

## **Appendix C3**

### **Restore Peregrine Falcons to the Baja California Pacific Islands**

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### C3.1 GOALS AND NEXUS TO INJURY

The goal of this action is to restore peregrine falcons to the Baja California Pacific Islands. Data collected in 1992 in the Southern California Bight demonstrated severe (>15 percent) eggshell thinning in peregrine falcons (Kiff 1994). Peregrine falcons declined drastically in Baja California during the 1960s and 1970s (Castellanos et al. 1997, Porter et al. 1998). This decline was apparently at least in part caused by high levels of DDTs (Porter et al. 1988, Kiff 1988).

### C3.2 BACKGROUND

The Baja California Pacific Islands are located along the western coast of Baja California, Mexico (see Figure D5-1 in Appendix D5). There are a total of 18 islands in this region and 3 of these islands or island groups (Coronado, Todos Santos, and San Martín) are oceanographically considered part of the Southern California Bight. Six individual islands (San Jeronimo, San Benito, Guadalupe, Natividad, Asunción, and San Roque) are located south of the bight but are still part of the California Current System.

The historical and current status of peregrine falcons in Mexico is not well known (Banks 1969, USFWS 1999). However, records indicate that the Baja California Pacific Islands historically supported important peregrine falcon breeding areas. Porter et al. (1988) reported a total of 42 occupied peregrine falcon territories on the western side of the Baja California Peninsula prior to 1966. However, peregrine falcons declined drastically on the west coast of Baja during the 1960s and 1970s and only 2 to 3 pairs were still nesting there between 1966 and 1971 (Porter et al. 1998). These breeding areas were often associated with dense seabird colonies that served as the principal food source (Kiff 1988).

#### C3.2.1 Northern Baja California Pacific Islands

The peregrine falcon was most abundant on the Coronado Islands and the historical density of breeding pairs may have been the highest ever recorded for the race *Falco peregrinus anatum* (Kiff 1980). At least three pairs regularly nested on these islands (Howell 1917), but the number was higher in certain years. Peregrine falcons were recorded on these islands as early as 1908, and field notes recorded 11 peregrine falcons on North Coronado Island in 1913 (Kiff 1980). The Coronado Islands supported at least four active peregrine falcon nests in 1940 and two in 1948 (Kiff 1980). The highest numbers of peregrine falcon pairs reported during a single year at the Coronado Islands is between five and nine pairs (Kiff 1980).

Peregrine falcons disappeared from the Coronado Islands during the same period as their extirpation on the Channel Islands. Peregrine falcons were not present during a visit in 1954 (Herman et al. 1970). As of 1988, peregrine falcons remained essentially extirpated from the northern Pacific coast region of Baja California (Kiff 1988).

Focused surveys for peregrine falcons have not been conducted recently on these islands. However, it is estimated that Coronado, Todos Santos, San Martín, and San Jeronimo Islands may currently support a total of 5 to 6 pairs (Keitt, pers. comm., 2004).

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### C3.2.2 Central Baja California Pacific Islands

The central west coast of the Baja California Peninsula was an important breeding area for peregrine falcons (Castellanos et al. 1997). San Benitos, Cedros, Natividad, San Roque, and Asunción Islands all supported breeding pairs (Castellanos et al. 1997). Natividad Island historically supported a high density of breeding peregrine falcons, with six pairs reported in 1924 (Banks 1969). Natividad Island supported dense colonies of seabirds, including a large population of black-vented shearwaters (see Appendix D5). It is currently estimated that 1 to 2 pairs are breeding on Natividad Island (Keitt, pers.comm., 2004).

In 1993, three active peregrine falcon nests were discovered in Ojo de Liebre (Scammon's Lagoon) on the western side of the Baja California Peninsula in an area without historical nesting records (Castellanos et al. 1997). Surveys between 1980 and 1994 documented a total of 10 nesting pairs in this area that included San Benito, Cedros, Natividad, San Roque, and Asunción Islands (Castellanos et al. 1997). These observations suggest some recent recovery on the central west coast of the Baja California Peninsula.

### C3.3 PROJECT DESCRIPTION AND METHODS

The goal of this 5-year action is to restore peregrine falcons on the Baja California Pacific Islands. Projects under consideration include comprehensive surveys of the islands, efforts to reduce impacts from human disturbance, and habitat enhancement.

The first project under consideration is a comprehensive survey of the islands. Systematic surveys have not been conducted recently, and the current status and distribution of peregrine falcons on these islands are largely unknown. This survey would document the number of breeding pairs, their reproductive success, the condition of nesting sites, and the potential impacts to the nesting area (e.g., from human disturbance). The survey would also include collection of egg and eggshell samples for contaminant analysis. These samples would be collected according to established protocols.

Based on the results of the survey, subsequent restoration actions would be identified and evaluated, such as reducing human disturbance and habitat enhancement. Human activities are known to cause disturbance to peregrine falcon nests along the central Baja California Peninsula (Daneman and Guzman Poo 1992). Actions to reduce human disturbance would include placement of signs and restriction on access to nesting areas. Habitat enhancement would include improvements such as stabilizing nesting sites, removing debris, or adding favorable substrate in the nest site to enhance reproductive success (e.g., pea gravel).

Seabird restoration is also being considered for the Baja California Pacific Islands. Seabird restoration projects would increase the abundance and distribution of prey species of the peregrine falcon, including petrels, auklets, and gulls. Proposed activities range from social attraction to habitat restoration to reducing human disturbance. Specific seabird restoration projects on these islands that are being considered are detailed in Appendix D5.

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**C3.4 ENVIRONMENTAL BENEFITS AND IMPACTS****C3.4.1 Biological***Benefits*

This restoration action would primarily benefit peregrine falcons. Although systematic surveys have not recently been conducted, the number of peregrine falcon pairs on these islands is below historical levels (Keitt, pers. comm., 2004, Castellanos et al. 1997). Focused surveys for peregrine falcons would provide essential information on the current status and distribution on these islands. This information is necessary to identify specific actions to protect and restore this species to historically occupied habitat. Actions taken to reduce human disturbance would likely result in recolonization of unoccupied habitat and increased reproductive success. The recolonization of peregrine falcons into historically occupied habitat on these islands would provide direct long-term benefits to this species, since peregrine falcon territories generally remained occupied indefinitely, with new adults being recruited from the floating population over time. In addition, peregrine falcons typically disperse 16 to 241 kilometers (10 to 150 miles) to adjacent unoccupied territories. An increase in the number of peregrine falcons on the Baja California Pacific Islands may lead to further recovery of peregrine falcons on the Channel Islands due to their proximity.

Raptors, such as the peregrine falcon, are an essential part of healthy, functioning ecosystems. The peregrine falcon is an apex predator that fills a particular ecological niche on island ecosystems. Significant efforts are under way to restore the ecosystems of the Baja California Pacific islands, such as the removal of nonnative species and habitat restoration. Recovery of this species on the Baja California Pacific islands would complement ongoing efforts to restore the island ecosystems of the region.

*Impacts*

The peregrine falcon is a highly specialized feeder, concentrating almost entirely on birds. Kiff (1980) reports that peregrine falcons prey on at least 22 species of birds on the Channel Islands and the Coronado Islands. A peregrine nest site examined on the Coronado Islands in 1924 contained 12 bird species, including 42 pairs of wings of Xantus's murrelets (Huey in Kiff 1980). On the Channel Islands, dietary studies of peregrine falcons in 1992 and 1993 showed that gulls, alcids, and land birds constituted between 73 and 82 percent of their diet, depending on season (Hunt 1994).

The presence of the peregrine falcon may have a negative impact on bird populations, particularly for those species that are in decline or have limited populations. Predators such as the peregrine falcon limit population growth by reducing nest productivity and increasing adult and juvenile mortality. The Baja California Pacific islands are critical breeding areas for seabirds and support important colonies of special-status or declining species, such as the state-threatened Xantus's murrelet and rare ashy storm-petrel. Because many seabirds are under constant threat (e.g., from oil spills, human disturbance, El Niño events), they may not be able to withstand peregrine falcon predation (Paine et al. 1990). In particular, depressed populations of seabirds

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may not be able to effectively absorb the additional predation pressure from increased peregrine falcons on these islands.

Peregrine falcons do not prey on California brown pelicans; therefore, an increase in the number of pairs is not expected to adversely impact brown pelicans.

**C3.4.2 Physical***Benefits*

This action would have no known benefits to the physical environment.

*Impacts*

This action would have no known impacts to the physical environment.

**C3.4.3 Human Use***Benefits*

The recovery of the peregrine falcon to the Baja California Pacific islands provides both aesthetic and recreational benefits to visitors and residents of the islands.

*Impacts*

This action would limit human disturbance in the vicinity of peregrine falcon nesting areas. This action may impact residents on the islands during the breeding season for this species. However, this impact is not anticipated to be significant due to the minimal number of people that inhabit the islands.

**C3.5 LIKELIHOOD OF SUCCESS/FEASIBILITY**

This action would consist of the following: surveys, reducing human disturbance, and habitat enhancement. Methodologies for these specific actions have been established and used successfully in the past. Survey protocols have been developed and are standardized. The surveys would identify additional measures to protect and restore peregrine falcons. Once these specific actions are identified, they would be evaluated for their feasibility and likelihood of success.

**C3.6 PERFORMANCE CRITERIA AND MONITORING**

A monitoring plan for this action would be developed using established protocols. The plan would be consistent with regional peregrine falcon monitoring efforts.

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### C3.7 EVALUATION

The Natural Resource Trustees for the Montrose case (Trustees) have evaluated this action against all screening and evaluation criteria developed to select restoration actions and concluded that this action is consistent with these selection factors. A systematic survey of the Baja California Pacific islands is necessary to assess the current status, distribution, and threats to peregrine falcons on these islands. However, as outlined in Appendix C2, a similar inventory of peregrine falcons is needed on the Channel Islands because the existing survey information is largely outdated for these islands. In light of the lack of current information on the Channel Islands, the Trustees have determined that surveys on the Channel Islands are a higher priority at this time than are surveys on the Baja California Pacific islands.

Despite the lack of comprehensive surveys of the Baja California Pacific islands, the limited information available indicates that the population is recovering from drastic declines in the 1960s and early 1970s (Castellanos et al. 1997). Similarly, peregrine falcons are experiencing an overall expansion on the Channel Islands despite the potential ongoing effects from DDT contamination.

An important factor in the recovery of the peregrine falcon is the availability of sufficient prey resources. Because peregrine falcons concentrate on smaller seabirds, a robust seabird population is needed to sustain an increasing number of pairs. As part of the Preferred Alternative, the Trustees have selected a suite of seabird restoration actions on both the Channel Islands and the Baja California Pacific islands. These projects would likely provide benefits to peregrine falcons on the Baja California Pacific islands by increasing their prey base. Without robust seabird populations, peregrine falcon recovery on these islands would likely be limited.

Although the Trustees are currently proposing to focus their restoration efforts for peregrine falcons on the Channel Islands, additional consideration may be given to specific restoration opportunities on the Baja California Pacific islands in Phase 2 of restoration implementation.

### C3.8 BUDGET

The estimated cost of a 5-year program (surveys, reducing human disturbance, and habitat enhancement) would be as follows:

- Labor .....\$295,000
- Supplies.....\$39,000
- Equipment.....\$64,000
- Transportation.....\$40,000
- Overhead.....\$109,000
- **Total cost, years 1–5 .....\$547,000**

Appendix D5 presents the estimated budgets for seabird restoration actions in the Baja California Pacific islands.