

MONTROSE SETTLEMENTS RESTORATION PROGRAM  
**FINAL RESTORATION PLAN**  
*Programmatic Environmental Impact Statement / Environmental Impact Report*



**October 2005**



**Natural Resource Trustees**

**National Oceanic and Atmospheric Administration**

**U.S. Fish and Wildlife Service**

**National Park Service**

**California Department of Fish and Game**

**California Department of Parks and Recreation**

**California State Lands Commission**

# **MONTROSE SETTLEMENTS RESTORATION PROGRAM**

## **FINAL RESTORATION PLAN AND PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT**

*Natural Resource Trustees:*

National Oceanic and Atmospheric Administration (lead Federal agency)  
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California Department of Fish and Game (lead State of California agency)  
California Department of Parks and Recreation (cooperating agency)  
California State Lands Commission (cooperating agency)

October 2005

### List of Preparers

Annie Little: MSRP staff, Bird Biologist  
David Witting: MSRP staff, Fish Biologist  
Jennifer Boyce: NOAA Restoration Center, Restoration Ecologist  
Greg Baker: MSRP staff, Program Manager  
Milena Viljoen: MSRP staff, Outreach Coordinator

### Acknowledgements

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### Citation

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### Copies

Copies may be requested from: **Montrose Settlements Restoration Program**  
**501 W. Ocean Blvd., Suite 4470**  
**Long Beach, CA 90802**  
**(866) 795-7786**

Or by e-mail at: [msrp@noaa.gov](mailto:msrp@noaa.gov)

Or from the MSRP web site at: [www.montroserestoration.gov](http://www.montroserestoration.gov)

### Cover:

*Photograph of the Southern California coast at White Point on the Palos Verdes Peninsula. Most of the DDTs and PCBs found in the sediments off the coast of Southern California entered the environment through the wastewater outfalls several miles offshore of White Point.*

*Photo by David Witting.*

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## List of Agencies, Organizations, and Individuals

### List of Agencies, Organizations, and Individuals to Whom Copies of the Final Restoration Plan and Programmatic EIS/EIR or Notice of its Availability Have Been Sent

The Natural Resource Trustees for the Montrose case (Trustees) have assembled a contact list of approximately 1,200 agencies, organizations, and individuals for the Montrose Settlements Restoration Program (MSRP). This list includes federal, state, and local agencies; commissions and special districts; elected officials; community-based organizations; environmental, fishing, and other special interest organizations; schools, universities, and research institutions; media outlets; and individuals who have asked to be placed on the contact list. Notice of availability of this document has been distributed via U.S. mail and/or e-mail to the entire MSRP contact list. Notice has also been placed on the MSRP web site, [www.montroserestoration.gov](http://www.montroserestoration.gov). The entire document may be obtained from this web site or may be requested from the MSRP office in Long Beach, California, in hard copy or on a compact disk (CD) readable on a personal computer. A printed summary version of the document has also been prepared and may be obtained from the web site or the MSRP Long Beach office.

Also, copies of this document have been provided to the following agencies and organizations:

#### Federal Agencies

U.S. Environmental Protection Agency  
National Oceanic and Atmospheric Administration  
U.S. Fish and Wildlife Service  
National Park Service  
U.S. Department of the Navy  
U.S. Army Corps of Engineers

#### California State Agencies

Governor's Office of Planning and Research  
Department of Fish and Game  
Department of Parks and Recreation  
State Lands Commission  
Department of Boating and Waterways  
Coastal Commission  
Coastal Conservancy  
Office of Historic Preservation  
Department of Water Resources  
State Water Resources Control Board  
Native American Heritage Commission

## **List of Agencies, Organizations, and Individuals**

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### **Other Agencies**

Secretary of the Environment and Natural Resources (SEMARNAT), Mexico

Los Angeles County Sanitation Districts

Santa Monica Bay Restoration Commission

Port of Los Angeles

Port of Long Beach

### **Organizations**

Institute for Wildlife Studies

Catalina Island Conservancy

Island Conservation

Heal the Bay

Predatory Bird Research Group

Pacific Seabird Group

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µg/g	micrograms per gram
ACC	Avian Conservation Center
ATTC	American Trader Trustee Council
C	Centigrade
CAA	Clean Air Act
CARB	State of California Air Resources Board
CBO	community-based organization
CDFG	California Department of Fish and Game
CDPR	California Department of Parks and Recreation
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
CFR	Code of Federal Regulations
cm	centimetres
CMS	Center for Marine Studies
CO	carbon monoxide
Commission	California Coastal Commission
CONANP	National Commission of National Protected Areas (Mexico)
CSLC	California State Lands Commission
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dBA	decibels
DDD	dichloro-2,2-bis (p-chlorophenyl) ethane
DDE	dichloro-diphenyl-dichloroethylene
DDT	dichloro-diphenyl-trichloroethane
DDTs	total DDT, or the sum of DDT, DDD, and DDE isomers
DO	Dissolved oxygen
DTSC	California Department of Toxic Substances Control
EA	Environmental Assessment
EE/CA	engineering evaluation and cost analysis
EFH	essential fish habitat
EIR	Environmental Impact Report



EIS	Environmental Impact Statement
ENSO	El Niño Southern Oscillation
EO	executive order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
F	Fahrenheit
FAD	Fish Aggregation Device
FCEC	Fish Contamination Education Collaborative
FDA	Food and Drug Administration
GC	General Counsel
GIS	Geographic Information System
IC	institutional control
INRMP	Integrated Natural Resources Management Plan
IWS	Institute for Wildlife Studies
JWPCP	Joint Water Pollution Control Plant (LACSD)
kg	kilogram
km	kilometre
km <sup>2</sup>	square kilometres
LACSD	Los Angeles County Sanitation Districts
LGEEPA	General Law of Ecological Balance and Environmental Protection (Mexico)
LNG	liquefied natural gas
m	meter
MBTA	Migratory Bird Treaty Act
mg/L	milligrams per liter
mi <sup>2</sup>	square miles
MLLW	mean lower low water
MLPA	Marine Life Protection Act
MMCC	Marine Mammal Care Center
MMPA	Marine Mammal Protection Act
MOA	Memorandum of Agreement
Montrose	Montrose Chemical Corporation
MPA	Marine Protected Area

MRFSS	Marine Recreational Fishing Statistical Survey
MSRP	Montrose Settlements Restoration Program
NAAQS	national ambient air quality standards
NCI	Northern Channel Islands
NEPA	National Environmental Policy Act
NMSA	National Marine Sanctuaries Act
NO <sub>2</sub>	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	National Marine Fisheries Service
NPS	National Park Service
NRDA	Natural Resource Damage Assessment
O <sub>3</sub>	ozone
OEHHA	California Office of Environmental Health Hazard Assessment
PAH	polynuclear aromatic hydrocarbon
Pb	lead
PCB	polychlorinated biphenyl
PISCO	Partnership for Interdisciplinary Study of Coastal Oceans
PM <sub>10</sub>	particulate matter equal to or less than 10 microns in size
PM <sub>2.5</sub>	particulate matter equal to or less than 2.5 microns in size
POLA	Port of Los Angeles
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand
PROFEPA	Federal Environmental Protection Agency (Mexico)
PRP	potentially responsible party
PSRPA	Park System Resource Protections Act
PVPLC	Palos Verdes Peninsula Land Conservancy
RecFIN	Pacific Recreational Fisheries Information Network
Record	Administrative Record
ROV	remotely operated vehicle
SCB	Southern California Bight
SCWI	Southern California Watershed Inventory
SEMARNAT	Secretary of the Environment and National Resources (Mexico)

## List of Acronyms

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SO <sub>2</sub>	sulfur dioxide
SONGS	San Onofre Nuclear Generating Station
Trustees	Natural Resource Trustees for the Montrose case
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WRP	Southern California Wetlands Recovery Project

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## INTRODUCTION

From the late 1940s to the early 1970s, millions of pounds of DDTs and PCBs were discharged from industrial sources through a wastewater outfall into the ocean at White Point, near Los Angeles. These discharges resulted in widespread impacts on the natural and human environment. The contaminants, chemical mixtures banned in the United States today but manufactured in the past for pesticides and industrial purposes, contributed to severe declines in the populations of several species of birds, including the extirpation of bald eagles and peregrine falcons from the Channel Islands. The high levels of DDTs and PCBs in certain species of fish also led the State of California to issue consumption advisories, impose bag limits, and enact a commercial catch ban on certain types of fish. Although the releases were largely brought under control in the 1970s, these chemicals still contaminate the marine environment (sediments, water, and biota) of the Southern California Bight (SCB) (Figure ES-1).

In 1990, the federal government and the State of California initiated legal action against the Montrose Chemical Corporation (Montrose) and the other polluters responsible for the discharges of DDTs and PCBs.<sup>1</sup> In December 2000 the final settlement was signed, ending ten years of litigation. Under the terms of four separate settlement agreements, Montrose and the other defendants agreed to pay \$140.2 million plus interest to the federal and state governments. Of this amount, the U.S. Environmental Protection Agency (EPA) and the California Department of Toxic Substances Control (DTSC) received \$66.25 million, the Natural Resource Trustees for the Montrose case (Trustees)<sup>2</sup> received \$63.95 million, and \$10 million of “swing money” was earmarked for EPA response actions, though the swing money may instead go to natural resource restoration, depending on the outcome of the EPA’s ongoing remedial investigation.

### Facts About DDTs and PCBs

#### *DDT (Dichlorodiphenyltrichloroethane)*

- DDTs include DDT and breakdown products (such as DDD, DDE, DDMU)
- Used in pesticides (insecticide)
- Manufactured at the Montrose chemical plant, Torrance, CA (1947–1982)
- DDT use banned in the U.S. (1972)

#### *PCB (Polychlorinated biphenyl)*

- PCBs are a group of 209 related chemicals
- Used for electrical transformer cooling fluids, hydraulic fluid in the paper industry, antifouling paints, manufacturing processes (electrical, glass)
- Widely used in industry
- Banned from manufacturing (1977)

#### *Sources of DDTs and PCBs to ocean:*

- Discharge through Joint Water Pollution Control Plant (JWPCP) ocean outfalls
- Ocean dumping of wastes
- Runoff and storm drain discharge
- Aerial transport

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<sup>1</sup> The other defendants were Aventis CropScience USA, Inc. (formerly Rhone-Poulenc, Inc., and corporate successor to Stauffer Chemical Company); Chris-Craft Industries, Inc.; Atkemix Thirty-Seven, Inc.; CBS Corporation (formerly Westinghouse Electric Corp.); Potlach Corporation; Simpson Paper Company; and County Sanitation District No. 2 of Los Angeles County (LACSD) and 150+ local government entities.

<sup>2</sup> The Natural Resource Trustees are charged with protecting, managing, and restoring natural resources that are held in trust for current and future generations. For the Montrose case, the Trustees include the National Oceanic and Atmospheric Administration, the U.S. Fish and Wildlife Service, the National Park Service, the California Department of Fish and Game, the California Department of Parks and Recreation, and the California State Lands Commission.



Figure ES-1. Geographic extent of the Southern California Bight.

The EPA and DTSC are using the recovery funds to address the contaminated offshore sediments as well as for public outreach, education, monitoring, and enforcement actions aimed at reducing human exposure to contaminated fish. The Trustees have used \$35 million to reimburse past damage assessment costs and are using the remainder plus accumulated interest (approximately \$38 million to date) for natural resource restoration.

In 2001, the Trustees created the Montrose Settlements Restoration Program (MSRP) as a multi-agency effort to manage the work of restoring the injured resources. Through the MSRP, the Trustees initiated a broad restoration planning effort, which included soliciting and evaluating potential restoration ideas. During the planning period, the Trustees also initiated certain studies in support of resource restoration, including a feasibility study on the reestablishment of bald eagles on the Northern Channel Islands, a comprehensive survey of fish contamination, and a survey of angler fishing practices and preferences.

As required by Superfund law, the Trustees must use the settlement monies to restore the natural resources that were harmed by the chemicals at issue in this case and must prepare a restoration plan subject to public review. The MSRP Restoration Plan and Programmatic Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) is a comprehensive document detailing the characteristics of the affected region, the restoration planning process, and the restoration alternatives, including the Trustees' Preferred Alternative. As an EIS/EIR, the document also addresses National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) requirements for environmental review for certain projects.

### RESTORATION GOALS AND OBJECTIVES

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; and
- Compensate for the interim lost services of the injured natural resources while those resources are recovering.

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” (page 5, lines 18–22). 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 restoration planning workshops. The MSRP restoration objectives are to:

- Restore fishing services within the 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; and
- 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, they often found that little practical distinction existed 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 actions is organized into four categories (fishing and fish habitat, bald eagles, peregrine falcons, and seabirds) that encompass the five restoration objectives listed above.

## RESTORATION IDEAS

The Trustees began collecting and compiling potential restoration ideas even before the legal case was settled in 2000. The early list of ideas was expanded through a public scoping process in 2002 and 2003. This process included further consultation with scientific experts with specialized knowledge about the injured resources as well as a series of public workshops to encourage public participation (see Section 1.4). The initial broad list of potential restoration ideas that the Trustees gathered was then evaluated in a two-step process.

### Tier 1 Evaluation

The initial list of project ideas was screened and consolidated in a Tier 1 evaluation, using the following criteria: nexus, feasibility, resource benefits, and ecosystem benefits. A detailed description of the Tier 1 process, including descriptions of the criteria and a list of those restoration ideas that did not receive further consideration after the Tier 1 evaluation, is included in Section 5 of this document.

The Tier 1 evaluation resulted in a list of the 17 most promising potential restoration actions. Some of these actions are fully developed, specific projects for which this EIS/EIR constitutes final environmental impact assessment under NEPA and CEQA. However, other actions are still conceptual approaches that would require further development and environmental review prior to initiation.

In addition to actions that directly and actively restore the specific injured resources and lost services of the Montrose case, the Trustees received several suggestions from the public that some of the restoration funds be used for more general public outreach and education. Other suggestions were received for further research studies to better understand the injuries and potential restoration approaches (data gap studies). The Trustees did not evaluate the outreach and education ideas gathered against specific actions that restore fishing and fish habitat, bald eagles, peregrine falcons, and seabirds. However, certain outreach concepts identified through this process have been incorporated into one of the fish restoration ideas ("provide public information to restore lost fishing services"). As the MSRP outreach program proceeds, other outreach and data gap ideas will receive consideration as planning and decision-making proceed and specific outreach and data needs become apparent.

### Tier 2 Evaluation

In the Tier 2 evaluation, the 17 potential restoration actions were analyzed in greater detail. The Trustees expanded on the criteria used in the Tier 1 evaluation by including consideration of



environmental acceptability and cost. The Tier 2 evaluation is also summarized in Section 5, and the full evaluations of the actions are presented in their entirety in Appendices A–D. Section 7 includes analyses and discussions to address the requirements of NEPA and CEQA at the action-specific level.

### RESTORATION FUNDING ALLOCATION AND PHASING

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, which did not specify how the restoration funds should be allocated. When the final consent decree for the case was signed in 2000, the settlements provided a principal amount of approximately \$30 million for natural resource restoration. As of summer 2004, interest had increased the amounts within these accounts to an estimated \$38 million. The ongoing restoration program operating costs are comparable to the interest currently accruing. The final legal settlements also provided the potential that additional settlement funds currently earmarked for EPA response actions (i.e., the swing money, which is \$10 million plus interest) may instead go to natural resource restoration, depending on the outcome of the EPA’s ongoing remedial investigation.

Taking these factors into consideration, along with the uncertain outcomes of the ongoing data gap studies, the Trustees will commit \$25 million during the first 5 years (Phase 1) of restoration implementation under this Restoration Plan. At the 5-year point, several uncertainties should be resolved, including the outcome of the Northern Channel Islands Bald Eagle Feasibility Study and the EPA’s site remediation decision. The Trustees will then assess their progress and allocate the remaining restoration funds.

The Trustees propose to allocate the \$25 million for Phase 1 among the four restoration categories: fishing and fish habitat, bald eagles, peregrine falcons, and seabirds. Considering the likely costs of the actions and various uncertainties, the Trustees propose to allocate the initial \$25 million on an approximately equal basis between fishing/fish habitat restoration and bird restoration as follows:

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

This overall commitment (\$25 million for the first 5 years) and its allocation are built into the restoration alternatives discussed below.

### RESTORATION ALTERNATIVES

NEPA, CEQA, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) require consideration of a range of possible restoration alternatives, including a natural recovery alternative with minimal management actions (i.e., a No Action Alternative). The 17 potential actions evaluated in Tier 2 represent a range of individual injury-specific restoration options. In addition to evaluating the actions individually, the Trustees have considered ways that these actions can be combined to build a comprehensive Restoration Plan. The Trustees present three such alternatives below and in Section 6.2 of this plan: Alternative 1 (No Action Alternative), Alternative 2 (Preferred Alternative), and Alternative 3 (see Figure ES-2).

### Alternative 1 (No Action)

For the purposes of this plan, this alternative assumes that the Trustees would not intervene to restore injured natural resources or 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.

Although natural recovery may eventually occur for many of the injured resources, it may take a significantly longer time than would recovery under an active restoration scenario; also, the interim losses of natural resource services would not be compensated. Certain events, such as the extirpation of bald eagles and the introduction of exotic species on the Channel Islands, have led to consequences 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 Trustees found that this alternative, as an overall approach across all resource categories, does not fulfill the goals of the MSRP. However, this determination 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.

### Alternative 2 (Preferred)

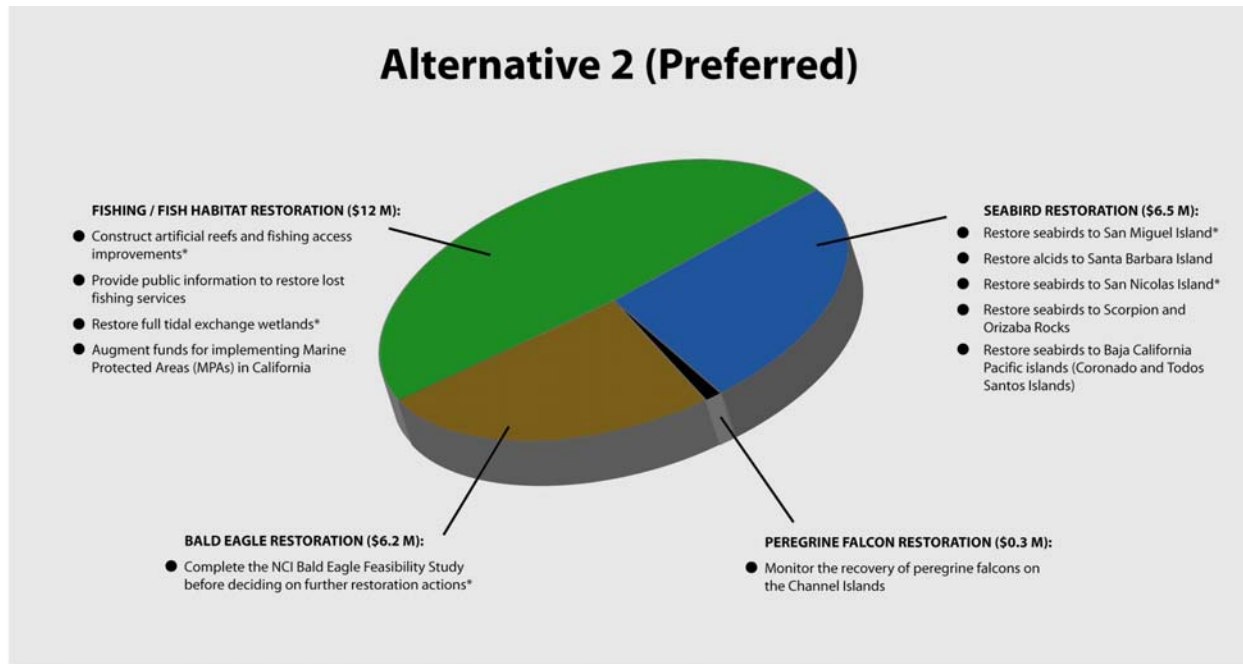
Based on the detailed evaluations performed in Tier 2 (see Appendices A–D), the Trustees have determined that the following subset of actions would most effectively address the continuing injuries and lost services of the Montrose case and compensate for past injuries. These actions, which constitute the Trustees' preferred alternative (Figure ES-2, top panel) include projects to restore fishing and fish habitat, bald eagles, and seabirds in the Southern California Bight, and a project to monitor the recovery of peregrine falcons in the Channel Islands. These actions will address all of the resource categories, their total cost falls within the limits of the funding allocated for Phase 1 of restoration implementation, and the actions encompassed by this alternative are distributed throughout the Southern California Bight (Figure ES-3).

The following sections describe how the restoration actions in Alternative 2 address the restoration objectives.

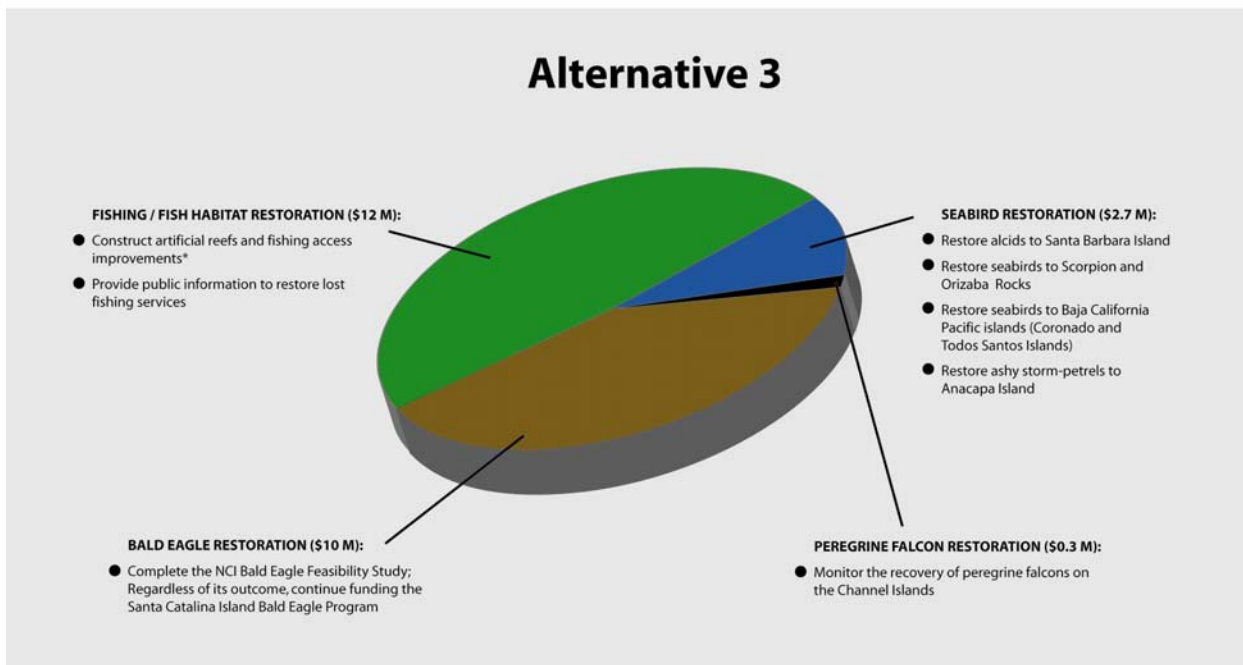
#### **Fishing and Fish Habitat**

Alternative 2 provides for a diverse set of actions that address both the restoration of human uses (fishing services) and the restoration of fish and the habitats on which they depend. The fishing and fish habitat actions for this alternative include:

**Construct artificial reefs and fishing access improvements.** This action funds the construction of reefs to displace the more highly contaminated fish that occupy existing soft-bottom habitats by recruiting and/or producing reef- and water-column-feeding fish that are lower in DDTs and PCBs. This action also provides facility improvements to promote the use of the enhanced fishing sites, to heighten awareness of how habitat affects the concentration of contaminants in different species of fish, and to provide compensatory restoration for past losses in fishing opportunities due to the limitations imposed by fish consumption advisories. This action would effectively address both fishing and fish habitat restoration close to the areas affected by the contaminants of the case.



\* 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 ES-2. Actions and fund allocations in Alternative 2 (Preferred) and Alternative 3.**

**Figure ES-2 BACK**

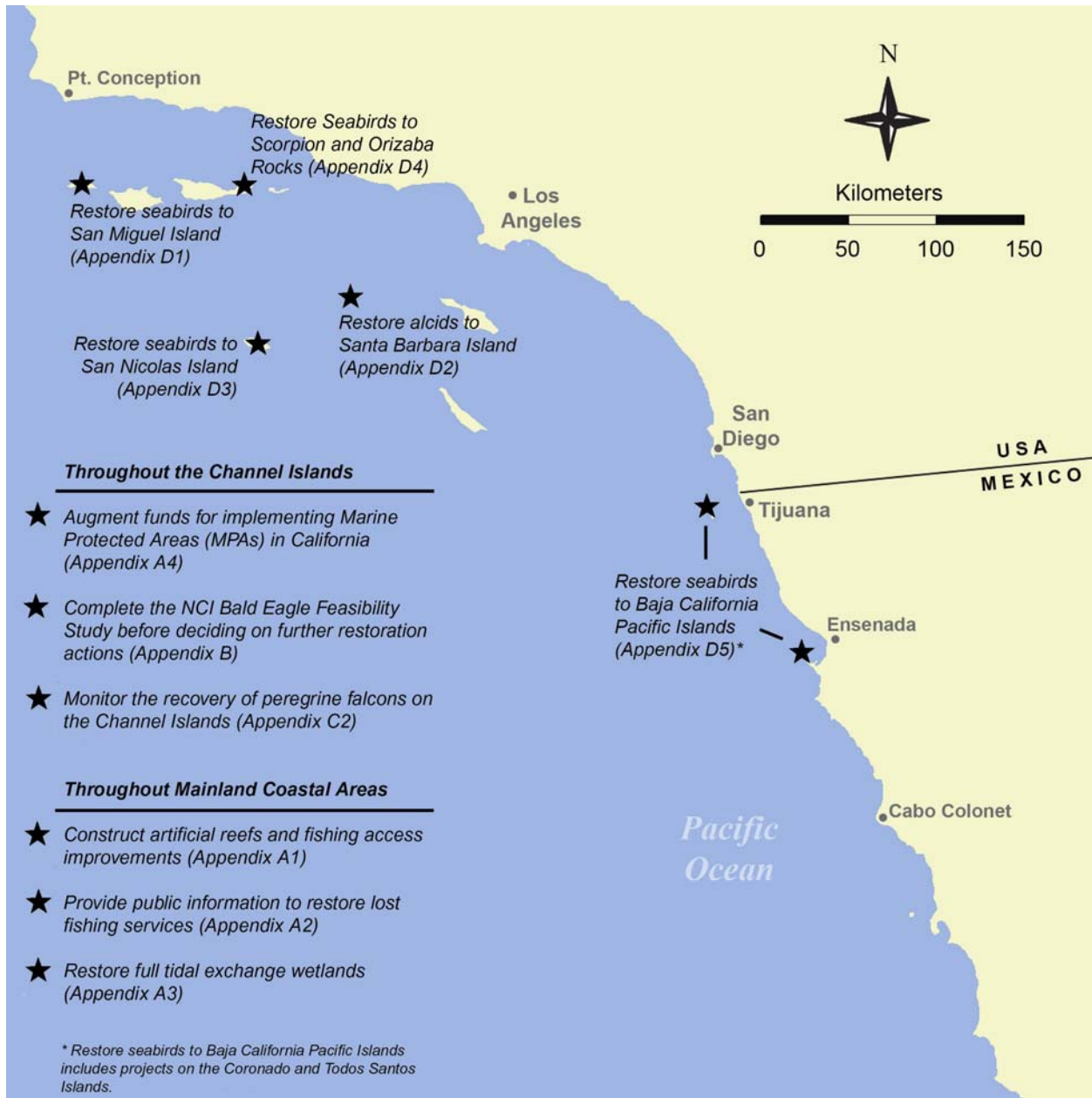


Figure ES-3. Geographic locations of actions included in Alternative 2 (preferred).

- **Provide public information to restore lost fishing services.** This action builds on the public outreach and education work initiated by the EPA through the establishment of the Fish Contamination and Education Collaborative (FCEC). 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 program provides information to help people reduce their exposures to DDTs and PCBs from the fish they eat.

The Trustees will expand this ongoing effort will be 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.

- **Restore full tidal exchange wetlands.** This action seeks out opportunities to contribute funding toward ongoing or planned larger-scale wetland restoration efforts in the Southern California Bight. In particular, restoration projects that involve coastal wetland/estuarine habitats that have direct tidal links to the ocean and serve as nursery habitats for fish, especially species that are targeted by ocean anglers (e.g., California halibut) will be given highest priority.
- **Augment funds for implementing Marine Protected Areas in California.** This action supplements existing management and monitoring activities within the recently created Channel Islands Marine Protected Areas (MPAs). This action provides specific benefits to fish habitats adjacent to the Northern Channel Islands, but this action will also provide longer-term benefits for fishing and fish habitats throughout California by helping to generate sound empirical underpinnings for the siting and design of future networks of MPAs.

### **Bald Eagles**

Efforts to reintroduce bald eagles to Santa Catalina Island, one of the Southern Channel Islands, began in the 1980s; however, even today bald eagles on Santa Catalina Island have high concentrations of DDTs from their diet, produce abnormal eggs, and require continued human intervention (manipulation of eggs and fostering of chicks into their nests) to sustain their presence on the island. Assessments indicate that this situation is likely to persist on Santa Catalina Island for the foreseeable future. The Northern Channel Islands (NCI) Feasibility Study currently under way seeks to determine whether the bald eagles reintroduced onto the Northern Channel Islands (and therefore further from the Montrose contamination source) can be self-sustaining (i.e., reproduce without human intervention). Alternative 2 thus provides for the following:

- **Complete the NCI Bald Eagle Feasibility Study Before Deciding on Further Restoration Actions.** The Trustees will defer making longer-term decisions on bald eagle restoration until the results of the NCI Bald Eagle Feasibility Study are known (in or around 2008). 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 Santa Catalina Island for several years despite their inability to hatch offspring naturally. When the results of the NCI Bald Eagle Feasibility Study become available, 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. The Trustees will then release a subsequent NEPA/CEQA document for public review and input once the results of the NCI Bald Eagle Feasibility Study are known. 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.

### **Peregrine Falcons**

Given that previous peregrine falcon recovery efforts have been successful and that the number of breeding pairs is increasing on the Channel Islands, Alternative 2 provides for the following:

- **Monitor the recovery of peregrine falcons on the Channel Islands.** This action monitors recovering peregrine falcon populations on the Channel Islands through periodic surveys and contaminant analysis.

The Trustees also recognize that peregrine falcons will benefit from seabird restoration actions, as an increase in the numbers of seabirds increases the availability of the preferred prey of peregrine falcons.

### **Seabirds**

Alternative 2 incorporates a diverse set of actions that provide for significant benefits to several species of seabirds. Evidence indicates that the seabird species benefiting from these actions are known to have been injured by DDTs or had elevated levels of DDTs in their eggs. The Trustees have selected those seabird restoration actions that they consider to provide the greatest restoration benefits within the limits of funding. The seabird actions for Alternative 2 include:

- **Restore seabirds to San Miguel Island.** This action enhances seabird nesting habitat on San Miguel Island in the Channel Islands National Park by eradicating the introduced black rat over a period of approximately 5 years.
- **Restore alcids to Santa Barbara Island.** This action re-establishes a once-active Cassin's auklet breeding population and augments Xantus's murrelets on Santa Barbara Island in the Channel Islands National Park through social attraction and habitat enhancement.
- **Restore seabirds to San Nicolas Island.** This action restores the western gull and Brandt's cormorant colonies on the U.S. Navy-owned San Nicolas Island by eradicating feral cats on the island.
- **Restore seabirds to Scorpion and Orizaba Rocks.** This action restores seabird habitat off of Santa Cruz Island, within the Channel Islands National Park, through the removal of non-

native vegetation, the installation of artificial nesting boxes, and reduction in human disturbance.

- **Restore seabirds to Baja California Pacific Islands (Coronado and Todos Santos Islands).** This action restores seabird populations using social attraction, habitat enhancement, and human disturbance reduction.

Having considered the restoration goals and objectives, the current state of recovery of resources, and the continuing presence of contamination, the Trustees believe that Alternative 2 represents an optimal distribution of funding for natural resource restoration across the demonstrated injury types for the purposes of both primary and compensatory restoration.

### Alternative 3

The Trustees developed Alternative 3 through a reconsideration of some of the restoration priorities of the program (Figure ES-2, bottom panel). In this alternative, a greater level of effort is devoted to restoration of continuing injuries and lost services (primary restoration), and consequently the set of actions proposed is less diverse than in Alternative 2 (the Preferred Alternative). Alternative 3 provides for the maintenance of breeding bald eagles in the Channel Islands regardless of the outcome of the NCI Bald Eagle Feasibility Study. Thus, Alternative 3 reserves a greater level of funding for bald eagle restoration to sustain the Santa Catalina Island birds until, and potentially long after, the conclusion of the NCI Bald Eagle Feasibility Study. The funds available for seabird restoration are commensurately reduced.

Alternative 3 also recognizes the continuing human use impacts of fish contamination and state consumption advisories for several commonly caught species of fish and gives restoration of lost fishing services greater emphasis. Actions that benefit fish habitat but do not have as clear and measurable a benefit to anglers are not included.

### SUMMARY

Table ES-1 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. Both Alternative 2 and Alternative 3 allocate \$25 million in restoration funding to cover data gap studies and the initial 5 years of restoration implementation. 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 the human use (fishing) benefits of fish restoration and (2) reserving greater funding for long-term intervention to maintain bald eagles on the Channel Islands despite continuing reproductive injuries. By reserving greater funding for bald eagles, Alternative 3 reduces the funds available for seabird actions. The Trustees' preferred alternative is Alternative 2.



**Table ES-1  
Comparison of Restoration Alternatives**

Potential Restoration Actions	Alternative 1 (No Action)	Alternative 2 (Preferred)*	Alternative 3*
<b>Fishing and Fish Habitat Restoration</b>		\$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>		•	
<b>Bald Eagle Restoration</b>		\$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>			•
<b>Peregrine Falcon Restoration</b>		\$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>			
<b>Seabird Restoration</b>		\$6.5 million	\$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 to Scorpion and Orizaba Rocks</i>		•	•
<i>Restore seabirds to Baja California Pacific Islands</i>			
<ul style="list-style-type: none"> <li>• <i>Coronado and Todos Santos Islands</i></li> <li>• <i>Guadalupe Island</i></li> <li>• <i>San Jeronimo and San Martin Islands</i></li> <li>• <i>San Benitos Islands</i></li> <li>• <i>Asuncion and San Roque Islands</i></li> <li>• <i>Natividad Island</i></li> </ul>		• (Coronado and Todos Santos Islands)	• (Coronado and Todos Santos Islands)
<i>Create/enhance/protect California brown pelican roost habitat</i>			
<i>Implement entanglement reduction and outreach program to protect seabird populations</i>			
<i>Restore ash 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.

## ENVIRONMENTAL CONSEQUENCES

The NEPA and CEQA analyses of the environmental consequences of the Montrose Settlements Restoration Program and the restoration alternatives are presented in Section 7. Expanded discussions of the individual actions are provided in Appendices A–D. The environmental effects of the MSRP will be largely beneficial given its fundamental purpose; however, final analysis of all issues cannot be completed, given that certain actions, such as the construction of artificial reefs, are only developed to a conceptual level at this stage. The Trustees have identified seven of the 17 actions evaluated in Tier 2 that will need further development and subsequent NEPA and/or CEQA analyses prior to implementation. These actions are:

- Construct artificial reefs and fishing access improvements

- Restore full tidal exchange wetlands
- Complete the NCI Bald Eagle Feasibility Study Before Deciding on Further Restoration Actions
- Restore peregrine falcons to the Channel Islands
- Restore seabirds to San Miguel Island
- Restore seabirds to San Nicolas Island
- Create/enhance/protect California brown pelican roost habitat

### PUBLIC INVOLVEMENT

The NEPA, CEQA, and CERCLA requirements that guide the restoration planning process require significant public involvement to support and direct the planning process. Public involvement for the MSRP Restoration Plan and Programmatic EIS/EIR was initiated through a scoping document released on August 24, 2001, which included notices of public meetings to discuss restoration planning. The document was disseminated to approximately 500 recipients, including individuals, organizations, and government agencies, and was posted to the program Web site. The Trustees also advertised the upcoming public meetings in local and area newspapers. The scoping document was followed by the publication of a Federal Register notice on October 9, 2001. The official public scoping period extended from October 9, 2001, to November 24, 2001.

In addition to the notice published in the Federal Register, the Trustees published a Notice of Preparation in the California State Clearinghouse on March 15, 2002. This established a second 30-day comment period, which extended from March 15, 2002, to April 15, 2002.

Since the close of the official scoping period, the Trustees have maintained open channels of communication with the public, other organizations, and government agencies. As planning progressed, the Trustees initiated a second round of technical and public workshops to encourage roundtable review of the draft restoration program goals and objectives as well as the screening criteria and to solicit restoration project ideas. These workshops were followed by a March 17, 2003, public announcement further soliciting restoration ideas that was disseminated to the mailing list.

The Trustees then released the draft MSRP Restoration Plan and programmatic EIS/EIR for a 45-day comment period from April 8, 2005, to May 23, 2005. During this time, a series of public meetings were held in affected locations to accept comments on the draft document. The Trustees received many comments spanning all aspects of the draft Restoration Plan. These comments served to enhance the final version. A full copy of the written comments as well as transcripts from the public meetings and transcripts from telephone comments has been included in the MSRP Administrative Record and is available online at [www.montroserestoration.gov](http://www.montroserestoration.gov). The Trustees' responses to comments are included in Section 9 of this plan.

The public is encouraged to follow the MSRP planning and implementation process by accessing the program web site at [www.montroserestoration.gov](http://www.montroserestoration.gov) or by contacting program staff at:

Montrose Settlements Restoration Program  
501 W. Ocean Blvd, Suite 4470

Long Beach, CA 90802  
(562) 980-3236  
msrp@noaa.gov

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Figure 1-1. Geographic extent of the Southern California Bight

## **1.1 PROPOSED ACTION: IMPLEMENT PROJECTS THAT RESTORE NATURAL RESOURCES INJURED AND SERVICES LOST DUE TO DDTs AND PCBs DISCHARGED TO COASTAL WATERS OF SOUTHERN CALIFORNIA**

For more than five decades, DDTs and PCBs have contaminated the Southern California marine environment. Although the major point source discharges of these chemicals were curtailed in the 1970s, large amounts of DDTs and PCBs persist in ocean water and sediments, and certain fish, birds, and other wildlife continue to accumulate DDTs and PCBs in harmful amounts. The state and federal governments investigated these problems and in 1990 filed an action in U.S. District Court against several of the parties responsible for the discharges of DDTs and PCBs.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or “Superfund,” Title 42 United States Code [U.S.C.] Section 9601 et seq.) provides a mechanism for addressing the nation’s hazardous waste sites: states and the federal government may sue polluters for the cleanup and restoration of sites. CERCLA provides for the designation of “natural resource trustees,” who are federal, state, or tribal authorities who represent the public interest in natural resources. These trustees may seek monetary damages from polluters for injury, destruction, or loss of natural resources resulting from releases of hazardous substances. These damages, which are distinct from cleanup costs, must be used by the natural resource trustees to “restore, replace, rehabilitate, or acquire the equivalent of” the natural resources that have been injured.

At the end of October 2000, after ten years of litigation, the federal and state governments and the remaining defendants signed the last of a series of settlements. The court approved the final settlement in March 2001. Under the terms of the four separate settlement agreements, Montrose Chemical Corporation and the other defendants<sup>1</sup> agreed to pay \$140.2 million plus interest to the federal and state governments. Of this amount, the U.S. Environmental Protection Agency (EPA) and the California Department of Toxic Substances Control (DTSC) received a total of \$66.25 million; the Natural Resource Trustees for the Montrose case (Trustees)<sup>2</sup> received \$63.95 million; and \$10 million was set aside in a special account (swing money).<sup>3</sup> The EPA and DTSC are using their recovery funds to address the contaminated sediments offshore and for institutional controls. The Trustees have used \$35 million to reimburse past damage assessment costs and are using the remainder plus the accumulated interest to plan and implement the actions necessary to restore the natural resources and their services<sup>4</sup> that were injured by the DDTs and PCBs. Further discussion regarding the current balances and the proposed allocation of restoration funds can be found in Section 6.3.2.

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<sup>1</sup> The other defendants were Aventis CropScience USA, Inc. (formerly Rhone-Poulenc, Inc., and corporate successor to Stauffer Chemical Company); Chris-Craft Industries, Inc.; Atkemix Thirty-Seven, Inc.; CBS Corporation (formerly Westinghouse Electric Corp.); Potlatch Corporation; Simpson Paper Company; and County Sanitation District No. 2 of Los Angeles County, and 150+ local governmental entities.

<sup>2</sup> The Trustees for the Montrose case are the National Oceanic and Atmospheric Administration, the U.S. Fish and Wildlife Service, the National Park Service, the California Department of Fish and Game, the California Department of Parks and Recreation, and the California State Lands Commission.

<sup>3</sup> The swing money goes to the Natural Resource Trustees in the event that EPA makes a decision not to select any in situ response or remedial action for the Palos Verdes Shelf.

<sup>4</sup> The “services” that a natural resource provides are the functions performed by a natural resource for the benefit of another natural resource and/or the public.

Once the case was settled, the Trustees established the Montrose Settlements Restoration Program (MSRP) to plan and conduct the natural resource restoration work called for under the settlement agreements. To satisfy the requirements of the National Environmental Policy Act (NEPA) (42 U.S.C. Section 4321 et seq.) and the California Environmental Quality Act (CEQA) (Public Resources Code Parts 21000–21178.1), the Trustees are combining the restoration planning process provided for under CERCLA with the development of a programmatic Environmental Impact Statement (EIS) and an Environmental Impact Report (EIR).

This document is the Restoration Plan and programmatic EIS/EIR for the Montrose Settlements Restoration Program. The Restoration Plan has incorporated public and professional opinion to develop, evaluate, and select specific actions to restore injured resources and the lost services that the natural resources provide. Some actions will be initiated in the near-term. Other actions have been selected conditionally, because they must await the outcome of further study, testing, and public review prior to final selection and implementation. Thus the Restoration Plan has a range of selected restoration actions that together will form the basis of a comprehensive plan to restore the natural resources and services affected by the DDTs and PCBs at issue in this case.

This document will guide the MSRP restoration effort as a whole, as well as the specific restoration actions selected for near-term implementation. Thus, this Restoration Plan establishes a process for adaptive decision-making, and future NEPA and CEQA documentation will incorporate by reference (or in the terminology of NEPA “tier off of”) this programmatic EIS/EIR.

## **1.2 NEED FOR THE ACTION: DDT AND PCB CONTAMINATION AND NATURAL RESOURCE INJURIES IN THE SOUTHERN CALIFORNIA BIGHT**

From the late 1940s to the early 1970s, Los Angeles area industries discharged approximately 2,000 metric tons (about 2,200 U.S. tons) of DDTs and PCBs into the ocean waters off the Southern California coast. Almost all of the DDTs released to the Southern California marine environment originated from the Montrose Chemical Corporation (Montrose) manufacturing plant in Torrance, California. The Montrose plant discharged waste into the Los Angeles County Sanitation Districts (LACSD) sewer collection system. Wastewater treatment methods employed at that time did not capture the DDTs prior to their discharge through ocean outfall pipes that empty into the Pacific Ocean off of White Point on the Palos Verdes Shelf. Montrose also dumped DDT-contaminated waste from barges into deep ocean waters in the San Pedro Basin near and possibly en route to Santa Catalina Island. In addition, large quantities of PCBs from numerous sources throughout the Los Angeles Basin were released into ocean waters through the LACSD and City of Los Angeles wastewater outfalls and the regional storm drain systems. Although DDTs were also released into the Southern California Bight through agricultural runoff and atmospheric deposition, these sources were found to be insignificant in comparison to the Montrose discharges.

In 1992 and 1993, surveys by the U.S. Geological Survey (Lee et al. 2002) found that more than 100 metric tons (110 U.S. tons) of DDTs and 10 metric tons (11 U.S. tons) of PCBs still remained in the sediments on the ocean bottom of the Palos Verdes Shelf. The highest concentrations of DDTs and PCBs were centered near the ends of the White Point outfalls, ranging between water depths of 40 to 80 meters (130 to 260 feet). Surveys conducted as part of the Southern California Bight 1994 Pilot Project (Schiff and Gossett 1998) showed that elevated

concentrations of DDTs and PCBs in bottom sediments extended beyond the Palos Verdes Shelf into Santa Monica Bay and were also present in Los Angeles and Long Beach Harbors. The discharge and fate of these chemicals in the Southern California Bight is further described in Section 2 of this Restoration Plan.

### 1.2.1 Geographic Target Area

The geographic focus of the Trustees' natural resource damage assessment and restoration efforts is the marine region bordering the Southern California mainland known as the Southern California Bight (SCB) (Figure 1-1). For the purposes of the Restoration Plan, the SCB is defined as the area between Point Conception (north), Cabo Colonet, located south of Ensenada, Mexico (south), outside of the Cortez and Tanner Banks (west), and coastal watersheds (east). The SCB includes the Northern and Southern Channel Islands and surrounding waters.

The SCB is a unique, discrete marine ecosystem. Although the SCB has been significantly affected by human activities, it has numerous environmental restoration, preservation, and enhancement opportunities. The SCB has been studied extensively at the ecosystem level, and a large body of data is available to evaluate environmental issues at both the local and the regional levels.

The portion of the SCB known as the Palos Verdes Shelf is located off the Palos Verdes peninsula, which separates Santa Monica Bay and San Pedro Bay. The Palos Verdes Shelf is generally defined as the offshore area extending from Point Vicente in the northwest to Point Fermin in the southeast. This sub-region contains the most significant deposits of DDTs and PCBs in sediments from historical discharges and is also the focus of Superfund cleanup activities by the EPA. However, DDTs and PCBs have come to be distributed over a wide region (through movement of sediments, water, and uptake by mobile biological organisms) beyond the immediate area of the Palos Verdes Shelf. Also, as further described in Section 2, the natural resource injuries and lost services caused by the DDTs and PCBs discharged by the defendants have occurred over a broader area of the SCB. For this reason, the SCB, rather than just the Palos Verdes Shelf, forms the primary geographic area of focus for the Trustees' natural resource restoration actions.

### 1.2.2 Overview of Injuries to Natural Resources

Numerous independent studies have shown that DDTs and PCBs are still found at harmful levels in the marine life and birds of Southern California (e.g., Hickey and Anderson 1968, Risebrough et al. 1971, Gress et al. 1973, Lee and Wiberg 2002). During the Montrose litigation, the Trustees carefully evaluated the evidence of injury to a number of resources. From this evaluation, the Trustees narrowed their claim at trial to focus on (1) reproductive problems in bald eagles and peregrine falcons and (2) PCB/DDT contamination of fish that resulted in a commercial fishing ban and fish consumption advisories. Although the Trustees recognized that DDTs had adversely affected a variety of other species in the past, notably California brown pelicans and double-crested cormorants, the priority was to focus the trial and the damages claim on those injuries that were continuing.

DDTs and PCBs degrade slowly in the environment and biomagnify (become more concentrated) in animals at higher levels in the food web. When feeding on prey contaminated with DDTs and PCBs, animals at the top of the food web, such as bald eagles and peregrine



**Figure 1-1. Geographic extent of the Southern California Bight.**



falcons, can accumulate injurious concentrations of these chemicals, even when levels in the water column appear to be very low. DDTs in particular cause these birds to produce eggs with shells that are so thin that they break when the adults sit on them during incubation, or allow the developing embryos to dry out.

Many common sport fish caught from the ocean in the Los Angeles area (eight species or species groups) have levels of DDTs high enough that the State of California has issued fish consumption advisories, which are recommendations that people limit or avoid consumption of certain fish. A number of these sports fish also have concentrations of PCBs high enough to be of concern for human consumption. Consequently, the State of California has issued health advisories to limit or avoid consumption of these fish when caught at certain coastal locations in Los Angeles and Orange Counties. In addition, because of especially high levels of DDTs and PCBs in the white croaker, the State of California has imposed bag limits for this fish and has banned commercial fishing for white croaker in the vicinity of the Palos Verdes Shelf.

### 1.2.3 Coordination with Cleanup Actions

In addition to the Trustees' natural resource restoration efforts, the EPA and the DTSC are using a part of the settlement funds to attempt to reduce ongoing exposure to DDTs and PCBs. For example, these agencies are considering covering the contaminated sediments with clean sediments and conducting additional efforts to reduce public consumption and prevent commercial catch of contaminated fish. The selection, design, and implementation of EPA actions to remediate contaminated sediments are likely to take five years or more. (More information on these agencies' activities in this regard may be found by contacting the EPA at (800) 231-3075 or [www.epa.gov/region9/features/pvshelf](http://www.epa.gov/region9/features/pvshelf).)

If instituted, cleanup options under evaluation by the EPA would in theory minimize trophic transfer of DDT and PCB contamination in the local ecosystem; however, at present it appears not to be feasible to clean up all of the area contaminated with DDTs and PCBs. The studies conducted for the Trustees have indicated that the reservoir of DDTs and PCBs in the bottom sediments on the Palos Verdes Shelf and surrounding areas will likely continue to contaminate and injure marine life and birds over a large area of the SCB for many years to come. Thus, the selection and design of restoration actions must take into account the likelihood of long-term effects from the remaining DDTs and PCBs in the coastal food web.

## 1.3 PURPOSE OF THE ACTION: RESTORE INJURED NATURAL RESOURCES AND LOST SERVICES

The Trustees propose to undertake actions aimed at restoring key species and services to their baseline condition (i.e., the condition that would exist if the releases of DDTs and PCBs had not occurred). The Trustees further propose to undertake additional natural resource restoration actions to compensate the public for the lost use of injured natural resources from December 1980 (when CERCLA provisions became effective) until the time when those injured resources have recovered to as close to baseline as possible given available restoration funds. These actions are referred to as compensatory restoration. One key criterion in the planning of compensatory restoration is that the restoration approaches benefit the same or similar natural resources as those that sustained injury as a result of the DDT or PCB releases addressed in Montrose case. Restoration actions implemented under this plan would thereby accelerate recovery of the injured

natural resources and the services they provide and provide compensation for the interim losses of resources and services.<sup>5</sup>

To accomplish these restoration objectives, the Trustees will implement a series of actions directed at a range of natural resources and services. The settlement agreements call for the Trustees to use settlement funds to restore, replace, or acquire the equivalent of the injured natural resources and/or the services provided by such resources. The final consent decree for the Montrose case further specifies that “[t]he 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” (page 5, lines 18–22).

In keeping with the settlement agreements and the laws and regulations governing natural resource damage assessment and restoration, the Trustees will target the following natural resource restoration actions: (1) primary restoration of specific natural resources still being injured by DDTs and PCBs (i.e., the bald eagle and peregrine falcon populations that historically inhabited the Channel Islands); (2) primary restoration/replacement of human use services that continue to be harmed (i.e., the public’s ability to fish for clean fish where certain marine species are contaminated to levels that have prompted the State of California to issue consumption advisories); and (3) compensatory restoration of these resources and services as well as the seabirds and their habitats and the fish and their habitats for which there is evidence of past harm from DDTs or PCBs.

As an overarching element of the restoration program, the Trustees will conduct active public outreach and education aimed at informing and engaging the public on ways to participate in, benefit from, and enhance the restoration of the environment injured by the DDTs and PCBs that were the subject of these settlements. The Trustees will also continue to undertake a limited amount of study and research to ensure that the restoration actions ultimately taken represent an efficient and effective use of settlement funds and maximize benefits to natural resources and their services.

Section 2 provides the background and context necessary for understanding the natural resource restoration planning process for the MSRP.

## 1.4 PUBLIC INVOLVEMENT

As mentioned above, the restoration planning process is guided by NEPA and CEQA regulations. These regulations require significant public involvement to support and direct the planning process. Public review is an integral component of the MSRP. Public involvement was initiated through a scoping document released on August 24, 2001, which included notices of public meetings to discuss restoration planning. The document was disseminated to

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<sup>5</sup> Under the CERCLA regulatory framework, natural resource damages may include, “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). In the Montrose settlements, no distinction was made between settlement funds for primary restoration and settlement funds for compensatory restoration. As a result, the Trustees will use this planning process to develop an appropriate mix of primary and compensatory restoration activities that will be conducted using the settlement funds.

approximately 500 recipients, including individuals, organizations, and government agencies, and was posted to the program web site. The Trustees also advertised the upcoming public meetings in local and area newspapers. The scoping document was followed by the publication of a Federal Register notice on October 9, 2001. The official public scoping period extended from October 9, 2001, to November 24, 2002.

The locations and dates of the MSRP public scoping meetings were as follows:

- **October 13, 2001:** Channel Islands National Park Headquarters  
Ventura, CA
- **October 21, 2001:** Cabrillo Sea Fair  
Cabrillo Marine Aquarium  
San Pedro, CA
- **November 1, 2001:** Ken Edwards Center  
Santa Monica, CA

In addition to the notice published in the Federal Register, the Trustees published a Notice of Preparation in the California State Clearinghouse on March 15, 2002. This established a second 30-day comment period, which extended from March 15, 2002, to April 15, 2002.

After the close of the official scoping period, the Trustees maintained open channels of communication with the public, other organizations, and government agencies. As the planning progressed, the Trustees initiated a second round of technical and public workshops to encourage roundtable review of the draft restoration program goals and objectives as well as the screening criteria and to solicit restoration project ideas. The locations and dates of the MSRP workshops were as follows:

- **January 9, 2003:** **Bird Technical Workshop**  
U.S. Fish and Wildlife Service Sacramento Office  
Sacramento, CA
- **January 22, 2003:** **Fish Technical Workshop**  
Long Beach Federal Building  
Long Beach, CA
- **January 27, 2003:** **Public Workshops**  
Cabrillo Marine Aquarium  
San Pedro, CA  
(Two sessions: morning and evening)

These workshops were followed by a March 17, 2003, public announcement further soliciting restoration ideas that was disseminated to the mailing list.

MSRP representatives also attend local and area outreach events to increase awareness of the project and the restoration planning process. Periodic updates and notices are disseminated through the MSRP mailing list, and updates are always available at the MSRP web site: [www.montroserestoration.gov](http://www.montroserestoration.gov).

On April 8, 2005, the Trustees released the draft Restoration Plan and programmatic EIS/EIR for public review and comment. A 45-day comment period was provided, which ran through May 23, 2005. During this time, four public meetings were conducted in affected locations to accept

comments on the draft Restoration Plan. The locations and dates of these public meetings were as follows:

- **Saturday, April 23, 2005:** 1:00 p.m.–3:00 p.m.  
Cabrillo Marine Aquarium  
John M. Olguin Auditorium  
3720 Stephen White Dr.  
San Pedro, CA 90731
  
- **Sunday, April 24, 2005:** 5:00 p.m.–7:00 p.m.  
Long Beach Aquarium of the Pacific  
Honda Theater  
100 Aquarium Way  
Long Beach, CA 90802
  
- **Thursday, April 28, 2005:** 10:00 a.m.–12:00 p.m.  
Long Beach Federal Building  
501 W. Ocean Blvd.  
Suite 3470  
Long Beach, CA 90802
  
- **Monday, May 9, 2005:** 7:00 p.m.–9:00 p.m.  
Channel Islands National Park  
Visitor Center Auditorium  
1901 Spinnaker Dr.  
Ventura, CA 93001

The MSRP sought comments on the individual restoration actions, the evaluation criteria, the restoration alternatives (including the proposed allocation of restoration funds across the different actions and categories of resources), and other aspects of the draft plan. Numerous comments were received. Section 9 of this plan summarizes the comments received and presents the Trustees' responses to the comments.

The public is encouraged to follow the MSRP restoration implementation process by accessing the program web site at [www.montrosere restoration.gov](http://www.montrosere restoration.gov), by contacting program staff at (562) 980-3236, or by e-mailing staff at [msrp@noaa.gov](mailto:msrp@noaa.gov).

## 1.5 ADMINISTRATIVE RECORD

The Trustees have opened an Administrative Record (Record) for restoration activities. The Record includes documents relied on by the Trustees during the restoration planning performed in connection with the release of DDTs and PCBs in the Southern California Bight.

The Record is on file at the MSRP Long Beach office. Arrangements may be made to review the Record by contacting:

Trina Heard  
501 W. Ocean Blvd., Suite 4470  
Long Beach, CA 90802  
(562) 980-4070

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During the 1960s and 1970s, scientists began investigating observations of dramatic declines in marine-associated bird populations in Southern California and observations of tumors and fin rot in local marine fish. Although the causes were at first unknown, researchers began examining associations between elevated DDT concentrations in fish and California brown pelican eggs collected from the Southern California Bight (SCB) and observed adverse effects such as eggshell thinning and other abnormalities.

In the same period the federal and state governments instituted more stringent environmental requirements, including mandates to monitor for a broader range of toxic chemicals in wastewater discharges. Thus, a large body of new data on contaminants and their effects on marine life began to develop in the 1960s and 1970s.

By the mid-1980s, the National Oceanic and Atmospheric Administration (NOAA) began collecting and reviewing information on extremely high levels of DDTs and PCBs in the SCB. These contaminants occurred at several levels of the local ecosystem, including sediments, fish, marine mammals and birds. Information available at that time reported adverse effects on natural resources, including reproductive abnormalities in birds and concentrations of DDTs and PCBs in fish that exceeded the guidelines set by the Food and Drug Administration for interstate commerce. The State of California had already issued advisories that warned about the consumption of fish caught locally. On the basis of this information, NOAA issued an initial report in 1989, called the Pre-Assessment Screen. It concluded that the concentrations and quantities of DDTs and PCBs were sufficient to have the potential to cause injury to natural resources and announced that the agency would begin a natural resource damage assessment. Soon thereafter other federal and state agencies with natural resource trustee responsibilities joined in the damage assessment efforts.

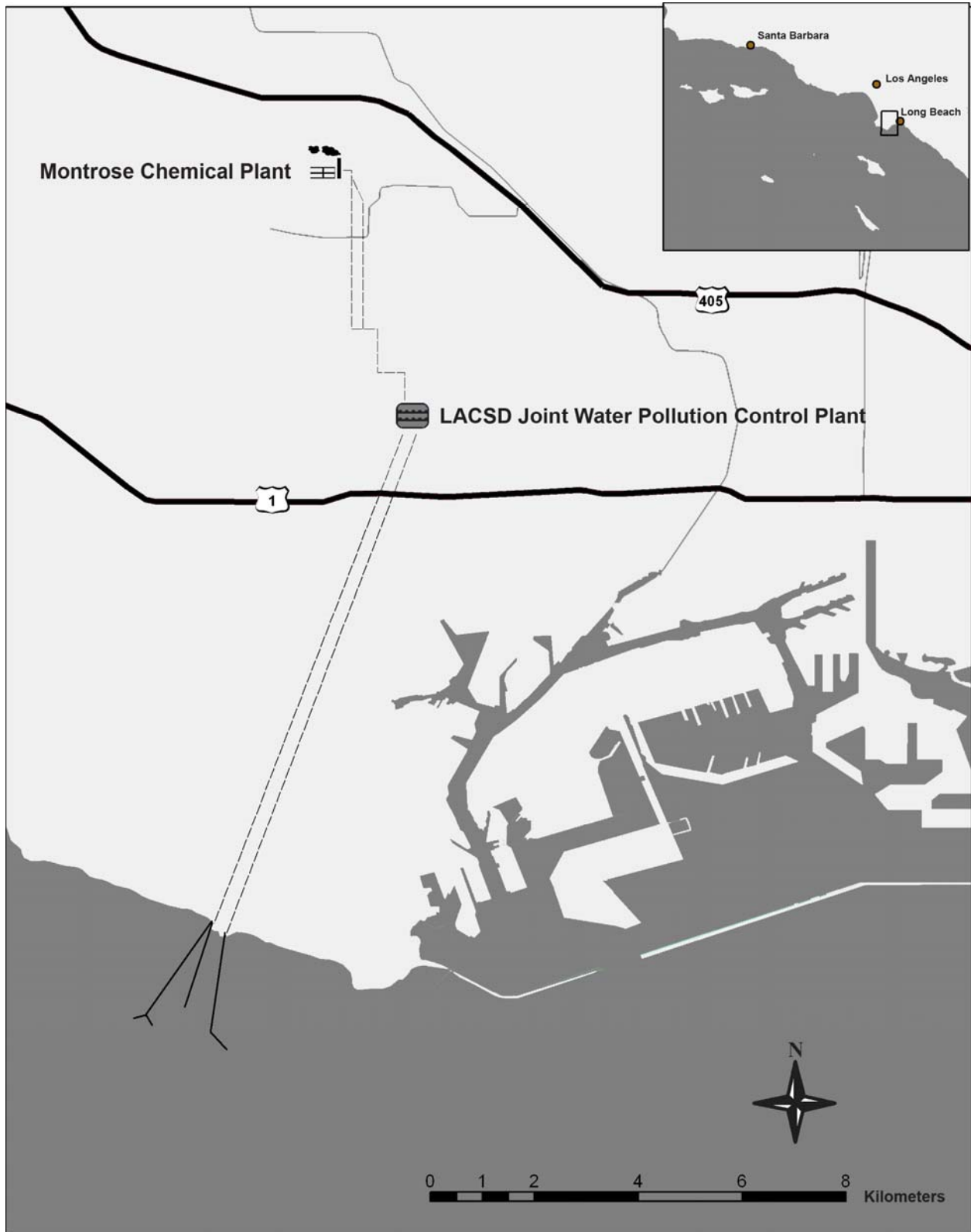
The following sections provide a more detailed background on the natural resource damage assessment, the nature of the injuries to natural resources that the Natural Resource Trustees for the Montrose case (Trustees) asserted were caused by the DDTs and PCBs at issue in the case, the litigation, and the resulting settlements. An understanding of the Trustees' damage assessment case and the legal settlements establishes the context of and the limitations on the uses of settlement funds for natural resource restoration.

## **2.1 RELEASES OF DDTs AND PCBs INTO THE SOUTHERN CALIFORNIA BIGHT**

Historically, DDTs and PCBs have been released to the Southern California marine environment through four different routes: (1) direct discharge to the ocean via public wastewater outfalls; (2) ocean dumping of wastes; (3) surface runoff, including runoff collected by storm drains; and (4) atmospheric transport and deposition. As discussed below, the most significant of these routes for releases of both DDTs and PCBs was the wastewater discharged through the Los Angeles County Sanitation Districts (LACSD) ocean outfalls near White Point on the Palos Verdes Shelf.

### **2.1.1 DDTs**

The Montrose Chemical Corporation (Montrose) manufactured the pesticide DDT (referred to in this report as *DDTs* since the pesticide is not just one chemical but a mixture of several) at its facility located at 20201 South Normandie Avenue in Los Angeles, about 10 kilometers (6 miles) north of Los Angeles Harbor in Los Angeles County (Figure 2-1). The Montrose facility



**Figure 2-1. Location of Montrose plant, LACSD Joint Water Pollution Control Plant, and outfalls.**

manufactured DDTs from 1947 to 1982. It was the only producer of DDTs in Southern California, and for much of that time it was the largest manufacturer of DDTs in the United States (NOAA et al. 1991). Although the sale of DDTs was banned in the United States in 1972, the Montrose facility continued to manufacture DDTs for export until 1982, when the plant was closed and its facilities dismantled (Metcalf and Eddy 1986, NOAA et al. 1991).

The Montrose plant's discharge was permitted by the City of Los Angeles. The releases of industrial waste containing DDTs from the Montrose plant entered the LACSD sewer collection system, which discharged the contaminants through the LACSD Joint Water Pollution Control Plant (JWPCP) outfalls offshore of White Point beginning in 1953. In the late 1960s and early 1970s, LACSD conducted an investigation of sources of DDTs and PCBs that were entering the sewer system. LACSD identified the Montrose facility as the sole major source of DDTs to its sewer system, and estimated that the discharge from the Montrose plant was contributing 654 pounds (about 300 kilograms) of DDTs per day to the LACSD system (Summers et al. 1988). Chartrand et al. (1985) estimated that 1,800 metric tons (about 2,000 U.S. tons) of DDTs were discharged from these outfalls into the Southern California Bight from 1953 to 1970.

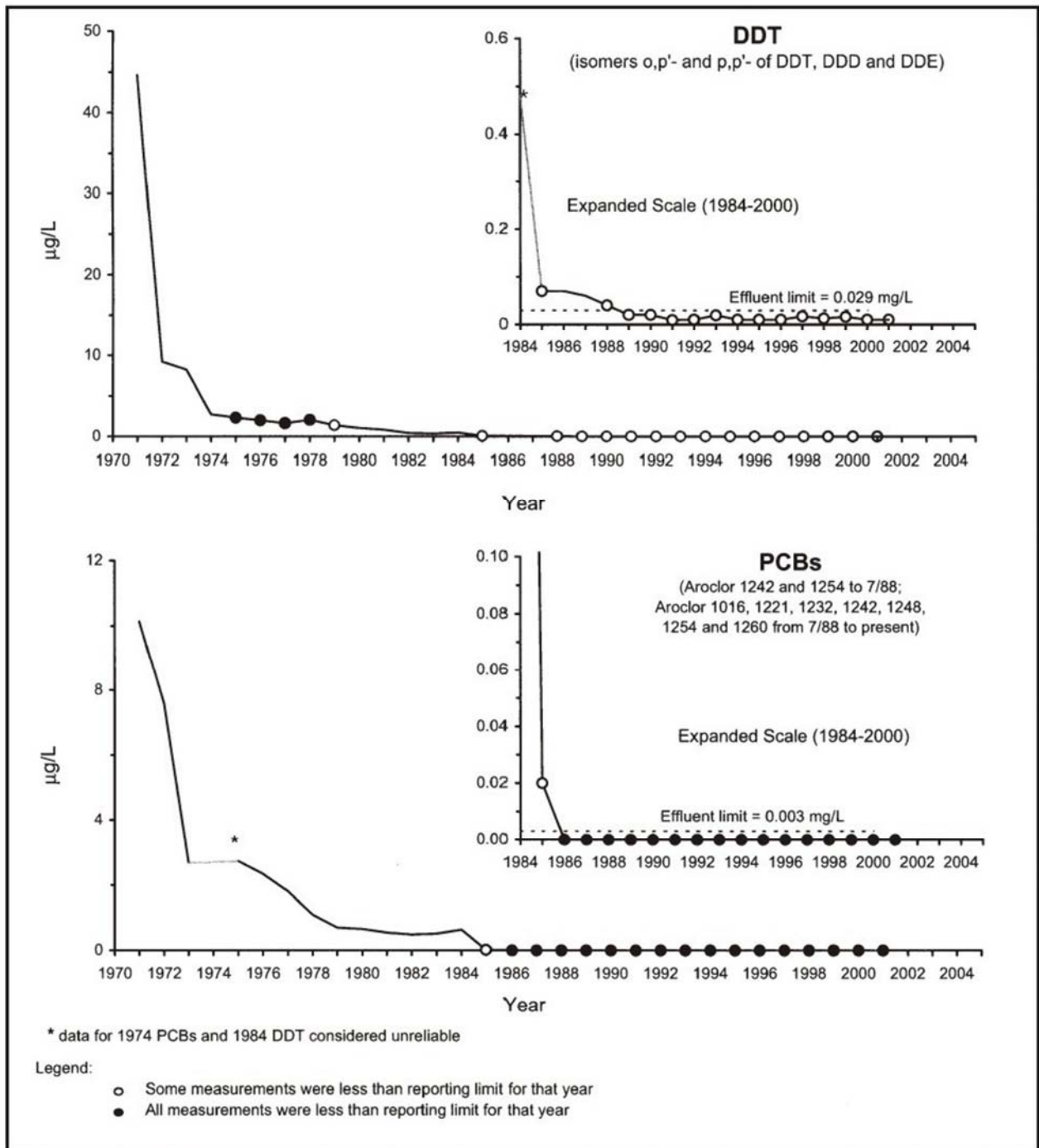
Although the Montrose facility stopped discharging to the LACSD sewer system in 1971, when its permit was revoked, residual DDTs remained in the sewer system and outfalls for some time thereafter. Annual mass emissions of residual DDTs from the outfall pipes decreased rapidly from 10 metric tons (11 U.S. tons) in 1971 to 1 metric ton (1.1 U.S. ton) in 1974 and then more gradually to 0.2 metric tons (0.22 U.S. tons) in 1984 (NOAA et al. 1991). Similarly, DDT concentrations dropped from 45 parts per billion (ppb) in 1971 to about 3 ppb in 1974, and were near zero after 1984 (LACSD 2002) (Figure 2-2).

To provide a perspective on the magnitude of the Montrose DDT discharges, MacGregor (1974) compared the Montrose DDT discharges to other estimates of organochlorine (pesticide) discharges into the marine environment and found that the amount discharged annually from the JWPCP outfall into the SCB in the late 1960s was about 10 times the amount of chlorinated pesticides estimated to be carried into the Gulf of Mexico each year by the Mississippi River at that time.

In addition to discharges from the JWPCP outfalls, DDTs were also released to the SCB through direct ocean dumping of acid sludge that originated from the Montrose facility. It is estimated that between 1947 and 1961, acid sludge containing 350 to 700 metric tons of DDTs were dumped into the San Pedro Basin off of Santa Catalina Island by the California Salvage Company (Chartrand et al. 1985, MBC 1988). The barrels were punctured at sea to make them sink; this procedure undoubtedly released large amounts of DDTs to surface waters (NOAA et al. 1991). The locations of the two dump sites are shown on Figure 2-3.

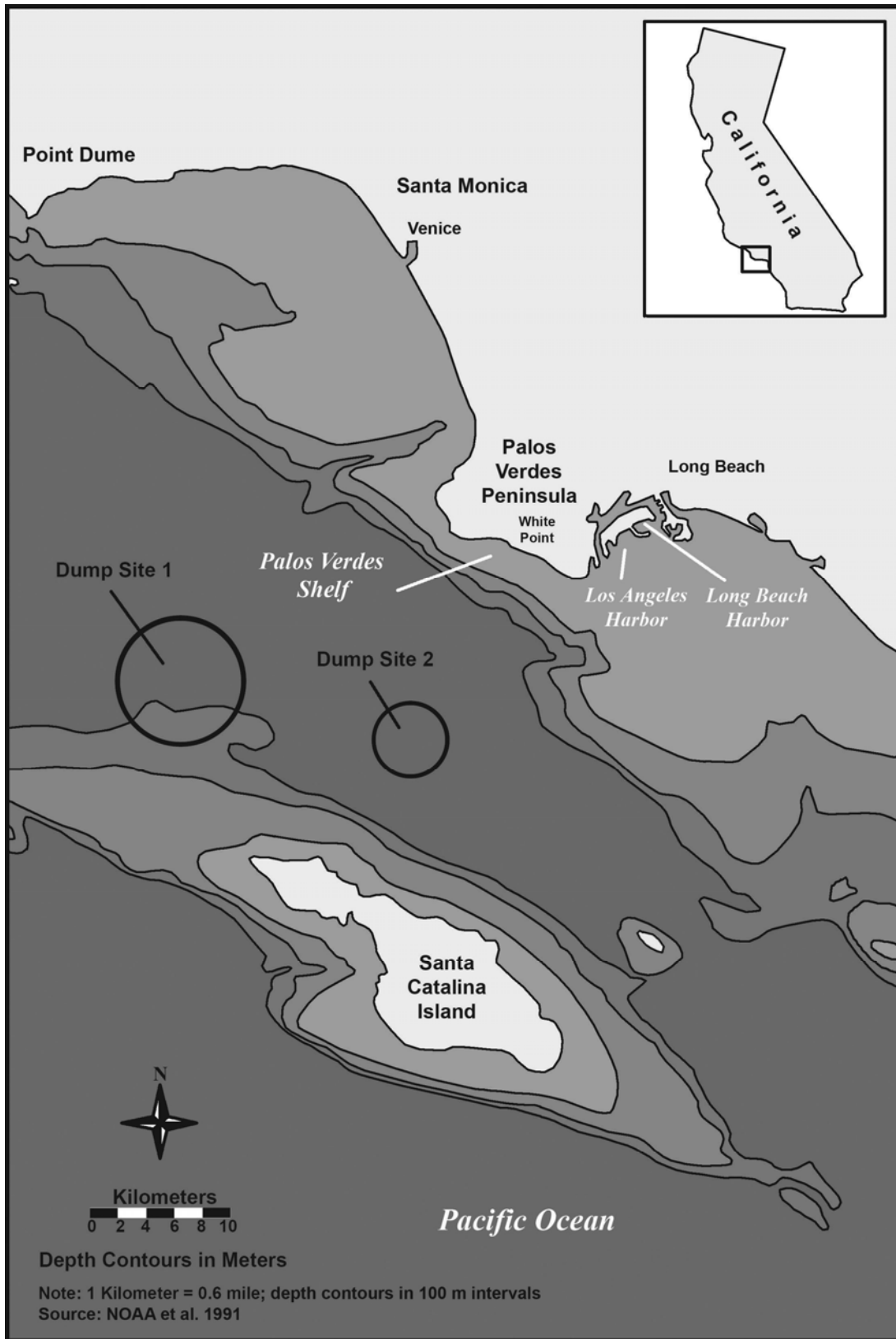
DDTs were also released from the contaminated soils and facilities at the Montrose plant through release of DDT dust generated by plant activities. An estimated 1.3 metric tons (1.4 U.S. tons) of DDTs were deposited by atmospheric transport into the coastal ocean waters off of Southern California during 1973–1974 (Young et al. 1976). DDTs were also released from the Montrose plant through surface water runoff. Contaminated surface waters collected from the site were transported via storm drains into the Dominguez Channel and from there into the Consolidated Slip in Los Angeles Harbor.





Source: LACSD 2002

**Figure 2-2. Concentrations of effluent constituents discharged to the ocean off Palos Verdes, 1971–2001.**



**Figure 2-3. Palos Verdes Shelf, Los Angeles Harbor, Long Beach Harbor, and Dump Sites 1 & 2**

### 2.1.2 PCBs

PCBs have been found in the Southern California marine environment since the late 1930s, with peak inputs into the SCB from 1965 to 1970 (Horn et al. 1974, Mearns et al. 1988). Similar to DDTs, PCBs were released by discharge through municipal wastewater outfalls, surface runoff, and atmospheric transport. PCB contamination was also documented at Dump Sites 1 and 2, but the specific PCB sources for the dump sites have not been identified (Lyons 1989, NOAA et al. 1991) (Figure 2-3).

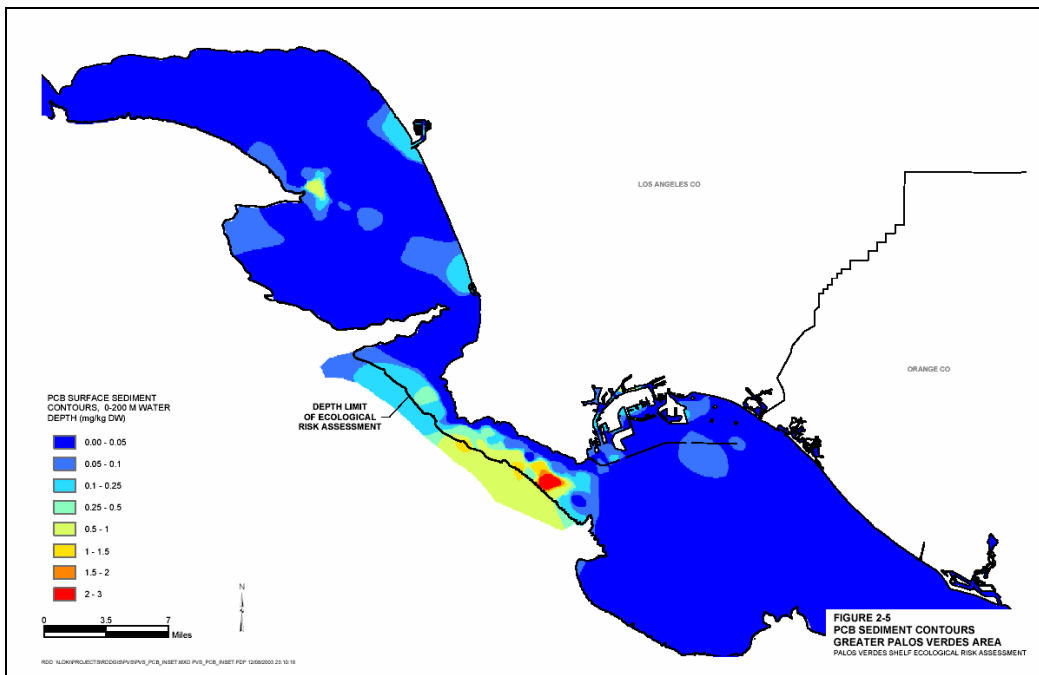
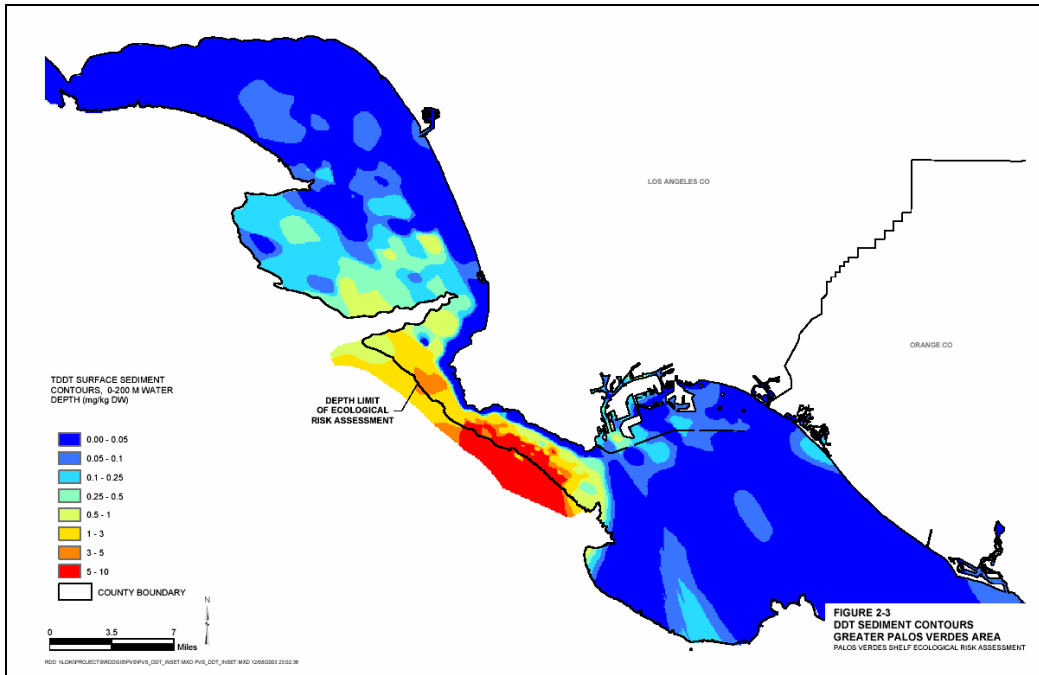
The LACSD wastewater outfalls on the Palos Verdes Shelf were the principal sources of releases of PCBs to the SCB (Young and Heeson 1980, NOAA et al. 1991). Concentrations of PCBs in the effluent from LACSD's JWPCP reached 10 ppb by 1971 (LACSD 2001), with annual mass emissions in 1972 exceeding 116 metric tons (NOAA et al. 1991). There were numerous sources for the PCBs in the LACSD system during this period. In the late 1970s LACSD identified 16 industries as potential sources of PCBs. Significant sources included a Westinghouse Electric Company maintenance and repair facility in Dominguez Hills, and a Potlatch Corporation paper manufacturing plant in Pomona (NOAA et al. 1991).

## 2.2 DISTRIBUTION OF DDTs AND PCBs IN THE SEDIMENTS OF THE STUDY AREA

The sediments and sediment-associated biota of the Palos Verdes Shelf and surrounding region have been the subject of intense investigations by the Southern California Coastal Water Research Project, the LACSD, the U.S. Geological Survey (USGS), and others. Numerous past studies have shown that sediment and organism concentrations of DDTs and PCBs in the SCB have been among the highest ever reported for any coastal marine ecosystem (USEPA 2003).

As indicated in Figure 2-2, ongoing releases of DDTs and PCBs to the marine environment from the LACSD outfalls at White Point had declined dramatically in the 1980s and were virtually non-existent by the 1990s. Subsequent less-contaminated discharges from the White Point outfalls have placed cleaner effluent-affected sediment above the highly contaminated effluent-affected deposit; however, biological, chemical, and physical processes have modified and partly mixed the sediment, bringing contaminants from the deeper part of the effluent-affected deposit into the surface layers. These processes continue to occur even today (Lee and Wiberg 2002).

The spatial and depth distributions of DDTs and PCBs in shelf and slope sediments were extensively evaluated by the USGS, initially as part of the Trustees' investigations for the natural resource damage assessment in the 1990s. Sediment data collected by USGS and LACSD provide the most complete coverage of the study area through 2001. The effluent-affected sediment deposit is most contaminated 20–30 centimeters (cm) (8–12 inches) below the sediment surface. This highly contaminated layer of the deposit, with concentrations of DDE (a metabolite, or breakdown, product of DDT) exceeding 10–100 parts per million (ppm), likely dates to the 1950s and 1960s, when the DDT manufacturer was discharging to the sewer system (Lee and Wiberg 2002). The overlying sediment, although less contaminated, still has widely distributed concentrations of DDE exceeding 1 ppm (Figure 2-4). Biological and physical mixing processes have likely combined older, more contaminated sediment with younger material to produce the surface layer. The results of USGS analysis of the temporal history of contamination levels at three locations on the Palos Verdes Shelf show that surface concentrations and total mass of DDE have remained



**Figure 2-4. Distribution of DDTs and PCBs in surface sediments in and beyond the Palos Verdes Shelf.**

Note: Distribution of DDTs and PCBs in surface (0–15 cm [0–6 inches]) sediments in and beyond the Palos Verdes Shelf region (USEPA 2003); the line representing the depth limit of the ecological risk assessment corresponds to a depth of 200 meters (660 feet).

# **SECTION TWO**

## **Summary of Natural Resource Damage Assessment, Litigation, and Montrose Settlements**

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(Back of Figure 2-4)

almost unchanged over the last 20 years at stations nearest the outfall, although both quantities appear to be decreasing at the more distant location studied (Lee et al. 2002).

Additional U.S. Environmental Protection Agency (EPA) evaluation of contaminant concentration data in horizons across the uppermost 15 cm (6 inches) of sediment shows a strong relationship between concentrations in the surface and the deeper, more contaminated sediments, reflecting the fact that contaminants at depth are being remobilized to the surface (USEPA 2003). The mixed surface sediment layer<sup>1</sup> represents the biologically active zone, that portion of the sediment where benthic (bottom) organisms are most abundant and where the greatest likelihood exists for exposure of benthic organisms and contaminant transfer up the food web. As part of its comprehensive evaluation of sediment and biological data trends for the ecological risk assessment, the EPA (2003) reported that within the Palos Verdes shelf study area, concentrations of DDTs and PCBs in surface sediments and tissues of marine organisms have decreased since the 1970s but have generally leveled off since the mid 1980s.

Transport of re-suspended sediments is considered an important process because contaminants such as DDTs and PCBs have strong affinities for particles. Thus, physical transport of sediments also results in dispersion of associated contaminants. In general, the most important processes governing the distribution and transport of sediment contaminants in the area appear to be a complex pattern of burial of older deposits by cleaner surface sediments, coupled with resuspension and desorption of contaminants, and redeposition of sediments and contaminants following the predominant currents northwestward along the continental shelf.

USGS researchers have also studied the processes that modify the seabed on the Palos Verdes shelf. Analysis of box-core samples of the seabed collected during field studies in the 1990s provided information about the physical and chemical properties of the sediment, biological mixing rates, and depositional history. Sherwood et al. (2002) developed a model to predict the evolution of DDE concentrations. Model predictions extending to 2050 indicate that most of the DDE present along the 60-meter depth northwest of the White Point outfall will remain buried and that surface concentrations will decrease slowly. The model also suggests that erosion near the southeast edge of the effluent-affected deposit is likely to reintroduce buried DDE into surface sediment and across the sediment-water interface.

As part of their ecological risk assessment, the EPA (2003) evaluated previous and more recent investigations of sediment contamination for trends in contaminant concentrations and distribution. Consistent with USGS findings, the EPA found that generally, concentrations of DDTs in surface layer sediment appear to be relatively constant as represented by the LACSD cores collected between 1991 and 2001.

Studies dealing with the Palos Verdes shelf region show a complex environment that is significantly impacted by anthropogenic processes. The studies also show that this area has partly recovered from the extremely high levels of contamination present in the early 1970s but that relatively high levels of contamination remain and continue to impact a number of animal

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<sup>1</sup> The depth stratification for biological activity in the study area results in sediment layers with varying mixing rates. The surface layer (0-15 cm) is referred to by EPA as the complete mixing layer, in which sediment mixing largely occurs. The next layer (15-30 cm), experiences periodic mixing by deep burrowing organisms although rates are expected to be lower than in the top 15 cm (EPA 2003).

species. Finally, models indicate that natural recovery will proceed slowly (Lee and Wiberg 2002).

### **2.3 THE DAMAGE ASSESSMENT AND DETERMINATIONS OF INJURIES TO NATURAL RESOURCES**

In 1990, six federal and State of California agencies signed a Memorandum of Agreement (MOA) forming a Co-Trustee Advisory Panel to pursue the Montrose damage assessment case. The following year the Trustees modified the MOA, and the Advisory Panel formally became known as the Southern California Marine Environment Trustee Council. The council, now known as the Montrose Trustee Council (referred to throughout this document as the “Trustees”) had responsibility for coordinating all damage assessment activities. The state and federal agencies that compose the Trustees are:

- The California Department of Fish and Game
- The California Department of Parks and Recreation
- The California State Lands Commission
- The U.S. Fish and Wildlife Service
- The National Park Service
- The National Oceanic and Atmospheric Administration

In 1991, the Trustees issued a Draft Injury Determination Plan (NOAA et al. 1991), which was the culmination of months of work by technical working groups formed to closely examine potential injuries to natural resources. The plan was circulated for public comment, and based on the comments received (including comments from the defendants in the litigation) the Trustees approved an assessment plan for approximately 60 studies, including injury studies across several areas, such as bioaccumulation in fish tissues, benthic community alteration, and reproductive impairment in fish, birds, and marine mammals. The Trustees also conducted valuation and restoration planning studies.

Given the widespread contamination and long-term occurrence of DDTs and PCBs throughout the ecosystem, the Trustees selected resources and injuries that they felt were representative, rather than inclusive, of the potential injuries caused by the release of the contaminants. The Trustees’ studies of potential biological injuries are summarized below.

#### **2.3.1 Sediment**

Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) damage assessment regulations, the sea floor sediments are defined as being injured if they are contaminated to a level that causes injury to a biological resource (Title 43 Code of Federal Regulations [CFR] Section 11.62(b)(v)). Large areas (20 square miles [52 square kilometers] or more) of the Palos Verdes Shelf and slope were known to possess surface sediment concentrations of DDTs and PCBs in excess of concentrations that could cause injury to benthic organisms. Much higher concentrations, hundreds of times higher, resided only 12 to 18 inches below the sediment-water interface due to deposition.

Based on the public comments, the Trustees decided to try to isolate any effects of DDTs and/or PCBs on benthic organisms from the potential effects of the numerous other contaminants that co-occurred with the DDTs and PCBs. To accomplish this goal, the Trustees commissioned a two-tiered study. The first tier involved toxicity testing of sediments collected from the Palos Verdes Shelf to determine the combined toxicity of all contaminants in the sediments. The second tier involved toxicity testing of clean sediments spiked only with DDTs and PCBs to isolate the effects of these contaminants. Some of the tests showed acute mortality in spiked sediment exposures but not from the field-collected sediments, and one test showed a reduction in reproductive output of the test organism; however, other tests did not meet quality control standards and were deemed unreliable because of high mortality among the control animals (i.e., too many animals died during the test that were not exposed to the test contaminants).

The Trustees also commissioned a “weight-of-evidence” analysis of sediment toxicity that used already-published results rather than gathering new field or laboratory data. This type of analysis is a standard approach for sediment toxicity evaluation. The weight-of-evidence analysis concluded that the concentrations of DDTs and PCBs in the sediments of the Palos Verdes Shelf are sufficient to cause toxicity to benthic organisms.

### 2.3.2 Fish Reproduction

Under the CERCLA regulations for natural resource damage assessment, injury to a biological resource occurs when a statistically significant difference in reproductive success between control organisms and test organisms can be measured (43 CFR 11.62(f)(4)(v)(E)). Reduced spawning rate, lowered number of eggs per spawn, diminished fertilization rate, and increased early loss of eggs were all reported by Hose et al. (1989) as being associated with exposure of white croaker and kelp bass to contaminants in San Pedro Bay. These investigators suggested that white croaker with ovarian DDT concentrations greater than 4 ppm wet weight could not spawn.

Concentrations of DDTs and PCBs in fish were lower in the early 1990s, when the Trustees commissioned the studies, than they had been in the early 1980s. However, the rate of decline in concentrations had leveled off, and there was no evidence that the downward trend was continuing. This leveling meant that past improvements in DDT and PCB concentrations in fish could not be expected to continue into the future, and that current conditions might continue indefinitely. The existing DDT and PCB concentrations in fish ovaries were near or exceeding the 4 ppm threshold that local researchers had suggested for reproductive impairment. In addition to evaluating the possibility of reproductive impairment in fish during the 1990s, the Trustees evaluated whether reproductive impairment had occurred at any time after the passage of CERCLA in 1980. This evaluation included a time when DDT and PCB concentrations in fish were elevated high above the levels that existed in 1992.

The Trustees commissioned a study that included the evaluation of both field-collected fish and laboratory-dosed fish. This approach allowed an assessment of effects in the field as well as under controlled laboratory dosing to provide a rigorous test for a causal relationship between exposure to DDTs and PCBs and reproductive effects, if any. Kelp bass was selected as the test species. The study also included work to evaluate the physiological response of the fish and hormone binding mechanisms to allow an understanding of the mechanisms of toxicity.



The fish collected from the field did not show the anticipated difference from the laboratory-dosed fish in body burdens of DDTs and PCBs. Thus, this part of the investigation provided no information on the effects of contaminant exposure. The laboratory exposures also failed to provide a valid test of contaminant effects because confounding factors made it difficult to isolate the effects of the contaminants. The results of the fish studies were inconclusive, neither proving nor disproving that reproductive impairment was caused by the DDTs and/or the PCBs.

### 2.3.3 Birds

The Trustees investigated potential injuries to several bird species that inhabit the Southern California marine environment. Two species in particular, the bald eagle and the peregrine falcon, received special focus because they, as top predators, are especially vulnerable to the effects of contaminants such as DDTs and PCBs (which are magnified at higher levels in the food web).

Bald eagles were a resident breeding species on all of the California Channel Islands from before the turn of the century (Kiff 1980). Kiff (2000) reports evidence that bald eagles nested on Santa Catalina, Anacapa, Santa Cruz, and Santa Rosa Islands, and probably San Nicolas Island, until at least the 1950s. From the late 1800s to 1960, active or remnant nests of bald eagles were reported at a minimum of 35 different locations on the islands, making the Channel Islands a stronghold for this species in Southern California (Kiff 2000). The last confirmed nesting of an eagle on the Channel Islands was in 1949 on Anacapa Island (Kiff 1980). By the early 1960s, bald eagles had disappeared from all of the Channel Islands. Efforts were initiated in 1980 to reintroduce bald eagles on Santa Catalina Island; however, the reintroduced bald eagles experienced reproductive failure. The bald eagles on Santa Catalina Island continue to this day to exhibit reproductive injury and are not self-sustaining (see Appendix B).

The peregrine falcon is one of five falcon species that occur in California. Peregrine falcons in California prey almost exclusively on smaller birds of aquatic and terrestrial ecosystems. Peregrine falcons were relatively common throughout California in the early 1900s and were part of Native American history and culture. Kiff (1980) and Hunt (1994) present evidence for 15 documented pairs of peregrines on the California Channel Islands during the first half of the century and estimate that between 20 and 30 pairs nested on the Channel Islands prior to 1945. The population of peregrine falcons on the Channel Islands was eliminated between the mid-1940s and the early 1960s due to shooting, harvest for falconry, egg collecting, and DDT contamination (Kiff 2000). In the mid 1980s, efforts were initiated to reintroduce peregrine falcons to the Northern Channel Islands. These efforts have increased the number of pairs of peregrine falcons on the Channel Islands, and even though peregrine falcons now appear to be self-sustaining on the Northern Channel Islands, they have not fully recovered to historical levels throughout the Channel Islands.

The Trustees were concerned about two types of bird injury specified in the CERCLA regulations for natural resource damage assessment. First, the regulations define eggshell thinning in birds as an injury if the current eggshells are more than 15 percent thinner than pre-DDT era eggshells (43 CFR 11.62(f)(4)(v)(A)). The regulations also make specific mention of eggshell thinning injury in cases where birds have been exposed to DDTs. Second, any type of avian reproductive impairment that causes a reduction in the mean number of fledglings per nest is defined as an injury according to 43 CFR 11.62(f)(4)(v)(B).

It is generally accepted that DDTs cause eggshell thinning in birds (Hickey and Anderson 1968, Risebrough et al. 1971, Lundholm 1997). Strong correlations have been reported between concentrations of DDTs and eggshell thinning in seven families of birds, including pelicans, cormorants, herons, ducks, eagles, falcons, and gulls. Eggshell thinning has also been experimentally induced in three families of birds. When the use of DDT was banned in the United States, severely affected species such as the pelicans, ospreys, and eagles recovered in most areas of the country. In addition, geographical patterns of eggshell thinning across the United States are consistent with the locations of high environmental concentrations of DDTs. The final piece of evidence supporting the connection between DDTs and eggshell thinning is that attempts to experimentally induce eggshell thinning with other compounds such as PCBs, dieldrin, mercury, and lead have failed at concentrations of these compounds typically found in the environment.

Prior to commissioning their own studies, the Trustees reviewed data showing that the eggshells of certain SCB seabirds (e.g., California brown pelicans, double-crested cormorants, Brandt's cormorants, and western gulls) collected in the late 1960s were more than 15 percent thinner than eggshells collected during the pre-DDT era. In addition, eggshell abnormalities that had been shown to be consistent with the effects of DDTs were documented in two federally listed endangered species (the bald eagle and the light-footed clapper rail) for the SCB. PCBs were also known to cause other types of effects that could have reproductive consequences. These effects included toxicity to embryos in the egg and abnormalities in adult breeding behavior that could prevent effective reproduction.

High concentrations of DDTs and PCBs had been reported in the prey of Southern California bird species as well as in the birds and eggs themselves. Severe population reductions in several species of birds in the SCB began to be observed shortly after the start of DDT discharge into the SCB from the JWPCP outfalls and ocean dumping. The peregrine falcon disappeared from the Channel Islands by 1955, the bald eagle was extirpated from the Channel Islands by the early 1960s, the California brown pelican was driven to near extinction in the 1970s, and the double-crested cormorant population declined severely during the 1960s and 1970s. Releases of DDTs and PCBs from the LACSD outfall declined dramatically beginning in the early 1970s. By 1980, when Congress passed CERCLA, the California brown pelican and double-crested cormorant populations in Southern California were recovering. In contrast, neither the bald eagle nor the peregrine falcon had returned to the Channel Islands, even though both of these species were beginning to repopulate their historical ranges across the United States and worldwide.

Faced with the facts outlined above, the Trustees decided in the early 1990s that it was necessary to determine whether injuries to bird species in the SCB had been caused by and were continuing because of exposure to DDT and/or PCBs.

The Trustees commissioned a suite of studies consisting of investigations of (1) the organochlorine (i.e., DDTs and PCBs) contamination levels, reproductive success, and food habits of the bald eagles recently introduced onto Santa Catalina Island; (2) the organochlorine contamination levels, the reproductive success, and food habits of the peregrine falcons recently reintroduced to the Northern Channel Islands; (3) the long-term consequences of reduced reproduction on the populations of bald eagles and peregrine falcons; (4) eggshell thinning and organochlorine contamination levels in seabirds of the Channel Islands and comparatively in seabirds from along the west coast of North America; (5) the reproductive output of brown

pelicans and double-crested cormorants in the SCB; and (6) a summary of effects of DDTs and PCBs on the birds of the SCB.

After considering the results of the commissioned bird studies and the interpretations of the Trustees' experts, the Trustees drew the following conclusions:

- As a result of the elevated levels of DDTs in the marine environment of the SCB, the eggshells of bald eagles and peregrine falcons have become so thin and/or otherwise so abnormal that reproduction of these bird species has been severely disrupted or has not occurred, since as early as the late 1940s. To this day, bald eagles on Santa Catalina Island continue to demonstrate reproductive failure.
- Because bald eagles and peregrine falcons are the top predators in their respective food webs, and because metabolites of DDT are magnified in their prey species, bald eagles and peregrine falcons are more severely affected than other species by the presence of DDTs in the marine environment.
- Many seabird species, including the California brown pelican and the double-crested cormorant, were severely impacted in the past by the discharges of DDTs to the coastal waters of the SCB.<sup>2</sup> However, the populations of these seabird species are generally recovering due to improved reproductive success since Montrose was stopped from discharging these contaminants into the LACSD system. For these other bird species, there was not conclusive evidence that reproductive problems meeting the definition of "injuries" within the CERCLA regulations were continuing.

### 2.3.4 Marine Mammals

Under the CERCLA regulations for natural resource damage assessment, both impaired reproductive capability and reduced immune response are considered injuries. A broad base of toxicological literature shows that compounds like DDTs and PCBs are capable of causing these types of effects (NOAA et al. 1991). Studies conducted in the 1970s in the SCB demonstrated an association between California sea lion females delivering non-viable premature pups and high concentrations of DDTs and PCBs (NOAA et al. 1991).

The vast majority of the marine mammal portion of the damage assessment was dedicated to investigating injury in California sea lions, a species that reproduces and resides at certain times on the Channel Islands. A comprehensive field study was undertaken to evaluate rates of premature pupping, rates of early life mortality, immune response, physiology, and contaminant body burdens in sea lions on San Miguel Island. In the final analysis, it was not possible to draw a cause and effect linkage between adverse effects on California sea lions and exposure to DDTs or PCBs. The Trustees decided not to put the work forward as part of the case because the causal linkage could not be established.

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<sup>2</sup> There is evidence that eggshell thinning occurred in California brown pelicans several years before it was first observed in 1969, because museum eggs collected from Anacapa Island in 1962 were found to be 26 percent thinner than eggs collected prior to 1946 (Anderson and Hickey 1970). Gress (1994) reported that the mean thickness of California brown pelican eggshells from the period 1986–1990 was 4.6 percent thinner than the pre-1947 mean (i.e., less than the regulatory definition of injury). Kiff (1994) further reports that 1992 California brown pelican eggs from Anacapa Island (18 eggs collected) was 3.6 percent thinner than the pre-1947 mean .

An important outcome of the work on marine mammals was the discovery that marine mammal carcasses, and probably placentas, are significant routes of DDT and PCB transfer through the food web. For example, marine mammal carcasses are eaten directly by bald eagles, and the carcasses and placenta of marine mammals are consumed by western gulls, which are subsequently preyed on by bald eagles and peregrine falcons. Contaminant concentrations in marine mammals may be so high that a small amount of consumption by a bird can represent a very large dose of contaminant.

### 2.3.5 Summary of Natural Resource Injury Findings

Based on the careful process undertaken by the Trustees, the information available, and the results of the studies commissioned as part of the damage assessment, the Trustees concluded that the following natural resource injuries had been occurring since before 1981 and were continuing to occur as a result of the historical releases of DDTs and PCBs at issue in the case:

- **Water and Sediment Quality.**<sup>3</sup> The concentrations of DDTs found in the water column over the Palos Verdes Shelf exceeded the standards established by the State of California in the California Ocean Plan. The highest concentrations of DDTs occurred near the sediments; concentrations were lower near the water surface. This characteristic indicated that the source of the unacceptable concentrations of DDT in the water column was the contaminated sediments, representing a per se injury under the CERCLA regulations for damage assessment. The sediments of the Palos Verdes Shelf could not provide the full range of functions normally performed by ocean floor sediments. Palos Verdes Shelf sediments in the effluent-affected layer carried quantities and concentrations of DDTs sufficient to trigger the fishing closure and advisories mentioned above. Pathway studies showed that these sediments and the contamination passed on through fish into the Palos Verdes Shelf food web were also the ultimate route of exposure to injured species of birds.
- **Fishing.** Kelp bass, white croaker, and other species of fish collected from numerous locations in the study area were carrying concentrations of DDTs in edible tissues that exceeded the guidelines and standards set by both federal and state agencies for safe consumption. A commercial closure for white croaker and recreational advisories for kelp bass, white croaker, black croaker, California scorpion fish, California corbina, queenfish, and several species of rockfishes and surfperches had been issued by the State of California. This injury represented a loss of natural resource value to the public and a per se injury under the CERCLA regulations for damage assessment. The human use values of these fish resources, namely the public's ability to catch and eat clean fish, continued to be harmed by the contamination.
- **Bald Eagles.** The Channel Islands (in particular, Santa Catalina Island) did not support a naturally reproducing population of bald eagles, as existed before the DDT releases. This injury was known because the bald eagles introduced onto Santa Catalina Island accumulated DDT at high concentrations and produced eggs that were structurally incapable of supporting the embryo without human intervention. Also, bald eagles had not yet returned to the other Channel Islands.

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<sup>3</sup> The Trustees deferred to response actions by the U.S. Environmental Protection Agency to address these injuries, and thus did not specifically seek natural resource damages to restore water and sediment quality.

- **Peregrine Falcons.** The peregrine falcons reintroduced to the Northern Channel Islands had eggshells in 1992–1993 that were more than 15 percent thinner than peregrine eggshells from the pre-DDT era (Hunt 1994, Kiff 1994). The level of eggshell thinning found in peregrine falcons in the Northern Channel Islands was sufficient to affect the ability of the population to sustain itself. Also, peregrine falcons had not yet re-populated the Southern Channel Islands.

The Trustees therefore focused their efforts on obtaining damages for these ongoing injuries, with the goal of restoring these resources and their services to their baseline conditions (i.e., the conditions they would be in had the DDTs and PCBs never been released). In addition to seeking damages for ongoing injuries, the CERCLA regulatory framework provides for compensatory damages (i.e., damages to compensate the public for lost uses of resources during the period when they are below their baseline conditions). Targets for compensatory restoration actions may include certain resources that the evidence shows sustained past injuries from the DDTs and PCBs at issue in this case. The following resources in particular fall into this category:

- **Fish.** Concentrations of DDTs and PCBs in fish were lower in the 1990s, when the Trustees undertook fish injury studies, than they had been in the early 1980s, when a body of toxicological literature indicated that fish were being harmed by concentrations of these contaminants found in the Southern California coastal environment. Specifically, Hose et al. (1989) suggested an observed DDT concentration in ovaries associated with failures to spawn. Although the Trustee efforts to demonstrate that injuries were occurring and had occurred after the authorization of CERCLA were not conclusive, the Trustees consider fish and their habitats to be an appropriate target for compensatory restoration actions.
- **Seabirds.** As stated previously, many seabird species, including the California brown pelican and the double-crested cormorant, suffered dramatic declines in their populations as a result of the reproductive abnormalities caused by exposures to DDTs. Although the evidence is not conclusive regarding continuing injuries to these birds on the scale of the continuing injuries to bald eagles, the Trustees consider seabirds and their habitats to be an appropriate recipient for restoration actions. As a result of studies conducted by Fry (1994) and Kiff (1994), the Trustees have focused on those restoration projects that target seabirds that have demonstrated severe or significant eggshell thinning and/or seabirds whose DDT egg residues were significantly elevated in their colonies of the Southern California Bight. According to the data from these studies, the following seabirds are priority species for restoration: the double-crested cormorant, Brandt's cormorant, the California brown pelican, the western gull, the ashly storm-petrel, Cassin's auklet, the pelagic cormorant, and the pigeon guillemot. See Section 5.1.1 for a summary of the results of the seabird studies.

Through the natural resource damage assessment process as well as the litigation and settlements described in Section 2.4, the Trustees sought damages to fund restoration projects that are directly related to the injuries outlined above.

## **2.4 LITIGATION AND SETTLEMENTS**

Following the preliminary investigations by NOAA mentioned at the beginning of this section,<sup>4</sup> the United States and the State of California (the governments), on behalf of the Trustees and the

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<sup>4</sup> See Appendix E for a timeline of the natural resource damage assessment and litigation.

EPA, filed a complaint in federal district court in Los Angeles in June 1990 against eight defendants.<sup>5</sup> The complaint stated two claims under CERCLA. The first concerned the recovery of costs incurred by the United States in response to the release or threatened release of hazardous substances from the Montrose facility (upland site). The second sought declaratory relief and the recovery of response costs and damages for injury to natural resources in the areas offshore of Los Angeles and Long Beach, including the Palos Verdes Shelf, the Channel Islands, and the surrounding environment (offshore area) as the result of the release of hazardous substances. The complaint summarized the natural resource injuries to include fish, birds, and marine mammals. Almost immediately, the governments amended the complaint to add a ninth defendant: the LACSD, a publicly owned treatment works composed of fifteen local sanitation districts in Los Angeles County.<sup>6</sup>

After the governments filed the complaint, the Trustees developed detailed injury study plans and implemented numerous studies over the next three and a half years. The studies covered nine categories.<sup>7</sup> Complying with a court-ordered deadline, in October 1994 the governments produced 28 expert reports and designated 84 witnesses. The district court established a schedule for the defendants to question (depose) the governments' witnesses and to provide their own expert reports and for the governments to question the defendants' experts. This expert testimony occurred prior to trial.

Scarcely had the depositions of the governments' experts commenced when the district court granted the defendants' motion to dismiss the natural resource damage claim on the ground that the governments had filed the claim too late. The governments appealed this ruling successfully, and two years later, in mid-1997, the district court reinstated the natural resource damage claim. During the appeal process, an important event occurred: the EPA decided to expand its investigation to include the Palos Verdes Shelf.<sup>8</sup>

Prior to this event, the Trustees had included restoration of the contaminated sediments on the Palos Verdes Shelf in their claim as primary restoration. This development changed the complexion of the case. Because the EPA now assumed responsibility for any response activity that might be conducted for the contaminated sediments on the Palos Verdes Shelf, the EPA's response costs claim increased, and the Trustees' claim for damages decreased, as the Trustees were no longer considering primary restoration for the contaminated sediments. With the EPA now addressing that aspect of the case, the Trustees narrowed their focus to the injured birds, fish, the lost use of the injured resources, and the restoration necessary to address those injuries.

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<sup>5</sup>The defendants were Montrose Chemical Corp. of California; Atkemix Thirty-Seven, Inc.; Stauffer Management Company; ICI American Holdings, Inc.; Chris-Craft Industries, Inc.; Westinghouse Electric Corp.; Potlatch Corp.; and Simpson Paper Company.

<sup>6</sup>The governments alleged that LACSD had transported the hazardous substances through its sewer system to the Palos Verdes Shelf - a violation of CERCLA.

<sup>7</sup>Those categories were (1) distribution and character of the contaminated sediments; (2) foodweb/pathway; (3) injury to sediments; (4) injury to fish; (5) injury to birds; (6) natural recovery of the contaminated sediments; (7) feasibility of sediment restoration alternatives; (8) biological restoration alternatives; and (9) prospective interim lost use value. In addition, the Trustees developed a quality assurance program, a data report and a natural resource damage assessment cost report.

<sup>8</sup>Previously, EPA had focused its efforts on the upland site and its surrounding area.

The reinstatement of the case initiated two years of depositions of the governments' experts by the defendants. In early 2000, the district court judge newly assigned to the litigation accelerated the pace of the case. That judge ordered the defendants to produce their expert reports within two months and allowed the governments only six weeks to depose the defendants' experts. The judge set trial for early October 2000.

During the course of the litigation and prior to trial, the governments reached five settlements with three sets of defendants:<sup>9</sup> two with Potlatch and Simpson, two with LACSD and other local governmental entities;<sup>10</sup> and one with CBS Corp. (formerly Westinghouse). These settlements left four defendants.<sup>11</sup> The settlements totaled \$67.2 million for the EPA and the Trustees.

Trial began on October 17, 2000. While the trial was ongoing, the governments and the remaining four defendants reached settlement. The final settlement provided \$73 million for the EPA and the Trustees. Appendix F contains a summary of the Montrose settlements and how the recoveries were divided between the EPA and the Trustees. The total principal amount paid to the federal government and the state government from all settlements combined was \$140.2 million.

## **2.5 LIMITATIONS ON USES OF SETTLEMENT FUNDS FOR NATURAL RESOURCE RESTORATION**

After considering the results of the damage assessment efforts, the Trustees determined that the following general categories of restoration actions meet the provisions of the settlement agreements and the relevant federal rules governing natural resource damage assessment and restoration (43 CFR Part 11):

- Actions that restore the public's ability to fish for clean fish in the marine waters of the SCB.
- Actions that restore bald eagles and peregrine falcons to the Channel Islands.
- Actions that compensate the public for interim losses of these resources and services, and that restore interim losses of the seabirds and fish for which there is evidence of past injuries from exposures to the DDTs and PCBs at issue in this case.

Section 4 of this Restoration Plan describes the restoration goals and objectives as well as the strategies and planning process developed with public consultation.

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<sup>9</sup>Due to EPA's decision to begin response actions related to the Palos Verdes Shelf, the parties amended the original consent decrees with Potlatch and Simpson and LACSD and the local governmental entities to address the changed role of EPA.

<sup>10</sup>The defendants named the 140+ local governmental entities as third party defendants. These entities were the municipalities that owned and operated sewage collection or storm water conveyance systems that discharged into the ocean.

<sup>11</sup>The governments had dropped one defendant from the case prior to the beginning of the trial. The remaining defendants were Montrose Chemical Corp. of California; Atkemix Thirty-Seven, Inc.; Aventis Cropscience USA, Inc. (formerly Rhone-Poulenc Inc., and corporate successor to Stauffer Chemical Company); and Chris-Craft Industries, Inc.