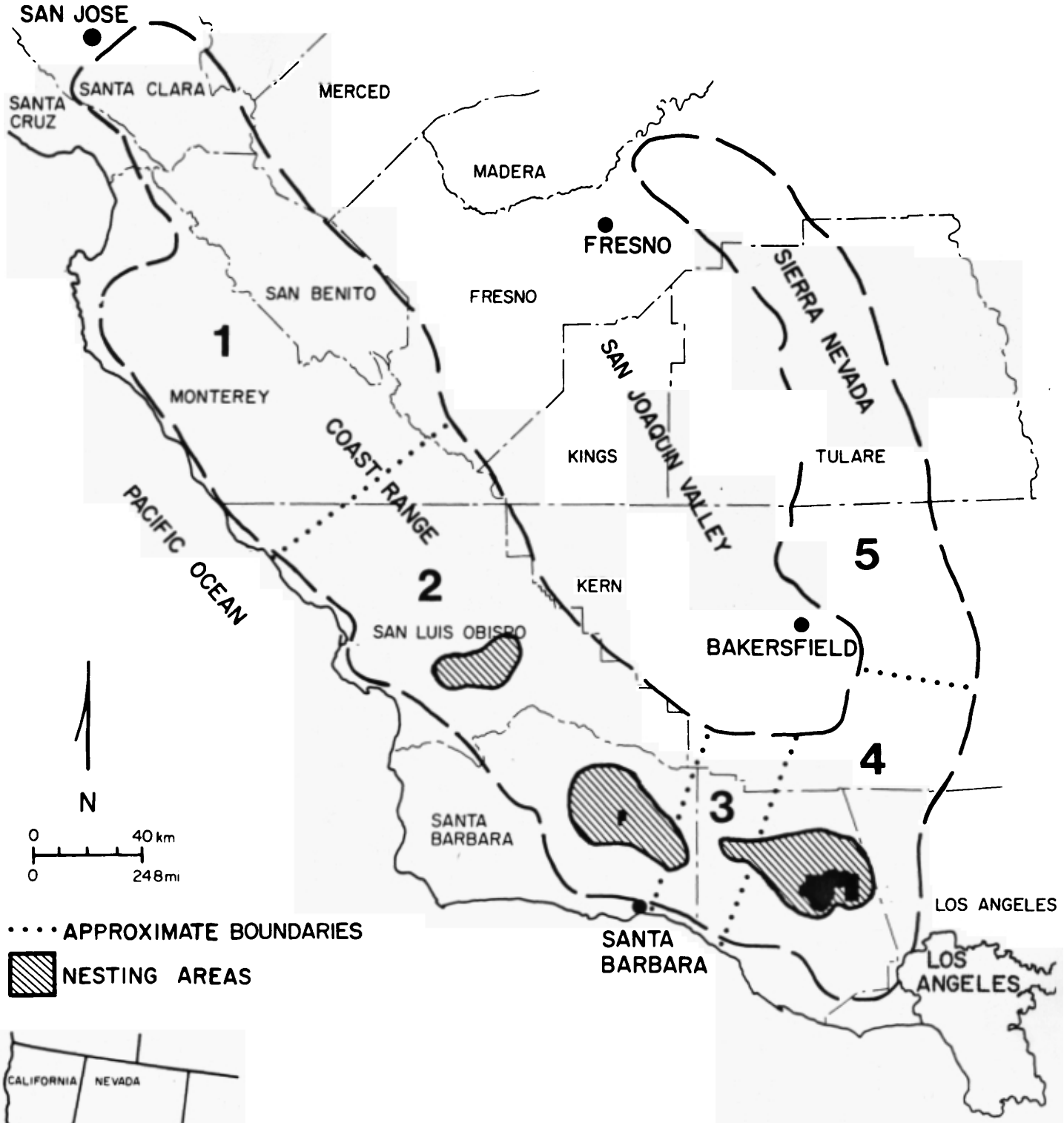


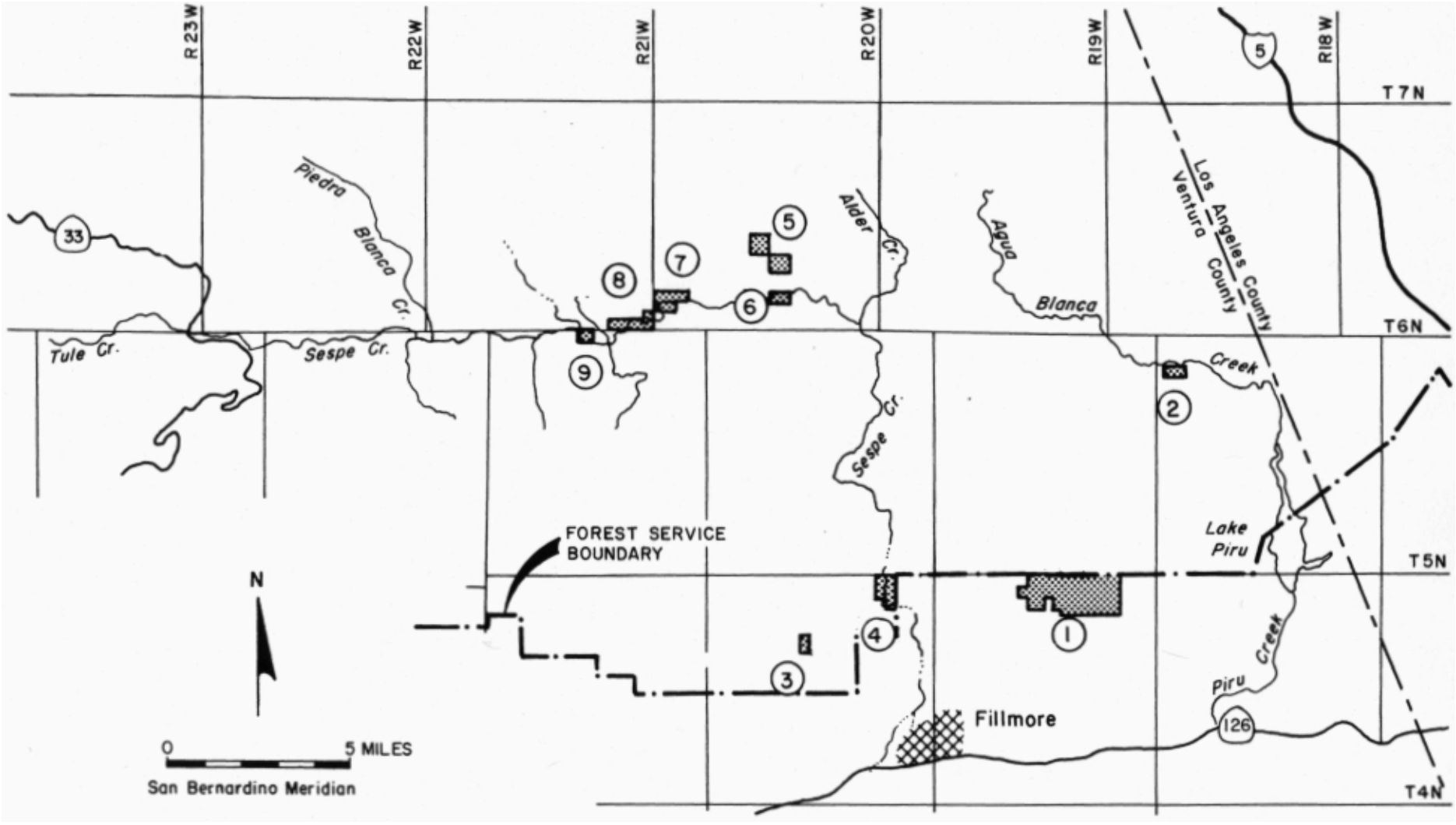
1- COAST RANGE POPULATION
AUGUST - DECEMBER

2- COAST RANGE POPULATION
YEARLONG

3- SUBPOPULATION
AFFILIATION UNKNOWN

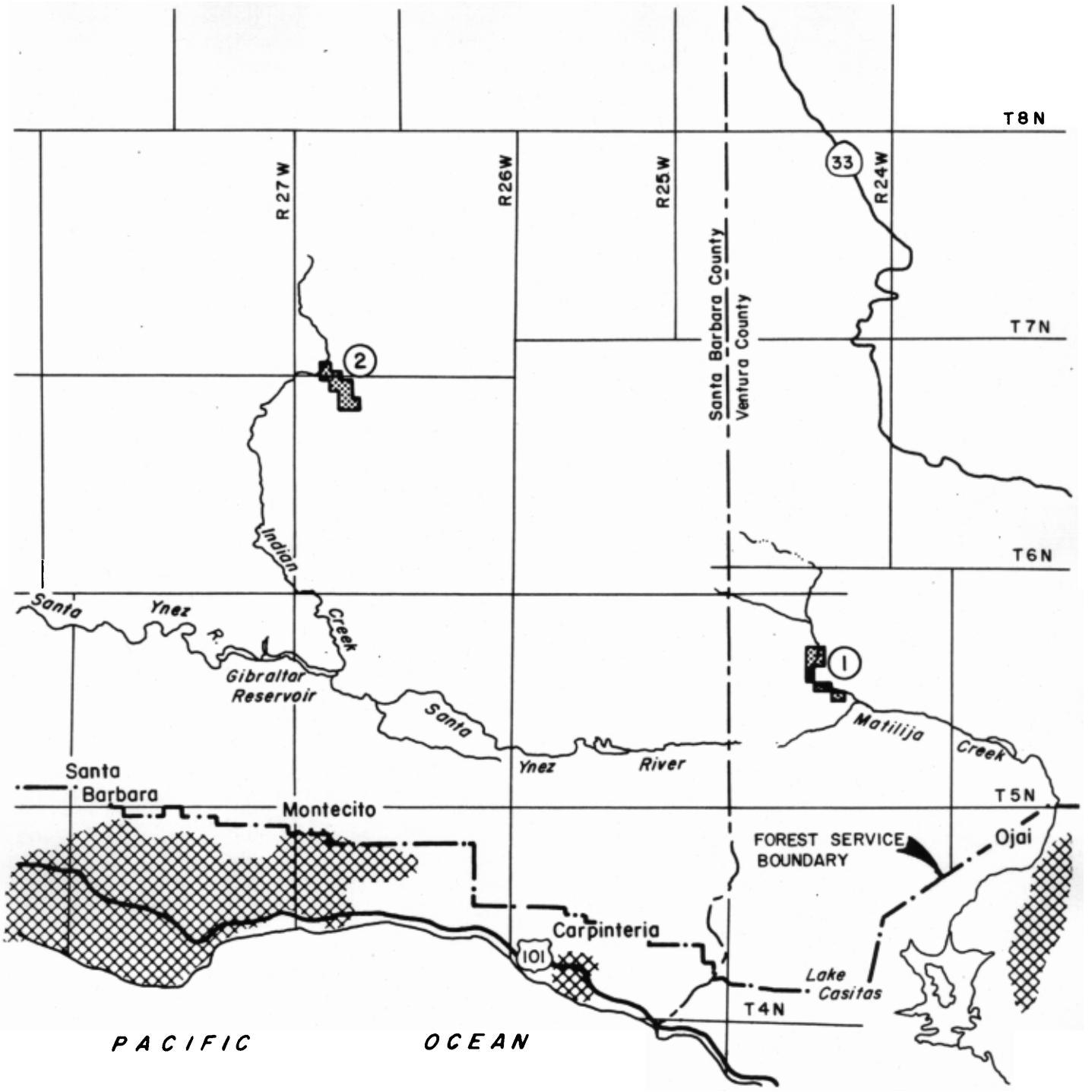
4- SESPE - SIERRA POPULATIC
YEARLONG

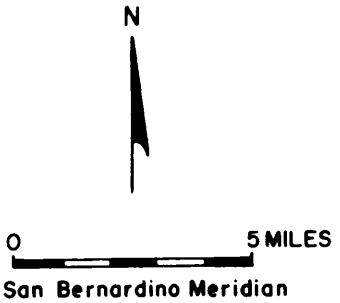
5- SESPE - SIERRA POPULATION
MAY - SEPTEMBER



(1) Hopper Mountain National Wildlife Refuge (Mineral rights only)
(2) Pothole (80.00 acres) 32 ha
(3) San Cayetano (76.00 acres) 30 ha
(4) Coldwater Addition (259.00 acres) 105 ha
(5) Sespe Hot Springs (320.00 acres) 130 ha
(6) Cottrell Flat (80.00 acres) 32 ha
(7) Ten Sycamore Flat (160.00 acres) 64 ha
(8) Oak Flat-Sycamore (200 acres) 81 ha
(9) Kerr Spring (222 acres) 90 ha

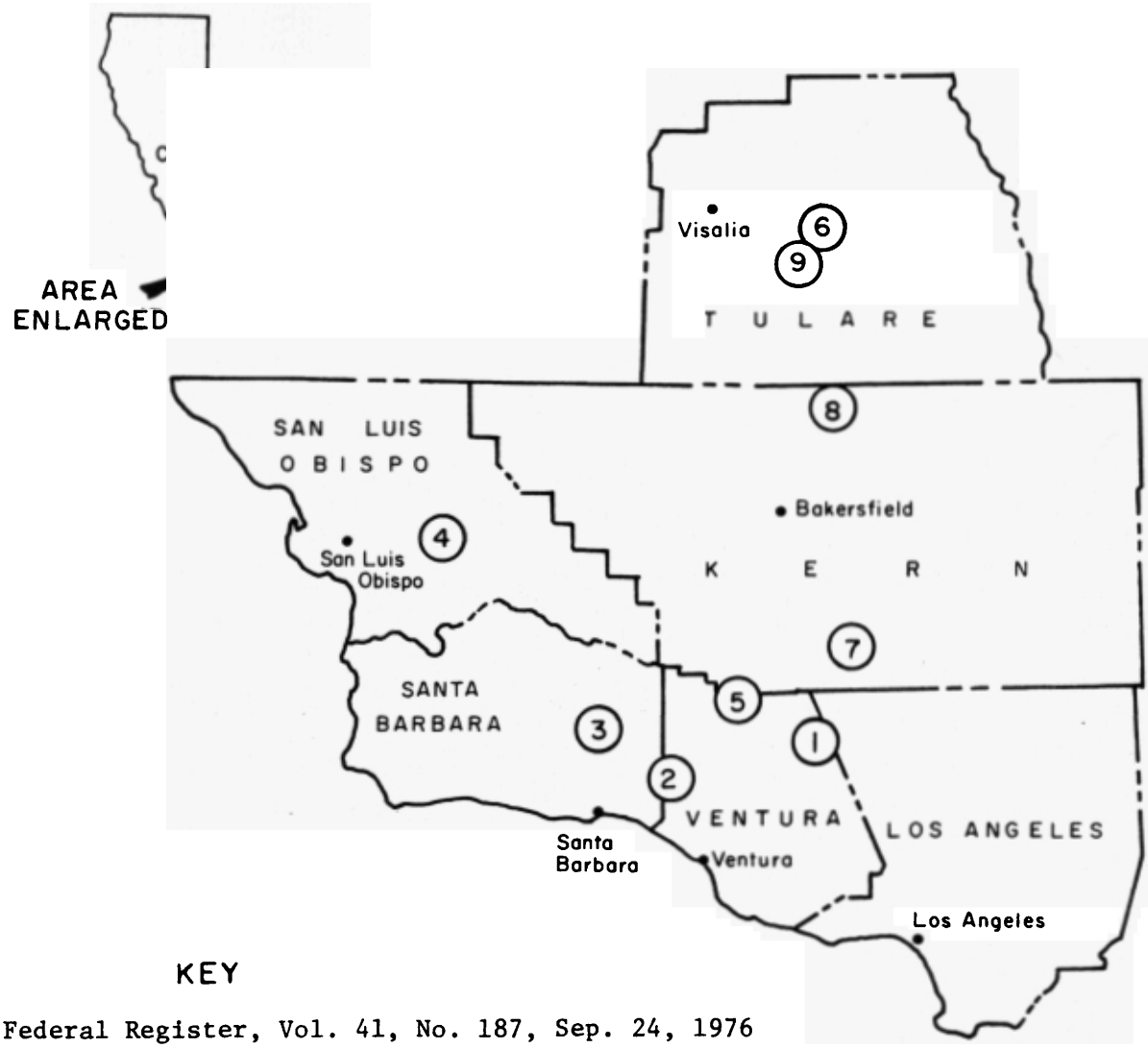
Figure 2. Proposed Acquisitions, Sespe-Piru Area.





(1) Matilija (360 acres) 145 ha
(2) Indian Creek (300 acres) 120 ha

Figure 3. Proposed Acquisitions, Santa Barbara and Western Ventura Counties.



KEY

Federal Register, Vol. 41, No. 187, Sep. 24, 1976
Paragraph 17.64 California Condor
(a)

(1) Sespe-Piru Condor Area
(2) Matilija Condor Area
(3) Sisquoc-San Rafael Condor Area
(4) Hi Mountain-Beartrap Condor Areas
(5) Mt. Pinos Condor Area
(6) Blue Ridge Condor Area
(7) Tejon Ranch
(8) Kern County rangelands
(9) Tulare County rangelands

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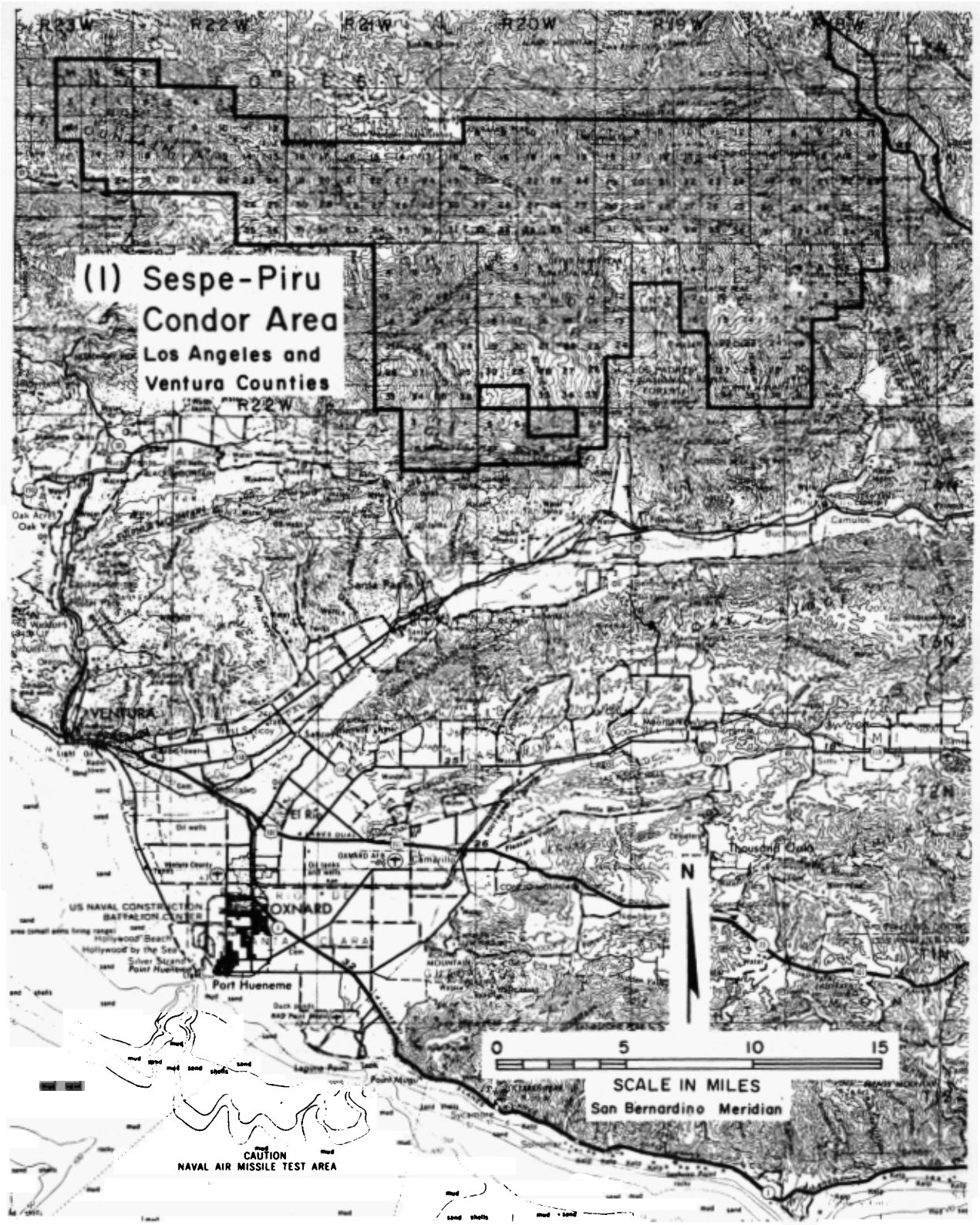
SCALE IN MILES

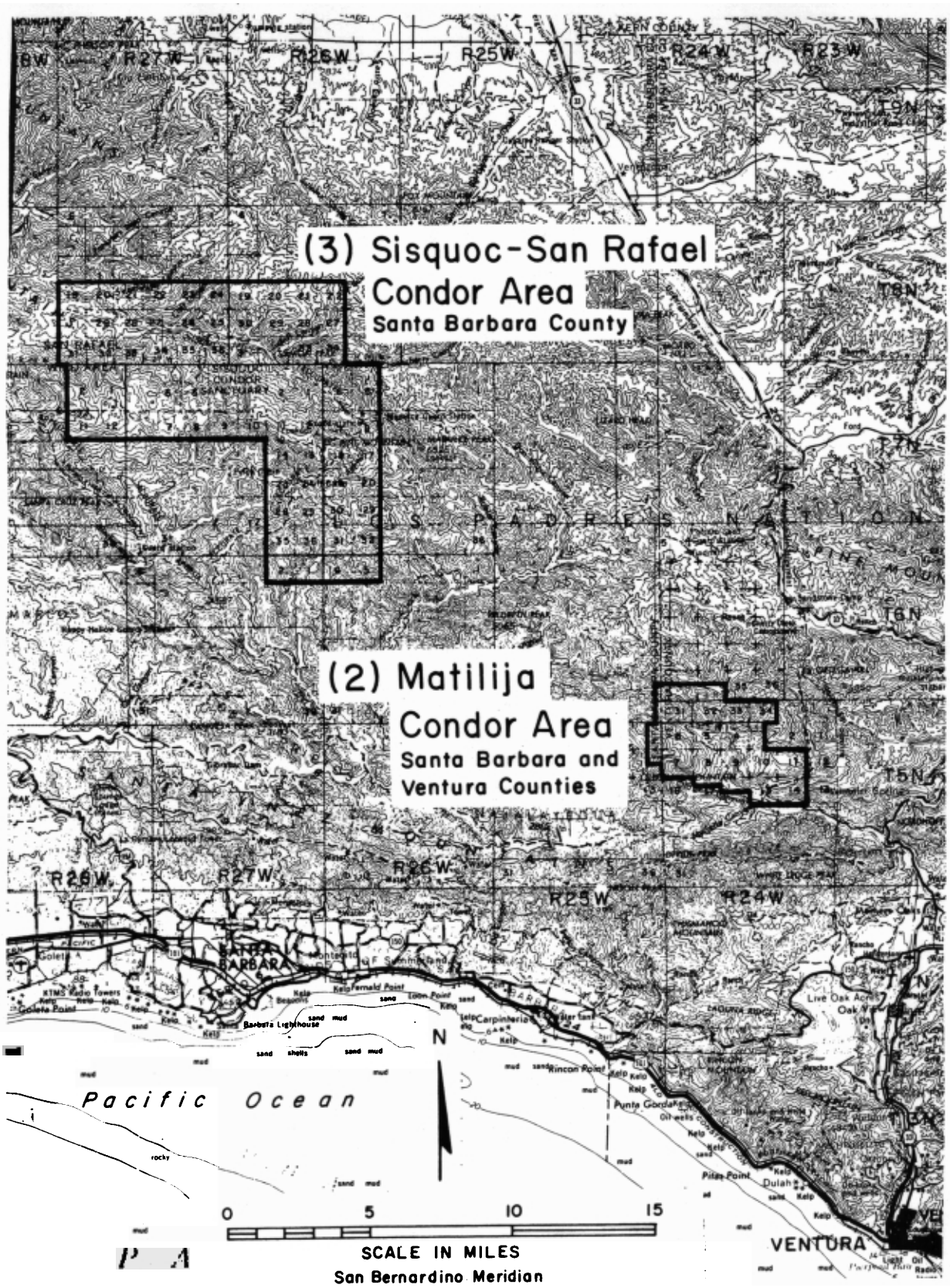
UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

DETERMINATION OF CRITICAL HABITAT
FOR
CALIFORNIA CONDOR



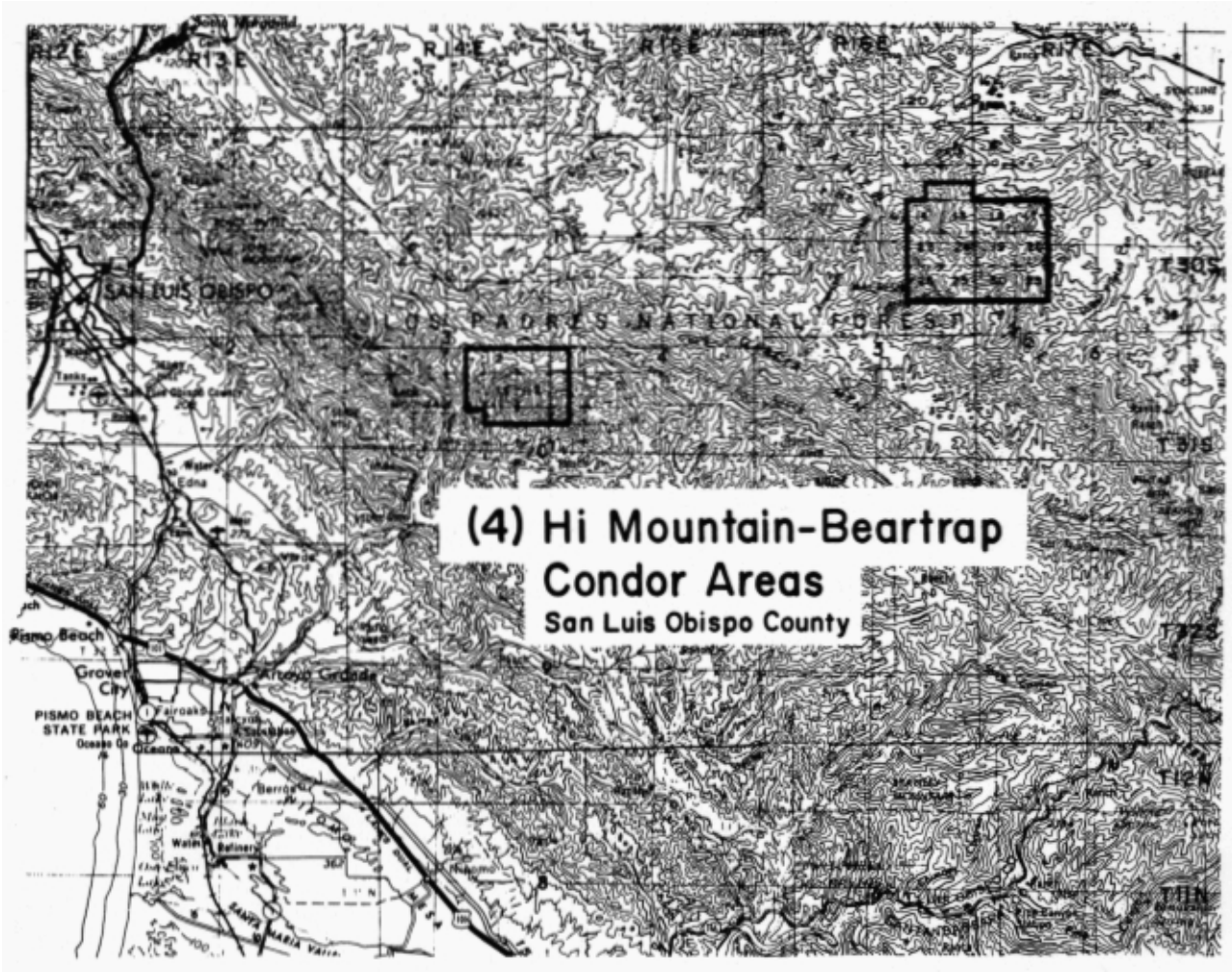
DETERMINATION OF CRITICAL HABITAT
FOR
CALIFORNIA CONDOR

Reference: Federal Register, Vol. 41, No. 187, Sep. 24, 1976



DETERMINATION OF CRITICAL HABITAT
FOR
CALIFORNIA CONDOR

Reference: Federal Register, Vol. 41, No. 187, Sep. 24, 1976



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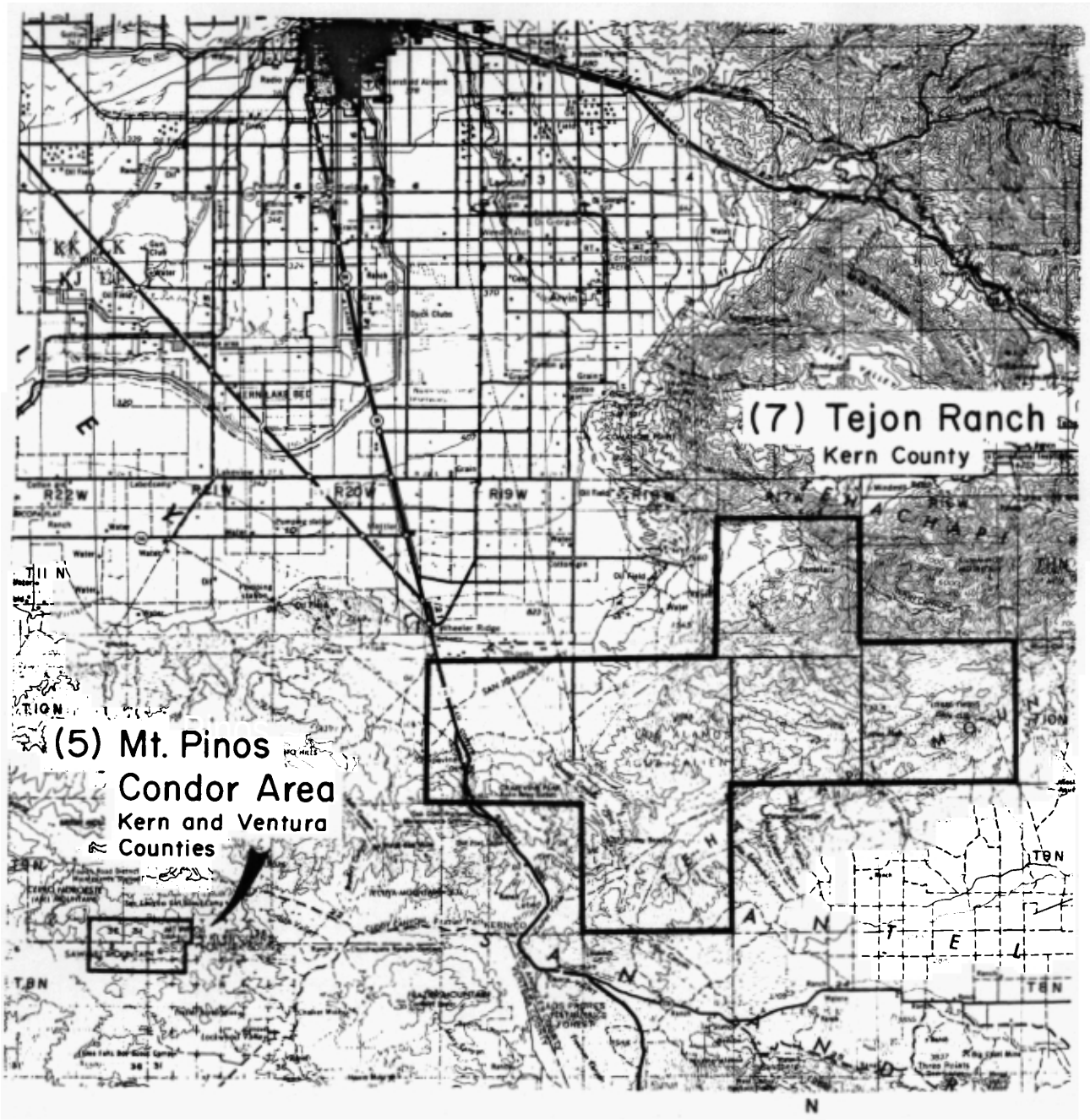
SCALE IN MILES

Mt. Diablo Meridian

DETERMINATION OF CRITICAL HABITAT FOR CALIFORNIA CONDOR

Reference: Federal Register, Vol. 41, No. 187, Sep. 24, 1976

Sheet 4 of 7



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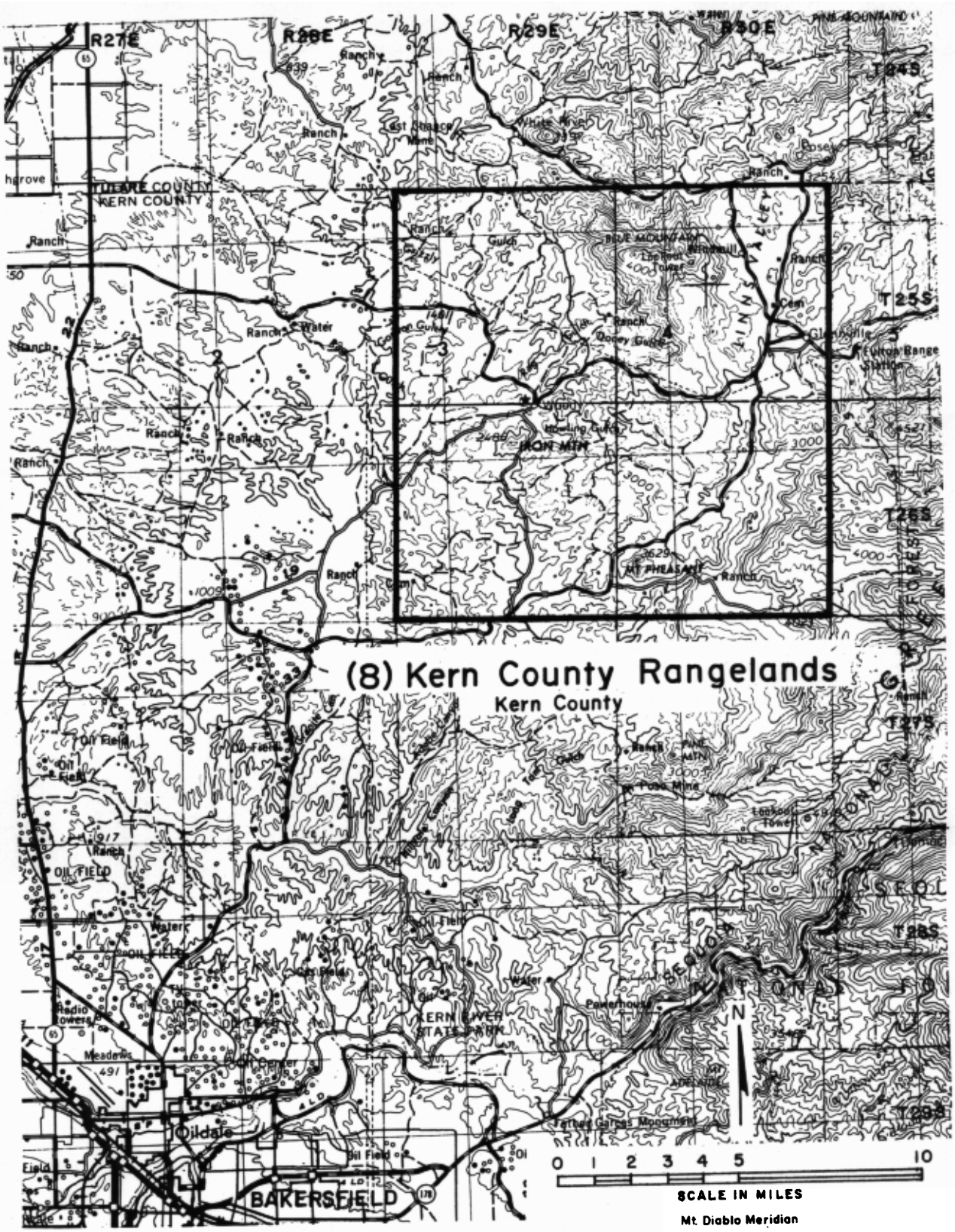
SCALE IN MILES

San Bernardino Meridian

DETERMINATION OF CRITICAL HABITAT
FOR
CALIFORNIA CONDOR

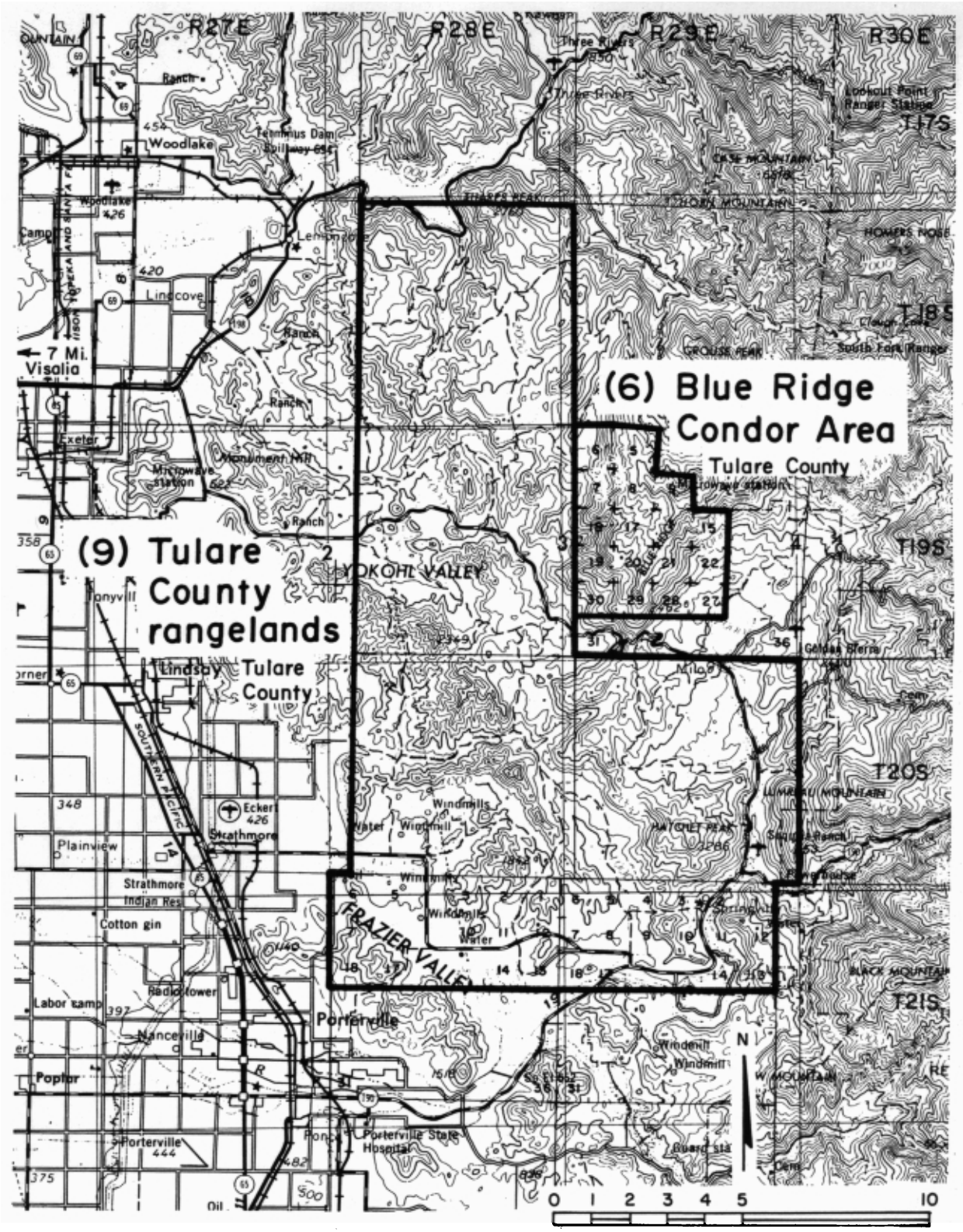
Reference: Federal Register, Vol. 41, No. 187, Sep. 24, 1976

Sheet 5 of 7



DETERMINATION OF CRITICAL HABITAT
FOR
CALIFORNIA CONDOR

Reference: Federal Register, Vol. 41, No. 187, Sep. 24, 1976
Sheet 6 of 7



Mt. Diablo Meridian

DETERMINATION OF CRITICAL HABITAT
FOR
CALIFORNIA CONDOR

Reference: Federal Register, Vol. 41, No. 187, Sep. 24, 1976

Sheet 7 of 7

ADDRESS ONLY THE DIRECTOR,
FISH AND WILDLIFE SERVICE

United States Department of the Interior

SE Log # 80-125
3/3 cc RD/DRD
x AFA
cc AM, Sacramento
sent 3/3

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

In Reply Refer To:
FWS/OES 310.6

FEB 26 1980

Memorandum

To: Regional Director, Region 1

From: Director

Subject: Approval of Revised California Condor Recovery Plan

I am pleased to approve the subject plan and sign the attached title sheet to so indicate. We have provided a few minor editorial comments by phone and would like to make a few additional comments on the Plan:

1. Add some wording to the Disclaimer Sheet similar to the following: "Goals and objectives will be attained and funds expended contingent upon appropriations, priorities, and other budgetary constraints."

2. Be sure the Table of Contents is changed to reflect the order of sections within the plan.

3. On page 30 #13243, change "Designate" to "Identify" and "critical" to "essential." On page 47, Responsibilities: Fish and Wildlife Service, change to read, "Consider designation of Critical Habitat." On page 51, Recommended Action: #2, change to read, "Consider designation of the east half..." On page 52, Responsibilities: Fish and Wildlife Service, change to read "consider designation of Critical Habitat."

4. Notations identifying the cooperating agencies' abbreviations should come before the Implementation Schedule.

5. Task numbers 11111 and 11131 are not assigned to an agency for implementation.

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

We are attempting to store all recovery plan implementation schedules on the IBM System 6. This means we need to standardize the format for all implementation schedules. Although there are several areas such as the plan task priorities and plan designation section that need to be improved, we are going to approve the recovery plan concepts and make the implementation schedule changes in a subsequent update.

Lynn G. Greenwalt

STATE OF CALIFORNIA—RESOURCES AGENCY

EDMUND G. BROWN JR., Governor

DEPARTMENT OF FISH AND GAME
1416 NINTH STREET
SACRAMENTO, CALIFORNIA 95814
(916) 445-3531

November 21, 1979

Mr. E. B. Chamberlain, Jr.
Assistant Regional Director
Federal Assistance
U.S. Fish and Wildlife Service
500 N.E. Multnomah St., Suite 1692
Portland, OR 97232

Dear Ed:

This is in reply to your letter of October 1, 1979, reference AFA-SE, in which you asked for agency review comments on a draft of the "California Condor Recovery Plan." I will be happy to comment on this latest planning effort of the California Condor Recovery Team.

I am pleased this draft of the Recovery Plan incorporates into a single document the information from the earlier Recovery and Contingency Plans, National Audubon Society's Conservation Report No. 6, members of the California Condor Recovery Team and correspondence from professional and interested individuals. Minor editorial comments are made in the margin of the report on pages 7, 13, 62, 64 and 66. Also on page 66 under the section on Responsibilities, Fish and Wildlife Service, I suggest the following wording change in line 5 to reflect a true picture of the resource responsibilities; "...station; obtain federal and state permits for capture and possession of condors for research and breeding purposes." For further clarification please consider the following for lines 6 and 7 on the same page; "Department of Fish and Game - will keep the California Fish and Game Commission fully informed of pertinent developments in the California Condor recovery effort and authorized work under State permits."

The Recovery Team is to be complimented on assembling such a complete and thorough plan to assure the preservation of the California Condor. Agencies cooperating in this recovery effort will be able to use this plan for budgetary purposes. The Department, subject to the availability of funds, will be happy to assist in this program.

Sincerely,

Director

Fa[illegible]e [illegible]

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Sequoia National Forest
900 W. Grand Ave.
Porterville, California 93257

November 14, 1979

E.B. Chamberlain, Jr.
Assistant Regional Director
Lloyd 500 Building, Suite 1692
500 N.E. Multnomah Street
Portland, Oregon 97232

Dear Mr. Chamberlain,

I appreciate your sending a copy of the Draft California Condor Recovery Plan for review. The plan seems satisfactory, and at this stage of the recovery program, the Sequoia National Forest has nothing further to add. Please keep us posted of the program's progress.

Sincerely,

JOE J. BROWN
Forest Supervisor

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Los Padres National Forest
42 Aero Camino
Goleta, California 93017

2620
November 21, 1979

E. B. Chamberlain, Jr.
Assistant Regional Director
U. S. Fish and Wildlife Service
500 N. E. Multnomah Street
Portland, Oregon 97232

Dear Mr. Chamberlain:

Our comments on the California Condor Recovery Plan draft are enclosed for your consideration. Most of the comments are editorial. The close cooperation between the Fish and Wildlife Service and the Los Padres during the development of the plan ensured that substantial changes would not be necessary.

I hope you find the comments useful.

Frederik G. deHoll

FREDERIK G. deHOLL
Forest Supervisor

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Monterey Ranger District

REPLY TO: 2620 Plans

October 26, 1979

SUBJECT: California Condor Recovery Plan
Your Request for Review Dated 10/10/79

TO: Forest Supervisor

The description of the current habitat for the Sespe-Sierra Condor population is excellent. In light of condor sightings during the last two years on the Monterey Ranger District further description of present and possible future importance of Monterey County to the Coastal Population would assist in project planning on the District.

In the Activities section there appears to be a conflict in the background information between Activity 13 (page 54) and Activity 15 (page 56) as to the effects of toxicants on condors. There is an inconsistency in the way the information is presented. This information should be more consistent in its presentation.

Under Activity 19 it is implied that the reproductive capacity will automatically increase by taking over the hatching and/or the care of the chicks. The normal reproductive capacity of condors, as indicated on pages 9 and 10, is one egg every other year with more frequent egg production sometimes occurring. This indicates that by taking over the hatching and/or care of the chicks it can be expected that the survival rate of the clutch to recruitment would be higher. It does not indicate that the clutch size or the number of clutches laid should be expected to increase.

The use of a table to show the schedule of priorities, responsibilities and costs by agency is a good format for showing base information for the recovery plan. In addition to this table a summary of the total project costs and individual agency costs should be included in the body of the plan. Those dollars which fall under the "Remaining" column should have a time frame indicated to give a clearer picture of the recovery plan costs.

ROBERT E. BREAZEALE
District Ranger

RECEIVED
LOS PADRES N.F.

FILE COPY
X ACTION
✓ INFORMATION
REF: INITIAL: DATE:
OCT 31 1979

Forest Supervisor
Deputy Supervisor
Administrative Officer
Planning Officer
Office Services

KERN COUNTY PLANNING DEPARTMENT

1103 Golden State Avenue
BAKERSFIELD, CALIFORNIA 93301
Telephone (805) 861-2615

October 12, 1979

File: General Corres.

United States Department of Interior
Fish and Wildlife Service
Lloyd 500 Building, Suite 1692
500 N. E. Multnomah Street
Portland, Oregon 97232

Re: California Condor Recovery Plan
AFA-SE

Gentlemen:

This office has reviewed the above-cited proposed plan and has no comments.

We appreciate the opportunity to review and comment on the document.

Very truly yours,

TED HILTON
Planning Director

BY: DAVID B. RICKELS
Associate Planner

DBR:bc

Planning Department

Rooms 107-111 · County Civic Center · Visalia · California · 93277
Telephone (209) 733-6254

November 14, 1979

E. B. Chamberlain, Jr.
Assistant Regional Director
Fish and Game Service
Lloyd 500 Building, Suite 1692
500 N.E. Multnomah Street
Portland, Oregon 97232

Dear Mr. Chamberlain:

The County of Tulare is currently involved in the preparation of a plan entitled "Foothill Growth Management Plan". The primary purposes of the FGMP are to: 1) rationally direct urban/suburban growth into specific areas of the foothills in order to protect its fragile environment; 2) maintain the agricultural viability of the foothills by identifying areas to be maintained or encouraged for intensive and extensive agricultural purposes; and 3) accommodate urban/suburban growth in areas serviceable by State and/or County agencies and in a manner which is cost efficient, safe and consistent with environmental constraints.

More specifically, the FGMP has delineated specific corridors along State Highways 245, 198 and 190 which may enclose land suitable for some type of development. The balance of the foothills (outside the Corridors) will most likely be zoned to a large lot agricultural zone - 80 or 160 acres minimum parcel size. This zoning will maintain a major portion of the foothills as open space.

The Development Corridor that would specifically concern your Condor Recovery Plan would be the State Highway 190 Corridor which also includes land along Bear Creek Road (see attached map).

The staff is currently preparing a sensitivity map for each Development Corridor which delineates steep slopes, soil type, floodplains, unique wildlife habitats and service areas of the California Division of Forestry. Regarding the wildlife mapping, Staff is working with Ron Thomas and Jim Crew, both from the Department of Fish and Game.

Upon reviewing the State Highway 190 Development Corridor, you'll notice that the Blue Ridge Area is excluded from any type of development potential; further, a very extensive portion of the foothills south of Blue Ridge is precluded from development in addition to Yokohl Valley. After the sensitivity mapping is completed, the proposed Development Corridor lines could be further reduced from their current size.

In addition to working with the Department of Fish and Game, the staff is also working with the Bureau of Land Management in terms of attempting to protect environmentally sensitive areas through traditional zoning or public purchase.

The staff will keep the Fish and Wildlife Service informed concerning the State Highway 190 Development Corridor. Please call if you have any specific questions concerning the FGMP and how it relates to your planning activities.

Sincerely,

TULARE COUNTY PLANNING DEPARTMENT
Eugene E. Smith, Planning Director

Greg F. Collins

Greg F. Collins, Planner II

GFC:jj

Attachment