Command Oil Spill

Draft
Restoration Plan and Environmental Assessment

for public review and comment

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Prepared by:
United States Fish and Wildlife Service
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California Department of Parks and Recreation
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Command Oil Spill
DRAFT RESTORATION PLAN AND ENVIRONMENTAL ASSESSMENT

TABLE OF CONTENTS

1.0 Introduction: Purpose of and Need For Restoration 1
- 1.1 Introduction 1
- 1.2 Purpose and Need 1
- 1.3 Overview 1
- 1.4 Natural Resources Trustees and Authorities 2
- 1.5 Settlement of Natural Resource Claims 3
- 1.6 Public Participation 4
- 1.7 Administrative Record 4

2.0 Affected Environment 5
- 2.1 Physical and Biological Environment 5
- 2.2 Threatened and Endangered Species 11
- 2.3 Archeological and Cultural Resources 13
- 2.4 Sandy and Rocky Intertidal Habitat 13
- 2.5 Recreational Services 14

3.0 Injured Resources 15
- 3.1 Seabird Resources 15
- 3.2 Lost and Diminished Use of Beaches for Human Recreation 17

4.0 Restoration Planning 18
- 4.1 Restoration Strategy 18
- 4.2 Criteria Used to Evaluate Restoration Project Concepts 19
  - 4.2.1 Threshold Criteria 20
  - 4.2.2 Additional Criteria 20
- 4.3 Evaluation of Environmental Restoration Alternatives 21
- 4.4 No Action Alternatives 22
- 4.5 Preferred Alternatives 23
  - 4.5.1 Marbled Murrelet Restoration and Corvid Management Project 23
  - 4.5.2 Marbled Murrelet Land Acquisition and Enhancement Project 40
  - 4.5.3 Seabird Colony Protection Program 44
  - 4.5.4 Common Murre Nesting Ledge Creation 53
  - 4.5.5 Brown Pelican Roost Site Enhancement and Protection 57
  - 4.5.6 Brown Pelican Entanglement Reduction Education and Outreach Program 61
  - 4.5.7 Sooty Shearwater Restoration Project 64
  - 4.5.8 Lost Human Use Restoration Projects 70
- 4.6 Cumulative Impacts 73

4.7 Non-Preferred Projects 73

5.0 Applicable Laws and Regulations 76
5.1 Overview 76
5.2 Key Statutes, Regulations and Policies 76
5.2.1 Federal Statutes 76
5.2.2 State Statutes 83
5.2.3 Other Potentially Applicable Statutes and Regulations 85

6.0 List of Preparers 85

7.0 Literature Cited/Bibliography 86

LIST OF FIGURES

Figure 1.	Area of oil observations during the Command Oil Spill.	2
Figure 2.	Marbled Murrelet breeding range in California.	23
Figure 3.	Primary Marbled Murrelet nesting area in Santa Cruz Mountains.	24
Figure 4.	Average number of Marbled Murrelet detections at the Redwood Meadow Park HQ, Big Basin Redwoods SP.	25
Figure 5.	Average number of Marbled Murrelet detections with "occupied site behavior" at the Redwood Meadow – Park HQ, Big Basin Redwoods SP.	25
Figure 6.	Average number of Marbled Murrelet detections recorded at the five CDFG monitoring stations in Big Basin Redwoods SP .	26
Figure 7.	Comparison of Marbled Murrelet activity at four areas in the Santa Cruz Mountains.	27
Figure 8.	Numbers of Common Ravens on the Santa Cruz County CBC 1957-2001 (standardized by total party hours).	28
Figure 9.	Numbers of Common Ravens on the Año Nuevo CBC 1972-2001 (standardized by total party hours).	29
Figure 10.	Location of campgrounds with one-mile radii, where corvids may range while foraging .	30
Figure 11	Average relative abundance of corvids in campgrounds and away from campgrounds in Marbled Murrelet habitat at seven areas in the Santa Cruz Mountains.	31
Figure 12	Open trash can and spilled garbage at Memorial Park campground, August, 2002.	31
Figure 13	Project timeline.	35
Figure 14	Sign at Tuolumne Meadows Campground, Yosemite National Park, California.	37
Figure 15	Sign on picnic table at Hoh Rainforest Campground, Olympic National Park, Washington.	37
Figure 16	Brochures regarding human disturbance of Snowy Plovers at California State Beaches.	37
Figure 17	Sign at Redwood National Park.	37
Figure 18	Approximate location of Girl Scout Creek property.	42
Figure 19.	Common Murre Colonies along the Central California Coast.	45
Figure 20.	Seabird Colony Protection Project timeline.	48

LIST OF TABLES

Table 1	Recovered Birds.	16
Table 2	Summary of Preferred Projects and Estimated Funding Allocations for the Command Spill.	22
Table 3	Santa Cruz Mountains Campgrounds by Park.	30

DRAFT RESTORATION PLAN AND ENVIRONMENTAL ASSESSMENT FOR THE 1998 COMMAND OIL SPILL

1.0 Introduction, Purpose and Need for Restoration

1.1 Introduction

This document is being prepared by the Command Oil Spill Natural Resources Trustee Council comprised of representatives of the U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration (NOAA), the California Department of Fish and Game (CDFG), the California State Lands Commission (CSLC), and the California Department of Parks and Recreation (CDPR). The purpose of this document is to inform the public about the affected environment and the proposed restoration actions to compensate for natural resource injuries and lost recreational uses caused by the Command Spill.

1.2. Purpose & Need

This draft Restoration Plan (RP) and Environmental Assessment (EA) provides information regarding the affected environment, natural resource and human use injuries resulting from the 1998 Command Spill (hereafter referred to as the Spill or the Command Spill) into the waters off of the San Mateo coast. This document also includes the Trustee agencies' plan for restoration, including descriptions of proposed restoration alternatives consistent with the Oil Pollution Act (OPA) and the National Environmental Policy Act (NEPA). The purpose of restoration planning is to identify and evaluate restoration alternatives and to provide the public opportunity for review and comment on the selected restoration alternatives. Restoration planning provides the link between injury and restoration. The goal of proposed restoration actions presented in this document is to address injuries to, or lost use of natural resources and services resulting from the Spill. This will be accomplished through the restoration, rehabilitation, or acquisition of equivalent natural resources and services, collectively referred to as restoration. The specific goals for this draft RP/EA, in compliance with OPA, are to restore the following natural resources affected by the Spill: seabirds, sandy beach and rocky intertidal shoreline habitats, and use of beaches for human recreation.

This document also serves, in part, as the Trustee agencies' compliance with the NEPA and the California Environmental Quality Act. Additional environmental compliance may be required prior to actual implementation of the proposed projects described herein.

1.3 Overview

On the evening of September 26, 1998, tanker Command left San Francisco Bay bound for Panama. As it traveled in the southbound traffic lane off San Francisco and San Mateo County coasts, it released an estimated 3,000 gallons of Intermediate Bunker Fuel (IBF) 380, also known as Fuel Oil No. 6. Due to light winds and fair weather, the oil

moved little in the first few days, primarily staying in the vicinity of the southbound traffic lane. On September 30, oil began to wash ashore, largely in the form of scattered tarballs, over 15 miles of beaches, mainly in San Mateo County (Figure 1). However, a tarball sample collected as far away as the Salinas River mouth in Monterey County matched the source sample from the tanker.

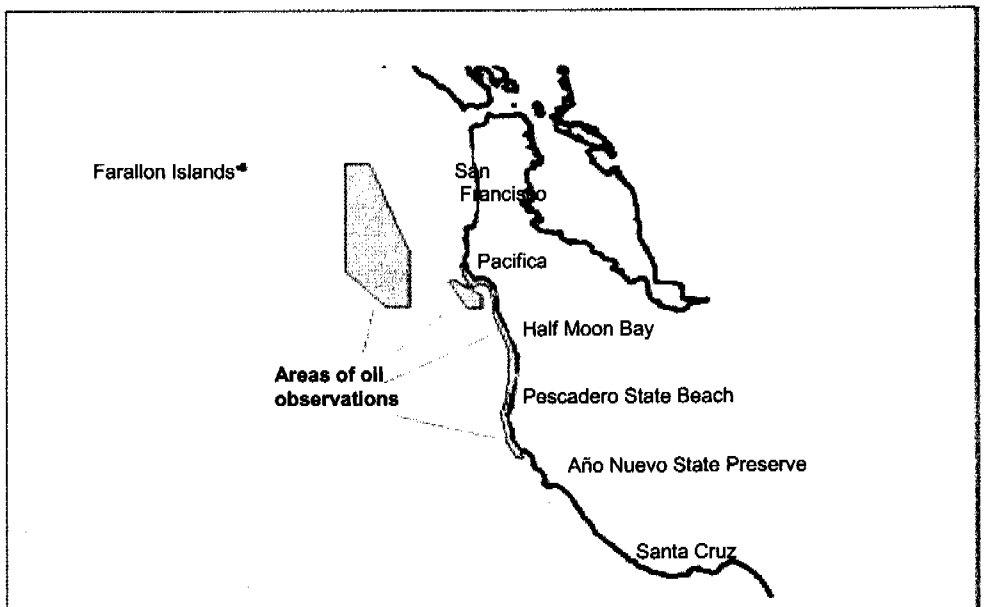


Figure 1 – Area of oil observations during the Command Oil Spill

Response activities included skimming by oil spill response vessels at sea; however, little oil could be collected. In addition, shoreline crews were able to clean up some of the oil that was found onshore in the form of tarballs, and tar patties. No beaches were closed as a result of the Spill but coastal access was interrupted.

1.4 Natural Resource Trustees and Authorities

Both federal and State of California laws establish liability for natural resource damages, requiring responsible parties to make the environment and the public whole for the injury, destruction and loss of natural resources and services resulting from oil spills. Natural resource damages include the reasonable cost of assessing resource injuries and lost services along with the cost of developing and implementing a restoration plan to make the environment and the public whole for the injury, of natural resources and to compensate for lost or diminished resource services resulting from oil spills.

The USFWS, NOAA, CDFG, CSLC, and CDPR are the Trustees for the natural resources injured by the spill (Trustees). The USFWS and NOAA are designated Trustees for natural resources pursuant to subpart G of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR § 300.600 et seq.) and Executive Order 12580 (3 C.F.R., 1987 Comp. p. 193, 52 Fed. Reg. 2923 (January 23, 1987) as amended by Executive Order 12777 (56 Fed. Reg. 54757 (October 19, 1991). Additionally, the

CDFG has State natural resource trustee authority pursuant to Fish and Game Code section 1802 and the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act (Government Code sections 8670.1 et seq.); the CDPR has State natural resource trustee authority pursuant to Public Resources Code section 5003; and the CSLC has State natural resource trustee authority pursuant to Public Resources Code section 6201 et seq.. As a designated Trustee, each agency is authorized to act on behalf of the public under State and/or federal law to assess and recover natural resource damages and to plan and implement actions to restore, rehabilitate, replace, or acquire the equivalent of the affected natural resources injured as a result of a discharge of oil. Pursuant to 15 CFR § 990.14(a), the Trustees designated CDFG and USFWS as the Co-Lead Administrative Trustees.

The Trustees have jointly developed this draft RP/EA to address restoration of the injured resources. The Trustees released a Public Scoping Document in May 2002 and held a Public Scoping Meeting on May 21, 2002 to assist in identifying potential restoration projects. The Trustees also held a workshop with Marbled Murrelet scientists and resource specialists. All public comments received during the public scoping period are reflected in this draft RP/EA. In all, the Trustees evaluated 23 proposed projects, 21 of which were proposed by the public.

1.5 Settlement of Natural Resource Claims

The United States and the State of California reached a settlement with the parties responsible for the Command Spill. The terms of the settlement were memorialized in a Consent Decree, which was reviewed by a U.S. District Court and was subject to public comment prior to being entered by the Court on March 31, 2000. The Consent Decree required the responsible parties to pay a total of $5,518,000 to resolve all civil claims (natural resource damages and civil penalties) arising from the Command Spill, of which $4,007,242 was allocated to natural resources damages. The natural resources damages portion of the settlement, together with interest earned on the entire settlement amount while held in escrow pending final Court approval of the settlement, was deposited into the Natural Resource Damage Assessment and Restoration Fund created pursuant to 43 U.S.C. § 1474b ("NRDAR Fund") and has been maintained in a segregated account within the NRDAR Fund ("the *Command* NRD Account"). Restoration funds are held in an interest bearing account, with a balance of $4,042,980 as of September 30, 2003. The Council anticipates that this balance will continue to change as interest accrues and planning activities proceed.

The Consent Decree requires the Trustees, when allocating monies for Restoration projects, to take into consideration their preliminary determination of injuries caused by the Spill. According to the Consent Decree, the Trustees determined that seabirds, primarily Common Murres (*Uria aalge*), suffered the greatest injury and as a result the restoration money would primarily be used for projects benefiting seabirds. The Consent Decree also provided for the Trustees to make a more precise allocation of the restoration monies through a Memorandum of Understanding ("MOU").

The MOU subsequently entered into by the Trustees provided some further guidance on allocations of money in the NRD account (approximately $2,850,000 for seabird projects, particularly benefiting Common Murres, $400,000 for Marbled Murrelet projects and $200,000 for projects benefiting shoreline and human use). These allocations were, however, subject to adjustments based on post-settlement assessment work. Based on the post-settlement injury assessments conducted by the Trustees, these allocations were adjusted to increase the allocation for Marbled Murrelet (*Brachyramphus marmoratus*) enhancement projects because the injury to this species was greater than originally estimated, relative to those of other seabirds (see Section 3.0 for more information). The MOU also allows up to $463,016 of the funds deposited in the Command NRD Account to be used for the Trustees' costs associated with planning, implementation and oversight of restoration.

The Trustees have committed to the expenditure of the NRD money for the design, implementation, permitting (as necessary), monitoring, and oversight of restoration projects, and for the costs of complying with the requirements of the law to conduct a restoration planning and implementation process. The Trustees share joint responsibilities regarding the injured seabirds, habitat, and human use losses.

1.6 Public Participation

Public review of this draft RP is an integral component of the restoration planning process. A public review period greater than 45 days is being provided for the draft plan. This comment period closes on Wednesday, February 11. Comments must be received by that date to be considered part of the official record. Comments should be sent to the attention of Charlene Hall at Charlene_Hall@fws.gov or the U.S. Fish and Wildlife Service, 2800 Cottage Way, suite 2605, Sacramento, CA 95825.

The Trustees will hold a public meeting at the Ocean Shore Train Depot, Higgins-Purissima Road, Half Moon Bay on January 29, 2004 from 6:30 to 8:00 pm. At this meeting, the Trustees will present a brief overview of the RP and accept public comment.

Further information on this public meeting and other activities of the Trustees will be distributed to those on our mailing list, and will be announced on our websites at http://www.darcnw.noaa.gov/command.htm and http://www.dfg.ca.gov/ospr/organizational/scientific/nrda/NRDAcommand.htm, and through press releases. To be placed on the mailing list, please contact Charlene Hall at the address above.

1.7 Administrative Record

The Trustees have opened an Administrative Record (Record) in compliance with 15 C.F.R. Section 990.45. The Record includes documents relied upon or considered by the Trustees during the assessment and restoration planning performed in connection with the Spill. The Record is on file at The Gulf of the Farallones National Marine Sanctuary, Fort Mason, Building 201, San Francisco, California 94123. Arrangements may be made

to review the Record by calling (415) 561-6622. The Record may also be viewed at our website at http://www.darcnw.noaa.gov/command.htm.

2.0 Affected Environment

2.1 Physical and Biological Environment

Physical Environment

The physical environment within the affected area includes the ocean and coastal environments within the Gulf of the Farallones and Monterey Bay National Marine Sanctuaries (GFNMS and MBNMS). The affected environment encompasses a 6,577 square mile area of Pacific Ocean along with near shore tidal flats, wetlands, rocky intertidal areas, coastal beaches, subtidal reefs, kelp forests, and underwater canyons. In addition, the physical environment encompasses rocks and islands contained within the California Coastal Monument managed by the Bureau of Land Management (BLM), public beaches that are under the jurisdiction of the CDPR, the Farallon National Wildlife Refuge managed by the USFWS and the Point Reyes National Seashore managed by the National Park Service (NPS). Designated by Presidential Proclamation on January 11, 2000, the California Coastal National Monument runs the entire length of the California coast (840-miles) between Oregon and Mexico, extends 12 nautical miles from the shoreline, and encompasses thousands of BLM administered islands, rocks, exposed reefs, and pinnacles above mean high tide.

The Farallon National Wildlife Refuge is a group of islands located 28 miles west of San Francisco. It sustains the largest seabird breeding colony south of Alaska and contains 30 percent of California's nesting seabirds. Thirteen species, representing up to 250,000 individuals breed here, including the largest colonies of Brandt's Cormorant (*Phalacrocorax penicillatus*) and Western Gull (*Larus occidentalis*) found anywhere.

The dominant oceanic current within the affected environment is the California current, which flows southward from Alaska to Mexico. During the year, several oceanic phenomena affect this general movement, such as the northward flowing Davidson counter current prevailing during the winter, upwelling processes, local gyres and eddies, and tidal exchanges with San Francisco and Monterey Bays. The average annual ocean surface temperature is 55° F.

The three distinct ocean seasons along the central California coast are: the oceanic period (July-October); the Davidson Current period (October- March); and the upwelling period (March/April-August). The oceanic period is the season in which the California Current dominates the circulation pattern. This period is characterized by low temperature, low salinity, high-nutrient, and highly oxygenated sub arctic water (Minerals Management Service 1983). The Davidson Counter Current carries oxygen-poor, nutrient rich waters that are characteristically warmer and more saline than the California Current. Low temperatures, high salinities, and high nutrient levels usually characterize coastal

upwelling. The process increases primary productivity of surface waters by supporting large phytoplankton blooms. Rich zooplankton and fisheries production ensues.

Biological Environment

The affected area has one of the most diverse and abundant assemblages of marine organisms in the world. A rich array of habitats including the open ocean, rugged rocky shores, sandy beaches, lush kelp forests, and wetlands support large numbers of seals and sea lions, whales, fish stocks, otters, and seabirds. The environment is home to, or a migration corridor for 26 species of marine mammals, 94 species of seabirds, 400 species of fish, 4 species of sea turtles, 31 phyla of invertebrates, and over 500 species of marine algae. Other important megafauna species in the affected area include the sea otter (*Enhydra lutris*), gray whale (*Eschrichtius robustus*), blue whale (*Balaenoptera musculus*), humpback whale (*Megaptera novaeangliae*), market squid (*Loligo opalescens*), Brown Pelican (*Pelecanus occidentalis*), rockfish (*Sebastes sp.*), commercial sea urchin (Class *Echinoidea*), and giant kelp (*Heterostichus rostratus*). For many migratory species, such as the gray whale, salmon, trout, and Brown Pelicans, the affected area is also an important link to other habitats beyond its boundaries.

Marine Mammals

Pinnipeds

Twenty-six species of marine mammals have been observed in the affected area, including five species of the sub-order pinnipeds (seals and sea lions), one species from the sub-order fissipeds (sea otter), and twenty species of the order cetaceans (whales and dolphins).

Both Año Nuevo and the Farallon Islands are important pinniped breeding sites in the area and the most important pinniped rookeries and resting areas in central and northern California. The five species of pinnipeds considered common within the affected area include California sea lions (*Zalophus californianus*), Steller sea lions (*Eumetopias jubatus*), Northern elephant seals (*Mirounga angustirostris*), Northern fur seals (*Callorhinus ursinus*), and Pacific harbor seals (*Phoca vitulina*). An additional species, the Guadalupe fur seal (*Arctocephalus townsendi*), has been documented on the Farallon Islands.

In any season, California sea lions are the most abundant pinniped in the area (Bonnell *et al.*1983). They breed farther south along the coast in the summer, then migrate northward, reaching their greatest numbers in the sanctuaries in autumn. Sea lions haul out on offshore rocks and islands. Both haul-out sites and foraging grounds are essential to the species' health. Northern elephant seals breed in the winter months and then disperse to feed in pelagic waters throughout the eastern North Pacific. A portion of the population returns to the colony later in the year to undergo an annual molt. Peak abundances occur on land in the spring when juvenile males and females haul out to molt.

The largest populations are on Año Nuevo Island and the adjacent mainland point. The spring population on land exceeds 4,000 (M.L. Bonnell *pers. com.*).

Pacific harbor seals are year-round residents in the area. They haul out at dozens of sites along the coast from Point Sur to Año Nuevo. Peak abundance on land is reached in late spring and early summer when they haul out to breed, give birth to pups, and molt. Favorite haul out sites are isolated sandy beaches and rocky reef areas exposed at low tide. Harbor seals also use the estuarine habitats of Elkhorn Slough, Tomales Bay and the Esteros.

Northern fur seals occur in the open waters in winter and spring. They feed offshore after migrating from the Pribilof Islands. The greatest density of individuals is found well offshore over the continental slope in waters from 100 to 1,000 fathoms (200 to 2,000 m) depth. Northern fur seals rarely haul out on land, although they are occasionally seen on Año Nuevo and the Farallon Islands. They have a declining population presently estimated at 1.2 million animals. Many causes have been attributed to this decline, including entanglement in marine debris. This species has been proposed for designation as a depleted species by NOAA.

Cetaceans

Seventeen species of whales and dolphins have been sighted within the affected areas. Ten species are seen regularly and of these, the killer whale (*Orcinus orca*), Minke whale (*Balaenoptera acutorostrata*), harbor porpoise (*Phocoena phocoena*), Dall's porpoise (*Phocoenoides dalli*), and Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) are considered year-round "residents". The affected area also lies on the migratory pathway of the gray whale and other large baleen and tooth whales.

Fissipeds

The California or southern sea otter (*Enhydra lutris nereis*) is a threatened species that is found throughout the shallow waters in the affected area. Sea otters inhabit a narrow zone of coastal waters, normally staying within one mile of shore. They forage in both rocky and soft-sediment communities as well as in the kelp understory and canopy. They seldom are found in open waters deeper than 30 m, preferring instead the kelp beds which serve as vital resting, foraging, and nursery sites. Otters are an important part of the marine ecosystem. By foraging on kelp-eating macroinvertebrates (especially sea urchins) sea otters can, in many instances, influence the abundance and species composition of kelp assemblages and animals within nearshore communities (Riedman 1987).

The California sea otter population is a remnant of the North Pacific population that was decimated by the commercial fur trade in the 18th and 19th centuries. In 1914, this population in California occupied a few miles of the rocky Point Sur coast and was estimated to contain about 50 otters. By 1938, when the public became aware of these remnant otters, the total California population was between 100-300 animals. Between

1938 and 1976 the population increased at about 5 percent per year. From 1976 until the early 1980's, the population did not grow at all, mainly due to the number of otters drowning from entanglement in fishing nets. Since state legislation restricted the use of entangling nets, spring population counts may be increasing at about 8 percent per year (Saunders 1989). However, this population growth rate is still much lower than the growth rates of sea otter populations in the Aleutian Islands. In addition to the entanglement in fishing nets, other possible factors for the low population growth include illegal shooting, shark attacks, pathological disorders, contamination from degraded water quality, starvation, and adverse weather conditions. Approximately 31 percent of this population is currently found in the area from Point Sur north to Año Nuevo/Pigeon Point.

Seabirds

Marine habitats along the affected coast are among the most productive in the world as measured by the sheer numbers of seabirds supported year-round. These populations forage in nearshore areas within the GFNMS and MBNMS and are highly dependent on the productive waters of the two sanctuaries. The Farallon Islands, within the GFNMS and a National Wildlife Refuge, support the largest concentrations of breeding marine birds in the continental United States (Ainley and Boekelhide 1990). The islands support a diverse nesting community of 11 species including over 50,000 breeding pairs of Common Murres, a species heavily impacted by the Command Spill. The populations of Ashy Storm-Petrels (*Oceanodroma homochroa)* and Western Gulls breeding on the Farallones are the largest for these species worldwide. The Ashy Storm-Petrel reaches the northern limit of its breeding range on the Farallones (Ainley and Boekelheide 1990, Ainley 1995). Rhinocerous Auklets (*Cerorhinca monocerata*) disappeared from the Farallones in the 1860s but recolonized and began breeding in the 1970s (McChesney and Whitworth 1995). In addition the island supports breeding colonies of Cassin's Auklets (*Ptychoramphus aleuticus),* and Tufted Puffins (*Fratercula cirrhata*).

There are also several species found in the area of the Spill that are of special concern because of their small world populations. These species include the endangered California Brown Pelican (*Pelecanus occidentalis californicus*), the federal listed threatened and State listed endangered Marbled Murrelet and several species being considered for listing, such as Black Storm-Petrel (*Oceanodroma melania*), Ashy Storm-petrel and Xantus's Murrelet *(Synthliboramphus hypoleucus).* The world's largest known concentration of Ashy Storm-Petrel can be found in Monterey Bay during the fall (Stallcup 1990). The California Brown Pelican once bred within the affected environment (Baldridge 1973), and with return of the sardine, may do so again.

Many seabird species use the affected area during migrations from their nesting areas. One notable species is the Sooty Shearwater (*Puffinus griseus)*, which occur in large numbers off California during their austral winter migration from New Zealand breeding colonies. The Sooty Shearwater is the most abundant seabird off central California during May to September (Briggs *et al.* 1987). They aggregate in large conspicuous flocks to feed on shoaling fishes, squid, and euphausids that concentrate in productive

shelf waters influenced by coastal upwelling (Briggs and Chu 1986). Single flocks can extend for many kilometers and number in the 10,000– 100,000s. Their aggregated dispersion along the populated coast and near offshore shipping lanes makes shearwaters particularly vulnerable to oil pollution. Numbers off California have declined precipitously during the past decade due to a combination of factors, including oil spills, marine climate change, incidental fisheries take, and pollution (Veit *et al.* 1996, 1997, Lyver *et al.* 1999, Uhlmann and Moller 2000, Oedekoven *et al.* 2001, Uhlmann 2001).

Fish

The diversity and abundance of the fish fauna within the affected area is a significant resource. Generally, the area exhibits the very rich cold-water fish fauna of the Oregonian province (Briggs 1979). The same environmental factors that determine the distribution, abundance, and species composition of the other living resources of the area also affect the fish communities.

Approximately 400 species of fish are found within the affected area. The diverse habitats of the area each have their own characteristic assemblage of fishes. Fishes of the nearshore subtidal habitats exhibit the greatest diversity. This habitat includes many commercially important fishes such as the pelagic schooling species [northern anchovy (*Engraulis mordax*), Pacific herring (*Clupea pallis*), jack mackerel (*Thyrsitops sp.*), and California sardine (*Sardinops caeruleus*)], the large predators [king or Chinook salmon (*Oncorhynchus tshawytscha*), sablefish (*Anoplopoma fimbria*), sharks)], and some demersal species [English *Parophrys vetulus*) and petrale sole (*Eopsetta jordani*)]. Many important species of rockfish are found over rocky reefs and chinook and coho (*Oncorhynchus kisutch*) salmon as well as steelhead trout can all be found within the boundaries of the affected waters.

Sandy intertidal areas are used by small pelagic species [California grunion (*Leuresthes tenuis*) and smelt (*Atherinopsis spp.*)] that use the beaches of the inner bay for spawning. Other species that forage near sand flats include the surf perch (Family *Embiotocidae*), striped bass (*Morone lineatus*), jack smelt, sand sole (*Pegusa lascaris*), Pacific sanddab (*Citharichthys sordidus*), and starry flounder (*Platichthys stellatus*). Most of the finfish found in shallow rocky reefs are also common in kelp beds. The kelp canopy, stipes, and holdfasts increase the available habitat for pelagic and demersal species and offer protection to juvenile finfish. Greenling (*Hexagrammos sp.*), lingcod (*Ophiodon elongatus*), and numerous species of rockfish are the dominant fishes.

The rocky intertidal habitat is characterized by a rather small and specialized group of fish adapted for life in tide pools and wash areas. The most representative species are the monkey-face eel (*Cebidichthys violaceous*), rock eel (*Pholis gunnellus*), dwarf surfperch, juvenile cabezon (*Scorpaenichthys marmoratus*), sculpins (*Cottidae sp.*), and blennies (*Blennius sp.*) (California Department of Fish and Game 1979).

Fishes in the submarine canyon of MBNMS are characterized by a variety of little known meso-and bathypelagic species. Because the canyon allows deep-living species to come

close to shore, many uncommon deep-sea fishes have been taken in Monterey Bay. Anderson *et al.* (1979) reports fishes belonging to 41 families were captured in Monterey Bay by Moss Landing Marine Laboratories or by fishermen. Several of the species were previously unrecorded in the area, while others were extremely rare or far beyond their normal range.

Few fishes live year-round in sloughs and estuaries although some fish such as the tidewater goby (*Eucyclogobius newberryi*) and the stickleback (*Gasterosteus aculeatus leiurus)* depend upon the more brackish upper reaches of the estuarine habitats. Full time residents such as the staghorn sculpin and the bay pipefish depend upon the mud, eelgrass and other microhabitats to feed, reproduce and hide from predators. Mid-water swimmers such as the Northern anchovies, Pacific herring, topsmelt and jacksmelt also use the area for feeding while simultaneously using the microhabitats for protection from predators (Silberstein and Campbell 1989). Large marine predators such as bat rays (*Myliobatis californica*) and leopard sharks (*Trakis semifasciata*) forage extensively on the benthic fauna of the more saline lower reaches of the estuaries. Sardines were the basis for an extensive fishery in the 1930's. Overfishing caused stocks of the Pacific sardine to decrease until the fishery collapsed.

Turtles

Four species of sea turtles are found in the affected area. The Leatherback (*Dermocheysp coriacea)* is the most common followed by the Green (or Black) turtle (*Chelonia mydas agassizi*), the Loggerhead turtle (*Caretta caretta*) and an occasional Olive Ridley (*Lepidochelys olivaceas*). There are no sea turtle nesting areas in the affected area. They are mostly seen during their foraging activities in the summer and early fall. Most appear during the warmest sea temperatures (above 16 degrees C and most common above 18 degrees C). Many of the turtle's distributions seem to be regulated by the 16 degree C isotherm (Scott Eckert NOAA/NOAA Fisheries, *pers. com.*).

Algae

Large marine algae, or seaweeds, are diverse and abundant within the affected area. The extent of this diversity is shown by the presence of over 500 of the 669 species of algae described for California (Abott and Hollenberg 1976). The area has the largest marine flora of the temperate northern hemisphere, with numerous endemic species and the only population of one large understory kelp (*Eisenia arborea*) between southern California and Canada.

The seaweeds of the Monterey Bay area are composed of three main phyla: red algae (Division *Rhodophycota*), brown algae (Division *Phaeophycophyta*), and green algae (Division *Chlorophycota*). They occur primarily in areas of rocky substrate and only rarely in water deeper than 40 m (Abbott and Hollenberg 1976). The most extensive algal communities are dominated by forests of giant kelp and bull kelp (*Nereocystis*

leutkeana). Bull kelp rejuvenates itself annually; giant kelp is generally perennial, growing all year.

Kelp beds are continuous from San Simeon in the south of the affected area to the city of Monterey. Within Monterey Bay from the city of Monterey to south of Santa Cruz there are no kelp beds due to the sandy substrate of the shore. Kelp beds are thick off of Santa Cruz and intermittent up to Año Nuevo. Kelp is rare from Año Nuevo to Half Moon Bay, the northern limit of its distribution. The Santa Cruz County coast between Terrace Point and Point Año Nuevo has changed from almost total dominance of giant kelp in 1911 to an increase in the number of bull kelp stands (Yellin *et al.* 1977). Although sea otters may produce further changes, the primary factors affecting these kelp forests appear to be storms and substrate composition (reviewed in Foster and Schiel 1985).

In addition to the marine and coastal types of algae, the estuary and slough habitats provide sheltered areas for an abundant growth of marine algae as well as specifically adapted vascular plants, such as eelgrass (*Vallisneria gigantean*) and pickleweed *Salicornia* sp.) that in turn provide rich micro-habitats for other organisms.

2.2 Threatened and Endangered Species

The federal Endangered Species Act of 1973 (16 USC 1531 et seq.) and the California Endangered Species Act of 1970 (Ca. Fish and Game Code 2050 et seq.) direct the protection and conservation of listed endangered and threatened fishes, plants, and wildlife. The habitat of endangered, threatened and rare species takes on special importance because of these laws and the protection and conservation of these species requires diligent management of their habitat. Six state and/or federally listed bird species and one federally listed mammal species are found in the area affected by the Command Spill.

The Marbled Marbled Murrelet is a federally listed threatened species and State listed endangered species that was injured in the Spill. Marbled Murrelets, a member of the alcid family, are a robin-sized seabird that feed on small fishes and can fly up to 50 miles inland to nest on the large branches of mature conifers. Marbled Murrelets range along the Pacific coast from Alaska to California with some wintering birds found as far south as northern Baja California, Mexico. The total world population is estimated at 263,000 to 841,000 individuals (Nelson 1997). The size of the Marbled Murrelet population in Washington, Oregon and California was estimated at 18,550-32,000 (Ralph *et al.* 1995). In 1992, due to the anticipation that "the species is likely to become endangered within the foreseeable future throughout a significant portion of its range" (Stein and Miller 1992), largely because of logging of old-growth forests, the USFWS listed the Marbled Murrelet as threatened in California, Oregon and Washington. Due to logging and habitat modification only 2.5 percent of original old-growth forests remain in California. In addition to removal and degradation of nesting habitat, the following are also known threats: predation, gill-net fishing operations, oil spills, marine pollution, and changes in prey abundances and distribution (USFWS 1997). Marbled Murrelets have a high vulnerability to oiling, and oil spills have had catastrophic effects when they have

occurred in the vicinity of Marbled Murrelet concentrations (USFWS 1996). Additionally, predation of eggs and chicks was found to be a major cause of nest failure (Nelson and Hamer 1995). Nelson and Hamer (1995) further predict that even small increases in predation can have deleterious effects to population viability due to low reproductive rates.

Once a species is listed as threatened, the federal Endangered Species Act (ESA) requires the preparation and implementation of a recovery plan. The ESA recovery plan for Marbled Murrelets identifies stabilizing and increasing habitat quality and quantity on land and at sea as the key means to stopping population decline and encouraging future population growth. This approach assumes that the species will respond positively to a long term reversal in the trend of habitat loss. The ESA recovery plan recommends the following short and long-term actions to stabilize and increase the population: (1) maintain as much occupied habitat as possible; (2) maintain and enhance buffer habitat; (3) decrease adult and juvenile mortality; (4) minimize nest disturbances to increase reproductive success; and (5) increase speed of development of new habitat (via silviculture practices).

A relatively isolated population of approximately 500 birds breeds in the Santa Cruz Mountains of San Mateo and Santa Cruz Counties, the area of the Spill. This population of Marbled Murrelets is in decline, probably due to low productivity (Peery *et al.* 2002). Low productivity likely reflects poor breeding success, most likely from predation. This low productivity could also reflect the development of a larger than normal nonbreeding segment of the population (possibly from immigration, loss of habitat, or other factors). This central California population forages off the coast from Half Moon Bay to Santa Cruz. Foraging activity primarily occurs within 0.5 – 2.0 miles of shore. Many of the Marbled Murrelets in the Santa Cruz area winter in Monterey Bay and concentrate in Año Nuevo Bay throughout the breeding season which occurs from May to early September. The Trustees estimate that 87 Marbled Murrelets were at risk during the Spill and that 6 to 12 Marbled Murrelets were killed as a result of the Spill (see section 3.1 of this RP/EA).

The Brown Pelican is a State and federally listed endangered bird found in the Spill area and is known to have been injured by the Spill. The species is a large bird weighing up to 8 pounds with a wing span of up 10 feet. The pelican breeding population on Anacapa was nearly extirpated in the late 1960s and early 1970s due to almost total reproductive failure attributed to excessive eggshell thinning associated with very high levels of *p.p'*-DDE, the principal metabolite of DDT (Gress 1994, Risebrough *et al.* 1971). As a result, the Brown Pelican was accorded endangered species status by the USFWS in 1970 and by the California Fish and Game Commission in 1971. DDT was banned in the U.S. in 1972 and since then Brown Pelicans numbers have increased. Today they are close to, or above, historical population sizes. During the Spill response, the Trustees collected four dead pelicans and 6 live oiled pelicans, two of which died following treatment. In addition, five Brown Pelicans were observed visibly oiled but not captured. Other pelicans were estimated to have been at risk and/or killed as a result of the Spill (see Section 3.1 of this Plan/EA). Pelicans are seasonal migrants to the California coast

during the late summer, fall and winter months following their dispersal from breeding colonies on Anacapa and Santa Barbara Islands in Southern California and islands in Mexico. They feed and roost throughout San Francisco Bay and coastal waters.

Communal roost sites are essential habitat for Brown Pelicans at all times of year, throughout their range (Gress and Anderson 1983, Jaques 1994). Brown Pelicans are unlike many seabirds in that they have wettable plumage (Rijke 1970) and will become heavy and hypothermic in cold water if they do not come ashore regularly to dry and restore their plumage. Brown Pelicans spend a large portion of their daily time budget at terrestrial roosts. These birds have many behavioral adaptations, including careful habitat selection, in order to conserve energy, as they are among the heaviest flying birds (Pennycuik 1972). Roost site selection is based on proximity to prey resources, isolation from potential predators and human disturbance, and microclimate features that aid in thermoregulation. Pelicans spread out to a larger number of roosts by day and gather into a smaller number of highest quality roosts at night. Island-type habitat is generally required at night. Major night roosts support hundreds to thousands of pelicans on a given night (Briggs and Chu 1987, Jaques and Anderson 1988, Jaques *et al.* 1996).

Other State or federally listed sensitive species found in the area of the Spill include: the Short-tailed Albatross (*Diomedea albatrus*), the American Peregrine Falcon (*Falco peregrinus anatum*), the California Least Tern (*Sterna antillarum browni*), the Western Snowy Plover (*Charadrius alexandrinus nivosus*) and the Steller sea lion (*Eumetopias jubatus*).

2.3 Archeological and Cultural Resources

Humans settled in the vicinity of the affected environment at least 10,000 years ago. At the time of Spanish arrival in the early 1700's, about forty Native American tribes populated coastal areas from San Francisco Bay to Point Sur. The size of coastal middens suggests that Native Americans were a principal control of animal population sizes in the intertidal zone in some areas. The Spanish, the first European settlers, arrived in the late 1700s, and began to exploit sanctuary resources by hunting sea otters and harvesting abalone for trade with northwest coast Native Americans.

Many shipwrecks along this coastline are a result of significant maritime exploration and trade, coupled with a coastline dotted with shallow, rocky headlands that are largely exposed to prevailing winds and storms. More than one hundred wrecks have been documented in this region, and there are undoubtedly more that are unrecorded.

2.4 Sandy and Rocky Intertidal Habitats

Sandy beaches are the dominant intertidal habitat within the affected area. This is a very dynamic habitat with constantly shifting sands caused by wave action and the along shore transport of sand. Most animals capable of tolerating the stresses of the intertidal area are burrowing organisms. The overall productivity of this habitat is lower than that for rocky intertidal habitats (Nybakken 1982).

Polychaete worms, bivalve mollusks, and crustaceans are the predominant invertebrates on sandy beaches. Sand dollars (*Clypeaster subdepressus*) and gastropod mollusks are also found here (Wilson 1986). The only fishes that are common are those that use sandy beaches for spawning [e.g., the surf smelt (*Hypomesus pretiosus*)]. Benthic diatoms are the only marine algae that may be present and growing within this habitat, although kelp beds may be common in subtidal habitats just offshore from sandy beaches. However, drift algae may accumulate on some sandy beaches, providing refuge and food for amphipods, insects, and shorebirds.

Rocky intertidal habitats are highly productive and diverse environments and located throughout the affected area within the lowest and highest tidal level. Organisms living in this area must be able to withstand periodic desiccation, high temperature and light, low salinities, and strong wave action (Nybakken, 1982). Variation in the degree of exposure to these environmental factors can create marked zonation patterns within this habitat (Foster *et al.* 1988). Marine plants are primarily red, brown, and green algae. The invertebrates include mostly sessile species such as mussels, barnacles (Infraclass *Cirripedia*), and anemones (Order *Actiniaria*). Mobile grazers and predators include crabs (Order *Decapoda*), amphipods (*Stygobromus sp.*), littorine snails (Class *Gastropoda*), limpets (Subclass *Streptoneura*), sea stars (Subclass *Asteroidea*), and sea urchins. Tidepool fishes include the striped surfperch (*Embiotoca lateralis*), tidepool sculpin (*Oligocottus maculosus*), and tidepool snailfish (*Liparis florae*).

Rocky intertidal habitats are probably the most well studied of all habitats in and adjacent to Monterey Bay. These habitats are not uniform within Monterey Bay, but vary in composition within short distances. In addition, Asilomar Beach and Point Sur are well known areas for invertebrates and the Fitzgerald Marine Reserve has one of the largest intertidal reefs in California supporting an extremely diverse and abundant array of invertebrate species.

2.5 Recreational Services

The Central California coast is well known for its scenic rocky coastline, open sandy beaches, and picturesque coves. Because much of the San Mateo County coast is undeveloped, many of these beaches have a remote, wild feeling to them. At the same time, Highway 1 and ample parking lots and pull-outs provide easy public access. These beaches host a wide range of recreational activities, including general beach use, hiking, biking, fishing, surfing, camping, wildlife viewing, horseback riding, and other specialized uses. Among the most well-known beaches in the area are the Fitzgerald Marine Reserve (containing Moss Beach and Seal Cove), Pillar Pt. (including Maverick's, a well-known surfing area), and Montara, Half Moon Bay, San Gregorio, Pomponio, Pescadero, and Bean Hollow State Beaches.

3.0 Injured Resources

The primary impacts from the Spill were: 1) injuries to seabirds; 2) injuries to sandy beach and rocky intertidal shoreline habitats; and 3) lost and diminished use of beaches for human recreation.

3.1 Seabird Resources

Oil is extremely harmful to birds that come in direct contact with it. First, many of the birds that come into direct contact with oil die of hypothermia as a result of oil coating their feathers. Others die from oil toxicity resulting from oil ingestion, or from oil inhalation which can cause pneumonia or emphysema. Finally, reproductive output may suffer, because reproduction by surviving oiled birds may be impaired for one or more breeding seasons.

During the Spill, 171 live and dead birds were recovered from the beaches. Table 1 (below) lists these by species, enumerating the number that died and the number that were rehabilitated and released. This spill, unlike many that occur along the Pacific coastline, remained at sea for several days before coming ashore. As a result, many bird injuries may not have been observed. After an oil spill only a fraction of the number of birds injured are actually recovered. Birds may be lost at sea, scavenged at sea or on shore, missed by searchers, or live debilitated birds may fly out of the search area. Many birds die at sea and sink; a few crawl into secluded spots on land. The likelihood of retrieving a carcass decreases with the decreasing body size of the bird (Carter *et al.* 2000). For example, deposition of Marbled Murrelet carcasses on Northern California beaches is unlikely because of low onshore transport, currents, at-sea carcass sinking, and scavenging by other wildlife (Ford *et al.* 1996). Many of the animals recovered alive and subsequently cleaned at rescue centers do not survive the process or have a reduced chance of surviving once released to the wild (Sharp 1996, Anderson *et al.* 1996).

In the alcid family, the Marbled Murrelet is one of the most vulnerable seabirds in the world. Due to the small size of the bird, it would be unlikely to be found after it dies. Beach scavenging of birds by mammal and avian scavengers also undoubtedly contributed to low carcass retrieval. Baseline beached bird surveys show an encounter rate of only 0.001 Marbled Murrelet carcasses per km. Only six Marbled Murrelet carcasses have been documented on beaches in the Spill area during non-oil spill surveys from 1993 – 2000 (Roletto *et al.* 2001). In comparison, the Common Murre, a much larger bodied and more abundant bird, is encountered in baseline surveys at a rate of 0.316 birds per km (Roletto *et al.* 2001) and a total of 1,332 Common Murres have been documented on beaches within the Spill area during non-oil spill surveys from 1993 to 2000. In evaluating the impacts of the *M/V Kure* and the *M/V New Carissa* on Marbled Murrelet populations, Ford *et al* (2000, 2002) estimated that on average only about 1 in 18 dead Marbled Murrelets would be recovered. Therefore, although Marbled Murrelets carcasses were not recovered during the Spill response (see Table 1), on-water surveys

and oil trajectory patterns indicate it is reasonable to assume that some mortality occurred.

During the Spill response, the Trustees conducted three forms of surveys: 1) aerial surveys for resources at risk at sea; 2) boat surveys for resources at risk and the collection of injured and dead specimens (specific focus on Marbled Murrelets) and 3) shoreline surveys for oiled wildlife, resources at risk, and the collection of injured or dead specimens. The purpose of these surveys was not only to collect oiled wildlife but also to identify resources that were potentially in the path of the oil or wildlife that were oiled but still mobile (for more information on resources impacted by the Spill see the Bird Injury Report available as part of the administrative record).

Table 1: Recovered Birds.				
SPECIES	**COLLECTED DEAD**	**COLLECTED LIVE – DIED**	**COLLECTED LIVE – RELEASED**	**TOTAL**
Common Loon (*Gavia immer*)	1	0	0	1
Pacific Loon (*Gavia pacifica*)	1	0	0	1
Western Grebe (*Aechmophorus occidentalis*)	1	0	0	1
Eared Grebe (*Podiceps nigricollis*)	1	0	0	1
Sooty Shearwater	11	0	1	12
shearwater, sp.	1	0	0	1
Double-crested Cormorant (*Phalacrocorax auritus*)	1	0	0	1
Brandt's Cormorant	1	0	0	1
cormorant, sp.	1	0	0	1
Brown Pelican	4	2	4	10
Surf Scoter (*Melanitta perspicillata*)	1	0	0	1
Common Moorhen (*Gallinula chloropus*)	1	0	0	1
Wandering Tattler (*Heteroscelus incanus*)	1	0	0	1
Western Gull	3	0	2	5
Glaucous-winged x Western Gull (hybrid)	0	1	0	1
California Gull (*Larus californicus*)	2	0	0	2
Common Murre	64	35	30	129
Unknown	1	0	0	1
TOTAL	**96**	**38**	**37**	**171**

Total Bird Mortality

The Trustees employed a mathematical model to obtain an estimate of the total bird mortality caused by the Command Spill (Boyce and Hampton 2002). By analyzing the aerial surveys conducted during the Spill and accounting for the amount of coastline inaccessible to searchers and carcass recovery rates documented in other spills, the model estimated that 11,193 Common Murres were at risk during the Spill and that a total of 1,490 murres were killed. By assuming that the proportion of Marbled Murrelets within the affected area that die as a result of oil exposure is the same as the proportion of Common Murres, the model also estimated that 87 Marbled Murrelets were at risk during the Spill and that 6 to 12 Marbled Murrelets were killed. For more information on this model see the Boyce and Hampton 2002 Report entitled Command Bird Injury Report, which is available as part of the Trustee's administrative record available at http://www.darcnw.noaa.gov/command.htm.

Although not the subject of a specific modeling exercise in the Bird Injury Report, the Trustees believe it is likely that several other species of seabirds were injured in the Spill but not recovered, i.e., Cassin's Auklets, Rhinoceros Auklets, Ashy Storm-Petrels, and Black-vented Shearwaters (*Puffinus opisthomelas*). The Bird Injury Report presents evidence that most of these species were detected in the post-spill surveys. One Cassin's Auklet was observed on a transect of the aerial surveys conducted during the response. Rhinoceros Auklets and Black-vented Shearwaters are frequently observed in the immediate vicinity of the oil spill and several were observed on aerial surveys conducted during the response. In order to maximize the amount of funds available for restoration, the trustees did not conduct modeling exercises for these seabird species (See 15 C.F.R. 990.27(c)). While no individuals of these species were collected during the response, all are pelagic species found in the vicinity of the Spill. Like the Marbled Murrelet, many of these species are small in size. As such, they would be expected to succumb quickly to oiling, be easily overlooked by search crews, and be removed quickly by scavengers. And, as with Marbled Murrelets, beachcast birds of this size are rarely found during oil spills.

3.2 Lost And Diminished Use Of Beaches For Human Recreation

The Spill interrupted recreational services to individuals participating in beach related activities from Montara State Beach to Bean Hollow State Beach. The predominant onshore recreational uses within the affected area include coastal hiking, nature observation (whale and bird watching), tidepooling, surfing and windsurfing, clamming and abalone diving, surf fishing, and duck hunting (Industrial Economics Inc.2001). Coastal access was interrupted for five days, from September 30 to October 4, 1998. During this period, service disruptions can be attributed to physical oiling and subsequent clean up activities.

Baseline use of the affected beaches was calculated from historic data. Based on historic data, it was estimated that 18,228 beach trips would have been taken in the absence of the Spill. It was estimated that 10 percent of the potential user population avoided the

beaches during the oil spill impact period of September 30 to October 4, 1998. It also was estimated that two percent of the potential user population avoided the beach during the week following the completion of clean up activities conducted during October 5 through October 11, 1998. Based on these assumptions, it was calculated that 1,823 individuals avoided the beaches during the impact period and 510 individuals avoided the beach during the following week. The value of these beach impacts was determined using the benefits transfer method, in which resource valuation estimates from existing studies are used to calculate the approximate value of lost and diminished services associated with affected activities. Using this approach, a value of $20.19 per person per day of beach recreation was derived. Applying this value to the total of 2,333 lost trips, the value of lost use is $47,108.

In addition to the lost use as a result of the Spill, the quality of use was also diminished. The number of diminished use trips during the oil spill impact period was estimated to be 16,405. Based on past use, it was estimated that each of these individuals experienced a 20 percent loss in utility due to the Command Spill (including associated clean up activities), which when valued results in a utility loss of approximately $4.04 per trip or a total diminished use value of $66,278. Combining total lost use with total diminished use, the total value of human use impacts resulting from the Command Spill was calculated to be $113,386. For more information of the valuation of human use losses please see the Estimate of Human Use Impacts from the T/V Command Oil Spill Report (by Industrial Economics Inc.) available as part of the administrative record.

4.0 Restoration Planning

4.1 Restoration Strategy

The goal of restoration under OPA is to make the environment and the public whole for injuries to natural resources and loss of services resulting from an oil spill. OPA and its implementing regulations (15 C.F.R. Part 990, hereafter referred to as the "OPA regulations") require that this goal be achieved by returning injured natural resources to their baseline condition and, if possible, by compensating for any interim losses of natural resources and services during the period of recovery to baseline.

Restoration actions under the OPA regulations are either primary or compensatory. Primary restoration is action(s) taken to return injured natural resources and services to baseline quicker than the natural recovery rate. The OPA regulations require that Trustees consider natural recovery alternatives in their consideration of primary restoration actions. Trustees may select natural recovery under three conditions: 1) if feasible 2) if cost-effective primary restoration is not available or 3) if injured resources will recover quickly to baseline without human intervention. Alternative primary restoration activities can include: natural recovery; actions that prevent interference with natural recovery; and more intensive actions expected to return injured natural resources and services to baseline faster or with greater certainty than with natural recovery.

Compensatory restoration is action(s) taken to compensate for the interim losses of natural resources and/or services pending recovery. The type and scale of compensatory restoration may depend on the nature of the primary restoration action and the level and rate of recovery of the injured natural resources and/or services given the primary restoration action. When identifying the compensatory restoration components of the restoration alternatives, Trustees must first consider compensatory restoration actions that provide services of the same type and quality and of comparable value as those lost. If compensatory actions of the same type and quality and comparable value cannot provide a reasonable range of alternatives, Trustees then consider other compensatory restoration actions that will provide services of at least comparable type and quality as those lost.

In considering restoration for injuries resulting from the Command Spill, the Trustees first evaluated possible primary restoration for each injury. Based on that analysis, the Trustees determined that all injured natural resources, except Marbled Murrelets, would best recover to baseline conditions over time through natural recovery. Therefore, the Trustees' preferred restoration alternatives are for primary and compensatory restoration for Marbled Murrelets and compensatory restoration for all other resources. In addition, given that natural recovery for many of the injured species may take many years, the proposed compensatory projects will also contribute, somewhat, to primary restoration by aiding natural recovery.

The Trustees considered twenty-three different restoration ideas and alternatives potentially capable of providing compensatory restoration for injuries from the Command Spill. Some of these ideas and alternatives were developed by the Trustees and presented in the scoping document; others ideas were provided to the Trustees by the public.

4.2 Criteria Used To Evaluate Restoration Project Concepts

OPA and other applicable laws require the Trustees to use monies in the Command NRD Account for restoring, replacing, rehabilitating and/or acquiring the equivalent of natural resources injured and services lost as a result of the Spill. These injuries and lost services include injuries to seabirds as well as impairment of habitat and human use along the coast of San Mateo County. The Trustees considered a reasonable range of restoration alternatives before selecting their preferred alternatives. Each restoration alternative was comprised of compensatory restoration components that address one or more specific injuries associated with the Command Spill.

The Trustee Council for the Spill developed two categories of selection criteria, the first being described as "threshold" and the latter described as "additional" criteria. The criteria used were developed from the OPA regulations and supplemental factors developed for this Spill. Restoration alternatives must achieve a minimum level of acceptance on the threshold criteria in order to receive further consideration under the additional criteria. The Trustee Council used the evaluation criteria listed below to consider and prioritize all restoration project alternatives, including alternative projects that were proposed by the public. The criteria are not ranked in order of priority. Preferred alternatives were then scaled to ensure that their size appropriately compensates

for the injuries resulting from the Spill.

4.2.1 Threshold Criteria

- Nexus to Injured Resources – As described above, restoration efforts must be directed at projects that restore, rehabilitate, replace, enhance or acquire the equivalent of the resources and services impacted by the Spill.

- Feasibility - Based on past experience or studies, the restoration projects must be technically and procedurally sound.

- Public Health and Safety – The possibility that a proposed alternative would create a threat to the health and safety of the public will be part of the evaluation process.

- Legality - The projects must comply with all applicable laws

4.2.2 Additional Criteria

- No Duplicate or Replacement Funding - The Trustees will not fund projects that are already going to be fully funded or accomplished by other means or should be funded by more appropriate sources.

- Likelihood of Success – Projects will be evaluated for their potential for success, including the level of expected return of resources and resource services. Performance criteria of projects will have to be clear and measurable.

- Cost Effectiveness – The projects will be evaluated by considering the relationship of expected project costs to the expected resource/service benefits from each project alternative.

- Multiple Resource Benefits – Benefits can be increased if proposed projects benefit more than one natural resource or resource service.

- Duration of Benefits – Long-term benefits are the objective of the restoration projects, and the Trustees will evaluate project alternatives according to their expected duration of benefits.

- Potential for Adverse Impacts – Evaluation of projects will include examination of potential adverse impacts on the environment and the associated natural resources.

- Opportunities for Collaboration – Cost effectiveness can be enhanced by matching funds, in-kind services, or volunteer assistance as well as coordination with on-going or proposed projects.

- Time to provide benefits- The Trustees will consider the time it takes for benefits to be provided to the target ecosystem and/or public. A more rapid response to providing benefits is favorable.

- Total cost and accuracy of estimate-The Trustees will evaluate the estimated total cost of each project alternative and the validity of the estimate. The total cost estimate should include costs to design, implement, monitor, and manage the alternative. The validity of cost estimates are evaluated based on the completeness, accuracy, and the reliability of methods used to estimate costs, as well as the credentials of the person or entity submitting the cost estimate to accurately estimate costs.

- Comprehensive range of projects- The Trustees will evaluate the extent to which a project contributes to a more comprehensive restoration package. Proposed project alternatives are evaluated for the degree to which it benefits any uncompensated spill injuries.

4.3 Evaluation of Environmental Restoration Alternatives

To reduce costs and avoid delays in restoration, the OPA regulations encourage Trustees to conduct the NEPA process concurrently with the development of the Restoration Plan. To comply with the requirements of NEPA, the Trustees analyzed the effects of each proposed alternative on the quality of the human environment. NEPA's implementing regulations direct federal agencies to evaluate the potential significance of proposed actions by considering both the context and the intensity of the action.

For most of the restoration actions considered, the appropriate context and area of potential significance of the action is regional, as opposed to national or worldwide. Several restoration alternatives included in this section are based on conceptual designs rather than detailed engineering refinements or operational plans. These alternatives may require additional refinements or adjustments to reflect site conditions or Project-specific NEPA and CEQA compliance may be needed for some of the proposed restoration projects once detailed implementation plans are developed. In addition, the cost estimates presented for each preferred project are the Trustees' best current estimate, and assume that project implementation will begin prior to 2005.

In accordance with the Consent Decree, the MOU and OPA, expenditures from the Command NRD Account are limited to restoring the injuries to seabirds, and to sandy beach and rocky intertidal shoreline habitats; and the lost and diminished use of beaches for human recreation that resulted from the Command Spill. To accomplish this goal the Trustees ranked restoration alternatives into two categories: preferred and non-preferred.

The restoration planning and public scoping process resulted in the identification of 10 preferred (Table 2) and 13 non-preferred (Section 4.7) proposed restoration projects. The public is encouraged to provide comments on these proposed projects during the 45-day comment period. The Trustees will review all comments received during the public comment period and analyze the need to modify the proposed restoration alternatives and/or the ranking and analysis of the alternatives, and identify any new alternatives prior to releasing the final RP.

4.4 No Action Alternative

NEPA requires the Trustees to consider a "no action" alternative, and the OPA regulations require consideration of the equivalent, "the natural recovery option". Under this alternative, the Trustees would take no direct action to restore injured natural resources or compensate for lost services pending natural recovery. Instead, the Trustees would rely on natural processes for recovery of the injured natural resources.

The principal advantages of this approach are the ease of implementation and the absence of monetary costs because natural processes rather than humans determine the trajectory of recovery. However, while natural recovery would occur over time for most of the injured resources, the interim losses suffered would not be compensated under the no action alternative. OPA clearly establishes Trustee responsibility to seek compensation for interim losses pending recovery of natural resources. Losses were, and continue to be, suffered during the period of recovery from this Spill, and technically feasible, cost-effective alternatives exist to compensate for these losses.

Table 2- Summary of Preferred Projects and Estimated Funding Allocations for the Command Oil Spill.

Project No.	Restoration Category and Project	Estimated Cost*
	Seabirds	
1	Marbled Murrelet Restoration and Corvid Management Project	$747,200
2	Marbled Murrelet Land Acquisition and Enhancement Project	$400,000
3	Seabird Colony Protection Project	$1,225,035
4	Common Murre Nesting Ledge Creation	$59,973
5	Brown Pelican Roost Site Enhancement and Creation Projects	$30,800
6	Seabird Entanglement Reduction and Education Program	$22,000
7	Sooty Shearwater Restoration Project	$365,400
	Lost Human Use	
8	Seal Cove Beach Access Improvement Project	$125,000
9	Half Moon Bay State Park Beach Access Improvement Project	$20,000
10	Mirada Surf Recreational Improvements	$50,000

* additional contracting and administrative costs may apply to each project

4.5 Preferred Alternatives

4.5.1 Marbled Murrelet Restoration and Corvid Management Project

4.5.1.1 Goals and Nexus to Injury

The goal of this project is to improve the nesting success of the Marbled Murrelet in the Santa Cruz Mountains of central California. The Command Spill is estimated to have killed six to twelve of these birds (Ford 2002).

4.5.1.2 Background

The Marbled Murrelet population of the Santa Cruz Mountains is small, isolated, and declining. At present, their rate of reproduction is insufficient to sustain the population.

The Marbled Murrelet is a small seabird in the alcid family (akin to puffins) found along the Pacific Coast from Alaska to California. At sea, it feeds by diving for small fishes in near-shore waters, typically within 5 km of the coastline. Unlike most alcids, the Marbled Murrelet nests up to 50 km (most within 30 km) inland in old growth coniferous forests (Nelson 1997). In California, it nests primarily in redwoods (*Sequoia sempervirens*) and occasionally in Douglas-fir (*Pseudotsuga menziesii*) greater than 300 years old (Hamer and Nelson 1995).

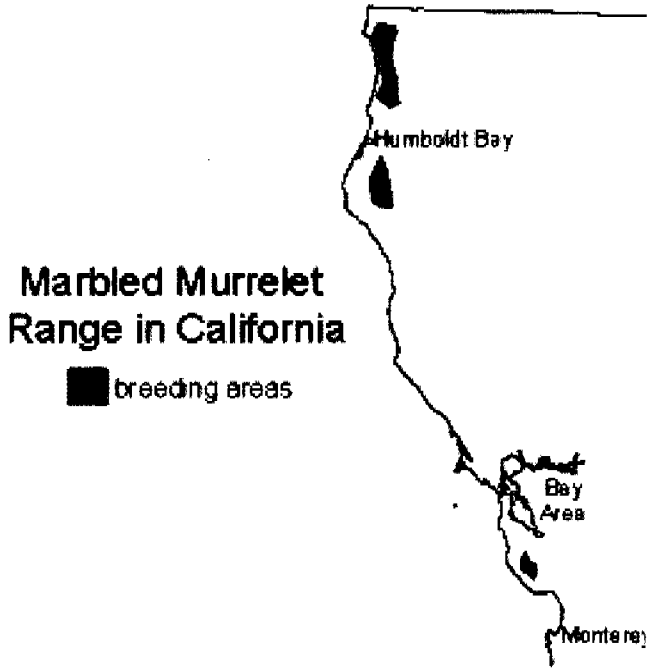


Figure 2: Marbled Murrelet breeding range in California.

The total world population of the Marbled Murrelet is estimated at 263,000 to 841,000 individuals (Nelson 1997). In California, the total population is estimated at 6,450 (Ralph and Miller 1995). The vast majority breed in the coastal redwoods of Del Norte and Humboldt Counties (Figure 2). A relatively isolated population of approximately 500 birds breeds in the Santa Cruz Mountains in San Mateo and Santa Cruz Counties of central California (Peery *et al.* 2002). A small number of birds may also nest at scattered locations in Mendocino County (Hamer, *pers. com.*).

In the Santa Cruz Mountains, nesting is largely limited to five adjacent watersheds: Pescadero Creek, Butano Creek, Gazos Creek, Waddell Creek, and Scott Creek. The nesting area thus encompasses approximately 15 miles from north to south and 10 miles from east to west. Within this area, the majority of nesting is thought to occur in five public parks or on adjacent private lands where suitable habitat still exists. The five parks are Big Basin Redwoods State Park, Butano State Park, Portola State Park, Memorial County Park, and Pescadero Creek County Park (Figure 3).

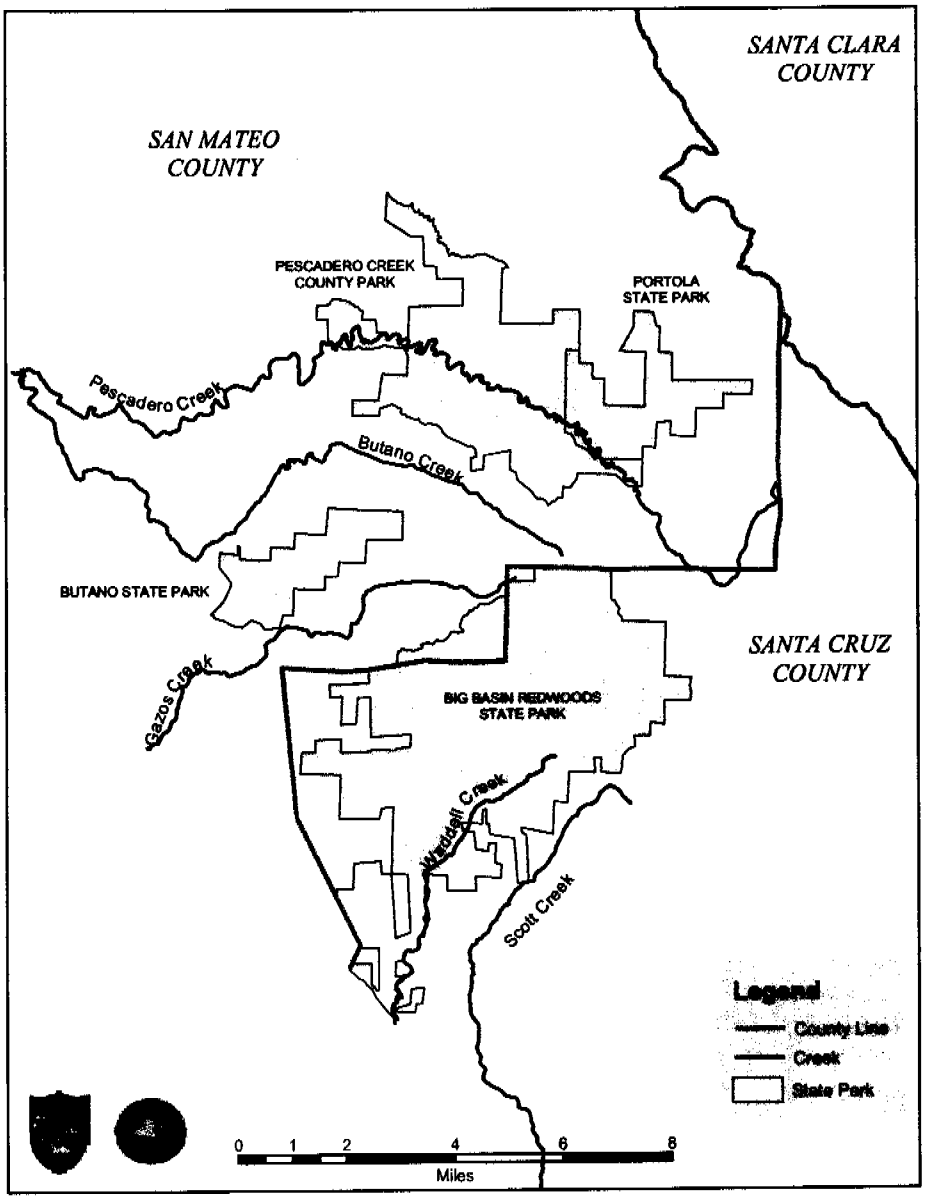


Figure 3: Primary Marbled Murrelet nesting area in Santa Cruz Mountains. Note that Memorial County Park is located in the western portion of Pescadero Creek County Park.

Several studies suggest that the Santa Cruz Mountain population is declining (Figures 4 through 7). The longest available data set (audio/visual detections from Redwood Meadow near Big Basin Redwoods State Park headquarters), suggests a continuous and pronounced decline in the number of nesting birds in that area. Formerly the site of the greatest detections, the current surveys report only a small fraction of the numbers recorded in the early 1990s.

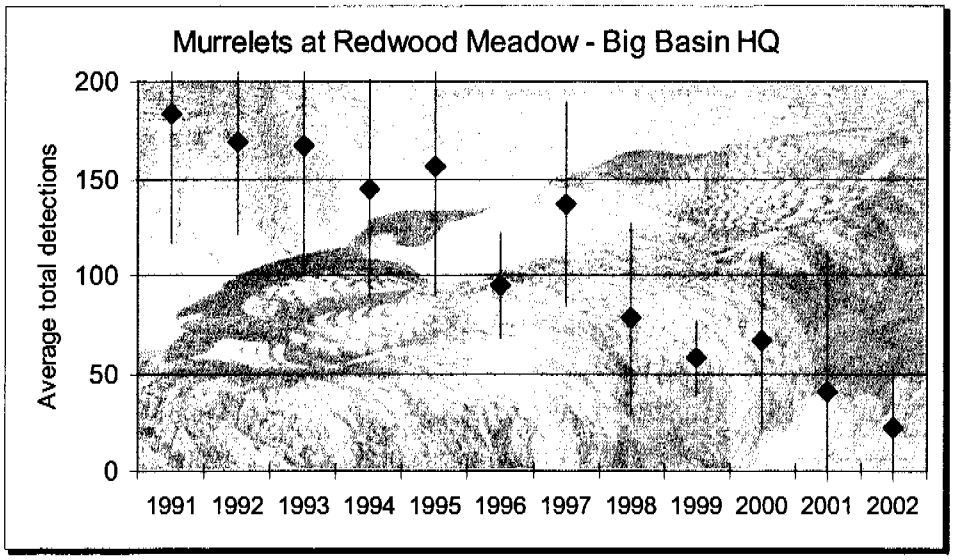


Figure 4: Average number of Marbled Murrelet detections at the Redwood Meadow – Park HQ, Big Basin Redwoods SP (Suddjian 2003a).

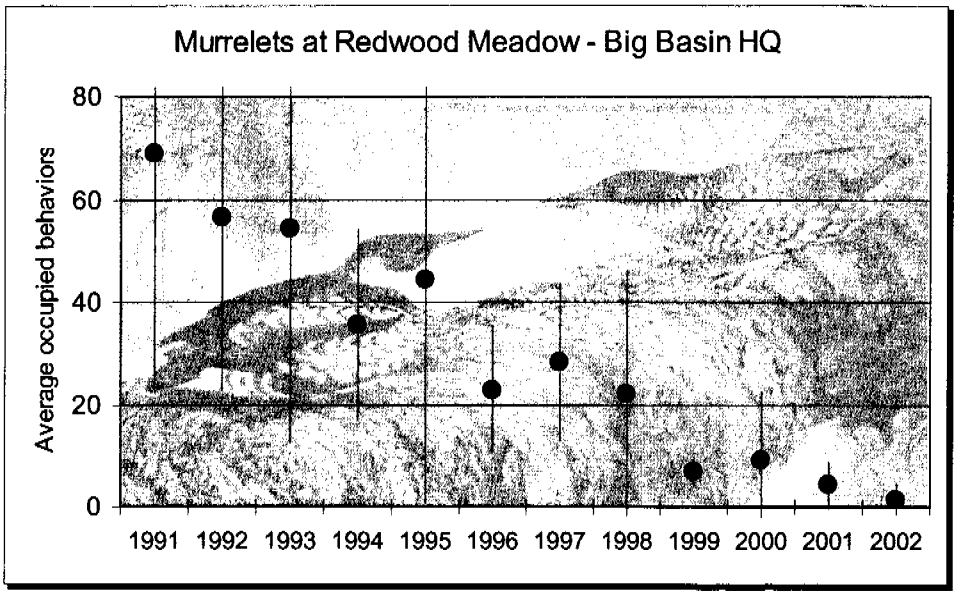


Figure 5: Average number of Marbled Murrelet detections with "nesting behavior" at the Redwood Meadow – Park HQ, Big Basin Redwoods SP (Suddjian 2003a).

Recent surveys partially funded by the Command Trustee Council revealed 16.3 detections at Redwood Meadow in 2003, with an average of 1.3 exhibiting occupied behavior (Suddjian 2003b). Other surveys span shorter time horizons, usually with just a few years of data. Nevertheless, some of these also show declines. For example, other survey sites within Big Basin Redwoods State Park have shown similar trends.

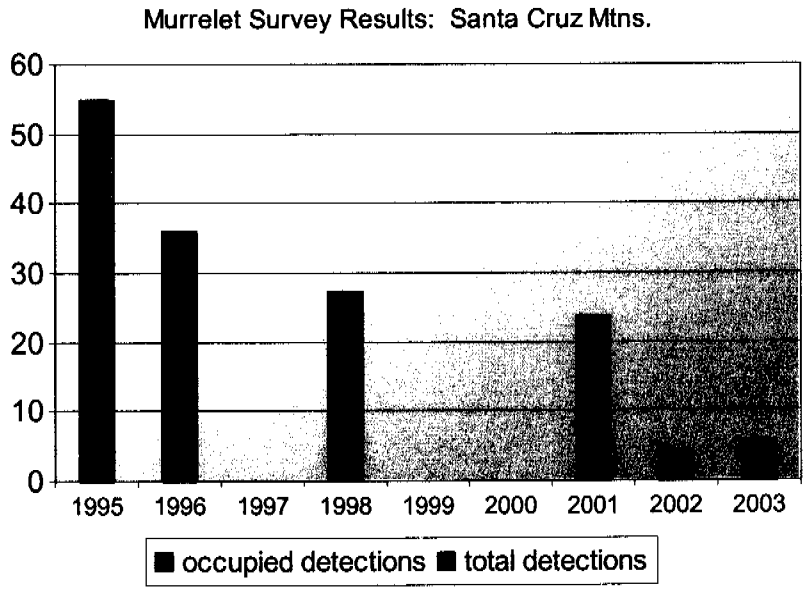


Figure 6-: Average number of Marbled Murrelet detections recorded at the five CDFG monitoring stations in Big Basin Redwoods SP (Suddjian 2003b).

Sites from other watersheds outside Big Basin have shown similar declines; only slight declines, or relatively stable numbers, though the total number of detections is relatively low when compared to former high counts at Redwood Meadow (Big Basin HQ). At-sea surveys have shown relatively stable population numbers, although with very few juveniles present (Beissinger, *pers. com.).* However, these surveys have only been conducted for three years and thus lack statistical power.

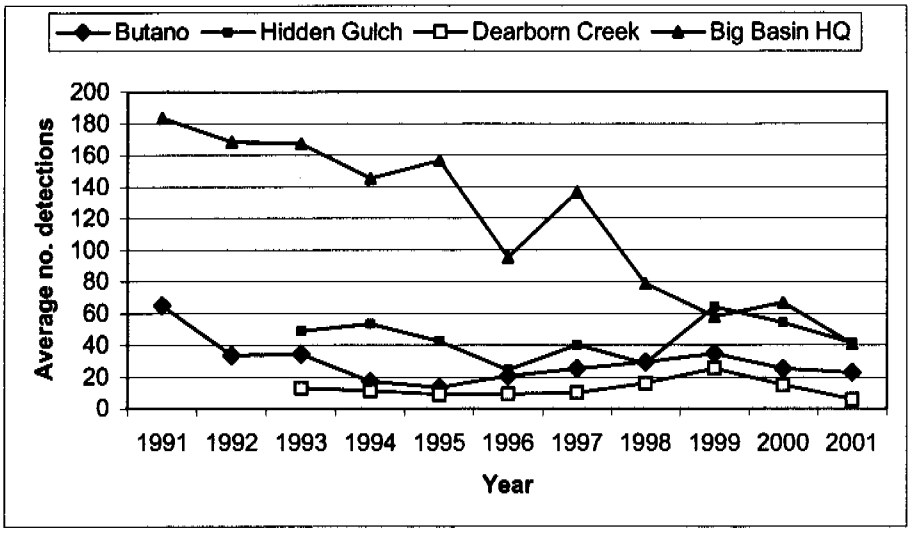


Figure 7: Comparison of Marbled Murrelet activity at four areas in the Santa Cruz Mountains. (Hidden Gulch and Dearborn Creek are located near Loma Mar in the Pescadero Creek watershed.)

The reason for the current decline is thought to be low reproductive success, likely compounded by low reproductive effort during years when foraging conditions are poor. Marbled Murrelets lay a single egg per year, though they may re-nest if they suffer an early nest failure. Recent studies of the Santa Cruz Mountain population suggest that reproductive success has fallen to near zero. Peery *et al.* (in review) estimates annual fecundity at 0.03 to 0.04, implying that only 3-4 young are produced per 100 pairs each year. Given that the species' adult annual survival rate is likely between 84% and 90% (Beissinger and Nur 1997), this fecundity rate implies that the Santa Cruz Mountain population, without immigration from other populations, will be extirpated within 25 years.

There are several factors that may be negatively impacting the Marbled Murrelets of the Santa Cruz Mountains. These include limited nesting habitat, nest predation, and probably reduced prey availability as a function of oceanographic events.

Historic logging of old growth redwoods has severely reduced the available nesting habitat. However, relatively limited logging has occurred in the last forty years and does not account for the recent decline in Marbled Murrelets. Peery et al. (in review) suggests that habitat availability is currently not a limiting factor, although the remaining habitat, because it is fragmented and subject to substantial predator pressure, may be sub-optimal for reproduction. Habitat availability, of course, does constrain future recovery of the population.

Nest predation is thought to be one of the primary causes behind the lack of reproduction of the Santa Cruz Mountains Marbled Murrelets. Nelson (1997), in discussing Marbled Murrelet fecundity in general, notes:

Predators contribute substantially to nest failure in North America (43% of 32 nests, Nelson and Hamer 1995; 71% of 14 nests, I. Manley *pers. com.*). Eggs may be preyed on when nests are neglected for short periods of time or abandoned, or if adult is chased off nest. Adults are vulnerable during incubation and during flights to nests. Chicks may be preyed on anytime during the 27-40 days they are along on nest.

Avian predators (1) of eggs: include Common Ravens (*Corvus corax*) and Steller's Jays (*Cyanocitta stelleri*), (2) of chicks: include Common Ravens, Steller's Jays, and Sharp-shinned Hawks (*Accipiter striatus*), (3) of adults on nest: include Common Ravens and Sharp-shinned Hawks, and (4) of adults flying in forests: include Peregrine Falcon (*Falco peregrinus*); Singer *et al.* 1991, Marks and Naslund 1994, Nelson and Hamer 1995, D. Suddjian *pers. com.*).

Note that corvids (i.e., ravens and jays) are some of the primary nest predators of Marbled Murrelets (see also Brand and George 2000). In the Santa Cruz Mountains, both Steller's Jays and Common Ravens are common. While the former have been present historically, the latter were apparently absent from the region until the mid-1970s. Raven numbers began to increase markedly by the late 1980s, and the raven population exploded in the 1990s, to the point where the species has become very numerous and widespread (Suddjian *pers. com.*). Two Christmas Bird Counts (CBCs) are conducted in the area, Santa Cruz County and Año Nuevo (Figures 8 and 9). These annual surveys seek to count all birds within a 15-mile diameter circle. From 1957 to 1972, no ravens were ever documented on either count. From 1973 to 1979, no more than ten birds were ever counted. In the 1980s, the number of ravens per count increased from 2 to 88 birds. In recent years, over 200 ravens have been documented within each count circle.

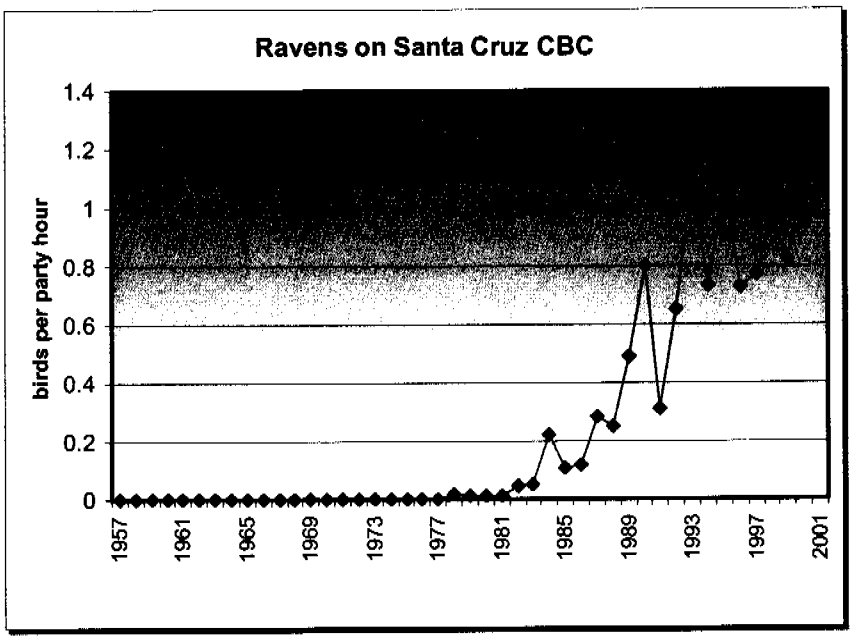


Figure 8: Numbers of Common Ravens on the Santa Cruz County CBC 1957-2001 (standardized by total party hours). Data courtesy of David Suddjian.

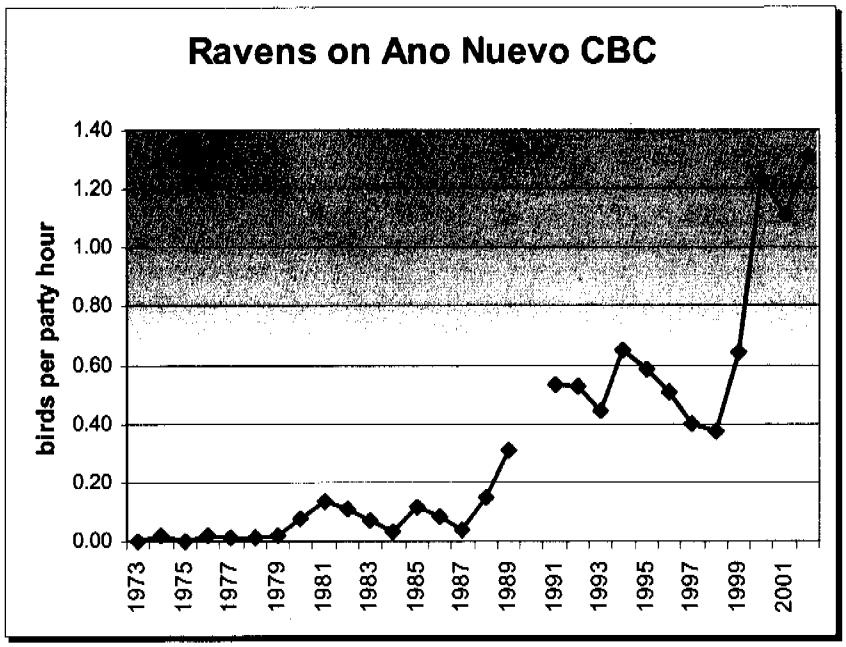


Figure 9: Numbers of Common Ravens on the Año Nuevo CBC 1972-2001 (standardized by total party hours).

It is suspected that the recent increase in ravens, especially around campgrounds within the parks where Marbled Murrelets nest, is a significant reason for the decline in the Marbled Murrelet population. Within the small region where nesting occurs, four public campgrounds (or complexes of adjacent campgrounds) are located, one within each of the public parks (not including Pescadero Creek County Park) (Figure 10 and Table 3). These campgrounds are also located within stands of old growth trees suitable for Marbled Murrelet nesting. Indeed, the Redwood Meadow survey site at Big Basin is immediately adjacent to a campground. In addition to the campgrounds, there are some private youth and group camps located in the area.

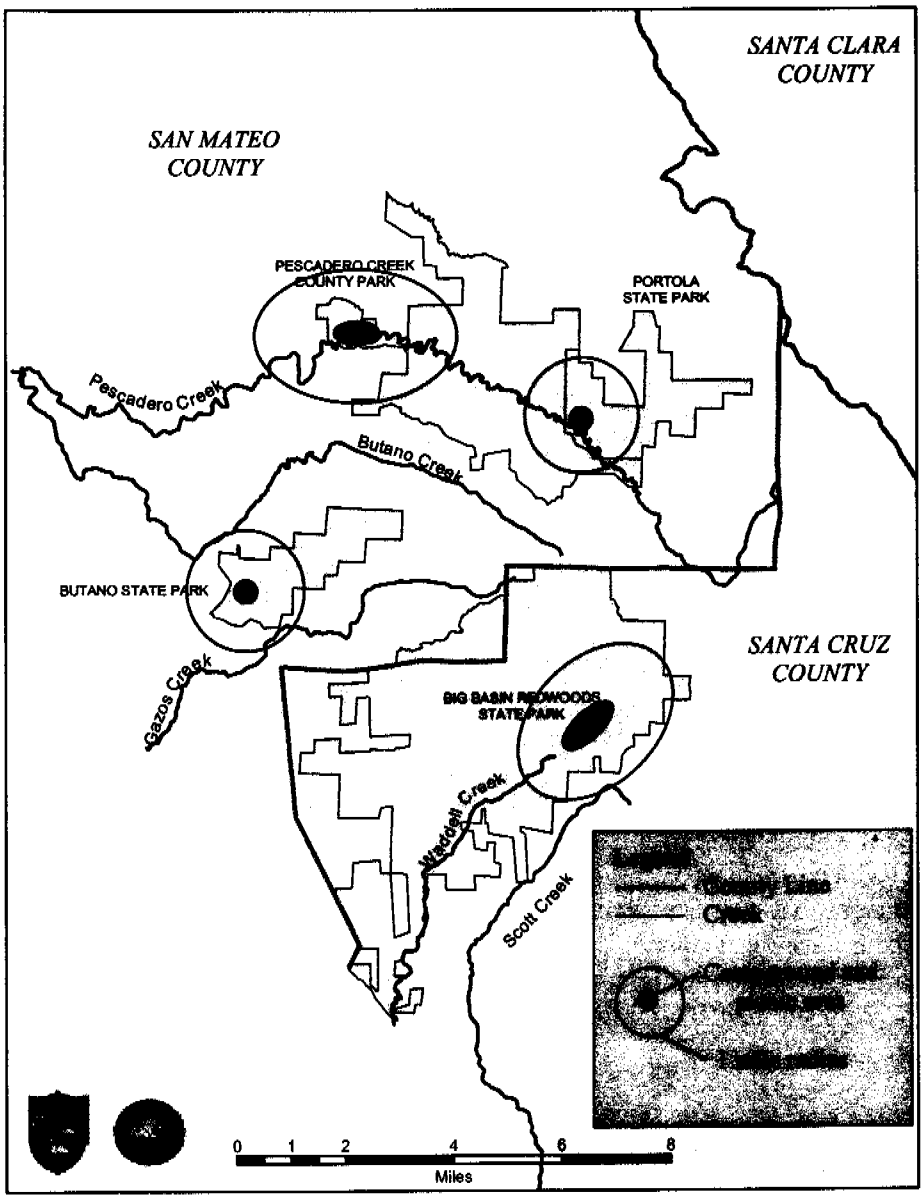
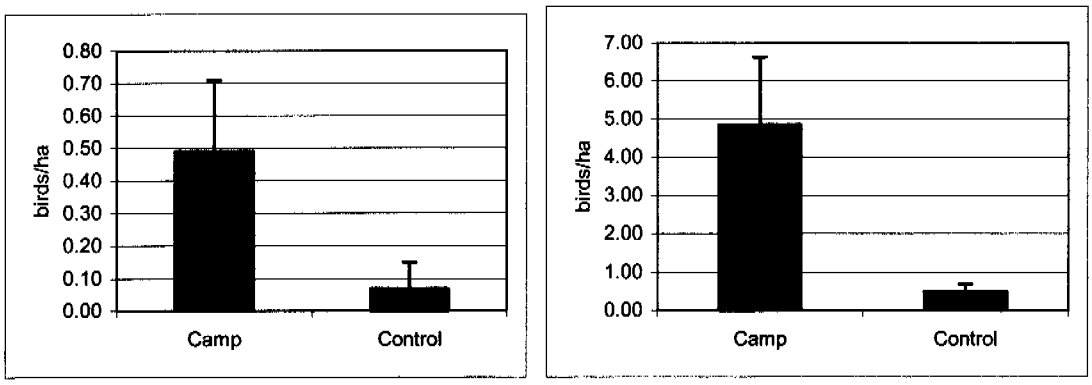


Figure 10: Location of campgrounds with one-mile radii, where corvids may range while foraging.

Table 3: Santa Cruz Mountains Campgrounds by Park

PARK	REGULAR CAMPSITES	GROUP SITES	PICNIC AREAS
Butano State Park	38	0	1
Memorial County Park	153	5	13
Portola State Park	67	4	4
Big Basin Redwoods State Park	183	2	4

Recent surveys have suggested that corvid density is especially elevated in campgrounds (Figure 11). This finding comes as no surprise, as these species readily scavenge human garbage, discarded food, and spilled food around picnic tables and other outdoor locations (Liebezeit and George 2002).



Common Raven **Steller's Jay**

Figure 11: Average relative abundance of corvids in campgrounds and away from campgrounds in Marbled Murrelet habitat at seven areas in the Santa Cruz Mountains. (Data from 2002). (D. Suddjian, *pers. com.*)

When trash receptacles are accessible to raccoons (*Procyon sp.*), squirrels, and foxes, corvids may feed off spilled food, or directly from the trash cans (Figure 12). Ravens, which have been termed "classic subsidized predators" (Boarman 2002), appear to be expanding from food sources on all sides of the Santa Cruz Mountains. To the north and south, they have become common visitors at the Ox Mountain Landfill near Half Moon Bay and at the Santa Cruz City Landfill. As many as 300 birds may be counted at once at a landfill (winter 2002-2003 Half Moon Bay Christmas Bird Count). Other garbage collection areas that may contribute to raven increases are the Ben Lomond Transfer Station, the Buena Vista County Landfill near Watsonville, and landfills in the south San Francisco Bay area. To the west, ravens are prevalent in agricultural fields and along the coast, where they utilize natural food sources deposited on the beaches as well as human food waste.

Figure 12: Open trash can and spilled garbage at Memorial Park campground, August, 2002.

Corvid predation of Marbled Murrelet chicks and eggs around the campgrounds in the Santa Cruz Mountains has been witnessed on several occasions (Singer *et al.* 1991, Suddjian 2003a). Given the difficulty in observing such an event, it is more likely that these few observations are symptomatic of regular occurrences, rather than chance observations of unusual events. Recent research in Redwood National Park has demonstrated that corvid predation of Marbled Murrelet nests is a serious problem (R. Golightly, *pers. com.*).

Because the Marbled Murrelet population is so small, there are probably fewer than 200 nests in the Santa Cruz Mountains each year. As such, Marbled Murrelet eggs and chicks would represent a minor component to the corvid diet. However, the loss of just 50 nests due to corvid predation would represent a major impact on the Marbled Murrelet.

Raven predation of endangered species is not a new problem. It has been widely documented in the Mojave Desert with respect to the Desert Tortoise. In that context, a comprehensive program to address anthropogenic food sources that support ravens is being recommended to supplement lethal control efforts (Boarman 2002). The problem of corvid management has also been addressed in a recent statewide Corvid Management Plan, which reviews many potential management options (Liebezeit and George 2002).

4.5.1.3 Project Description and Methods

Given that corvid predation is known to occur and that it is likely a significant cause in the recent decline of Marbled Murrelet nest success, and given that Marbled Murrelets nests around the four campground complexes where corvid densities are inflated, the Command Trustee Council proposes to increase Marbled Murrelet nest success through a multi-pronged approach to corvid management at the campgrounds. This project has many similar components to a project at Redwood National Park, Prairie Creek Redwoods State Park, Jedidiah Smith Redwoods State Park, and Mill Creek State Park that began in May 2003.

This project will consist of three phases:

Phase 1: Pre-implementation Monitoring

Prior to the implementation of corvid management efforts, monitoring will be conducted at the four campgrounds (Big Basin, Portola, Butano, and Memorial Park). This work was performed in the summer of 2003 for restoration planning purposes. Because direct monitoring of Marbled Murrelet nests is difficult, monitoring methods will include:

- <u>Marbled Murrelet surveys near all four campground areas.</u> In order to build on existing data sets and augment our ability to detect long-term trends, the surveys will include the following 11 audio/visual survey stations:
    1. Five stations at Big Basin Redwoods State Park (all five are pre-existing stations);
    2. Two stations each at Butano and Portola State Parks, and at Memorial and/or Pescadero Creek County Park (one station at Portola is pre-existing).
    All stations will have several surveys per summer.

- Jay and raven surveys at all four campground areas. In order to identify problem areas and monitor the success of the project, there will be a number of survey sites in high human activity areas (at Big Basin, Memorial Park, Butano, and Portola), plus several control sites spread through the parks where feasible. These surveys will be conducted several times per summer, approximately every month, May through August.

Phase 2: Corvid Management Efforts and Continued Monitoring
Corvid management efforts will be implemented at all four campground complexes. Because it may take several years for the results to be detected, all Phase 2 components will continue for five years. These efforts will include:

- Development of camper education materials and park staff training. This task requires developing educational materials for campground users, explaining the problems associated with human waste, corvids and other wildlife, and Marbled Murrelets, and offering instructions regarding keeping food and garbage from where animals can get it. These materials will include: (1) a brochure for campers and picnickers; (2) signs to be posted on food picnic tables, storage lockers, trash disposal areas, and in bathrooms; (3) the development of a short video and presentation devices for use in visitor centers. Additionally, this task will include familiarizing park staff with these issues, such that park staff may develop campfire programs on the topic as well as answer questions from the public.

- Improved garbage protection at Memorial County Park. Memorial County Park contains approximately 90 open trash cans with no lids (Figure 12). This makes it quite easy for corvids to access food waste. Additionally, raccoons and other animals may spill trash on the ground that is, in turn, eaten by corvids. This project will fund the acquisition of new garbage cans at Memorial County Park that can be secured with lids.

- Improved garbage protection at Big Basin Redwoods State Park. Big Basin Redwoods State Park contains approximately 40 large dumpsters with plastic lids. Holes are chewed in these lids by animals (primarily squirrels), allowing corvids to enter the dumpsters. This project will fund new aluminum lids. Additionally, dumpsters sometimes overflow between trash pick-up days. This project will fund new dumpsters as needed. Finally, garbage is stored in an open garbage truck for two weeks prior to disposal off-site. Ravens routinely access the truck and feed on the uncovered garbage while it is parked. Efforts to cover the garbage with tarps and use hazing devices to deter the ravens have been unsuccessful. This project will fund the construction of a shed in which to park the vehicle, which is the most cost-effective solution to this problem.

- Augmented seasonal staff. Despite educational materials and improved trash receptacles, campers and picnickers will need reminding about proper food storage and waste disposal. This task envisions the hiring of seasonal campground staff between Memorial Day and Labor Day. These staff will walk the campgrounds and picnic areas daily, monitoring for compliance of camping regulations and educating the public with regard to food storage and wildlife impacts from human actions. The project would fund two

full time seasonal staff at Big Basin, two at Memorial Park, and partially fund a position at Portola and Butano.

- Removal of ravens and nests. Based on field observations, it is estimated that approximately one pair of ravens is associated with each campground. It is thought that these ravens, which reside primarily among Marbled Murrelet nesting habitat, are the primary sources of nest predation. This task involves the removal of ravens (probably through trapping and euthanasia) and is intended to remove only those ravens immediately associated with the campgrounds. Because ravens are long-lived species, this component of the plan is necessary in order to achieve benefits in the short term (see Liebezeit and George 2002). It is hoped that, by combining this action with the other program components that limit human food waste, immigration of "replacement" ravens into the campgrounds will be minimized. Because the Memorial Park and Big Basin campgrounds are actually a complex of several adjacent campgrounds, more than one pair of ravens may be present at these sites. Removal of ravens will likely achieve considerable benefits. In the Mojave Desert, it was determined that nesting ravens spend most of their time foraging within 0.8 km of their nests (Sherman 1993). Likewise, evidence from the Mojave Desert suggested that certain ravens were responsible for taking relatively large numbers of tortoises (Boarman 2002).

- Removal of any nests of raven that immigrate into the campgrounds will also be done to the extent feasible. Removal of nests with eggs is likely to discourage re-nesting or reduce nest success (Boarman 2002). Nest removal will include all areas within an appropriate radius of Marbled Murrelet nesting habitat near the campgrounds.

The Marbled Murrelet and corvid monitoring surveys in Phase 1 will continue annually through each year of Phase 2.

Phase 3: Adaptive Management; Alterations to Corvid Management Efforts

The results of Phase 2 will be analyzed and evaluated between the second and third years of the project. At this time, we will consider alterations and improvements to existing Phase 2 components, as well as augmenting Phase 2 with additional measures. These measures may include:

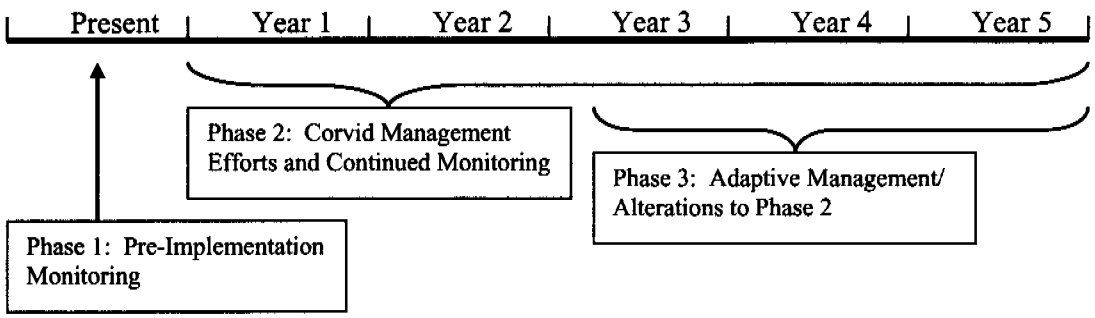
- improvements to camper education and food waste control efforts
- installation of food waste receptacles at water spigots (grates)
- improved garbage protection at Butano State Park
- additional removal of ravens
- efforts to limit corvid use of landfills
- expansion of education and other project components to private camps
- exploration of predation by Eastern gray squirrels

The effects of West Nile Virus on the corvid population will also be evaluated throughout the life of the project to determine appropriate levels of corvid management at the campgrounds. This virus is expected to impact California avifauna, particularly corvids,

in the near future. It is likely that the need for this program will remain, however, as surviving corvids will be attracted to campground areas. Nevertheless, changes to the project as a result of West Nile Virus may be incorporated during Phase 3.

Figure 13 below provides a timeline of the various phases.

Figure 13: Project Timeline



The project will also require two project managers to oversee all monitoring efforts and all corvid management tasks, to work with State Parks and county staff, to secure all necessary permits, and to report to the Trustee Council. One project manager will oversee efforts in the State Parks, as well as all project-wide activities (e.g., monitoring surveys), while another project manager will oversee only those activities specific to Memorial County Park.

4.5.1.4 Environmental Consequences (Adverse and Beneficial)

Beneficial Effects

The project is intended to improve Marbled Murrelet nest success through a decrease in predation caused by jays and ravens. Any improvement in nest success will help forestall the extirpation of the Marbled Murrelet from the Santa Cruz Mountains. Sustaining the Marbled Murrelet population through the next few decades will enable future Marbled Murrelets to access increasing amounts of protected old growth forest and second growth forest as it matures into suitable nesting habitat.

Because the campgrounds are located near the largest old growth trees, many known nesting stands with the highest Marbled Murrelet activity are near the campgrounds. Figure 12 illustrates the extensive area that the four campground complexes actually impact, assuming a one mile radius of foraging range by corvids. To the extent that the campgrounds serve as source populations for jays and ravens, the project may considerably lower corvid numbers in areas adjacent to the campgrounds as well. Consequently, those Marbled Murrelets beyond the immediate vicinity of the campgrounds may also benefit from the project.

The educational components of the project will teach the public about imbalances in the ecosystem that may be caused as different species respond positively and negatively to human actions. Specifically, the public will learn how seemingly innocuous interactions with wildlife (e.g., feeding jays at a picnic table) or poor housekeeping at a campsite (e.g., leaving a bag of chips on a table) sustains corvid populations at unnaturally high levels, which in turn can have long-term negative consequences for the Marbled Murrelet. The educational message may carry beyond the campgrounds to local residences and other human gathering places in the Santa Cruz Mountains (e.g., conference centers and private camps), resulting in increased awareness at those locations as well.

The results of the project will have research value that will be of interest in other locations where similar relationships between campgrounds, corvids, and Marbled Murrelets are suspected to occur (e.g., northern California, Oregon, and Washington).

Adverse Impacts

This project will have direct impacts upon both campers at these four campground areas and upon jays, ravens, and possibly other animals that scavenge food waste at campgrounds.

Campers may experience more rules and restrictions upon their food management and may be under the threat of enforcement action should they fail to comply. While this will likely make camping less convenient, such measures are commonplace in campgrounds where bears pose a threat to campers (e.g., Yosemite National Park, Redwood National Park, Olympic National Park, and many others) (Figures 14 through 17). Because locations with bear problems are popular camping destinations, most campers are accustomed to dealing with the inconveniences associated with food management restrictions. As it is most effective to address the root causes of raven predation pressure rather than to simply remove ravens, efforts to control anthropogenic food sources are critical in the long run (Goodrich and Buskirk 1995).

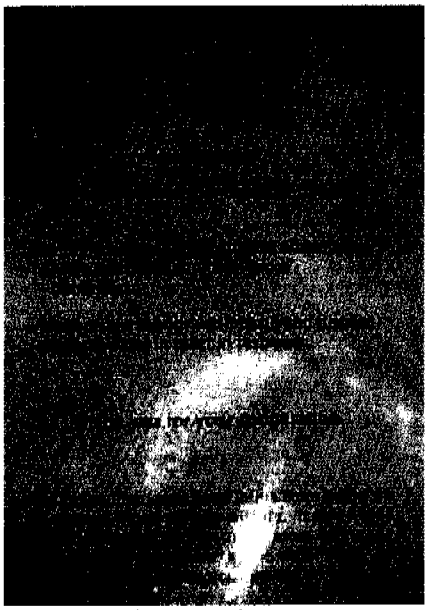


Figure 14: Sign at Tuolumne Meadows Campground, Yosemite National Park, California.

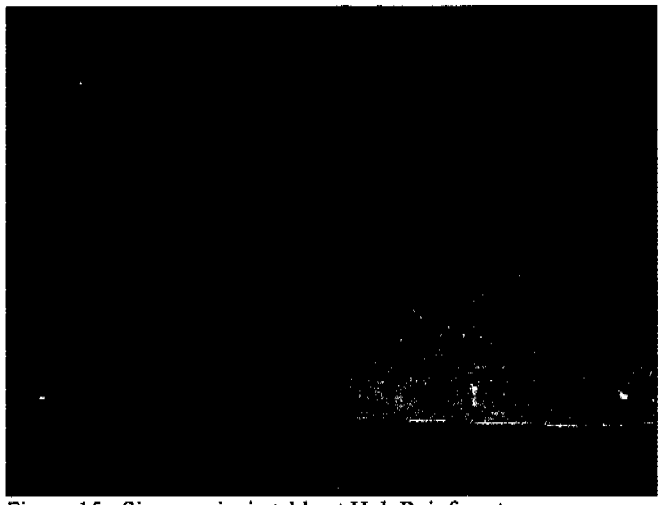


Figure 15: Sign on picnic table at Hoh Rainforest Campground, Olympic National Park, Washington.

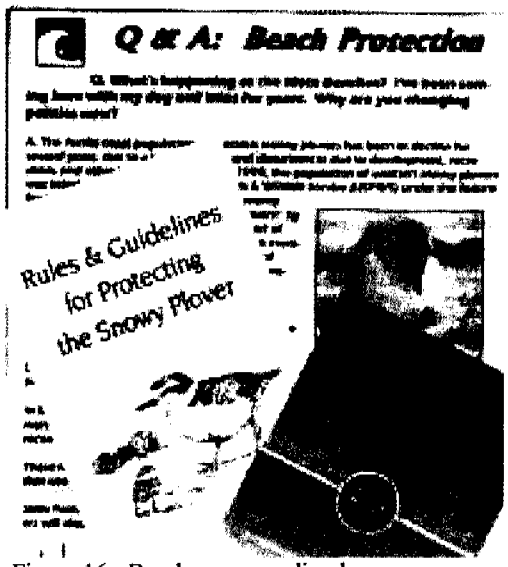


Figure 16: Brochures regarding human disturbance of Snowy Plovers at California State Beaches.

Figure 17: Sign at Redwood National Park.

Ravens will experience the most direct impacts. However, the overall raven population in Santa Cruz and San Mateo Counties will be unaffected. Because ravens are protected under the Migratory Bird Treaty Act, appropriate permits will be required for removal.

While jays and other animals such as raccoons will not be trapped and removed, they will likely experience a reduction in their available food supply beginning in 2004. For jays, this may lead to decreased fledgling survival and lower reproductive success. It may also cause jays to wander and leave the area, possibly subjecting them to increased predation or low nesting success. These adverse impacts are an inevitable part of the path from artificially elevated population levels to lower more natural population levels. Jays, raccoons, and other animals living outside of the campgrounds are not likely to be impacted.

One remote possibility is that Marbled Murrelets may experience *increased* nest predation in the initial year of the program, as corvids normally expecting to rely on campground food waste turn instead to natural food sources, including Marbled Murrelet chicks and eggs. The project will seek to minimize such an effect by implementing food control measures early in 2004 before the Marbled Murrelet breeding season begins and by removing certain ravens closely associated with the campgrounds. Jays are expected to decline with the initiation of the program, as decreased food availability results in decreased nesting effort and thus decreased jay density. Given these anticipated decreases in corvid numbers, the small number of Marbled Murrelet nests in the area, and the real possibility that all Marbled Murrelet nests are predated under current conditions, it is unlikely that predation of Marbled Murrelet nests will increase.

4.5.1.5 Probability of Success

The success of this project relies on several linkages: the link between project tasks and an actual reduction in food waste; the link between a reduction in food waste and an actual reduction in corvid numbers; and the link between a reduction in corvid numbers and an actual reduction in nest predation.

The first two linkages have been demonstrated at other campgrounds dealing with bear problems. For example, daily camper education, constant enforcement, and improved food waste receptacles at Yosemite National Park severely limits the amount of food available to wildlife. In the Santa Cruz Mountains, corvid density has been correlated with the level of campground occupancy (D. Suddjian, *pers. com.*).

Additionally, the elevated corvid levels already demonstrated in the Santa Cruz Mountains campgrounds suggest that corvids do depend on human food waste, and thus corvid numbers may be reduced by a reduction in food waste. The final link between corvid numbers and actual nest predation is difficult to measure directly, as Marbled Murrelet nests are difficult to find and study. However, experiments with artificial eggs have found that predation pressure declines with decreasing corvid density (Raphael *et al.* 2002). Thus, the project has a reasonable probability of success.

4.5.1.6 Performance Criteria and Monitoring

Because Marbled Murrelet nests are so difficult to find and nest predation so difficult to study directly, the success of the project will be monitored through a variety of indirect measures: annual audio/visual surveys of Marbled Murrelets near the campgrounds to detect the presence and relative abundance of breeding birds; annual surveys of jays and ravens both in the

campgrounds and at control sites to detect changes in corvid numbers as the project is implemented; and annual progress reports on the implementation of the corvid management tasks.

While no quantitative performance criteria will be established, the quantitative results of the various surveys and monitoring studies will be evaluated. Prior to the 2006 camping and breeding season, Phase 3 includes a project-wide evaluation with the anticipation that adjustments to the project may be made.

4.5.1.7 Evaluation

While this is a novel project with several uncertainties, the Trustees believe this is the best option available for restoring and enhancing the Marbled Murrelet population impacted by the Spill. We selected this project as a preferred alternatives for three reasons:

1) The condition of the Santa Cruz Mountain Marbled Murrelet population is so critical that a lower threshold regarding uncertainty is acceptable. As Boarman (2002) states, "When managing a threatened or endangered species, we must rely on the best available data and, when little or no data is available, it may be best to err on the side of the threatened or endangered species rather than risk greater population declines due to inaction. Most management decisions can be reversed or relaxed as new information is obtained, but a slip to extinction or critical endangerment may be irreversible."

2) This project has been identified by nearly every Marbled Murrelet researcher in the state as important and valuable, addressing a known problem (S. Beissinger, *pers. com.*, , Z. Peery, S. Singer, D. Suddjian, H. Carter, R. Golightly, T. Hamer, J. Shulzitski, L. Henkel, E. Burkett).

3) No other feasible project that addresses the low rate of reproductive success in the Santa Cruz Mountains has been identified. Note that land acquisition will benefit Marbled Murrelet populations in the future and make greater recovery of the population possible.

The Trustees have evaluated this project against all threshold and additional screening criteria developed to select restoration projects and concluded that this project is consistent with these selection factors.

4.5.1.8 Budget

The following table provides additional detail and budget information regarding each task. Note that these budgets are estimates. Actual amounts will vary depending upon competitive bids from outside contractors.

Phase 1 and 2 Monitoring Tasks

TASK		BUDGET
Audio/visual Marbled Murrelet surveys		$60,000
Jay and raven surveys		$72,000
	Sub-total:	**$132,000**

Phase 2 Implementation Tasks

TASK		BUDGET
Development and installation of camper education materials (brochures, signs, video)		$40,000
Improved garbage protection at Memorial Park (approximately 90 wildlife-proof garbage cans)		$60,000
Improved garbage protection at Big Basin (aluminum lids, new dumpsters, and new shed)		$40,000
Removal of ravens		$10,000
Augmented seasonal staff (4 full-time positions; 2 part-time positions; years 1 through 5)		$200,000
Project manager (State Parks) (years 1 through 5)		$183,600
Project manager (Memorial Park) (years 1 through 5)		$81,600
	Sub-total:	**$615,200**

Total cost of the project from for all years: $747,200.

4.5.2 Marbled Murrelet Land Acquisition and Enhancement Project

4.5.2.1 Goals and Nexus to Injury

The goal of this project is to protect and enhance nesting habitat of the Marbled Murrelet in the Santa Cruz Mountains of central California. The Command Spill is estimated to have killed six to twelve of these birds.

4.5.2.2 Background

The status of the Marbled Murrelet in the Santa Cruz Mountains is explained in detail under the Corvid Management Project description. In that section, it is noted that historic logging of old growth redwoods has severely reduced available nesting habitat in the Santa Cruz Mountains. This habitat loss has severely restricted the number of Marbled Murrelets that this region can support. Moreover, the habitat loss has caused the remaining Marbled Murrelets to nest in smaller and more marginal parcels, possibly subjecting them to greater nest predation and lower fecundity. While the Corvid Management Project aims to address immediate needs and recent trends regarding nest productivity, this project focuses on the long-term needs of the species to have suitable nesting habitat.

4.5.2.3 Project Description and Methods

Given that habitat loss is likely a major cause of the long-term decline of Marbled Murrelets in the Santa Cruz Mountains, the Command Trustee Council proposes to protect and enhance Marbled Murrelet nesting habitat through the acquisition and management of a parcel of forest land that supports nesting Marbled Murrelets. Surveys indicate that there are no remaining parcels that contain 100% virgin old growth. However, there are some parcels that contain some uncut old growth suitable for Marbled Murrelet nesting and that have been confirmed to host Marbled Murrelets. The Trustee Council used these characteristics as criteria in identifying parcels to protect in the Santa Cruz Mountains.

According to information furnished to the Trustee Council, opportunities to acquire property containing Marbled Murrelet nesting habitat are extremely limited at this time. This lack of availability is due to a number of factors. These include, for example, the highly specialized nature of habitat (e.g., old growth forests), limited suitability of location (e.g., sufficiently near current populations of Marbled Murrelets to serve as breeding habitat) and infrequency with which such properties are made available for acquisition (e.g., willing sellers). Working within these limitations, the Trustee Council has identified a parcel referred to as the "UC Regents Girl Scout Creek" property (Figure 18), located north of Butano State Park within the Butano Creek watershed. This parcel is 80 acres in size and is located in a remote area where access is difficult.

The parcel has been unevenly harvested several times and currently contains a mix of residual old growth clusters, especially in drainages on the southern half of the parcel. Four audio/visual surveys for Marbled Murrelets were conducted at one station in July 2002 by Bryan Mori Biological Consulting Services. "Occupied behavior" of Marbled Murrelets, suggestive of local nesting, was observed on all four visits. At least ten potential nest trees were noted in the immediate vicinity of this survey site as well. The parcel is also located near current Marbled Murrelet breeding pairs. It is located approximately one-quarter mile to the south of Butano State Park, which contains known Marbled Murrelet breeding pairs. This location also makes it susceptible to management by a State land steward, as the CDPR currently has an effective presence in the immediate vicinity of the parcel and a staff already in place. At this time, there is no public access to the parcel.

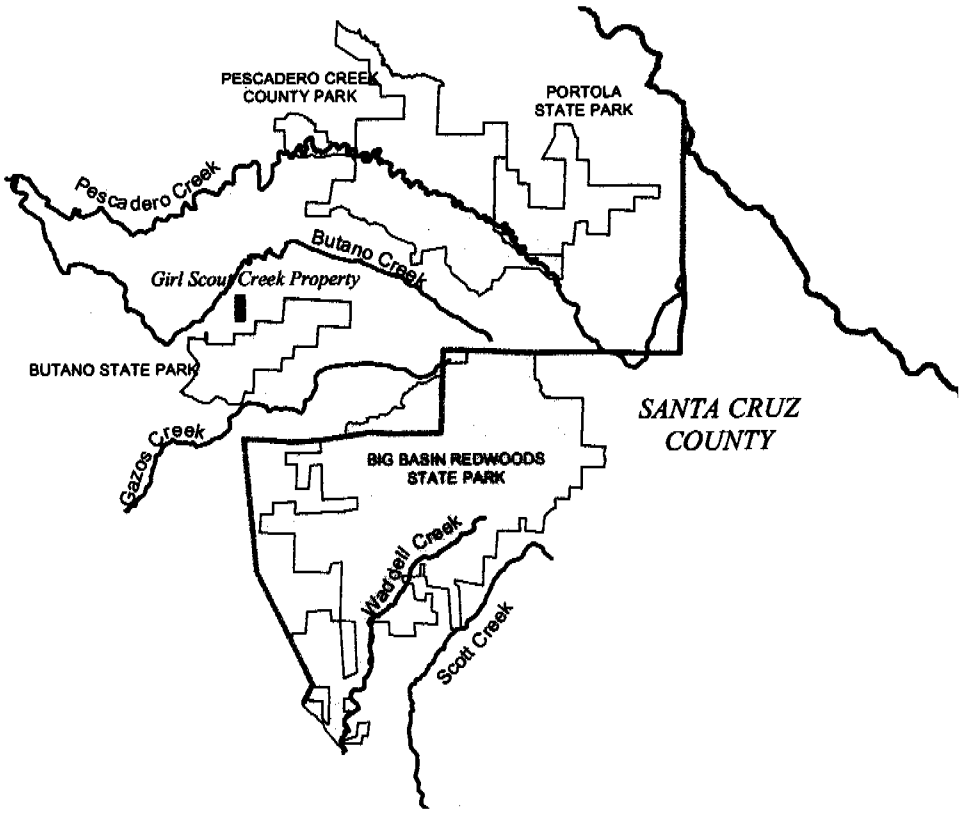


Figure 18: Approximate location of Girl Scout Creek property..

Currently, this parcel is being held by Save-the-Redwoods League, a non-profit conservation organization. The League recently acquired the parcel, reportedly to prevent the parcel from being placed on the open market by its prior owner. Save-the-Redwoods League is willing to sell the parcel to a State or federal land steward that will be able to permanently protect the habitat.

This project consists of providing up to $400,000 to be used for the following tasks: (1) resource inventory and development of guidelines for managing the parcel to protect and enhance Marbled Murrelet habitat ("habitat management guidelines); (2) acquisition of the parcel by CDPR provided CDPR agrees to manage the parcel as part of the State park system and in accordance with habitat management guidelines to be developed by the Trustee Council and CDPR; and (3) periodic monitoring of the habitat to ensure that all management guidelines are implemented and enforced.

These tasks will provide for protection and enhancement of Marbled Murrelet habitat in the Santa Cruz Mountains in a number of ways. CDPR will be a permanent land steward. It has staff and an on-site presence that will enable CDPR to manage the property day-to-day in a proactive manner. Those attributes combined with the transfer of the property to CDPR on condition that CDPR manage the property in accordance with approved habitat management guidelines should protect the Marbled Murrelet habitat and promote the continued (and perhaps increased future) use of the parcel by nesting Marbled Murrelets.

4.5.2.4 Environmental Consequences (Adverse and Beneficial)

Beneficial Impacts

This project will protect nesting Marbled Murrelet habitat and guarantee that it remains in existence into the future. Because the project focuses on the entire habitat, all other species associated with redwood forests should benefit as well.

Adverse Impacts

There are no obvious adverse impacts to wildlife or habitat from this project provided that the habitat is managed according to approved habitat management guidelines.

Given that there is no current public access to the property, there will be no adverse impacts to recreation uses.

4.5.2.5 Probability of Success

The probability of success is quite high. Such land acquisitions have been done in the past (e.g., by the Apex Houston Oil Spill Trustee Council) and such lands remain protected and still contain nesting Marbled Murrelets. There is no reason to expect Marbled Murrelets to abandon suitable nesting habitat.

4.5.2.6 Performance Criteria and Monitoring

Periodic updates by CDPR will be provided to the council regarding the status of the habitat and the implementation of the habitat management guidelines developed by the Council and CDPR.

CDPR will be responsible for periodic monitoring of the habitat to ensure that all management guidelines are implemented and enforced.

4.5.2.7 Evaluation

Habitat acquisition is an effective and practical method to achieve the restoration of injured Marbled Murrelets. However, opportunities to acquire property containing Marbled Murrelet nesting habitat are extremely limitedand make opportunities for Marbled Murrelet habitat acquisition unique. By providing funding to CDPR to take ownership of this habitat, the Trustee Council believes it is taking advantage of this unique opportunity to protect and promote Marbled Murrelet nesting habitat and to move the Girl Scout Creek property into the hands of a long-term land steward. Furthermore, by instituting land management guidelines, the Council is guaranteeing that no use of the land will jeopardize Marbled Murrelet nesting.

The Trustees have evaluated this project against all threshold and additional screening criteria developed to select restoration projects and concluded that this projects is consistent with these selection factors. The Trustees determined that this type and scale of project would effectively

provide appropriate compensation for Marbled Murrelets injured as a result of the Spill and have selected this project a preferred alternative.

4.5.3 Seabird Colony Protection Program

4.5.3.1 Goals and Nexus to Injury

Breeding seabirds, in particular species that nest on cliffs or offshore rocks such as Common Murres, are highly susceptible to negative impacts caused by human disturbance (Manuwal 1978, Anderson and Keith 1980, Carney and Sydeman 1999). When disturbance events occur in seabird colonies, the birds may flee from their nests, leaving their eggs and chicks unprotected from predators and adverse weather conditions. Eggs and chicks can also be accidentally knocked off rocks or moved into another territory where they may be attacked or killed. Human disturbances are frequently caused by low flying aircraft, landings on islands and rocks by boaters or kayakers, or by commercial and recreational fishers anchoring close to colonies.

The Spill is estimated to have impacted approximately 1,490 Common Murres and to have placed another 11,193 birds at risk. Other injured species that will also benefit from the project are a variety of other seabirds including Brown Pelican and cormorants.

The primary goal of this program is to improve nesting success of California's resident breeding seabird species (especially surface nesting species such as Common Murres, Brown Pelicans and cormorants) by reducing disturbance at their breeding colonies. In addition, the project proposes to increase the quality of roosting habitat of cormorants and pelicans by reducing disturbance.

4.5.3.2 Background

Sixteen species of seabirds breed along the central California coast, typically on offshore rocks and islands (Figure 19). California seabird nesting habitat occurs within several ownerships and jurisdictions (NPS, CDPR, BLM, U.S. Army, U.S. Navy, CDFG, USFWS, USFS, CSLC and private ownerships). As a result of this complex ownership arrangement and overlapping jurisdictions, no coordinated management and conservation program for seabirds currently exists in California. A few planning efforts are underway that address some aspects at California seabird conservation needs (USFWS, BLM, Point Reyes Bird Observatory), but no one plan considers all the biological factors, status, regulatory issues, conservation threats, management needs and restoration opportunities in one statewide document. A few of California's listed or sensitive species have been the focus of intermittent monitoring efforts, (e.g., Brown Pelican, Marbled Murrelet, Xantus's Murrelet, Ashy Storm-petrels). However, except for the Marbled Murrelet and Brown Pelican, no recovery plans have been prepared.

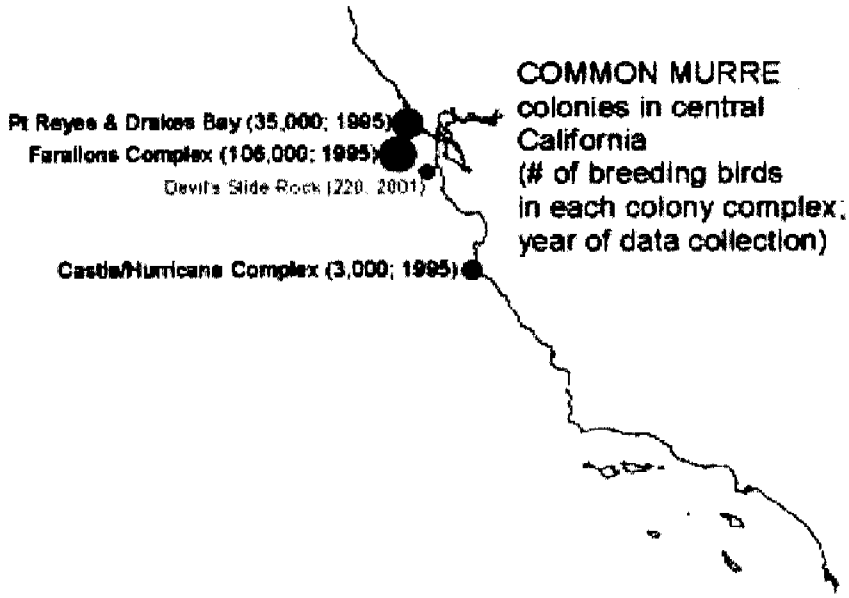


Figure 19- Common Murre colonies along Central California Coast.

Threats to Seabird Colonies

The primary anthropogenic threats to seabirds in California are (not necessarily in order of severity) catastrophic oil spills, chronic oil pollution, conflicts with commercial fisheries and disturbance to breeding colonies.

An overarching threat to nesting and roosting seabirds in California and one that has not been addressed through coordinated agency action is that posed by human disturbance. Human disturbance takes numerous forms and includes, but is not limited to, disturbance by aircraft, fishing boats, sea kayakers, sport divers, squid light boats, and unauthorized entrance onto colonies. Due in part to insufficient agency funding and complex jurisdictional boundaries, human disturbance threats have not been addressed or resolved through coordinated programs and recently have been documented at a few locations (Restoration of Common Murre Colonies in Central California – Annual Reports). The MBNMS is currently engaged in a Joint Management Plan Review that has created a draft document that identifies disturbance threats to nesting seabirds as a serious multi-faceted problem requiring yet-to-be developed, multi-pronged solutions. No specific implementation plan is underway.

The central California Common Murre population is recovering from a 50% decline due to gill net and oil spill mortality that occurred during the 1980s and 1990s. Today, this population still remains approximately 40% below levels reported in the early 1980s. Disturbances only increase the vulnerability of this population. The slow recovery rate of the central California Murre population puts these birds in a vulnerable condition and warrants definitive actions by trustee agencies to abate disturbance problems. Reduction of anthropogenic disturbance such as aircraft and boat disturbances is essential if the complete recovery of nearshore seabird colonies in central California is to be accomplished (Parker *et al.* 2001).

Seabird Colony Disturbance by Fishing Activities in Central California

Biologists working on the Apex Houston Common Murre Restoration Project have documented repeated disturbances to Common Murre and Brandt's Cormorant colonies caused by fishing boats involved in the nearshore fishery at colonies near San Pedro, Point Reyes and Monterey, California. Seabirds are disturbed by the boat's movement, the boat's engine noise, and human activity on board the boats. Observations of fishing boats deploying and retrieving traps and lines in close proximity to breeding colonies show that these boats can cause seabirds to flush or move about on the breeding rocks. Sport and commercial divers could pose similar threats. These disturbances cause lower reproductive success through the direct loss of eggs and chicks as a result of being dislodged from the nesting site or being trampled by birds responding to the disturbance. Also, opportunistic predation by gulls and ravens occurs when adults are flushed leaving eggs and chicks unprotected. Squid light boats are suspected to have impacted seabirds at some colonies, however, few direct observations have been made (F.Gress, *pers. com.*).

Seabird Colony Disturbance by Aircraft in Central California

Documentation of aircraft disturbance to California seabird colonies is not readily available because of the difficulty inherent in documenting such intermittent events. However, one data set compiled by a USGS biologist at Piedras Blancas describes regular disturbances to seabirds by various types of aircraft. Helicopters in particular are known to flush seabirds causing the types of impacts described above. Civilian and military helicopter pilots generally have little awareness of the vulnerability of seabird colonies to disturbance by their aircraft. Information about the sensitivity of marine wildlife resources is generally lacking on aeronautical charts and enforcement of existing regulations is problematic. The Apex Houston project staff have documented numerous examples of disturbance to murres by helicopters and other aircraft. Given the difficulty in observing such an event, it is more likely that these few observations are symptomatic of regular occurrences, rather than chance observations of unusual events. Rojek and Parker (2000), have reported that a flyover by a helicopter (at the Castle-Hurricane colony) was more likely to cause a disturbance than a plane (82.9% of helicopter flyovers vs. 56.9% of plane flyovers). Helicopters were also more likely than planes to cause murres to flush off rocks: 60.3% of helicopter disturbance resulted in flushing versus just 10.3% of plane disturbance.

Seabird Colony and Seabird Roost Disturbance by Human Recreational Uses in Central California

The number of people involved in recreational activities specifically geared toward viewing wildlife is increasing rapidly. For many years, it was assumed that such activities were harmless to wildlife and could aid in conservation efforts by generating revenue and publicity. However, it has become clear that even visitation by those most interested in conserving wildlife can have detrimental effects.

The species account for the Common Murre (The Birds of North American, No. 666, 2002)

reports that "panic flights from colonies are caused by low-flying aircraft, especially helicopters (<1000 m), by humans on land or in boats, and even kayaks. The total collapse of colonies in S. Norway was caused by the increased approach of pleasure boats". The popularity of sea kayaking, for example, has increased rapidly, resulting in access into coastal areas that were previously inaccessible. Jaques and Strong (2002) reported on the effects an "explosion" of water-based ecotourism and kayak use in Elkhorn Slough. "Kayaks and boats accounted for 77% of all disturbances in the Moss Landing area in 1999-2000". They further reported that "human disturbance in estuaries appears to have the most severe negative effects...." "Flushing distances were greater, disturbance was more frequent, and the total number of pelicans affected by disturbances was higher in these natural habitats...."

Communal roost sites such as Elkhorn Slough are essential habitat for Brown Pelicans (Gress and Anderson 1983, Jaques 1994.) Disturbance at these roost sites is extremely high and can have serious impacts to individual survival. Brown Pelicans are unlike many other seabirds in that they have wetable plumage (Rijke 1970). Their feather structure is such that they will take on water, become soaked to the skin and hypothermic if they do not come ashore regularly to dry out and restore their plumage. Brown Pelicans are also among the earth's heaviest flying birds (Pennycuik 1972). They have evolved a series of behavioral adaptations to conserve energy in flight, and spend a large portion of their daily time budget resting onshore at terrestrial roosts. Roost site selection is based on proximity to prey resources, isolation from potential predators and human disturbance, and microclimate features that aid in thermoregulation. Pelicans spread out at larger number of roosts by day and gather into a smaller number of traditional night roosts at dark, when they are more vulnerable to mammalian predation. Island-type habitat is generally required at night. Major night roosts support hundreds to thousands of pelicans on a given night (Jaques and Anderson 1988, Jaques *et al.* 1996). Reducing disturbance at communal roosts will have positive benefits to pelicans by reducing energy costs associated with flushing and relocating due to human disturbance. Reducing energy expenditures should result in improved body condition of individual birds, which will lead to increased juvenile and adult survival and increased reproductive success of pelicans.

Nesting colonial waterbirds are particularly vulnerable to human intrusion. Their high visibility, animated behavior and physical beauty tend to attract human visitors. When approached by humans, nesting colonial waterbirds often flush from nests in an attempt to either intimidate a potential predator or to flee from danger. During such times, nest contents can be spilled, exposed to predation, or perish from exposure to the elements during temporary or permanent abandonment. This sensitivity of nesting waterbirds, in combination with increasing pressures of visitation on areas containing their colonies presents a difficult situation for land and resource managers. Though visitation of nesting areas can generate conservation interest and revenue, disturbance, paradoxically, can cause birds to abandon the site that managers are attempting to preserve.

4.5.3.3 Project Description and Methods

The Command Trustee Council proposes to improve Common Murre and other seabird species nesting success through a multi-pronged coordinated approach to reducing human disturbance at seabird nesting colonies and roosts.

In addition, this project will benefit Brown Pelicans and other seabird species by enhancing critical non-breeding habitat. Specifically, this project will enhance, and protect coastal roosts along the California mainland. Improvements in the existing network of communal roosts along the coast will have a positive influence on the energy budgets of pelicans and other seabirds by reducing energy costs associated with: 1) commuting between foraging areas and roosts, 2) flushing and relocating due to human disturbance, and 3) use of sub-optimal microclimates within roosts. Pelicans migrating along the California mainland will also benefit from increased availability, quality, and capacity of stopover sites. Cumulative energy reductions should result in improved body condition of individual birds. Population-level effects from improving the condition of individual birds should include increased juvenile and adult survival, and increased reproductive success of the Brown Pelican population.

This project will focus on the major seabird breeding colonies and roosting areas found along the Central California Coast (Figure 19).

The project will be divided into three phases: (1) Pre-Implementation Monitoring, (2) Implementation and (3) Adaptive Management and Monitoring (Figure 20). The project is projected to last a minimum of five years.

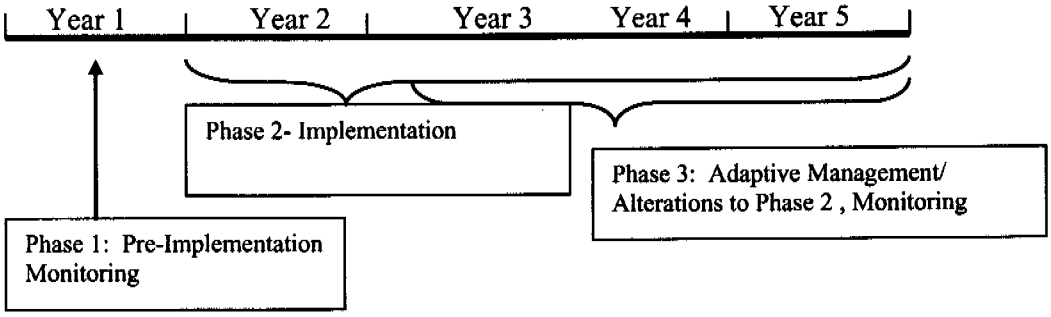


Figure 20: Seabird Colony Protection Project Timeline.

Phase I- Pre-implementation monitoring

Prior to the implementation of human disturbance reduction actions, monitoring will be undertaken at key colony and roost sites for the first two project years to better define the scope of disturbance problems and to provide a basis for comparison in future years. Monitoring methods will build upon those developed by the Apex Houston project staff and will include the following:

- Seabird population size, breeding success, and attendance patterns at colonies and roosts will be monitored before, during and after implementation of the project to evaluate effectiveness. Aerial photography and photo interpretation methods would be utilized.

- The types and degree of human disturbance throughout the restoration area will be documented in order to identify specific colonies and roost sites that require specific protection efforts.

Phase II-Implementation

- Appropriate protective measures to reduce disturbance at specific colonies will be developed, implemented, and enforced;

- Compliance by the public will be monitored and appropriate modifications will be made if necessary.

- Signs would be erected at coastal launching ramps to educate sport and commercial fishermen, kayakers and others about the sensitivity of nearby seabird colonies. Specially produced pamphlets will be distributed through marine supply stores and sporting goods stores.

- In coordination with Team Ocean (MBNMS), a video will be developed depicting the threats to seabird colonies, highlighting the importance of the regional seabird fauna and its conservation problems, and describing applicable State and federal laws. The video would be produced and distributed through tourist information services, tourist lodging facilities and local school districts. Sea kayak touring, sales and rental companies would be asked to show the video to customers. The video could function as a public service announcement on local television.

- Anchored buoys with warnings will be placed around key colonies seasonally to establish protection zones and signs will be placed on selected offshore rocks and sensitive coastal trails.

- Public outreach to promote awareness of seabird conservation needs will be accomplished through seasonal presentations to community groups and schools.

- Presentations will be developed for U.S. Coast Guard pilots, Highway Patrol and military pilots and general aviation pilots to promote conformance with Department of Fish and Game Code Sections, National Marine Sanctuary regulations and USFWS regulations prohibiting low altitude flights over State Ecological Reserves and Marine Sanctuaries and increase agency awareness. These presentations would be repeated twice annually for all agencies because of staffing turnovers. Measures would be taken to ensure that aeronautical charts contain current information about altitude restrictions over sensitive colony sites. Project staff would monitor annual events involving aircraft, such as the Big Sur Marathon.

- The technical feasibility of video surveillance at key colonies will be explored.

- Wildlife interpretive programs and materials will be developed to promote public awareness and used to provide seabird viewing opportunities at selected coastal vantage points.

- Improved surveillance at key colonies will identify unauthorized actions. Coordination between the project staff and DFG, USFWS, and NFMS agents would promote more effective enforcement of state and federal regulations.

- Restoration project staff will coordinate with the California Coastal Commission, State Parks, Point Reyes National Seashore (PRNS) and the California Coastal Conservancy to work towards accommodating the protection needs of seabird colonies and roost sites in planning activities for public coastal access.

- Sport fishing charter boat crews will be educated to ensure that party boats maintain an appropriate distance from colonies and to advise them on ways to reduce hooking and entanglement conflicts.

- A CD-ROM will be created, depicting all colony and roost sites in GIS layers for state and federal agency land managers and regulatory agencies.

- Project staff will work cooperatively with BLM Coastal Monument staff, CDFG, Marine Sanctuaries, PRNS Staff and USFWS staff to provide for a coordinated approach to seabird conservation in the project area.

In general, the project staff would monitor the health of seabird populations, while identifying types and sources of disturbances. Action plans would be developed and implemented by the project staff to minimize disturbance problems.

Phase III: Adaptive Management; Refinements of the Human Disturbance Reduction Program and Monitoring

The results of Phase I and II from the first two years of the project will be analyzed and evaluated prior to the third project year. At this time the Council will consider alterations and improvements to existing Phase II components as well as augmenting Phase II with additional measures.

The impact of the program will be monitored through a combination of aerial and ground based surveys.

4.5.3.4 Environmental Consequences (Adverse and Beneficial)

Beneficial Effects

The actions implemented by this project will increase public awareness of seabird habitat requirements and educate the public about the potential impacts of seabird human interactions. By educating the public in ways to safely observe seabirds while engaged in recreation, the Trustees can reduce the impacts of disturbance to nesting populations of Common Murres and other seabirds thereby aiding in the recovery of these populations to pre-spill levels. Disturbance caused by planes, helicopters and kayakers are known to have resulted in eggs and chicks being lost from Common Murre colonies in central California. Decreasing or eliminating these disturbances will likely have a direct impact on the reproductive output of these colonies.

Adverse Impacts

Signs used in any of the above projects need to be carefully designed and placed so as not to detract from the natural aesthetics of any area. Open-air kiosks and signs are subject to vandalism. Therefore, repair or replacement costs for structures should be factored into cost estimates. Placing structures in open, well-traveled areas will reduce the risk of vandalism.

The restriction of recreational activities around sensitive areas may be perceived by some to limit the enjoyment and scope of the public's recreational experience. However, given the small number of seabird colonies in the region and the limited nesting season, the actual size and time of any restrictions should be minimal. Moreover, a balance will be sought between minimizing the impacts on the resource and preserving quality opportunities for recreation. If appropriate, additional environmental compliance specifically for this project will be conducted prior to implementation.

4.5.3.5 Probability of Success

The likelihood of success for this project is very high. The project is likely to have a tremendous positive impact on breeding seabirds in central California and to greatly aid the Trustees' actions to recover these species to pre-spill levels. Human disturbance to nesting and roosting areas is one of the major threats facing seabird populations in California.

4.5.3.6 Performance Criteria and Monitoring

To monitor the success of the restoration efforts, a combination of aerial and ground based surveys will be conducted for the duration of the project. Monitoring of the colony will be used to evaluate whether there has been a decrease in human caused adverse effects. Public feedback and the amount of reaction will be the primary means of monitoring the success of educational activities.

4.5.3.7 Evaluation

Implementation of this project should result in major positive benefits to Common Murres and other surface nesting seabirds by reducing the impact of human disturbance to their nesting colonies. The primary anthropogenic threats to seabirds in California are (not necessarily in order of severity) catastrophic oil spills, chronic oil pollution, conflicts with commercial fisheries and disturbance to breeding colonies. Human disturbance takes numerous forms and includes, but is not limited to, disturbance by aircraft, fishing boats, sea kayakers, sport divers, squid light boats, and unauthorized entrance onto colonies. Through education and prevention activities this project will strive to minimize the number of disturbance events involving loss of eggs and chicks and thereby increase the population of impacted seabirds.

The Trustees have evaluated this project against all threshold and additional screening criteria developed to select restoration projects and concluded that this projects is consistent with these selection factors. The Trustees determined that this type and scale of project would provide appropriate compensation for many of the surface-nesting seabirds injured as a result of the Spill and have selected this project as a preferred alternative.

4.5.3.8 Budget-

Colony Observation/Monitoring Component

	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel (Project Manager/Field Techs)	$31,500	$53,750	$53,750	$54,750	$38,370
Aerial Surveys	Donated by Cal	Fish and Game			
Equipment	$0	$15,500	$11,000	$11,000	$8,250
Agency Admin Support	$0	$5,000	$5,000	$5,000	$5,000
Travel/Vehicles	$0	$11,000	$11,000	$11,000	$11,000
Sub-total	$31,500	$85,250	$80,750	$81,750	$79,500
USFWS Overhead Costs (11%)	$3,465	$9,378	$8,883	$8,992	$8,745
Total	$34,965	$94,628	$89,633	$90,742	$88,245
				Total (all years)	**$398,213**

Law Enforcement Component

	Year 1	Year 2	Year 3	Year 4
GS 11-USFWS	$18,710	$18,710	$18,710	$18,710

Law Enforcement Agent (1/4 time)				
USFWS Overhead (11%)	$2,058	$2,058	$2,058	$2,058
			Total (all years)	**$83,072**

Outreach/Education Component

	Year 1	Year 2	Year 3	Year 4
Personnel (Project Manager/Field Techs)	$105,000	$105,000	$105,000	$105,000
Signs, Buoys, Ed. Materials, other equipment, workboat charter	$60,000	$65,000	$15,000	$150,000
Travel	$5,000	$5,000	$5,000	$5,000
Sub-Total	$170,000	$175,000	$125,000	$125,000
Overhead (25%)	$42,500	$43,750	$31,250	$31,250
Total	$212,500	$218,750	$156,250	$156,250
			Total (all years)	**$743,750**

Total Project Cost- $1,225,035

4.5.4 Common Murre Nesting Ledge Creation

4.5.4.1 Goals and Nexus to Injury

The goal of this project is to benefit the Common Murre population injured by the Spill. This project will create nesting habitat capable of supporting 200-400 breeding murres on Southeast Farallon Island (SEFI) at the Farallon National Wildlife Refuge (FNWR).

4.5.4.2 Background

The Farallon Islands are home to one of the largest and most important colonies of Common Murres on the west coast of North America, south of Alaska. It is estimated that 400,000 murres once bred on the Farallon Islands. Extensive egg harvesting between 1849 and the late 1800s caused murre populations to plummet. By 1910, only 20,000 murres remained. Between 1911 and the late 1950s, the population remained in a seriously depleted state due to oil spills and human disturbance. By the 1950s, the population reached a low of 6,000 birds. (Ainley and Boekelheide 1990). The breeding population gradually increased over the next several decades, peaking at over 102,000 in 1982 (Briggs *et al.* 1983). During the mid to late 1980s, Common Murres again declined mainly due to the combined effects of the El Niño Southerly Oscillation (El Niño) and gill-net caused mortality. (Ainley and Boekelheide 1990). The near shore gill-net fishery was halted in late 1987 due to its impact on seabirds (primarily murres) and marine animals. Beginning in the early 1990s the murre population began to recover, but recovery was interrupted by the 1992 and 1998 El Niño events.

Over the last 5 years, favorable oceanic conditions have resulted in rapid growth of the murre population. In 2002, the South Farallon Islands (SFI) colony exceeded 100,000 birds for the first time in over a century, and the total Farallon Islands breeding population currently exceeds over 150,000 individuals. This population increase, combined with reduced mortality from gill netting and oil spills, poises this colony on the brink of a dramatic population increase. The Farallon Islands is already one of the two largest Common Murre breeding colonies in California, tied with Castle Rock in Humboldt Co.

At some point, lack of available, secure breeding habitat will become a limiting factor. The expansion of Western Gulls into previously unused areas and the establishment of a permanent human presence on the island have reduced the amount of available murre breeding habitat from historic times. The majority of the SFI is not likely to be re-colonized because of the lack of available habitat, loss of habitat to Western Gulls, and the nearby human activities associated with the small field station.

Currently there are few projects that are able to directly enhance habitat for Common Murres, the species most commonly affected by oil spills. The proposed project would restore/enhance Common Murre habitat in two ways: 1) it would create additional ledge nesting habitat, and 2) would put a barrier between the murre colony and the path to North Landing, thereby reducing human disturbance.

4.5.4.3 Project Description and Methods

A series of murre nesting ledges would be built to create nesting habitat for Common Murres. Sections of concrete block would be stacked and tied together to create a wall with numerous terraced ledges that will simulate the natural (occupied) cliff habitat found on the islands. The blocks to be used in the construction are part of a retired containment berm for two large diesel tanks, and are already on the island. The US Coast Guard (USCG) plans to remove the tanks and break up the containment wall in October 2003. Elimination of this unused containment berm will also benefit other seabirds that breed on the island, because it fills with rainwater every winter and has posed a drowning hazard for decades.

The project consists of several steps or phases: 1) Breaking the concrete containment berm into "ledge-sized" blocks; the USCG has agreed to do this as part of their contribution to the project. 2) Moving the blocks from their present location on the southeast side of SEFI to the project site. 3) Stacking the blocks into an engineered design of murre nesting ledges, and 4) Constructing a wooden monitoring blind that will be incorporated into the backside of the ledge structure in way that will allow biologists to monitor murre colonization without disruption.

4.5.4.4 Environmental Consequences (Adverse and Beneficial)

Beneficial Effects

The construction of this blind is expected to create high quality nesting habitat, encouraging expansion and growth of the adjacent Sea Lion Cove Colony. It is estimated that an additional 200-400 breeding murres (100-200 pairs) will eventually use the newly created habitat. In

addition, murres and Brandt's Cormorants nesting on natural cliff/ledge habitat in the area may also benefit from reduced human disturbance. The ledge wall will screen these existing colonies from human (pedestrian) traffic.

The unique viewpoint afforded by this structure will allow monitoring of the reproductive success, population growth and feeding ecology of a recently established colony of murres. It will also allow the monitoring of a large and expanding colony of Brandt's Cormorants. Other bird species that will benefit from the project include Cassin's and Rhinoceros Auklets, Pigeon Guillemots (*Cepphus columba*), Leach's (*Oceanodroma leucorhoa*) and Ashy Storm Petrels, Western Gulls, and migratory landbirds. Additionally, the concrete diesel containment structure is an entrapment and drowning hazard for seabirds and landbirds and its removal will reduce impacts to seabirds. It holds water during the winter/spring rains, and although it is kept covered and periodically pumped out, birds find their way into it and drown. Also, since it is located on the marine terrace and surrounded by Cassin's Auklets nesting burrows, pumping it out runs the risk of flooding nesting burrows.

Adverse Impacts

Demolition of the containment wall and construction of the murre nesting ledges would be completed after most breeding seabirds have left the island, and when wildlife activity on SEFI is at is lowest point. Some post-breeding and non-breeding western gulls and Brandt's cormorants may be temporarily disturbed (flushed) from the project area during construction.

Five species of pinnipeds either breed or haul-out on the FNWR. The proposed work window will avoid impacts to breeding pinnipeds. Some seals and sea lions will likely be hauled out in Sea Lion Cove during this time period, however. Human activity and noise during construction of the murre nesting ledge may cause some of them to flush into the water. Few Steller's sea lions are usually present during the fall in the project area; however, there is a possibility that one or a few could be flushed, which would be considered a "take" under the Endangered Species Act. Therefore, proponents will complete Section 7 consultation with the National Marine Fisheries Service (NOAA Fisheries) prior to project implementation.

4.5.4.5 Probability of Success

Probability of success is considered high based on the results of a similar project in the area. In September 2000, a habitat was constructed of a similar concrete rubble construction as is proposed for the nesting ledge, in the north landing area. Concrete blocks were stacked upon one another in a design engineered to create habitat for crevice nesting birds and incorporated an observation blind as part of its design. The habitat sculpture was very successful and 9 of the 32 available sites were occupied by Cassin's Auklets in the first year (2001). In 2002 12 Cassin's Auklet pairs and 1 Pigeon Guillemot pair nested in the created habitat, and in 2003, there were 17 auklet pairs and 1 guillemot pair.

This project proposes to use the same design and contractor to implement murre nesting ledges. The contractor is familiar with the challenging logistics and wildlife sensitivity of the island, and is creative yet practical in their design of habitat restoration projects.

4.5.4.6 Performance Criteria and Monitoring

This project will be determined successful when Common Murres and/or Brandt's Cormorants begin occupying the newly created nesting ledges. The observation blind will allow biologists to monitor colonization and reproductive parameters. Thirty-two years of pre-project murre and cormorant breeding population and productivity data collected from SEFI will also allow comparisons of pre-and post-project changes in populations, and how the newly colonized site compares to older, more established colonies. Seabird monitoring will be conducted by biologists from PRBO through a cooperative agreement with the USFWS, San Francisco Bay National Wildlife Refuge Complex. Post-project monitoring will take place for a minimum of 5 years, and probably longer.

4.5.4.7 Evaluation

The Farallon Islands are home to one of the largest colonies of Common Murres on the west coast of North America, south of Alaska. Creation of nesting habitat is expected to result in a long-term measurable increase in the number of Common Murres that can nest on these islands. These positive effects will aid in the population recovery of Common Murres and other seabird species affected by the Spill.

The Trustees have evaluated this project against all threshold and additional screening criteria developed to select restoration projects and concluded that this project is consistent with these selection factors. The Trustees determined that this type and scale of project would effectively provide appropriate compensation for Common Murres injured as a result of the spill and have selected this project as a preferred alternative.

4.5.4.8 Budget

	Cost	Description	Comment
	$0	Breaking Containment Berm	USCG Donated
	$ 2,000	N. Landing trail improvements	labor/materials
	$ 500	Wheeled, non-motorized vehicle to transport large blocks of concrete over rough terrain	
	$10,415	Materials for habitat ledge/blind	materials
	$ 8,715	Labor: Moving blocks; constructing ledge wall/blind	265 hrs @$35/hr
	$ 2,400	Transport/per diem for personnel from mainland	To/From island
	$ 4,500	Transport of materials/equipment to island	
	$ 3,300	FWS Project Management	GS9 @ 2 PP
	$22,200	Monitoring success of project (3 years @ $7,400/yr)	
Sub Total	**$54,030**		
	$5,943	11% FWS Administrative Overhead	
Total	**$59,973**		

4.5.5 Brown Pelican Roost Site Enhancement and Protection

4.5.5.1 Goals and Nexus to Injury

The goal of this project is to benefit the Brown Pelican population injured by the Command Spill. This project will restore critical non-breeding pelican habitat by enhancing and protecting coastal roosts along the central California mainland.

4.5.5.2 Background

Communal roost sites are essential habitat for Brown Pelicans (Gress and Anderson 1983). The primary roost sites for Brown Pelicans in the western U.S. are offshore rocks and islands on the outer coast, and sand islands within large estuaries (Briggs *et al.* 1987, Jaques 1994). Intense shoreline development, wetland filling, and other habitat alteration has eliminated much of the natural onshore roost habitat. Loss of historic roost habitat from human encroachment has been somewhat offset by the addition of artificial structures, such as jetties, breakwaters and floating structures. Pelicans now rely heavily on these types of structures for roost sites in California

(Jaques *et al.* 1996). Few roosts along the mainland fall under the jurisdiction of natural resource agencies, and several major roost sites on privately owned structures have been lost in recent years. The most frequent cause of this disturbance is recreational activities and the most heavily disturbed habitats used by pelicans are estuaries (Jaques and Anderson 1987). Birds that were injured in the Spill use habitat throughout the central California coast.

Improvements to communal roosts will have positive benefits to pelicans by reducing energy costs associated with commuting between prey and roosts, and with flushing and relocating due to human disturbance. Reducing energy expenditures should result in improved body condition of individual birds, which should lead to increased juvenile and adult survival and increased reproductive success of pelicans.

4.5.5.3 Project Descriptions and Methods

One project under this category involves improvements to the roost site at Breakwater Island, located in San Francisco Bay adjacent to Alameda. This is the largest roosting area and the only known night roost in the San Francisco Bay area (U.S. Navy 1997). It is used primarily in late summer through fall (from July into November or December), when pelicans move northward in a post-breeding dispersal from breeding areas in southern California and Mexico. On June 28, 2002 the Island had a record number of 2,498 pelicans roosting on it. Breakwater Island was formerly part of the Alameda Naval Air Station (NAS), closed to the public, and protected from human disturbance. Since closure of the Alameda NAS, the roost has been subject to human disturbance from recreational boaters and fishers (USFWS 1998). Methods to protect this roost include buoy placement to keep boaters a safe distance from the island, signing, public outreach/education programs, and enforcement patrols.

Both the U.S Navy and the USFWS are willing partners on this project. Moreover, the parties currently propose to turn Alameda NAS into a National Wildlife Refuge. The U.S. Coast Guard has approved the use of Class 6 buoys with regulatory lettering and anchoring apparatus. Ten buoys will be needed to adequately delineate the restricted area. Eight signs will be deployed with lettering large enough to be read from a distance notifying boaters of the restricted areas. In addition, an interpretive sign will be placed at the mouth of the Navy Seaplane Lagoon, which is gradually being developed into a marina, from which the majority of the recreational boats originate. The sign would educate boaters on the sensitivity of the roosting pelicans to disturbance and the need to stay out of the restricted area. The costs of the signs and buoys are delineated in the attached budget.

Other potential sites such as the Davenport Pier will be considered for roost site enhancement work, as appropriate, during project design and development.

4.5.5.4 Environmental Consequences (Adverse and Beneficial)

Beneficial Effects

Improvements in the existing network of communal roosts along the coast will have a positive influence on the energy budgets of pelicans by reducing energy costs associated with: 1)

commuting between prey and roosts; 2) flushing and relocating due to human disturbance; and 3) use of sub-optimal microclimates within roosts. Costs of migration will also be reduced by increased availability, quality and capacity of stopover sites. Cumulative energy reductions should result in improved body condition of individual birds. Expected population-level effects from improving the condition of individual birds are increased juvenile and adult survival, and increased reproductive success of pelicans in California. Juvenile survival and adult reproductive success are the primary life history parameters affecting the Brown Pelican population (Anderson and Gress 1983).

All other bird species that occur in association with roosting pelicans are likely to benefit from the proposed roost projects. Bird groups that will benefit from increased availability of island habitat and reduced human disturbance in coastal environments will include gulls, terns, cormorants, shorebirds, herons (Order *Ciconiiformes*), egrets (Family *Ardeidae*), guillemots, and ducks (Order *Anseriformes*). The suite of species receiving benefits will vary with the type of roost treatment and project site. The restoration projects will also enrich the public through associated interpretation and will help foster an awareness and stewardship ethic that should result in reduced disturbance to roosting Brown Pelicans, and other coastal waterbirds at other locations. Public enjoyment of pelicans will be increased by projects that allow the public to view communal roosting groups without causing disturbance. These positive effects will aid in the recovery of the population to pre-spill conditions.

Adverse Impacts

Environmental consequences of increased pelican use of lagoons and other roosting areas may include impacts on water quality if guano accumulation exceeds the circulation ability of the lagoon. However, on the outer coast, Brown Pelican guano in the vicinity of roosts will provide a desirable source of nutrient enrichment and may enhance local food webs in given areas.

Pelican roost site creation projects will be associated with variable degrees of liability and some projects will require ongoing management oversight. Careful site selection, project design, selection of raw materials, and adequately funded maintenance programs will offset potential liability costs. Signs, posts, or fences may need to be replaced during the projected life of the project due to fading, corrosion, or vandalism. Vegetation on any earthen islands that are created may need to be periodically controlled or removed.

Negative aspects of pelican use of harbors for roosting include the increased risk of contact with environmental contaminants such as oil, the increased likelihood of injury due to scavenging (e.g., entanglement in fishing line, puncture from fishing hooks, etc.) and the development of nuisance issues. However, most of the proposed projects are not expected to result in major increases in pelican use of harbors. Rather they are expected to improve the quality of resting time allowed within harbors.

Concerns regarding visual impacts of signs and their potential for providing predator perches near Snowy Plover or Least Tern nesting areas will need to be addressed. Signs will be carefully conceived and located so as not to detract from the natural beauty of any area. Signs will be

carefully conceived and located so as not to provide predator perches near Snowy Plover or Least Tern nesting areas.

4.5.5.5 Probability of Success

Brown Pelicans respond readily to novel roost sites as long as the key habitat elements are provided. Key elements have been described in this document and in Gress and Anderson (1983) and Jaques and Anderson (1987). All projects that involve physical manipulation of habitat are very likely to succeed. The successes of projects that rely on alteration of human behavior include a wider range of unknowns. Projects that provide the most secure island habitat in areas that harbor reliable food resources are expected to receive the highest level of use and will function as communal night roosts as well as daytime use areas.

Only one pelican roost site enhancement project has been attempted on the Pacific west coast. This project, construction of a small island in a remnant salt pond, took place at Moss Landing Wildlife Area. The "island" was not an effective island and the effort was a failure due to poor site selection and poor design. Projects conducted under this draft RP/EA will be designed and implemented utilizing the best available expertise and information on Brown Pelican habitat selection, microclimate preference, and behavioral ecology.

Education and awareness programs, including displays, signs and brochures nearly always attracts public attention. If done well, experience has demonstrated that such programs result in instilling in the public new knowledge and appreciation of the subject considered. Informational and warning signs to protect seabirds had a high probability of reducing human behaviors that are detrimental to the resource.

4.5.5.6 Performance Criteria and Monitoring

Performance Criteria: Performance criteria will be developed for each specific project. Success will be based on increases in roost attendance and increases in population abundance.

Monitoring: To monitor the success of restoration efforts, a combination of aerial surveys and ground-based observations at roosts will be conducted for the duration of the project.

Ground-based observations at selected roost sites will be designed to monitor the response of pelicans to individual roost treatments. The amount of time spent observing each site will vary according to the type of roost, type of project, and questions that need to be addressed. For each major project, observations spanning a period of approximately 3 days, 4 times per year are anticipated.

4.5.5.7 Evaluation

Breakwater Island, located in San Francisco Bay adjacent to Alameda is the largest roosting area and the only known night roost in the San Francisco Bay Area (U.S. Navy 1997). Improvements to the roosting site are expected to result in a long-term measurable increase in the number of

pelicans that roost along the Northern California mainland. These positive effects will aid in the recovery of the Brown Pelican population to pre-spill conditions.

The Trustees have evaluated this project against all threshold and additional screening criteria developed to select restoration projects and concluded that this project is consistent with these selection factors. The Trustees determined that this type and scale of project would provide appropriate compensation for Brown Pelicans injured as a result of the Spill and have selected this project as a preferred alternative.

4.5.5.8 Budget

Breakwater Island Roost Site Protection

Regulatory Buoys- $10,000
Regulatory Signs- $4,800
Interpretive Signs- $6,000
Monitoring- $10,000
Installation costs for signs and buoys will be provided in-kind by the USFWS.

Total- $30,800

4.5.6 Brown Pelican Entanglement Reduction Education and Outreach Program

4.5.6.1 Goals and Nexus to Injury

The goal of this project is to benefit the Brown Pelican population injured by the Command Spill. Entanglement in fishing line and hooking of pelicans by fishers is a major factor affecting Brown Pelican survival. This project will reduce entanglement of Brown Pelicans and other seabirds in fishing line by educating fishers in ways to minimize negative interactions with seabirds while fishing.

4.5.6.2 Background

Most avid recreational anglers have at some point interacted with seabirds while fishing along our coast. Seabirds may eat the same fishes being targeted or may be attracted to bait at the end of fishing lines and, as a result, they can accidentally be hooked or entangled. The entanglement situation is not resolved when the line breaks and the seabird flies away. Both hooks and broken lines injure and kill seabirds. Hooks, which penetrate the bird's hollow bones, can lead to infection. Broken lines can rap around legs, wings, or beaks and result in death due to starvation or inability to fly or swim.

While seabird entanglements can occur during any type of recreational fishing activity, the problem has been more severe at piers where large numbers of bait fishes concentrate. This concentration attracts both fishermen and seabirds, such as Brown Pelicans that feed on bait fishes. In late summer of 2001, seabird and angler interaction was a big problem at the Santa Cruz City Pier. Nearly 200 Brown Pelicans were rescued with hooks or line entanglements, and 59 of those died or had to be euthanized due to the severity of the injuries. Many other injured

birds could not be rescued. Due to the severity of the problem, the City of Santa Cruz and the Department of Fish and Game (CDFG) closed fishing on two-thirds of the city's pier for several weeks.

4.5.6.3 Project Descriptions and Methods

This project involves expanding the American Trader Trustee Council's (ATTC) Seabird Entanglement Education and Outreach Program to problem fishing piers and wharfs in Northern California. The goal of the program is to provide information in the form of brochures, signs, and wildlife guides that heighten public awareness about the potential hazards to the endangered Brown Pelicans and other seabird species vulnerable to being hooked by fishing tackle or entangled by monofilament line. Additionally, information will be provided about the impacts of human disturbance to seabird breeding colonies (i.e. nest abandonment) and measures that can be taken to avoid such disturbances. A similar program has been developed by the ATTC for sites in southern California. The Command Council will be able to adopt the designs and materials from the ATTC program and modify them slightly to address sites in Northern California. The program will involve producing a minimum of ten signs that will be placed at problem areas educating anglers about ways to reduce hooking birds and what to do if one is hooked.

Specific locations where the signs will be installed will be identified during implementation. One known problem area is the Santa Cruz Pier. The County of Santa Cruz in conjunction with the CDFG has created some products and measures to address the immediate problem. The Command Trustee Council will work with these groups to determine if additional measures are needed at the Santa Cruz pier and to identify other potential trouble areas.

In addition to educational signs, the program will involve the production of a brochure designed to educate fishers in the ways to minimize risk to seabirds from fishing line and measures that can be taken to avoid impacts to seabirds from human disturbance. A version of this type of brochure for Southern California has been produced by the ATTC and the Command Council would only need to modify the design to cover Northern California sites. The development of these products would be closely coordinated with the disturbance reduction program described in section 4.5.1. By using the products developed for the Southern California program, the Trustees are able to save considerable costs in the initial mock-up and design of the signs and brochures (see budget below).

4.5.6.4 Environmental Consequences (Adverse and Beneficial)

Beneficial Effects

For very little monetary output for signs and brochures, the conservation benefits of public information at piers and wharfs will be considerable. These activities will help promote public awareness and thus reduce bird injuries and deaths. When successful, these efforts will aid in assuring that the on-going recovery of injured seabird populations are not hampered by conflicts with anglers. Furthermore, to the extent that pelican entanglement decreases, the need for emergency closures to pier fishing will be reduced.

Adverse Impacts

Negative aspects of pelican use of harbors for roosting include the increased risk of contact with environmental contaminants such as oil, the increased likelihood of injury due to scavenging (e.g., entanglement in fishing line, puncture from fishing hooks, etc.) and the development of nuisance issues. However, most of the proposed projects are not expected to result in major increases in pelican use of harbors, rather they are expected to improve the quality of resting time allowed within harbors.

Concerns regarding visual impacts of signs and their potential for providing predator perches near Snowy Plover or Least Tern nesting areas will need to be addressed. Signs will be carefully conceived and located so as not to detract from the natural beauty of any area.

4.5.6.5 Probability of Success

Education and awareness programs, including display signs and brochures, nearly always attract public attention. If done well, experience has demonstrated that this will result in instilling in the public new knowledge and appreciation of the subject considered. Informational and warning signs to protect seabirds have a high probability of reducing human behaviors that are detrimental to the resource.

4.5.6.6 Performance Criteria and Monitoring

Public feedback and reaction will be the primary means of monitoring the success of educational activities. These programs will continually evolve and be updated to keep the information current.

4.5.6.7 Evaluation

Entanglement in fishing line and hooking of pelicans by fishers is a major factor affecting Brown Pelican survival. For a relatively little expenditure of funds, a great deal of information concerning seabird conservation issues can be disseminated through educational materials.

The Trustees have evaluated this project against all threshold and additional screening criteria developed to select restoration projects and concluded that this project is consistent with these selection factors. The Trustees determined that this type and scale of project would provide appropriate compensation for Brown Pelicans injured as a result of the Spill and have selected this project as a preferred alternative.

4.5.6.8 Budget

Signs

Design modification -$1,400.00
Signs- $3,600.00

Posts and Brackets-$8,000.00
Sign Assembly-$1,000.00

$14,000

Brochure

Design Modification
$1,500
Printing
$4,000
Content writer/editor
$2,500

$8,000

Total- $22,000

4.5.7 Sooty Shearwater Restoration Project

4.5.7.1 Goals and Nexus to Injury

The goal of this project is to protect and enhance nesting habitat of the Sooty Shearwater on its native nesting ground in New Zealand. During the Command oil spill response 12 shearwaters were collected, one of which had been banded on Whenua Hou Island, New Zealand. This recovery along with 11 shearwaters recovered on beach surveys provides a direct nexus between the proposed project and the Command Spill, showing a negative impact on this trans-Pacific migrating seabird. This project will attempt to eradicate rats from their breeding areas at the Big South Cape Islands group (Taukihepa, Pukeweka, and Rerewhakaupoko Islands) and Mokonui Island off Stewart Island (Rakiura), New Zealand.

The three main objectives of the project are:

1. Eliminate rodents from four shearwater breeding islands, thereby eliminating egg and chick predation;
2. Establish quarantine contingencies to prevent reintroduction of rats to restored island colonies;
3. Monitor the restoration progress and project effectiveness.

4.5.7.2 Background

The majority of Sooty Shearwaters that occur off California during the austral winter migrate from New Zealand breeding colonies. The Sooty Shearwater is the most abundant seabird off

central California during May to September (Briggs *et al.* 1987). They aggregate in large conspicuous flocks to feed on shoaling fishes, squid, and euphausids that concentrate in productive shelf waters influenced by coastal upwelling (Briggs and Chu 1986). Single flocks can extend for many kilometers and number in the 10,000– 100,000s. Their aggregated dispersion along the populated coast and near offshore shipping lanes makes shearwaters particularly vulnerable to oil pollution. Numbers off California have declined precipitously during the past decade due to a combination of factors, including marine climate change, incidental fisheries take, and pollution (Veit *et al.* 1996, 1997, Lyver *et al.* 1999, Uhlmann and Moller 2000, Oedekoven *et al.* 2001, Uhlmann 2001).

The most easily reversed detrimental impact to New Zealand shearwater breeding populations is predation by introduced predators. Rats (*Rattus spp.*), stoats (*Mustela erminea*), feral ferrets (*M. furo*) and feral house cats (*Felis catus*) were introduced 125–200 years ago and now kill both shearwater adults and chicks at mainland colonies (Hamilton and Moller 1995, Lyver 2000, Jones 2000, 2001). The Polynesian or Pacific rat.(*R. exulans*), also called the kiore, was introduced to breeding islands by Mäori several centuries ago and the black rat (*R. rattus*) was introduced during the 1960s. Whereas Norway rats (*R. norvegicus*) are destructive predators of shearwater on mainland colonies, and until recently on Campbell Island, the more serious threat to shearwater eggs and chicks is posed by the black rat and the smaller Polynesian rat. Rats probably kill some eggs but their main population impact is caused by predation of young chicks just after the 'guard stage' when both parents must leave the chick unattended in order to forage for themselves and their chick. Direct action to eliminate predation of shearwaters by introduced rats at breeding colonies will greatly aid the Trustees' efforts to restore the injured shearwater population.

Although there have been no formal studies of the impact of rats on shearwater abundance, accumulating evidence indicates negative effects of rat predation are occurring. Inferences indicating rat impacts include:

- Declines in seabird abundance and total elimination of some seabird breeding colonies have been well documented in New Zealand and other Pacific islands (Atkinson *et al.* 1978, King 1990, Towns *et al.* 1990).
- Predation by introduced mammals has been identified as the most serious threat to New Zealand seabirds (Taylor 2000 a and b). Rats are listed as the main threat, especially to the smaller seabirds. Continued eradication of rats from island breeding colonies is the main recommended conservation strategy. Rats impact Grey Petrel (*Procellaria cinerea*), Black Storm-Petrel (*Oceanodroma melania*), Cook's Petrels (*Pterodroma cookii*), Chatham Island Taiko (*Pterodroma magentae)*, New Zealand Sooty Tern (*Sterna fuscata*), and several non-threatened seabird species.
- Norway rats killed virtually every Sooty Shearwater chick on Campbell Island during a 1985/86 study.
- There was no breeding of shearwaters in 1994/95 and 1995/96 at the Taiaroa Head Reserve colony where mustelids and feral house cats were virtually eliminated, but rats were abundant.
- Rats occur at very high densities on the Big South Cape Islands group considered in this proposal for eradication.

- Chick harvest rate (associated with traditional harvesting by the Mäori) declined sharply from 1970 to 1973 on Taukihepa (the main Big South Cape Island proposed for eradication) 6 to 9 years after the accidental introduction of *R. rattus*. The timing of this decline coincides with when the 1964 and 1965 cohorts of eggs and chicks would have re-appeared for breeding if they had not been killed by rats. The shearwater research team is currently seeking additional chick harvest diaries to determine if similar perturbation in harvest rates occurred on Pukeweka and Rerewhakaupoko, compared with nearby rat-free islands.

Sooty Shearwater are a culturally important species for the Rakiura Mäori, New Zealand's southern-most indigenous people. The Ngäi Tahu Settlement Act (1987) established the Rakiura Mäori as environmental stewards for this species and returned to them ownership and management rights of shearwater breeding islands. The Rakiura Mäori harvest Sooty Shearwater for food, oil and feathers. The annual journey to harvest chicks from the islands is an important activity for the Rakiura Mäori. The Rakiura Mäori abide by traditional teaching and bylaws to regulate chick harvest and to protect the adult birds and their island breeding habitat. The Rakiura Mäori community instigated a long-term research project called *Kia Mau Te Tïtï Mo Ake Tönu Atu* ("Keep the Tïtï or Shearwater Forever") to work toward ensuring that the shearwater populations remain available for future generations. Because of their concern for the shearwaters and their traditional harvest, the Rakiura Mäori are supportive of this project and will be involved in its implementation.

4.5.7.3 Project Descriptions and Methods

Currently about 47% of the total area of Sooty Shearwater breeding ground in New Zealand is infested with rats. The first priority for eradication is the Big South Cape Island group. The Big South Cape Islands include Taukihepa (939 ha), Pukeweka (3 ha), and Rerewhakaupoko (30 ha) The Big South Cape Island group is sufficiently far from the Rakiura mainland that rats could not re-invade naturally. Eradication of black rat from the Big South Cape Islands would reduce by one half the total breeding area infested by rats, and benefit the shearwater population dramatically.

In addition to eradicating black rats from the Big South Cape Islands, it is also proposed that Polynesian rats (*R. exulans*) be eradicated from Mokonui (86 ha), the next largest island in the area with rats remaining. Successful eradication from both areas would leave only about 14% of the total New Zealand shearwater breeding area infested with rats.

Rats can swim at least 500 m. Therefore, the eradication campaign must occur simultaneously on all three of the Big South Cape islands. The isolated nature of the Mokonui precludes potential natural reinvasion. Combining the eradication work on Mokonui with Big South Cape islands operations allows cost-sharing and would be much more cost-effective than eradicating rats from each island separately. Efficiency gain results from taking full advantage of the assembled helicopter teams and equipment and trained personnel when at the remote southern islands.

The project will use Pestoff™ rodenticide (20 ppm Brodifacoum). Cereal baits will be dyed green to minimize uptake of baits by birds as per Department of Conservation requirements. The bait

has a field life equivalent to approximately 1-inch of rainfall. Two drops of bait are planned using helicopters, the first at 8 kg/ha to be carried out on the first suitable forecast after an agreed date. The optimum time for the drop will be around 1st of July when rats are unlikely to be breeding and probably have the least natural foods available as alternatives to bait. The breeding shearwaters will be absent from the islands at this time. The second drop will be at 4 kg/ha, which will take place in the next suitable weather window at least 5 days after the first drop. This second drop is to ensure that there are no gaps in the bait coverage and to lengthen the time that rats have access to bait. The first drop will be done in strips with 50 % overlap between passes (*i.e.* 4 kg/ha coming out of the helicopter delivery bucket, sowing the 8 kg/ha on the ground). The second will involve 20% overlap. This strategy maximizes the proven quality standard required for total eradication, and minimizes the amount of toxin introduced to the environment. On each drop, cliff areas will be flown twice to ensure sufficient bait is applied to these areas (*i.e.* 16 kg/ha over steep areas equates roughly to 8 kg/ha planar area).

The rodent eradication project methods proposed have been proven to be effective against rats on islands throughout the world. These methods have been used successfully for other eradication projects in New Zealand including Whenua Hou (1,900 ha), Kapiti Island (2,200 ha) and Raoul Island (1,300 ha). The first two operations were proven successful, and results on the other islands are pending two more years post-drop before success can be established.

The proposed actions will comply with the New Zealand statutory processes for Environmental Impact Assessment and resource approval. The New Zealand Department of Conservation and Rakiura Tïtï Islands Administering Body (RTIAB) will guide the overall project and handle all statutory requirements. Aerial broadcast of rodenticide requires resource approval from the Southland Regional Council. Similar to the U.S., this approval requires the development of an Environmental Impact Assessment. The project will be publicly announced and individuals and groups have the opportunity to submit formal comments on the proposed eradication. The Council will consider all objections before permitting aerial dispersal of rodenticide. Decisions may be appealed to the New Zealand Environment Court.

The rat eradication operation will require a full health and safety plan, as required by the New Zealand Department of Conservation's (DOC) policy. The safety plan will cover the handling of bait, work around helicopters, boat travel, etc. New Zealand has now successfully completed many such aerial poisoning campaigns to eradicate rodents from islands (Veitch and Bell 1990 and Veitch and Clout 2002). As a further safeguard, the New Zealand Department of Conservation is required to obtain additional internal consents for the use of toxins. The Department is required to notify the local 'Medical Officer of Health' who will manage any human health issues.

To help guide the project both in the development and implementation, an international working group will be established. The project's preliminary working group includes members of the RTIAB, Rakiura Tïtï Islands Committee (RTIC), DOC, the *Kia Mau Te Tïtï Mo Ake Tönu Atu* ("Keep the Tïtï Forever") research team from the University of Otago, the United States-based non-profit research group *Oikonos*, and independent consultants from the United States. The RTIAB, a statutory non-profit body established under the Ngäi Tahu Settlement Act 1997, consists of 10 elected representatives of the Rakiura Mäori community. They will consult with the Rakiura Mäori community in regular meetings to discuss the rat eradication.

4.5.7.4 Environmental Consequences (Adverse and Beneficial)

Beneficial Effects

The project will benefit multiple island ecosystems including the terrestrial faunal community, as well as restoring the Spill injury to shearwaters. Introduced rats have probably altered regeneration patterns, so restoration of plant processes can also be expected. Re-introduction of several threatened native species [e.g., saddleback *Philesturnus carunculatus*)] or ones similar to those driven extinct by the rat predation will suggest that eradication has been successful. A general increase in invertebrate, lizard, bird and bat populations is expected after initial reductions immediately following poisoning (Towns *et al.* 1990, Towns 1991, Veitch 1994, Towns 1996, Empson and Miskelly 1999, Taylor 2000a, Veitch and Clout 2002).

Adverse Impacts

Potential adverse impacts mainly involve potential poisoning of non-target native species (Colvin *et al.* 1991, Department of Conservation 1996, McClelland 1999). Because there are no land mammals native to New Zealand, the risk of impacted non-target species is minimal. Nevertheless, care is needed to minimize loading and delivery of the bait in order to minimize risks to non-target species (Godfrey 1985, Eason 1992, Eason and Spurr 1995, WHO 1995). Many of the species present on the islands proposed for rat eradication have also been present during previous poisoning operations elsewhere in New Zealand. Monitoring of these species during other operations has shown that while there may be some individual losses at the time of poisoning, no species is at risk at a population level (Towns 1991, Robertson *et al.* 1993, Ogilvie 1997, Empson & Miskelly 1999). The monitoring has shown that the populations rapidly recover from any losses and will generally reach numbers far in excess of levels when rats were there.

4.5.7.5 Probability of Success

World-wide, in the course of more than 100 island rodent eradication attempts, there have been no cases of failure where proven methods were applied with appropriate care and planning (C.R. Veitch in litt. 26 November 2002). Most of these eradications have occurred in New Zealand. The same team that would direct the eradication project described here has just completed the largest and most logistically difficult rodent eradication program yet attempted – to rid the sub Antarctic Campbell Island of Norway rats. Campbell Island is more than ten times the size of the combined islands targeted in this proposal and much more remote. Proof of eradication success at Campbell Island will not be available for two more years, but preliminary signs are encouraging (, P. McClelland, *pers. com.*). Even if the complete eradication of rats fails, the density of rats will be suppressed to near zero for at least three years.

4.5.7.6 Performance Criteria and Monitoring

Population monitoring before and after the application of rodenticide will provide data to evaluate the effectiveness of this project and determine the recovery time for these shearwater colonies. The project will include 'before' and 'after' monitoring data (burrow occupancy, hatching success, chick survival, and breeding success) during 3-5 years of intensive monitoring on the Big South Cape islands and Mokonui (impact sites) and islands with and without rats (control sites). The success of the project will be measured by documenting increases in breeding success by shearwaters before and after rat eradication.

Sooty Shearwater population recovery is expected to be slow relative to other birds because shearwaters are long-lived, have low annual productivity, and do not begin breeding until about seven years of age. As a result, documentation of the project's success on a population level will be augmented by using mathematical models. Preliminary mathematical models of shearwater population dynamics have already been developed (Hamilton and Moller 1995, Hunter *et al.* 2000a, Jones *et al* in pres) so the simulations of the proposed rat eradication project should be rapid and cost-effective. The RTIAB hopes to continue to monitor population with funds, other than the Command Spill funds, to independently validate model predictions.

Predicted recovery will then be tested by repeated monitoring of fixed plots on impact and control sites 8 and 9 years after eradication (2012 and 2013), by which time the additional fledglings resulting from the elimination of predators will have been recruited to the breeding population.

Long-term benefits of rat eradication are critically dependent on establishing effective quarantine measures amongst the Rakiura Mäori harvesters and other visitors to the Big South Cape Islands. The project will establish quarantine measures to be maintained by the RTIAB, thus ensuring long-term viability of the eradication. Similar programs have been established on the Pribilof Islands, Alaska by State and Federal agencies in co-operation with the Tribal Government of the Pribilof Islands and the native Tanadgusix Corporation. They work and plan together to protect these important seabird colonies from potential "rat spills". These well-planned programs provide a model framework for similar effective measures to be imposed by the project.
The harvesters carry considerable quantities of gear and food supplies to the islands, so effective management and educational outreach is essential to prevent re-introduction by rodent 'stowaways'.

4.5.7.7 Evaluation

Approximately 70% of recorded animal extinctions have occurred on islands, and most of these extinctions, including more than half of all seabird extinctions, were caused by invasive species. The most easily reversed detrimental impact to the Sooty Shearwater is to focus restoration on the breeding grounds in New Zealand. The successful implementation of this project would protect a substantial portion of the shearwater breeding area from rats.

The Trustees have evaluated this project against all threshold and additional screening criteria developed to select restoration projects and concluded that this projects is consistent with these

selection factors. The Trustees determined that this type and scale of project would effectively provide appropriate compensation for Sooty Shearwaters injured as a result of the Spill and have selected this project as a preferred alternative.

4.5.7.8 Budget

Eradication	**$236,700**	
Quarantine Procedures	**$39,720**	
Monitoring (pre and post implementation)	**$87,000**	
Education/Outreach	**$1,980**	
TOTAL	**$365,400**	

4.5.8 Lost Human Use Restoration Projects

4.5.8.1 Goals and Nexus to Injury

The lost human use restoration projects will be focused on the recreational areas that were impacted by the Command Spill. To develop potential restoration projects that could be implemented to compensate for human use impacts the Trustees collected restoration concepts from the public and staff of CDPR, San Mateo County, and the Fitzgerald Marine Reserve. Projects developed will be designed to avoid impacts to wildlife.

The Trustees have narrowed the focus of the human use projects to three sites: Half Moon Bay State Beach, Seal Cove Beach at the Fitzgerald Marine Reserve, and improvement and enhancement of the Mirada Surf Property.

Enhancement of the Mirada Surf property will address the loss of human use by providing the public with an additional safe, public access area at the shoreline. The property lies just south of "Surfer's Beach" and is prominently visible from the Highway 1. The open nature of the site combined with its location makes it a natural destination for coastal visitors. Coastal access and the coastal trail on the site are not yet improved.

4.5.8.2 Background

The area impacted included over 15 miles of shoreline in San Mateo County. The Command Oil Spill interrupted the flow of existing recreational services to individuals in beach related activities (e.g., walking, jogging, surfing, tidal pool viewing, and picnicking) on the coastline from Montara State Beach to Bean Hollow State Beach. Combining total lost use with total diminished use, the total value of human use impacts resulting from the Command Spill was calculated to be $113,386 (see discussion in Introduction). Based on this estimate of injury, the MOU allocated approximately $200,000 for projects benefiting shoreline and human use projects.

4.5.8.3 Project Description and Methods

At the Fitzgerald Marine Reserve, the project involves replacement of a heavily worn walkway/staircase to Seal Cove Beach, an intertidal area where guided interpretive walks are conducted. This walkway/staircase, which consists of older decomposing railroad timbers, contains an 80-foot change in elevation. The proposed project would greatly enhance access and safety at this heavily used area.

At Half Moon Bay State Beach the proposed project involves improving beach access and protection of natural resources through construction of a stairway to the beach. The purpose of the project is to improve public access to the coastline at the State Beach and protect natural resources. CDPR will design and construct the stairs and walkway to enhance coastal access. By defining appropriate pathways and beach access points, CDPR can eliminate a network of informal paths that have caused erosion and damage to sensitive resources. For example, trails and access points will be directed away from the nesting area of the Western Snowy Plover.

Mirada Surf is a 49-acre parcel located at the south end of El Granada, a community in the unincorporated mid-coast of San Mateo County. The Mirada Surf Property has been identified for open space and parkland on the local coastal plan maps for over 20 years, but it was privately owned. Its mixed terrain supports numerous habitats, including coastal bluff, a creek with healthy native willows, seasonal wetlands, grasslands and forested hillsides. The Mirada Surf property is the missing link of the Coastal Trail between Pillar Point Harbor and Half Moon Bay.

On August 4, 2003, the County of San Mateo took title to the Mirada Surf Oceanside parcel. The site will remain in permanent public ownership and is dedicated for open space and recreational activities. The council proposes to contribute funds to assist in the implementation of the next phase of the project: the completion of the missing link of the coastal trail and coastal access improvements. The County already has secured a $100,000 grant to pay for the planning, design and permitting of the trail, access improvements and other amenities. It is anticipated that the planning, design, and permitting process will take nine to twelve months and that actual improvements will begin in Spring of 2005.

4.5.8.4 Environmental Consequences (Adverse and Beneficial)

Beneficial Effects

These projects should result in positive benefits by enhancing the quality and amount of public use at the affected sites which were affected by the spill. Improvements to beach access to Half Moon Bay State Beach and Seal Cove will prevent or minimize future adverse impacts to vegetation which is currently affected by soil erosion caused by use of informal foot trails. This will result in additional project benefits since impacted vegetation will recover and soil erosion will be minimized or prevented.

Implementation of these projects will result in an improved visitor experience to these beaches. The project at Half Moon Bay and Seal Cove will provide visitors with safer and more accessible

routes to the beach. The Mirada Surf property is the missing link of the Coastal Trail between Pillar Point Harbor and Half Moon Bay. The purchase of Mirada Surf will close the gap in the Trail and enhance safe public access and recreation, protect sensitive wetlands and arroyo willows, and preserve open space and native habitats.

Adverse Impacts

No significant adverse economic impacts are expected to occur as a result of this project. To minimize potential short-tem impacts to human use that may occur during construction, the projects will be implemented during periods of low use. Potential environmental impacts will be addressed through the permit process. The improvements will likely result in increased visitation which will likely result in an increased need for trash control and safety patrols. These needs can be met with existing resources.

4.5.8.5 Probability of Success

Considering the unimproved condition of the sites targeted for improvement, the probability of success for these projects is very high. Similar projects at Half Moon Bay State Beach have resulted in increased use and improved public safety.

4.5.8.6 Performance Criteria and Monitoring

Performance criteria for these projects will be the completion of the project elements described above. Monitoring is not practical or cost-effective for this project. Ongoing maintenance of the new facilities will be provided by CDPR and San Mateo County personnel.

4.5.8.7 Evaluation

These projects should result in positive benefits by enhancing the quality and amount of public use at Half Moon Bay State Beach, Seal Cove, and Mirada Surf, which were affected by the Spill.

The Trustees have evaluated these projects against all threshold and additional screening criteria developed to select restoration projects and concluded that this projects is consistent with these selection factors. The Trustees determined that this type and scale of projects would effectively provide appropriate compensation for lost or diminished beach user days that occurred as a result of the spill and have selected these projects as preferred alternatives.

4.5.8.8 Budget

Seal Cove Beach Access Improvement Project	$125,000
Half Moon Bay State Park Beach Access Improvement Project	$20,000
Mirada Surf Recreational Improvements	$50,000

4.6 Cumulative Impacts

The Trustees examined a variety of proposed projects to restore resources and/or services lost as a result of the Command Spill. Project-specific environmental consequences for each preferred project are provided in Sections 4.5. This section addresses the potential overall cumulative impacts to be considered in both OPA and NEPA.

The Trustees believe that the projects selected in this restoration program will not cause significant adverse impacts to natural resources or the services they provide. The Trustees further do not believe that the proposed projects will affect the quality of the human environment in ways deemed "significant."

Cumulative environmental impacts are those combined effects on quality of the human environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what Federal or non-Federal agency or person undertakes such other actions (40 CFR 1508.7, 1508.25(a), and 1508.25(c)). Since the projects are designed to achieve recovery of injured natural resources, the cumulative environmental consequences will be largely beneficial. Although this plan directs efforts at restoring injured resources and creating beneficial impacts to injured resources, many other local and regional activities may influence the ability of our project to create a net population or species level benefit for injured seabirds throughout their range. In Central California, serious threats such as oil spills, El Niño impacts, and changes to prey availability may have a negative impact on the recovery of injured seabird populations. Monitoring of projects funded under this draft RP/EA will confirm that cumulative impacts will be beneficial rather than adverse. Any unanticipated cumulative adverse effects from a proposed project identified prior to implementation will result in reconsideration of the project by the Trustees.

4.7 Non-Preferred Projects

The following is a list of projects that the Command Trustee Council considered for funding but has decided not to fund for reasons explained below. These projects were suggested to the Council from members of the public, non-profit organizations, and government agencies during the public scoping process. All of these projects were evaluated using the project selection criteria described above. Furthermore, they were compared with the preferred projects. Should some of the preferred projects above become infeasible, or should extra funds remain, it is possible that the Council will revisit these projects at a later date.

Seabird Nesting Habitat Restoration and Enhancement on the Farallon Islands
This project would restore critical seabird nesting habitat on the Farallon Islands for burrow/crevice nesting seabirds such as the Ashy Storm-petrels and the Cassin's Auklet, by eradicating the introduced house mouse. The Trustees have rated this project as non-preferred due to financial constraints and a low nexus to the injured resoruces.

Año Nuevo Island Seabird Habitat Restoration
This restoration project would revegetate the central marine terrace, the main habitat for burrowing seabirds, with a diversity of native shrub and grass assemblages. The Trustees have

rated this project as non-preferred due to financial constraints and a low nexus to the injured resources.

Appanolio Canyon Steelhead Passage Project

This project would remove a fish barrier and allow passage for steelhead to increase their spawning habitat. As steelheads were not directly impacted by the Spill, the nexus to resources injured by the Spill is low.

Pescadero Marsh Restoration Plan

Funding was sought to contribute (with matching funds) towards the development of a Pescadero Marsh Restoration Plan. This proposal was less preferred for two reasons: 1) the marsh was not directly impacted by the Spill, and thus the nexus is low; 2) the project would merely be the development of a plan (much like this one) but with no direct funding for on-the-ground work.

San Vicente Creek Restoration

This project would focus on storm drain run-off and stream restoration in San Vicente Creek, in order to improve water quality. This would provide benefits not just to the creek, but to the Fitzgerald Marine Reserve at the creek's outfall. This project would provide some direct benefits to the coastal habitat, which was lightly impacted by the Spill, and indirect benefits to seabirds and human recreational beach use. Nevertheless, relative to the other preferred projects, the nexus to the Spill is low and the benefits to impacted resources are relatively small. For this reason, it was not preferred.

Moss Landing Project Monitoring

This project would augment on-going restoration efforts for Brown Pelican roosting habitat and Snowy Plover nesting habitat near Moss Landing. Specifically, funds were sought to augment the monitoring component of this project, as the project implementation funding needs have already been satisfied. This project was considered and compared to the other projects benefiting Brown Pelicans. Because this project would focus on monitoring only, while the other projects addressed immediate needs at other places along the coast, this project was less preferred compared to them.

Gulf of the Farallon Islands Research

This project would focus research on the oceanic areas around the Farallon Islands, exploring the possibility of increased preservation and protection of the marine habitat through the creation of a Farallon Archipelago National Marine Park and Preserve. While the implementation of such protection may yield substantial benefits to natural resources, it is difficult and speculative to quantify the direct benefits of this research. Additionally, the criteria imply a strong preference for on-the-ground projects over research. For this reason, this project was not preferred.

Seabird Protection in Chile

This project would focus on protecting Pink-footed Shearwater (*Puffinus creatopus*) nesting areas in Chile. While this species was present in small numbers during the Spill, none were collected. Furthermore, the option of contributing to the restoration of Sooty Shearwaters in New Zealand offered greater assurance of success and a higher degree of nexus to the Spill. Thus, the Sooty Shearwater project was preferred over this one.

Education and Planning for Seabird Protection on Natividad Island, Mexico
This multi-pronged project would seek to educate local islanders regarding the effects of introduced predators (e.g., cats, rats, others) on seabirds, to develop a map of the island to assist in enforcement of regulations, to develop and implement a quarantine plan to keep the island free of introduced predators. This project would benefit Black-vented Shearwaters (of which 95% of the world's population nests on this island), as well as Brown Pelicans, Double-crested and Brandt's Cormorants, and Western Gulls. Because goats, sheep, and feral cats have been removed from the island in recent years, and educational outreach with island residents has recently been conducted, this project aims to continue and augment these previous efforts. This project provides only marginal on-the-ground restoration benefits. Thus, the Sooty Shearwater Project was preferred over this one.

Leash Law Enforcement at Pillar Point
This project would provide for additional enforcement of leash laws at Pillar Point in order to reduce disturbance of shorebirds. Additionally, it may also provide added benefits for some recreational beach users. Because the disturbance of shorebirds at this location is not likely to impact large numbers of shorebirds, nor any nesting shorebirds, the benefits of this project to shorebirds were thought to be rather small. Additionally, shorebirds were only minimally impacted by the Spill, and thus the nexus to the Spill is low. For these reasons, this project was given lower priority when compared to other projects benefiting impacted bird species.

Education Projects
There were several proposals to focus on the education of youth regarding seabird conservation and marine ecology. These included a project to develop curriculum for high school students, the development of a seabird education website, and a proposal to allocate $1 million for an educational trust fund. As stand-alone projects, these ideas were compared to other seabird projects and were less preferred because they did not provide tangible benefits in the immediate future. However, these projects, specifically the concrete proposals to develop curriculum, would complement the Seabird Colony Protection Program, which focuses education on user-groups most likely to cause disturbance to seabird colonies. Thus, the curriculum development project may be considered as a component of the Seabird Colony Protection Program if funds are available after the implementation of its primary objectives.

Donations to Existing Programs to Benefit Water Quality
There were several proposals to donate $1 million to $2 million to existing programs such as the Monterey Bay National Marine Sanctuary water quality program, the Agriculture Clean Water Foundation, and the San Mateo County Resource Conservation District. The aim was to allocate funds to improve water quality at various sites. Because this Trustee Council is obligated to use the above criteria to address specific injuries to specific resources from the Command Spill, and because these programs apply a different set of criteria to achieve a different set of objectives, the Trustees cannot make such a donation. However, the Trustees could contribute to specific projects carried out by these programs if they were consistent with the Trustees' goals and criteria.

California Coastal Monument Recreation Planning
This project would develop outreach materials and information to increase recreational use of the Bureau of Land Management's rocks off the coast of San Mateo. A comprehensive investigation and planning effort would be undertaken along the San Mateo coast to identify access points for viewing and kayaking along the National Monument rocks, performing an assessment, and identifying partners to increase local tourism tied into rock viewing and use. This project could enhance the quality and amount of public use in areas affected by the Spill. However, this project was less preferred because it does not provide tangible benefits in the immediate future.

5.0 APPLICABLE LAWS AND REGULATIONS

5.1 Overview

The three major laws guiding the restoration of the injured resources and services for the Command Spill are OPA, CEQA and NEPA. These statutes set forth a specific process of impact analysis and public review. In addition, the Trustees must comply with other applicable laws, regulations and policies at the federal, state and local levels.

The potentially relevant laws, regulations and policies are set forth below. In addition to laws and regulations, the Trustees must consider relevant environmental or economic programs or plans that are ongoing or planned in or near the affected environment. The Trustees must ensure that their proposed restoration activities neither impede nor duplicate such programs or plans. By coordinating restoration with other relevant programs and plans, the Trustees can enhance the overall effort to improve the environment affected by the incident.

5.2 Key Statutes Regulations and Policies

5.2.1 Federal Statutes

Oil Pollution Act of 1990, 33 U.S.C. 2701, et seq.; 15 C.F.R. Part 990

The Oil Pollution Act, 33 USC§2706(b), establishes a liability regime for oil spills which injure or are likely to injure natural resources and/or the services that those resources provide to the ecosystem or humans. Federal and state agencies and Indian tribes act as Trustees on behalf of the public to assess the injuries, scale restoration to compensate for those injuries and implement restoration. This draft RP/EA has been prepared jointly by NOAA, CDFG, USFWS, CDPR, and CSLC. Each of these agencies is a designated natural resource Trustee under the Oil Pollution Act of 1990 (OPA), 33 USC§2706(b) and/or State law for natural resources injured by the Command Oil Spill. OPA defines "natural resources" to include land, fish, wildlife, water sources and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States, any State or local government or Indian tribe, or any foreign government. Assessments are intended to provide the basis for restoring, replacing, rehabilitating, and acquiring the equivalent of injured natural resources and services. OPA

mandates that the Trustees assess natural resource damages injured under their trusteeship. OPA further mandates that the designated Trustees shall develop and implement a plan for the restoration, rehabilitation, replacement, or acquisition of the equivalent of the natural resources under their trusteeship. The process emphasizes both public involvement and participation by the Responsible Party(ies).

National Environmental Policy Act, 42 U.S.C. 4321, et seq.; 40 C.F.R. Parts 1500-1508

The National Environmental Policy Act (NEPA) sets forth a specific process of impact analysis and public review. NEPA is the basic national charter for the protection of the environment. Its purpose is to "encourage productive and enjoyable harmony between man and the environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; and to enrich the understanding of the ecological systems and natural resources important to the Nation." The law requires the government to consider the consequences of major federal actions on human and natural aspects of the environment in order to minimize, where possible, adverse impacts. Equally important, NEPA established a process of environmental review and public notification for federal planning and decision making.

Generally, when it is uncertain whether an action will have a significant effect, federal agencies will begin the NEPA planning process by preparing an environmental assessment (EA). The EA may undergo a public review and comment period. Federal agencies may then review the comments and make a determination. Depending on whether the impact is considered significant, an environmental impact statement (EIS) or a finding of no significant impact (FONSI) will be issued.

The Trustees have integrated OPA restoration planning with the NEPA process to comply, in part, with those requirements. This integrated process allows the Trustees to meet the public involvement requirement of OPA and NEPA concurrently.

The Clean Water Act, 33 U.S.C. 1251, et seq.

The Clean Water Act (CWA or the Act) is the principle statute governing water quality. The Act's goal is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. The CWA regulates both the direct and indirect discharge of pollutants into the Nation's waters. Section 301 of the Act prohibits the discharge into navigable waters of any pollutant by any person from a point source unless it is in compliance with a National Pollution Discharge Elimination System (NPDES) permit.

Section 311 of the CWA regulates the discharge of oil and other hazardous substances into navigable waters and waters of the contiguous zone, as well as onto adjoining shorelines, that may be harmful to the public or to natural resources. The Act allows the Federal government to remove the substance and assess the removal costs against the responsible party. The CWA defines removal costs to include costs for the restoration or replacement of natural resources damaged or destroyed as a result of a discharge of oil or a hazardous substance.

Section 404 of the Act authorizes the U.S. Army Corps of Engineers (the Corps) to issue permits, after notice and opportunity for public hearings, for the disposal of dredged and fill material into navigable waters. Generally, projects which move material in or out of waters or wetlands require section 404 permits. Section 401 of the Act provides that projects that involve discharge or fill to wetlands or navigable waters must obtain certification of compliance with state water quality standards.

Coastal Zone Management Act, 16 U.S.C. 1451, et seq.

The goal of the Coastal Zone Management Act (CZMA) is to encourage States to preserve, protect, develop and, where possible, restore and enhance valuable natural coastal resources. Participation by States is voluntary. The State of California has enacted the federally approved California Coastal Act.

Section 1456 of the CZMA requires that any federal action inside or outside of the coastal zone that affects any land or water use or natural resources of the coastal zone shall be consistent, to the maximum extent practicable, with the enforceable policies of approved State management programs. It states that no federal license or permit may be granted without giving the State the opportunity to concur that the project is consistent with the State's coastal policies. The regulations outline the consistency procedures.

The Trustees do not believe that the draft RP/EA will adversely affect the State's coastal zone. However, to comply with the CZMA, the Trustees intend to seek the concurrence of the State of California that their preferred alternatives are consistent to the maximum extent practicable with the enforceable policies of the state coastal program.

Endangered Species Act, 16 U.S.C. 1531, et seq.

The purpose of the Endangered Species Act is to conserve endangered and threatened species and the ecosystems upon which they depend. The Endangered Species Act (ESA) directs all federal agencies to utilize their authorities to further these purposes. All federal agencies are required to ensure that any action that they authorize, fund or carryout is not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of habitat designated as critical for such species, unless the agency is granted an exemption for the action. Under the ESA, the National Marine Fisheries Service (NOAA Fisheries) and the USFWS publish lists of endangered and threatened species. If a federal agency proponent (action agency) of a project determines that a listed species may be in the action area of the project, the agency must consult with the Fish and Wildlife Service and/or NOAA Fisheries to ensure that implementing the project will not jeopardize the listed species. If the action agency concludes that the project will not adversely affect a listed species or its critical habitat, it submits a "no effect determination" to the USFWS and / or NOAA Fisheries for its concurrence. If the project constitutes a major construction activity, then the action agency must prepare a biological assessment with a more in-depth evaluation of the potential effects of the project on the listed species, which may still lead to a no effect determination. If the project is likely to adversely affect either a listed species or its critical habitat, then more formal consultation procedures are required.

The federally endangered Marbled Murrelet and Brown Pelican and the federally threatened Western Snowy Plover may utilize and nest on beaches and in forests which may be included in selected areas for implementing restoration projects. Marbled Murrelets nest near and around the corvid control projects sites and nest within the acquisition project sites. Corvid and Marbled Murrelet surveys and corvid removal activities will occur in a manner that will not disturb Marbled Murrelets, and are intended to increase nest success of Marbled Murrelets. Several species of birds, including the Brown Pelican and the Western Snowy Plover may utilize beaches near the human use projects and seabird restoration projects. These projects will be implemented outside of the nesting and rearing season and will not be located within zones of the beaches used for nesting.

The Trustees do not believe that any of its projects constitute a major construction activity, or that they will adversely affect listed species, and does not believe that a biological opinion is required to complete its ESA consultation requirements. The Trustees will submit this determination to the USFWS and will seek its concurrence prior to implementing any proposed activities. If the Trustees determine that a restoration project planned in the future will have an affect on a threatened or endangered species, the Trustees will either redesign the project, substitute another project, or obtain a permit under Section 7 from the USFWS.

Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801, et seq.

The federal Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as amended and reauthorized by the Sustainable Fisheries Act (Public Law 104-297) establishes a program to promote the protection of essential fish habitat (EFH) in the review of projects conducted under federal permits, licenses, or other authorities that affect or have the potential to affect such habitat. After EFH has been described and identified in fishery management plans by the regional fishery management councils, federal agencies are obligated to consult with the Secretary of Commerce with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH.

The Trustees believe that the projects identified in the Draft RP/EA will have no adverse effect on EFH and will promote the protection of fish resources and EFH.

Fish and Wildlife Coordination Act, 16 U.S.C. 661, et seq.

The federal Fish and Wildlife Coordination Act (FWCA) requires that federal agencies consult with the USFWS, NOAA Fisheries, and state wildlife agencies for activities that affect, control or modify waters of any stream or bodies of water, in order to minimize the adverse impacts of such actions on fish and wildlife resources and habitat. This consultation is generally incorporated into the process of complying with Section 404 of the Clean Water Act, NEPA or other federal permit, license or review requirements.

The Trustees do not expect the Draft RP/EA to implicate the FWCA, but may consult with the appropriate agencies.

Marine Mammal Protection Act, 16 U.S.C. 3371, et seq.

Under the Marine Mammal Protection Act (MMPA), the Secretary of Commerce is responsible for the conservation and management of pinnipeds (other than walruses) and cetaceans. The Secretary of the Interior is responsible for walruses, sea otters, polar bears, manatees, and dugongs. The Secretary of Commerce delegated MMPA authority to NOAA Fisheries. Title II of the Act established an independent Marine Mammal Commission and its Committee of Scientific Advisors to oversee and recommend actions necessary to meet the intents and provisions of the Act. The Act provides that the Secretary shall allow the incidental, but not intentional, taking, by U.S. citizens engaged in activities other than commercial fishing of small numbers of depleted as well as non-depleted marine mammals if, after notice and opportunity for public comment, the Secretary finds that the total of such taking will have a negligible impact on the affected species or stock, and prescribes regulations setting forth permissible methods of taking, and requirements for monitoring and reporting such taking." However, the 1994 Amendments provide that this regulation requirement may be waived provided that the proposed activity results in only harassment, and no serious injury or mortality is anticipated.

The Trustees do not expect the Draft RP/EA to "take," "harass," or "injure" any species protected under the MMPA.

Migratory Bird Treaty Act of 1918, 16 U.S.C. 703, et seq.

The Migratory Bird Treaty Act (MBTA) implements four international treaties involving protection of migratory birds, including all marine birds, and is one of the earliest statutes (amended several times) to provide for avian protection by the Federal Government. Among its other provisions, it broadly prohibits actions to "pursue, hunt, take, capture, kill, attempt to take, kill, possess, offer for sale, sell, offer to purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird...or any part, nest, or egg of such bird." Exceptions to these prohibitions are only allowed under regulations or permits issued by USFWS. Hunting of game birds, including waterfowl and certain shore birds, is annually regulated through a process in which the USFWS sets "framework regulations" based on the best current population data available, and States pass regulations that conform to those Federal regulations. All other prohibited actions are only allowed under specific permits issued by the USFWS. Criminal violations of this Act are enforced by USFWS, and it is also the primary statute under which USFWS and Interior have responsibility to manage all migratory birds wherever they occur, including marine birds.

The MBTA also is the basis for USFWS oversight and permitting of collection and preservation or rehabilitation of birds oiled during spill response, which usually provides the primary data for determining extent of injury to marine birds and the need for restoration.

Projects identified in the Draft RP/EA will be conducted in full compliance with the MBTA.

National Marine Sanctuaries Act, 16 U.S.C. 1431, et seq.

The National Marine Sanctuaries Act (NMSA) prohibits the destruction, loss of, or injury to any sanctuary resource and any violation of the Act, any regulations, or permits issued pursuant to the NMSA. The Secretary of Commerce (Secretary) is required to conduct such enforcement activities as are necessary and reasonable to carry out the Act. The Secretary may issue special use permits which authorize specific activities in a sanctuary, in order to establish conditions of access to and use of any sanctuary resource, or to promote public use and understanding of a sanctuary resource.

The NMSA also establishes liability for response costs and natural resource damages for injury to sanctuary natural resources. Under the Act, the Secretary may undertake or authorize all necessary actions to prevent or minimize the destruction or loss of, or injury to, sanctuary resources, or to minimize the imminent risk of such destruction, loss, or injury. Furthermore, the Secretary shall assess damages to sanctuary resources. The Act defines natural resource damages to include the cost of replacing, restoring, or acquiring the equivalent of a sanctuary resource; the value of the lost use of the resource pending its restoration the cost of damage assessments; and reasonable monitoring costs. The Secretary is required to use recovered response costs and damages to finance response actions and damage assessments to restore, replace or acquire the equivalent of the injured sanctuary resource, and to manage and improve national marine sanctuaries.

Park System Resource Protection Act, 16 U.S.C. 19jj

Public Law 101-337, the Park System Resource Protections Act (16 U.S.C. 19jj), requires the Secretary of the Interior (Secretary) to assess and monitor injuries to the National Park Service (NPS) resources. A "park system resource" is defined by the PSRPA as "any living or nonliving resource that is located within or is a living part of a marine regimen or a Great Lakes aquatic regimen...within the boundaries of a unit of the NPS...." The Act specifically allows the Secretary to recover response costs and damages from the Responsible Party causing the destruction, loss of, or injury to park system resources. "Response costs" are defined by the Act to include the costs of actions taken by the Secretary to prevent, abate or minimize the destruction, loss or injury or imminent risk of such destruction, loss, or injury. The Act further provides that "response costs" include monitoring ongoing effects of incidents causing such destruction, loss, or injury.

Rivers and Harbors Act, 33 U.S.C. 401, et seq.

The federal Rivers and Harbors Act regulate development and use of the Nation's navigable waterways. Section 10 of the Act prohibits unauthorized obstruction or alteration of navigable waters and vests the Army Corps of Engineers with authority to regulate discharges of fill and other materials into such waters. Restoration actions that require Section 404 Clean Water Act permits are likely also to require permits under Section 10 of the Rivers and Harbors Act. However, a single permit usually serves for both. Therefore, the Trustees can ensure compliance with the Rivers and Harbors Act through the same mechanisms.

Executive Order (EO) 11988 – Construction in Flood Plains

This 1977 Executive Order directs federal agencies to avoid, to the extent possible, the long-and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct or indirect support of development in flood plains wherever there is a practicable alternative. Each agency is responsible for evaluating the potential effects of any action it may take in a flood plain. Before taking an action, the federal agency should determine whether the proposed action would occur in a flood plain. For any major federal action significantly affecting the quality of the human environment, the evaluation would be included in the agency's NEPA compliance document(s). The agency should consider alternatives to avoid adverse effects and incompatible development in flood plains. If the only practicable alternative requires siting in a flood plain, the agency should: (1) design or modify the action to minimize potential harm, and (2) prepare and circulate a notice containing an explanation of why the action is proposed to be located in the flood plain.

Executive Order 13112 - Invasive Species

EO 13112 applies to all Federal agencies whose actions may affect the status of invasive species and requires agencies to identify such actions and to the extent practicable and permitted by law (1) take actions specified in the Order to address the problem consistent with their authorities and budgetary resources; and (2) not authorize, fund, or carry out actions that they believe are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, "pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions."

Executive Order (EO) 12898 - Environmental Justice

On February 11, 1994, President Clinton issued EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This EO requires each federal agency to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority and low income populations. EPA and the CEQ have emphasized the importance of incorporating environmental justice review in the analyses conducted by federal agencies under NEPA and of developing mitigation measures that avoid disproportionate environmental effects on minority and low-income populations. The Trustees have concluded that there are no low income or ethnic minority communities that would be adversely affected by the Draft RP/EA.

Environmental Justice further requires federal agencies to provide opportunities for community input in the NEPA process. The Trustees will make every effort to involve the affected community by providing notice to members of the public and access to related documents.

Information Quality Law, Public Law 106-554, Section 515

Information disseminated by federal agencies to the public after October 1, 2002, is subject to information quality guidelines developed by each agency pursuant to Section 515 of Public Law 106-554 that are intended to ensure and maximize the quality of the objectivity, utility and integrity of such information. This Draft RP/EA is an information product covered by information quality guidelines established by NOAA and DOI for this purpose. The quality of the information contained herein is consistent with these guidelines, as applicable.

5.2.2 State Statutes

California Environmental Quality Act, Pub. Res. Code 21000-21178.1

The California Environmental Quality Act (CEQA) was adopted in 1970 and applies to most public agency decisions to carry out, authorize or approve projects that may have adverse environmental impacts. CEQA requires that agencies inform themselves about the environmental effects of their proposed actions, consider all relevant information, and provide the public an opportunity to comment on the environmental issues, and avoid or reduce potential environmental harm whenever feasible.

The CEQA process begins with a preliminary review as to whether CEQA applies to the project in question. Generally, a project is subject to CEQA if it involves discretionary action by an agency that may cause an effect on the environment. Once the agency determines that the "project" is subject to CEQA, the lead agency must then determine whether the action is exempt under either a statutory or categorical exemption.

If the lead agency determines that the project is not exempt then an initial study must be prepared to determine whether the project may have a potentially significant effect on the environment. Based on the initial study, the lead agency determines the type of CEQA documentation that will be prepared. The test for determining whether an environmental impact report (EIR) or negative declaration must be prepared is whether a fair argument can be made based on substantial evidence that the project may have a significant effect on the environment.

CEQA encourages the use of an EIS or finding of no significant impact or combined state/federal documents in place of a separate EIR or negative declaration. After reviewing the proposed Draft Restoration Plan, the State Trustee (CDFG) has determined that the proposed actions will not result in substantial, or potentially substantial, adverse changes in any of the physical conditions within the areas affected by the projects. Additionally, the State Trustee considers these actions to be categorically exempt pursuant to: (1) "Minor alterations to land, water, or vegetation"; (2) "Actions by regulatory agencies for protection of natural resources", and (3) "Actions by regulatory agencies for the protection of the environment."

The Trustees have integrated both NEPA and CEQA requirements into this Draft RP/EA.

California Lempert-Keene-Seastrand Oil Spill Prevention and Response Act, Government Code Section 9574.1, et seq.

The Lempert-Keene-Seastrand Oil Spill Prevention and Response Act, commencing with Section 8574.1, became effective on September 24, 1990. This legislation is the key state compensatory mechanism for subsequent spills. It establishes a comprehensive liability scheme for damages resulting from marine oil spills. Recoverable damages include injury to natural resources, the cost of rehabilitating wildlife, habitat, and other resources, and loss of use and enjoyment of natural resources, public beaches, and other public resources. Responsible parties are required to fully mitigate adverse impacts to wildlife, fisheries, and wildlife and fisheries habitat by successfully carrying out environmental restoration projects or funding the activities of CDFG to carry out environmental restoration projects.

California Coastal Act, California Public Resources Code sections 30000, et seq.

The California Coastal Act was enacted by the State Legislature in 1976 to provide long-term protection of California's 1,100-mile coastline for the benefit of current and future generations. The Coastal Act created a partnership between the State (acting through the California Coastal Commission) and local government (15 coastal counties and 58 cities) to manage the conservation and development of coastal resources through a comprehensive planning and regulatory program.

The Commission's authority (called federal consistency review) comes from the Federal Coastal Zone Management Act (CZMA). After California's Coastal Management Program (CCMP) was approved by the NOAA pursuant to the CZMA in 1977, all federal activities affecting coastal zone resources became subject to the Commission's regulatory jurisdiction.

The Trustees do not believe that the RP/EA will adversely affect California's coastal zone resources. However, the Trustees intend to seek the California's Coastal Commission's concurrence that their preferred alternative is consistent with California's federally approved Coastal Management Program .

California Endangered Species Act*, Fish and Game Code 2050 *et seq.

It is the policy of the State of California that state agencies should not approve projects as proposed which would jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species if there are reasonable and prudent alternatives available. If reasonable alternatives are infeasible, individual projects may be approved if appropriate mitigation and enhancement measures are provided. Under this act, the Fish and Game Commission established a list of threatened and endangered species based on criteria recommended by the Department of Fish and Game.

***California Harbor and Navigation Code* section 294**

Harbors and Navigation Code Section 294 creates absolute liability for damages from the discharge or leaking of gas, oil, or drilling waste onto marine waters. Damages include cost of

wildlife rehabilitation and injury to natural resources or wildlife, and "loss of use and enjoyment of public beaches and other public resources or facilities."

Public Resources Code, Division 6*, Sections 6001, *et seq.

The Public Resources Code, Division 6, gives the California State Lands Commission trustee ownership over State sovereign tide and submerged lands. Permits or leases may be required from the State Lands Commission if a restoration project is located on such lands.

5.2.3 Other Potentially Applicable Statutes and Regulations

Additional statues may be applicable to NRDA restoration planning activities. The statutes listed below, or their implementing regulations, may require permits from federal or state permitting authorities.

- National Park Act of August 19, 1916 (Organic Act), 16 USC 1, *et seq.*
- Archaeological Resources Protection Act, 16 U.S.C. 460, *et seq.*
- National Historic Preservation Act of 1966 as amended (16 U.S.C. 470-470t, 110)
- Clean Air Act, 42 U.S.C. 7401, *et seq.*
- Executive Order 11514 – Protection and Enhancement of Environmental Quality
- Executive Order 11990 – Protection of Wetlands
- Executive Order 11991 – Relating to the Protection and Enhancement of Environmental Quality

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FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Restoration and Environmental Assessment for the Final Restoration Plan for the 1998 Command Oil Spill

The National Oceanic and Atmospheric Administration (NOAA) is a cooperating agency for the National Environmental Policy Act (NEPA) compliance for the final Restoration Plan and Environmental Assessment for the 1998 Command Oil Spill. NOAA, the Department of the Interior (DOI) through the USFWS(Federal Trustees), and the California Department of Fish and Game's (CDFG) Office of Spill Prevention and Response (OSPR), the California Department of Parks and Recreation (CDPR), and the California State Lands Commission (CSLC) (State Trustees), propose to implement restoration to benefit natural resources injured by the Command Oil Spill. The Federal and State Trustees participate in damage assessment and restoration planning activities to address injury and lost services to natural resources as a result of the oil spill under all appropriate environmental laws and regulations.

On September 26, 1998, the T/V Command released an estimated 3,000 gallons of Intermediate Bunker Fuel (IBF) 380, also known as Fuel Oil No. 6. On September 30, oil began to wash ashore, largely in the form of scattered tarballs, over 15 miles of beaches, primarily in San Mateo County. A tarball sample collected as far away as the Salinas River mouth in Monterey County, however, matched the source sample from the tanker.

The primary impacts from the Spill were injuries to large numbers of seabirds, primarily Common Murres. In addition, a number of Brown Pelicans and Marbled Murrelets were impacted along with various other sea birds species. Brown Pelicans and Marbled Murrelets are listed as threatened and/or endangered species under the Endangered Species Act (ESA)(16 U.S.C. 1533(c)) and the California Endangered Species Act (Fish & Game Code 2050, *et seq.*). In addition, injuries occurred to sandy beach and rocky intertidal shoreline habitats and lost and diminished use of beaches for human recreation. No beaches were closed as a result of the Command Spill; however, coastal access was interrupted.

Both federal and California statutes establish liability for natural resource damages to compensate the public for injury, destruction, and loss of such resources and their services resulting from oil spills. Natural resource trustees are authorized to act on behalf of the public under state and federal statutes to assess natural resources damages and to plan and implement actions to restore natural resources and resource services injured or lost as a result of a discharge of oil. The terms of the settlement that was reached between the responsible parties and the Trustees were memorialized in a Consent Decree that was entered by the Court on March 31, 2000. Pursuant to the Consent Decree, the responsible parties placed a total of $5,518,000 into an interest bearing account. Of the total settlement, approximately $3,968,000 will be used to restore natural resources injured by the oil spill.

The Restoration Plan and Environmental Assessment (RP/EA) examines and evaluates the effects of the proposed restoration actions on the environment and concludes that the action does not constitute a major Federal action that would significantly affect the quality of the human

environment. Therefore, an Environmental Impact Statement has not been prepared. The EA considered in detail the "No-action Alternative" and 21 individual projects to address the injured resources in a public process. The Trustees developed fourteen criteria to evaluate and prioritize the entire suite of projects that were under consideration. The criteria include restoring those resources directly impacted by the oil spill, relevant federal and state law provisions governing use of recoveries for natural resources, and the potential for restoration benefits to be realized. The final RP/EA contains nine projects that met the screening criteria and were selected as preferred restoration projects.

The Trustees evaluated several categories of restoration alternatives that would benefit resources injured by the Spill, including injuries to seabirds, sandy and rocky intertidal habitats and recreational use along the California coast. The "No action Alternative" was not selected because it would not meet the requirement under the Oil Pollution Act and the goal of restoring lost and diminished human-use restoration alternatives. The "No action Alternative" would be contrary to the mandate of the parties under the NRDA settlement agreement, the injured environment would not be restored, additional adverse ecological effects would occur, and potential for negative threats to the health and safety of the public would continue.

Based upon the information contained in the Restoration Plan and Environmental Assessment, we have determined that the RP/EA would not significantly affect the quality of the human environment. The proposed restoration actions are: Marbled Murrelet Restoration and Corvid Management Project, Marbled Murrelet Land Acquisition and Enhancement Project, Seabird Colony Protection Project, Common Murre Nesting Ledge Creation, Brown Pelican Roost Site Enhancement and Protection Projects, Sooty Shearwater Restoration Project, Half Moon Bay State Beach Access Improvement Project, Seal Cove Beach Access Improvement, Mirada Surf Recreational Improvements. Mitigation measures have been designed to minimize any potential for adverse environmental impacts.

The public has been afforded three opportunities to review and provide input on the alternatives, including the preferred alternatives. Initially, a public scoping meeting was held on May 21, 2002 in Half Moon Bay, California. A second public meeting was held on <insert date> to present the draft Restoration Plan/Environmental Assessment to the public. Additionally the Draft RP/EA was made available to the public for a 45-day comment period beginning <insert date> and closing <insert date>. The Draft Restoration Plan/Environmental Assessment was available in both hardcopy form and posting on federal and state agency website pages.

DETERMINATION

Based upon an environmental review and evaluation of the Final Restoration Plan and Environmental Assessment for the 1998 Command Spill, I have determined that the proposed action does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of Section 102(2)(c) of the National Environmental Policy Act of 1969, as amended. Accordingly, an Environmental Impact Statement is not required for the Restoration Plan and Environmental Assessment.

DRAFT Date **DRAFT**

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