Report to the California Fish and Game Commission

Status Review of the American Peregrine Falcon in California

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California Department of Fish and Game
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The Resources Agency
Department of Fish and Game

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Status Review of the American Peregrine Falcon (*Falco peregrinus anatum*) in California

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Wildlife Branch
Nongame Wildlife Program Report 2008-06

October 9, 2008

Dedication

Brian J. Walton
1951-2007
raptor biologist, conservationist, scientist
California's burgeoning peregrine falcon population is a monument to his dedicated service on behalf of the State's wildlife

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EXECUTIVE SUMMARY

A petition requesting the removal of the American peregrine falcon (*Falco peregrinus anatum*) from the list of endangered species under the California Endangered Species Act (CESA) was received by the Fish and Game Commission (Commission) on May 4, 2007. The Commission accepted the petition for consideration and, pursuant to §2074.6 of the Fish and Game Code (FGC), the Department of Fish and Game (Department) undertook a review of the petition. Based on the review of the best scientific information, the Department recommends that the Commission delist the American peregrine falcon as an endangered species. The Department further recommends that management, conservation actions, and periodic monitoring be performed, following delisting.

In making this recommendation to delist the American peregrine falcon, the Department relied upon the following key findings:

1) Current American peregrine falcon breeding range in California includes most of the known historic breeding range;

2) American peregrine falcon breeding population size has increased dramatically following State and federal listing as endangered and may have reached or even exceeded historical levels within California, as best as can be determined given the uncertainty of the historic population data;

3) The threat posed to the peregrine falcon nesting populations in California by organochlorine pesticide contamination has lessened due to the restrictions imposed on the use of such substances in the United States and Canada since the 1970s. However, "hot spots" remain in the State; these areas need further evaluation and monitoring as to their impact on peregrine recovery;

4) Recovery goals specific to California populations of peregrine falcons as established through the federal recovery plan for the Pacific States have been met for range and population size; productivity goals have been met at most, but not all, sites in California;

5) The U.S. Fish and Wildlife Service (Service) delisted the peregrine falcon from the federal endangered species list in 1999 and established a monitoring program, contingent on funding, to document breeding status of this species through the year 2015. A sub-set of 30 nest sites will be monitored in California every three

years, providing current occupancy and productivity data for the State's peregrine population;

6) The captive breeding and reintroduction program established in the 1970s and continued through 1992 was highly successful in aiding the recovery of the peregrine in California;

7) The American peregrine falcon is designated as a fully protected species, pursuant to FGC §3511 (b)(1). This designation is separate from the CESA statute and will not be affected by a delisting action. Therefore, the legal prohibition on take of this species, as defined in FGC §86, will be unaffected by delisting.

Report to the Fish and Game Commission

Status Review of the American Peregrine Falcon (*Falco peregrinus anatum*) in California

October 9, 2008

Introduction

Petition History

A petition dated May 1, 2007 was submitted by Mr. Gary R. Alten of Alta Loma, California to the California Fish and Game Commission (Commission) seeking to delist the American peregrine falcon (*Falco peregrinus anatum*) from the endangered species list under the California Endangered Species Act ("CESA"; Fish and Game Code §§2050-2116). In California, the *anatum* subspecies of peregrine falcon is listed as endangered under CESA and is also a fully protected species under Fish and Game Code (FGC) §3511.

The Commission reviewed the petition for completeness and pursuant to FGC §2073, referred the petition to the Department of Fish and Game (Department) on May 15, 2007 for evaluation. As per FGC §§2072.3 and 2073.5, the Department requested and received a 30-day time extension to complete the petition evaluation report and submitted the final report to the Commission on September 11, 2007 (Comrack and Logsdon 2007). The Department found that the petitioned action may be warranted and recommended the petition be accepted and considered. At its October 11, 2007 meeting in Concord, the Commission received the Department's petition evaluation report, recommendation, and public testimony, and accepted the petition.

On November 2, 2007, the Commission published a Notice of Findings in the California Regulatory Notice Register (Register) declaring the American peregrine falcon a candidate species for delisting, thereby starting the one year status review process.

Department Review

This report, pursuant to FGC §2074.6, details the Department's review and recommendations to the Commission regarding the proposed delisting of the American peregrine falcon from endangered status under CESA. The discussion and analysis set forth here is based on the best scientific information available. The Department's recommendation as to whether the petitioned action is warranted is also addressed. Further, this status review provides recommendations for the continued conservation of this species.

The Department worked independently and with Commission staff to contact affected and interested parties, invited comment from the public, and requested additional scientific information as required under FGC §2074.4. The Department solicited input

and assistance from raptor experts to facilitate evaluation of the status of the peregrine falcon in California. The Commission published a Notice of Receipt of Petition in the Register on June 1, 2007 and requested information relating to the petition be submitted to the Department. The Commission's Notice of Findings, dated November 2, 2007 and published in the Register, solicited written comment or data from the public on the status of the peregrine falcon. The Department posted its petition evaluation report on its website beginning on January 2, 2008. On April 8, 2008, the Department posted a Public Notice on its website and requested comments on the petition be received by the Department by no later than July 15, 2008. The Department received 53 written communications relating to the petitioned action. Copies of correspondence received from organizations are appended while communications from private citizens are summarized (Appendix 3). Several news articles regarding the petitioned delisting and the status of the peregrine were published during the review period which further served to notify the public (Appendix 4).

State Listing History

The American peregrine falcon was part of the first listing action undertaken by the State of California as a result of the newly enacted California Endangered Species Act. The California Legislature passed the Endangered Species Act of 1970, giving the Commission authority to declare species of California wildlife to be rare or endangered in the State. The Department was asked to develop criteria to determine which species merited immediate listing under the new statute. The process for developing this list was described by Director Pete Bontadelli in 1989, as follows: "The Department conducted a review [in 1971] by first developing a working list of [vertebrate animal] species based on a list of federal species, the State's list of fully protected species, and internal knowledge of the status of certain species" (Bontadelli 1989 in Gustafson 1993). A working list of nominee taxa was then sent to approximately 15 of the State's top biological scientists in addition to Departmental staff; survey participants were asked to rank the working list of taxa against four categories of concern. The categories included: 1) Endangered ("...one whose prospects of survival and reproduction are in immediate jeopardy"); 2) Rare ("...one that, although not presently threatened with extinction, is in such small numbers throughout its range it may be endangered if its environment worsens"); 3) Peripheral ("...one whose occurrence in California is at the edge of its natural range and which is rare or endangered within California although not in its range as a whole"); and 4) Unknown ("...one that has been suggested as possibly rare or endangered, but about which there is not enough information to determine its status").

The Department included the American peregrine falcon on the working list based on its prior status as a federally listed endangered species and its fully protected status under the FGC, as well as concern by knowledgeable sources that the species was at risk of extinction in California. Results of the expert opinion survey showed 79% of all the respondents recommended endangered status for the peregrine. Of those who did not include the peregrine in the endangered category, one respondent agreed that the species was close to extinction but categorized it as peripheral based on its wide range outside of California while another suggested it be accorded rare status (CDFG 1970). Following

assessment of the data and supplemental information received through this process, the Department recommended to the Commission that 43 taxa (nine fish, eight amphibians, five reptiles, ten birds, and 11 mammals) be placed on the California rare and endangered species list (CDFG 1972a). The Department ultimately recommended the peregrine be classified as endangered.

Meeting minutes from the Commission hearing on May 27, 1971 reveal that 88 letters and one telegram with comments on the Department's list of proposed rare and endangered animals were received by the Commission (Gustafson 1993). By unanimous decision, the Commission formally listed all 43 species, including the American peregrine falcon, on June 27, 1971.

In the first report to the Commission on the status of the newly listed rare and endangered species, the Department concluded that the American peregrine falcon was declining due to "food chain contamination by persistent pesticides and other contaminants, illegal taking by falconers, human disturbance, and occasional shooting" (CDFG 1972a).

Life History

Systematics

The American peregrine falcon is currently classified as a member of the Order Falconiformes (vultures, eagles, hawks, kites, osprey and falcons) in the Family Falconidae (falcons and caracaras; AOU 1998). Recent research on bird genetics by the Field Museum of Chicago suggests falcons may in fact be more closely related to parrots than raptors (Field Museum June 27, 2008).

Three subspecies of peregrine falcon occur in California: *Falco peregrinus anatum, F. p. pealei* and *F. p. tundrius*. Of these, *anatum* is the only subspecies that nests in the state while *pealei, tundrius* and *anatum* that nest elsewhere occur as migrants and/or winter visitors (October to April) in California (Earnheart-Gold and Pyle 2001).

Appearance

Adult American peregrine falcons typically show a dark head with a pronounced moustacial streak, a bluish-slate nape and back, and pale-tinged buff breast and belly with varying amounts of black barring. Immature birds are much browner than adults and show heavy brown streaking on breast and belly (Brown and Amadon 1968). Sexual dimorphism is prominent as is the case for most raptorial bird species, with females approximately one-third larger than males in all dimensions.

Demography

The average maximum life span of the peregrine varies between 16 and 20 years with an average life span ranging between 4 and 17 years (White et al. 2002).

Habitat

This is a species adapted to open habitats in all seasons. Peregrines show a preference for breeding sites in proximity to water with nearby vertical structure such as niches in cliffs, steep banks, and ledges to serve as nesting sites (Palmer 1988). An abundant food source (e.g., seabird colonies, waterfowl concentration, feral pigeons in urban areas) nearby is highly attractive to peregrines. Coastal cliffs and bluffs are favored for nesting in California as are the granitic outcroppings of the Sierra Nevada. Peregrines are also found in urban areas and use tall buildings and bridges and other structures for resting, foraging platforms, and breeding sites and were documented using these urban environments early in the 20th century. A pair of peregrines famously established an eyrie on the Sun Life building in Montreal, Canada, first discovered in 1936; the site was continually occupied for decades (Hall 1970). California currently supports many pairs of urban-nesting peregrine falcons.

Food Habits

Peregrines feed primarily on birds which make up to 99% of their diet; however, they also hunt mammals (primarily bats and some rodents), and on rare occasions, amphibians, fish, and insects. Size of prey varies from hummingbird snacks that can be eaten on the wing to gulls or waterfowl that are knocked to the ground and consumed (Walton 1997, White et al. 2002). In California, approximately 190 species have been documented as prey of the peregrine (B. Walton pers. comm. in White et al. 2002).

Peregrines tend to forage in open habitats. They hunt aerially or from a perched position, often above the air space in which prey species fly. Their flight adaptations allow special aerial techniques such as stooping down on prey with radar-recorded speeds of up to 402 km (250 mi) per hour (B. Latta, pers. comm.).

Breeding

With rare exceptions, peregrines are monogamous, mate for life, and occupy the same breeding territories throughout their careers. In California, breeding pairs of peregrines tend to stay in the general vicinity of their breeding territories year round (Jurkek 1989). Capable of breeding at two years of age, most peregrines, however, breed at age three to four years (Walton 1997, White et al. 2002). Time of year for breeding varies, with resident pairs in California seen copulating every month of the year (White et al. 2002 citing personal communication). In southern California, egg-laying begins in mid- to late February; in northern California, egg-laying begins in May with replacement clutches possible into September (B. Walton in White et al. 2002).

Peregrines do not build nests but make scrapes in substrate such as sand, gravel, dirt, or decomposed matter. They nest on cliff ledges that vary in height with a preference for ledges between 50 and 200 meters (164-656 ft) high (White et al. 2002). Nesting in tall trees in either abandoned nests of other birds or hollow trunks has been well-documented elsewhere (Campbell et al. 1978); in recent years, peregrines have been

documented nesting in tree cavities in coastal redwoods in California (CDFG 2005). Peregrines use a variety of human-made structures such as building ledges, bridges, and crane platforms as nesting substrate and also, rarely, nest on the ground (Bell et al. 1996 in White et al. 2002).

Details on the breeding biology of the peregrine falcon cited below are summarized from White et al. 2002. Peregrines lay three to four eggs with incubation starting after the penultimate egg, at least in temperate latitudes. They will lay another clutch if eggs are lost or removed. Both sexes incubate for 33-35 days with the female performing this duty more often than the male. The semialtricial hatchling is capable of thermoregulation at about 10 days old. In colder climates, the parents continue to brood until this time but it is not clear that this is required in temperate climates such as California. Both members of the pair feed the young but the male typically provides food to the female who feeds the chicks during the first two weeks of life. After 18-21 days, the chicks may be left alone and both parents may forage. Fledging occurs in 35 to 42 days with the larger females fledging later than the smaller males. Fledglings remain near the nest site to develop aerial and hunting skills for up to six weeks after fledging before they disperse.

An important feature of peregrine falcon populations is the existence of "floaters". According to Walton (1997), floaters are "...sexually mature falcons seeking nesting territories, or "serviceable breeding locations", where the disappearance of one member of a pair has occurred. Virtually all nests are visited during the breeding season by floaters testing the territory for availability of a breeding opportunity. The number of floaters may equal or even exceed the number of breeders but their population size cannot accurately be determined." The California peregrine population includes floaters of unknown numbers.

Breeding Density

Peregrines are generally wide-ranging but sparsely distributed. In the breeding season, territories are typically quite large but spacing of pairs can vary, depending on the availability of food. According to White et al. (2002), breeding densities for peregrines in California vary by region, as follows: Sierra Nevada region, 49 historical eyries in 146,335 km² (90,928 mi²) or about 1 site/3,000 km² (1864 mi²); northern coast region, 49 eyries in 32,022 km² (19,897 mi²) or 1 site/654 km² (406 mi²); San Francisco Bay region, 22 eyries in 10,360 km² (6437 mi² or 1 site/471 km² (293 mi²), central coast region, 93 eyries in 34,965 km² (21726 mi ²) or 1 site/376 km² (234 mi²); south coast region, 31 eyries in 30,433 km² (18910 mi ²) or 1 site/982 km² (610 mi²; Thelander 1977); in 2001, Long Beach, CA, had an urban/industrial population of 7 pairs in about 25 km² (15 mi ²) area or 1 pair/3.6 km² (2.2 mi²) with a mean nearest neighbor distance of 1.85 km (1.14 mi²) with a range of 1.2–2.94 km² (0.7-1.8 mi ²).

Territory Occupancy

Peregrine territory occupancy can be variable. Although some sites have long histories of occupancy, others are infrequently used. Some pairs or individuals select alternate nest sites within a larger territory and shift between sites over the years. Territory occupancy averaged 83% in the western United States with a range of 74% to 95% for each state (USFWS 2003). Enderson and Craig (1974) reviewed historical data for peregrine territorial occupancy and found that "at least 10%, perhaps 20%, of known eyries would not be used in any one year" in pre-contaminant populations. The territory occupancy rate for California from 1975 to 1997 averaged 76% (147 sites checked, 111 sites occupied; SCPBRG data in USFWS 2003).

Range and Distribution

Historic Range in California

According to Grinnell and Miller (1944), the American peregrine falcon occurred the "entire length of the state, chiefly along seacoast and around the islands, but also, especially in winter, inland, normally west of southern desert divides." Peregrines nested in California at elevations ranging from sea level to about 1829 m (6,000 ft) elevation on the west slope of the Sierra and to 2591 m (8,500 ft) on the east side of the crest (Gaines 1992).

Historical nesting sites along the north coast included Castle Rock, Del Norte County, Trinidad Head, Humboldt County, Dry Creek, Sonoma County, Point Reyes and Tomales Point, Marin County. In the San Francisco Bay area, several egg sets were collected at unnamed site(s) in Alameda County. The species was also documented nesting in the bay marshes of San Mateo and Santa Clara counties. Many nesting sites were known from coastal central and southern California including Pt. Lobos and Big Sur, Monterey County, Morro Rock, San Luis Obispo County, Gaviota Pass and Mission Canyon, Santa Barbara County, Corona del Mar, Orange County, El Capitan and San Diego, San Diego County. The peregrine falcon was confirmed nesting on Santa Catalina Island, Anacapa Island, Santa Barbara Island, Santa Rosa Island, San Miguel Island, and Santa Cruz Island and suspected of nesting on San Clemente and San Nicolas islands. Some interior nesting locales included Lava Beds National Monument, Siskiyou County, Mono Lake, Mono County, Santa Lucia Mountains, Monterey County, Mt. Diablo, Contra Costa County, the inner coast ranges of San Luis Obispo, San Benito and Kern counties, and Escondido, San Diego County. Peregrines nested near Parker Dam at least until 1954 and probably at Imperial National Wildlife Refuge and Topock Gorge during the same time period. It is unclear whether the eyrie locations for the lower Colorado River records were in California or Arizona (MVZ egg set data, Grinnell and Wythe 1927, Grinnell and Miller 1944, Kiff in Power 1980, Rosenberg et al. 1991, Roberson 1993, Shuford 1993, Lehman 1994, Hamilton and Willick 1996, Hunter et al. 2005).

By the 1970s, the range of the peregrine in California was much more restricted. Only a few active nests were known from Humboldt County east to Shasta County, and south to Sonoma County. A few pairs continued to breed along the central California coast from Monterey County south to Santa Barbara County (Herman et al. 1970, Herman 1971, Thelander 1976).

Current Breeding Range in California

The peregrine has reoccupied much of its historic breeding range in California. Recent data collected by Santa Cruz Predatory Bird Research Group (SCPBRG) and other workers from 1999 to present were used to depict current peregrine range in California (Figure 1). A summary of the species' current occurrence in each region of the state is as follows:

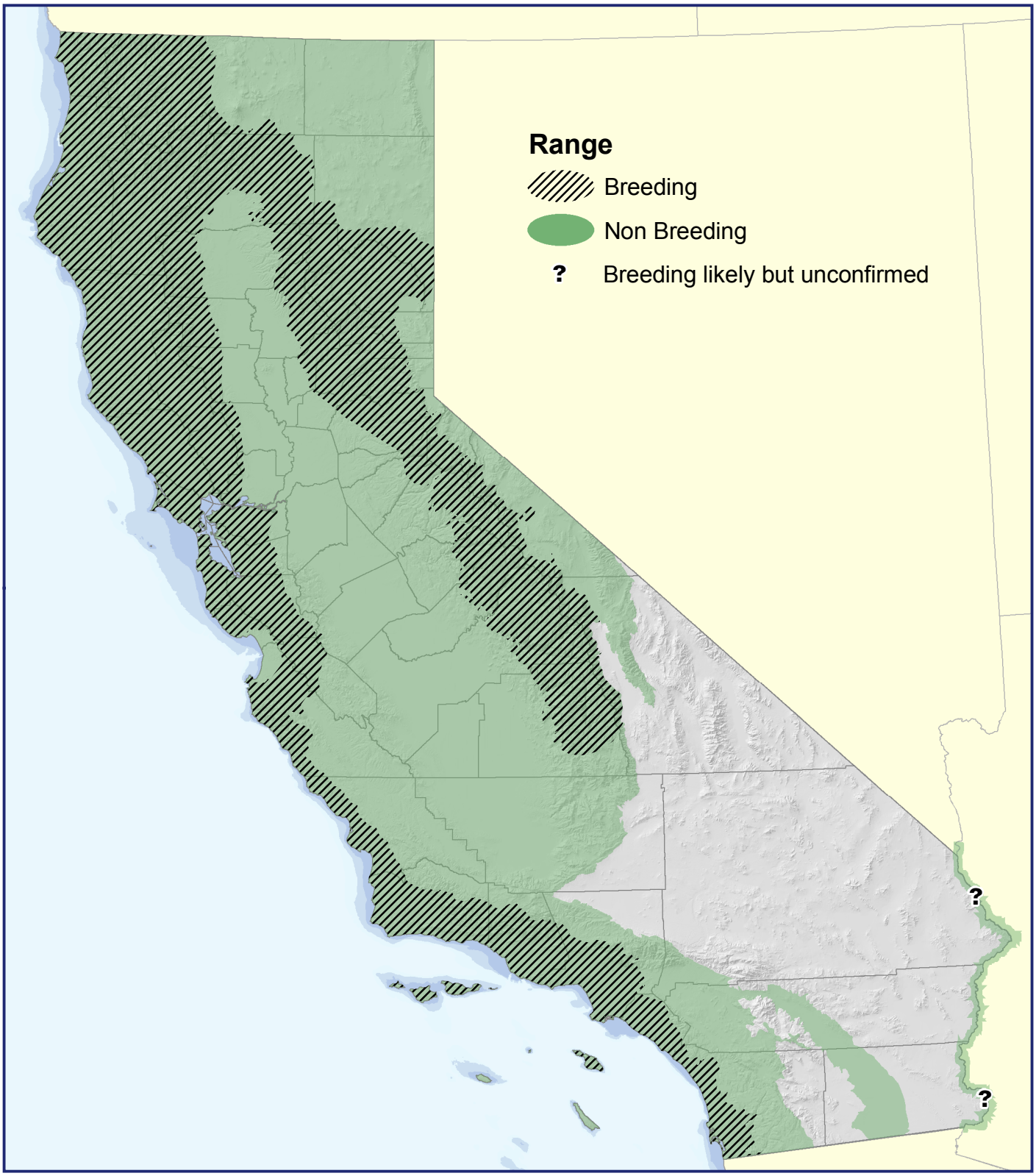
Along the north coast, peregrines are known to nest from the Oregon border south to Marin County; additionally, the northern Coast Ranges support nesting territories in Lake, Glenn and Napa Counties. There is confirmed nesting in the Klamath region including multiple sites in Siskiyou, Trinity and Shasta counties.

The northeastern region including the east side of the Sierra was historically sparsely populated by peregrines. Currently only a few nesting locations (Lassen and Mono counties) are known but the region has not been surveyed in recent years. Shuford and Metopulos (1996) reported that young peregrines were released at a hack site near Crowley Lake from 1988-1992. Some of these birds survived to maturity and may now be nesting in the area somewhere between Mono Lake and Crowley Lake although confirmation is lacking. Scattered nesting sites are known throughout the western Sierra Nevada from Plumas County south to Tulare County.

The San Francisco Bay-Delta region supports multiple nesting territories including sites in San Francisco, Contra Costa, Alameda, Santa Clara, and Solano counties.

The central and southern California coastal region continues to support nesting peregrines. Currently, the species nests from San Mateo County to the Mexican border, including most, but not all, of the Channel Islands (Roberson 1993, Unitt 2004, SCPBRG 2007). In 2007, a successful nesting attempt by peregrine falcons on Santa Barbara Island marked the first breeding there since the 1950s (http://www.darrp.noaa.gov/southwest/montrose/pdf/msrp_pr_2007_04_26.pdf). Multiple nesting territories were found on San Miguel, Santa Rosa, Santa Cruz, and Anacapa islands during the 2007 survey for nesting peregrines. Although peregrines engaged in courtship behavior on Santa Catalina Island in 2004, actual nesting was not confirmed. In 2007, the species was found on Catalina only in winter (SCPBRG files, A. Little, pers. comm.). Peregrine falcons remain extirpated from San Clemente and San Nicolas islands (Sullivan et al 2005, A. Little, pers. comm.).

Figure 1. Current American Peregrine Falcon *(Falco peregrinus anatum)* range in California



California Department of Fish & Game
Source: Santa Cruz Predatory Bird Research Group files 2008
Author: Lyann Comrack
KFien:WB 9-5-08. Projection Teale Albers NAD83.

0 50 100 150 Miles

1:5,200,000

Rosenberg (1991) documented the species as a winter resident and transient to the lower Colorado River. Nesting, however, is suspected based on observations of multiple pairs of peregrines at several locations in the vicinity of Needles and elsewhere during the breeding season in recent years (R. McKernan, pers. comm., T. Corman, pers. comm.). Although peregrines are encountered year-round at the Salton Sea, individuals found during the summer are likely visitors from the Gulf of California breeding population (Porter et al. 1988, Patten et al. 2003).

The federal recovery plan for the Pacific population of the peregrine falcon (USFWS 1982) did not specify range recovery goals. Rather, it states "distribution within the Pacific States must be as widespread as possible within the historical range." Peregrine falcon management units were delineated with ten of these established wholly or partially in California. With the exception of the Modoc Plateau management unit, which in recent years has not been surveyed for peregrine activity at least in California, all management units in California are currently occupied by nesting peregrine falcons.

Current Non-breeding Range in California

In migration and winter, peregrines range "along the entire coast from the Oregon border to the Mexican border and into adjacent mountains, valleys and lowlands, as well as along the entire Central Valley" (Small 1994). They are rare in the arid southeastern part of the State but are regular non-breeding visitors to the Salton Sea (Patten et al. 2003).

Abundance

Historic Breeding Population in California

Grinnell and Miller (1944) considered the American peregrine falcon to be a "permanent resident, fairly common for a hawk...numbers, save locally, seem to hold fairly constant." Willett (1912) described it as a "common" resident on the Santa Barbara [Channel] Islands although "less plentiful" in the interior. Kiff (in Powers 1980) confirmed (or inferred from the available data) a minimum total of 15 active nest sites on the Channel Islands with an additional 5 active nest sites on Los Coronados Islands, Baja California, just south of the U.S./Mexico border.

The actual size of the historic breeding population in California is unknown. Best estimates range from between 100 to 300 active eyries prior to the 1940s (Herman et al. 1970, Harlow et al. 1979, Shuford 1993). Breeding densities were higher along the coast and lower in the interior including the Cascade Range, Sierra Nevada and Great Basin (Bond 1946). By the 1970s, the statewide population of the peregrine falcon had declined by about 90% from pre-1947 levels (Kiff 1988, Jurek 1989). Only 5 successful breeding pairs were documented by Herman (1971) while Thelander (1976) found only 9 active nest sites. Thelander (1977) estimated the statewide population at between 22-40 active pairs.

The population decline was apparent in all regions of the state. Along the north coast, Shuford (1993) found no peregrines were documented nesting along the coastline north of San Francisco between 1971 and the mid-1980s, an area formerly supporting over 30 nest sites. The central coast held approximately 65 historical nest sites, 24 of which were known from Monterey County although not all were active in any given year (B. Walton pers. comm. in Roberson 1993, Shuford 1993). None of the historic sites was active by the mid-1960s (Davis and Baldridge 1980 in Roberson 1993). More than 40 pairs of peregrines bred along the southern California coast and Channel Islands; however, by 1960, the species was essentially gone from all of southern California (Walton et al. 1988, Shuford 1993).

Current Breeding Population in California

Approximately 274 peregrine falcon nesting sites were documented as "active" (that is, used at least once since 1975) in the state through 2007 (Table 1; SCPBRG unpublished data). The results of the 2006 peregrine nest monitoring effort (the latest comprehensive survey) revealed that 236 known or suspected sites were sampled; 215 of these sites yielded enough data to determine occupancy. One hundred fifty four sites had an active pair present, an additional 13 sites had only one adult present, while 48 sites were unoccupied (SCPBRG 2007). Based on these data, the current breeding population is estimated at between 215 to 246 pairs in California (SCPBRG unpublished data).

The peregrine population has increased substantially in the northern coast, northern interior and the central coastal regions of the state; the Sierra Nevada and the Channel Islands populations have also grown since the 1970s (Table 1; SCPBRG unpublished data). Coastal southern California populations have also increased in recent years but at a slower pace. San Diego County's approximately 12 breeding pairs of peregrines were extirpated with no nesting reported between 1950 and 1989. By 2004, however, five pairs had established eyries in the county (Unitt 2004).

The federal recovery plan for the Pacific population of the peregrine falcon (USFWS 1982) included population recovery goals for California. The minimum number of known, self-sustaining wild pairs required for consideration of delisting was 120 pairs in the State, 185 pairs for the entire region which also included Oregon and Washington. With an estimated breeding population of 215 to 246 pairs, this recovery criterion is met in California.

Population Trend

The breeding population of peregrine falcons has been steadily increasing in California following listing as an endangered species by the State and federal governments in the early 1970s and the concomitant management and protective strategies that resulted (restriction of DDT and management effort; Table 2). Passive and active management of the peregrine by State and federal government, private research and conservation organizations, notably the Santa Cruz Predatory Bird Research Group, effectively bolstered the California peregrine population through a highly successful

Table 1. Peregrine Falcon Nesting Territories in California, active at least once since 1975 (Source: Santa Cruz Predatory Bird Research Group)

County Name	Cumulative Number of Known Nest Sites (1975-2007)	County Name	Cumulative Number of Known Nest Sites (1975-2007)
Alameda	4	Plumas	3
Butte	6	Sacramento	1
Calaveras	1	San Benito	1
Contra Costa	4	San Diego	6
Del Norte	5	San Francisco	3
El Dorado	2	San Luis Obispo	13
Fresno	4	San Mateo	5
Glenn	1	Santa Barbara	32
Humboldt	22	Santa Clara	3
Lake	3	Santa Cruz	5
Lassen	2	Shasta	6
Los Angeles	19	Siskiyou	17
Madera	3	Solano	2
Marin	7	Sonoma	10
Mariposa	4	Tehama	7
Mendocino	29	Trinity	15
Mono	1	Tulare	5
Monterey	8	Tuolumne	3
Napa	7	Ventura	3
Orange	1	Yuba	1
Total # of counties with nesting peregrines, 1975-2007: 40 Total # of nest sites, 1975-2007 : 274			

captive breeding and nest augmentation program. The documented population increase can be attributed to improved nest success following DDT restrictions and protection of nest sites. Additionally, there is ample evidence that the captive breeding and nest augmentation program effort was indispensable to peregrine recovery in California (Jurek 1989, Kauffman et al. 2003).

After 1992, the captive breeding and nest augmentation program for peregrine falcons was suspended and the species was not regularly monitored on a statewide basis thereafter. Therefore, data collected after 1992 represent only partial surveys and are not directly comparable with the earlier data set.

During the nest augmentation period (1977-1992), annual statewide surveys were conducted and yielded data documenting an annual population increase of 16.83% (range 2.56% to 58.33%). After augmentation was suspended (1993-2008), the annual increase was measured at 4.08 to 5.01% (G. Langham and D. Taylor pers. comm.-see Appendix 3C, SCPBRG unpublished data).

Table 2. Peregrine Falcon Breeding Population Size and Productivity in California, 1975 through 1992 (Jurek 1989; SCPBRG unpublished data)

YEAR	# Known Sites[1]	# Active Sites Observed[2]	# of Young Fledged, Total[3]	% of Young Released [4]	# of Young Wild-Fledged[5]
1975	10	7	12	0 %	12
1976	15	11	17	0 %	17
1977	17	12	20	5 %	19
1978	24	19	31	10 %	28
1979	37	28	37	14 %	32
1980	48	39	68	12 %	60
1981	50	38	61	30 %	43
1982	61	49	63	35 %	41
1983	67	52	67	49 %	34
1984	73	63	91	49 %	46
1985	88	70	105	27 %	77
1986	92	77	98	28 %	71
1987	100	79	108	22 %	84
1988	109	82	117	21 %	92
1989	103	90	117	15 %	99
1990	144	106	112	13 %	99
1991	152	111	122	1 %	113
1992	162	113	111	1 %	103

[1] All sites where peregrines have occupied territories in any year since 1975.
[2] "Active" sites are those with a copulating pair of peregrines (seen or inferred). This summary excludes the number of sites annually observed to have one or more non-copulating birds ("occupied" sites).
[3] Total number of young that fledged from manipulated and non-manipulated sites. Manipulated sites are those that received captive-hatched nestlings.
[4] Of all young fledged from nests of wild peregrines, this is the proportion that had been captive-hatched and placed ("fostered") into active nests.
[5] Total number of young fledged from unmanipulated sites.

The Service funded two monitoring efforts to date for peregrine falcons, one in 2003 and one in 2006, following federal delisting. In 2003, monitors sampled 30 territories in California. Of these territories, 93% were occupied, 75% were considered successful, and overall productivity was measured at 1.5 young per pair with a minimum of 57 young produced (CDFG 2005, SCPBRG unpublished data). Results of the 2006 nest monitoring effort in California revealed 236 nest sites sampled with approximately 71% activity and an average of 2 young per successful pair, with a minimum total of 146 young produced (SCPBRG 2007).

The federal recovery plan for the Pacific population of the peregrine falcon (USFWS 1982) included productivity recovery goals for the Pacific States. According to the Plan, the minimum productivity should average 1.5 fledged young per active territory per year over a five year period. This value was adopted based on the best estimate of other peregrine population reproductive rates. Between 1993 and 2006, productivity in California ranged from 1.4 to 2.72 young per pair (Mesta 1999, SCPBRG unpublished data). On average therefore, this recovery goal has been met in California.

Non-breeding Population in California

In winter and migration, peregrines are more numerous along the coast and in regions where prey (particularly shorebirds, waterfowl and feral pigeons) are concentrated. Several long-term bird monitoring programs conducted during the non-breeding season corroborate an increasing peregrine population in California. Golden Gate Raptor Observatory has conducted annual counts of raptors at the Marin Headlands, Marin County since 1984. Their data show increasing numbers of peregrines detected during fall migration from the late 1980s to the present (A. Fish, pers. comm., see Appendix 3C). The Christmas Bird Count, an annual bird monitoring effort currently coordinated and sponsored by the National Audubon Society and run by volunteers since 1900, also indicates an increasing wintering population of peregrine falcons in California following the ban on organochlorine pesticides (see http://Audubon2.org/cbchist/graph.html). Note, however, in California, the resident peregrine population is bolstered during migration and winter by peregrines that breed outside the State including individuals of the non-listed subspecies *tundrius* and *pealei.*

Factors Affecting the Ability of the Population to Survive and Reproduce

The pesticide DDT (Dichloro-diphenyl-trichloroethane) and the use of other organochlorine pesticides were the most significant factors contributing to the precipitous decline of peregrine falcon populations. Population declines due to reproductive failure were correlated with egg-shell thinning caused by DDT throughout North America, including California (Peakall and Kiff 1988, USFWS 2003). Contaminants in general are recognized by the Service as posing the most likely long-term future threat to peregrines because there still remains a significant amount of exposure and vulnerability to inorganic compounds and the effects on peregrines have not yet been adequately studied (Mesta 1999, USFWS 2003). At the time of listing under CESA, human disturbance, illegal falconry take and shooting were considered significant risk factors to the population (CDFG 1972a). These risks have subsided and are no longer affecting the peregrine falcon at the population level in California.

Threats

Organochlorine Pesticides

DDT is a synthetic insecticide that was used from the early years of World War II until its use was tightly restricted in 1972. Its peak usage in the United States occurred during the late 1950s with some of the heaviest concentrations found in the California marine ecosystem between Los Angeles and the Channel Islands (Mesta 1999). When DDT is metabolized, it breaks down into a compound known as DDE (dichlorodiphenylethane) which accumulates in animal tissue and affects predators higher in the food chain. Coinciding with consumption of prey species with high bioaccumulations of DDE, peregrines suffered a sharp decline in reproduction and a near population crash worldwide. Many studies correlated decreases in peregrine eggshell thickness with increased DDE concentrations in the eggshell membrane (Cade et al.

1971, Enderson and Wrege 1973, Peakall and Kiff 1988). Thinning eggshells caused adults to crush their eggs during incubation which resulted in frequent nesting failures. Following restriction on use of DDT in 1972, population recovery in the U.S. was positively correlated with reductions of DDE detected in peregrine falcon tissues and eggs and these reductions were positively correlated with increasing eggshell thickness and nesting success (Henny et al. 1996, Mesta 1999, White et al. 2002).

Scientific sources indicate DDE contamination still presents a threat to successful nesting attempts and peregrine falcon population persistence in the Channel Islands. Approximately 91 metric tonnes (100 tons) of DDT were discharged by Montrose Corporation into about 40 km ^{2} (9885 ac^2) of the California Bight just off the coast of Los Angeles (EPA 2002, EPA 2007, NOAA 2007). For peregrines nesting in the nearby Channel Islands, this resulted in higher levels of residual DDE contamination and eggshell thinning relative to other areas of the State. Data collected in 1992 in the Southern California Bight demonstrated severe eggshell thinning (Kiff 1994 in NOAA 2005). Recent analysis of fish tissues indicated higher concentrations of DDT present in the Palos Verdes shelf and San Pedro Bay, sites where the initial discharge occurred, than in other parts of the State (EPA 2007).

Under the Montrose Settlement Restoration Program (MSRP), surveys by the SPBRG indicated failed nesting attempts by breeding pairs of peregrines on Santa Catalina Island in 2004. Such failed attempts were suspected to be a result of crushed eggshells prior to incubation due to excessive thinning (SCPRG 2004). The MSRP continued to monitor peregrine falcons on the Channel Islands to determine reproductive success. "An essential part of this [monitoring] program will be contaminant analysis of addled eggs and the measuring of eggshell fragments, particularly in light of the lack of current data on levels of eggshell thinning and the potential ongoing effect of DDT contamination" (NOAA 2005, (http://www.darrp.noaa.gov/southwest/montrose/peregrinefalcons.html).

California's breeding peregrine population is largely resident and so is not directly exposed to contaminants in Latin America, where DDT is still used. However, consumption of contaminated prey species is possible and may be the subject of future investigation if warranted. DDE contamination in migrant peregrines and prey species from Latin American countries was also recognized by the Service as a potential threat although it was not considered significant (Mesta 1999, White et al. 2002).

Other organochlorine pesticides collectively called HEOD (an acronym for a lengthy and difficult scientific name) were considered another threat that contributed to the severe peregrine population decline of the late 1950s with residues recently reported in peregrine eggs in Great Britain (Newton et al. 2000). HEOD, which includes Aldrin and Dieldrin, was introduced in the United States shortly after DDT use was restricted in the 1970s. HEOD causes lethal poisoning of adult birds but does not have the same effect as DDT on reproductive processes. The Department is not aware of any recent studies in California that analyze the residues of HEOD in peregrine falcon populations independent of DDE. HEOD itself is not considered by the Department to be a severe

threat to continued peregrine falcon recovery but it should be considered in conjunction with other sources of contamination, particularly in southern California.

PBDEs

Recent studies have indicated that peregrine falcon eggs in urban environments contain high levels of polybrominated diphenyl ethers (PBDEs) which are used in consumer product flame retardants. PBDEs escape into the environment from decaying consumer products such as television sets, mattresses, synthetic fabrics, and electronic paraphernalia. Deleterious effects on brain and nervous system development have been associated with high levels of PBDEs (K. Hooper in lit.). Two commercial PBDE mixtures have already been banned because of their effects on the environment, human health, and wildlife. Legislation has been introduced to ban the most widely used mixture, *Deca*, due to similar effects (See Appendix 4).

Other Toxic Exposure

Heavy metal exposure including mercury, lead, selenium, and cadmium is a threat to the peregrine. Selenium levels at three to five micrograms per gram (μg/g) of sample weight could result in embryo deformities and reproductive damage (Presser and Luoma 2007) and chronic exposure of dietary concentrations at contaminated sites may lead to reproduction failures in falcons (Santolo et al. 1999). High concentrations of selenium contamination in the San Joaquin Valley from agriculture runoff raised concern of bioaccumulation in birds, with a higher risk for predatory species (Presser and Luoma 2007). Presser and Luoma (2007) reported a moderate to high hazard score for selenium contamination in bird eggs from studies between 1990 and 1996. They also found average selenium concentration levels in shorebird liver tissue in California ranging from 4 to 12 μg/g dry weight. U.S. Geological Survey (USGS) is currently studying mercury and selenium contamination in pisciverous water birds in wetlands throughout the State's most affected regions (M. Ricca pers. comm., J. Ackerman pers. comm.). Notably, high levels of selenium and mercury contamination in Texas were thought to contribute to low peregrine falcon reproduction rates in the Big Bend region (Mora et al. 2002).

Exposure to polychlorinated biphenyls (PCBs) potentially causes embryo mortality in peregrines as well as other reproductive problems (Merino et al. 2005). Though recently banned from use in microelectronics, decreasing residual levels of PCBs are still found in the San Francisco Bay (Davis et al. 2007). USGS reported high mean PCB concentration levels for peregrine eggs collected in California during the 1980s (Jarman et al. 1993). These high levels of PCB contamination may be diminishing as PCBs are being replaced by PBDEs yet concentrations in the bay still remain high enough to adversely affect wildlife (Davis et al. 2007) and may still pose a threat for peregrines.

Predation

Mortality of peregrines associated with predation occurs primarily within the first year of life. Predators of young peregrines include other raptors, predominantly great-horned owls (*Bubo virginianus*) and sometimes golden eagles (*Aquila chrysaetos*; Mesta 1999, White et al. 2002). Mammalian carnivores may also prey on nestling peregrines, especially when nest sites lack protective characteristics such as ledge cover or are too near to the ground (White et al. 2002). Predation of adult peregrines by larger raptors such as eagles and owls was not considered to have an effect at a population level (Mesta 1999).

Human Disturbance

Disturbance of peregrines at their nest sites can have deleterious effect on breeding pairs, depending on the timing of the disturbance event. According to Walton (1997), disturbance during copulation and courtship can result in infertile eggs, relocation to another nest ledge, and possibly abandonment of a nesting attempt. Disturbance during egg-laying and incubation can result in egg breakage, premature laying of eggs lacking a proper shell, or eggs being laid on more than one ledge. Near time of fledging, disturbance can cause young to prematurely leave the nest prior to development of adequate flight feathers and ability to glide or fly, resulting in mortality. Direct harm or take of peregrines at their nesting areas can occur from falconers, egg collectors, and even occasionally from shooting by pigeon fanciers. Additionally, human disturbance at nesting sites by recreationists (e.g., rock climbers) and researchers may also have an impact (Stewart 2008). Indirect human disturbance of eyries from large-scale projects and operations may also contribute to a decline in peregrine productivity.

The degree of human disturbance on the nesting peregrine varies, depending on location. In Yosemite National Park, for example, human activity such as rock climbing may cluster around the same cliffs favored by peregrines for nesting. Public education and restriction of climbing routes, including closures during the breeding season, reduce disturbances to the extent that they do not cause permanent nest abandonment or other detrimental effects on peregrine populations. However, pairs in remote locations where there are fewer restrictions tend to be more reactive to human disturbance (White et al. 2002).

Direct mortality from shooting was still considered a problem in the last decade; however, there was no evidence of these direct mortalities causing an increase in nesting failures (B. Walton pers. comm. in White et al. 2002). During the 1990s, SCPBRG relocated young peregrines from sites near pigeon fanciers' lofts to reduce negative interactions (Stewart 2008).

Take of peregrine falcons from the wild for falconry purposes is not allowed in California and is not considered a threat at this time. Research activities and egg collection are restricted and conditioned by State and federal collecting permits to minimize the amount of risk and disturbance these activities may cause.

SCPBRG rescued peregrine chicks and released them at hack sites to mitigate project-related human disturbance at several peregrine falcon eyries. Disturbance from military operations at Vandenberg Air Force Base in Santa Barbara County and retrofitting projects on San Francisco Bay Area bridges resulted in funded mitigation plans to compensate for the loss of peregrine nesting success. The annual numbers of salvaged peregrine young due to such mitigation activities has been steadily decreasing since the 1990s (Stewart 2008).

Collisions

Collisions with structures, objects, water, or the ground especially threaten fledglings practicing their novice flight skills in urban or developed environments (Bell 1994, White et al. 2002). SCPBRG determined that certain nesting sites in urban areas, such as buildings and bridges, can be lethally dangerous for fledglings (G. Stewart pers. comm.). Nests on bridges, in particular, do not offer landing platforms for fledglings with developing flight skills; they may crash into the water below or onto a roadway and could be mobbed by gulls (Stewart 2008). The combination of high winds, height of the ledge above the water, lack of perches, and distance to land make nesting sites such as the ones used by peregrines on the Bay Bridge in the San Francisco bay area particularly dangerous for fledglings. Since 1989, observations of such lethal collisions have prompted SCPBRG biologists to continue removing hatchlings from these locations to hack them at less dangerous nest sites (G. Stewart pers. comm., Stewart 2008).

In addition to bridges, many peregrine pairs from recovered populations in California are using tall buildings, silos, or industrial complexes as nesting sites, particularly in the greater Los Angeles area. Some of these nesting locations are too narrow to accommodate developing chicks and result in premature fledging. The risk of collision with buildings or structures by the young falcon is great. Approximately fourteen urban nesting sites have been listed by SCPBRG as having a poor history of fledging success and most of these sites occur in either the greater Los Angeles or San Francisco Bay areas (Stewart 2008).

Reducing bird electrocutions and avian collisions with lethal results has been a high priority for the utility industry. Several funded projects continue to provide data for better retrofitting of power poles, monitoring and estimating electrocution mortalities, and monitoring wind farm mortalities. Feasibility studies are underway for the design of sensor systems and scientists are making suggestions regarding alternative designs for wind resource areas that could mitigate avian mortality.
(See http://www2.ucsc.edu/scpbrg/funded_projects.htm.)

Habitat Degradation

Habitat degradation affects peregrine populations, mostly with respect to loss of suitable nesting structures as a result of increasing development along the coast and along rivers and estuaries. Degradation of wetlands that would have otherwise provided an abundance of shorebirds and waterfowl was recognized as significantly detrimental to

peregrine survival (Mesta 1999, White et al. 2002). Construction of roads and quarries also potentially disrupts peregrine breeding and foraging within preferred habitats.

Given the wide variety of habitats and landscapes used by peregrines, it has been difficult for scientists to quantitatively measure the direct impact that loss of habitat has on recovering populations (White et al. 2002). In California, coastal and mountain development degrades the quality of potential nesting sites with suitable characteristics (e.g., cliffs with appropriate ledge space, height, and cover) and this in turn affects an increase in fledgling mortality from collisions and predation.

Climate Change and Weather Phenomena

Unusual climate conditions and effects of global warming could cause early or extra-torrential storms, extremely variable ambient temperatures and spring water runoff, as well as toxic or altered food supply resulting from changes in oceanic temperatures. These weather-related phenomena are recognized by the scientific community and the media as threats to most of California's wildlife, including peregrines, and these threats are potentially escalating in severity.

Shifting weather patterns and oceanic temperatures affect the marine food web that supports the abundance and distribution of California seabirds such as alcids (Oedekoven et al. 2001, Hyrenbach and Veit 2003). Alcids, along with urban-dwelling gulls, constitute up to 50% of the peregrine's diet in some coastal regions of California (White et al. 2002). In areas of California where a large proportion of the peregrine's diet comes from marine ecosystems, changes in climate can alter the abundance and types of prey the peregrine relies upon, indirectly affecting foraging success. For example, in central coastal California, Oedekoven et al. (2001) reported a decrease in abundance in auklets resulting from climate phenomena and another species of alcid, the common murre (*Uria aalge*), tended to move closer to the shore where peregrines mostly hunt. In southern California, all species of common alcids have decreased in abundance due to oceanic warming trends (Hyrenbach and Veit 2003).

Elsewhere, anecdotal observations have been made of unusual weather phenomena directly destroying nests or killing young peregrines (e.g., unusually cold spring conditions, early storms). Few studies have correlated weather parameters with peregrine reproductive success. One study in an extreme climate area (arctic) failed to show significantly negative correlations between most reproductive success variables and weather factors such as rainfall, snowfall and wind speed; however, the study did indicate a possible negative correlation between rain or snow fall and mean clutch size as well as observations of heavy chick mortality after storms (Bradley et al. 1997). Good nesting site characteristics often confer protection from adverse weather; therefore, the combination of fewer high-quality nest sites and changing weather patterns could have a compounded effect on peregrine fledgling survival or reproductive success.

Disease and Parasites

Disease and parasites (e.g., Asian Bird Flu, West Nile Virus (WNV)) are still relatively new and unidentified threats to peregrine falcon survival in California since there are few to no studies available to reference. Several species of raptors including American kestrel (*Falco sparverius*) and merlin (*F. columbarius*), species closely related to peregrines, were reported positive for WNV during 2007 and 2008 in California (through September 30, 2008; http://www.westnile.ca.gov/reports.php). A few cases of peregrine mortality from WNV have been reported in New Jersey and Virginia (USFWS; http://www.fws.gov/endangered/recovery/peregrine/monitoring-QandA.html).

Peregrine falcons worldwide are susceptible to a number of parasites and other diseases such as avian pox (*Poxvirus avium*), Newcastle disease, herpes virus, mycotic infections, strigeid trematodes (Strigeidae), nematodes (*Serratospiculum amaculata*), malaria (*Plasmodium relictum*), tapeworms, and bacterial infections. Ectoparasites include chewing lice (Phthiraptera, including *Colpocephalum zerafae*, *Degeeriella rufa*, *Laemobothrion tinnunculus*, and *Nosopon lucidum*), fleas (*Ceratophyllus garei*), and flies (*Icosta nigra* and *Ornithoctona erythrocephala*; Dewey and Potter 2002). However, the Department has found no evidence of significant outbreaks of any of the above diseases or conditions that affect wild populations of peregrines in California and considers this a threat low in significance and immediacy.

Management conflicts with other sensitive species

Management conflicts arise when peregrines occur in areas occupied by other species listed as threatened or endangered. The California least tern (*Sternula antillarum browni*), a State and federally-listed endangered species and the western snowy plover (*Charadrius alexandrinus nivosus*), a federally-listed threatened species, both nest along the beaches and strands of coastal California. Peregrines are known to prey upon these and other endangered species and, in certain situations, may be hazed from sensitive nesting sites if the predation pressure exerted is deemed excessive. Hazing or other harassment activity is only undertaken with appropriate State and federal permits, however. Translocation of "problem" peregrines is allowed only by permit and will continue to be managed on a case by case basis with or without CESA protection.

Impact of Existing Management Efforts

Federal Delisting from Endangered Species List

The Service delisted the American peregrine falcon under the federal Endangered Species Act (ESA) on August 25, 1999 (Mesta 1999). Following delisting, the Service was mandated through the ESA to develop a plan to monitor peregrine populations at the national level. The goal of the monitoring is to examine trends and detect declines in territory occupancy, nest success and productivity in six regions across the United States. Under this effort, 30 randomly selected nest sites were monitored in California in both 2003 and 2006. The next monitoring effort is scheduled for 2009.

Removal of the American peregrine falcon from the ESA list made the species ineligible for federal funding to states (e.g., Section 6). Section 6 addresses cooperative actions between the Service and the states for recovery of federally-listed threatened and endangered species.

Management of Factors that Cause Mortality or Nest Failure or other Disturbance

There are controls in place for the protection of California birds in general that are particularly beneficial to peregrines. For example, peregrines spend a considerable amount of time in the air while foraging, displaying, defending territories, or practicing flight-intensive hunting skills. The Service and California Energy Commission (CEC) are working to control problems with electrocution caused by collisions with electrical towers and wires. Power companies are provided with guidelines to construct towers and lines designed to mitigate potential collisions, to report such collisions and resulting mortalities, and in some cases, are prosecuted and fined for these deaths (USFWS 2005, SCPBRG 2007). The SCPBRG cooperated with other agencies or associations on a number of funded projects that monitored the mortality rates of raptors due to electrocutions and the efficacy of the existing programs.

Potential human disturbances (e.g., rock climbing near active eyries) are managed by the agencies that govern the land (e.g., National Park Service, USDA Forest Service, California Department of Parks and Recreation). Some historical and current peregrine breeding sites throughout California are officially closed during the breeding season (Access Fund 2006). Additionally, State and federal agencies post seasonal restrictions and publish educational pamphlets alerting the public about peregrine nesting. While these efforts are undoubtedly helpful in mitigating mortality and nest failure within these localized regions, it should be noted that some of the closures are voluntary and much of this mitigation depends upon the education and decisions of the climbing community. Remote climbing areas are not regulated; peregrines nesting in remote areas are thus more susceptible to human disturbances than peregrines nesting in managed sites (White et al. 2002).

Researchers are managed by broad-purpose permits and regulations (e.g., Migratory Bird Treaty Act collecting or banding permits, scientific research memoranda of understanding, Department Scientific Collecting Permit). Permitting agencies do not always have the resources available to effectively evaluate all activities that are being permitted at very specific and localized levels.

The Service implemented focused management plans with biological criteria for falconry take of peregrine nestlings which impose limits on the number of individuals taken (USFWS 2001, 2004). Beginning in 2001 and later revised, the Service authorized the western states, at their discretion, to allow take of up to 5% of the state's productivity of peregrine nestlings for falconry purposes. The Department concluded that this level of take would not have an impact on California's peregrine falcons at the population level (CDFG 2005).

California does not allow falconry take of American peregrine falcons due to the species' endangered status as well as fully protected status under FGC §3511. The "fully protected" law prohibits the take of peregrines except under special circumstances. Legislative action would be necessary to change that provision. In addition to the statutory changes, regulation changes would have to be approved by the Commission before peregrine falcons from the wild in California could be legally taken for use in falconry. In Section 670, Practice of Falconry, in Title 14 of the California Code of Regulations, the peregrine falcon is not listed among the species that are authorized for use in falconry [Title 14 §670(c)(4)(C)]. Review of such regulation changes would entail preparation of an environmental document and holding of a public hearing by the Commission.

Population and Recovery Goals Management

Though eggshell thickness and contaminant level measurements were not listed as a Service recovery goal for peregrines in California, there has been ongoing monitoring of these elements in the Channel Islands. In 2007, eggshell fragments and/or addled eggs were collected from nests to provide data for contaminant analysis (SCPBRG 2007) but data have not yet been analyzed. The Southern California Bight (which includes nearshore waters from Pt. Conception to the Mexican border) is the focus of the multi-agency Montrose Settlement Restoration Program under which the natural resources affected by the high concentrations of DDTs and PCBs in the region are studied and restored. Peregrine management options currently under consideration include restoring local island populations, acquiring and enhancing habitats at specific regional levels, and creating a peregrine falcon management group (NOAA 2004).

The Service continues monitoring indices of population health under the peregrine falcon post-recovery monitoring plan (USFWS 2003). These indices include territory occupancy, nest success rates, and productivity (e.g., number of birds successfully fledged per nest). Random populations are being sampled over the entire Pacific Region, which includes four other states, and for five sampling periods at three-year intervals (USFWS 2003). Data gathered on a temporal and spatial scale as large as this will give information about overall trends of potential population declines on a national level but not necessarily on a regional level within the State. It would be an effective monitoring tool for California populations if supplemented with additional localized surveys. The petition (Alten 2007) also refers to the contaminants monitoring component of this study. It is not likely that the contaminants monitoring funded by the Service will occur in the Pacific Region, since the recovery goals for such measurements were set only for two of the other regions (Alaska and Rocky Mountains/Southwest; Mesta 1999, USFWS 2003). Therefore, these efforts would provide very limited data on California populations.

Captive Breeding Program

Jurek (1989) provided an overview of the captive breeding program established for the peregrine in California, as follows. The SCPBRG and The Peregrine Fund established a captive breeding program and release of young to the wild at facilities at the

University of California, Santa Cruz. This project was multi-faceted and included collecting and captively incubating wild-laid, thin-shelled eggs, breeding of peregrines in captivity, hatching of captive-laid and wild-collected eggs, and releasing young birds into the wild. Release methods included several processes: "fostering", in which nestlings were placed into nests where eggs had previously been collected and replaced temporarily by artificial eggs and the wild parents then cared for the young; "cross-fostering" included placing captively-hatched nestling peregrines into the nests of wild prairie falcons (*Falco mexicanus*) in place of translocated prairie falcon nestlings; and "hacking" whereby groups of captively raised peregrine nestlings were released from artificial nesting structures without contact with humans or wild adult peregrines.

By the close of the active captive breeding program in 1992, approximately 800 peregrines had been released to the wild in California (SCPBRG website). Peregrine falcon nests are currently manipulated only as a result of intervention resulting from human impacts or need to salvage young from unsafe urban nest situations.

Establishment of Protected Areas

Many California peregrine nesting sites are found on or adjacent to public lands (e.g., National Parks, National Forests, State Parks) and receive management protection via these agencies. The Department established several ecological reserves expressly to protect peregrine nesting habitat in Mendocino, Sonoma, and San Luis Obispo counties. These sites will continue to be managed to support peregrine nesting regardless of listed status (CDFG 1972b, T. Le Blanc, pers. comm.).

Essential Habitat

Cliffs and bluffs with high ledges that contain loose substrate for scraping and which are situated near an abundant food source are essential components of peregrine breeding habitat in California. California's coastal zone is particularly important to the species' breeding population. Ledges and perches of varying heights are not only used for the actual placement of the nest and for hunting but are also critical for breeding rituals, behavioral displays, and self-maintenance such as sunning (White et al. 2002). Features offering predator protection, such as overhangs and sufficient height above the reach of ground predators, limit suitable ledge availability and selection (Wrightman and Fuller 2005). In all seasons, coastal and inland wetlands supporting an abundance of prey species are important to foraging peregrines.

Management and Conservation Recommendations

The Department provides the Commission with the management and conservation recommendations set forth below pursuant to FGC §2074.6. This section includes provision for "management activities and other recommendations for recovery of the species". These recommendations are consistent with actions to conserve the American peregrine falcon as a fully protected species under the California Wildlife Action Plan (WAP; http://www.dfg.ca.gov/wildlife/wap/report.html). As a fully protected species,

the American peregrine falcon will remain on the Department's Special Animals list and thereby be included in the WAP.

The peregrine falcon will continue to be protected under the federal Migratory Bird Treaty Act (MBTA) after delisting from California's endangered species list. The American peregrine falcon will also continue to be listed as a fully protected species under FGC §3511. Both the MBTA and the fully protected statutes protect peregrine falcons from take, except under limited conditions by special permit (usually restricted to scientific research activities as approved by the Service or the Department, respectively). The MBTA protects nests of the peregrine as long as eggs or chicks are present. Additionally FGC §3503 provides protection against needless destruction of nests and eggs while FGC §3503.5 provides protection against take, possession or destruction of raptor birds, nests or eggs.

The Department should continue to work with the Service, USDA Forest Service, USDA Wildlife Services, National Park Service, Bureau of Land Management, California Department of Parks and Recreation, National Oceanic and Atmospheric Administration, other affected federal and state agencies, universities, researchers, Santa Cruz Predatory Bird Research Group, Audubon California, Golden Gate Raptor Observatory, The Peregrine Fund, other conservation organizations, and other interested parties to identify and prioritize future monitoring and management needs for the peregrine falcon. A memorandum of understanding that addresses peregrine falcon conservation may be desirable between State and federal entities.

Future management of the peregrine falcon in California should address the following:

- Continue monitoring efforts and contaminant analyses which should include levels of DDE and HEOD; heavy metals (mercury, lead, and cadmium) and emerging contaminants issues should be monitored as needed. Eggshell thickness should also be analyzed;
- Monitor mortalities resulting from collisions with electrical power lines and towers. Determine the degree to which these mortalities contribute to general mortally trends and evaluate the efficacy of current guidelines and regulations;
- Improve regulation and education programs regarding human disturbances of falcon nests in natural habitats;
- Implement Southern California Bight peregrine falcon restoration suggestions under consideration by the Montrose Settlement Restoration Program Trustees (NOAA 2004);
- Implement population monitoring studies in California to supplement the larger-scale post-recovery Service monitoring plan for the Pacific Region (USFWS 2003). These should include contaminant analyses as described above and should be performed periodically through 2025;
- Implement management programs that directly restore, acquire, or regulate specifically defined habitat areas suitable for peregrine territories (in addition to those being considered by the Montrose Settlement Restoration Program);

- Habitat improvements and manipulations should be continued to provide nesting structures with predator-protection characteristics and safe placement of alternate nesting sites (e.g., safe for fledglings practicing flight; White et al. 2002); and,
- Minimize conflicts between peregrines and other sensitive species by developing and implementing site-specific predator management plans.

Regulatory Standard for Delisting or Downlisting

The Commission may elect to delist a species as endangered or threatened, pursuant to California Code of Regulations, Title 14, §670.1 (i)(1)(B), if it "determines that its continued existence is no longer threatened by one or a combination of the" following factors:

1. Present or threatened modification or destruction of its habitat;
2. Overexploitation;
3. Predation;
4. Competition;
5. Disease; or,
6. Other natural occurrences or human-related activities (14 CCR §670.1(i)(1)(A)).

The Commission will form its decision as to whether to delist the peregrine falcon based on the Department's status review, other scientific reports that are submitted and any other public comments and submissions it receives during the assessment period. The Commission may review all of the pertinent information and conclude that listing is still warranted, but at a level different than that recommended by the Department or requested by the petitioners, or, that endangered status is still appropriate.

Protections Resulting from Listing

It is the policy of the State to conserve, protect, restore, and enhance any endangered or threatened species and its habitat (FGC § 2052). If the American peregrine falcon remains listed, it will continue to receive protection from unauthorized take under CESA. Regardless of its status under CESA, the American peregrine falcon is a fully-protected species (FGC §3511) and take authorization is limited to necessary scientific research, including efforts to recover other fully protected, threatened or endangered species.

Retaining this species on the endangered list increases the likelihood that State and federal land and resource management agencies will allocate funds and resources towards protection and recovery actions. With limited funding and a large list of threatened, endangered and special concern species, priority for funding is usually given to species that are listed under CESA. However, no state funding has been awarded to study, monitor, or conserve the peregrine falcon in recent years.

Alternatives to the Petitioned Action

Alternatives to the petitioned action include a) decline to delist/retain endangered status; and b) downlist to threatened status.

Retain Endangered Status

An "endangered species" is defined under FGC §2062 as one in "serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease". Relative to this regulatory standard, the peregrine does not currently face imminent threats, has recovered population size to meet or exceed historic levels within the State, and has reoccupied historic range in the State. Further, the threat to the reproductive biology of the species brought about by pesticide contamination has lessened considerably due to the restrictions placed on the use of DDT-DDE in the 1970s.

Downlist to Threatened Status

A "threatened species" is defined under FGC §2067 as one that, "although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter." Relative to the regulatory standard, however, peregrine falcons are not likely to become endangered in the foreseeable future in the absence of special protection and management efforts. The peregrine falcon continues to be exposed to residual DDT-DDE contamination in several key breeding localities in the California (San Francisco Bay area, Elkhorn Slough, Channel Islands). Further, peregrine falcons in northern California show unusually high levels of contamination by PBDEs (i.e., flame retardants); repercussions to the health of the species are unclear from this newly identified source of contamination. However, peregrines in California have reoccupied most historic breeding range and their population size has recovered to historic levels. Productivity goals as set by the federal recovery planning effort (USFWS 1982) have been met in the State, although not at all sites. Intensive management efforts performed on behalf of this species including nest augmentation, captive breeding and cross-fostering were suspended in 1992 following a highly successful campaign and the determination that these actions were no longer necessary for this self-sustaining population.

Recommendation on Listing Status

The Department recommends that the Commission delist the American peregrine falcon under CESA. In making the recommendation to delist the American peregrine falcon pursuant to CESA, the Department relied most heavily on the following factors: 1) Current American peregrine falcon breeding range in California includes most of the known historic breeding range; 2) American peregrine falcon breeding population size has increased dramatically following State and federal listing as endangered and may have reached or even exceeded historical levels within California, as best as can be

determined given the uncertainty of the historic population data; 3) The threat posed to the peregrine falcon nesting populations in California by organochlorine pesticide contamination has lessened due to the restrictions imposed on the use of such substances in the United States and Canada since the 1970s. However, "hot spots" remain in the State; these areas need further evaluation and monitoring as to their impact on peregrine recovery; 4) Recovery goals specific to California as established through the federal recovery plan for the Pacific States populations of peregrine falcon have been met for range and population size; productivity goals have been met at most, but not all, sites; 5) The U.S. Fish and Wildlife Service (Service) delisted the peregrine falcon from the federal endangered species list in 1999 and established a monitoring program, contingent on funding, to document breeding status of this species through the year 2015. A sub-set of 30 nest sites will be monitored in California every three years, providing current occupancy and productivity data for the State's peregrine population; 6) The captive breeding and reintroduction program established in the 1970s and continued through 1992 was highly successful in aiding the recovery of the peregrine in California; 7) The American peregrine falcon is designated as a fully protected species, pursuant to FGC §3511 (b)(1). This designation is separate from the CESA statute and will not be affected by delisting the peregrine falcon. Therefore, the legal prohibition on take of this species, as defined in FGC §86, will be unaffected by a delisting action.

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