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The Natural Resource Trustees for the Montrose case (Trustees) first began to envision possible approaches for natural resource restoration during the damage assessment and litigation period in the 1990s. As specific evidence of the injuries caused by the DDTs and PCBs was collected, it became important to begin identifying potential actions that could restore the natural resources to their baseline conditions (that is, the conditions the natural resources would be in were it not for the contamination at issue), and to compensate for the loss of services resulting from injuries to natural resources. Using several potential restoration actions as examples, the Trustees estimated damages in terms of the cost of the potential restoration actions that could make the resources whole again and compensate for interim losses. Potential restoration actions considered for this purpose included replacing contaminated fish stocks using constructed reefs and re-establishing bald eagles and peregrine falcons in the Channel Islands using methods that have been successful elsewhere.

Although examining potential restoration actions and their estimated costs was a crucial step in settling the Montrose case, the final consent decree neither prescribes specific restoration projects that must be implemented nor dictates the distribution of funding among the different injured resources or between primary and compensatory restoration actions.¹ Thus, within the framework of an overarching goal to restore injured resources to their baseline conditions and compensate for interim lost services, the settlements provide latitude to develop explicit restoration objectives and strategies for achieving the goals. This section explains the restoration goals that the Trustees seek, discusses the specific objectives and strategies that the Trustees propose for attaining the restoration goals, and describes the process the Trustees are following to plan the work of the Montrose Settlements Restoration Program.

4.1 GOALS, OBJECTIVES, AND STRATEGIES OF THE MONTROSE SETTLEMENTS RESTORATION PROGRAM

For this plan, a *goal* is a broad statement about a long-term desired outcome that may or may not be completely attainable. An *objective* is a measurable outcome to be achieved in a specific time frame to help accomplish a desired goal. *Strategies* address the process rather than the endpoint, and are approaches for accomplishing the goals and objectives.

¹ Restoration actions may be categorized as either primary or compensatory.

Primary restoration actions are taken to return injured natural resources and lost services to their respective baselines. For instance, if a contamination release has impaired the ability of biological organisms to reproduce, actions that restore the injured organisms' reproductive function to the level that would exist were it not for the release are considered primary restoration. An example of a primary restoration action is the removal of the injurious contamination from the organisms' environment.

Compensatory restoration actions are taken to compensate for interim losses of natural resource services pending recovery. Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulatory framework, compensatory restoration claims are recovered as "compensable damages." The regulations describe these damages as, "The compensable value of all or a portion of the services lost to the public for the time period from the discharge or release until the attainment of the restoration, rehabilitation, replacement, and/or acquisition of the equivalent of the resources and their services to baseline" (Title 43 Code of Federal Regulations [CFR] Part 11.80).

4.1.1 Restoration Goals

The overarching goals of the Montrose Settlements Restoration Program (MSRP) have been constant throughout the damage assessment and restoration effort, and appear in the final consent decree for the case. The overall goals of the MSRP are to:

- Restore, replace, rehabilitate, or acquire the equivalent of the injured natural resources and the services those resources provide to their respective baselines (the conditions they would be in were it not for the injuries from the contaminants of the case); and
- Provide compensatory restoration for the interim lost services of the injured natural resources.

The Trustees give highest priority to the first goal, the primary restoration of resources that still show evidence of injury or lost services; nevertheless, it is not the Trustees' intent to forgo compensatory restoration actions until all injured resources have fully recovered to their respective baselines. In fact, the Montrose settlements made no distinction between settlement funds for primary restoration and settlement funds for compensatory restoration. Many of the potential approaches being considered to address the injuries and lost services of the Montrose case may serve as either primary or compensatory restoration, or as both (depending on the scale of the actions and whether they simply bring an injured resource back to baseline or go beyond it to make up for past losses).

The Trustees used this planning process to develop an appropriate mix of primary and compensatory restoration actions to be conducted using the settlement funds. For restoration actions that are compensatory in nature, the Trustees sought restoration approaches that benefit the same or similar natural resources as those that sustained injury as a result of the DDTs and PCBs released in the Montrose case. This approach was applied, for instance, in the evaluation criteria presented in Section 5 for seabird restoration, in which higher priority was given to projects that benefit seabird species for which there have been documented effects from the Montrose contaminants (i.e., DDT-induced eggshell thinning).

4.1.2 Restoration Objectives

The final consent decree for the Montrose case states: "The Trustees will use the damages for restoration of injured natural resources, including bald eagles, peregrine falcons and other marine birds, fish and the habitats upon which they depend, as well as providing for implementation of restoration projects intended to compensate the public for lost use of natural resources." The restoration objectives for the MSRP (i.e., the specific targets or milestones that help accomplish the overall goals) have been formulated with this consent decree provision in mind and with consideration of the input from the public during the restoration planning workshops. The MSRP restoration objectives are:

- Restore fishing services within the Southern California Bight (SCB)
- Restore fish and the habitats on which they depend within the SCB
- Restore bald eagles within the SCB
- Restore peregrine falcons within the SCB
- Restore seabirds within the SCB

Of the two fish-related objectives, one addresses human use (restoring anglers' ability to catch fish that are low in contamination), and the other aims for ecological results. When the Trustees initially sorted and categorized the many restoration ideas they had compiled, there was often little practical distinction between projects benefiting fish and fish habitat and projects benefiting fishing as a human use. Therefore, for the purpose of evaluating restoration ideas in categories, these two fish-related objectives have been combined into a single broad category labeled "fishing and fish habitat." Thus, the evaluation of restoration ideas (described in Section 5) is organized into four categories (fishing and fish habitat, bald eagles, peregrine falcons, and seabirds) (described in Section 6) that encompass the five restoration objectives listed above.

4.1.3 Restoration Strategies

In addition to restoration goals and objectives, the Trustees have identified three strategies that embody their approach for optimizing the results of the MSRP. These strategies are:

- Follow an adaptive approach to restoration through iterative planning, implementation, and monitoring to optimize restoration results
- Promote public involvement in restoration planning and implementation
- Coordinate with other regional resource management and restoration programs and take advantage of regional partnerships to gain efficiency and avoid duplication of effort

Restoration planning is only one step in achieving the most effective natural resource restoration possible within the limits of available funding. The MSRP operates as an adaptive restoration program. This plan provides an overall framework for selecting and implementing restoration actions over the life of the MSRP, and establishes a significant initial phase of restoration actions to be undertaken during the first five years following its adoption (see Section 6). This plan will be followed by design, implementation, and monitoring of several restoration projects, leading to subsequent review and evaluation of results and other new information, and revision of the Restoration Plan as restoration progresses.

Throughout this iterative planning and implementation process, the Trustees will continually seek to involve the public, including interested groups and the expert scientific community. The Trustees will also coordinate MSRP efforts with other organizations that are conducting work of a similar nature and seek opportunities to collaborate.

4.2 DEVELOPING THE RESTORATION PLAN

The approach and assumptions used in developing this Restoration Plan have been derived from a number of sources: current conditions, including the ongoing injuries and the continued presence of contamination, the CERCLA regulatory framework, the Trustees' experience with past natural resource damage assessment (NRDA) restoration plans, certain provisions in the Montrose settlements, and close coordination with the U.S. Environmental Protection Agency (EPA) on the progress of its feasibility study on sediment remediation.

The CERCLA regulations (43 CFR Part 11) provide guidance on the restoration planning process, including the evaluation and selection of restoration alternatives. Under 43 CFR Part 11.82, these provisions require the authorized official (in this case the Trustees) to develop a reasonable number of possible restoration alternatives linked to the injured natural resources and

the services those resources provide and then select the alternative determined to be the most appropriate based on all relevant considerations, including several suggested factors (further described at the beginning of Section 5). As has been done in previous restoration planning efforts, the Trustees are using the CERCLA regulatory framework as a guide and adapting the criteria and the evaluation approach to the specific circumstances of the case.

Preparation of the Restoration Plan has been conducted using the following approach:

- Develop restoration goals, objectives, and strategies
- Compile injury benchmark information
- Project future trends in contaminant levels and distribution
- Solicit and formulate a wide range of restoration ideas
- Complete a Tier 1 (screening) evaluation of preliminary restoration ideas that leads to a synthesized set of potential restoration actions/approaches for detailed evaluation
- Complete a Tier 2 (detailed) evaluation of potential restoration actions/approaches from Tier 1, including a National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) analysis
- Develop the restoration alternatives and identify the preferred alternative

The soundness of this approach was discussed at the restoration planning workshops and received support from the interested public and the technical community.

The first of these seven elements is addressed above in Section 4.1. The remaining six are addressed below.

4.2.1 Compiling Injury Benchmark Information

An important early aspect of planning was the gathering and compiling of background information for all resource categories useful to restoration planning. This element included a review of the historical and recent literature and data (including studies specifically conducted as part of the damage assessment) and the performance of studies to fill critical data gaps. This information has been synthesized to develop environmental benchmark information against which the performance of different restoration project actions will be assessed. This benchmark information (both existing and future) will also be used to assess the environmental impacts of the restoration project alternatives. The efforts associated with this element are described in more detail below.

Historical and Recent Literature and Data

Several sources of information were reviewed to prepare the benchmark information, including reports, journal articles, environmental impact reports (EIRs) and environmental impact statements (EISs), recent monitoring reports, environmental databases, resource management plans, and restoration plans. Some of the key information sources included:

- California Department of Fish and Game (CDFG) environmental sensitivity index maps for oil spill response

- The CDFG database on locations of artificial reefs and kelp beds
- Information on watersheds and wetlands compiled by the State Coastal Wetlands Recovery Project
- Seabird and marine mammal monitoring information from the National Oceanic and Atmospheric Administration (NOAA), the U.S. Fish and Wildlife Service (USFWS), the National Park Service (NPS), and the U.S. Geological Survey (USGS)
- Resource management and restoration plans for the Channel Islands
- USGS seafloor mapping and information on seismic hazards
- Marine Recreational Fishing Statistical Survey
- Information from wastewater outfall monitoring programs
- The technical studies and reports associated with the damage assessment

Data Gap Studies in Progress or Completed

The Trustees have conducted or are in the process of conducting five data gap studies to provide information to enhance their ability to make sound restoration planning decisions. These five studies are briefly described below.

Santa Catalina Island Bald Eagle Reintroduction Study

In 1980 the USFWS and the Institute of Wildlife Studies (IWS), with the cooperation of the CDFG and the Santa Catalina Island Conservancy, initiated efforts to reintroduce bald eagles to Santa Catalina Island. These efforts are ongoing, as the bald eagles inhabiting Santa Catalina Island continue to experience reproductive problems (see Appendix B). Because of their role in the legal case, the Trustees began contributing funding toward this program during the natural resource damage assessment and litigation phase in the 1990s, and have continued to support the program since the final legal settlement to maintain current conditions until this Restoration Plan is completed.

The purpose of this data gap study is to learn from the ongoing efforts to maintain breeding bald eagles on Santa Catalina Island. Information for the study is gained from monitoring the status of the bald eagle population on Santa Catalina Island, including contaminant levels, reproductive behavior, reproductive success, and feeding behavior. This information is critical for understanding the nature of the continuing injury to bald eagles on the island and will be used to guide restoration planning for this species. Annual reports on the Santa Catalina Island bald eagle program are available from the MSRP Administrative Record.

Northern Channel Island Bald Eagle Feasibility Study

This approximate five-year study was initiated in summer 2002 to determine the feasibility of recolonizing the Northern Channel Islands with bald eagles. A separate Feasibility Study/Environmental Assessment was completed for this study (MSRP 2002). The study consists of the following actions:

- Releasing 12 captive-bred or translocated wild nestlings each year for five years on Santa Cruz Island (using techniques developed on Santa Catalina Island)
- Monitoring contaminant levels in released birds, their eggs, and their food to determine whether the concentrations of DDTs and PCBs present may be affecting the ability of the eagles to reproduce successfully

The information from this data gap study will be used to evaluate whether a bald eagle reintroduction program should be implemented on the Northern Channel Islands.

Peregrine Falcon Survey of Santa Catalina Island

A survey conducted in 1992 found nine pairs of peregrine falcons nesting on several of the Northern Channel Islands; however, the extent to which peregrine falcons have become re-established on the Southern Channel Islands has until recently been uncertain. The Trustees undertook a formal survey of Santa Catalina Island in 2004 to determine whether peregrine falcons are nesting and reproducing there. The survey results indicated that two pairs of peregrine falcons have established territories and are nesting on Santa Catalina Island; however, no successful hatching or fledging of chicks was observed on the island (PBRG 2004).

Fish Contamination Study

A comprehensive fish collection and analysis study was initiated in 2002 to examine existing contaminant concentrations in fish from Ventura to Dana Point in the waters off of Ventura, Los Angeles, and Orange Counties. Fish collection has been conducted in several phases from 2002 to 2004. During the first phase, concentrations of DDTs, PCBs, dieldrin, chlordanes, and mercury were measured in 24 species of fish collected from 29 locations. Data from individual fish were generated for organochlorines, and data from composite samples within species and by location were obtained for mercury. A second phase of analysis will involve filling the data gaps identified by the results from the first phase, and evaluating the need for conducting follow-up individual-level analyses for mercury. This study is a joint project with the EPA, and funding is provided by both MSRP and the EPA.

The purpose of the study is to provide more complete information on the existing geographic patterns of contaminant concentrations in a variety of fish that are caught by both recreational and subsistence anglers in the SCB. The study data will be used for a variety of restoration planning purposes, including the identification of possible restoration projects. The data also will also be made available to the public to enable people to make more informed decisions about where to fish and the types of fish they consume.

Angler Study

Together, MSRP and the EPA also designed and implemented a survey and gathered qualitative information on fishing and fish consumption practices and preferences from people who fish, whether for recreation or subsistence, in the coastal waters from Point Dume to Dana Point. The angler study was conducted at fishing piers, beaches, jetties, and boat docks. The information collected by the study addresses angler demographics, fishing preferences, fish preparation techniques, and fish consumption rates and patterns. The purpose of this study was three-fold:

- To gain a better understanding of which recreational and subsistence anglers are being impacted by the contamination associated with the Montrose case, as well as how they get their information on fish and fishing
- To collect information on how many meals of fish per month are consumed by recreational and subsistence anglers, and how they prepare their fish for consumption
- To gain insights on the fishing preferences of these anglers (i.e., the types of fish they seek and their typical fishing locations)

The Trustees will use the information from the angler study to plan restoration projects that increase opportunities to fish for cleaner fish and to help guide the development of more effective public outreach and education programs that reduce public exposure to DDTs and PCBs from fish.

4.2.2 Projecting Future Trends in Contaminant Levels and Distribution

An important part of the restoration planning process is consideration of what the future conditions of contamination will be within the study area. It is challenging to project future changes in the concentrations and geographic distribution of DDTs and PCBs in the environment of the SCB. The Trustees have considered evidence that natural factors (e.g., the gradual burial of the more highly contaminated sediments over time) are altering levels of biological exposures to these contaminants over time. The Trustees have also coordinated closely with the EPA in their efforts to study the feasibility of taking remediation actions to reduce the availability of these contaminants.

In addition to the ongoing data gap studies described above, the Trustees have consulted with scientific experts within and outside their agencies to obtain the best estimates and projections into the future of the likely trends in continued contaminant exposures. The Trustees convened a workshop in May 2004 to review recent monitoring data and observations on levels of DDTs and PCBs in sediment, marine mammals, bald eagles, and other receptors. The purpose of the workshop was to evaluate trends in exposures, particularly related to ongoing observations of bald eagle reproductive impairment on Santa Catalina Island. One major variable to be considered is whether the potential remediation of the sediment contamination by the EPA is likely to significantly alter biological exposures to DDTs and PCBs and if so, within what time frame. The EPA efforts are described below.

Coordination with the EPA

The Trustees and the EPA were co-plaintiffs in the Montrose case, and have continued their coordination since the final settlements, collaborating on and co-funding the studies described above. In addition, MSRP staff work closely with the EPA to ensure consistency in their respective programs, and to avoid duplication of effort.

The EPA has a two-pronged approach to its Superfund responsibilities for the offshore areas of DDTs and PCBs stemming from the Montrose releases. The first is an “institutional controls” program that uses non-engineering measures to address the human health risks associated with consumption of contaminated fish from the Palos Verdes Shelf. Non-engineering measures include public outreach and education. The second is an “in situ” response program that is

currently at the remedial investigation/feasibility study stage. The remedial investigation report will describe the conditions of the site, and the feasibility study will examine the technically feasible solutions to containing the DDT- and PCB-contaminated sediments over portions of the Palos Verdes Shelf. Only the second of these programs addresses “source control” of contamination, but both programs are briefly described below.

Institutional Controls

In a 2001 EPA Superfund Action Memorandum, the EPA established a program of institutional controls (ICs) as initial actions to address the immediate human health risks associated with the consumption of contaminated fish from the Palos Verdes Shelf. These ICs involve information and enforcement measures designed to affect human activities in such a way as to reduce exposure to the contaminants related to or at a site, and are usually applied in concert with other methods aimed at physical site remediation. The ICs consist of three primary components: (1) public outreach, (2) monitoring, and (3) enforcement. These three components complement each other to maximize the effectiveness of the EPA’s goal of protecting human health. Currently, the ICs program is envisioned to be a ten-year program with a budget of \$7.8 million.

The objectives of the public outreach IC component are to reduce the health risks associated with eating contaminated fish by (1) increasing public awareness and understanding of fish consumption advisories and restrictions and (2) building local capacity to address fish contamination issues. The EPA also convened a Seafood Contamination Task Force, now known as the Fish Contamination Education Collaborative (FCEC), which is a consortium of federal, state, and local government agencies; local institutions; and community-based organizations. The FCEC is a means of coordinating the development and implementation of a public outreach program with direct involvement at all levels. FCEC also serves as a decision-making body for the public outreach and education component of the ICs program and advises the EPA on other Palos Verdes Shelf IC activities. The EPA started the full implementation of the public outreach and education program in January 2003.

The IC monitoring component consists of the EPA’s co-funding of the two fish-related data gap studies previously described and two additional fish-related contamination studies: a study of white croaker contamination levels in the ocean to assess the need for changes in the current commercial catch ban designation, and a study of the white croaker being sold in local ethnic fish markets to assess whether contaminated white croakers are reaching these markets. The sampling of white croaker from the ocean for the commercial catch ban study and the additional sampling from local fish markets were completed in 2004. The results from the laboratory analysis of all of these fish are expected in late 2005 or early 2006.

The EPA has designed an enforcement program to meet two goals: (1) to prevent to the extent practical the commercial catch and sale of contaminated fish from the catch ban area on the Palos Verdes Shelf and (2) to ensure that white croaker are not caught at or near the Palos Verdes Shelf in violation of CDFG regulations that establish a daily bag limit for these fish for sport fishers.

Once the monitoring results become available, the EPA will work closely with appropriate state agencies and interested stakeholders to interpret the results and identify specific enforcement needs that address the problems, if necessary.

Sediment Remediation

The EPA conducted the Palos Verdes Shelf Pilot Capping Project in 2000 to assess the feasibility of capping DDT-contaminated sediment on the Palos Verdes Shelf with cleaner material. The goal would be to reduce the ongoing inputs of DDTs and PCBs into the food web. The pilot cap placement project was completed in September 2000. Sediment was deposited at three 45-acre areas (capping cells) at depths of 150 to over 200 feet, for a total area of 135 acres northwest of



Figure 4-1. Sites where EPA conducted a pilot capping study in 2000. (Dashed line indicates region designated as the “area of highly contaminated sediments” by USGS [Lee et al. 2002]. Further analyses by the EPA have shown that contaminated sediments exist beyond this area.)

the Los Angeles County Sanitation Districts' outfall system (Figure 4-1) (USEPA 2003). An environmental monitoring program collected data before, during, and after cap placement to address key questions about the feasibility of capping on the Palos Verdes Shelf. The results of the Palos Verdes Shelf Pilot Capping Project will be used to evaluate the short-term results of capping DDT-contaminated sediment with clean sediment. The project will also determine how these results are affected by variables such as cap material, placement method, and water depth. In 2006, the EPA will use the results from the pilot project, along with other relevant information, to decide whether or not to propose full-scale capping as a cleanup action for the site.

Assumptions Regarding Future Contamination Distributions and Exposures

In light of the data and consultations identified above, the Trustees have made certain assumptions for the purposes of developing this Restoration Plan. At this time, the EPA has not determined the feasibility of a full-scale cap for sediment remediation. The EPA's overall goal is to reduce most if not all DDT/PCB levels in fish tissues to below health-based levels of concern as well as to levels that are protective of ecological receptors (Schauffler, pers. comm., 2003). The EPA anticipates that a remedy will be selected in 2006. Changes in contaminant concentrations throughout the food web would be realized gradually as the sediment source is controlled.

In light of the uncertainties associated with the remedial actions on the Palos Verdes Shelf and environs, several technical assumptions were formulated relative to future contaminant distributions and concentrations. Restoration planning must have a reasonable understanding of both current and future conditions so that effective decisions can be made regarding where and what type of actions should be implemented to achieve the desired restoration goals and objectives. Furthermore, an evaluation of the benefits and the likelihood of success of potential restoration projects will require a comparison of the existing conditions with the expected future conditions.

Several assumptions are listed below regarding future contaminant distributions and concentrations. These assumptions will be updated and/or revised in the future based on the results of the current data gap studies, upcoming regional monitoring, and the ultimate decisions made by the EPA. As discussed earlier, the Trustees will adaptively manage this restoration program based on updated information about and assumptions on contaminant concentrations.

The assumptions made for this Restoration Plan regarding future conditions were as follows:

- **Substantial reductions in the levels of DDTs and PCBs in marine sediments will not occur for many decades without human intervention.** Three key processes affect the contaminant concentrations in the surface layer of sediment at any given time: the recent history of sediment deposition or erosion, bed mixing through bioturbation, and loss of sediment through resuspension and desorption during storm events. According to recent mathematical modeling, it is predicted that most of the p,p'-DDE (the most abundant isomer of DDE and a persistent component of DDT) immediately northeast of the White Point outfall will remain buried and that surface concentrations will gradually decrease as DDE degrades to its decay products (Sherwood et al. 2002). However, the modeling also predicts that erosion will occur along the southeast edge of the existing effluent deposit, which, in addition to causing bio-diffusion, will reintroduce DDE to the sediment surface.

- **Sediment remediation on the Palos Verdes Shelf will reduce, but not eliminate, DDT and PCB contamination within the SCB.** If capping is selected as the remediation alternative, the cap would only be implemented on the parts of the Palos Verdes Shelf that are of the greatest concern. Other areas of contamination would remain uncovered and bioavailable.
- **Only limited sediment remediation is planned for other areas with DDT and PCB contamination.** With the exception of sediment remediation within the Consolidated Slip of the Inner Los Angeles Harbor and possibly upstream in Dominguez Channel, no other sediment remediation is planned within Los Angeles or Long Beach Harbors. However, maintenance dredging within the harbors may continue to result in reduced sediment contaminant concentrations relative to historical concentrations. No capping and/or other sediment remediation is planned within Santa Monica Bay, at the two historical sites where DDTs and PCBs were disposed of by dumping off of Santa Catalina Island, or within or offshore of coastal wetlands within the SCB.
- **Sediment remediation will take more than a decade to implement.** No capping or other sediment remediation would be implemented before 2006 on the Palos Verdes Shelf, and remediation could take up to 15 years to complete.
- **Maintenance may be required to ensure the benefits of sediment remediation.** Areas to the north of White Point on the Palos Verdes Shelf, particularly at Portuguese Bend and Royal Palms Park, have known geologic hazards such as landslides. These processes, together with earthquakes, have the potential to disrupt a sediment cap and potentially liberate higher concentrations of DDTs and PCBs. Severe storms also have the potential to erode a sediment cap.
- **Substantial reductions in DDT and PCB contamination in the food web would take more than a decade to achieve after the implementation of sediment remediation.** Concentrations of p,p'-DDE and PCB in bottom-feeding fish such as the white croaker will decrease after sediment remediation on the Palos Verdes Shelf and in the Consolidated Slip in Los Angeles Harbor. However, elevated concentrations in fish will persist for several years after sediment remediation, due to the life span of fish contaminated prior to remediation. Also, p,p'-DDE and PCB concentrations in surface sediments will be lower, but still above background concentrations off the Palos Verdes Shelf and extending north into Santa Monica Bay. In addition, elevated concentrations of DDTs and PCBs would be expected to persist for longer than a decade in some marine mammals, bald eagles, and seabirds due to their longer life spans and their foraging preferences.
- **Seafood consumption advisories are likely to remain in effect for many years.** Advisories warning against consumption of white croaker and other fish will likely continue for many years even after sediment remediation.
- **Reproductive impairment of bald eagles on Santa Catalina Island will likely continue for the foreseeable future.** Contaminant concentrations in carcasses of marine mammals and in many species of seabirds that are fed upon by bald eagles will continue to impact the species for the foreseeable future, even in the event that the EPA undertakes a sediment source control effort. In part, this continuing impairment will result from the relatively long life spans of marine mammals. Levels of DDE in bald eagle eggs laid on Catalina Island

from the 1980s to 2004 have fluctuated, but have not fallen below the thresholds associated with reproductive injuries.

- **Seabirds in general and peregrine falcons in particular have been and will likely continue to recover from contaminant injuries over time.** Most seabirds feed upon pelagic fish, which have experienced substantial reduction in DDTs and PCBs tissue concentrations since the ban on the discharge of these contaminants through the LACSD ocean outfall near White Point. Peregrine falcons, which feed almost exclusively on birds, will experience reductions in contaminant concentrations and impairments with the passage of time due to cleaner food resources. Contaminant concentrations in scavenging seabirds, such as gulls, may persist for more than a decade due to their habit of foraging on marine mammal carcasses, which are expected to remain high in contaminants for decades or longer (see above).

4.2.3 Soliciting and Formulating a Wide Range of Restoration Ideas

Active involvement of the interested public and the scientific community has been an integral part of the restoration planning process. This involvement has included the public review and comment periods associated with the NEPA/CEQA process (described later), outreach and education activities, and restoration planning workshops. These latter two activities are described below. Public outreach and involvement will continue throughout the restoration planning cycle and during the implementation of specific restoration actions.

A number of potential restoration concepts were originally explored during the damage assessment phase of the Montrose case. On settlement of the case, the Trustees initiated an effort to gather as broad a range of additional potential ideas as possible from the public, including members of the scientific community and various public interest groups. Some of the ideas were put forward in brief conceptual terms, and others were submitted in the form of concrete proposals. At this planning stage, the solicitation was an effort to gather “ideas” rather than formal proposals for funding, so all submittals were treated as ideas without concern regarding who would implement them or how they would be implemented. Specific decisions about who will ultimately implement projects and how the funding will be administered will not be made until after the completion of the Restoration Plan.

Four roundtable workshops were held in January 2003 with various stakeholders, including representatives from governmental and non-governmental agencies, academicians, scientists, and local residents. Over 80 individuals attended the January 2003 workshops. The purpose of the workshops was to:

- Review and obtain feedback on draft program goals and objectives
- Review and obtain feedback on the draft screening and evaluation criteria for restoration concepts
- Brainstorm on preliminary restoration concepts and ideas

Two workshops were held with technical experts, including academic researchers, resource agencies, and public entities involved with monitoring. The technical workshops covered all three purposes noted above and included additional discussion on restoration concepts for injured

resources. One of the technical workshops focused on restoration ideas for injured bird resources, and the other focused on ideas for restoring fishing and fish habitats.

Two additional general public workshops were held to cover both bird and fishing injuries. These workshops were attended by representatives from governmental and non-governmental agencies, homeowner associations, environmental groups, environmental consultants, and residents. The public workshops were announced in local newspapers and were advertised on the MSRP web site.

The comments received from both the technical and the public workshops were considered in the preparation of this document. Notes from these workshops can be found in the MSRP Administrative Record (MSRP 2004).

4.2.4 Completing a Tier 1 Evaluation of Preliminary Restoration Ideas

The breadth and number of potential restoration ideas gathered was so large that the Trustees developed a two-tier evaluation process. The first screening level of evaluation, referred to as Tier 1, is described in detail in Section 5 of this Restoration Plan. Section 5 presents the criteria developed to evaluate the restoration ideas and summarizes the results of the evaluations. The complete record of all of the initial restoration ideas and the Tier 1 evaluation is not contained in this document, but has been placed separately in the Administrative Record for the case (MSRP 2004).

4.2.5 Tier 2 Evaluation of Restoration Ideas

The result of the Tier 1 screening evaluation was a set of 17 potential restoration actions, some specific and some still conceptual. These actions were then put through a more rigorous evaluation process, the Tier 2 evaluation. The Tier 2 evaluation is described in detail in Section 5, and the full evaluations for each action are in Appendices A–D of this Restoration Plan.

4.2.6 Developing the Restoration Alternatives and Identifying the Preferred Alternative

To facilitate public review and analysis of the alternatives for the comprehensive restoration program, the restoration ideas carried into Tier 2 were assembled into three comprehensive alternatives spanning all the restoration categories: fishing and fish habitat, bald eagles, peregrine falcons, and seabirds. The alternatives analysis, including the presentation of the Trustees' preferred comprehensive restoration alternative, is presented in Section 6.

4.2.7 Public Participation

Public participation in the Trustees' decision-making efforts is not only a requirement of the federal regulations for natural resource damage assessment and restoration (43 CFR Part 11) but is also an important aspect of the NEPA and CEQA requirements. Because this document is both a Restoration Plan and a programmatic EIS/EIR, the evaluations of the efficacy of the potential restoration actions and approaches include evaluations of the potential environmental consequences, as mandated by NEPA and CEQA. These are presented in Section 7.

Compliance with NEPA and CEQA procedural requirements occurred as follows. A Notice of Intent to conduct restoration planning and to prepare an EIS was published on October 9, 2001

(Federal Register, Vol. 66, No. 195). Three public meetings were held (on October 13, October 21, and November 1, 2001) to gather public comments on the scope of the Restoration Plan and programmatic EIS/EIR and restoration ideas. The NEPA public scoping comment period ended on November 24, 2001. A CEQA Notice of Preparation for the Restoration Plan and programmatic EIS/EIR was published in the California State Clearinghouse on March 15, 2002, and the public comment period ended 30 days later on April 15, 2002.

Public comments were sought on the draft version of this Restoration Plan and programmatic EIS/EIR during a 45-day review period from April 8 to May 23, 2005. A Notice of Availability was published in the Federal Register and in the California State Clearinghouse on April 8, 2005. The Trustees conducted public meetings on the draft Restoration Plan and programmatic EIS/EIR on April 23, April 24, April 28, and May 9, 2005. After the close of the public comment period, the Trustees considered and responded to public comments, made changes to the plan to address the comments received, and released this Restoration Plan and programmatic EIS/EIR as a final document in October 2005.

4.3 FUTURE FUNDING CONSIDERATIONS

The amount of funding ultimately available for natural resource restoration in this case is subject to certain variables. As described in Section 2.4, the final consent decree for the Montrose case contains a provision at Paragraph 11.C whereby the United States and the State of California have agreed that, under certain conditions, \$10 million of the \$43 million provided for response actions by the EPA and the California Department of Toxic Substances Control (DTSC) may be used either (1) by the EPA or DTSC for response actions or (2) by the Trustees for natural resource restoration. This \$10 million and the interest it is accruing is being held in a court registry account until such time that the EPA makes a decision on the in situ response action for this case (that is, the response action that addresses the contamination remaining in situ in the sediments on the Palos Verdes Shelf). This provision of the consent decree states:

In the event EPA makes a response action selection determination to not select any “in-situ” response action... then all funds retained in the Court Registry Account... shall be paid from the Court Registry Account to the Trustees.

In other words, should the EPA ultimately make a decision not to pursue any cleanup action for the contaminated sediments, then \$10 million plus interest of the \$43 million in settlement funds earmarked for response actions would instead go to the Trustees for additional natural resource restoration. The EPA currently estimates that it will reach its decision in 2006.

As explained in Section 4.1.3 and Section 6.2, this Restoration Plan provides a guide for commencing natural resource restoration actions and adapting to new information as it becomes available. Since it is too early to know whether the \$10 million of “swing money” will be made available for natural resource restoration, the Trustees have developed alternative sets of restoration actions based upon a commitment of approximately \$25 million over the first several years of implementation. Subsequent revisions of this plan will consider how accrued interest from the settlements and the swing money (if made available) may be utilized for additional natural resource restoration in the future.

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During the early stages of restoration planning, the Natural Resources Trustees for the Montrose case (Trustees) compiled about 100 potential restoration ideas. Some of the ideas in this initial inventory were outdated or were no longer applicable, as they had been identified years earlier during the damage assessment phase of the case; other ideas proposed guidelines or management plans that were more appropriately the responsibilities of other jurisdictions; and yet other ideas were variations on similar themes and could be combined. The Trustees edited, sorted, and reorganized this initial inventory of ideas before undertaking systematic evaluation. A complete compilation of all the original restoration ideas and a description of how they were sorted and organized into the lists described in this section has been placed in the Montrose Settlements Restoration Program (MSRP) administrative record (MSRP 2004).

After editing, sorting, and reorganizing the initial inventory of ideas, approximately 50 potential restoration ideas remained. To select actions from among such a large number of ideas, the Trustees developed a two-stage evaluation process. The first stage, Tier 1, consisted of a screening-level analysis of all of the restoration ideas.

The principal objective of the Tier 1 evaluation was to refine and narrow the list of restoration ideas within each resource category (see below) to a reasonable number of the most promising candidate restoration actions. The Tier 1 evaluation consisted of a limited, systematic analysis of each restoration idea and the rating of each idea's relative capabilities to achieve the restoration goals of the Montrose case. The result was a list of ideas arranged from most to least promising within each category, with the most promising ideas then advancing to a detailed evaluation and environmental impact analysis in the subsequent evaluation step, Tier 2.

To facilitate evaluation and to ensure that a diverse set of restoration ideas were carried forward for further consideration, the Trustees organized the restoration ideas into general resource categories. In the public scoping document prepared at the outset of restoration planning (MSRP 2001), the Trustees suggested the following general types of restoration actions:

- Cleaner fish for anglers: projects to restore fishing injured by DDTs and PCBs
- Continued reintroduction of bald eagles to Santa Catalina Island
- Expansion of efforts to reintroduce bald eagles to all the Northern Channel Islands
- Restoration of peregrine falcons on the Channel Islands
- Wetlands and estuarine projects to benefit resources injured in the Montrose case
- Seabird projects

Considering the input received during the scoping and the initial planning phase, the Trustees refined the general categories of restoration actions into the following:

- Fishing and fish habitat restoration projects
- Bald eagle restoration projects
- Peregrine falcon restoration projects
- Seabird restoration projects

In addition to restoration ideas that fell within these four categories, the Trustees received ideas to create and implement general public outreach and education programs, as well as several

specific research proposals. Public outreach programs and research proposals are addressed separately later in this section, as they differ in their fundamental nature from actions whose purpose is to directly restore injured natural resources and lost services.

5.1 TIER 1 CRITERIA AND PROCESS

5.1.1 Developing Criteria

Federal natural resource damage assessment and restoration regulations at Title 43 Code of Federal Regulations (43 CFR) Part 11 provide guidance on the selection of restoration alternatives. Specifically, under 43 CFR Part 11.82, these federal procedures require the authorized official (in this case the Trustees) to develop a reasonable number of possible restoration alternatives linked to the injured natural resources and the services those resources provide, and then select the alternative determined to be the most appropriate based on all relevant considerations. The federal procedures list the following factors to consider:

- Technical feasibility
- The relationship of the expected costs of the proposed actions to the expected benefits from the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources
- Cost-effectiveness
- The results of any actual or planned response actions
- The potential for additional injury from the proposed actions, including long-term and indirect impacts, to the injured resources or other resources
- The natural recovery period
- The ability of the resources to recover with or without alternative actions
- The potential effects of the proposed actions on human health and safety
- Consistency with relevant federal, state, and tribal policies
- Consistency with relevant federal, state, and tribal laws

This list is not a fixed list of the factors required of all natural resource restoration plans, but rather is a list of the potentially relevant factors to consider in developing evaluation criteria that are tailored to each restoration planning effort. Additional factors may be considered (for instance, this list does not include an explicit factor for evaluating the nexus between a potential restoration action and the injuries of a case). The Trustees considered these factors and other evaluation criteria developed for previous natural resource restoration plans. The Trustees then developed six criteria suited to this case and sought public input on those criteria during the public scoping of this plan in 2002 and 2003.

Table 5-1 summarizes the relationship between the six evaluation criteria (and their subcomponents) utilized in the Montrose Restoration Plan and the list of factors to consider from the federal regulations (43 CFR Part 11). For the Tier 1 evaluation step in which a large number of potential actions were screened, the Trustees limited the evaluation to the first four of these six criteria.

Table 5-1

Relationship between MSRP Evaluation Criteria and Evaluation Factors Listed in the Federal Natural Resource Damage Assessment Regulations (43 CFR Part 11)

MSRP Evaluation Criteria	Factors Listed under 43 CFR Section 11.82(d) Incorporated into Corresponding MSRP Criteria
<p>Nexus</p> <ul style="list-style-type: none"> • Nature of action • Location 	<p>Not listed</p>
<p>Feasibility</p> <ul style="list-style-type: none"> • Technical feasibility • Potential institutional or administrative barriers to an action’s implementation • Degree of ongoing operation and maintenance needed to ensure intended results 	<ul style="list-style-type: none"> • Technical feasibility • Consistency with relevant state, federal, or tribal policies and laws
<p>Resource Benefits</p> <ul style="list-style-type: none"> • Degree to which injured natural resource values and services are improved by the action • Degree to which benefits are measurable • Duration of benefits • Conservation status of resource(s) 	<ul style="list-style-type: none"> • Relationship of the expected costs of the proposed actions to the expected benefits from the restoration • Results of any planned or actual response actions • Natural recovery period • Ability of the resources to recover with or without alternative actions
<p>Ecosystem Benefits</p> <ul style="list-style-type: none"> • Degree to which action leads to sustainable improvements in broader ecological functions 	<ul style="list-style-type: none"> • Relationship of the expected costs of the proposed actions to the expected benefits from the restoration • Results of any planned or actual response actions • Natural recovery period • Ability of the resources to recover with or without alternative actions
<p>Environmental Acceptability</p> <ul style="list-style-type: none"> • Potential beneficial and adverse environmental effects 	<ul style="list-style-type: none"> • Potential human health and safety effects • Potential for additional injury resulting from the proposed action, including long-term and indirect impacts
<p>Cost</p> <ul style="list-style-type: none"> • Includes possible partnerships 	<ul style="list-style-type: none"> • Relationship of the expected costs of the proposed actions to the expected benefits from the restoration • Cost-effectiveness

The Trustees considered these an initial set of evaluation criteria for distinguishing the capabilities of the different potential actions to achieve the restoration objectives. The Trustees determined that the characteristics most important at the screening stage were the link between a potential restoration action and the injuries of the case (i.e., the nexus), feasibility, and potential benefits. The Trustees organized these characteristics into four specific Tier 1 evaluation criteria, which are described separately below.

Criterion 1: Nexus

Criterion 1 concerns the relationship between a potential action and the natural resource injuries and lost services of the Montrose case. The strength of a potential action's connection to the injuries of the Montrose case was evaluated by considering both the nature of the proposed action (i.e., whether it addresses injured resources or services that were lost) and the location of the proposed action.

To evaluate the nature of the proposed action, the Trustees evaluated the degree to which the fundamental objective of a potential action focuses on restoring one or more of the natural resources and services identified for restoration in the final Montrose case consent decree, which states: "The Trustees will use the damages for restoration of injured natural resources, including bald eagles, peregrine falcons, and other marine birds, fish and the habitats upon which they depend, as well as providing for implementation of restoration projects intended to compensate the public for lost use of natural resources" (United States v. Montrose, No. CV 90-3122-R [C.D. Cal 2001]).

The Trustees also considered the location of a potential action. Locations that provide benefits in proximity to where specific natural resource injuries and service losses are occurring or have occurred (i.e., in the Southern California Bight [SCB]) were given highest consideration. This consideration did not always equate to actions proposed at the immediate sites of injury, as contamination is still at issue, but after considering the limitations of ongoing contamination, greater value was placed on projects that are as close as feasible to sites of the original injury/lost services.

For the nexus criterion, the seabird category presented a special situation. A large number of potential actions benefit one or more species of seabirds, and specific evidence of injuries from DDTs and PCBs varies from species to species. For this reason, the Trustees adopted an evaluation approach for the seabird category that considers evidence of injury for each seabird species in addition to the nature of the proposed action and its location.

After consideration of the foraging ecology of seabirds in the SCB, the Trustee Council concluded that it was likely that most, if not all, species of seabirds using the SCB had been exposed to DDTs or PCBs. Across different species, this exposure either caused documented evidence of adverse injury (specifically, eggshell thinning), documented elevated DDT levels in eggs, or the injury was unknown. Severe eggshell thinning is documented when mean eggshell thickness is determined to be at least 15 percent reduced when compared to the thickness observed in pre-1947 museum specimens. The seabird species in the SCB for which there was evidence of severe eggshell thinning (as defined above) are the double-crested cormorant, Brandt's cormorant, the California brown pelican, and the western gull (Kiff 1994). A study in 1992 demonstrated that even though seabird populations in the SCB were not experiencing continued severe eggshell thinning (with the exception of the double-crested cormorant),

individual eggs of the ashy storm-petrel, western gull, and Cassin's auklet were measuring greater than 15 percent thinner than pre-1947 values (Kiff 1994). The 1992 study also found highly significant differences in mean eggshell thickness ($p < 0.01$) compared to pre-1947 values for the double-crested cormorant, the ashy-storm petrel, Cassin's auklet, and the western gull, as well as significant differences ($p < 0.05$) in mean eggshell thickness for the pelagic cormorant.

The Trustees also considered information regarding elevated DDT levels in seabird eggs in the SCB compared to eggs of the same or closely related species at distant colonies along the Pacific coast. Fry (1994) reported that total DDT egg residues were significantly elevated in the SCB colonies compared to other colonies for the following species: the western gull, the double-crested cormorant, the pigeon guillemot, and the ashy storm-petrel. Xantus's murrelets were also documented as having elevated residues of DDTs in their eggs on Santa Barbara Island (Fry 1994).

The Trustees assigned nexus ratings to different seabird species of the SCB after considering the above information regarding eggshell thinning and DDT levels in seabird eggs. A high nexus rating was given for those projects targeting species with severe or significant eggshell thinning and/or for which DDT egg residues were significantly elevated in the SCB colonies. Consequently, the following seabirds received a high nexus and are considered priority species for restoration: the double-crested cormorant, Brandt's cormorant, the California brown pelican, the western gull, the ashy-storm petrel, Cassin's auklet, the pelagic cormorant, and the pigeon guillemot. The Trustees assigned a moderate rating to projects aimed at a species whose eggs did not show severe or significant eggshell thinning but had elevated levels of DDTs in eggs (e.g., Xantus's murrelet). The Trustees gave the lowest ratings to projects directed at species that were likely exposed but for which no known evidence existed of severe or significant eggshell thinning or elevated levels of DDTs.

In addition to eggshell thinning and DDT data, the Trustees also considered the conservation status of a seabird species when determining priority seabirds for restoration. For example, the California brown pelican and Xantus's murrelet are considered priority species for restoration based on their endangered and threatened status, respectively.

Criterion 2: Feasibility

Criterion 2 concerns the likelihood that the benefits associated with potential actions will be achieved in actuality. The feasibility of a potential action refers to a number of considerations relating to the likelihood that the action will be completed and will produce its intended results. For this criterion, the Trustees considered three sub-factors:

- An action's technical feasibility (i.e., the practical question of an action's ability to be built and/or implemented as envisioned)
- Potential barriers to an action's implementation (e.g., regulatory hurdles or public acceptance)
- The degree of ongoing operation and maintenance needed to ensure that the action continues to produce the intended results

Criterion 3: Resource Benefits

Criterion 3 concerns the benefits of a potential action to specific injured natural resources/lost services. Specifically, the Trustees considered how effective each action would be in restoring the specific injured natural resources and lost services at issue in the Montrose case. For the purposes of Tier 1, evaluation of the Criterion 3 was isolated from considerations of feasibility or cost and included consideration of four sub-factors:

- The degree to which injured natural resource values and services are improved by the action
- The degree to which benefits are measurable
- The duration of the benefits
- The conservation status of the resource(s) receiving benefits

Criterion 4: Ecosystem Benefits

Criterion 4 concerns the degree to which a potential action leads to sustainable improvements in broader ecological functions. By design, some actions are narrowly focused on benefiting a particular resource (e.g., fish stock enhancement or fishing access improvements are intended specifically to benefit specific fishing services and not to have broader benefits on fish habitat). Under this criterion, the Trustees gave a higher rating to actions that not only benefit a targeted resource but also benefit multiple species or resources or employ an ecosystem approach to restoring resources and services.

5.1.2 Process for Applying the Criteria within Each Restoration Category

In the Tier 1 evaluation, each restoration idea was evaluated only in relation to the other ideas within the same category, as it is the Trustees intent to carry forward several ideas from all of the categories to maintain a diverse set of alternative actions. Thus, a peregrine falcon project was evaluated against other peregrine falcon projects, but not against bald eagle, seabird, or fishing projects.

Once all the restoration ideas within each category were evaluated, the ideas and their ratings were arranged in an ordered list, with those considered most promising at the top of the list. Tier 1 was not simply a pass/no pass evaluation; sometimes the most promising elements of two or more ideas were combined into a single stronger action. The following sections describe the specific considerations and results of the Tier 1 evaluation by category.

5.2 TIER 1 EVALUATION OF FISHING AND FISH HABITAT RESTORATION IDEAS

There were 21 wide-ranging restoration ideas evaluated within the fishing and fish habitat category. Many of them represented variations on common themes, and as a result the Trustees found it useful to organize and consolidate restoration ideas according to five common themes: habitat manipulation, stock enhancement, public access, marine protected areas, and public outreach and education.

5.2.1 Fish Habitat Manipulations

Habitat manipulations encompass three sub-themes or approaches, each of which arises from several individual project ideas. The first approach involves some variation of artificial reef creation, the second approach involves kelp forest restoration, and the third approach involves restoring wetland habitats. Reef construction and kelp forest restoration are primarily directed toward changing habitats from open, sandy-bottom habitats that produce or attract soft-bottom feeding fishes, which generally contain higher concentrations of DDTs and PCBs, to hard-bottom and structured habitats that produce/attract fish species that forage in the water column or on reef-based food items and generally contain lower concentrations of these contaminants. Wetland restoration has more general aquatic habitat benefits that, if properly designed, include some general and less area- or site-specific improvements to fishing via the contribution of estuarine/wetland habitats to fish production.

In applying the Tier 1 criteria, the various artificial reef approaches rate high. Because fish, fish habitat, and the services that fish provide to anglers are integrally linked, the MSRP restoration objectives target not just improvements to fishing services but also to fish and the habitats on which they depend. Constructing artificial reefs in areas where fish consumption advisories exist for soft-bottom-feeding species but not for water-column-feeding species accomplishes both the fishing and the fish habitat objectives of the restoration. Thus, reef construction provides a habitat-based solution to increase the relative abundance of fish that provide maximal health benefits and pose minimal health risks in areas affected by advisories.

Relative to the predominant expanses of soft-bottom and other types of hard-bottom habitats in the Southern California marine environment, kelp forests are relatively rare, with an average total of approximately 88 square kilometers (34 square miles) of canopy coverage in the Southern California Bight, including the Northern and Southern Channel Islands (Murray and Bray 1993). This coverage constitutes approximately 0.1 percent of the 78,000-square-kilometer (30,116-square-mile) area of the SCB (Dailey et al. 1993). Increasing the extent of kelp beds along the Southern California coast would provide conditions that favor the production of water-column feeding fishes that are less likely to feed from contaminated benthic (sediment) communities and may therefore be less likely to accumulate contaminants. However, kelp forest rehabilitation by itself (i.e., out-planting of kelp and other algae species in the absence of other actions to create suitable substrate) is not viewed as a sustainable approach to restoring habitat in part because of the transient nature of kelp-forest canopies (Dayton et al. 1992). Thus, “stand-alone” approaches to expanding kelp beds (e.g., the out-planting of kelp) in the absence of other actions do not rate as high as artificial reef development approaches that incorporate into their design the promotion of natural recruitment of kelp. Nevertheless, the out-planting approach might be investigated at a later date as an add-on component to artificial reef development should it be found that such out-planting methods accelerate the creation of self-sustaining kelp communities.

The restoration of full tidal exchange wetland and estuarine habitats has broad ecological benefits including benefits to several species of marine fish. However, based on analysis of factors influencing marine fish production at local and regional scales, the Trustees estimate that creation of artificial reefs at sites where consumption advisories are in place would have more direct, measurable benefits to the specific lost fishing services of the case. Although wetlands and estuaries are clearly important habitats for some fishes, the link between production of fish by newly restored estuarine habitats and changes in fishing services for the anglers that are most

affected by fishing advisories is difficult to establish (Appendix A3). However, contributing to wetland restoration may be viewed as fulfilling the MSRP fish habitat objective by increasing the amount and quality of what is currently an important but limited aquatic habitat in the region. Furthermore, this approach could be directed to specifically benefit popular sport fish species known to depend on coastal estuarine habitat at critical life stages (e.g., California halibut) and species that are at particularly low population levels (e.g., spotted sand bass). For this reason, wetland restoration was carried forward into detailed Tier 2 evaluation.

5.2.2 Stock Enhancement

Stock enhancement ideas for restoring fishing services (ideas 7, 8, and 15 in Table 5-2) include two approaches. One is a “put-and-take” approach, whereby fish are cultured until they reach a legal or nearly-legal size and then are released in marine waters near fishing locations where fish consumption advisories are in place. In theory, these fish would be much lower in contaminants and would be caught instead of existing fish that are contaminated (the released fish could be tagged so the angler would know which fish were safe to eat). Although the put-and-take approach has some positive features, its sustainability is limited because of its high and long-term operational and maintenance costs. For this reason, restoration ideas involving this put and take form of stock enhancement were not carried forward to the Tier 2 evaluation.

A second stock enhancement approach is to use captivity-reared fish to re-build populations of fish that have reached critically low levels of abundance or to increase the availability of popular sport fish that are typically lower in contamination. The effectiveness of this approach for marine species is uncertain, though there may be some potential for successful stock enhancement of some estuarine-dependent species (e.g., the California halibut or the spotted sand bass).

When considered as isolated projects, the hatchery-based approaches to restoration did not rate as high as other approaches for fulfilling the MSRP restoration objectives and were not carried forward to Tier 2.

5.2.3 Fishing Access Improvements

Several restoration ideas in this category proposed improving fishing services by creating or improving public access to fishing sites where anglers are likely to catch fish lower in contaminants (see ideas 5 and 14 in Table 5-2). These improvements could entail building new or extending existing fishing structures, operating fishing barges, and other similar approaches.

When evaluated apart from fish habitat improvement projects, fishing access projects only partially fulfill the restoration objectives of the case and thus are not rated high overall. Developing fishing access in association with the creation of artificial reefs links fishery improvements to anglers and thus is more highly rated. For this reason, stand-alone fishing access improvement projects were not carried forward to the detailed Tier 2 evaluation; however, fishing access improvements have been incorporated as potential design components to enhance the public benefits of artificial reef creation projects in the Tier 2 evaluation.

5.2.4 Marine Protected Areas

Marine Protected Areas (MPAs) are sections of the ocean set aside for various conservation, restoration, recreational, and fisheries management purposes. The MPA concept spans a broad

range of management options, from designation of ecological preserves to the application of limited fishing or biota collection restrictions. MPAs may, among other things, help rebuild depleted fisheries and improve fish catch outside of their boundaries, thus enhancing fishing services.

Two fishing restoration ideas proposed for MSRP funding suggested the use of MPAs as a means of restoring both fishing and fish habitats. One idea is that the Trustees contribute funds to support a more comprehensive implementation (i.e., monitoring, public education, and enforcement) of the newly established Channel Island MPAs. The other idea is for the Trustees to pursue, in partnership with other appropriate entities, the future establishment of MPAs in closer proximity to the areas affected by the contaminants of the Montrose case (i.e., closer to the Palos Verdes Shelf).

Of the two specific MPA ideas, only the idea of providing implementation support to the existing Channel Islands MPAs was carried forward for detailed Tier 2 evaluation. Because these MPAs already exist this proposal is readily achievable, and strengthening the management and evaluation of the Channel Island MPAs would contribute to MSRP goals by clarifying the “spillover” benefits of MPAs to fishing and fish stocks outside their boundaries, which may ultimately benefit fishing services throughout California. The idea of creating new MPAs in the Palos Verdes Shelf region did not receive a high feasibility rating, as the Trustees consider the likelihood of successfully implementing new MPAs to be uncertain at this time. This idea was not carried forward to Tier 2.

5.2.5 Public Outreach and Education on Fishing

Public outreach and education activities are key components of MSRP restoration activities on a number of levels (see Section 5.4.1). Under the category of fishing and fish habitat restoration, public outreach and education activities were proposed as a specific approach to restoring lost natural resource services by providing information to people that allows them to make knowledgeable choices about where to fish, what to fish for, and how to prepare fish for consumption. Because contamination levels are not uniform but vary by location and species of fish, adequate fish contamination data would make it possible to identify and promote optimal fishing services and thus increase public use and enjoyment of fish services. This type of activity would transcend current outreach efforts, which focus on warning the public about where they should avoid fishing or which fish they should avoid catching and eating.

Although a public information program on fishing services would not provide any fish habitat benefits, the concept rated high enough with respect to nexus, feasibility, and resource benefits to be brought forward to the Tier 2 evaluation.

5.2.6 Other Fishing and Fish Habitat Ideas

Several other ideas evaluated in Tier 1 did not rate as high overall as the four combined ideas that have been carried forward to Tier 2. Each of these ideas is discussed briefly below.

- **Convert decommissioned oil platforms to artificial reefs.** This idea did not rate high enough to be brought forward to Tier 2 because of regulatory feasibility issues and its appropriateness for MSRP implementation. This idea calls for modifying existing permit requirements to allow decommissioned oil platforms to remain in place; however, there

would be no need for MSRP funding given that the decommissioning is the responsibility of platform owners/operators. Also, the locations of these platforms would not make fishing readily accessible to shore-based anglers. Finally, there is a potential that chemical contaminants in shell mounds (formed over time under platforms as encrusting invertebrates fall from the platform support surfaces and accumulate on the bottom) may need to be addressed.

- **Restoring overgrazed seashore in Abalone Cove.** This idea did not rate high in the areas of technical and regulatory feasibility. The culturing and out-planting techniques suggested raised technical practicability issues and long-term sustainability is uncertain.
- **Provide transportation for anglers to areas with “clean” fish.** This idea raised operational and regulatory feasibility issues (e.g. concern that such a program could be sustained financially and whether local communities would object to out fluxes/in fluxes of anglers) as well as concerns that benefits to anglers would likely be short-term and highly dependent on many use and preference factors beyond the control of the program.
- **Restore white abalone.** This idea did not have a strong nexus to the injuries of the case.
- **Clean up Consolidated Slip.** This idea did not meet the requirements of the final Montrose consent decree, which prohibits use of settlement funds for response actions in the “onshore areas,” which the U.S. Environmental Protection Agency and the State of California continue to pursue.
- **Create a 50-acre wetlands and wildlife preserve within the Consolidated Slip.** This idea did not rate high overall, principally on technical feasibility grounds (creating wetlands out of uplands). In addition, the nexus to the injuries of the case was moderate since higher, intertidal type of wetlands would not likely function as good habitat for the species of fish, such as California halibut, commonly caught by marine anglers.
- **White croaker commercial market certification program.** This idea did not rate high in the areas of operational feasibility and ecosystem benefits. The feasibility issues that such a program would present include having a verifiable system to ensure the integrity of the certification that white croaker for sale are in fact clean.

The results of the Tier 1 evaluation of fishing and fish habitat restoration ideas are presented in Table 5-2. Several separately listed ideas pertaining to reefs, kelp, and fishing access were combined into a single concept for the purposes of Tier 2 evaluation.

**Table 5-2
List of Ideas to Restore Fishing and Fish Habitats**

Idea No.	Fishing and Fish Habitat Restoration Ideas	Pass to Tier 2?
1	Construct artificial reefs and fishing access improvements	Yes
2	Provide public information to restore lost fishing services	Yes
3	Restore full tidal exchange wetlands (several potential locations)	Yes
4	Augment funds for implementing Marine Protected Areas in California	Yes
5	Operate fishing barge(s) over existing or constructed reef(s)	Merge concept with #1
6	Create protected shallow water habitat in existing harbor areas	No
7	Supplement near-shore fisheries in areas affected by the contaminants of the case with clean, hatchery-raised fish	No
8	Spotted sand bass hatchery program	No
9	Restore depleted kelp beds of Malibu and Palos Verdes	Merge concept with #1
10	Convert decommissioned oil platforms to artificial reefs	No
11	Establish new Marine Protected Areas within the Palos Verdes Shelf region	No
12	Restore overgrazed seashore in Abalone Cove	No
13	Provide transportation for anglers to areas with “clean” fish	No
14	Improve public amenities and fishing access at Marina del Rey, White Point Beach, Point Vicente, and Point Fermin	Merge concept with #1
15	Giant sea bass hatchery program	No
16	Restore white abalone	No
17	Restore algae (kelp) on Palos Verdes coast	Merge concept with #1
18	Protect and restore Ormond Beach wetlands	Merge concept with #3
19	Clean up Consolidated Slip	No
20	Restore/create 50-acre wetlands and wildlife preserve within the Consolidated Slip of Los Angeles Harbor	No
21	White croaker commercial market certification program	No

5.3 TIER 1 EVALUATION OF BIRD RESTORATION IDEAS

Three categories of bird resources were considered separately for the purposes of this Restoration Plan: bald eagles, peregrine falcons, and seabirds.

5.3.1 Bald Eagles

The Trustees are funding two ongoing studies for bald eagles in the SCB (see Section 4.2.1). The outcomes of the studies will influence the ultimate selection of bald eagle restoration actions within this Restoration Plan. Nevertheless, the Trustees were able to refine some of the initial restoration options through Tier 1 evaluation, irrespective of future study results. These results are presented below.

All of the restoration ideas for bald eagles fell into three main concepts: (1) restoring bald eagles to the Northern Channel Islands, (2) restoring bald eagles to Santa Catalina Island, and (3) restoring bald eagles to the mainland.

- Restoring bald eagles to the Northern Channel Islands. In 2002, the Trustees initiated a multi-year study to investigate the feasibility of re-establishing bald eagles on the Northern Channel Islands. This study, described in an Environmental Assessment released by the Trustees (MSRP 2002), seeks to determine whether current levels of DDTs in the marine environment surrounding the Northern Channel Islands have declined sufficiently to allow a self-sustaining population of bald eagles to once again occupy this habitat. Because the young bald eagles hatched onto Santa Cruz Island under this study will not attain reproductive age for several years, the outcome of the study will not be known within the time frame of the development of this Restoration Plan. For this reason, the Trustees will continue to retain options in support of restoring bald eagles to the Northern Channel Islands, including maintaining a bald eagle captive breeding program and releasing additional eagles. These options were further explored within the context of the Tier 2 evaluation; however, final decisions on whether to implement additional actions will be made once the outcomes of the Northern Channel Islands (NCI) Feasibility Study are known (in or around 2008). Once the Trustees decide on a specific course of action, they will document it and provide the public an opportunity for review and comment.
- Restoring bald eagles to Santa Catalina Island. This concept entails continuing and/or modifying the ongoing program to restore/maintain bald eagles on Santa Catalina Island in addition to completing the NCI Feasibility Study. This program was initiated in the early 1980s by the Institute for Wildlife Studies, the U.S. Fish and Wildlife Service, the California Department of Fish and Game, and other parties, independent of the governments' natural resource damage assessment case against the Montrose defendants. The MSRP began funding this effort after the settlement in 2001 as a data gap study (see Section 4.2.1). Although DDT discharges virtually ceased many years ago, exposure to the residual levels of DDTs still present in the environment have thus far prevented the Santa Catalina Island bald eagles from successfully reproducing without human intervention. Annual collection of eggs from the nests of Santa Catalina Island bald eagle pairs, artificial incubation of the eggs, and fostering of chicks back into the nests are required to maintain this population. In recent years, the Trustees have assumed full funding of this program to ensure that the option of maintaining a population of bald eagles on Santa Catalina Island received consideration

within this Restoration Plan. The current program and any additional options to restore this population were rated high enough to be brought forward to detailed analysis in the Tier 2 evaluation.

- Restoring bald eagles on the mainland. The third concept entails restoration of bald eagles at one or more sites on the mainland of Southern California and Baja California. The goal of this concept would be to promote and enhance breeding and wintering opportunities in general geographic proximity to, but not in the Channel Islands. This concept could include such actions as the enhancement of nesting and foraging habitat, protection of nest and roosting trees, and reintroduction of eagles into suitable, but unoccupied, habitat. Several specific ideas for this concept were proposed, including the reintroduction of eagles to the Baja California coastline and enhancement of foraging habitat at Ken Malloy Harbor Regional Park, located on the Palos Verdes Peninsula.

In the Tier 1 evaluation, the mainland bald eagle restoration concept did not rate as high as the Northern Channel Island and Santa Catalina Island concepts for nexus and resource benefits. Mainland restoration of bald eagles was not found to have a strong nexus to the Montrose case (as the bald eagle injuries occurred and continue to occur in the Channel Islands). Furthermore, because bald eagle populations on the mainland of California are already recovering from past decline (Jurek, pers. comm., 2004), and because intensive urbanization throughout the greater Los Angeles metropolitan region leaves suitable bald eagle breeding habitat extremely scarce, the potential benefits did not rate as high as the benefits associated with the other two concepts. Thus, the mainland bald eagle restoration concept was not carried forward to Tier 2 evaluation. The results of the Tier 1 evaluation of bald eagle restoration ideas are presented in Table 5-3. The two ideas brought forward to Tier 2 were further developed and renamed as described in Section 5.5, Section 6, and Appendix B.

Table 5-3
List of Ideas to Restore Bald Eagles

Idea No.	Bald Eagle Restoration Project Ideas	Pass to Tier 2?
1	Restore bald eagles to the Northern Channel Islands	Yes
2	Restore bald eagles to Santa Catalina Island	Yes
3	Restore bald eagles on the mainland	No

5.3.2 Peregrine Falcons

A total of five restoration ideas for peregrine falcons were analyzed within the Tier 1 evaluation. These ideas ranged from restoring peregrine falcons to the Southern Channel Islands to forming a management group to address peregrine falcon-related issues. The project ideas fell into the following five concepts: (1) restoration of peregrine falcons to the Southern Channel Islands, (2) restoration of peregrine falcons on the Baja California Pacific Islands, (3) acquisition and enhancement of peregrine falcon habitat on the Palos Verdes Peninsula, (4) creation of a peregrine falcon management group, and (5) enhancement of foraging habitat for peregrine falcons at Ken Malloy Harbor Regional Park.

The first concept involves the restoration of peregrine falcons to the Southern Channel Islands. It is estimated that historically up to 30 pairs of peregrine falcons nested on the Channel Islands

prior to 1945 (Hunt 1994). The first re-established pair of peregrine falcons was recorded in 1987 on San Miguel Island. Although peregrine falcons have resumed nesting on all the Northern Channel Islands, up until recently no nesting observations have been confirmed for peregrine falcons on the Southern Channel Islands, with the exception of Santa Barbara Island. To confirm the anecdotal accounts of the presence of breeding peregrine falcons on Santa Catalina Island, the Trustees funded a survey of the island in 2004 (PBRG 2004). The survey confirmed the presence of two pairs of peregrine falcons on Santa Catalina Island, although successful breeding was not observed. Coupled with observations of increasing numbers of peregrine falcons throughout the Channel Islands, the Trustees brought forward two different approaches for evaluation in Tier 2 for the restoration of peregrine falcons to the Channel Islands: implement active peregrine falcon restoration (Appendix C1) and monitor the recovery of peregrine falcons (Appendix C2).

The Trustee Council also brought forward the concept of restoring peregrine falcons populations on the Pacific islands off of Baja California, Mexico. By increasing the number of peregrine falcons on these islands, the recovery of this species on the Channel Islands may occur faster due to an increase in dispersing juveniles from the Baja California Pacific Islands. The Trustees further explored this concept within a Tier 2 evaluation (Appendix C3).

The concept of enhancing foraging habitat for peregrine falcons on the Southern California mainland (ideas 3 and 5 in Table 5-4) was not selected for Tier 2 evaluation. This decision was largely due to the successful recovery of peregrine falcons on the mainland. The Trustees received two specific restoration ideas for habitat enhancement on the Palos Verdes Peninsula; however, because peregrine falcons in this area are not limited by foraging habitat, the benefits associated with this concept are expected to be minimal.

The final concept of creating a management group to work on peregrine falcon issues was likewise not carried forward to the Tier 2 evaluation. Although the presence of such a group would be useful in coordinating regional issues, the creation of a management group would not result in on-the-ground restoration of peregrine falcons. This concept does not further the Trustees' goal of restoring the peregrine falcon population on the Channel Islands.

The results of the Tier 1 evaluation of peregrine falcon restoration ideas are presented in Table 5-4.

Table 5-4
List of Ideas to Restore Peregrine Falcons

Idea No.	Peregrine Falcon Restoration Project Ideas	Pass to Tier 2?
1	Restore peregrine falcons to the Channel Islands	Yes, divided into two actions: implement active restoration and monitor ongoing recovery
2	Restore peregrine falcons to the Baja California Pacific Islands	Yes
3	Acquire and enhance peregrine falcon habitat on the Palos Verdes Peninsula	No
4	Create a peregrine falcon management group	No

**Table 5-4
List of Ideas to Restore Peregrine Falcons**

Idea No.	Peregrine Falcon Restoration Project Ideas	Pass to Tier 2?
5	Enhance foraging habitat for peregrine falcons at Ken Malloy Harbor Regional Park	No

5.3.3 Seabirds

Eighteen restoration ideas receiving consideration fell within the category of seabird restoration. The Trustees evaluated these projects against the criteria and rating considerations identified in Section 5.1.

For the nexus criterion, the seabird category presented a special situation, given the large number of proposed actions that would benefit one particular species of seabird or group of similar seabirds. Not all seabirds proposed for restoration can be clearly shown to have been impacted by DDTs and/or PCBs. The Trustees concluded that they would consider injury evidence for seabirds species by species and rank higher those projects that benefit species having an injury associated with these contaminants (see Section 5.1.1).

The seabird projects that were carried forward to Tier 2 represented a diverse set of ideas to restore seabird populations in the SCB. The majority of the projects that were carried forward include some form of habitat restoration, creation, or enhancement that would provide benefits to multiple species. The highest-rated projects also demonstrated a high degree of feasibility and benefit, as demonstrated by similar projects that have been successfully carried out elsewhere.

Several other ideas evaluated in Tier 1 did not rate as high overall as the eight ideas that were carried forward to Tier 2. These other ideas are described briefly below.

- **Restore ashy storm-petrels to the Southeast Farallon Island.** This idea did not rate as high as other seabird projects primarily due to its location outside of the SCB. Although this project targets a priority species for restoration (the ashy storm-petrel), other projects targeting ashy storm-petrels within the SCB received higher ratings with respect to nexus.
- **Create mainland nesting habitat for colonial seabirds.** This idea did not pass Tier 1 due to a relatively weak nexus to the injuries of the case (see Section 5.1.1). Although the benefits of this idea were considered high for the target species, this idea did not rate high in the ecosystem benefits category because it focuses on certain colonial seabirds.
- **Create cormorant nesting platforms.** Although this idea rated high for nexus, benefits were not considered long term due to the necessary maintenance on such platforms. This idea also received a lower rating in the category of ecosystem benefits since it would be designed solely to attract nesting cormorants.
- **Fund a California brown pelican patrol/enforcement position.** This idea did not pass Tier 1 because the benefits were anticipated to last only as long as the project was in place, and would therefore not be self-sustaining. This idea also received a lower rating in the category of ecosystem benefits, as it would primarily target California brown pelicans.
- **Enhance nesting habitat for shearwaters in New Zealand.** This idea did not pass Tier 1 due to a relatively weak nexus and a location outside of the SCB (see Section 5.1.1).

- **Reintroduce tufted puffins to Prince Island.** This idea did not pass Tier 1 due to a combination of factors. This species received a lower nexus rating and is not considered a priority for restoration (see Section 5.1.1). This idea also received a lower rating in the category of ecosystem benefits, as it focuses on the reintroduction of a single species.
- **Purchase Bird Rock off of Santa Catalina Island.** This idea did not pass Tier 1 because its benefits to the priority seabirds and ecosystem are expected to be low. Given its proximity to Santa Catalina Island, seabirds on the 1.3-acre Bird Rock receive a high level of disturbance from human activity (e.g., from kayakers and boaters). It is also highly unlikely that Bird Rock would be developed in the future; therefore, purchase of the Rock would not provide substantial long-term benefits to seabirds.
- **Create a Geographic Information System (GIS) atlas of California brown pelican roost sites.** Although this project targets a priority seabird, the atlas would cover areas outside of the SCB, as a similar atlas is currently being created for Southern California. Because this idea would target areas outside of the SCB, it received a relatively low nexus rating. The benefits of this atlas are expected to be lower than on-the-ground restoration projects for California brown pelicans because it would largely be a planning tool for events such as oil spills and would need to be updated on a periodic basis. This idea also received a lower rating in the category of ecosystem benefits, as it focuses only on the roosting locations of California brown pelicans.
- **Enhance nesting habitat for grebes and loons in Northern California.** This idea proposes to reduce human disturbance at nesting locations. This idea did not pass Tier 1 due to a relatively weak nexus (see Section 5.1.1). Also, implementation of this idea would occur outside of the SCB. In addition, this idea received a lower rating in the category of ecosystem benefits, as it focuses on reducing human disturbance at particular nesting colonies.
- **Attract common murrelets to Prince Island.** This idea did not pass Tier 1 due to a relatively weak nexus (see Section 5.1.1). Common murrelets do not currently breed in the target area, and the feasibility of the idea is uncertain. This idea also received a lower rating in the category of ecosystem benefits, as it focuses on the restoration of one species.
- **Attract California brown pelicans to Prince Island and Scorpion Rock.** This idea was evaluated separately for the two locations. Although the nexus rated high for both locations, the benefits of the idea received a low rating. California brown pelicans are currently not limited by available breeding habitat on Anacapa and Santa Barbara Islands; therefore, no substantial benefits are anticipated from establishing breeding at these locations. This idea also received a lower rating in the category of ecosystem benefits, as it focuses on the restoration of one species.

The results of the Tier 1 evaluation of seabird restoration ideas are presented in Table 5-5.

Table 5-5
List of Ideas to Restore Seabirds

Idea No.	Seabird Restoration Project Ideas	Pass to Tier 2?
1	Restore seabirds to San Miguel Island	Yes
2	Restore alcids to Santa Barbara Island	Yes

**Table 5-5
List of Ideas to Restore Seabirds**

Idea No.	Seabird Restoration Project Ideas	Pass to Tier 2?
3	Restore seabirds to San Nicolas Island	Yes
4	Restore seabirds to Scorpion and Orizaba Rocks	Yes
5	Restore seabirds to Baja California Pacific Islands	Yes
6	Create/enhance/protect California brown pelican roost habitat	Yes
7	Implement an entanglement reduction and outreach program to protect seabird populations	Yes
8	Restore ashy storm-petrels to Anacapa Island	Yes
9	Restore ashy storm-petrels to the Southeast Farallon Island	No
10	Create mainland nesting habitat for colonial seabirds	No
11	Create cormorant nesting platforms	No
12	Fund a California brown pelican patrol/enforcement position	No
13	Enhance nesting habitat for shearwaters in New Zealand	No
14	Reintroduce the tufted puffin to Prince Island	No
15	Purchase Bird Rock off of Santa Catalina Island	No
16	Create a GIS atlas of California brown pelican roost sites	No
17	Enhance nesting habitat for grebes and loons in Northern California	No
18	Attract common murrelets to Prince Island	No
19	Attract California brown pelicans to Prince Island and Scorpion Rock	No

5.4 TIER 1 EVALUATION OF OUTREACH PROGRAMS AND RESEARCH PROPOSALS

5.4.1 Outreach Programs

Effective public communication and involvement is an integral element of the MSRP. Public outreach and education activities are a means for achieving several goals: ensuring transparency and public involvement in the planning and implementation of the restoration program; improving utilization of and thus increasing human use services provided by natural resources; and potentially benefiting natural resources themselves by modifying human actions that can cause injuries. For the purposes of this restoration plan, the Trustees are not classifying proposals for public outreach and education work as a separate natural resource restoration category. Instead, the Trustees are including outreach ideas submitted for consideration in developing a comprehensive and coordinated public outreach and education program that will ensure the accuracy and consistency of messages, establish effective partnerships with other programs sharing common goals, and support the restoration goals of the MSRP.

In response to solicitations for restoration ideas during the initial stages of restoration planning, the Trustees received several proposals that MSRP funds be used to support existing outreach and education programs that raise awareness of regional environmental issues and stewardship on a broader scale. These programs are listed in Table 5-6. To the extent that such programs may support MSRP restoration goals (e.g., through the development of educational materials specific

to the injuries and restoration of the Montrose case) or the utilization of facilities and staff in direct support of MSRP outreach goals, the programs are being retained for funding consideration. However, the Trustees are not evaluating such programs against specific projects that restore fishing and fish habitat, bald eagles, peregrine falcons, and seabirds. Rather, as the MSRP outreach program proceeds, these proposals will receive consideration as a means of implementing outreach objectives.

5.4.2 Research Proposals

The received several proposals that MSRP funds be used for scientific investigations designed to fill gaps in our current understanding of the pathways Trustees and exposures of biota to DDTs and PCBs in the SCB as well as gaps in our understanding of the conservation status and recovery of seabirds. These proposals are listed in Table 5-6.

One of the goals identified in this restoration plan is to conserve as much of the funding as possible for actual on-the-ground restoration. Although many important questions remain unanswered regarding the fate and effects of DDTs and PCBs in the marine ecosystem, the Trustees seek to limit expenditures on scientific investigations to those deemed essential to informed restoration decision-making, design, and implementation. Rather than passing these research proposals through tiered evaluation, the Trustees will retain them for consideration in a stepwise fashion as planning and decision-making proceed and specific data needs become apparent.

**Table 5-6
List of Public Outreach and Research Ideas**

Outreach Ideas	
1	Provide funds for the Channel Islands National Park/ Sanctuary educational programs
2	Provide funds for the Center for Marine Studies educational programs
3	Expand the existing educational program of the Marine Mammal Care Center
4	Develop interdisciplinary curriculum/activity guide for middle school grade levels
5	Provide funds for construction of an interpretive center at White Point Nature Preserve
Research Ideas	
1	Monitor DDT/PCB concentrations in peregrine falcons
2	Marine mammal monitoring/sampling program in the Los Angeles area
3	Enhancement of restoration efforts for birds through collection and assessment of pinniped carcasses
4	Seabird monitoring <ul style="list-style-type: none"> • Implement a comprehensive seabird monitoring program (contaminant concentrations, population, effectiveness of MPAs in protecting populations) • Expand monitoring of seabird populations at Northern Channel Islands • Augment seabird monitoring of Anacapa Restoration Program funded by the American Trader Restoration Council
5	Determine current DDT/PCB concentrations in seabird eggs within and adjacent to the SCB
6	Analysis of impacts to seabirds from chronic releases of DDT and PCBs into SCB
7	Increase scope and monitoring of brown pelican nesting area closures

5.5 TIER 2 EVALUATION

Seventeen actions were brought forward from the Tier 1 evaluation for detailed evaluation in Tier 2:

Fishing and Fish Habitat

- Construct artificial reefs and fishing access improvements
- Provide public information to restore lost fishing services
- Restore full tidal exchange wetlands (several potential locations)
- Augment funds for implementing Marine Protected Areas in California

Bald Eagles

- Complete the NCI Bald Eagle Feasibility Study before deciding on further restoration actions
- Complete the NCI Bald Eagle Feasibility Study; regardless of its outcome, continue funding Santa Catalina Island Bald Eagle Program

Peregrine Falcons

- Restore peregrine falcons to the Channel Islands
- Monitor the recovery of peregrine falcons on the Channel Islands
- Restore peregrine falcons to the Baja California Pacific Islands

Seabirds

- Restore seabirds to San Miguel Island
- Restore alcids to Santa Barbara Island
- Restore seabirds to San Nicolas Island
- Restore seabirds to Scorpion and Orizaba Rocks
- Restore seabirds to Baja California Pacific Islands
- Create/enhance/protect California brown pelican roost habitat
- Implement an entanglement reduction and outreach program to protect seabird populations
- Restore ashy storm-petrels to Anacapa Island

5.5.1 Tier 2 Criteria

For the Tier 2 evaluation, the Trustees expanded on the set of criteria used in Tier 1 to distinguish how well the different potential restoration actions achieve the restoration objectives. Four of the criteria for evaluating actions in the Tier 2 evaluation are identical to those used in the Tier 1 evaluation:

- **Criterion 1: Nexus** (relationship to the natural resource injuries and lost services of the Montrose case)
- **Criterion 2: Feasibility** (likelihood that potential benefits will be achieved in actuality)

- **Criterion 3: Resource benefits** (benefits to specific injured natural resources and lost services)
- **Criterion 4: Ecosystem benefits** (degree to which the actions lead to sustainable improvements to broader ecological functions)

Among these criteria, the Trustees consider the nexus and resource benefits to be of paramount importance.

In the Tier 2 evaluation the Trustees considered two additional factors:

- **Criterion 5: Environmental acceptability.** All of the restoration actions under consideration are intended to improve the natural and human environment. Nevertheless, there can be environmental trade-offs in any project and the National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), and other requirements mandate full consideration and disclosure of potential environmental consequences. Actions are evaluated to determine whether they have no significant impacts to the environment, have impacts that may be easily mitigated to non-significance, or are likely to result in significant impacts that require substantial mitigation commitments.
- **Criterion 6: Cost.** Cost estimates were developed for each action. If an action being evaluated is still conceptual (e.g., an artificial reef program) and is scalable, estimates of incremental components were developed. For the actions ultimately selected, the Trustees may pursue partnerships to increase the effectiveness of the projects and reduce their costs.

5.5.2 Results of the Tier 2 Evaluation

All of the actions evaluated individually in Tier 2 were found to satisfy the evaluation criteria and are considered reasonable approaches to restoration, though some are still conceptual and would require further evaluation and impact assessment on development of greater project specificity. The complete write-ups of the Tier 2 evaluations are lengthy and have been provided in Appendices A–D.

All 17 actions cannot be included within a single comprehensive restoration plan alternative, as some are mutually exclusive (e.g., the two bald eagle actions) and available funding is not sufficient to cover all the projects. The ultimate aim of this Restoration Plan is to identify alternative combinations of these individual actions and to select one alternative that optimizes restoration of natural resources and services within the constraints of available funds.

As a final step in developing this Restoration Plan, the Trustees assembled different combinations of the individual restoration actions from Tier 2 into comprehensive alternatives for comparison and analysis. In the next section, the 17 potential restoration actions are first summarized, and then the comprehensive alternatives assembled from different combinations of these actions are described.

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This section describes the 17 individual restoration actions that underwent detailed evaluation and National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) analysis. Because the full evaluations of all 17 actions are lengthy, only their summaries are provided here (Section 6.1); the complete write-ups have been placed into four appendices:

- Appendix A (Fishing and Fish Habitat Restoration Actions)
- Appendix B (Bald Eagle Restoration Actions)
- Appendix C (Peregrine Falcon Restoration Actions)
- Appendix D (Seabird Restoration Actions)

The reader is directed to these appendices for a more thorough discussion of each of the 17 restoration actions.

To facilitate review of this Restoration Plan, the Natural Resource Trustees for the Montrose case (Trustees) assembled different combinations of these individual restoration actions into two comprehensive restoration plan alternatives and a “no action” alternative that address the entire range of resources and services to be restored. These three alternatives are evaluated and compared in Section 6.2 to illustrate the trade-offs involved in emphasizing different restoration priorities. The alternatives consist of Alternative 1 (No Action), Alternative 2 (Preferred), and Alternative 3.

Section 7 presents the NEPA/CEQA analysis of potential environmental consequences, including the cumulative impact analysis and the other discussions mandated by NEPA/CEQA for the three alternatives.

6.1 SUMMARIES OF THE INDIVIDUAL ACTIONS THAT RECEIVED DETAILED EVALUATION

This section provides summaries of the 17 restoration actions resulting from the Tier 1 and Tier 2 evaluations. Ten of the restoration actions are of a sufficient level of detail and specificity that they will not need further NEPA/CEQA environmental review beyond this Restoration Plan. The remaining seven restoration actions are still under development and will require supplemental NEPA and/or CEQA documentation before implementation (Table 6-1).

The discussions of costs that accompany the descriptions of the restoration actions are not action-specific allotments of Montrose Settlements Restoration Program (MSRP) funding, as they do not reflect potential cost-sharing opportunities and do not factor in contingencies. Even without contingencies factored in, the sum of all of these individual cost estimates exceeds the available MSRP funding. The Trustees will fund \$25 million in restoration work during Phase 1 of implementation (years 2005–2010), allocated among actions that restore fishing and fish habitat, bald eagles, peregrine falcons, and seabirds. The Trustees will also pursue funding partnership opportunities where appropriate.

**Table 6-1
Restoration Actions for Which this Programmatic EIS/EIR
Constitutes Complete NEPA/CEQA Review**

Restoration Actions Evaluated in Tier 2	Actions for Which this Plan Represents the Complete NEPA/CEQA Analysis	Actions That Would Require Additional NEPA and/or CEQA Analysis if Pursued
Fishing and Fish Habitat		
Construct artificial reefs and fishing access improvements		✓
Provide public information to restore lost fishing services	✓	
Restore full tidal exchange wetlands		✓
Augment funds for implementing Marine Protected Areas in California	✓	
Bald Eagles		
Complete the NCI Bald Eagle Feasibility Study before deciding on further restoration actions		✓
Complete the NCI Bald Eagle Feasibility Study; regardless of its outcome, continue funding Santa Catalina Island Bald Eagle Program	✓	
Peregrine Falcons		
Restore peregrine falcons to the Channel Islands		✓
Monitor the recovery of peregrine falcons on the Channel Islands	✓	
Restore peregrine falcons to the Baja California Pacific Islands	✓	
Seabirds		
Restore seabirds to San Miguel Island		✓
Restore alcids to Santa Barbara Island	✓	
Restore seabirds to San Nicolas Island		✓
Restore seabirds to Scorpion and Orizaba Rocks	✓	
Restore seabirds to Baja California Pacific Islands	✓	
Create/enhance/protect California brown pelican roost habitat		✓
Implement an entanglement reduction and outreach program to protect seabird populations	✓	
Restore ashy storm-petrels to Anacapa Island	✓	

CEQA = California Environmental Quality Act

NCI = Northern Channel Island

EIR = Environmental Impact Report

NEPA = National Environmental Policy Act

EIS – Environmental Impact Statement

6.1.1 Fishing and Fish Habitat Restoration Actions

Construct Artificial Reefs and Fishing Access Improvements

Constructed reefs have often been employed as a means of recruiting and/or producing fish as mitigation for environmental impacts. An MSRP-constructed reef program would have the added specific objectives of recruiting and/or producing fish lower in DDTs and PCBs for anglers to

catch and displacing highly contaminated soft-bottom species from a fishing location (Figure 6-1). For this reason, the geographic placement of reefs will require that the predominant reef-dwelling species in the area not be limited or less limited by fish consumption advisories than the predominant soft-bottom species. Several critical design considerations will also guide the location and development of all restoration reefs (including degree of sediment contamination, existing fishing pressure and accessibility, suitability for kelp recruitment and establishment, and consideration of other human uses). Thus, in this Restoration Plan, constructed reefs and fishing access improvements are evaluated as a general action in Tier 2 rather than as a set of site-specific actions. This action will require supplemental analysis, siting, design, and public and environmental review prior to implementation.

A complementary part of this action will be to implement various fishing access improvements (e.g., improvements to piers) to facilitate and encourage fishing in the areas where habitat manipulation is performed. Together, reef construction and fishing access improvements can target fishing sites where the continued impact of contamination is greatest (i.e., where fish consumption advisories are in effect), measurably improve the opportunities for catching fish lower in contamination, and do so in a self-sustaining manner. Access improvements can also act as compensatory restoration for past losses in fishing opportunities resulting from fish consumption advisories by enhancing the quality of the fishing experience.

The costs of this action are scalable. That is, the more funds that are made available, the more reef and access improvements that can be implemented. Depending on reef size, whether and what type of fishing access improvements are included, and potential cost sharing with partners, the Trustees estimate potential costs of \$1 million to \$4 million per site, and propose an objective of constructing two to three reefs in the initial implementation phase of the Restoration Plan.

Additional information on this action can be found in Appendix A1.

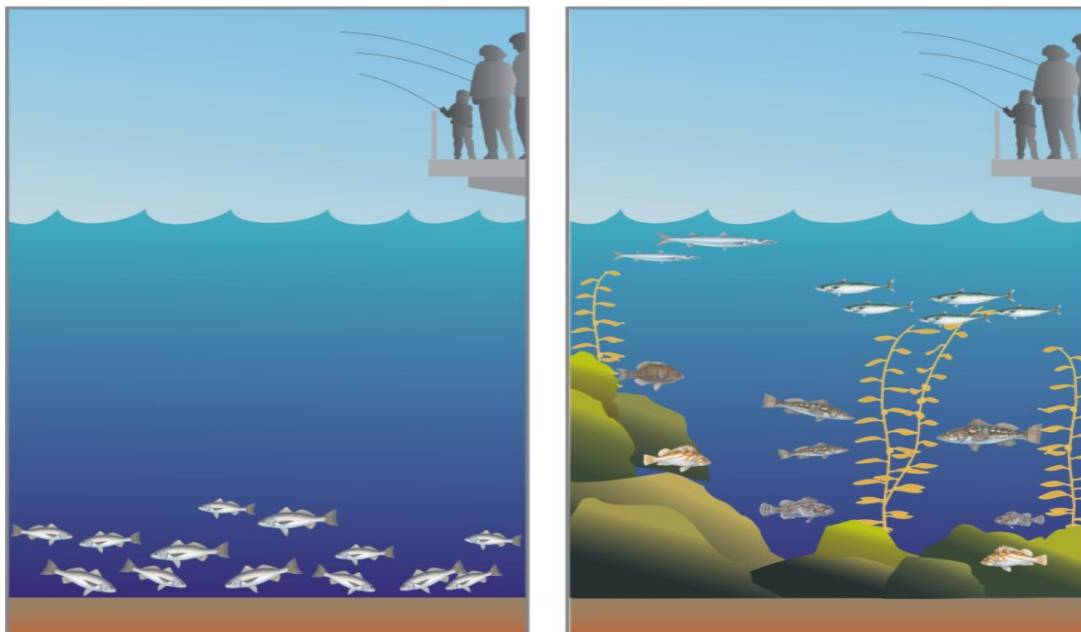


Figure 6-1. Changes in fish community structure with the placement of an artificial reef.

Provide Public Information to Restore Lost Fishing Services

The goal of this action is to build on the public outreach and education work initiated by the U.S. Environmental Protection Agency (EPA) through the establishment of the Fish Contamination Education Collaborative (FCEC). The FCEC is a federal, state, and local partnership project that addresses public exposure to contaminated fish in the Southern California coastal area. The FCEC focuses on educating the public about the human health hazards associated with DDT and PCB contamination in fish. In particular, the FCEC provides information to help people reduce their exposures to DDTs and PCBs from the fish they eat.

The Trustees will expand this ongoing effort to increase fishing services by providing information to anglers that allows them to make sound decisions about where and for which species to fish. The Trustees will also provide outreach materials that establish the link between the ecology and life history of a particular species and its tendency to bioaccumulate contaminants. This information will enable people to make knowledgeable choices about where, when, and for which species to fish and in doing so will minimize anglers' exposure to contaminants, regardless of where they fish. This action has a strong nexus to the ongoing loss of natural resource services caused by the contaminants of the case (which have led to the imposition of state fishing advisories and other limitations on the human use values of fish).

The costs of this action, which will include both public information work and periodic monitoring of fish to supplement the fish contamination survey currently being completed, are scalable. Clear opportunities exist to collaborate with the ongoing EPA-funded efforts to inform the public about fish contamination and safe fish preparation and consumption. This action will expand these efforts by focusing on the link between fish ecology and life history and the risks they impose on their consumers. In particular, the action will identify the fish species that are free of consumption advisories and the locations where anglers can catch them. Thus, this action would directly and effectively address the human use fishing losses associated with the Montrose case.

Additional information on this action can be found in Appendix A2.

Restore Full Tidal Exchange Wetlands

Wetlands restoration was evaluated as a general action that will require further planning and site selection. Because large-scale wetlands restoration is costly and numerous entities are involved in coastal wetlands restoration in the Southern California region, the presumption is that MSRP funds will be used to augment efforts at a specific larger-scale restoration project in the region. In particular, MSRP funding will be directed at habitat restoration that seeks to promote the production of commonly caught coastal fish species, such as the California halibut. Several wetland restoration sites in the region at different stages of planning and funding could serve this purpose.

The benefits from estuarine wetlands habitat restoration and improved fish catch services for anglers who fish in surrounding coastal areas are not as readily measurable or likely as substantial as the benefits from constructed reefs. However, the restoration of coastal estuarine wetlands contributes to the overall restoration of fish and their habitats, as identified in the Montrose consent decree. By including wetland restoration among the fishing and fish habitat actions, the Trustees will provide a more diverse method of addressing the ongoing injuries and

lost services and compensating for interim losses. It is also conceivable that fishing benefits could be derived from coastal wetlands restoration if they are designed to create new fishing sites.

The costs of this action are scaleable and proportional to the size and complexity of the action undertaken. Existing large-scale wetlands restoration work involving significant engineering (such as the work at Bolsa Chica in Orange County) can cost several tens of millions of dollars, not including land acquisition costs. Given the limits of MSRP funding, restoration funds will be best used to complement funding from other sources in achieving larger-scale habitat improvements. The specifics of the site and the nature of the wetlands restoration work will be guided by the MSRP goals and objectives for restoring fishing and fish habitat. The Trustees will inventory current coastal wetlands restoration planning efforts and funding gaps in Southern California and identify a project or projects where MSRP funds will help realize broad-scale accomplishments. Once a specific project is identified, further NEPA and/or CEQA analysis will be performed. Such analysis will likely be part of the broader documentation by the lead agency or agencies for the overall wetlands restoration effort to which MSRP funds will be contributed.

Additional information on this action can be found in Appendix A3.

Augment Funds for Implementing Marine Protected Areas in California

The goal of this action is to improve the fish habitat function in Southern California by augmenting funds needed to evaluate and implement Marine Protected Areas (MPAs) as part of an ecosystem-based management approach for fishery resources. The primary focus of this action will be to provide needed funds for implementation of the recently established Channel Islands network of MPAs to ensure that they provide the best possible basis for further implementations of MPA networks throughout California. Although this action will provide specific benefits to the fish habitats adjacent to the Northern Channel Islands, the action will also provide longer-term benefits for fishing and fish habitats throughout California by helping to generate sound empirical underpinnings for the site and design of future networks of MPAs. The recently established network of MPAs in the Channel Islands is currently the most appropriate area for such an effort because those MPAs were specifically designed to evaluate the utility of using MPAs as a management tool. If MPA networks are established along mainland coasts in the future, the Trustees will consider directing additional funds to their implementation and/or evaluation during the next phase of restoration, particularly if they are established in Southern California.

Through this action, MSRP funds will contribute to the goals of (1) ensuring that the MPAs function as intended (i.e., through effective public awareness and enforcement efforts) and (2) measuring the impacts (positive and negative) of MPAs on fishing services. The Trustees propose to contribute approximately \$500,000 toward these MPA efforts over five years to fill, in part, funding gaps identified by the implementing agencies. Depending on the findings of the monitoring efforts, the effective management of MPAs in the Northern Channel Islands may ultimately lead to the expanded use of this fisheries management tool throughout California, including the Palos Verdes Shelf region.

Additional information on this action can be found in Appendix A4.

6.1.2 Bald Eagle Restoration Actions

Bald eagle restoration throughout the Channel Islands presents a special situation because the bald eagles introduced to and currently nesting on Santa Catalina Island continue to exhibit reproductive injuries caused by ongoing exposures to DDTs and PCBs. Also, even though bald eagles historically inhabited most of the Channel Islands, we do not yet know if they would have greater success reproducing on islands other than Santa Catalina Island (none of the Santa Catalina Island bald eagles has established territories on any of the other Channel Islands). Thus, selecting restoration actions requires consideration of interrelated factors and depends ultimately on the outcome of the ongoing Northern Channel Islands (NCI) Bald Eagle Re-establishment Feasibility Study (referred to as the NCI Bald Eagle Feasibility Study). This section describes the two contrasting options for bald eagle restoration addressed in this plan.

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

Under this course of action, the Trustees will defer making longer-term decisions on bald eagle restoration until the NCI Bald Eagle Feasibility Study results are known (in or around 2008). Also, the Trustees will discontinue funding for the Santa Catalina Island Bald Eagle Program during the interim period until the results of the NCI Bald Eagle Feasibility Study are known. At that point, the Trustees will re-evaluate all potential options for bald eagle restoration, including actions that might be taken even if bald eagles are not able to reproduce on their own anywhere in the Channel Islands. The remaining bald eagle restoration funds could then be used on any of the Channel Islands. This action conserves limited restoration funds until sufficient information is known on the ability of the environments on the different Channel Islands to support bald eagles.

This course of action is modified from the one proposed in the draft Restoration Plan and programmatic EIS/EIR, which was released for public comment in April 2005. The modification is a result of the Trustees' consideration of the public comments received. In the draft Restoration Plan and programmatic EIS/EIR, the Trustees had proposed that the restoration of bald eagles proceed only if it was ultimately found that they are able to reproduce on their own in the Northern Channel Islands. If the results of the NCI Bald Eagle Feasibility Study indicated that there were no territories in the Channel Islands where bald eagles could reproduce unaided, the preferred course of action proposed in the draft Restoration Plan called for the bald eagle restoration efforts to cease and the remaining funds to be either set aside or used for seabird restoration.

The Trustees received diverse and opposing public comments on the advisability of bald eagle restoration given the continued observation of contaminant effects on Santa Catalina Island. However, predominantly the public comments expressed the desire to maintain the presence of bald eagles on the Channel Islands regardless of whether or not they can reproduce successfully on their own. After considering the public comments and the evaluation criteria for this Restoration Plan (particularly the preference that actions have long-term benefits and minimal ongoing operation and maintenance requirements), the Trustees modified the preferred action for bald eagles to provide for a re-examination of all options once the results of the NCI Bald Eagle Feasibility Study are known, rather than predetermining subsequent actions. The re-examination will be conducted with opportunity for public review and comment in a subsequent document.

The results of the NCI Bald Eagle Feasibility Study are expected to be known in or around 2008. If the results show that the birds released on Santa Cruz Island are able to fledge chicks without human intervention, the Trustees may continue releasing and monitoring bald eagles on Santa Cruz Island. The Trustees anticipate that if eagles can successfully reproduce on the Northern Channel Islands, then eagles will eventually repopulate the rest of the Channel Islands, including Santa Catalina Island. The general methods for additional hacking and monitoring would be the same as those outlined in the Feasibility Study for Reestablishment of Bald Eagles on the Northern Channel Islands (MSRP 2002).

In light of the continuing high levels of contamination in bald eagles on Santa Catalina Island, continued funding of the Santa Catalina Island Bald Eagle Program over the near term is unlikely to achieve the goal of long-term restoration of bald eagles to the Channel Islands. Thus, during the interim period until the NCI Bald Eagle Feasibility Study is completed, the Trustees have chosen to focus restoration efforts on the Northern Channel Islands, which continue to hold the potential for long-term restoration, and discontinue funding of the Santa Catalina Island Bald Eagle Program.

Even without continued Trustee funding for the current Santa Catalina Island Bald Eagle Program, 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. There are currently five active bald eagle nesting territories 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 the eagles 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 as many as 10 years or longer as some of the birds die and are not replaced by others or certain bald eagle pairs break their pair bonds and leave after several years of failing to produce chicks.

Thus, the Trustees anticipate that bald eagles will still inhabit several of the Channel Islands, including Santa Catalina Island, when the NCI Bald Eagle Feasibility Study results are known in or around 2008. If the results of the NCI Bald Eagle Feasibility Study indicate that bald eagles throughout the Channel Islands still experience reproductive impairment due to the persistence of DDTs and PCBs in their diets, the Trustees would explore various options for further bald eagle restoration on one or more of the Channel Islands, including Santa Catalina Island. Some options may not be as costly as the current egg manipulation and chick fostering work being conducted on Santa Catalina Island. For example, the Trustees could fund a monitoring and hacking program to maintain a non-breeding bald eagle presence on the Channel Islands (and thus maintain their human use and ecological services) for as long as funds remain available or until contaminant levels decline to a level that would support naturally reproducing eagles.

The Trustees will release a subsequent NEPA/CEQA document for public review and input once the results of the NCI Bald Eagle Feasibility Study are known. The document will be released between 2008 and 2010 and will outline the next steps for bald eagle restoration on the Channel Islands.

To fund this course of action, a total of \$6.2 million will be allocated for bald eagle restoration on the Channel Islands. This allocation would cover the costs of the Santa Catalina Island Bald

Eagle Program through 2005 (approximately \$1.2 million spent since 2001) and the ongoing NCI Bald Eagle Feasibility Study (approximately \$3.3 million). After funding these two efforts, the balance remaining would be approximately \$1–2 million. The Trustees will defer a decision on how to use these remaining funds until the results of the NCI Bald Eagle Feasibility Study are known. At that time, the Trustees will consider a range of restoration options and decide on the best course of action. Additional funds could be used on any of the Channel Islands.

Additional information on this course of action can be found in Appendix B.

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

This course of action would continue to maintain bald eagles on Santa Catalina Island through human intervention (e.g., egg manipulation, incubation, and chick fostering) for as long as funds remain available. Under this course of action, which is not an interim but a longer-term action, efforts to restore bald eagles to the Channel Islands would focus on the continuous maintenance of the Santa Catalina Island bald eagle program for as many years as funds are available, with the hope that eventually the Santa Catalina Island birds' exposures would decline to a level that would allow them to reproduce on their own. Maintenance of the bald eagles on Santa Catalina Island would be favored over efforts to repopulate the Northern Channel Islands due to the existing infrastructure and ongoing program on Santa Catalina Island. Under this course of action, financial support of the Santa Catalina Island program would continue after 2005. The NCI Bald Eagle Feasibility Study would also continue until its results were known.

Under this course of action, the Trustees propose to allocate a total of \$10 million for bald eagle restoration on the Channel Islands. Approximately \$4 million would be used through the end of the NCI Bald Eagle Feasibility Study (supporting both the NCI and Santa Catalina Island programs), leaving approximately \$6 million to place into a long-term endowment or other financial mechanism to support the continuation of the Santa Catalina Island Bald Eagle Program for as long as possible or until such time as the birds are able to reproduce successfully on their own. The \$6 million would fund approximately 22 years of restoration efforts on Santa Catalina Island if the average annual cost remains at approximately \$270,000. This estimate does not include any interest that may be generated.

Additional information on this course of action can be found in Appendix B.

6.1.3 Peregrine Falcon Restoration Actions

Restore Peregrine Falcons to the Channel Islands

The goal of this action is to accelerate the recovery of peregrine falcons to the Channel Islands. For the last several years, the number of peregrine falcon pairs has been steadily increasing on the islands, though recolonization on the Southern Channel Islands has been slower than on the Northern Channel Islands for reasons not yet fully understood. Because the majority of the known occupied territories in 2004 occurred on the Northern Channel Islands (18 of 21), this 5-year action would involve active restoration of peregrine falcons to the Southern Channel Islands through hacking techniques. Implementation of this action would consist of releasing 10 birds per year on Santa Catalina Island, for a total of 50 birds over a 5-year period. A

monitoring component would also be developed for this action. Should this action be selected, further action-specific NEPA and/or CEQA analysis would be prepared. A 5-year active restoration program for peregrine falcons on the Southern Channel Islands would cost an estimated \$603,000 plus the costs of additional monitoring.

Additional information on this action can be found in Appendix C1.

Monitor the Recovery of Peregrine Falcons on the Channel Islands

This action proposes to develop a comprehensive program to monitor the recovery of the peregrine falcon on the Channel Islands. This program would monitor the distribution, number of pairs, reproductive success (i.e., productivity), recruitment, foraging behavior, and dispersal of peregrine falcons on the Channel Islands. An essential part of this program would also include contaminant analysis of addled eggs and eggshell measurements, particularly in light of the lack of current data on levels of eggshell thinning and the potential ongoing effect of DDT contamination. The monitoring program would be designed such that data are comparable to previous studies on the Channel Islands (such as the study conducted in 1992). The scope of the monitoring program (including its frequency and intensity) would be developed in consultation with experts. The estimated cost for comprehensive monitoring to occur twice within Phase 1 of implementation is \$250,000.

Additional information on this action can be found in Appendix C2.

Restore Peregrine Falcons to the Baja California Pacific Islands

The goal of this 5-year action is to restore peregrine falcons on the Baja California Pacific Islands. Possible actions would include comprehensive surveys of the islands, efforts to reduce impacts from human disturbance, and habitat enhancement. Peregrine falcons have historically nested on the Baja California Pacific Islands but experienced a sharp decline similar to peregrine falcons nesting in the United States. Although peregrine falcons have resumed nesting on some Baja California Pacific Islands, the current status of this species on these islands is largely unknown. The estimated cost for this action over 5 years is \$547,000.

Additional information on this action can be found in Appendix C3.

6.1.4 Seabird Restoration Actions

Eight actions for restoring seabirds and their habitats were evaluated in detail. One of the eight actions, Restore Seabirds to Baja California Pacific Islands, was subdivided into four separate sets of actions addressing seabird restoration in four separate island groups.

Restore Seabirds to San Miguel Island

This action aims to restore seabird nesting habitat on San Miguel Island in the Channel Islands National Park by eradicating the introduced black rat (*Rattus rattus*) over a period of approximately 5 years. San Miguel Island and its associated islets, Prince Island and Castle Rock, support regionally important and diverse seabird colonies, including one-third of the breeding seabirds in the Channel Islands. Introduced rats are responsible for approximately 40 to 60 percent of all bird and reptile extinctions from islands and are known to have ecosystem-wide

impacts on California islands. Target bird species for restoration include burrow/crevice nesting seabirds such as the ashy storm-petrel, Cassin's auklet, and Xantus's murrelet, as well as other seabirds such as the western gull, Brandt's cormorant, and pigeon guillemot. Eggshell thinning and/or elevated levels of DDTs were documented in the eggs of all of these species in the Southern California Bight (Kiff 1994, Fry 1994).

Because of the presence of several endemic species on San Miguel Island, including the federally endangered island fox, this action will require substantial planning and the development of a comprehensive mitigation program. The National Park Service, with the assistance of the Trustees, will prepare a supplemental Environmental Impact Statement for this action that will undergo public review and comment. The supplemental document will detail the specific methodologies of the action, the expected benefits and impacts, and the proposed mitigation measures to reduce potential impacts. Estimated costs for this action are \$2.5 million to \$3 million.

Additional information on this action can be found in Appendix D1.

Restore Alcids to Santa Barbara Island

The goal of this action is to re-establish, over a period of 5 years, a once-active Cassin's auklet breeding population on Santa Barbara Island that was decimated by cats brought to the island in the late 1800s. Efforts to re-establish this colony will include using social facilitation methods (e.g., vocalization playback systems to attract other individuals), installing nest boxes, and improving habitat through the removal of non-native vegetation from historical nesting areas and revegetation with native plants. The state-threatened Xantus's murrelet will also be targeted for restoration on the island. Santa Barbara Island is home to the largest colony of Xantus's murrelets in California despite a documented population decline over the last 20 years. Because some Xantus's murrelet nest sites have been lost due to reduction in shrub cover on the island, this action will provide secure nesting area for this species. The main objectives of this habitat restoration effort will be to benefit Cassin's auklets and Xantus's murrelets by: (1) increasing recruitment, (2) increasing reproductive output, and (3) decreasing egg and chick mortality by providing safe breeding habitat. Eggshell thinning and/or elevated levels of DDTs were documented in the eggs of both of these species in the Southern California Bight (Kiff 1994, Fry 1994). The estimated cost of this action is \$602,000.

Additional information on this action can be found in Appendix D2.

Restore Seabirds to San Nicolas Island

The goal of this action is to restore western gull and Brandt's cormorant colonies on the U.S. Navy-owned San Nicolas Island by eradicating feral cats over a period of approximately 4 years. Eggshell thinning and/or elevated levels of DDTs were documented in the eggs of both of these species in the Southern California Bight (Kiff 1994, Fry 1994).

Introduced predators, particularly feral cats and rats, are one of the greatest threats to seabird populations on islands. Feral cats are directly responsible for a number of extinctions and extirpations on islands across multiple taxa. The U.S. Navy has funded limited cat removal on San Nicolas Island in the past to protect endangered species and sensitive seabird colonies. This action will include expanding these efforts with the goal of eradicating cats from the island.

The successful eradication of cats from the island would result in increases in the currently reduced western gull and Brandt's cormorant colonies on the island. In addition to seabirds, San Nicolas Island supports a large number of endemic species, including at least 20 plant species, 25 invertebrates, one reptile, three birds, and two mammals. Collateral benefits to the island ecosystem are anticipated from the cat removal. The estimated cost of this restoration action is \$1.8 million.

Additional information on this action can be found in Appendix D3.

Restore Seabirds to Scorpion and Orizaba Rocks

The goal of this 5-year effort on Scorpion and Orizaba Rocks (off Santa Cruz Island) is to restore seabird habitat through the removal of non-native vegetation, the installation of artificial nesting boxes, and reductions in human disturbance. This action will directly benefit the following nesting or roosting species: Cassin's auklet, ashy storm-petrel, Xantus's murrelet, California brown pelican, and double-crested cormorant. Eggshell thinning and/or elevated levels of DDTs were documented in the eggs of these species in the Southern California Bight (Kiff 1994, Fry 1994). This action will also directly benefit rhinoceros auklets.

This action will involve the elimination of invasive plants (e.g., ice plant) and the restoration of native plants such as tree sunflower, buckwheat, and purple needlegrass. Nest boxes will be installed to provide a stable and secure nesting area for Cassin's auklets, Xantus's murrelets, and ashy storm-petrels. Disturbance reduction efforts will be implemented to protect nesting and roosting seabirds from human disturbance. Signs will be deployed around the rocks and at the visitor center on Santa Cruz Island informing the public about the nesting seabirds and the closure of the rock. The estimated cost of this restoration action is \$326,000.

Additional information on this action can be found in Appendix D4.

Restore Seabirds to Baja California Pacific Islands

The Baja California Pacific Islands in Mexico support 17 species and 8 subspecies of breeding seabirds, 10 of which also breed on the California Channel Islands. These birds range freely across the U.S./Mexico border. Of these 10 shared species or subspecies, 5 have special status listings in the United States as endangered species, threatened species, or species of special concern. Restoration efforts would target 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. Nine of the ten islands identified in Figure 6-2 are being considered for seabird restoration, as described below.

Additional information on these actions can be found in Appendix D5.

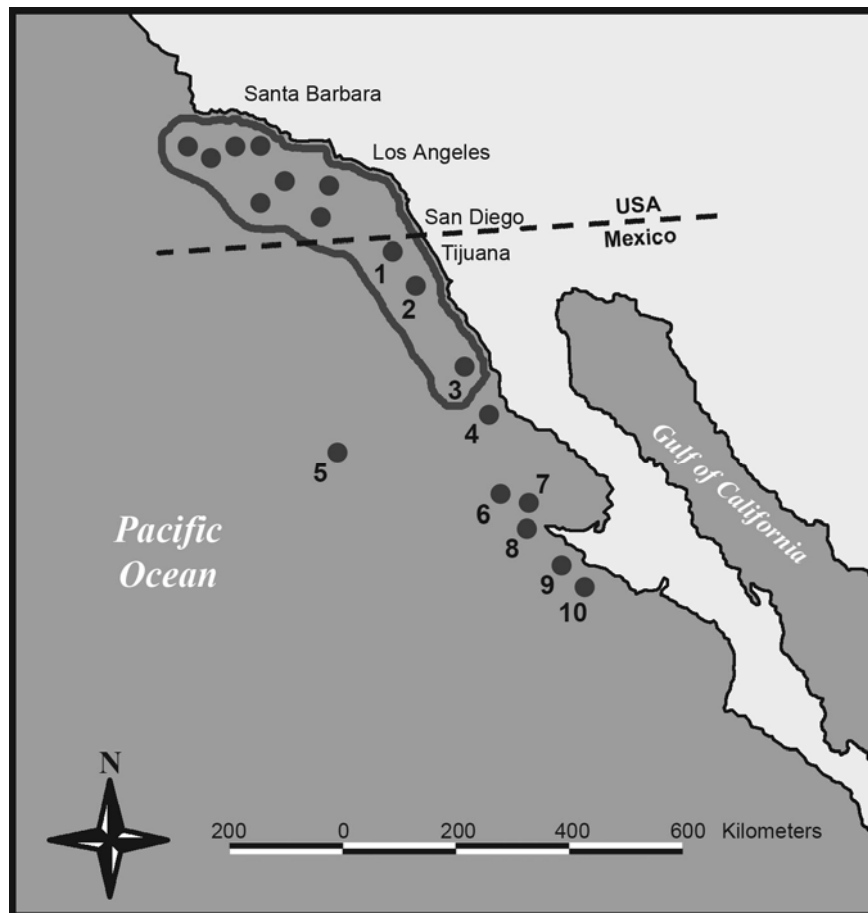


Figure 6-2. Baja California Pacific Islands.

Identification of Islands: (1) Coronado (2) Todos Santos (3) San Martín (4) San Jeronimo (5) Guadalupe (6) San Benito (7) Cedros (8) Natividad (9) San Roque (10) Asunción. The solid line indicates the islands located within the Southern California Bight.

Coronado and Todos Santos Islands

The goal of this action is to restore seabird populations on Coronado and Todos Santos Islands. These islands are oceanographically considered part of the Southern California Bight. To maximize restoration efforts on these islands, which are in close proximity to each other, a combined 5-year restoration action is proposed. Restoration actions will include using social attraction techniques (including decoys and vocalizations), improving nesting opportunities with artificial nests, shielding lights, and reducing human disturbance. The target species for restoration on these islands are Brandt's cormorants, double-crested cormorants, California brown pelicans, western gulls, Cassin's auklets, ashly storm-petrels, and Xantus's murrelets. Eggshell thinning and/or elevated levels of DDTs were documented in the eggs of these species in the Southern California Bight (Kiff 1994, Fry 1994). This action will also directly benefit pelagic cormorants and black storm-petrels.

Recent eradication efforts have been undertaken on Coronado and Todos Santos Islands to remove non-native fauna and restore the island ecosystem. The success of these efforts provides a unique opportunity to facilitate seabird recolonization and recovery on these islands. The estimated cost of this restoration action is approximately \$1 million.

Guadalupe Island

The goal of this 4-year action is to eradicate feral cats and restore seabird populations on Guadalupe Island. This action will target a suite of seabirds, including Cassin's auklet, Brandt's cormorant, Xantus's murrelet, and western gull. Eggshell thinning and/or elevated levels of DDTs were documented in the eggs of these species in the Southern California Bight (Kiff 1994, Fry 1994). Although outside of the Southern California Bight, Guadalupe Island is biogeographically affiliated with coastal Southern California and a part of the critically endangered California coastal sage and chaparral ecoregion. World renowned for its high level of biodiversity, Guadalupe Island supports 34 endemic plants, 2 endemic subspecies of seabirds, 10 endemic land birds, 11 endemic land snails, and at least 18 endemic insects.

Feral cats are a significant threat to seabird populations on Guadalupe Island. Introduced prior to 1880, cats are responsible for the likely extinction of the endemic Guadalupe storm-petrel and the likely extirpation of many other seabird populations from the main island of Guadalupe. Proven techniques used worldwide in recent cat removal programs will be employed in this action. This effort will have both immediate and permanent conservation benefits for seabirds that use the Southern California Bight as well as for the unique ecosystem of Guadalupe Island. The estimated cost of this restoration action is approximately \$1.1 million.

San Jeronimo and San Martín Islands

The goal of this 5-year action is to enhance the recovery of seabird colonies following the removal of introduced species on San Jeronimo and San Martín Islands. San Martín Island is oceanographically considered part of the Southern California Bight, whereas San Jeronimo Island is just south of this boundary. To maximize restoration efforts on these islands, a combined action is proposed. Activities on San Martín Island would focus on restoring the California brown pelican, double-crested cormorant, and Brandt's cormorant colonies by reducing human disturbance through signage, public education, and a re-design of the trail system on the island to avoid the colonies. Efforts on San Jeronimo Island would focus on restoring the extirpated Brandt's cormorant colony through social attraction efforts (e.g., decoys) and reducing human disturbance. Additional restoration actions for Cassin's auklets and Xantus's murrelets will include shielding light sources, constructing a boardwalk to stop the destruction of burrows by fisherman walking through the colony, and controlling waste on the island. Eggshell thinning and/or elevated levels of DDTs were documented in the eggs of these species in the Southern California Bight (Kiff 1994, Fry 1994). The estimated cost of this action is \$751,500.

San Benito, Natividad, Asunción, and San Roque Islands

The goal of these 5-year actions is to restore seabird colonies on the central Baja California Pacific Islands. The San Benito, Natividad, Asunción, and San Roque Islands are clustered around the Vizcaíno Peninsula in central Baja California. Restoration efforts will target a suite of seabirds, including Cassin's auklet, Brandt's cormorant, double-crested cormorant, California brown pelican, and Xantus's murrelet. Eggshell thinning and/or elevated levels of DDTs were documented in the eggs of these species in the Southern California Bight (Kiff 1994, Fry 1994). These 5-year restoration actions include rehabilitation of degraded habitat, social attraction of

target species (both decoys and playback systems), use of artificial burrows, reduction in human disturbance through signage, shielding of lights around fishing villages, and waste management.

The estimated budgets for these actions range from approximately \$700,000 to \$1,000,000.

Create/Enhance/Protect California Brown Pelican Roost Habitat

The goal of this action is to restore critical non-breeding habitat for the California brown pelican by enhancing and protecting coastal roosts along the Southern California mainland. Eggshell thinning and/or elevated levels of DDTs were documented in the eggs of this species in the Southern California Bight (Kiff 1994, Fry 1994). Improvements to communal roosts will provide positive benefits to California brown pelicans by reducing the energy costs associated with commuting between prey and roosts as well as flushing and relocating due to human disturbance. This action will consider the creation of new roost habitat, such as a floating dock or a similar structure. Several locations are under consideration for the creation of new habitat, including Batiquitos Lagoon in San Diego County. This action is scalable and the costs can have a considerable range. The estimated costs range from \$50,000 to \$2 million, depending on the type of action.

Additional information on this action can be found in Appendix D6.

Implement an Entanglement Reduction and Outreach Program to Protect Seabird Populations

The goal of this action is to benefit the California brown pelican and other seabirds by reducing injury from entanglement with fishing line. Entanglement in fishing line and the hooking of California brown pelicans by anglers is a major factor affecting their survival. Seabirds may eat the same fishes being targeted by anglers or may be attracted to the bait at the end of the fishing lines. This action would involve expanding the American Trader Trustee Council's Seabird Entanglement Education and Outreach Program to the fishing piers and wharfs in Southern California where entanglement is a concern. The goal of the program is to provide information in the form of brochures, signs, and wildlife guides that heighten public awareness about the potential hazards to seabirds from fishing tackle and monofilament line. The signs will help promote public awareness and educate anglers about ways to reduce their chances of hooking birds and what to do if one is hooked. The seabirds that will benefit from this action include California brown pelicans, cormorants, and gulls. Eggshell thinning and/or elevated levels of DDTs were documented in the eggs of these species in the Southern California Bight (Kiff 1994, Fry 1994). The estimated cost for this action is \$22,000.

Additional information on this action can be found in Appendix D7.

Restore Ashy Storm-Petrels to Anacapa Island

The goal of this 5-year action is to facilitate breeding for populations of the rare ashy storm-petrel on Anacapa Island. Eggshell thinning and/or elevated levels of DDTs were documented in the eggs of this species in the Southern California Bight (Kiff 1994, Fry 1994). The suitability of Anacapa Island as breeding habitat for the ashy storm-petrel has been significantly enhanced due to the eradication of the black rat in 2003. Black rats were known to occupy prime nesting habitat on Anacapa Island and likely prevented the ashy storm-petrels from breeding over large

portions of suitable habitat. Ashy storm-petrels were mist-netted on Anacapa Island in 1994, but to date no active nests have been found (Whitworth et al. 2003). Recorded vocalizations and nest boxes will be used to attract the ashy storm-petrels. Ashy storm-petrels are also known to nest on the adjacent Santa Cruz Island (Carter et al. 1992).

This action will benefit a priority seabird that is limited in distribution and has experienced significant population declines. The establishment of a breeding colony of ashy storm-petrels on Anacapa Island will contribute to the recovery of this species. The estimated cost of this action is \$609,000.

Additional information on this action can be found in Appendix D8.

6.2 RESTORATION ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

6.2.1 Development of Alternatives

Under NEPA, CEQA, and the federal National Resource Damage Assessment regulations (Title 43 Code of Federal Regulations [CFR] Part 11.82(c)), the Trustees must consider a range of possible restoration alternatives, including a natural recovery alternative with minimal management actions (i.e., a “no action” alternative). The 17 individual actions evaluated in detail represent a range of options for addressing the specific injuries of the Montrose case. As a final step in developing this Restoration Plan, the Trustees assembled different combinations of the individual restoration actions from Tier 2 into comprehensive alternatives for comparison and analysis.

Not all 17 actions can be included within a single comprehensive Restoration Plan alternative, as some are mutually exclusive (e.g., the two bald eagle actions) and available funding is not sufficient to cover all the actions. The ultimate aim of this Restoration Plan is to identify alternative combinations of these individual actions and to select one preferred alternative that optimizes restoration of natural resources and services within the constraints of available funds. However, one or more actions that are included in the preferred alternative may later unexpectedly prove to be infeasible. If this happens, then actions from the Tier 2 list that were not included in the original alternatives may be substituted as replacements, since all were found to satisfy the evaluation criteria.

Recognizing that this Restoration Plan covers a set of actions that are broad in scope and in some cases still only conceptual, this document has been prepared as a programmatic Environmental Impact Statement (EIS)/Environmental Impact Report (EIR). This programmatic EIS/EIR undertakes general analysis of the restoration program and will be linked to any further action-specific environmental documentation as necessary. The Trustees will proceed by implementing a specific set of actions for the first 5-year phase of restoration (Phase 1). At the end of Phase 1, progress will be assessed and the remaining restoration funds will be allocated. The planning for this subsequent phase of restoration (i.e., Phase 2) will be conducted in or around 2010 with public involvement; however, the Phase 2 planning will not necessarily require the preparation of a new programmatic EIS/EIR.

6.2.2 Allocation of Restoration Funds Among Resource Categories

One important consideration in this Restoration Plan is how available funds should be distributed between the different natural resources and services identified for restoration in the final Montrose consent decree. The decree itself did not specify how restoration funds should be allocated. During the natural resource damage assessment in the 1990s, the Trustees attempted to estimate the costs of restoring injured natural resources and lost services to their baseline level (primary restoration) and compensating for interim lost natural resource services (compensatory restoration). These previous restoration scaling estimates are a part of the administrative record for the damage assessment. They do not provide a useful guide for allocating restoration funding at this stage because: (1) the final settlement was not based on the scaling estimates per se, (2) the recovery status of the injured natural resources has changed in the intervening years since the scaling was performed, and (3) the Trustees have developed a more specific understanding of potential restoration actions in each resource category targeted for restoration.

The final settlements provided a principal amount of approximately \$30 million for natural resource restoration. Interest accruing in the settlement accounts provides an additional source of restoration funding. In addition, additional settlement funds (\$10 million plus interest) that may be used for EPA response actions could instead be allocated to natural resource restoration depending on the outcome of the EPA's ongoing remedial investigation (see Section 4.3). These funds are referred to as "swing money," as they may be used by either the EPA or the Trustees depending on the EPA's final cleanup decision.

In the summer of 2004, the Trustees commissioned an audit of the Montrose settlement accounts to determine their current balances and interest rates and to develop a reasonable projection of funds available in the future. The audit identified an estimated balance of restoration funds in the settlement accounts of \$38 million as of July 2004 (not including the swing money). Interest is currently accruing at 1.75%, adding approximately \$700,000 per year to the accounts. Ongoing restoration program operating costs are comparable to the interest currently accruing. The Trustees propose to commit approximately \$25 million during the first 5 years (2005–2010) of restoration implementation under this Restoration Plan. After 5 years, several uncertainties should be resolved, including the outcome of the NCI Bald Eagle Feasibility Study and the EPA's cleanup decision. The Trustees will then assess progress and allocate the remaining restoration funds in Phase 2.

The Trustees have allocated the \$25 million for Phase 1 among the four restoration categories: fishing and fish habitat, bald eagles, peregrine falcons, and seabirds. Consideration was given to the potential costs of restoring those resources still experiencing injuries due to the contaminants of the case. The continued presence of DDTs and PCBs in the marine environment and the uncertain outcomes of ongoing data gap studies (Section 4.2.1) limit the Trustees' ability to accurately project these costs. Considering the likely costs of actions and the uncertainties, the Trustees reached consensus on a proposal to allocate the initial \$25 million on an approximately equal basis between fishing and fish habitat restoration and bird restoration as follows:

- \$12 million for fishing and fish habitat restoration actions, and
- \$13 million for bald eagle, peregrine falcon, and seabird restoration actions.

This overall commitment (approximately \$25 million) and its allocation are built into the restoration alternatives discussed below. The costs of the fish and bald eagle data gap studies

presently being conducted were assumed to be a part of the overall \$25 million to be earmarked for Phase 1.

6.2.3 Alternative 1 (No Action)

For the purposes of this plan, the No Action Alternative assumes that the Trustees would not intervene to restore injured natural resources and compensate for lost services for any of the affected resources of the Montrose case. Instead, the Trustees would rely on natural processes for the gradual recovery of the injured natural resources and would only take the limited action of monitoring natural recovery.

The principal advantages of this approach are the ease of implementation and the absence of monetary costs. Although natural recovery may eventually occur for many of the injured resources, the recovery may take a significantly longer period of time than would recovery under an active restoration scenario. Also, the interim losses of natural resource services would not be compensated under the No Action Alternative. In addition, certain events, such as the extirpation of bald eagles and the introduction of exotic species in the Channel Islands, have led to consequences for other natural resources that may not be addressed under a natural recovery alternative. Because feasible restoration actions have been identified that would address the injuries and lost services of the case, the No Action Alternative as an overall approach across all resource categories does not fulfill the goals of this Restoration Plan. However, this does not preclude selection of natural recovery as an option for specific resources (e.g., peregrine falcons) within the overall framework of a comprehensive restoration alternative.

6.2.4 Alternative 2 (Preferred)

After considering the 17 potential restoration actions evaluated in detail and the available funds, the Trustees assembled the following diverse set of actions to generate Alternative 2:

Fishing and Fish Habitat Restoration
<i>Construct artificial reefs and fishing access improvements</i>
<i>Provide public information to restore lost fishing services</i>
<i>Restore full tidal exchange wetlands</i>
<i>Augment funds for implementing Marine Protected Areas in California</i>
Bald Eagle Restoration
<i>Complete the NCI Bald Eagle Feasibility Study before deciding on further restoration actions</i>
Peregrine Falcon Restoration
<i>Monitor the recovery of peregrine falcons on the Channel Islands</i>
Seabird Restoration
<i>Restore seabirds to San Miguel Island</i>
<i>Restore alcids to Santa Barbara Island</i>
<i>Restore seabirds to San Nicolas Island</i>
<i>Restore seabirds to Scorpion and Orizaba Rocks</i>
<i>Restore seabirds to Baja California Pacific Islands</i>
<ul style="list-style-type: none"> • <i>Coronado and Todos Santos Islands</i>

The Trustees have concluded that conducting these actions will most effectively address the continuing injuries and lost services of the Montrose case and compensate for past injuries within the limits of funding allocated during Phase 1 of restoration implementation. This combination of

actions represents the Trustees' preferred alternative. Further explanation of why this collection of actions is preferred follows.

Fishing and Fish Habitats

For the fishing and fish habitat resource category under this alternative, the Trustees will conduct a diverse set of four actions that addresses both the restoration of human uses (fishing services) and the restoration of fish habitats. In particular, one of the actions, "construct artificial reefs and fishing access improvements," effectively addresses both the need to restore lost fishing services and the need for fish habitat in close proximity to areas affected by the contaminants of the case. For this reason, this action will receive greater funding emphasis within this category than the other three actions (see Appendix A).

The degree to which each of these four actions fulfills all six of the MSRP evaluation criteria varies, but all of the actions are considered sufficient to satisfy the criteria for selection. "Construct artificial reefs and fishing access improvements" rates high for nexus, resource benefits, and ecological benefits. "Provide public information to restore lost fishing services" rates high for nexus, feasibility, resource benefits, and cost. "Restore full tidal exchange wetlands" rates high for feasibility and ecological benefits. "Augment funds for Marine Protected Areas in California" rates high for feasibility, resource benefits, and ecological benefits.

Bald Eagles

For the bald eagle resource category under this alternative, the Trustees fund the Santa Catalina Island Bald Eagle Program only through 2005, complete the NCI Bald Eagle Feasibility Study to determine whether bald eagles placed on the Northern Channel Islands can reproduce on their own, and only then decide what additional bald eagle restoration will be conducted. This alternative discontinues funding for the Santa Catalina Island Bald Eagle Program during the interim period until the results of the NCI Bald Eagle Feasibility Study are known (in or around 2008). At that point, the Trustees will re-evaluate all potential options for bald eagle restoration, including measures that may be taken even if bald eagles are not able to reproduce on their own anywhere in the Channel Islands (see Section 6.1.2).

This bald eagle restoration approach better fulfills the restoration goals and objectives and the MSRP evaluation criteria than the bald eagle restoration approach considered under Alternative 3, which would continue funding the Santa Catalina Island Bald Eagle Program even though these birds cannot reproduce on their own. The bald eagle restoration approach under Alternative 2 better fulfills restoration goals and objectives because the MSRP evaluation criteria give preference to actions that have a long duration under the resource benefits criterion and actions that require less ongoing operation and maintenance under the feasibility criterion. In other words, the preferred bald eagle restoration approach, which focuses on restoring naturally reproducing bald eagles on the Channel Islands, has greater potential to realize long-term, self-sustaining benefits.

Peregrine Falcons

For the peregrine falcon resource category, this alternative provides for recovery with monitoring. This approach recognizes the evidence that, with the aid of prior release efforts and natural recruitment, peregrine falcons are recovering on the Channel Islands. The number of breeding pairs on the Channel Islands has increased from nine pairs in 1992 (Hunt 1994) to approximately 21 breeding pairs in 2004 (PBRG 2004). Lack of successful breeding on the Southern Channel Islands might be indicative of continuing contaminant-caused injuries in that region; however, if this were the case, further hacking of peregrine falcons would not effectively address this issue. The Trustees also recognize that peregrine falcons benefit from seabird restoration, as an increase in the numbers of seabirds increases the availability of the preferred prey of peregrine falcons. For these reasons, the Trustees did not include active restoration of peregrine falcons to the Channel Islands as part of the preferred alternative; however, restoration funds will be used to monitor the continued recovery of this species on the Channel Islands.

Seabirds

For the seabird resource category, this alternative incorporates a diverse set of actions that provides significant benefits to several species of seabirds. Evaluation of past data indicates that the seabird species benefiting from these actions have demonstrated eggshell thinning and/or elevated levels of DDTs in their eggs (Kiff 1994, Fry 1994). Although the seabird actions not included in this alternative also have a strong nexus to the Montrose case and would benefit seabirds injured by the contaminants of the case, insufficient funding is available at this time to fund all the restoration actions evaluated in Tier 2. Among the MSRP evaluation criteria, the degree of resource benefits best distinguishes the different seabird actions. Therefore, the Trustees have selected those actions that they consider to provide the greatest restoration benefits within the limits of funding.

Should one or more of the seabird actions requiring supplemental analysis later be determined to be inadvisable to pursue, the MSRP will provide public notice and use the available funds to proceed with one or more of the other seabird actions that met the Tier 2 criteria but were not incorporated into this alternative. The Trustees will also seek partnerships to reduce the costs of individual actions. Depending on the level of cost sharing, the Trustees may be able to implement additional seabird actions not currently included in Alternative 2.

Summary of Alternative 2

After consideration of the restoration goals and objectives, the MSRP evaluation criteria, the current status of injured resources, and the continuing presence of contamination, the Trustees believe that Alternative 2 represents the optimal distribution of funding for natural resource restoration across the demonstrated injury categories and for the purposes of both primary and compensatory restoration (Figure 6-3).

6.2.5 Alternative 3

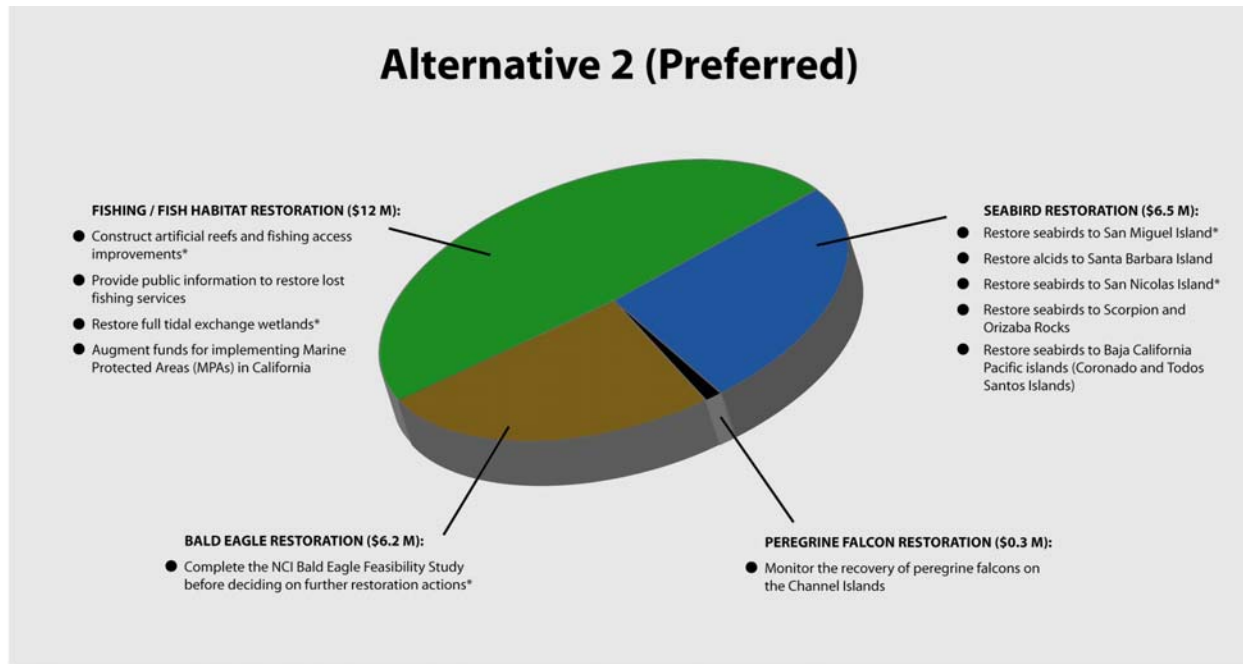
The Trustees assembled another comprehensive alternative for consideration and comparison in this Restoration Plan. Alternative 3 consists of the following set of actions:

Fishing and Fish Habitat Restoration
<i>Construct artificial reefs and fishing access improvements</i>
<i>Provide public information to restore lost fishing services</i>
Bald Eagle Restoration
<i>Complete the NCI Bald Eagle Feasibility Study; Regardless of its Outcome, Continue Funding Santa Catalina Island Bald Eagle Program</i>
Peregrine Falcon Restoration
<i>Monitor the recovery of peregrine falcons on the Channel Islands</i>
Seabird Restoration
<i>Restore alcids to Santa Barbara Island</i>
<i>Restore seabirds to Scorpion and Orizaba Rocks</i>
<i>Restore seabirds to Baja California Pacific Islands</i>
<ul style="list-style-type: none"> • <i>Coronado and Todos Santos Islands</i>
<i>Restore ashy storm-petrels to Anacapa Island</i>

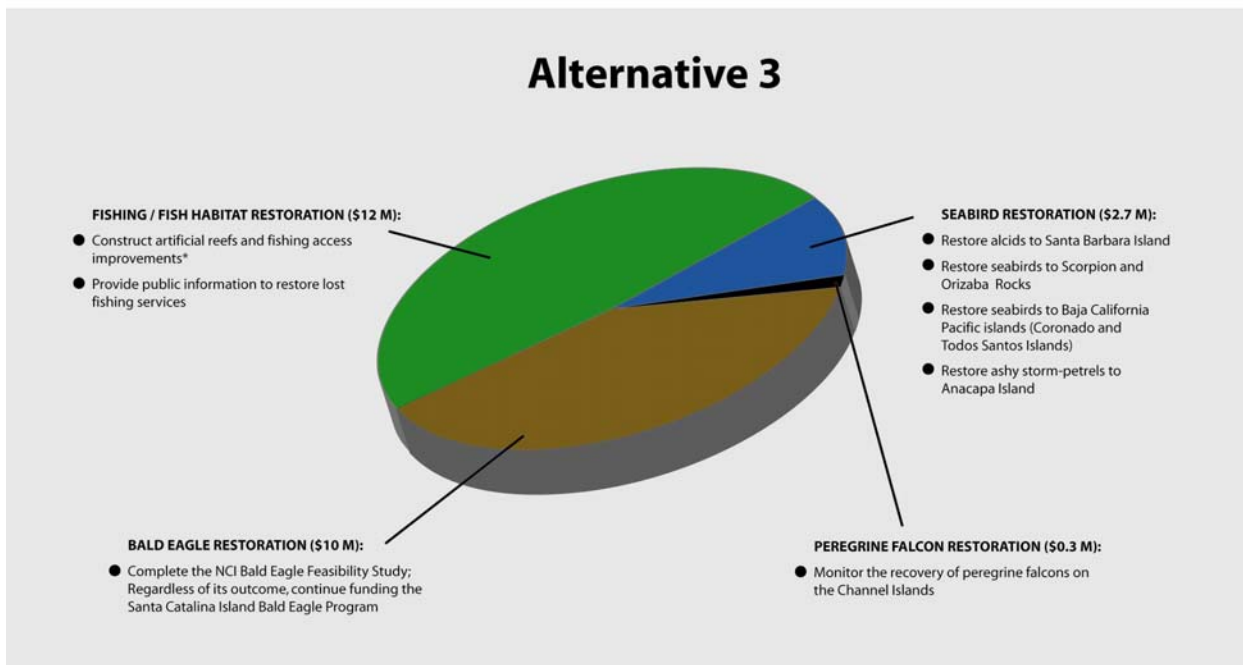
In this alternative, the Trustees would fund a narrower range of actions that would place greater emphasis on primary restoration of injuries and lost services. For the actions that are scaleable (e.g., the two fishing restoration actions), greater levels of funding would be available to each individual action identified in Alternative 3 than in Alternative 2, as available funds within that category would be distributed across fewer actions.

For the fishing and fish habitat category under this alternative, the Trustees focus restoration efforts on the two actions that most directly address the continuing loss of fishing services from contaminated fish. The remaining two actions evaluated in the fishing and fish habitat category, Restore Full Tidal Exchange Wetlands and Augment Funds for Implementing Marine Protected Areas in California, are not included in this alternative, as they restore fish habitats in ways that are not as directly linked to the continuing loss of fishing services of the Montrose case but instead serve to restore fish habitats as specified in the Consent Decree.

For the bald eagle category under this alternative, the Trustees would fund the continued human intervention (i.e., egg manipulation and chick fostering) needed to sustain a bald eagle presence on Santa Catalina Island for many years to come. The Trustees would also complete the NCI Feasibility Study. Funds for seabird restoration would be commensurately reduced. This bald eagle restoration option, considered in the broader context of the need to restore a wide range of injured resources, does not rate as high against the MSRP evaluation criteria as the preferred bald eagle option under Alternative 2. This is because the MSRP evaluation criteria give preference to actions with long term benefits that do not require continuous operations and maintenance. Since it remains to be determined whether DDTs and PCBs have attenuated sufficiently in the Northern Channel Islands to allow bald eagles to be self-sustaining, the Trustees prefer to await the conclusion of the NCI Study before committing further restoration funding for bald eagles.



* These actions require further detailed development and subsequent NEPA and/or CEQA analysis prior to implementation.



* These actions require further detailed development and subsequent NEPA and/or CEQA analysis prior to implementation.

Figure 6-3. Illustration of the collective restoration actions and funding distributions proposed under Alternative 2 (Preferred) and Alternative 3.

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6.2.6 Summary of the Alternatives

Table 6-2 lists the 17 potential restoration actions that received detailed evaluation and indicates how they are assembled into the two comprehensive alternatives and the No Action Alternative for this Restoration Plan and programmatic EIS/EIR. Each alternative allocates approximately \$25 million in restoration funding to cover data gap studies and the initial 5 years of restoration implementation (Phase 1). Alternative 2 distributes funding across a wide range of actions that are both primary and compensatory in nature. Alternative 3 focuses greater effort on primary restoration by (1) targeting fish restoration for human use (fishing) benefits and (2) reserving greater funding for long-term intervention to maintain bald eagles in the Channel Islands despite continuing reproductive injuries (thus reducing funds available for seabird actions). The Trustees’ preferred alternative is Alternative 2.

**Table 6-2
Comparison of Restoration Alternatives**

Potential Restoration Actions	Alternative 1 (No Action)	Alternative 2 (Preferred)*	Alternative 3*
Fishing and Fish Habitat Restoration		\$12 million	\$12 million
<i>Construct artificial reefs and fishing access improvements</i>		•	•
<i>Provide public information to restore lost fishing services</i>		•	•
<i>Restore full tidal exchange wetlands</i>		•	
<i>Augment funds for implementing Marine Protected Areas in California</i>		•	
Bald Eagle Restoration		\$6.2 million	\$10 million
<i>Complete the NCI Bald Eagle Feasibility Study Before Deciding on Further Restoration Actions</i>		•	
<i>Complete the NCI Bald Eagle Feasibility Study; Regardless of its Outcome, Continue Funding Santa Catalina Island Bald Eagle Program</i>			•
Peregrine Falcon Restoration		\$0.3 million	\$0.3 million
<i>Restore peregrine falcons to the Channel Islands</i>			
<i>Monitor the recovery of peregrine falcons on the Channel Islands</i>		•	•
<i>Restore peregrine falcons to the Baja California Pacific Islands</i>			
Seabird Restoration		\$6.5million	\$2.7 million
<i>Restore seabirds to San Miguel Island</i>		•	
<i>Restore alcids to Santa Barbara Island</i>		•	•
<i>Restore seabirds to San Nicolas Island</i>		•	
<i>Restore seabirds Scorpion and Orizaba Rocks</i>		•	•
<i>Restore seabirds to Baja California Pacific Islands</i>		•	•
<ul style="list-style-type: none"> • <i>Coronado and Todos Santos Islands</i> • <i>Guadalupe Island</i> • <i>San Jeronimo and San Martín Islands</i> • <i>San Benito Islands</i> • <i>Asunción and San Roque Islands</i> • <i>Natividad Island</i> 		<ul style="list-style-type: none"> • <i>Coronado and Todos Santos Islands</i> 	<ul style="list-style-type: none"> • <i>Coronado and Todos Santos Islands</i>
<i>Create/enhance/protect California brown pelican roost habitat</i>			
<i>Implement an entanglement reduction and outreach program to protect seabird populations</i>			
<i>Restore ashy storm-petrels to Anacapa Island</i>			

*The budgets shown in this table reflect the estimated costs of data gap studies and the initial 5 years of restoration implementation.

6.3 UNCERTAINTIES

Several uncertainties are inherent in the restoration actions described in this Restoration Plan. As stated in Section 4, the Trustees' strategy is to approach restoration planning as an iterative, adaptive process, and this Restoration Plan will be updated in the future as restoration progress is assessed and new information becomes available. Some of the uncertainties that the Trustees have identified are:

- All of the actions are subject to obtaining the required permits and authorizations (if necessary) before proceeding.
- The budgets assembled for each action in Appendices A–D are estimates and do not include contingencies. These estimates will be refined once the actions approach the stage of implementation and potential funding partners are identified.
- Although all of the actions selected as part of Alternative 2 (preferred) are considered feasible for implementation, unforeseen issues could potentially arise that might prevent implementation. Because all 17 actions evaluated in Tier 2 meet the restoration criteria, in the event that certain actions in Alternative 2 cannot go forward or cost savings are realized that leave funding available, the Trustees would consider pursuing one or more of the remaining Tier 2 actions. The Trustees would document such changes and provide opportunity for public review and comment.
- The outcomes of the ongoing fish contamination and bald eagle data gap studies are not known at the time that this Restoration Plan is being prepared. It is possible that these studies might provide unanticipated new information and cause the Trustees to reconsider the actions of the restoration program.
- Funding beyond that on which this Restoration Plan is based may be made available in the future, depending on the EPA's upcoming determination on the potential in situ response action (see Section 4.3).