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7.1 INTRODUCTION TO EVALUATION OF ENVIRONMENTAL CONSEQUENCES

This section describes and compares the potential environmental consequences of the proposed action (restoration of the natural resources injured by the DDTs and PCBs discharged to coastal waters of Southern California) by analyzing the individual projects and the three alternatives described in this Restoration Plan. This plan has been prepared as a programmatic Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) for the purposes of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The potential environmental consequences are considered within the following context:

- The fundamental purpose of the proposed action is to restore injured natural resources and the services they provide (i.e., to improve the natural and human environment).
- The DDTs and PCBs of the Montrose case are expected to persist in the marine environment of the Southern California Bight for many years.
- The alternatives presented in this Restoration Plan include actions for which this programmatic EIS/EIR fulfills NEPA/CEQA requirements as well as actions that will require further NEPA and/or CEQA analysis at a subsequent stage, after the details of the action are developed.
- The Natural Resource Trustees for the Montrose case (Trustees) anticipate updating the Restoration Plan as implementation progresses and new information becomes available. The actions evaluated constitute the actions the Trustees reasonably foresee implementing over the initial phase (Phase 1) of the program, which will run approximately through 2010.

Subsequent planning and environmental impact analysis will be tiered off of this programmatic EIS/EIR. In the terminology of NEPA, “tiering” refers to the coverage of general matters in a broad EIS with subsequent narrower environmental analysis that incorporates by reference the general discussions and concentrates solely on the issues specific to the analysis subsequently prepared. Tiering is appropriate when impact analysis progresses from a program, plan, or policy EIS to an analysis of lesser scope or to a site-specific analysis. Tiering is appropriate when it helps focus analysis on the issues that are ripe for decision and excludes from consideration issues already decided or unresolved (U.S. Council for Environmental Quality regulations for implementing NEPA, Title 40 Code of Federal Regulations [CFR] Section 1508.28).

In addition to addressing the overall Montrose Settlements Restoration Program (MSRP) effort at a programmatic level, this Restoration Plan and Programmatic EIS/EIR fulfills the impact analysis requirements for ten individual actions (see Table 6-1).[1] Analyses of the direct and indirect environmental effects and proposed mitigation are provided in Section 7.2 for these ten

[1] As a matter of practice, the lead federal agency for this programmatic EIS/EIR, the National Oceanic and Atmospheric Administration (NOAA), undertakes a NEPA analysis for all of its major actions with potential for significant effects on the environment, including those occurring outside the United States and its territories. The analysis of potential restoration actions on Baja California Pacific Islands is being provided to ensure that the public is fully informed about important environmental issues. The production of this NEPA document is in no way intended to affect or influence other United States government policies regarding the applicability of NEPA to actions taken outside the United States. Subsequent site-specific detail development for potential restoration actions in Baja California Pacific Islands may be subject to the environmental review requirements of the Mexican government.

actions and, to the extent possible at this stage, for the remaining seven actions that will require further analysis at a later point when more details are available. Expanded discussions of the actions are provided in Appendices A–D.

NEPA and CEQA also require the analysis of cumulative impacts (Section 7.3) and other mandated discussions (Section 7.4), including: irreversible and irretrievable environmental changes and commitments of resources, the relationship between short-term uses of the environment and the maintenance and enhancement of long-term environmental productivity, growth-inducing effects, and identification of any significant and unavoidable adverse impacts.

The environmental impact analysis in this Restoration Plan and Programmatic EIS/EIR focuses on the following categories considered to have potential relevance to the anticipated actions:

- Biological resources (fish, birds and other wildlife)
- Physical resources (earth resources, including sediments, water resources, and oceanographic and coastal processes)
- Human use (recreation, socioeconomics, and aesthetics)

Effects in the following categories are considered insignificant or not relevant to the anticipated actions:

- Air quality: Air quality impacts from any individual project will either be non-existent or minor (i.e., involve limited production of fugitive dust and emissions from construction vehicles). The impacts will be insignificant contributions, both individually and combined, when compared to impacts from other construction projects and from motor vehicle emissions on highways and streets in the areas where restoration actions take place, and will not represent a significant contribution to regional air quality.
- Agriculture: None of the project sites or anticipated sites are suitable for agricultural use.
- Noise: Restoration activities will not take place at sites near existing human habitation. Construction will involve equipment that produces noise similar to or below the levels already allowed by local ordinances governing normal construction activities. Social attraction as a method for restoring seabirds to islands involves production of recorded sounds in these remote areas, but these activities have been successfully employed in the past and it is unlikely to result in adverse consequences to other biological organisms.
- Population and housing: The sites where actions will take place are not populated and are not considered viable areas for housing development.
- Soils, geology, and geologic hazards: Restoration activities do not involve any modification of the geology at any sites, and no geologic hazards will be increased by MSRP activities.
- Land use planning: The implementation of the MSRP Restoration Plan will not involve significant changes in land use or be inconsistent with existing local and regional plans and policies on land use.

The potential effects in the following categories are not anticipated to be significant at this point, but detail is not yet sufficient for final analysis in this EIS/EIR because the actions that could affect these categories are still conceptual:

- Hydrology: The restoration of full tidal exchange wetlands may have hydrological impacts, depending on the nature of the actions and their scale. The potential for such impacts, if any, will be addressed once potential site(s) are identified and project details are more fully developed. None of the other actions evaluated in this Restoration Plan involve physical changes that have the potential for hydrological impacts.
- Navigation and navigation safety: The construction and final placement of material for artificial reefs as envisioned in this Restoration Plan will either have no impacts or insignificant impacts to navigation and navigation safety. During the site selection and design of artificial reefs, the Trustees and other project proponents will consider potential effects on navigation and address these issues in site-specific environmental analyses. Numerous artificial reefs have been constructed in Southern California coastal waters in recent decades (Appendix A1, Figure A1-1), and potential impacts to navigation are avoided through consideration of the locations and depths of material placement. For example, in a Mitigated Negative Declaration that the Port of Los Angeles prepared for the proposed San Pedro artificial reef project (Los Angeles Harbor Department 2003), the Port proposed a minimum reef crest depth and proposed avoiding placement of reef material within shipping lanes or within a 200-yard radius around a navigational marker buoy to accommodate U.S. Coast Guard maintenance of the buoy.
- Transportation, traffic, and roadway safety: Existing transportation, traffic, and roadway systems will remain unaltered by any projects undertaken under the MSRP. A small amount of temporary traffic may result from moving equipment in and out of certain sites. The potential traffic impacts of transporting rock or concrete to potential reef or roost sites may need to be addressed in a subsequent environmental analysis once greater details about site-specific activities are known; however, it is likely that the minimal number of truck trips to move material from source sites to barge-loading areas will simply replace truck trips of alternative uses of the materials (e.g., to crushers and landfills).
- Cultural resources: No significant impacts to cultural resources have been identified for any of the restoration actions. For projects that will involve construction and for which specific sites have not yet been identified (e.g., construction of reefs or modification to fishing facilities), a review of potential cultural resource impacts will need to be conducted once specific sites are identified.

7.2 DIRECT AND INDIRECT IMPACTS OF THE ALTERNATIVES

This section evaluates the direct and indirect environmental effects of the proposed action through analysis of each of the three alternatives: Alternative 1 (No Action), Alternative 2 (Preferred) and Alternative 3. This section also presents mitigation measures to reduce or avoid potential adverse impacts. Expanded descriptions and detailed analysis of the individual projects against the evaluation criteria, including their beneficial and adverse impacts, are provided in Appendices A–D.

7.2.1 Alternative 1 (No Action)

Under the No Action Alternative, the MSRP would not implement any restoration activities except monitoring. Consequently, there would be no environmental impacts when compared to

the baseline, or current conditions. Beneficial effects of natural resource restoration actions would not be realized. The purpose and need for the MSRP (i.e., utilizing the funds from the Montrose settlements to restore injured resources and lost services) would not be met. Without active restoration projects, there would be no biological, physical, or human use benefits or adverse impacts. However, natural resource injuries and lost services resulting from the DDTs and PCBs of the Montrose case would persist in the Southern California Bight for the foreseeable future. Also, no compensation for interim lost natural resource services from the date of the enactment of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (1980) until injuries cease would be realized.

7.2.2 Alternatives 2 and 3

Each of these two alternatives consists of a different combination of the 17 restoration actions described in Section 6 and evaluated in detail in Appendices A–D. Several of these individual actions are common to both alternatives, some are only in one alternative, and some are not included in either. The direct and indirect environmental effects of each of the 17 actions are presented here individually (in the same order as the actions are listed in Appendices A–D); the headings indicate which of the alternatives each action is a part of.

These two comprehensive alternatives have been compiled to evaluate different mixes of restoration actions that the Trustees believe they can accomplish within the $25 million funding level set for Phase 1 of implementation. Although some of the actions are not specifically included under either Alternative 2 or 3, all actions are evaluated at this point. As a result, the Trustees would be able to proceed with any of the other actions should additional funding become available, or should any of the proposed actions prove infeasible.

A1. Construct Artificial Reefs and Fishing Access Improvements

Alternative 2 [✓] *Alternative 3 [✓]* *Neither [ ]*

This action will require subsequent environmental analysis when the project details are more fully developed.

Biological Effects

Direct Effects. This action will convert soft-bottom aquatic habitat to reef habitat. The reduction of soft-bottom habitat on the limited scale feasible under this restoration action, when compared to the predominant extent of such habitat throughout the region, will not significantly affect the total available soft-bottom habitat to those species that rely on it. Unless care is exercised in siting artificial reefs, their construction can potentially impact the availability of other limited inshore habitat or resources, such as eelgrass beds, spawning areas for market squid (*Loligo opalescens*), or important nursery areas for certain fish species such as California halibut.

The displacement of the sandy- or muddy-bottom habitat with hard-bottom substrate will increase the diversity and may increase the number of the animal and plant biota in the area. The fish productivity of rocky reef habitat has been estimated to be between 9 and 23 times that of sandy-bottom habitat (MEC Analytical Systems 1991).

At a conceptual level, reef construction projects are not likely to adversely affect threatened or endangered species or essential fish habitat. Nonetheless, detailed analysis will be performed at a site-specific level once specific sites for reefs are identified.

Indirect Effects. To the extent that reefs constructed under the MSRP program function as production sites for rockfishes or other species that are currently depleted, the reefs may benefit the management and recovery of these depleted species of fish.

Reef-associated fish typically contain lower concentrations of DDTs and PCBs than soft-bottom species, so constructed reefs benefit the biological organisms that prey on fish in the vicinity of the constructed reefs, as these organisms are likely to be exposed to reduced levels of these contaminants.

It is possible that fishing pressure and thus fish mortality may increase in the vicinity of newly constructed reefs. Such an effect might also occur should improvements to fishing access and amenities be constructed under this restoration action and lead to increases in fishing trips to a particular site.

Mitigation Measures. The specific location of each constructed reef will be studied and selected such that the MSRP reefs avoid impacts to eelgrass beds or other nearshore soft-bottom areas that are currently important and contain limited habitat types. State and federal fisheries agencies will be consulted to ensure appropriate reef design, size, and placement, and to ensure that long-term management will accommodate anticipated increases in fishing and other uses of the reef site.

Physical Effects

Direct Effects. The placement of concrete or rock materials into marine waters will cause short-term suspension of sediments at the reef construction site that will result in short-term water quality impacts. The principal effect will be increased turbidity; however, depending on local conditions, the sediments at the reef site might contain elevated contaminant levels.

Indirect Effects. To the extent that the material used to construct a reef is from the demolition of concrete structures, the beneficial reuse of this material will divert it from land disposal and conserve a corresponding increment of landfill space. There may be other trade-offs related to transportation and disposal of materials (such as reduced air quality impacts relative to land disposal), but whether these trade-offs will have net positive or net negative consequences cannot be determined until the site-specific implementation factors are determined.

Placement of reefs in nearshore areas has the potential to disrupt the normal transport of sediment and affect the topography of adjacent subtidal and beach areas. Also, depending on the nature of the soft substrate in a given area, the depth to bedrock, and the slope, the hard substrate dropped to the marine bottom could potentially not perform as intended.

Mitigation Measures. Adjustments to the methods and timing for reef material placement may be developed in consultation with regulatory agencies (i.e., the California Regional Water Quality Control Board, the U.S. Army Corps of Engineers, and the U.S. Environmental Protection Agency [EPA]) to address local conditions and reduce the potential short-term water quality impacts of the construction.

Once planning progresses to the stage in which site-specific studies are undertaken, the potential short-term physical impacts from placing rock or rubble in a given area will undergo engineering and water quality analysis, and additional evaluation will be performed to identify measures to minimize adverse effects.

Human Use Effects

Direct Effects. Artificial reef construction in areas where fish species contaminated by DDTs and PCBs will be displaced by less-contaminated species associated with hard-bottom and water-column habitats will have a direct benefit to anglers whose fishing has been impacted by fish consumption advisories.

Improvements to fishing access (e.g., the addition of various fishing site amenities, including pier extensions, fish-cleaning stations, benches, parking improvements, or other such actions) are not possible to evaluate at this stage as they are highly dependent on the specific details and local site characteristics. However, construction activities at fishing sites (e.g., construction improvements to piers, amenities such as fish-cleaning stations, parking, etc.) may cause short-term disruption to users of a site during the construction period.

Indirect Effects. Artificial reefs provide human use benefits beyond fishing, as they are also popular areas for scuba and free diving for purposes of recreation, hunting, and underwater photography. As with the biological benefits, the human use benefits will be sustained for a period of decades or perhaps longer with minimal operational or maintenance costs.

Depending on their location, design, and depth, artificial reefs could have adverse impacts on various other types of human uses. Uses that could potentially be impacted by shallow reefs include body surfing or wind surfing and, possibly, navigation. Also, constructed reefs will displace soft-bottom species, and the anglers who favor catching these species at the site of a constructed reef will find it harder to catch these fish. Potential impacts to recreational and navigational uses will be a significant consideration in the selection of candidate sites. Findings on these issues will be included in subsequent site-specific environmental documentation and provided to the public for review.

Mitigation Measures. The Trustees undertook a survey of recreational and subsistence anglers in 2002 and 2003, in part for the purpose of determining fishing preferences at fishing sites along the Los Angeles County and Orange County coastline. The data generated by this field intercept survey and follow-up public involvement activities will be used to select sites that minimize negative impacts to anglers who may be targeting soft-bottom fishes exclusively. The Trustees are also gathering chemistry data on fish contamination. Up-to-date fish contamination data provide a means for optimizing the placement of constructed reefs with respect to prevailing contamination. Thus, if the fish caught after reef construction are lower in contamination, then fishing and fish consumption benefits will be realized from these projects.

Steps will be taken to minimize the impacts resulting from the construction of fishing access improvements. These impacts will be addressed at the stage when site-specific plans are being considered.

When initiating a design for site-specific reef development, the MSRP will consider the potential adverse human use impacts identified above by avoiding placement of reef material where it would cause such adverse impacts. Also, fishing reefs will not typically be constructed in areas shallow enough to affect surfing because swells and waves would deter development of the types of fish communities that are the intent of the reefs.

A2. Provide Public Information to Restore Lost Fishing Services

Alternative 2 [✓] Alternative 3 [✓] Neither [ ]

Biological Effects

Direct Effects. This action will not have any direct biological effects.

Indirect Effects. Should the public information program lead to changes in fishing practices in the region, it is possible that fishing exploitation of certain contaminated species of fish will decrease and fishing for cleaner species of fish will increase. It is also possible that the public information program could lead to increased fishing exploitation of fish populations in the locations that the program identifies as having fish lower in contamination.

Mitigation Measures. The Trustees will consider both contamination levels and vulnerability to over-fishing as factors when providing fishing advice to anglers. Thus, the program will not advise anglers to target any species that is currently over-fished or at risk of future over-fishing due to population status or specific life-history characteristics that might make that species more vulnerable to over-fishing. The Trustees will work closely with state and federal fisheries managers and provide them opportunities to review materials prior to initiating public information and outreach on fishing to ensure that any MSRP recommendations on specific fishing sites and species do not conflict with pertinent fishing regulations (e.g., catch restrictions).

Physical Effects

This program will not have any direct or indirect effects on the physical environment.

Human Use Effects

Direct Effects. Because this project focuses on providing information that enables fishing rather than restricting fishing, no significant direct effects on human uses are anticipated.

Indirect Effects. Development of better data on fish contamination and improved dissemination of information on fish contamination (including the locations and species of fish that are safer for catching and consuming) should provide recreational benefits for anglers and could potentially lead to increased human uses of ocean fish resources. Minor impacts to aesthetics could occur if informational signs or kiosks are erected, depending on the design, size, and placement of the signs.

Mitigation Measures. The designs for the informational signs will be adopted from the previous designs developed and employed by the State of California and the county health departments in the study area. The signs will be placed in consultation with appropriate local authorities in such a way as to minimize any impacts to the aesthetics of the surrounding area.

A3. Restore Full Tidal Exchange Wetlands

Alternative 2 [✓] Alternative 3 [ ] Neither [ ]

This action will require subsequent environmental analysis when the project details are more fully developed.

Biological Effects

Direct and Indirect Effects. The biological consequences of restoration projects for Southern California coastal wetlands are largely beneficial given the historical losses of such habitats, their relative scarcity today, and their valuable ecological functions. Wetlands restoration requires careful planning, analysis, and consideration of the trade-offs between different and sometimes competing biological resources and uses. MSRP funding will be specifically earmarked for actions that benefit wetlands-dependent marine fish species, which might conceivably alter the relative balance of habitat types targeted for restoration within an overall plan. However, this possibility cannot be fully analyzed until site-specific details are developed.

Mitigation Measures. Appropriate mitigation measures will be identified once potential site(s) are identified and project details are more fully developed.

Physical Effects

Direct Effects. Depending on their location and design, wetlands may provide benefits to water quality (USEPA 2001). Restoration of full tidal exchange may also increase contributions of sediment from terrestrial watersheds into coastal areas.

Indirect Effects. Wetlands restoration could have several indirect physical effects, including hydrological consequences, the need to identify disposal requirements for dredged material, and impacts on roads and utilities.

Mitigation Measures. Appropriate mitigation measures will be identified once potential site(s) are identified and project details are more fully developed.

Human Use Effects

Direct and Indirect Effects. Wetlands provide numerous active and passive recreational use values, including birding, boating, fishing, and other uses. Wetlands restoration may also impact current recreational and other human uses of sites slated for restoration. Environmental effects on human uses will need to be analyzed at a later stage, when more site-specific information is available.

Mitigation Measures. None are identified at this time.

A4. Augment Funds for Implementing Marine Protected Areas in California

Alternative 2 [✓] Alternative 3 [ ] Neither [ ]

This action will not establish new Marine Protected Areas (MPAs) or modify the boundaries or human use restrictions of the MPAs already established for the Channel Islands. Rather, this action will enhance implementation of these MPAs so that they will be managed and monitored in ways closer to those originally envisioned. Thus, this analysis evaluates impacts relative to the No Action Alternative (i.e., the current MPA management activities), not the MPA management plan as originally developed.

Biological Effects

Direct Effects. MPAs are established for the purpose of restoring and/or preserving marine biological communities, so increased funding to improve management and monitoring efforts for the Channel Island MPAs will increase the beneficial biological effects for which the MPAs were established.

Indirect Effects. It is possible that the increased public awareness and enforcement of restrictions on the taking of biological organisms from within the boundaries of the Channel Island MPAs that might result from this action could redirect fishing efforts to other marine areas to a greater extent than do the current MPAs. However, the original selection of MPA locations and boundaries was in large part driven by a conscious effort by resource managers to shift such fishing to areas capable of supporting it and away from areas where such practices have led to depletions of critical marine resources. Also, an important component of MPA monitoring is an examination of the degree to which MPAs may result in spillover benefits to fish stocks outside of their boundaries, thus increasing the capacity of surrounding areas to support greater fishing pressure.

Mitigation Measures. Before providing funding to augment implementation of the Channel Islands MPAs, the Trustees will ensure that overall MPA monitoring efforts include adequate provisions for reviewing the effects of the MPAs on surrounding areas.

Physical Effects

This action will have no known direct or indirect effects on the physical environment.

Human Use Effects

Direct and Indirect Effects. Several potential benefits to human uses could result from improved effectiveness of the implementation of the Channel Island MPAs. Restoration of depleted resources within the boundaries of the reserves could provide recreational opportunities outside of the reserve. Although the MPAs generally prohibit the taking of biota within the MPA boundaries, effectively managed MPAs have the potential to lead to spillover of fish to adjacent areas and thus improve fishing use outside their boundaries.

It is possible that augmenting MPA implementation and enforcement (i.e., to levels closer to those originally envisioned) may have increased consequences on some human uses (e.g., fishing within their boundaries) above what might exist in the absence of MSRP support. By their nature, MPAs restrict several types of human uses within their boundaries. This impact was addressed in the environmental documentation that supported the original establishment of the Channel Island MPAs (CDFG 2002). The most seriously debated impact of the Channel Island MPAs related to the question of their contribution to commercial and recreational catches. The opponents of these MPAs suggested that even though MPAs may increase the abundance of fish within their boundaries, they exclude fishermen from productive fishing areas, concentrating them in the less productive areas and resulting in an overall reduction of catch. This concern was addressed during the development of the Channel Island MPAs through extensive collaboration with the fishing community to avoid restrictions to fishing in already established, favored fishing locations. In addition, the Channel Island MPA evaluation plan included extensive socio-economic impact studies designed to address the potential negative impacts of MPAs on human uses (CDFG 2004a).

Mitigation Measures. Before providing funding to augment implementation of the Channel Island MPAs, the Trustees will ensure that the Channel Island MPA Monitoring Plan provisions for socioeconomic impact studies are being implemented as planned.

B. Complete the NCI Bald Eagle Feasibility Study Before Deciding on Further Restoration Actions

Alternative 2 [✓] *Alternative 3 [ ]* *Neither [ ]*

This is an interim action that will require subsequent environmental analysis.

Biological Effects

Direct Effects. Individual bald eagles will be impacted by the restoration efforts. Eight of the 34 bald eagles released on Santa Cruz Island as part of the Northern Channel Island (NCI) Bald Eagle Feasibility Study have died from various causes. Overall, the survival rate of eagles released on the Northern Channel Islands appears to be within the normal range of both eagle survival in the wild and a reintroduction program. The loss of several individuals is not considered significant in light of the overall recovery of the bald eagle in the United States and the efforts to restore this species to the Channel Islands.

This course of action proposes to suspend funding of the Santa Catalina Island Bald Eagle Program after 2005 during the interim period until subsequent restoration decisions are made, in or around 2008. One potential outcome of stopping human intervention and allowing bald eagle nests to fail is that eagle pair bonds may break down and the birds may abandon the island. However, it is highly likely that bald eagles will remain on the island for several years despite their inability to hatch offspring naturally. Bald eagles in the wild typically live for 25 to 30 years, and Santa Catalina Island currently supports 15 to 20 birds of a wide range of ages. Currently, five bald eagle nesting territories are active on the island, and the Institute for Wildlife Studies reports that two birds are currently establishing a new territory near Avalon. Even assuming that the Santa Catalina Island bald eagles fail to hatch new chicks in the coming years, bald eagle experts do not expect that they will immediately break their pair bonds and abandon their Santa Catalina Island territories. Rather, it is likely that bald eagles will remain on the island, with their numbers diminishing gradually over a period of 10 years or longer as some of the birds die and are not replaced by others and as certain bald eagle pairs break their pair bonds and leave the island after several years of failing to produce chicks.

Indirect Effects. Bald eagles historically played an important role in the ecology of the Channel Islands by serving as both a top carnivore and a scavenger. Bald eagles prey primarily on fish taken live from the ocean; however, they also feed on seabirds and the carcasses of animals that wash up on shore. Restoration of bald eagles to the Channel Islands provides broad benefits to the island ecosystems.

The presence of bald eagles in the Northern Channel Islands may provide benefits to the endangered island foxes on San Miguel, Santa Rosa, and Santa Cruz Islands. Predation by golden eagles on island foxes has resulted in precipitous declines in island fox populations on these islands (Coonan et al. 1998, USFWS 2004). The presence of territorial bald eagles on the Northern Channel Islands will complement other efforts in the recovery of the island fox if they deter golden eagles from inhabiting the islands.

As explained above, suspension of funding for the Santa Catalina Island Bald Eagle Program until the completion of the NCI Bald Eagle Feasibility Study is highly unlikely to result in the disappearance of bald eagles from Santa Catalina Island. Nevertheless, the Trustees have analyzed the potential indirect effects of a disappearance of bald eagles from Santa Catalina

Island and have concluded that such a disappearance is not likely to adversely affect the endangered island fox.

Unlike the Northern Channel Islands, island fox numbers diminished on Santa Catalina Island as a result of canine distemper rather than predation by golden eagles. An absence of bald eagles on Santa Catalina Island is unlikely to result in the future establishment of golden eagles on the island, as the island likely does not have a sufficient terrestrial vertebrate prey base to attract and sustain golden eagles. Also, unlike on the Northern Channel Islands, there is no nearby mainland source for golden eagles. Given the ongoing efforts to remove golden eagles and eradicate their non-native prey base from the Northern Channel Islands, it is unlikely that these islands would serve as a source of golden eagles to Santa Catalina Island.

The Trustees have informally consulted with the endangered species office of the U.S. Fish and Wildlife Service (USFWS) on this issue, and this office has concurred with this analysis. The Letter of Concurrence is available as part of the MSRP Administrative Record.

The restoration of bald eagles on the Northern Channel Islands is not expected to result in significant impacts to seabird populations. Seabirds are not a principal component of bald eagle diets on Santa Catalina Island, and the same situation is expected to apply on the Northern Channel Islands. This potential impact was discussed in detail in the Feasibility Study for Reestablishment of Bald Eagles on the Northern Channel Islands (MSRP 2002).

Mitigation Measures. The methods for hacking and monitoring bald eagles are well established and designed such that potential impacts to birds are minimized. Measures such as supplementing prey for the juvenile eagles once they are released are part of the NCI Bald Eagle Feasibility Study and will be incorporated into future restoration efforts.

Physical Effects

This action would have no known direct or indirect effects on the physical environment.

Human Use Effects

Direct and Indirect Effects. The presence of the bald eagle on the Channel Islands provides benefits to humans on many levels. The presence of bald eagles provides both aesthetic and recreational benefits to visitors. Also, the bald eagles inhabiting the Channel Islands, which are readily identified by their tags, range freely over great distances and have been sighted on the U.S. mainland, notably along the Southern California coast.

The bald eagle also plays an important role in the cultural history of the Channel Islands. The presence of bald eagles on the island therefore fills an important cultural as well as an ecological niche.

The suspension of funding for the Santa Catalina Island Bald Eagle Program may lead to a diminishing number of bald eagles on Santa Catalina Island during the applicable time period. Fewer bald eagles could result in a reduction in the human use benefits they provide, as there may be fewer occasions for viewing the eagles.

Mitigation Measures. The Trustees' placement of approximately 12 young birds per year on Santa Cruz Island since 2002 may offset the potential reduction in opportunities for viewing bald eagles should their numbers diminish on Santa Catalina Island during the intervening years before a decision is reached on further bald eagle restoration.

B. Complete the NCI Bald Eagle Feasibility Study; Regardless of its Outcome, Continue Funding Santa Catalina Island Bald Eagle Program

Alternative 2 [ ] *Alternative 3 [✓]* *Neither [ ]*

Biological Effects

Direct Effects. This course of action will seek to continue maintaining bald eagles on Santa Catalina Island through human intervention (e.g., egg manipulation, incubation, and chick fostering) for as long as funds remain available. Historically, the Channel Islands were a stronghold for this species. Should it ultimately be found that bald eagles are unable to reproduce on their own on other Channel Islands, maintaining a bald eagle presence on Santa Catalina Island will at least represent a partial or temporary restoration of this important resource.

Individual bald eagles will continue to experience reproductive injuries if intervention efforts continue to maintain them on Santa Catalina Island. These birds are exposed to sufficiently high levels of DDTs and PCBs that they experience reproductive failure. Also, at least one bald eagle death on Santa Catalina Island has been attributed to DDT poisoning. However, the loss of several individuals is not considered significant in light of the overall recovery of the bald eagle in the United States and the efforts to restore this species to the Channel Islands.

Indirect Effects. Bald eagles historically played an integral role in the ecology of the Channel Islands by serving as both a carnivore and a scavenger. Bald eagles prey primarily on fish taken live from the ocean; however, they also feed on seabirds and the carcasses of animals that wash up on shore. Thus, the restoration of bald eagles to the Channel Islands will provide benefits to the island ecosystem.

The continued presence of bald eagles on Santa Catalina Island is not expected to result in significant impacts to seabird populations. Seabirds are not a principal component of the diets of the bald eagles on Santa Catalina Island.

Mitigation Measures. Humans have actively maintained bald eagles on Santa Catalina Island for over 15 years. Therefore, the methods for manipulating nests and monitoring bald eagles on Santa Catalina Island are well established and have been designed such that potential impacts to birds are minimized. Monitoring would continue to be performed to examine trends in contamination levels and to guide the ongoing restoration efforts.

Physical Effects

This action would have no known direct or indirect effects on the physical environment.

Human Use Effects

Direct and Indirect Effects. The presence of the bald eagle on Santa Catalina Island provides important benefits to humans on many levels. Santa Catalina Island is a popular tourist destination, and the presence of bald eagles provides both aesthetic and recreational benefits to visitors on the island. Also, the bald eagles inhabiting the Channel Islands, which are readily identified by their tags, range freely over great distances and have been sighted on the U.S. mainland, notably along the Southern California coast.

The bald eagle also plays an important role in the cultural history of the Channel Islands. The presence of bald eagles on the island therefore fills an important cultural as well as an ecological niche.

C1. Restore Peregrine Falcons to the Channel Islands

Alternative 2 [ ] *Alternative 3 [ ]* *Neither [✓]*

This potential action will require subsequent environmental analysis when the project details are more fully developed.

Biological Effects

Direct Effects. The active restoration of peregrine falcons would speed the recovery of this species into its historically occupied habitat on both the Channel Islands and the U.S. mainland. Based on the results of earlier release programs, this effort would likely result in the establishment of additional peregrine falcon territories on the Channel Islands (Walton 1997). This program would result in an influx of birds around the Southern Channel Islands, thus encouraging recolonization on these islands. Although peregrine falcons are recolonizing the Southern Channel Islands, as demonstrated by the recent breeding on Santa Barbara and Santa Catalina Islands, recolonization has not yet occurred on San Clemente and San Nicolas Islands. In addition, peregrine falcons that fledge from the Channel Islands frequently disperse to the mainland (Walton 1999). Therefore, unoccupied territories on the mainland are also likely to benefit from a release program.

Indirect Effects. Raptors, such as the peregrine falcon, are an essential part of healthy, functioning ecosystems. The peregrine falcon is an apex predator that fills a particular ecological niche in the Channel Islands ecosystem. Although peregrine falcons are once again a top predator on the majority of the Channel Islands, complete recovery has not yet been achieved. Additional active restoration would further encourage recovery on the Channel Islands and help to fully restore a missing component of the island ecosystem.

The peregrine falcon is a highly specialized feeder, concentrating almost entirely on birds. The recovery of the peregrine falcon on the Channel Islands may have a negative impact on bird populations, particularly for those species that are in decline or have limited populations. The Channel Islands are critical breeding areas for seabirds and support important colonies of special status or declining species, such as the state-threatened Xantus's murrelet, rare ashy storm-petrel, and federally threatened western snowy plover. Peregrine falcons are known predators of the Xantus's murrelet and western snowy plover (Hunt 1994, USFWS 2001). Peregrine falcons have also been documented preying on petrels (Walton 1997, White et al. 2002); therefore, ashy storm-petrels could be impacted as well. Because many seabirds are under constant threat (e.g., from oil spills, human disturbance, and El Niño events), they may not be able to withstand peregrine falcon predation (Paine et al. 1990). In particular, depressed populations of seabirds may not be able to effectively absorb the additional predation pressure from increased numbers of peregrine falcons on these islands.

Recolonization of peregrine falcons to the Southern Channel Islands may also impact the federally endangered San Clemente loggerhead shrike (*Lanius ludovicianus mearnsi*). This bird subspecies is endemic to the U.S. Navy–owned San Clemente Island, and the U.S. Fish and Wildlife Service listed it as endangered in 1977 due to its localized range, critically low population numbers, consistently low productivity, and intense predation pressure. Significant effort has been made to decrease the threat of extinction to the wild population. Although this population has been increasing recently, the subspecies remains highly endangered and vulnerable to predation pressure.

Peregrine falcons do not prey on California brown pelicans (Walton 1997); therefore, release of additional birds is not expected to adversely impact this species.

Mitigation Measures. The methods for hacking and monitoring peregrine falcons are well established and designed such that potential impacts to the birds are minimized. Seabird populations would continue to be monitored to determine whether they are being significantly impacted by increased predation pressure from the restoration of peregrine falcons to the Channel Islands.

Physical Effects

This action would have no known direct or indirect effects to the physical environment.

Human Use Effects

Direct and Indirect Effects. The recovery of the peregrine falcon to the Channel Islands provides both aesthetic and recreational benefits to visitors to the islands. Peregrine falcons are known for their spectacular flights, with an average speed of 40–55 kilometers/hour (25–34 miles/hour) and speeds reaching 112 kilometers/hour (70 miles/hour) (Cade 1982).

C2. Monitor the Recovery of Peregrine Falcons on the Channel Islands

Alternative 2 [✓] Alternative 3 [✓] Neither [ ]

Biological Effects

Direct Effects, Due to the lack of focused surveys for peregrine falcons on the Channel Islands, important information regarding this species is unknown. A monitoring program would provide information on territory occupancy, nest success, and productivity. These measures are all indicators of population health and are important in understanding the long-term recovery of this species on the Channel Islands. The monitoring data would inform natural resource managers of potential threats to peregrine falcon recovery, thereby enabling improved management of this species on the Channel Islands.

A monitoring program would not result in significant impacts to the biological environment. Peregrine falcon pairs may be temporarily disturbed during certain monitoring activities (e.g., entering the nest to collect eggshell fragments or band young); however, the majority of the observations would be from a distance and would not disturb peregrine falcons. The monitoring plan would also consider the presence of seabird nesting colonies and avoid and minimize any impacts to nesting areas during the monitoring efforts.

Indirect Effects. As top predators of their food chain, peregrine falcons are an excellent indicator species of the overall health of the ecosystem in which they live. The monitoring of this species would provide valuable information on the overall levels of contamination in the environment.

Mitigation Measures. Impacts from monitoring activities would be minimized through established survey techniques for peregrine falcons and avoidance of biologically sensitive areas, such as seabird colonies.

Physical Effects

This action would have no known direct or indirect effects on the physical environment.

Human Use Effects

This action would have no known direct or indirect effects on human uses.

C3. Restore Peregrine Falcons to the Baja California Pacific Islands

Alternative 2 [ ] Alternative 3 [ ] Neither [✓]

Biological Effects

Direct Effects. Actions taken to reduce human disturbance would likely result in recolonization of unoccupied habitat and increased reproductive success. The recolonization of peregrine falcons into historically occupied habitat on these islands would provide direct long-term benefits to this species, as peregrine falcon territories generally remain occupied indefinitely, with new adults recruiting from the floating population over time.

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

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

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

In addition, peregrine falcons typically disperse 16 to 241 kilometers (10 to 150 miles) to adjacent unoccupied territories. An increase in the number of peregrine falcons on the Baja California Pacific islands may lead to further recovery of peregrine falcons on the Channel Islands due to their proximity.

Mitigation Measures. Impacts from monitoring activities would be minimized through established survey techniques for peregrine falcons and avoidance of biologically sensitive areas, such as seabird colonies.

Physical Effects

This action would have no known direct or indirect effects on the physical environment.

Human Use Effects

Direct and Indirect Effects. The recovery of the peregrine falcon to the Baja California Pacific islands would provide both aesthetic and recreational benefits to visitors and residents of the islands.

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

Mitigation Measures. No mitigation is currently proposed.

D1. Restore Seabirds to San Miguel Island

Alternative 2 [✓] Alternative 3 [ ] Neither [ ]

This action will require subsequent environmental analysis when the project details are more fully developed.

Biological Effects

Direct and Indirect Effects. The eradication of rats on San Miguel Island has a wide range of potential direct and indirect beneficial and adverse biological impacts; these impacts are more extensively described in Appendix D1. The potential benefits of rat eradication on San Miguel Island include (1) increases in small crevice-nesting seabird populations (such as alcids and storm-petrels), (2) decreased predation on ground-nesting seabirds, such as western gulls, (3) protection of the important seabird colonies on Prince Island and Castle Rock from rat invasion, (4) a decrease in predation of some terrestrial and marine intertidal invertebrates, and (5) broad ecological benefits to the San Miguel Island ecosystem.

However, to eliminate rats from San Miguel Island, a highly efficacious rodenticide must be used to ensure complete eradication. Because there are no rat-specific toxicants, the use of a rodenticide to eradicate rats will pose a primary and secondary risk of poisoning to non-target species on San Miguel Island. Of particular concern are the potential impacts to non-target species, such as the endemic deer mouse and the endangered island fox. Studies will be initiated to evaluate the potential risk of poisoning to non-target species and to develop appropriate mitigation measures.

Mitigation Measures. The removal of the rats will be timed according to a set of biological conditions that maximize the probability of eradicating rats and minimize the potential impact to the San Miguel Island environment. This project will be designed and implemented in a manner that avoids, minimizes, and mitigates impacts to the natural environment on San Miguel Island. Comprehensive measures to avoid and mitigate any impacts from the project will be developed during the planning phase and addressed in subsequent environmental analysis. Particular emphasis will be given to the development of a comprehensive mitigation strategy for the island fox and deer mouse. The successful mitigation program used during rat removal on Anacapa Island will be considered during the development of a mitigation program for San Miguel Island. Potential mitigation measures are outlined in Appendix D1.

This project will proceed only if the risks to non-target species, in particular the endangered island fox and endemic deer mouse, can be minimized to an acceptable level.

Physical Effects

Direct and Indirect Effects. Generally, this action will have no known direct or indirect effects on the physical environment. Unintended temporary water quality impacts could result should some of the bait enter the marine environment.

Mitigation Measures. Specific measures will be developed and implemented to prevent bait from entering the marine environment or to minimize and carefully monitor the amount entering the marine environment.

Human Use Effects

Direct and Indirect Effects. Because rats pose health and safety hazards (e.g., Pratt et al. 1977) and can cause destruction to supplies and equipment, the eradication of rats will benefit visitors and National Park Service (NPS) personnel on San Miguel Island. Although no known rodent-vector diseases have been transmitted to island staff or residents in the recent past, any rodent population has the potential to transmit disease to humans. This action will improve health and safety standards at NPS facilities on the island and will eliminate a potential source of disease. The removal of black rats from San Miguel Island is expected to have long-term health, safety, aesthetic, and recreational benefits and will remove a destructive nuisance to human habitation and use of the island. However, the removal of rats from the island may reduce the human use and non-use benefits to any members of the public who value the presence of this species on the island.

With the possible exception that project workers might experience skin irritation as a result of contact with bait, no negative impacts are expected on humans. Although rodenticides are toxic to humans, significant health effects are not expected unless standard safety precautions are ignored and very large doses are consumed.

Mitigation Measures. To minimize the potential exposure of visitors, San Miguel Island will be closed for several days when the rodenticides are applied. Recreational activities such as camping and hiking will not be permitted during this time. However, due to the distance of San Miguel Island from the U.S. mainland and the annual visitation rate of less than 200 campers each year, the closure of the island will not have a significant impact on recreational and visitor activities.

Project workers will be educated to follow proper safety procedures and avoid contact with the bait. Monitoring will be used to ensure that the project workers follow the safety procedures.

D2. Restore Alcids to Santa Barbara Island

Alternative 2 [✓] Alternative 3 [✓] Neither [ ]

Biological Effects

Direct Effects. Restoring native vegetation and placing nest boxes in appropriate locations on Santa Barbara Island will provide a favorable environment for both Cassin's auklets and Xantus's murrelets. In Northern California, nest boxes have enhanced the population growth rate of several cavity-nesting alcid species at various sites by increasing recruitment of breeding-age birds, improving productivity, and decreasing mortality (Sydeman et al. 2000). The use of playback systems will further facilitate the recolonization of the Cassin's auklet on the island. These techniques should increase the number of breeding pairs of Cassin's auklets and Xantus's murrelets on the island, thereby increasing the number of offspring produced successfully.

This project is expected to have minimal short-term adverse biological impacts. Additional human activity will occur on Santa Barbara Island as a result of this project that could result in temporary displacement of native wildlife or the trampling of native plants.

Indirect Effects. The removal of exotic vegetation may include the use of herbicides, which could have short-term adverse impacts on non-target plants. Subsequent monitoring may temporarily disturb target species.

Mitigation Measures. The removal of exotic vegetation and the planting of native plants will be done during the non-breeding season to avoid impacts to nesting birds. Any herbicides will be applied in a way that avoids or minimizes adverse impacts and is in compliance with NPS policies and other applicable laws and regulations. Potential short-term adverse environmental impacts that might occur during the removal of exotic vegetation will be addressed as part of the environmental compliance for this project.

The use of nest boxes will minimize adverse impacts to nesting alcids due to any disturbance during monitoring.

Physical Effects

There may be minimal short-term adverse impacts due to trampling and increased soil erosion.

Human Use Effects

This action will have no known impacts to human uses. Cultural resources will be avoided on the island during project implementation. It is expected that the nest boxes will be largely screened by vegetation and will not be visible to the public.

D3. Restore Seabirds to San Nicolas Island

Alternative 2 [✓] *Alternative 3 [ ]* *Neither [ ]*

This potential action will require subsequent environmental analysis when the project details are more fully developed.

Biological Effects

Direct Effects. This action will result in the eradication of feral cats from San Nicolas Island. Eradication of these introduced cats will provide long-term conservation benefits for Brandt's cormorants and western gulls by removing a non-native predator from the island ecosystem. The Trustees anticipate that this project will result in increased reproductive success for these species and therefore an expansion of these colonies. Both of these species are endemic to the west coast of North America and have limited ranges. The colonies on San Nicolas Island are located within the center of their range and have historically supported large numbers of birds. This project will contribute to the protection of these colonies, though they will still be subject to predation by the native island fox. However, it is anticipated that larger, more robust colonies will more effectively resist ongoing predation pressure from the island fox.

This action could potentially affect the island fox due to its similarity in size to a feral cat and their similar diets. Although some short-term impacts might occur to individual foxes, the fox population will likely benefit overall from the eradication of feral cats, as they are competitors for food resources and habitat. The eradication methodologies and potential impacts will be addressed fully in subsequent environmental documentation for the project.

Indirect Effects. In addition to benefiting seabirds, this project will also have collateral benefits to the island ecosystem. Sensitive species such as the island fox, the endemic deer mouse, the threatened island night lizard, and the threatened snowy plover will likely benefit from reduced

predation and competition. The removal of feral cats will also likely benefit both resident and migratory landbirds on San Nicolas Island. The U.S. Navy has identified the control/eradication of cats as a recommended management action to protect the island's biological resources.

Mitigation Measures. Before initiating this action, techniques that will vary according to the eradication methodologies selected will be investigated and employed in a manner that avoids and minimizes the potential for impacts to the non-target island fox.

Physical Effects

This action will have no known direct or indirect effects to the physical environment.

Human Use Effects

Direct Effects. The removal of non-native species is a critical step in the restoration of island ecosystems. The eradication of feral cats will help restore populations of native species on San Nicolas Island. Such restoration will provide aesthetic and recreational benefits to U.S. Navy personnel. Because the island has restricted access, this project will not likely provide aesthetic or recreational benefits to the general public.

During the eradication program, certain areas may be closed or their use restricted for safety reasons. Such restrictions may limit recreational opportunities for U.S. Navy personnel. However, feral cat control was initiated in the 1980s, and U.S. Navy personnel have accommodated to this activity. Although the action is designed to be an intensive effort over approximately 3 years, it will be compatible with the military use of the island.

Indirect Effects. This action will have no known indirect effects.

Mitigation Measures. Feral cat eradication efforts will be closely coordinated with the U.S. Navy, and the project will be developed in a manner that minimizes impacts on military and recreational activities on the island.

D4. Restore Seabirds to Scorpion and Orizaba Rocks

Alternative 2 [✓] *Alternative 3 [✓]* *Neither [ ]*

Biological Effects

Direct Effects. Elimination of invasive plants and restoration of native plants will benefit burrow-nesting species by providing increased nesting habitat and stabilization of the rapidly eroding soil horizon on Scorpion Rock. By providing additional high-quality breeding habitat, this action seeks to increase the number of breeding seabirds on the rock, in particular Cassin's auklets, Xantus's murrelets, and ashy storm-petrels. The use of nest boxes will enhance suitable habitat for seabirds on both Scorpion and Orizaba Rocks, thereby increasing the number of offspring produced and decreasing mortality.

Seabirds such as the California brown pelican are particularly sensitive to human disturbance. Reducing human disturbance will have a positive influence on the survival of brown pelicans by reducing the energy expenditure associated with flushing and relocating due to human disturbance. In addition, reducing disturbance will protect nesting auklets and murrelets from harassment by trespassers.

This project is expected to have minimal short-term adverse effects. Some temporary disturbance to roosting seabirds may occur during the revegetation effort. Exotic vegetation will be removed

using mechanical methods, thereby eliminating the need for herbicides. Mechanical removal may result in minimal short-term adverse impacts to surrounding native vegetation and soil.

Indirect Effects. Subsequent monitoring may result in temporary disturbance to seabirds.

Mitigation Measures. The removal of exotic vegetation and the planting of native plants will be done during the non-breeding season to avoid impacts to nesting birds. The National Park Service will consult with the U.S. Fish and Wildlife Service regarding project implementation to ensure that California brown pelicans will not be adversely affected. The use of matting will help minimize potential erosion and stabilize the soil. The use of nest boxes will greatly minimize impacts to nesting alcids.

Physical Effects

Mechanical removal of invasive plants may result in minimal short-term adverse impacts to surrounding soil.

Human Use Effects

This action will have no known effects on cultural resources, recreation, aesthetics, or transportation. Cultural resources will be avoided on the island during project implementation.

D5. Restore Seabirds to Baja California Pacific Islands

Alternative 2 [✓] Alternative 3 [✓] Neither [ ]

Multiple seabird restoration projects are under consideration for the Baja California Pacific islands. Recent efforts to remove introduced species on many of these islands have resulted in opportunities to restore seabird populations. In general, restoration actions will include using social attraction techniques (including decoys and vocalizations), improving nesting opportunities with artificial nests, restoring habitat, reducing human disturbance, shielding lights, and eradicating non-native species. The effects of individual projects are described in Appendix D5 and are summarized collectively below.

Biological Effects

Direct Effects. The restoration activities proposed for the Baja California Pacific islands will result in direct benefits to a suite of seabirds, including the Cassin's auklet, Brandt's cormorant, double-crested cormorant, California brown pelican, ashy storm-petrel, and Xantus's murrelet.

Social attraction efforts will facilitate the recolonization of seabirds on these islands after the removal of introduced species. These types of efforts will encourage seabirds to use suitable and historically occupied habitats. Once attracted to the island, seabirds will be further encouraged to nest in suitable habitat by the presence of nest boxes. The use of nest boxes will also allow biologists to monitor the success of the restoration efforts and minimize disturbance to nesting seabirds. Although social attraction may only be used for a limited time, the recolonization and recovery of historically occupied colonies will provide long-term benefits to seabird populations in the Southern California Bight, as the re-established presence of a colony of birds will likely serve as an ongoing natural attractant in perpetuity.

A reduction in human disturbance around the colonies will significantly benefit roosting and breeding seabirds. Nesting seabirds that are sensitive to disturbance, such as California brown pelicans and cormorants, will in particular benefit from a reduction in human disturbance. At

least six species of marine birds had experienced severe population declines due to human disturbance, and subsequent protection has resulted in almost complete recovery of all of these populations (Anderson and Keith 1980).

The proposed activities have the potential to result in limited short-term impacts, including soil disturbance in the areas where nest boxes are used or short-term disturbance to seabirds during monitoring efforts. However, the proposed activities will not result in significant impacts to biological resources.

Indirect Effects. The increase in seabird populations that could result from this action will also likely benefit resident peregrine falcon pairs that prey on seabirds such as petrels and auklets. Because peregrine falcon pairs prey on a number of seabirds (Kiff 1980), increases in seabird populations may help buffer the impacts of increased predation by peregrine falcons.

Mitigation Measures. The removal of exotic vegetation and the planting of native plants will be done during the non-breeding season to avoid impacts to nesting birds. The use of matting will help minimize potential erosion and stabilize the soil. The use of nest boxes will minimize the impacts of monitoring activities on breeding seabirds.

Physical Effects

This action will have no direct or indirect effects on the physical environment.

Human Use Effects

Direct and Indirect Effects. The waters around the Baja California Pacific islands offer many recreational and economic opportunities. Healthy and complete ecosystems support fishing communities around these islands (Anderson and Keith 1980). Seabird colonies are a valuable part of island ecosystems and provide economic benefits in the form of tourism.

This action proposes to limit human disturbance in the vicinity of seabird colonies. This action will likely impact people that either inhabit or illegally camp on the islands. However, this impact is not anticipated to be significant due to the small number of people that inhabit the islands.

Mitigation Measures. When this action involves limiting human activity around seabird colonies, alternate routes will be provided to accommodate human activities on the islands.

D6. Create/Enhance/Protect California Brown Pelican Roost Habitat

Alternative 2 [ ] Alternative 3 [ ] Neither [✓]

This action will require subsequent environmental analysis when the project details are more fully developed.

Biological Effects

Direct Effects. Improvements in the existing network of communal roosts along the coast would have a positive influence on the energy budgets of pelicans by reducing the energy costs associated with (1) commuting between prey locations and roosts, (2) flushing and relocating due to human disturbance, and (3) using suboptimal microclimates within roosts. The costs of migration would also be reduced by the increased availability, quality, and capacity of stopover sites. Cumulative energy reductions should result in improved body condition for individual birds. The expected population-level effects from improving the condition of individual birds are

increased juvenile and adult survival and increased reproductive success for pelicans in California.

The environmental consequences of increased use of lagoons and other roosting areas by pelicans may include impacts on water quality if guano accumulation exceeds the circulation ability of the lagoon. However, in some locations brown pelican guano in the vicinity of roosts could provide a desirable source of nutrient enrichment and might enhance local food webs.

The 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 or puncture from fishing hooks), and the development of nuisance issues. However, the project is not expected to result in major increases in pelican use of harbors. Rather, the goal would be to improve the quality of resting time within harbors.

Indirect Effects. Other bird species that occur in association with roosting pelicans are likely to benefit from the proposed roost projects. Bird groups that would benefit from increased availability of island habitat and reduced human disturbance in coastal environments would include gulls, terns, cormorants, shorebirds, herons, egrets, and ducks. The suite of species receiving benefits would vary with the type of roost treatment and project site. The restoration projects would inform and enrich the public through associated interpretation displays and would help foster an awareness and stewardship ethic that should result in reduced disturbance to roosting California brown pelicans and other coastal waterbirds at other locations.

Mitigation Measures. Specific mitigation measures would be developed and incorporated into project design as specific sites are selected and potential impacts are identified.

Physical Effects

Given the relatively small scale of physical construction envisioned under this conceptual action, and given that pelican roost site enhancements would be constructed on existing physical features or structures, no direct or indirect physical effects are anticipated. Further environmental analysis would be required should this action be selected for implementation.

Human Use Effects

Direct Effects. Public enjoyment of pelicans would be increased by projects that allow the public to view communal roosting groups without causing disturbance.

Pelican roost site creation projects, if not carefully designed, could lead to interference with human activities or potential liability situations. Some projects would likely require ongoing inspection and/or management oversight. This issue would be addressed in subsequent planning and environmental documentation.

Indirect Effects. Vegetation on any earthen islands that are created may need to be periodically controlled or removed.

Mitigation Measures. Pelican restoration projects would be designed to minimize impacts to recreational activities such as fishing, boating, and kayaking. Because pelicans are very susceptible to human disturbance, projects would be sited in areas that are compatible with human uses. Potential impacts to navigation would be evaluated for each site-specific project. Careful site selection, project design, selection of raw materials, and adequately funded maintenance programs would offset potential liability concerns.

D7. Implement an Entanglement Reduction and Outreach Program to Protect Seabird Populations

Alternative 2 [ ] *Alternative 3 [ ]* *Neither [✓]*

Biological Effects

Direct Effects. The use of signs and brochures would help promote public awareness of entanglement issues and thus reduce bird injuries and deaths. Seabirds that would benefit from this project include California brown pelicans, cormorants, and gulls. A successful outreach program would aid in the ongoing recovery of the endangered California brown pelican by reducing a source of injury and death to the species.

Indirect Effects. This program would provide information on the proper disposal of fishing line. A reduction in fishing line debris would provide benefits to other marine organisms currently impacted by waste fishing line.

Mitigation Measures. This action is not anticipated to have any adverse effects.

Physical Effects

A reduction in fishing line debris would improve the general quality of the marine environment.

Human Use Effects

Direct Effects. The proper handling and disposal of fishing line would result in improved health and safety, as discarded hooks can injure humans as well as wildlife. Humans are also at risk of injury when attempting to disentangle a hook or line from a seabird. A reduction in seabird/angler interactions would result in improved recreation because hooking a seabird is a frustrating and unwelcome experience. The proper disposal of fishing line would also enhance the aesthetics of the fishing structure and its vicinity.

This action focuses on education rather than restrictions on fishing, so no negative impacts on human uses would result.

Indirect Effects. The design, size, and placement of program signs could have minor impacts to aesthetics.

Mitigation Measures. The design of program signs would likely be adopted from the design developed and employed by a recent restoration effort performed by the American Trader Trustee Council. The signs would be placed in consultation with appropriate local authorities in such a way as to minimize any impacts to the aesthetics of the surrounding area.

D8. Restore Ashy Storm-Petrels to Anacapa Island

Alternative 2 [✓] *Alternative 3 [✓]* *Neither [ ]*

Biological Effects

Direct Effects. The Channel Islands are critical nesting habitat for the ashy storm-petrel. With the recent removal of rats from Anacapa Island, high-quality breeding habitat is again available to crevice-nesting seabirds such as the ashy storm-petrel. The combination of social attraction and nest boxes will provide a favorable environment for the establishment of an ashy storm-petrel colony. Although social attraction may only be used for a short amount of time, the colonization of Anacapa Island will provide long-term benefits to the ashy storm-petrel in the

Southern California Bight, as the established presence of a colony of birds will likely serve as an ongoing natural attractant over the long term.

This project seeks to aid in the recovery of this rare and declining species. Given the limited range and overall small population size of the ashy storm-petrel, the establishment of additional secure breeding sites will be a significant benefit. Additional breeding sites buffer the potential catastrophic effects of oil spills and the negative impacts of non-native species on this species.

This action will have minimal short-term adverse biological impacts. The playback of tape-recorded vocalizations causes little disturbance or trauma to birds if the duration of the playback is kept within reasonable bounds.

Indirect Effects. Human activity in the vicinity of the target locations may disturb other species of seabirds that may be nesting nearby.

Mitigation Measures. Researcher activity in the vicinity of nesting areas will be minimized to avoid destruction of the local habitat and disturbance (Johnson et al. 1981, Baptista and Gaunt 1997). Storm-petrels are sensitive to disturbance, including that generated by researchers, especially during the incubation period (Ainley et al. 1974). The project will be implemented in a manner that avoids impacts to nesting seabirds on Anacapa Island.

Physical Effects

This action will have no known direct or indirect effects on the physical environment.

Human Use Effects

A slight increase in human uses on Anacapa Island will occur during the implementation of the action, and this use may impact visitors' experience on the island. However, this use is expected to have minimal short-term adverse impacts.

7.3 CUMULATIVE IMPACTS

Cumulative impacts are impacts that result from an action and other past, present, and reasonably foreseeable near-term future actions taken together. Significant cumulative impacts can result from a combination of actions that do not have significant impacts individually. Taken collectively, the effects of several actions may be additive, countervailing, or synergistic. Impacts are considered regardless of the agencies or parties involved. Thus, in considering cumulative impacts, this analysis is not limited to the actions of the MSRP but also considers current operations, resource management programs, land use plans, and development projects in the region of interest.

Overall, the Montrose Settlements Restoration Program actions will result in a long-term net improvement in fish and wildlife habitat, the restoration of ecological balance in areas where contamination and other human-caused disturbances have led to adverse impacts on sensitive native species, and improvement in the human use and non-use services provided by fish and wildlife in the region. Cumulative impact analysis is nonetheless required to evaluate whether specific components of the MSRP actions, when considered in combination with other past, present, and future actions in the affected area, will have potentially significant adverse effects.

The cumulative effects analysis in this Restoration Plan and programmatic EIS/EIR focuses on the same environmental issues as those in the direct/indirect effects analyses in Section 7.2:

- Biological resources (fish, birds, and other wildlife)
- Physical resources (earth resources, including sediments, water resources, and oceanographic and coastal processes)
- Human uses (recreational, socioeconomic, and aesthetics)

The MSRP study area (see Figure 3.0-1) is located within the Southern California Bight (SCB), extending from Point Dume to Dana Point along the Southern California mainland coast. The study area includes the California Channel Islands and those Baja California Pacific Islands that lie within the SCB. Other actions considered as part of the cumulative impacts analysis for this programmatic EIS/EIR were identified by researching the activities within this study area that are affecting or will affect the same or similar resources. These other actions were identified through consultations within each of the six agencies that constitute the Trustees, consultations with the planning departments of local governments and authorities and other state and federal agencies, and searches of the database of the State of California Office of Planning and Research.

Several of the actions in this programmatic EIS/EIR are still only conceptual and will require subsequent environmental analysis. Some actions do not have specific project locations identified yet. The assessment of cumulative impacts herein focuses on those MSRP actions, locations, and resources for which sufficient detail is currently available. To the extent it is included, the cumulative effects analysis for the actions that are still conceptual is not as detailed. More specific analysis of these actions will be performed in subsequent environmental analyses. When there is uncertainty about cumulative impacts, the Council on Environmental Quality recommends that the uncertainty be addressed through subsequent project monitoring and adaptive management (Council on Environmental Quality 1997).

The study area encompasses a large geographic region in which many types of other actions affect the environment. In keeping with Council on Environmental Quality recommendations, the Trustees have narrowed the focus of the cumulative effects analysis to those actions that have relevance to the effects of the MSRP actions and to important issues of national, regional, or local interest (Council on Environmental Quality 1997).

The following discussion identifies the plans or categories of actions that may affect the same or similar resources as the MSRP actions. The MSRP actions and the affected resources that are relevant to each of these other actions are also listed. These other actions are considered in the cumulative impacts analysis that follows.

- **Channel Islands National Park 2001–2005 Strategic Plan:** This plan addresses the management of natural resources and research and the recreational uses of these resources for the Channel Islands National Park. The plan also develops long-term policy recommendations to enhance the management of the areas in the Channel Islands under the park's jurisdiction. Cumulative additive beneficial effects are expected from the combination of NPS management activities and MSRP actions.

  MSRP actions affecting the same or similar resources: the bald eagle, peregrine falcon, and seabird restoration actions on the Channel Islands will occur within the park's boundaries.

- **Channel Islands National Marine Sanctuary 1983 Management Plan:** This plan addresses the management of marine resources under the sanctuary's jurisdiction. The

management plan has been under review since 1999, and a revision is currently being prepared; it is anticipated that the draft revised management plan will be released for public review and comment during 2005. Expansion of the boundaries of the Channel Islands National Marine Sanctuary is under consideration as part of the draft revised plan. Cumulative additive beneficial effects are expected from the combination of Channel Islands National Marine Sanctuary management activities and MSRP actions.

MSRP actions affecting the same or similar resources: "augment funds for implementing Marine Protected Areas in California," and bald eagle, peregrine falcon, and seabird restoration projects on the Channel Islands within the boundaries of the Channel Islands National Marine Sanctuary.

- **Southern California Wetlands Recovery Project 2001 Regional Strategy and Implementation Plan:** This plan articulates long-term goals and specific implementation strategies to guide the efforts of the multi-party project and its partners to accelerate the restoration of coastal wetlands. Cumulative additive beneficial effects are expected from the combination of Southern California Wetlands Recovery Project activities and MSRP efforts to restore coastal wetlands.

  MSRP action affecting the same or similar resources: "restore full tidal exchange wetlands."

- **Other Seabird Restoration Projects:** In addition to the seabird restoration actions proposed by the MSRP, several other recently completed, ongoing, and proposed projects target the same seabird species and their habitats. These projects stem from natural resource damage (NRD) settlements from other cases and from the independent efforts of various environmental organizations that focus on seabird restoration. Other recently settled NRD cases that have resulted in seabird restoration actions in the region include the American Trader, Command, and Cape Mohican cases. Other NRD case settlements are likely to occur in the future, leading to additional seabird restoration projects. The seabird restoration projects conducted or planned for target species and/or within the study area include the Anacapa Island Restoration Project, the Brown Pelican Roost Enhancement Project in the San Diego Bay Salt Ponds, the Brown Pelican Entanglement Outreach and Education Program for Southern California, the Common Murre Restoration Project, the Western and Clark's Grebe Restoration Project, and the Seabird Colony Protection Program. These and other projects are further described in the restoration plans associated with these NRD cases. Cumulative additive beneficial effects are expected from the combination of these projects and the MSRP seabird restoration actions. The other seabird restoration projects, when considered together with the MSRP bald eagle and peregrine falcon restoration actions, will have minor additive beneficial effects on bald eagles (which prey to a limited extent on seabirds) and will have somewhat greater additive beneficial effects on peregrine falcons (which prey on seabirds to a greater extent than bald eagles).

  MSRP actions affecting the same or similar resources: bald eagle, peregrine falcon, and seabird restoration actions.

- **Ports of Los Angeles and Long Beach:** The Ports of Los Angeles and Long Beach are the largest ports on the west coast of the United States. Numerous construction and environmental mitigation projects are at various stages of planning, design, and implementation. Some of these projects include marine harbor and pier terminal redevelopments projects, construction of the Rainbow Harbor master plan, reconfiguration of

wharves and expansion of backlands, channel deepening projects, construction of a crude oil receiving facility at Port of Los Angeles Pier 400, expansion of Cabrillo Marine Aquarium, and construction of a fishing reef off of Point Fermin, near the San Pedro breakwater. The potential for cumulative impacts from MSRP actions and port projects cannot be adequately assessed until further details are developed on the MSRP fishing and fish habitat actions. The Trustees will consider the potential for cumulative impacts as the planning and design of these actions progress.

MSRP actions affecting the same or similar resources: "construct artificial reefs and fishing access improvements."

- **Cooling Water Intake Entrainment and Impingement – New Requirements:** Coastal electric power generation stations and other large industrial facilities draw in millions of gallons per day from nearshore waters for cooling purposes. Marine life can be either entrained or impinged on the intake structures. Entrained organisms are those that are not strong enough to swim against the current of the intake system. Impinged organisms are those that are collected on traveling screens designed to remove large debris from the intake water. Cooling water intakes kill billions of fish larvae and hundreds of thousands of juveniles and adults each year (USEPA 2004a). In addition to fish losses, larval forms of invertebrates and adult zooplankton are lost to the ecosystem. Fourteen coastal power plants in Southern California use large quantities of cooling water. In July 2004, the EPA issued new regulations under Section 316(b) of the federal Clean Water Act that set requirements for large power plants (those utilizing over 50 million gallons of water per day) to reduce the impacts of cooling water intake on marine organisms. MSRP restoration actions will have beneficial counteracting effects to the ongoing adverse effects from the operation of major cooling water intake structures in the Southern California Bight. MSRP restoration actions will have beneficial additive effects to the beneficial effects from the reductions in entrainment and impingement that are expected as a result of the implementation of the new EPA regulatory requirements for cooling water intakes.

  MSRP actions that affect the same or similar resources: fishing and fish habitat actions.

- **Desalination Facilities:** Currently, several seawater desalination facilities exist in the study area and about a dozen facilities are being considered. The existing coastal desalination facilities are relatively small, but the total output of all of the proposed coastal facilities, including some that would be among the largest in the country, could be far greater. Coastal desalination facilities may have adverse impacts on marine organisms due to the effects of the seawater intake and discharge on nearby marine life. The largest proposed desalination facilities would be located at coastal power plants that use ocean water for cooling, and these facilities would propose to use hundreds of millions of gallons of seawater per day. The existing desalination facilities in Southern California are located on Santa Catalina Island, San Nicolas Island, and various offshore oil and gas platforms. These facilities have a combined maximum capacity of about 200 acre-feet per year. New facilities in various stages of planning, design, and approval for construction include facilities in Long Beach, Los Angeles, Huntington Beach, San Onofre, Carlsbad, and San Diego. The potential combined maximum capacity of these new facilities is over 200,000 acre-feet per year.

  MSRP actions that affect the same or similar resources: fishing and fish habitat restoration actions.

- **California Marine Life Protection Act (MLPA) Initiative:** The 1999 MLPA directed the state to design and manage a network of marine protected areas to, among other things, protect marine life and habitats, marine ecosystems, and marine natural heritage, as well as improve the recreational, educational, and study opportunities provided by marine ecosystems. The California Resources Agency and the California Department of Fish and Game are partnering with the Resources Legacy Fund Foundation, NOAA, and the MPA Science Institute of the National Marine Protected Areas Center in a new initiative to achieve the MLPA goals. This public-private partnership is being guided by the advice of scientists, resource managers, experts, stakeholders, and members of the public. The MLPA Initiative, which is governed by a blue-ribbon task force, will oversee the preparation of a statewide guide for developing a Marine Protected Area master plan, create a pilot project in an area along the central coast to identify potential networks of Marine Protected Areas, develop a strategy for long-term funding, and make recommendations for improved coordination of Marine Protected Areas with key federal agencies.

  MSRP actions that affect the same or similar resources: "augment funding for MPAs in California."

- **Liquefied Natural Gas Deepwater Port Import Terminals and Associated Facilities and Operations:** Several proposals have been made to construct and operate liquefied natural gas (LNG) import, storage, and transport facilities within the study area of this plan. Specific projects include three along the Southern California coast (a Port of Long Beach LNG terminal and the Cabrillo Port and Crystal Clearwater Port projects, which are proposed for 11 to 12 miles offshore of Ventura County) and three along the Pacific coast of Baja California (Energia Costa Azul, which is 14 miles north of Ensenada, GNL Mar Adentro [Chevron], which is near South Coronado Island, and the Moss Maritime facility, which is 5 miles offshore of Rosarito). Sempra Energy has commenced construction of the Energia Costa Azul facility, which is expected to be operational by 2008; the other facilities are in various stages of planning, design, and environmental review and legal dispute. These projects have several common components, including LNG carrier berths, storage facilities, regasification units, and pipelines. The Cabrillo Port and Crystal Clearwater Port projects are approximately 20 miles away from the nearest Channel Island, Anacapa, and for this analysis it is assumed that they are far enough away that normal operations would not be expected to seriously disrupt seabird colonies in the Channel Islands. In contrast, the potential GNL Mar Adentro facility, which is proposed for a location near South Coronado Island, would be located approximately 1 mile from that island, and thus disruption to seabirds would be expected to occur if this facility were built.

  MSRP actions that affect the same or similar resources: seabird restoration projects near South Coronado Island.

- **SOCAL Range Complex and Point Mugu Sea Range Operations:** The U.S. Navy owns two of the Channel Islands, San Nicolas and San Clemente, and conducts military training and testing operations on them. The SOCAL Range Complex includes the following military training ranges: San Clemente Island, the Southern California Anti-Submarine Warfare Range, a live-fire exercise range, an aircraft emergency jettison area, the shallow water training range, and the shore bombardment range. Missile and aircraft overflights associated with ongoing operations on San Nicolas Island occur about eight times per year along the shore of the island. The Navy is also working with other partners to restore the endemic and

federally endangered San Clemente loggerhead shrike. Restoration of peregrine falcons to the Southern Channel Islands could have counteractive effects on efforts to increase the numbers of San Clemente loggerhead shrikes, as the peregrine falcons might prey on the shrikes.

MSRP actions that affect the same or similar resources: "restore seabirds to San Nicolas Island" and peregrine falcon restoration.

7.3.1 Alternative 1 (No Action)

7.3.2 Alternatives 2 and 3

As described in Section 7.2.1, under the No Action Alternative no cumulative impacts would occur. The beneficial effects of natural resource restoration actions would not be realized. The purpose and need for the Montrose Settlements Restoration Program (i.e., utilizing the funds from the Montrose settlements to restore injured resources and lost services) would not be met. Without active restoration projects, there would be no biological, physical, or human use beneficial or adverse impacts. However, natural resource injuries and lost services resulting from the DDTs and PCBs of the Montrose case would persist in the Southern California Bight for the foreseeable future. Also, no compensation for interim lost natural resource services from the date of the enactment of CERCLA until the time that the injuries cease would be realized.

This section presents an assessment of cumulative effects for the two action alternatives, Alternatives 2 and 3. Each of these two alternatives consists of a different combination of the 17 restoration actions described in Section 6 and evaluated in detail in Appendices A–D. Several of these individual actions are common to both alternatives, some are only in one alternative, and some are not included in either. The cumulative impacts of each of the 17 actions are presented here one by one (in the same order as the actions are listed in Appendices A–D); the headings indicate which of the alternatives each action is a part of.

A1. Construct Artificial Reefs and Fishing Access Improvements

Alternative 2 [✓] *Alternative 3 [✓]* *Neither [ ]*

This action will require subsequent environmental analysis when the project details are more fully developed.

Cumulative Biological Effects

The soft-bottom marine habitats covered by artificial reefs under this action are the spatially predominant benthic habitat type in the coastal regions of the Southern California Bight. For example, in a U.S. Geological Survey (USGS) study of the seafloor of Short Bank in central Santa Monica Bay (Dartnell and Gardner 2004), less than 11 percent of the seafloor was classified as rock. Thus, on a regional scale the percentage of soft-bottom marine benthic habitat that may be covered by reefs constructed by the MSRP, even when considered along with other jurisdictions that have constructed or may construct artificial reefs (e.g., Port of Los Angeles or the San Onofre Nuclear Generating Station) would be insignificant.

The construction of new artificial reefs may increase fish production, though the amount of increase would depend on their design and location (see Appendix A1). When considered in association with the adverse effects on marine life from current and proposed desalination and

cooling water intake structures in the study area, the construction of artificial reefs may have countervailing (i.e., beneficial or mitigating) biological effects. Cumulative beneficial biological effects may also be realized by the combination of MSRP artificial reef construction with other similar fisheries enhancement actions in the study area (construction of the Point Fermin and other artificial reefs, reduction of entrainment and impingement brought about by the implementation of new EPA regulations on cooling water intakes, and increased productivity from the establishment of Marine Protected Areas).

Cumulative Physical Effects

At the regional level, when considering the cumulative size of the proposed MSRP and other artificial reef projects reasonably foreseeable for the Southern California Bight, the potential cumulative impacts of artificial reef construction on sediments, water resources, and oceanographic and coastal processes are not considered to be significant. Potential concerns over short-term water quality impacts from reef material placement and concerns about potential effects on sediment transport or other processes will be addressed in subsequent site-specific analysis as potential reef sites are identified. Individual reef construction projects will be spatially and temporally spread apart; thus, the physical impacts from MSRP reef construction are not expected to have additive cumulative impacts. The potential for additive impacts due to non-MSRP construction activities will be addressed in subsequent site-specific environmental analysis.

Cumulative Human Use Effects

Considered cumulatively, the effects of MSRP- and other-constructed reefs on recreation would be largely beneficial. The restoration of lost fishing services, one of the objectives of the MSRP, would entail actions to improve the ability of recreational and subsistence anglers to fish for fish that are not the subject of state consumption advisories. Unless care is taken during planning to consider the potential cumulative impacts associated with the locations and construction of multiple new reefs, these reefs have the potential to adversely affect other aquatic human uses such as surfing and boating. The locations and designs of reefs will be determined so as to avoid or minimize potential conflicts with other human uses and to consider the cumulative impacts associated with the combination of MSRP-sponsored work and other actions.

A2. Provide Public Information to Restore Lost Fishing Services

Alternative 2 [✓] Alternative 3 [✓] Neither [ ]

Cumulative Biological and Physical Effects

This action would have no known direct or indirect effects on the biological or physical environment.

Cumulative Effects on Human Uses

The public information on fishing and fish contamination that is made available by the MSRP and others may potentially redistribute or increase or decrease the number of fishing trips that occur at different fishing sites along the Southern California coast. These effects will improve recreational enjoyment by making better information available on where and how to fish for cleaner fish. Several other regional and national public campaigns are aimed at educating the public and changing public fishing and fish consumption practices. for example, the EPA has created the local Fish Contamination Education Collaborative, and the EPA and the Food and

Drug Administration have implemented national campaigns on reducing exposures to mercury in certain fish species. In combination, these public information actions have beneficial additive cumulative effects on human uses.

A3. Restore Full Tidal Exchange Wetlands

Alternative 2 [✓] Alternative 3 [ ] Neither [ ]

This action will require subsequent environmental analysis when the project details are more fully developed.

Cumulative Biological, Physical, and Human Use Effects

Coastal wetland habitat is scarce along the Southern California coast, and the large-scale projects that create or improve existing habitat of this type that the MSRP may contribute funding to are the subject of a major regional planning effort (Southern California Wetlands Recovery Project 2004). Although restorers of coastal wetlands in Southern California seek outcomes having highly beneficial cumulative effects on the environment, such projects involve numerous biological, physical, and human use trade-offs. The cumulative effects of coastal wetlands restoration in Southern California has been analyzed recently in several relevant environmental impact reports and statements (e.g., the 2001 Final EIS/EIR for the Bolsa Chica lowlands restoration project [USFWS 2001a]). Until more specific decisions are made, this MSRP action, which contributes toward wetlands restoration, is not yet specific enough for cumulative impacts analysis; these effects will be addressed in subsequent NEPA/CEQA analysis for the specific wetlands restoration project(s) to which the MSRP contributes a portion of funding. Alternatively, should the Trustees contribute toward a wetlands project for which NEPA/CEQA documentation has already been completed, the Trustees will evaluate and adopt that existing documentation.

A4. Augment Funds for Implementing Marine Protected Areas in California

Alternative 2 [✓] Alternative 3 [ ] Neither [ ]

Cumulative Effects on the Biological Environment

To the extent that MSRP funding improves the implementation of the Channel Islands MPAs, it may increase the biological productivity within the MPA boundaries. This increase may have beneficial (countervailing) cumulative effects on marine life in the study area when considered in combination with the potentially adverse impacts to marine life if new desalination plants are constructed in the region. This action may also have beneficial additive cumulative effects when considered in combination with the reductions in entrainment and impingement from coastal cooling water intakes as new EPA regulations are implemented.

Cumulative Effects on the Physical Environment

This action would have no known direct or indirect effects on the physical environment.

Cumulative Effects on Human Uses

Given the long-term goals of the California Marine Life Protection Act (see Appendix A4), it is possible that the MSRP enhancement to implementation and monitoring of the Channel Island MPAs may contribute information to the efforts at implementing the California Marine Life Protection Act, and this information will factor into subsequent decisions on whether to create

additional MPAs elsewhere along the California coast. The information from this action may potentially lead to both beneficial and adverse effects on fishing and other types of human uses of the ocean environment in and around the MPAs; however, insufficient information is available at this point to consider how such future actions will play out.

B. Complete the NCI Bald Eagle Feasibility Study Before Deciding on Further Restoration Actions

Alternative 2 [✓] Alternative 3 [ ] Neither [ ]

This is an interim action that will require subsequent environmental analysis.

Cumulative Biological Effects

This is an interim action in that it defers longer range decisions on bald eagle restoration until the NCI Bald Eagle Feasibility Study is concluded. Other actions affecting the same or similar resources are the Channel Islands National Park and Channel Islands National Marine Sanctuary management plans and the Catalina Island Conservancy annual operational plan. Because some, if not most, of the bald eagles currently on Santa Catalina Island are expected to remain during the interim period even if the suspension of MSRP funding leads to a discontinuation of that program, no cumulative adverse biological effects are expected from this bald eagle action. There is a potential that the separate past, present, and future bald eagle restoration actions on Santa Catalina Island, Santa Cruz Island, and on the California mainland will have additive or synergistic beneficial effects on bald eagles throughout the region. Further analysis of the potential cumulative effects will be a part of subsequent decision-making on bald eagle restoration in or around 2008.

Bald eagle restoration actions alone are not expected to result in significant impacts to seabirds, as seabirds are not a principal component of bald eagle diets in the Channel Islands. This potential impact was discussed in detail in the Feasibility Study for Reestablishment of Bald Eagles on the Northern Channel Islands (MSRP 2002). When bald eagle actions are considered cumulatively with the restoration of peregrine falcons, which prey almost exclusively on other birds, there is a greater potential for impacts on sensitive seabird and terrestrial bird species in the Channel Islands. Further discussion of this point is presented in the following section on peregrine falcon restoration.

Cumulative Physical Effects

This action would have no known direct or indirect effects on the physical environment.

Cumulative Effects on Human Uses

Cumulative effects on human uses are not expected from this action given the interim nature of this action and the likelihood that bald eagles will remain on Santa Catalina Island and continue to be sighted by residents and visitors.

B. Complete the NCI Bald Eagle Feasibility Study; Regardless of its Outcome, Continue Funding Santa Catalina Island Bald Eagle Program

Alternative 2 [ ] Alternative 3 [✓] Neither [ ]

Cumulative Effects on the Biological Environment

This action, along with implementation of other Channel Island management plans identified above, is expected to have additive beneficial effects on bald eagles and further the collective aims of these plans to restore the natural ecological attributes of these island environments. Bald eagle restoration actions alone are not expected to result in significant impacts to seabirds, as seabirds are not a principal component of bald eagle diets in the Channel Islands. This potential impact was discussed in detail in the Feasibility Study for the Reestablishment of Bald Eagles on the Northern Channel Islands (MSRP 2002). When bald eagle actions are considered cumulatively with the restoration of peregrine falcons, which prey almost exclusively on other birds, there is a greater potential for impacts on sensitive seabird and terrestrial bird species in the Channel Islands. Further discussion of this point is presented in the following section on peregrine falcon restoration.

Cumulative Effects on the Physical Environment

This action would have no known cumulative effects on the physical environment.

Cumulative Effects on Human Uses

This action would have no known cumulative effects on human uses.

C1. Restore Peregrine Falcons to the Channel Islands

Alternative 2 [ ] *Alternative 3 [ ]* *Neither [✓]*

C2. Monitor the Recovery of Peregrine Falcons on the Channel Islands

Alternative 2 [✓] *Alternative 3 [✓]* *Neither [ ]*

C3. Restore Peregrine Falcons to the Baja California Pacific Islands

Alternative 2 [ ] *Alternative 3 [ ]* *Neither [✓]*

These three peregrine falcon restoration actions are analyzed collectively.

Cumulative Biological Effects

The Trustees have evaluated whether peregrine falcon restoration to the Channel Islands, together with other actions that could adversely affect sensitive seabird and terrestrial bird species in the Channel Islands, may have additive cumulative impacts. Increasing the overall numbers of predatory birds (bald eagles and peregrine falcons) inhabiting the Channel Islands may have countervailing impacts when considering other actions aimed at restoring rare, threatened, or endangered seabirds and terrestrial birds. Birds constitute only a small fraction of the diet of bald eagles; however, peregrine falcons prey almost exclusively on other birds. Given that other actions (by the MSRP and other entities) to restore other bird populations are proceeding at the same time and given that bald eagles and peregrine falcons have had a long historical presence on the Channel Islands prior to their extirpation and presumably coexisted with other bird populations there, the restoration of bald eagles and peregrine falcons at a carefully monitored, measured pace is not expected to have a significant adverse cumulative impact on recovery efforts for other bird populations (MSRP 2002).

In addition to the potential countervailing effects of the restoration of bald eagles and peregrine falcons on the restoration and recovery of seabirds and terrestrial birds, the potentially adverse impacts of the LNG facility to be constructed and operated near South Coronado Island should

be considered. The incremental degree of increase in losses of sensitive seabird species such as petrels and auklets to predation due to a rise in the numbers of peregrine falcons foraging in the Coronado Islands and the LNG development is uncertain. This uncertainty will be addressed through subsequent project monitoring and adaptive management.

The potential for interactive effects from MSRP bird restoration projects is one of the factors contributing to the Trustees' preference for Alternative 2, which provides a more balanced mix of funding for predatory bird and seabird restoration. In the absence of seabird restoration, predatory bird restoration has a greater potential to adversely affect sensitive seabird populations. Similarly, increases in seabird numbers likely benefit peregrine falcons and other predatory birds. Thus, the potential for cumulative adverse effects on other birds from peregrine falcon and bald eagle restoration are offset when seabird restoration proceeds at the same time.

Cumulative Physical Effects

This action would have no known cumulative effects to the physical environment.

Cumulative Human Use Effects

This action would have no known cumulative effects on human uses.

D1. Restore Seabirds to San Miguel Island

Alternative 2 [✓] Alternative 3 [ ] Neither [ ]

This action will require subsequent environmental analysis when the project details are more fully developed.

Cumulative Biological Effects

As described in Section 7.2.2, efforts to restore seabirds through the eradication of rats from San Miguel Island has the potential to adversely affect non-target species, particularly the native deer mouse, and to indirectly affect the ongoing recovery efforts for the endangered island fox. This action will proceed only if the risks to non-target species can be minimized to an acceptable level, which will be the subject of subsequent planning efforts.

Potential cumulative adverse effects to rats targeted for removal or eradication from San Miguel Island under this action are considered insignificant given the wide distribution and numbers in which such rats occur elsewhere, particularly on the U.S. mainland. Numerous efforts to remove non-native species (rabbits, cats, feral sheep, cattle, burros, and feral pigs) from the island environments along the California coast have occurred in the recent past, including the projects undertaken by the natural resource trustee councils for the Cape Mohican, M/T Command, and American Trader oil spill cases (NOAA 2005a) as well as the resource management projects undertaken by the Channel Islands National Park (NPS 2005). Together, these projects have resulted in substantial recoveries of endemic plants and animals on the islands (MSRP 2002) without adversely affecting the species targeted for eradication where they occur elsewhere.

Cumulative Physical Effects

This action would have no known cumulative effects to the physical environment.

Cumulative Human Use Effects

This action would have no known cumulative effects on human uses.

D2. Restore Alcids to Santa Barbara Island

Alternative 2 [✓] Alternative 3 [✓] Neither [ ]

This action will require subsequent environmental analysis when the project details are more fully developed.

Cumulative Biological Effects

This action would have no known cumulative effects on biological resources.

Cumulative Physical Effects

This action would have no known cumulative effects on the physical environment.

Cumulative Human Use Effects

This action would have no known cumulative impacts to human uses. Cultural resources would be avoided on the island during project implementation.

D3. Restore Seabirds to San Nicolas Island

Alternative 2 [✓] Alternative 3 [ ] Neither [ ]

This action will require subsequent environmental analysis when the project details are more fully developed.

Cumulative Biological Effects

This action would complement the conservation actions that the U.S. Navy is taking on San Nicolas Island. The MSRP-funded feral cat eradication effort would expand ongoing control efforts with the goal of eradicating cats from the island over a 3-year time frame. Eradication of feral cats would benefit not only seabird populations but also island foxes and other endemic species on San Nicolas Island.

Potential cumulative adverse effects to non-native feral cats targeted for removal or eradication from San Nicolas Island under this action are considered insignificant given the wide distribution and numbers in which such cats occur elsewhere, particularly on the U.S. mainland. Numerous efforts to remove non-native species (rabbits, cats, feral sheep, cattle, burros, feral pigs, and invasive plants) from the island environments along the California coast have occurred in the recent past, including projects undertaken by natural resource trustee councils for the Cape Mohican, M/T Command, and American Trader oil spill cases (NOAA 2005a) as well as the resource management projects undertaken by the Channel Islands National Park (NPS 2005). These projects have resulted in substantial recoveries of endemic plants and animals on the islands (MSRP 2002) without adversely affecting the species targeted for eradication where they occur elsewhere.

Cumulative Physical Effects

This action would have no known cumulative effects on the physical environment.

Cumulative Human Use Effects

This action would have no known cumulative effects on human uses.

D4. Restore Seabirds to Scorpion and Orizaba Rocks

Alternative 2 [✓] Alternative 3 [✓] Neither [ ]

This action will require subsequent environmental analysis when the project details are more fully developed.

Cumulative Biological, Physical, and Human Use Effects

This action would have no known cumulative effects on the biological or physical environment or on human uses.

D5. Restore Seabirds to Baja California Pacific Islands

Alternative 2 [✓] Alternative 3 [✓] Neither [ ]

Cumulative Biological Effects

As described above in the analysis of cumulative effects for the peregrine falcon restoration actions, seabird restoration on the Coronados Islands and future LNG-related construction and operation near these islands may have countervailing effects. Specifically, the benefits of the MSRP actions aimed at restoring seabird populations around the Coronado Islands may be counteracted should the proposed GNL Mar Adentro (Chevron) LNG facility be constructed. The nature and degree of countervailing effects is unknown at this time. This uncertainty will be addressed through subsequent project monitoring and adaptive management.

Cumulative Physical Effects

These actions would have no known direct or indirect effects on the physical environment.

Cumulative Human Use Effects

These actions would have no known direct or indirect effects on human uses.

D6. Create/Enhance/Protect California Brown Pelican Roost Habitat

Alternative 2 [ ] Alternative 3 [ ] Neither [✓]

This action will require subsequent environmental analysis when the project details are more fully developed.

Cumulative Biological, Physical, and Human Use Effects

Because no specific sites have been selected for this action, the nature and degree of cumulative effects are unknown at this time. This uncertainty will be addressed through subsequent environmental analysis.

D7. Implement an Entanglement Reduction and Outreach Program to Protect Seabird Populations

Alternative 2 [ ] Alternative 3 [ ] Neither [✓]

Cumulative Biological Effects

This action would have no known cumulative effects on the biological environment.

Cumulative Physical Effects

This action would have no known cumulative effects on the physical environment.

Cumulative Human Use Effects

Although numerous other small- and larger-scale public outreach and education efforts aim at reducing adverse impacts to non-targeted resources from fishing and other coastal recreational activities, the cumulative effects on human uses of this and other such actions are not considered significant.

D8. Restore Ashy Storm-Petrels to Anacapa Island

Alternative 2 [✓] Alternative 3 [✓] Neither [ ]

This action will require subsequent environmental analysis when the project details are more fully developed.

Cumulative Biological Effects

This action will capitalize on the recently completed rat eradication efforts on Anacapa Island. The recent removal of the rat population provides an excellent opportunity for colonization on the island by ashy storm-petrels, as the amount of suitable nesting habitat for seabirds has increased substantially.

Cumulative Physical Effects

This action would have no known cumulative effects on the physical environment.

Cumulative Human Use Effects

This action would have no known cumulative effects on human uses.

7.4 OTHER NEPA- AND CEQA-MANDATED DISCUSSIONS

7.4.1 Irreversible and Irretrievable Commitment of Resources and Environmental Changes

The MSRP will require a relatively small but irretrievable commitment of energy and material resources to construct and monitor the preferred alternative. CEQA regulations require that an EIR consider significant irreversible environmental changes. Construction of artificial reefs will involve physical placement of material on the seafloor that will be for all practical purposes an irreversible action. Most of the MSRP actions, however, such as those aimed at restoring birds through removal of non-native fauna and flora from islands, the use of social attraction techniques, and the hacking of bald eagles and peregrine falcons, could theoretically be reversed at some point in the future. Depending on other future developments, the suspension of the Trustees' funding support for the bald eagle program on Santa Catalina Island could eventually lead to the disappearance of bald eagles from that island. This result could happen if no other funding sources are found to continue the intervention needed because the bald eagles cannot reproduce on their own and if the Trustees decide not to pursue further bald eagle restoration work on Santa Catalina Island after the NCI Bald Eagle Feasibility Study is complete. Such consequences could be reversed at some point in the future by hacking new bald eagles onto the island.

7.4.2 Relationship between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

The short-term uses of the environment that will occur in conjunction with the proposed actions are expected to lead to substantially greater long-term productivity.

7.4.3 Growth-Inducing Impacts

CEQA regulations require that an EIR address the potential growth-inducing impacts of a proposed project. Implementation of the MSRP actions will not foster economic or population growth or the construction of additional housing, and therefore will not have a growth-inducing impact.

7.4.4 Significant and Unavoidable Adverse Impacts

To the extent known at this stage in the planning, no adverse impacts identified in this programmatic EIS/EIR are expected to be significant. Several individual projects require subsequent site-specific detail development and environmental analysis. Should any significant and unavoidable adverse environmental impacts be identified at a later stage in planning, they will be addressed in subsequent environmental documentation. The Trustees do not intend to pursue natural resource restoration projects that, on subsequent analysis, have significant and unavoidable adverse environmental impacts.