State of California
THE RESOURCES AGENCY
Department of Fish and Game

A PLAN FOR CALIFORNIA RAPTORS

by

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Presented to the California Fish and Game Commission, December 1978.
Drawings courtesy of U. S. Fish and Wildlife Service.

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INTRODUCTION

Raptors are among the largest and most important groups of avian predators. Of the 8,650 known species of birds found in the world today, 422 are raptors. Of these, 37 species may be found in California, either as migrants or as residents (Grinnell and Miller 1944, Brown and Amadon 1968). Taxonomists have grouped all raptors or "birds of prey" into two orders of birds: the Falconiformes, the diurnal birds of prey, include vultures, hawks, eagles, and falcons; and the Strigiformes, the nocturnal birds of prey, include all species of owls (Brown and Amadon 1968).

The basis for administering California's fish and wildlife resources, including raptors, was provided in 1901 when the State Legislature enacted the "protective laws." All but three species of raptors were given protection. Protection was not extended to the Peregrine Falcon (Falco peregrinus), Cooper's Hawk (Accipiter cooperii), and Sharp-shinned Hawk (Accipiter striatus) because, at that time, it was believed that they posed a serious threat to domestic and game fowl.

Until recently, the status of many raptors in California was unknown and little attention was directed toward their welfare and management. It was not until 1957, when falconry regulations were established, that the Department initially focused attention on the management of raptors. Talbot (1977) stated that surveys or ecological studies always should precede new or changed uses of resources, and adequate monitoring and analysis must accompany the actual use of the resources, with results made readily available for critical public review. Talbot (1977) cautions against applying simplified management schemes when dealing with species whose ecology is poorly understood.

Growing public concern over rare and endangered wildlife prompted the California State Legislature to enact the Ecological Reserve Act of 1968, California Endangered Species Act of 1970, and California Species Preservation Act of 1970. In California, the California Condor (Gymnogyps californianus), American Peregrine Falcon (F. p. anatum), and the Bald Eagle (Haliaeetus leucocephalus) are classified as Endangered by the U. S. Secretary of the Interior and also are protected under the Federal Endangered Species Act of 1973.

Prior to the enactment of the Federal Bald Eagle Act of 1940, the California Fish and Game Commission exercised sole regulatory jurisdiction over raptors and other birds resident to California. Bald Eagles, and later Golden Eagles (Aquila chrysaetos), were protected by the Bald Eagle Act. When the Migratory Bird Treaty Act was amended in 1971, a convention with the Republic of Mexico added an additional 32 bird families and thereby extended Federal protection to raptors as migratory bird species. Thus, the U. S. Fish and Wildlife Service is responsible for administration of Federal regulations relating to all migratory birds including eagles, hawks, and owls. These State and Federal regulations were enacted for a number of reasons including: 1) to protect raptors from persecution, 2) to protect habitats, and 3) to control falconry. With this combination of regulations in force, all California birds of prey are afforded protection. Raptors may not be taken except under permit for falconry purposes or in special cases where depredation results in the loss of private property. In addition, raptors may be possessed for approved captive breeding projects when authorized by the Fish and Game Commission. The Department may also enter into a memorandum of understanding with applicants for approved research projects.

The continued existence of raptors and other species of wildlife is constantly threatened by continuing habitat destruction and human disturbance. The needs of an expanding human population is creating greater demands on the limited

resources of the State, largely at the expense of wildlife and their habitats. Intensive recreational activities in many areas of the State pose serious disturbance problems to raptors.

Recent research in the fields of basic and applied ecology have stressed the importance of viewing wildlife in an ecological context (Odum 1971). Research concerning the transfer of nutrients and energy through food chains has stressed the importance of animals occupying the higher trophic levels as indicators of environmental quality (Odum 1971). As a group, raptors occupy a high trophic level and function as an important ecological barometer. Considerable evidence has been gathered which proves that environmental contaminants such as chlorinated hydrocarbons (DDT and its metabolites, DDE and DDD) cause reproductive failures in certain raptors (Ratcliffe 1970, Cade et al. 1971, Hickey and Anderson 1968, Wiemeyer and Porter 1970, Lincer 1972, Henny 1972). Peterson (1969) predicted that the effects of food chain contamination would be most noticeable in predators whose diet consisted primarily of birds and fish and that mammal-eating birds would be less affected. Moore (1966) and Keith (1969) varified this prediction with their studies of raptors with varying food preferences.

The bird-eating falcons, the Peregrine and the Merlin (Falco columbarius), and the fish-eating Bald Eagle and Osprey (Pandion haliaetus) have experienced severe population declines since the initial applications of chloronated hydrocarbons in the late 1940's (Ratcliffe 1967, Hickey and Anderson 1968, Henny and Ogden 1970, Fox 1971). Recent studies suggest food chain contamination as the primary cause for population declines in the northeastern United States for the bird-predators, the Cooper's Hawk and the Sharp-shinned Hawk (Anderson et al. 1968, Schriver 1969, Hackman and Henny 1971, Snyder et al. 1973).

The ban on use of DDT in the United States in 1972 may be cause for guarded optimism that the trend toward reproductive failure in Bald Eagles, Peregrines, and other affected species will reverse itself in time. However, resident raptors, such as American Peregrines, face continued threat of food chain contamination as they feed on migratory birds that winter in pesticide-ladden environments in Mexico, Central America, and South America. There is a need to continue monitoring levels of pesticides in affected species and work toward international agreements to control the use of chemical contaminants in the rest of the Western Hemisphere.

Aside from their intrinsic value as co-inhabitants of this planet and their aesthetic appeal to mankind, raptors may be of added importance to humans. We, too, occupy a high trophic level in the ecosystem and also are subject to accumulation of high levels of pesticides and other chemical contaminants within our bodies. Thus, our efforts to maintain healthy raptor populations, free from environmental contamination, may accrue survival benefits to human populations which share the same environment with these birds.

Through the implementation of the plan, the Department of Fish and Game will comply with the basic intent of the Fish and Game Commission's Raptor Policy. That policy is as follows:

> "Raptors, including vultures, hawks, eagles, falcons, kites, ospreys, and owls, are part of California's native fauna and serve an important purpose in wild ecosystems. It is the intent of the Fish and Game Commission to ensure that the raptor populations shall be maintained for their intrinsic, ecological,

recreational, economic, scientific, and educational values and to make certain that the utilization of any raptor species in no way contributes to its depletion."

"In instances where raptor depredation occurs, reasonable measures shall be taken by the landowner to protect his property before permission may be obtained to take depredating animals as authorized by State and Federal law. The taking of endangered species and indiscriminate take of raptors shall not be permitted."

"The Fish and Game Commission recognizes falconry, as authorized in the Fish and Game Code, as a legitimate use of this wildlife resource. Species found to be endangered or rare shall receive maximum protection and management effort to ensure their survival. The Commission recognizes that captive raptor breeding programs may be an important management tool in the re-establishment of endangered and/or rare species in the wild."

OBJECTIVES

In order to acheive the objectives of effective management of California's raptors, it will be necessary to apply sound wildlife management practices which are based on extensive research and careful planning.

It is important to recognize that extremely complex ecological relationships are involved in natural populations of raptors. Any action to be undertaken concerning raptor populations must be viewed in an ecological context. Great caution must always be exercised when dealing with raptor populations whose biology or ecology has been inadequately investigated.

The objectives of this raptor management plan are as follows:

1. Maintain and, in some cases, enhance raptor populations and their habitats in the State.

2. Improve knowledge of the biology and ecology of raptors.

3. Increase public awareness and appreciation of raptors through educational programs.

4. Provide for diversified use where it can be demonstrated that such use does not pose a threat to the raptor resource.

The basic objectives of this Plan can be accomplished only through widespread interagency and public cooperation. Endangered species recovery team and working team plans are good examples of existing interagency cooperation. Because of limited personnel and budgets, it will be necessary to rely heavily on assistance from qualified personnel outside the Department of Fish and Game to meet the objectives of this Plan. Assistance will be welcomed from amateur ornithologists, universities, researchers, falconers, and other interested people and organizations.

PRIORITIES

Each major program has been assigned a priority rating as follows: high (1), moderate (2), and low (3). Priority ratings are based on a number of criteria including: 1) benefits of program to wild raptor populations, 2) costs of program implementation, 3) urgency of need for program, and 4) public interest in and support of program.

PROGRAMS TO MAINTAIN ENDANGERED RAPTORS

Priority: 1

General Description:

The California Condor is the largest North American raptor (Bent 1926, Brown and Amadon 1968). These birds presently range over an area of approximately 4.5 million ha (11 million acres), 36% of which is public land. The remaining 64% is in private ownership, primarily large cattle ranches such as the 117,000-ha (290,000-acre) Tejon Ranch in the Tehachapi Mountains. Condors occupy a wishbone-shaped range in California, extending from Santa Clara County south to Ventura County then north to Fresno County, corresponding to the mountainous terrain surrounding the San Joaquin Valley (Wilbur 1978). The principal condor nesting area is in Ventura County, less than 75 km (45 miles) from Los Angeles.

While all recent known nesting sites are located on the Los Padres National Forest, most areas where condors feed are in private ownership. Two sanctuaries have been set aside for the protection of nesting, resting, and roosting areas for condors. The 485-ha (1,200-acre) Sisquoc Condor Sanctuary, Santa Barbara County, was established in 1937. The Sespe Condor Sanctuary, Ventura County, was first established in 1947 and presently encompasses 21,465 ha (53,000 acres). Both areas are administered by the U. S. Forest Service and are closed to public use. In addition, the Department recently acquired the 23.7-ha (58.5-acre) Coldwater Canyon Ecological Reserve for the condor. Also, the National Audubon Society recently acquired two parcels of land which are being transferred to the Los Padres National Forest to be included as California Condor Critical Habitat. The U. S. Fish and Wildlife Service's Hopper Mountain National Wildlife Refuge is a vital area important in the preservation of condor nesting habitats. In addition, a number of other Critical Habitats have been proposed for acquisition specifically for condors. The Forest Service has established two condor observation stations at Mount Pinos, near Frazier Park, and Dough Flat, near Fillmore, for public use to view this endangered species.

The decline of the California Condor may be due to a variety of factors. These factors include possible changes in climate, Native American ceremonial uses, wanton shooting, and scientific and hobby collecting (Koford 1953, Wilbur 1978). During the Twentieth Century, however, condors continued to decline as a result of changes in land-use practices, loss of principal food sources near nesting areas, increased human disturbance, shooting, and pesticide contamination (Koford 1953, Wilbur 1978). Today, the unavailability of adequate food near nesting areas may be the primary cause of the decreasing size of the condor population. Conversion of large ranches to subdivisions, increased mining and oil drilling activities, and other disturbance factors threaten the continued survival of this endangered species throughout its entire range.

Recent population surveys indicate there may be less than 30 California Condors alive in the world today (Wilbur 1978, Ricklefs ed. 1978). A realistic estimate places the number between 22 and 26 individuals. The annual adult survival of this long-lived bird may be high (average longevity of wild California Condors is about 20 years). Wilbur (1978) suggests a minimum of 16 nestlings may have been produced in the past 11 years (an average of less than 1.5 per year). However, Verner (1976) reported that 20 fledged, 1966 to 1976. Further aggravating the situation is the fact that the average age of the condor population may be increasing.

Wilbur (1977) states that the use of captive propagation, which has been quite successful in certain raptors, may be our last opportunity to increase condor productivity and save the species from extinction. In the Report of the Advisory Panel on the California Condor (Ricklefs ed. 1978) the need to initiate a

program of captive propagation of California Condors is stressed as a means to rapidly increase numbers. The report states that since good success has already been achieved in the captive propagation of Andean Condors (Vultur gryphus) and other large vulture species, there is little doubt that similar success can be expected with the California Condor. However, it remains to be seen whether these condors will breed in captivity or in the wild.

The California Condor Recovery Team, composed of biologists and administrators working independently of their respective conservation agencies, has developed a California Condor Recovery Plan (Wilbur et al. 1974). This plan includes provisions, based on available survey and research information, intended to ensure preservation of the condor.

A number of agencies and organizations will participate in the management of the California Condor. The Department has full management authority under cooperative agreements. The following will be used as guidelines for Departmental condor management programs.

Problems:

1. Expanding urban and industrial development with accompanying increases in human activity and distrubance are rapidly encroaching into remaining essential California Condor habitat.

2. Disturbance factors and changes in land-use practices have influenced condor behavior, movements, and their ability to find adequate food resources (Wilbur 1978).

3. The condor is in danger of extinction unless immediate steps are taken to increase population size and protect remaining habitat (Wilbur 1974, 1978). At least 4 to 6 fledged young per year are needed to maintain a condor population level of 50 which includes 40 adults; many more are needed to bring the present population of 30 to that level (C. Koford, pers. comm.).

Objective:

The prime short-term objective is to increase and maintain condor numbers at a stable level in suitable habitat: 1) maintain a population of at least 50 California Condors, well distributed throughout their 1974 range; 2) improve production to increase population size then maintain an average of at least 4 to 6 young fledged per year; and 3) reduce mortality to its lowest possible level.

Programs:

To accomplish the objective of the Plan, the following programs are recommended in order of priority (includes current programs):

1. Conduct research to increase understanding of the biological and ecological needs of the California Condor and to determine factors causing mortality and limiting productivity.

2. In cooperation with other agencies and conservation organizations, delineate Condor Critical Habitat, identify and acquire key areas as ecological reserves, and develop and implement management plans.

3. Cooperate in a captive breeding program to produce captive reared California Condors to augment the wild bird population.

4. Continue to work through the California Condor Recovery Team to implement programs to ensure preservation of the California Condor.

5. Increase public awareness of the plight of the condor and encourage land-use practices which will provide for the needs of the condor.

6. Coordinate and participate in a California Condor survey to be conducted at frequent intervals by a few trained observers.

7. Provide effective law enforcement in cooperation with other law enforcement agencies to provide maximum protection to the remaining condor population throughout its range.

8. Participate in a supplemental feeding program and work toward preservation of food resources near condor nesting areas.

9. Encourage increased communication among raptor biologists with expertise in condor biology and management. Disseminate information through factual newsletters or other forms of communication geared toward serious students of condor biology, ecology, and management.

General Description:

The Peregrine Falcon has long been revered as the epitome of the complete avian predator. Its splendid physical adaptations, molded over eons of time, have resulted in a creature whose predatory abilities have been admired by men since early recorded history (Grossmand and Hamlet 1964, Brown and Amadon 1968). Today, this endangered species is highly regarded because of its spectacular flight characteristics, hunting prowess, and wild beauty (Mavrogordato 1966, Peeters and Jameson 1970). The Peregrine, listed as Endangered by the U. S. Secretary of the Interior and protected under the provisions of the Endangered Species Act of 1973, was placed on the California endangered species list by the Fish and Game Commission in 1971.

In the past, a number of factors have caused population declines in Peregrine Falcons; these have included wanton shooting, egg collecting, falconry take, various forms of human disturbance, and some destruction of habitat. However, none of these factors can account for the severe population declines that have occurred in recent decades.

Studies have implicated chlorinated hydrocarbons as the primary cause of the precipitous post-war decline of Peregrine Falcons throughout their cosmopolitan range (Ratcliffe 1967, Hickey and Anderson 1968, Hickey ed. 1969). DDE, a metabolite of the pesticide DDT, was identified as the chemical contaminant responsible for the production of thin-shelled eggs. Thin-shelled eggs have led to massive reproductive failures in Peregrines as well as in other raptors and fish-eating birds (Porter and Wiemeyer 1969, Hickey and Anderson 1968).

Prompted by mounting evidence of the deleterious effects of chlorinated hydrocarbons on several species of birds, the Environmental Protection Agency banned most use of DDT in the United States in December, 1972. There is evidence that such limits on the use of persistent pesticides will reverse the trend of reproductive failure (Lockie et al. 1969). However, since DDT will persist in the environment for decades and because the use of chlorinated hydrocarbons continues on the wintering grounds of the Peregrine's migratory bird prey base, there is still reason for concern even though DDT use has been severely curtailed in the United States.

The American Peregrine Falcon is believed to be extirpated as a breeding bird east of the Mississippi River, but it continues to breed in reduced numbers in the western states (Enderson 1965). In 1970, Herman (1971) conducted a survey in California of historical Peregrine eyries and concluded that the breeding population had declined 95% from numbers nesting in the 1940's.

Loss of habitat remains a primary concern, even if the effects of pesticides are eliminated. Land conversion and manipulation, which destroys or disturbs Peregrine eyries and the habitats of the prey, can make otherwise suitable habitat unusable. Results of recent studies also indicate that nest site disturbance and continuing illegal nest robbing activities threaten the few remaining Peregrines in California (Herman 1970).

The Department and other agencies and conservation organizations have initiated a number of positive steps to delineate and acquire Critical Habitat, protect eyrie sites from disturbance, increase breeding populations, and augment natural reproduction.

A Pacific Coast American Peregrine Falcon Recovery Team was formed in 1976. This team, consisting of biologists from State and Federal agencies and conservation organizations is charged with the responsibility of developing a

plan for the recovery of the Peregrine on the west coast. The following provisions are included in the recovery team's plan:

1. Delineate Critical Habitat and provide adequate nesting, resting, and foraging areas for the Peregrine.

2. Protect active Peregrine eyries from human disturbance.

3. Augment the wild population through habitat enhancement, captive breeding, reintroduction, and prey base enhancement.

Research and management of the American Peregrine Falcon will be accomplished on a cooperative basis by several State and Federal agencies, conservation organizations, and other interested groups and individuals. The Department's share in this effort will include the following programs.

Problems:

Various authorities have attributed the decline of Peregrine populations to:

1) cumulative effects of chlorinated hydrocarbons obtained from the food chain;

2) habitat destruction due to changes in land-use practices; and

3) human disturbance of birds and their breeding activities.

Objectives:

The objectives of this program are as follows: 1) in the near future, restore and maintain California's wild American Peregrine Falcon population and the essential nesting and foraging habitats required to sustain a stable breeding population of 55 pairs with an average annual fledging rate of 1.5 to 2.0 young per pair, and 2) strive to eventually restore and maintain the wild Peregrine Falcon population at 100 breeding pairs, the level that existed in the 1930's.

Programs:

To accomplish the objective of the Plan, the following programs are recommended in order of priority (includes current programs):

1. Increase our knowledge of the biology and ecology of the American Peregrine Falcon.

2. Acquire in public ownership as much key habitat as is necessary to meet the goals of this Plan. Develop and implement management plans for these areas and recommend to the Fish and Game Commission that such areas become ecological reserves.

3. Work through the Pacific Coast American Peregrine Falcon Recovery Team to develop and implement a recovery plan to ensure the Peregrine's survival. Periodically review and evaluate recovery programs.

4. Cooperate in a captive breeding program to augment wild populations of Peregrines and to manipulate selected eyries to enhance productivity.

5. Make a comprehensive survey of all known Peregrine eyries and recommend measures that will ensure their preservation.

6. Participate with other agencies in the protection and surveillance of Peregrine eyries to eliminate human disturbance during the nesting season. Protect Peregrines from harassment and disturbance throughout the year.

7. Work in cooperation with land management agencies to enhance nesting, resting, and foraging habitats to provide maximum benefits to Peregrine Falcons throughout the year.

8. Increase public awareness of the plight of the Peregrine Falcon, and encourage input into and support of all recovery programs.

PROGRAM TO MAINTAIN THE BALD EAGLE

General Description:

The drastic population declines of the Bald Eagle have been documented throughout the United States (Sprunt 1969). Formerly, the Bald Eagle occurred as a resident species throughout its range in California (Bent 1937, Grinnell and Miller 1944). Presently, Bald Eagles are known to nest only in northern California counties. No Bald Eagles are known to nest south of Lake County (Detrich 1977). During 1973 Thelander (1973) surveyed 31 nesting territories in California. He reported that 19 pairs produced 24 young for a production rate of 1.26 per active nest. Detrich (1977) reported Bald Eagle productivity on the Shasta-Trinity National Forest totaled 19 fledglings from 11 nests. Lehman (1977) formulated management recommendations for 11 Bald Eagle nesting territories he located on or near private land in northern California. Thelander (1973) indicates that human disturbance caused by different kinds of recreational activities, as well as logging activities, are major factors contributing to the decline of the Bald Eagle in California.

The U. S. Fish and Wildlife Service and the Fish and Game Commission recognize that all Bald Eagles occurring in California are endangered and, therefore, are protected under State and Federal laws.

A Bald Eagle Working Team, composed of biologists from State, Federal, and private conservation organizations, was organized in California in 1974 to coordinate efforts to maintain and enhance Bald Eagle populations in the State. The team assists agencies by coordinating Bald Eagle conservation programs, such as statewide surveys; reviewing nest territory management plans; reviewing research and management proposals; preparing research and management recommendations, and advising cooperating agencies and organizations on request. Only through the delineation of Critical Habitats and implementation of management plans developed by cooperating agencies, conservation organizations, and private industries can this endangered species be saved from extirpation in the State. Bald Eagle management and research will be the responsibility of the Department and cooperating agencies and groups. The Department's share in this effort includes the following programs.

Problems:

The Bald Eagle population decline is attributed to many factors including:

1) pesticide contamination of the food chain;

2) loss of suitable nesting and foraging habitat; and

3) human disturbance and persecution (Hickey 1969, Sprunt et al. 1973).

Objective:

Restore and maintain a wild Bald Eagle population of 120 pairs in California and the habitats required to sustain them.

Programs:

To accomplish the objective of the Plan, the following programs are recommended in order of priority (includes current programs):

PROGRAMS TO MAINTAIN RAPTOR POPULATIONS
Priority: 1

RAPTOR RESEARCH PROGRAMS

General Description:

In recent years there has been a great deal of research on various species of raptors throughout the United States and the rest of the world (Craighead and Craighead 1956, Brown and Amadon 1968, Hickey and Anderson 1968). Research has involved a myriad of subjects ranging from general descriptive and ecological information (Brown and Amadon 1968) to complex investigations of physiological mechanisms and how they are affected by pesticide contamination (Hickey and Anderson 1968, Henny 1972, Snyder et al. 1973, Lincer 1975). Olendorff and Olendorff (1968-70) provide an extensive bibliography of the raptor literature covering a wide variety of raptor related subject matter. A number of recent studies and monographs have concentrated on California raptors (Hickey and Anderson 1968, Hickey ed. 1969, Wilbur 1978). The recent interest in raptor research has been so keen that a number of organizations (Raptor Research Foundation, Inc., Santa Cruz Predatory Bird Research Group, and Raptor Information Center of the National Wildlife Federation) have been established. These organizations are devoted to promoting research and disseminating information concerning a variety of raptor topics.

The Department has conducted surveys and produced status reports on endangered and nonendangered raptors within California (Herman 1971, Garber 1972, Thelander 1973, 1975, 1976, Garrett & Mitchell 1973, Gould 1974, Detrich 1977, Walton 1977, Cardiff 1978). These studies were conducted primarily to determine species range, distribution, and abundance. Future research should include biotelemetric determination of movements of raptors, effects of pesticides and other chemical contaminants on raptors, food habits, foraging ecology, habitat requirements, direct and indirect effects of human disturbance, effects of land-use changes, and survey and monitoring techniques. In addition, computer simulation techniques should be used to develop ecological models of raptor populations.

Of primary concern are California raptors that may be experiencing population declines or are maintaining small breeding populations; these include:

1) Swainson's Hawk (Buteo swainsoni)
2) Harris' Hawk (Parabuteo unicinctus)
3) Merlin (Falco columbarius)
4) Elf Owl (Microthene whitneyi)
5) Great Gray Owl (Strix nebulosa)

Swainson's Hawk

The Swainson's Hawk once was an abundant breeding bird in California, but the population has declined in recent decades. Urban development and conversion of grasslands to croplands have been major factors contributing to the population decline. Pesticide contamination, shooting, and habitat deterioration on wintering grounds in South America also may be important causes of the decline of Swainson's Hawk populations.

Harris' Hawk

The Harris' Hawk, once a locally common resident of the lower Colorado River and Imperial Valley, probably has been extirpated as a breeding bird in California. Its disappearance is due to the destruction of riparian woodland and mesquite woodland habitats and human disturbances. Pesticide contamination apparently has not reached high enough levels to affect this species' reproductive success (Mader 1977).

Merlin

Although no record of Merlins breeding in California has been published, there are undocumented reports that limited breeding may occur in certain northern counties in Douglas-fir (Pseudotsuga menziesii) forested areas. Those Merlins found in California are principally migratory, passing through the State on their spring and fall migrations. Fox (1971) reported that reproductive failure of the Richardson's subspecies (F. c. richardsonii) due to DDE contamination was widespread in central Canada. Recent reports indicate the trend may be reversing itself, however.

Elf Owl

A recent survey of the Elf Owl has resulted in only 10 pairs located in remaining suitable habitat areas in eastern San Bernardino County (Cardiff 1978). Destruction of mesquite-cottonwood riparian woodlands along the Colorado River is the primary reason for the decline of this diminutive desert owl. Human disturbance at desert oases may be an additional factor causing a reduction in productivity.

Great Gray Owl

The Great Gray Owl may never have been a common species in California; however, very little effort has been directed toward determining its status. Without basic information on distribution and abundance in California, little can be done to manage this species. It is suspected that habitat loss and human disturbance may be important factors affecting nesting success of Great Gray Owls (Remsen 1978). Shooting has been a significant mortality factor in adult birds in other portions of the owl's range in North America (J. Winter pers. comm.).

Raptors on the following list are of concern because: 1) little is known about their status and biological needs in California; 2) the populations may be declining in certain regions of the State; and 3) some of these species are authorized by the Department for falconry and research purposes. These species which need added attention are as follows:

1) Goshawk (Accipiter gentilis)
2) Cooper's Hawk (Accipiter cooperii)
3) Sharp-shinned Hawk (Accipiter striatus)
4) Marsh Hawk (Circus cyaneus)
5) Golden Eagle (Aquila chrysaetos)
6) Osprey (Pandion haliaetus)
7) Prairie Falcon (Falco mexicanus)
8) Screech Owl (Otus asio)
9) Long-eared Owl (Asio otus)
10) Short-eared Owl (Asio flammeus)
11) Spotted Owl (Strix occidentalis)
12) Burrowing Owl (Athene cunicularia)

Destruction of lowland riparian areas have affected populations of Cooper's Hawks and Long-eared Owls. Loss of fresh water and salt marsh habitat has caused declines in Marsh Hawks and Short-eared Owls. Present timber harvest practices which remove snags and old growth timber on both private and public lands threaten nesting habitats of Ospreys, as well as nesting, foraging, and other required habitats of Spotted Owls and Goshawks. Conversion of grasslands to agriculture and to residential and industrial development has led to the decline of Burrowing Owls, Marsh Hawks, Long-eared Owls, and Short-eared Owls. Screech Owls appear to be declining in Southern California owing to unknown reasons (L. Kiff pers. comm.).

Pesticide contamination of the food chain has led to reproductive failure in Ospreys (Hickey and Anderson 1968, Henny and Ogden 1970, Ames 1966, Henny 1972) and has been shown to cause eggshell thinning in Cooper's Hawks (Henny 1972, Snyder et al. 1973) and Sharp-shinned Hawks (Snyder et al. 1973). Habitat destruction, shooting, and disturbance of nesting birds are the prime reasons for concern for the future of Golden Eagles in California. Additional adverse impacts on these raptor populations include illegal shooting, collisions with automobiles, and various kinds of human disturbances (Remsen 1978).

Recent efforts to manage California Prairie Falcon populations have included an annual eyrie monitoring program to determine reproductive success. Provisions have been established to allow a limited take of nestlings for use in the sport of falconry. Continued management and enforcement efforts will be necessary to ensure protection of the Prairie Falcon.

Virtually all the relatively common raptor species in California are subjected to habitat destruction, various forms of human disturbance, and collisions with automobiles and various man-made structures. Although these raptors appear to be common to abundant, the status of many species is unknown. For example, little is known about certain small forest owls because of their secretive habits. Research (e.g., population surveys, pesticide studies, etc.) is the essential first step required to maintain healthy populations of all of California's raptors, regardless of their apparent status at the present time.

Problems:

1. Destruction of raptor habitat due to urbanization, logging, land conversions, and losses of birds due to various forms of human caused mortality and disturbance pose serious threats to birds of prey.

2. Lack of research information necessary to effectively plan and implement resource management programs is a continuing problem.

3. Some species of raptors are threatened with extirpation in California unless immediate steps are taken to preserve and protect the habitats upon which they depend for survival.

Objectives:

The objectives are: 1) to increase knowledge of the biology and ecology of all California raptors, and 2) to make management recommendations to maintain stable wild populations.

Programs:

To accomplish the objectives of the Plan, the following programs are recommended in order of priority (includes current programs):

1. Determine the status of all raptors in California, determine population densities, monitor movements by using biotelemetry, monitor the effects of pesticides on various raptors, determine tolerance of raptors to various forms of human disturbance, determine pattern of juvenile dispersal, determine mortality rates, and investigate other biological and ecological problems as required.

2. Compile existing research information and identify additional research needs.

3. Assign research priorities according to the severity of the problems confronting a particular raptor species. A possible order might be as follows: a) endangered species, b) threatened or rare species, c) species with declining numbers and unknown status, d) species used for falconry and e) abundant or relatively common species.

4. Coordinate research and management efforts with other agencies, groups, and individual researchers.

5. Continue to monitor and evaluate California's falconry program to ensure that the use of certain raptors for falconry does not threaten any species.

6. Develop ecological models with applications for computer simulation, and use this tool to test management alternatives prior to implementation in the field.

7. Periodically evaluate research programs, incorporating advice from public and private conservation agencies.

RAPTOR SURVEY PROGRAMS

General Description:

The Department has developed survey programs to determine the relative abundance, distribution, and population trends of selected California raptors. Survey procedures have been modified periodically to improve the program. In 1966, Department field personnel were asked to report observations of certain raptor species. This program provided information of limited use and was replaced in 1971 by an annual raptor survey program. Originally 54 routes were selected for censusing in December, January, March, and May. In 1973-74, the survey was modified to sample 15 routes each year and 42 routes every fourth year. This procedure was followed through 1977. In 1979, a total of 42 routes were sampled statewide and efforts are presently being made to improve techniques for subsequent surveys.

Specialized surveys already have been developed for endangered species and other species of special concern (Herman 1971, Thelander 1973, 1975, Gould 1974, Wilbur 1978). Most of these involve a systematic survey and inventory of specific nesting territories (e.g., the Raptor Eyrie Repository Program).

A breeding bird survey, coordinated nationally by the U. S. Fish and Wildlife Service, has been conducted by volunteers along 145 survey routes (1977) in California. Survey data will be useful in indicating raptor population trends.

Techniques need to be developed to effectively survey the more secretive raptor species such as the accipiters and owls. Careful planning and design are needed to develop sampling methods that will reduce bias and provide adequate information on which to base management recommendations.

Problems:

Without adequate knowledge of abundance, distribution, and general population trends of all California raptors, the Department is limited in its ability to determine what management activities are needed to maintain or restore raptor populations. The Department must know the present status of raptors to develop management plans that will ensure the protection and enhancement of the resource.

Objective:

Determine abundance, distribution, and population trends of all species of California raptors. This will entail research to improve existing survey techniques.

Programs:

To accomplish the objective, the following programs are recommended in order of priority (includes current programs):

1. Develop survey methods necessary to survey all raptors in California.

2. Evaluate and modify survey methods as needed.

3. Cooperate with other agencies and interested conservation groups in conducting existing raptor surveys. Survey selected routes annually during the months of January and May.

4. Continue annual participation in the U. S. Fish and Wildlife Service's Breeding Bird Surveys.

5. Survey raptor prey populations.

RAPTOR EYRIE REPOSITORY PROGRAM

General Description:

The Department initiated the Raptor Eyrie Repository Program in 1970. Using this repository, the Department assigns field personnel to periodically report on the nesting success of selected raptor species (Herman 1970, Garber 1972, Thelander 1973, 1975, 1976, Garrett and Mitchell 1973, Walton 1977). This has yielded information useful in the management of selected species. The repository is an information source on over 1,600 active or historically used eyrie locations and nesting territories for 8 species of raptors. It is updated periodically as new information becomes available from Department personnel, cooperating land management agencies, and cooperating individuals.

Problem:

Information on nest site activity and raptor productivity changes from year to year. Securing up to date knowledge or raptor eyrie locations of selected species is essential to determine reproductive status and for making land management decisions to minimize detrimental effects to the raptor resource.

Objective:

Continue to maintain and improve the Department's repository of eyrie locations for selected endangered, threatened, uncommon, or common raptors. Periodically check certain eyries to determine breeding productivity.

Programs:

To accomplish the objective, the following programs are recommended in order of priority (includes current programs):

1. Maintain the central repository of known eyrie locations for California Condor, Bald Eagle, Golden Eagle, Peregrine Falcon, Osprey, Prairie Falcon, Goshawk, and Spotted Owl. Expand the program to include nesting territory locations of additional raptor species. Solicit additional eyrie information from conservation agencies and groups.

2. Periodically monitor selected eyries to determine effects from human disturbance.

3. Incorporate into the raptor eyrie repository data on annual production of endangered, threatened, and uncommon raptors.

4. Maintain confidentiality of raptor eyrie files by making eyrie information available only to those agencies needing information for land-use and planning decisions.

PROGRAM TO PRESERVE RAPTOR HABITATS

General Description:

Every raptor species in California has been affected by some form of habitat destruction. Conversion of native grasslands to agriculture and residential areas has destroyed foraging habitats of buteos, falcons, and condors and nesting habitats of Burrowing Owls and Short-eared Owls. Loss of riparian habitat due to stream channelization and reservoir development has destroyed thousands of square miles of foraging and nesting habitat for Red-shouldered Hawks (Buteo lineatus), Cooper's Hawks, Long-eared Owls, and many others. Logging of old growth forests and the removal of snags have destroyed habitats of the Goshawk and several owl species, including the Spotted and Flammulated Owls (Otus flammeolus). In addition, timber harvest practices have affected Bald Eagle, Peregrine Falcon and Osprey populations by destroying or altering their foraging and nesting habitats. Land clearing activities in desert mesquite-woodland to make way for agriculture have contributed to the extirpation of the Harris' Hawk and may well do the same to the Elf Owl. The situation is critical, and unless a great deal of effort is expended by this Department and other land management agencies and conservation groups, the destruction will not only continue but will accelerate. To further illustrate the urgency of the situation, less than 1% of the State is critical habitat essential for saving endangered raptors. Every year construction activities destroy the habitats of raptors. Further developments are inevitable; however, certain projects can be modified to reduce adverse impacts on wildlife and various mitigation measures may be implemented to enhance marginal habitat or create new ones.

Problem:

The continual destruction of wildlife habitats poses the greatest threat to California raptors today. Expansion of urban and industrial development destroys an estimated 2% of the remaining wildlife habitat each year.

Objective:

Preserve enough of the remaining raptor habitats to maintain viable populations of all species and minimize disturbance to raptors and their habitats.

Programs:

To accomplish the objective of the Plan, the following programs are recommended in order of priority (includes current programs):

1. Work with the State and Federal agencies to ensure that logging, mining, geothermal development, recreational developments, water projects, and other developments are conducted in such a way as to minimize loss or disturbance of habitats.

2. Encourage private landowners and land-use regulatory agencies such as the Coastal Commission, State Board of Forestry, U. S. Forest Service, and Bureau of Land Management, to consider habitat needs of raptors on public and private lands when making land use changes or decisions.

3. Where habitat will be destroyed, coordinate with local State or Federal planning sections to ensure that suitable mitigation or compensation is made.

4. Support habitat preservation efforts of other State and Federal agencies, and private industry.

5. Periodically evaluate accomplishments of this program to identify needed improvements. Involve public participation in this review.

HABITAT ENHANCEMENT PROGRAMS

General Description:

Many acres of raptor habitat could be enhanced to support an even greater density and diversity of raptors if certain habitat management actions were taken. Kahl (1971) enhanced the nesting habitat for Ospreys at Eagle Lake, Lassen County, by erecting artificial nest platforms or modifying live trees and thereby increased Osprey productivity. This management technique has had limited application in the west but has been used successfully to enhance Osprey populations in many other parts of the U. S. (Reese 1970, Henny 1975).

The number and kinds of management options presently available to enhance raptor populations are many. However, few attempts have been made to implement these on a large scale in California. Olendorff and Stoddart (1974) present a number of management options. These relatively inexpensive measures include nest site improvements, conservation of trees, and placement of artificial nests in known nest trees. In general, artificial enhancement techniques should be used in special situations where efforts to preserve or enhance natural habitats have failed and some sort of manipulation or structure created by man is necessary to hold raptors in a particular area until natural habitat can be restored. For example, when an artificial nest or perch is placed in a treeless area, trees should be planted nearby so that raptors eventually can move to a natural site.

Snyder and Snyder (1975) caution against the implementation of intensive raptor management programs that place greater emphasis on promoting abundance than on preserving diversity. From a recreational and esthetic point of view, many raptor enthusiasts prefer to enjoy birds of prey in a natural, not artificial, setting. Thus, while the immediate goal of a raptor management program may be to increase nesting success by whatever means are available, the long term goal is to restore natural habitat.

Problem:

Land developments are destroying raptor habitat at an accelerating rate. There is a need to increase raptor productivity elsewhere by enhancing marginal habitats using conventional and innovative management techniques.

Objective:

Increase raptor productivity in selected areas by enhancing nesting and other important habitats.

Programs:

To accomplish the objective of the Plan, the following programs are recommended in order of priority (includes current programs):

1. Encourage private landowners and public land managing agencies: a) to prohibit human access to important raptor nesting areas by erecting warning signs and constructing barriers, b) to discourage most human activities in important raptor nesting, foraging, and roosting areas, and c) to plant trees for future nest sites.

2. Encourage the participation of all agencies, conservation groups, and private citizens in raptor habitat enhancement programs on public and private lands.

3. To enhance certain raptor populations, construct elevated platforms, nest boxes, or other structures to encourage the birds to nest in areas where nest sites are a limiting factor. Develop ledges or cavities in cliffs for cliff nesting raptors where these nesting features are lacking. Erect artificial roosts and hunting perches. Manage certain wildlands for greater densities of prey species to enhance raptor use.

4. Cooperate with the U. S. Fish and Wildlife Service to identify areas where raptor mortality caused by electrocution is significant and warrants special attention. Work with utility companies to eliminate existing and potential causes of raptor electrocution.

5. Review pest control programs and "rough" fish control programs to ensure that raptors are not adversely affected.

6. Where certain pest animals are abundant, construct raptor perches to encourage greater hunting use by birds of prey.

7. Periodically evaluate the habitat enhancement program and monitor the results during program implementation to ensure that desired results are being produced. Invite comments and suggestions on improving the program from other agencies, groups, and individuals.

PROGRAM FOR SCIENTIFIC CAPTIVE RAPTOR BREEDING

General Description:

Since April, 1970, 24 permits for captive raptor breeding research have been authorized by the Fish and Game Commission. These permits allow the possession of a maximum of 237 raptors of 15 species. So far 124 birds have been authorized for captive breeding research. These birds have produced 278 eggs from which 77 young have hatched and survived to fledging age. The disposition of these young has been as follows: the majority, or 42 birds (55%), have been transferred to falconers, including some residing out of state and in foreign countries; two birds (3%) have been transferred to other raptor breeding projects; eleven (14%) have been retained in individual projects for breeding stock or to be flown in falconry; and nine (12%) have been released to the wild. The remaining birds have either died or the disposition can not be determined from annual reports submitted by captive raptor breeders (13 birds). More Prairie Falcons have been produced than any other species (43; 56%) and most of these were transferred to falconers (24; 56%).

Throughout North America this work is being done largely by biologists and falconers with an interest in captive propagation of raptors. Recent nationwide work in captive raptor breeding have been largely due to the efforts of James Weaver and Dr. Tom J. Cade of New York, Richard W. Fyfe of Canada, and William Burnham of Colorado. Researchers working in various agencies, zoos, and universities have become more involved in captive propagation of raptors. Throughout North America, in 1976, approximately 140 Peregrines were produced in captivity, and 42 young were placed into the wild. Although reintroduction efforts in California have been disappointing thus far, American Peregrine Falcon breeding birds recently placed in a breeding project at the University of California, Santa Cruz, may produce young for release to the wild in the next few years. Only offspring of the subspecies native to California will be authorized for release by the Department.

The Harris' Hawk is believed to be extirpated from California as a breeding bird, and its future in this state may well hinge on re-establishment of a viable population from birds produced in captive breeding projects. Harris' Hawks have been successfully bred in captivity in California and certain program members have expressed interest in re-establishing wild populations.

Limited success has been achieved in developing captive breeding techniques for some raptor species. However, only a handful of birds have been released into the wild. Departmental guidance and assistance should be provided to ensure that primary resource-oriented goals of this program are met. This will entail Departmental financial assistance for suitable scientific research programs dedicated to the maintenance and enhancement of wild raptor populations.

Problems:

There is a need to refine techniques for successfully breeding, incubating, hatching, and rearing certain species of California raptors. Problems facing the captive raptor breeding program include the following: 1) greater emphasis needs to be placed on release of captive reared raptors into the wild; 2) suitable breeding birds are difficult to obtain either from the wild or from another captive population; 3) many birds in the program are not yet of breeding age; 4) birds acquired as adults or injured birds generally can not be bred in captivity; 5) information on raptor nutrition is inadequate; and 6) certain program members have indicated increasing interest in commercialization of raptors produced in captivity. There is also a need to develop experience and expertise in order to effectively use these techniques to manage endangered and other species of raptors.

Objective:

The primary objectives of captive raptor breeding have been to develop the technology by which self-sustaining captive populations can be maintained and to develop techniques for the restoration of endangered species in the wild. An additional objective is to provide captive reared raptors for various scientific and educational purposes and for falconry.

Programs:

To accomplish the objectives, the following programs are recommended in order of priority (includes current programs):

1. Develop policies and gain experience and expertise necessary to implement management programs for restoring or augmenting wild populations of endangered and certain threatened species of raptors.

2. Expand the Department's role in the Captive Raptor Breeding Program and cooperate with captive raptor breeders to improve authorized captive breeding programs. In addition, the Department will:

   a. Review existing and proposed breeding projects and make necessary recommendations for changes in regulations to ensure that specific scientific goals and resource needs are met.

   b. Provide guidance and coordination in research programs.

   c. Periodically monitor captive raptor breeding projects.

   d. Control the distribution of progeny produced in captive raptor breeding programs to ensure that resource needs are met in California.

   e. Work to improve and standardize the annual captive raptor breeding reporting system.

3. Promote free exchange of information through publication and correspondence to ensure that the latest techniques are being used in California captive raptor breeding projects.

4. Assess the subject of commercialization of raptors and determine its relationship to present and future raptor management policy.

5. With the aid of public and private groups, evaluate captive breeding programs periodically and make any changes in regulations needed to improve the program and ensure that the wild raptor resource is protected.

PROGRAM TO AUGMENT WILD RAPTOR POPULATIONS

General Description:

Following the initial successes of raptor researchers to breed various species in captivity, there have been some successful attempts to release birds into the wild or otherwise augment wild raptor populations. In 1976, 42 Peregrine Falcons were placed in the wild in North America. Such efforts have been tried to a limited extent in California. In 1976 two young Prairie Falcons raised in captivity were fledged from an eyrie in the wild by foster parents. Walton (1977) used the techniques of double clutching (induced laying of second clutches), egg clutch augmentation (placing additional eggs in nests), and fostering (placing captive reared birds in nests of wild parents), in a Department study to manipulate and increase Prairie Falcon productivity in California. The study was designed to increase the efficiency of these three raptor management techniques. The techniques are applicable to other raptors and will be particularily valuable for the endangered American Peregrine Falcon. Walton (1978) working under contract with the Department, employed techniques that resulted in the successful fledging of captive reared Peregrine Falcons from eyries in the wild such as the one at Morro Rock.

Peregrine Falcons and other raptors lay replacement clutches if their eggs are removed or destroyed. Thus, it is possible to increase the productivity of wild birds through certain management techniques. The technique of double clutching has great promise for enhancing the wild populations of certain raptors (Fyfe 1976, Walton 1977). However, depending on a variety of conditions, some pairs may be unable to lay replacement clutches or some may lay smaller replacement clutches (Hickey 1942). Walton (1977) stresses the importance of: 1) the stage of egg development at the time of collection, 2) time of breeding season when the clutch is laid, and 3) individual ability of breeding birds to lay more than one clutch of eggs. Cade (1978) discusses the feasibility of double clutching to increase wild Peregrine Falcon productivity. Fyfe (1976) describes the application of this technique to augment Peregrine Falcon populations in Canada. Olendorff and Stoddart (1974) review several raptor management techniques including many for increasing the production of young. They further discuss the possibilities for release of adult birds, fostering and cross fostering techniques, and controlled release of juveniles.

Problems:

Raptors such as the endangered American Peregrine Falcon have not increased in population size to a level that will allow removal from endangered status. Productivity appears to be low in certain endangered and declining populations of raptors. There are techniques available to increase productivity of wild raptors through management but there are dangers involved in employing some of these techniques. Several precautions and techniques are offered by Fyfe and Olendorff (1976) which can reduce the adverse effects certain management techniques may have on raptor populations. These precautions include methods to eliminate scent trails which may invite mammalian predators, timing and weather considerations to prevent mortality of nestlings due to over-exposure to heat and cold, methods to avoid injury due to mishandling of nestlings, and many others.

Objective:

Use various management techniques to increase reproductive capabilities of endangered, threatened, and other raptor populations throughout the State. Work

to restore endangered, declining, and extirpated raptor populations in suitable habitat. Continue to refine management techniques to maximize beneficial results.

Programs:

To accomplish the objectives, the following programs are recommended in order of priority (includes current programs):

1. Continue to refine currently used management techniques of double clutching, fostering and cross fostering and controlled release of captive reared birds into the wild for selected species.

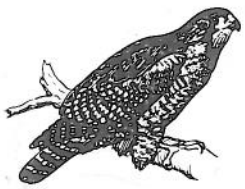
2. Before proceeding, obtain a concensus of interested and concerned professionals as to what should be done regarding a particular eyrie management program.

3. Continue to employ skilled professional biologists to manage selected raptor eyries.

4. Insure that techniques include adequate safeguards to protect the raptor resource. Monitor managed eyries to determine success.

5. Monitor the fate of captive reared progeny released into the wild in augmentation efforts.

6. Periodically evaluate this program and document results. Invite public review and comments on the eyrie augmentation program.



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PUBLIC RELATIONS PROGRAMS
Priority: 2

PUBLIC EDUCATION PROGRAMS

General Description:

Each day decision makers plan and promote activities which directly or indirectly affect raptors in California. These decisions frequently result in habitat destruction. Although many developments have occurred in spite of knowledge of adverse impacts on wildlife, impacts could be lessened if planners and developers understood the ecological relationships involved. The California Environmental Quality Act provides a mechanism to inform developers of the environmental consequences of their activities. Unfortunately, recommendations by resource protection agencies, like the Department of Fish and Game, are not given full consideration. Often, State and Federal regulatory agencies that can exert significant influence through their permitting process are more effective in curtailing or modifying any projects which may have adverse environmental impacts. Public involvement and the amount of pressure citizens generate on officials often can mean the difference between success and failure in efforts to prevent adverse impacts on wildlife and their habitat.

A vital aspect of public involvement in environmental issues concerns the need for greater public education. In this way, an informed public can support efforts of conservation agencies and groups to preserve wildlife populations and the habitats they depend on.

Some of the best remaining raptor habitat exists on private lands. Therefore, it is important that landowners appreciate and understand the needs of raptors. Many people appreciate the need to maintain raptors such as hawks, eagles, and owls in a naturally functioning ecosystem. Unfortunately, however, the public often is exposed to much misinformation concerning raptors and other wildlife through popular literature and media presentations. Golden Eagles have been killed in this State and elsewhere in the U. S. because they occasionally prey on livestock. Research indicates the predation usually is less significant than ranchers believe and that certain changes in range management practices may be responsible for present levels of livestock loss by predators (Kalmbach et al. 1964). There may be a need to develop programs to reduce conflicts between livestock owners and certain raptors.

Certain universities, museums, and conservation organizations provide excellent and comprehensive educational programs concerning many aspects of raptor biology and ecology. For decades the National Audubon Society has provided leadership in this field. The National Audubon Society also has established sanctuaries, raised funds for various conservation and public education projects, and become involved in a number of legislative battles for raptors and other wildlife on a global scale.

The Department distributes thousands of leaflets, booklets and educational material through its Conservation Education Branch. Each year thousands of Californians receive information on wildlife through the many publications and films. A recent Department publication is devoted entirely to the raptors of California (Mallette and Gould 1976).

Problem:

It is important to recognize that various governmental officials, land use planners, landowners, the general public, and other decision makers determine events which may have far reaching adverse effects on great numbers of raptors. Special education programs are needed to inform these decision makers of the basic needs of raptors. The Department's education programs will not be effective without a great deal of support from the public.

Objective:

Provide the public and members of decision-making bodies with basic biological information on the raptor resource in California. Stress the need to view raptors in an ecological context and the need for public involvement in the political decision-making process.

Programs:

To accomplish the objective of the Plan the following programs are recommended in order of priority (includes current programs):

1. Work with State and Federal agencies, private conservation organizations, and the public to ensure that land-use decisions will protect or benefit the raptor resource.

2. All Departmental personnel are encouraged to further promote the protection and preservation of raptors through their daily contacts with the public.

3. Offer Departmental support and cooperation in the development by conservation groups of interpretive programs to convey to the public the basic needs of raptors.

4. Continue to improve the educational and informational services of the Conservation Education Branch of the Department through the use of leaflets, booklets, television, and other forms of communication.

5. Assess depredation problems involving birds of prey and livestock and develop information and action programs which provide relief to property owners while ensuring that raptor populations are not unduely persecuted or jeopardized in any way.

6. Review and update programs periodically with the aid of private and public agencies, interest groups, and individuals.

PROGRAMS FOR RAPTOR OBSERVATION AND PHOTOGRAPHY

General Description:

During recent decades interest in the recreational enjoyment of nongame birds has been increasing (Payne and DeGraaf 1975). In 1974 Americans spent an estimated 500 million dollars in the enjoyment of nongame birds. Expenditures for bird seed, binoculars, and camera equipment constituted 95% of the total. There may be more than 14 million bird watchers throughout the nation.

This rapidly growing interest in nongame birds is reflected in the increasing memberships in the National Audubon Society. The Society's membership has grown from 41,000 in 1963 to at least 400,000 in 1978 (G. Olson pers. comm.). Membership in California's 46 local Audubon chapters has risen from about 8,600 in 1968 to over 50,000 in 1978, almost a six-fold increase in a decade.

Demand for nonconsumptive enjoyment of wildlife is likely to increase, not only in California, but nationwide. Even though these activities are recognized as important forms of recreation for Americans, relatively small amounts of money are spent on the management of nongame birds compared with what is spent for game species. Payne and DeGraaf (1975) predict moderate increases in the economic importance and the recreational activities associated with nongame birds. They further state that a substantial portion of these increases will occur at the expense of other recreational activities, including hunting.

A number of known raptor concentration areas in California have been suggested as good locations to develop raptor observation and interpretive centers. These could be patterned after the Snake River Birds of Prey Natural Area near Boise, Idaho. The Bureau of Land Management is responsible for managing the Natural Area, which contains one of the greatest densities of raptors in the nation. Twelve species of raptors are known to nest within its boundaries. In California, the Carrizo Plain in San Luis Obispo County, the Tule Lake National Wildlife Refuge, and the Golden Gate National Recreation Area are known concentration areas of raptors which may be suitable for establishing observation and interpretive stations.

Problems:

Programs that promote added human exposure to raptors must be designed to ensure that the resource is not detrimentally affected. Therefore, perhaps only a limited number of raptor observation and interpretive centers should be developed initially. The use and human activity should then be monitored before additional facilities are designed and built.

Objective:

Institute a pilot program to determine the public demand for raptor observation and interpretive centers. If demand is sufficient and if there is no threat to the resource, develop additional center(s).

Programs:

To accomplish the objective, the following programs are recommended in order of priority (includes current programs):

1. Determine the public demand for raptor observation and photography centers.

2. Inventory known raptor concentration areas and select one or two appropriate sites to develop observation stations and interpretive centers.

3. Monitor raptor use and human activities at observation station(s) and make modifications if needed to ensure protection of the resource.

4. Expand this program to meet the public demand for additional raptor observation centers where appropriate and where no threat to the resource exists.

5. Encourage and solicit interagency and public review and participation in this program.

RAPTOR REHABILITATION PROGRAM

General Description:

In recent years growing concern for the welfare of animals among numerous groups and individuals has led to the establishment of several wildlife rehabilitation centers statewide. The number of rehabilitation centers is large (100+) and growing despite the fact that, generally, there are no government funds available to finance their operation. Several care centers recently have formed the Wildlife Rehabilitation Council in order to better deal with increased demands placed on their services and to provide specialized emergency treatment for certain species. Rehabilitation facilities range from small backyard aviaries to large established wildlife care centers, such as the Alexander Lindsey Junior Museum, Walnut Creek. The California Conservation Corps and the Avian Sciences Department at the University of California, Davis, also have become active in this field. Dedicated volunteer and permanent staff at rehabilitation centers throughout California have cared for thousands of sick, injured, or orphaned wildlife. The staff of the Alexander Lindsey Junior Museum treated 1,000 raptors of 37 species and successfully rehabilitated and released at least 500 birds. Species most commonly treated at rehabilitation centers include the relatively common Barn Owl (Tyto alba), American Kestrel (Falco sparverius) and Red-tailed Hawk (Buteo jamaicensis). Occasionally endangered species, such as Bald Eagles, or less common species, such as Osprey, are treated.

These rehabilitation centers provide medical treatment (with the cooperation of local veterinarians), care for immature birds, find care facilities for permanently disabled birds, and humanely authanize seriously injured or ill birds.

Several groups specialize or emphasize care and treatment of injured raptors. It is these centers in particular which can be incorporated into raptor research and management programs of the Department. With the aid of these institutions several of the Departments raptor programs can be implemented efficiently.

Besides providing medical treatment, these centers are active in public education and scientific research. By promoting wildlife appreciation and awareness, those involved in rehabilitation work hope to eventually reduce the incidence of human-caused death and injury to animals. It is important that the Department recognize the important work done by many of these groups. Members of the Wildlife Rehabilitation Council have expressed interest in and willingness to participate in a number of Departmental raptor management programs.

Problems:

Increased impact of man and his activities on the environment has led to increased incidence of raptor death and injury through shooting, collisions with automobiles and structures, electrocution, poisoning, and other unnatural mortality factors. The Department has neither the resources nor the personnel required to care for the great volume of sick, injured, and orphaned raptors. Those groups presently caring for these birds often have difficulties obtaining basic facilities and lack communication among individual care centers, resource agencies, and the public.

Objectives:

The Department, with the aid of the Wildlife Rehabilitation Council, should update information on numbers, kinds, and locations of wildlife rehabilitation

centers in the State and make the information more readily available to all Fish and Game personnel, other concerned agencies, and the public. The Department and other interested groups and individuals should seek the assistance of certain rehabilitation centers in the implementation of various raptor research, education, and management programs contained in this Plan. The Department also should offer encouragement and support of present and future raptor rehabilitation programs dedicated to increased public awareness and appreciation for wild raptors.

Programs:

To accomplish the objectives, the following programs are recommended in order of priority (includes current programs):

1. Work with the Wildlife Rehabilitation Council to develop a program for quick and efficient treatment of endangered raptors.

2. Work with the Wildlife Rehabilitation Council to develop a master list of all accredited wildlife care centers. Aid in distribution of the list to Departmental personnel, cooperating agencies, conservation groups, and the public so that better use of centers can be made.

3. Continue to allow qualified individuals and groups to care for sick, injured and orphaned raptors through issuance of necessary Department permits.

4. Work with the Wildlife Rehabilitation Council to develop a mechanism for accreditation of raptor rehabilitation centers.

5. Work with the Wildlife Rehabilitation Council and individual raptor care centers to implement Departmental raptor research, education, and management programs.

6. Include representatives of rehabilitation centers in the membership of a raptor research and management committee to be formed to direct implementation of programs contained in this Plan.

7. Periodically evaluate this program with the help of concerned agencies, groups, and individuals.

RAPTOR USE PROGRAMS
Priority: 3

FALCONRY PROGRAM

General Description:

In 1957 the California State Legislature authorized the Fish and Game Commission to regulate the taking, possession, training, and use of birds of prey for falconry. The Legislature and the Commission thereby recognized falconry as a legitimate use of the raptor resource. The Department is charged with the responsibility of enforcing regulations set forth governing the sport and of ensuring that this use is not harmful to raptor populations.

Since falconry regulations were first adopted, the number of licensed falconers has increased dramatically. In 1957 only 3 falconry permits were issued. That number rose to more than 903 in 1977, and in 1978 the number dropped to about 475 persons. Reasons for the decrease in licensed falconers between 1977 and 1978 include falconers' failure of the new falconry exam, resistance to increased license fees, and failure to submit required annual falconry reports. Since 1971, falconers renewing their licenses have been required to submit an annual report of birds possessed during the license year. According to 1978 falconry report records, California falconers now possess over 600 raptors of 24 native and exotic species. Red-tailed Hawks, Harris' Hawks, Prairie Falcons, and Goshawks are the most popular species, based on numbers possessed.

As in most states, California has amended its falconry regulations through the years to keep pace with: 1) the needs for stricter control and administration of falconry, and 2) the changes in the status of raptors used in the sport. In 1968, major changes in regulations placed Prairie Falcons and Peregrine Falcons on the protected list in California. No further taking of these species for falconry was allowed. Those Prairie Falcons and Peregrines legally held under a falconry license, produced in captive breeding programs, or imported under an importation permit were required to be registered and identified with a permanent leg band furnished by the Department. By January 1976 the Department had banded and registered 119 Prairie Falcons and 58 Peregrine Falcons either as falconry birds or birds held in captive breeding programs. In 1970 an open book falconry exam was required for first-time license applicants, and an import permit was required to bring any raptors into California for the purpose of falconry. The latter provision has allowed for added control of the importation of raptors taken in other states and other countries.

In 1974 the Commission added several new regulations to further control the sport of falconry. These regulations included institution of a closed book examination, limits on the number of birds that can be taken or possessed, and experience requirements for falconers. In 1977 Federal falconry regulations were implemented by the U. S. Fish and Wildlife Service and State regulations were changed to prohibit the take of Gyrfalcons (Falco rusticolus) and Harris' Hawks in California. In 1978, further changes in State regulations permitted a limited harvest of Prairie Falcon nestlings during years with normal reproduction. Departmental Wildlife Protection personnel are responsible for enforcing State falconry regulations and special agents of the U. S. Fish and Wildlife Service enforce all Federal laws and regulations concerning raptors and falconry.

The impact of falconry on wild raptor populations has been the subject of heated debate between pro- and anti-falconry groups. The impacts are believed to be minimal on a statewide or nationwide basis but further study is needed to determine the significance in specific locales. Studies conducted in metropolitan areas indicate that illegal take of raptors may be as much as 3 to 4 times the legal take (Kiff pers. comm., Wiley 1975). Available data seem to indicate that the overall legal take has a relatively minor impact on raptor populations;

however, this impact steadily increases each year as raptors are exposed to greater amounts of habitat destruction, human disturbance, and environmental contamination. For these reasons, it is essential that any activity that potentially would reduce breeding populations or productivity of wild raptors must be carefully scrutinized to ensure that there is not threat to the species involved.

Problems:

1. Uncontrolled illegal take of raptors.

2. Excessive legal and illegal take of raptors near metropolitan areas.

3. Human-induced nestling mortality resulting from disturbance of the nest site associated with falconry harvest activities.

4. Lack of understanding of raptor biology and ecology among falconers.

5. Inhumane treatment of raptors due to inadequate housing facilities, lack of exercise, and exposure to disease and parasites.

Objective:

Administer falconry to ensure that this use does not threaten the existence of any raptor species. Expand efforts to protect raptors from illegal take and disturbance and to ensure that falconry birds are treated humanely.

Programs:

To accomplish the objectives, the following programs are recommended in order of priority (includes current programs):

1. Continue to administer the falconry program and, when necessary, improve regulations for added protection of the raptor resource. Coordinate with the Fish and Wildlife Service in strengthening State and Federal regulations.

2. Determine what impacts disturbance and harvest have on wild raptor reproductive success.

3. Increase enforcement of falconry regulations and encourage the courts to obtain maximum penalties from convicted offenders. Recommend that the Fish and Game Commission revoke falconry priviledges of those convicted of falconry regulation violations.

4. Periodically inspect raptor holding and housing facilities under falconry permits.

5. Obtain adequate information (e.g., specific location of take of birds) from falconers for use in raptor management programs.

6. Ensure that regulations permitting non-resident and non-citizen falconers to pursue the sport of falconry in California provide adequate safeguards to protect the wild raptor resource in the State.

7. Continue to encourage falconer participation in raptor conservation programs and raptor survey and monitoring programs. Cooperate in developing and implementing means to significantly reduce illegal take and disturbance of raptors.

8. Improve programs to increase appreciation and knowledge of raptor natural history and ecology among all falconers.

9. Allow the take of nestling Prairie Falcons only in those years when the wild population is monitored adequately and the productivity is at least normal.

10. Assess the role of raptor hybridization in falconry and captive breeding programs. Support only legitimate scientific research in this field.

11. Evaluate this program periodically to ensure that no raptor population is threatened because of falconry. Invite public review of and comments on the Falconry Program.

CAPTIVE RAPTOR BREEDING: FALCONRY

General Description:

The current program of scientific captive raptor breeding authorizes a portion of progeny produced, that are not used in reintroduction and other raptor management programs, to be available for use in falconry. Some captive raptor breeders have produced birds for falconry purposes. During 1970 to 1978, a total of 42 of the 77 (55%) birds produced were transferred to falconers. A new program to permit captive reared birds to be used for falconry may not be necessary at this time since falconry use is already provided for under the present scientific captive raptor breeding program. Some captive raptor breeders have expressed an interest in reintroduction programs as well as in falconry, thus, the dual-purpose nature of the present program may be important in fostering greater interest in and appreciation for wild raptor resource programs among falconers and falconer/breeders.

State and Federal regulations and policies prohibit the barter and sale of raptors produced in captivity. There is considerable interest in commercialization of raptors and proponents have exerted pressure on State and Federal wildlife agencies to permit the barter and sale of raptors produced in captivity; however, substantial changes in existing regulations and laws would be required. In addition to this, there is a question whether such commercial exploitation of wildlife could be justified in California considering the great public opposition to any such proposal. A new raptor management program of this magnitude would require substantial biological and ecological assessments and economic feasibility studies prior to implementation; and adequate programs of population monitoring afterward to determine if there are adverse impacts on wild raptor populations. Additionally, the entire process would require an extensive public review.

Standards for the issuance of captive raptor breeding permits must be raised rather than lessened. The Department and appropriate advisory committees should continue to have the opportunity to review each proposal and make a recommendation to the Fish and Game Commission for approval or rejection of the proposal. In this way, each applicant's proposed breeding program can be closely scrutinized to ensure that it conforms to current standards, regulations, and raptor policies.

It may be necessary to impose a quota on the number of permits issued to keep the captive raptor breeding program within manageable bounds.

Problems:

1. There is a demand for raptors produced in captivity to be authorized for falconry and other uses.

2. There are significant pressures being exerted on State and Federal agencies to allow barter and sale of captive reared raptors.

3. It is unknown whether a captive raptor breeding program for falconry would have beneficial or detrimental effects on wild raptors.

4. It is unknown whether such programs could be administered and monitored economically and adequately by the Department under present financial constraints and priorities.

Objective:

Determine the biological, economic, and administrative feasibility of a captive raptor breeding program for falconry and other purposes. Identify potential beneficial and detrimental effects and ensure that no threat to wild raptor populations would result from such uses. The Department and the Commission should address the subject of commercial exploitation of raptors and determine if such a program would be compatible with existing and future State policy on raptors.

Programs:

To accomplish the objective of the Plan, the following programs are recommended in order of priority (includes current programs):

1. Continue the present program which permits captive raptor breeding for scientific purposes. Allow a specified portion of the progeny produced under this program to be used for falconry. Ensure that sufficient numbers of progeny are available for programs benefiting wild raptor populations.

2. Study the biological and administrative feasibility of establishing a captive raptor breeding program that permits barter and sale of raptors produced in captivity. Before considering implementing a pilot program of limited duration, conduct the following assessments and studies:

    a. Conduct Departmental studies and monitor raptor commercialization programs in other states to determine any adverse effects on wild raptor populations.

    b. Determine the administrative costs involved in commercialization programs including costs of monitoring breeding facilities, law enforcement, and wild population monitoring programs involving all affected raptor species in California. Implement no commercialization programs unless participants and proponents can provide adequate financial support (through permits, etc.) of administration, resource protection measures, and monitoring programs.

    c. Review existing laws and regulations governing captive raptor breeding and falconry programs to ensure that wild raptor populations recieve adequate protection should commercialization programs be implemented. Make any changes needed to ensure protection of wild raptor populations.

    d. Ensure that there would be provisions allowing speedy termination of any raptor commercialization programs should adverse affects on wild populations be suspected.

3. Evaluate the captive raptor breeding program periodically to ensure that the raptor resource receives adequate protection. Invite comments and suggestions from interested agencies, groups, and individuals.

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