

Draft Environmental Assessment and Land Protection Plan

*Proposed South San Diego Bay Unit,
San Diego National Wildlife Refuge*



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*Proposed South San Diego Bay Unit,
San Diego National Wildlife Refuge*

Prepared by

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This is the legacy I would like to leave behind:

*I would like to have stopped the ridicule
about the conservation of snails, lichens, and fungi, and
instead move the debate to which ecosystems
are the most recoverable and how we can save them,
making room for them and ourselves.*

**Mollie H. Beattie, Director
U.S. Fish and Wildlife Service
1993-1996**

Cover: California least terns, Kendal Morris

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DRAFT ENVIRONMENTAL ASSESSMENT

PROPOSED SOUTH SAN DIEGO BAY UNIT

San Diego National Wildlife Refuge
San Diego County, California

Chapter 1. PURPOSE OF AND NEED FOR ACTION

1.1 Introduction

San Diego National Wildlife Refuge (Refuge) helps conserve the rich and varied natural heritage of the San Diego region. The diverse habitats contained within the Refuge boundaries are protected and managed by the U.S. Fish & Wildlife Service (Service) as wildlife habitat for the continuing benefit of the American people (see map 1). The Service proposes to protect the last remaining wildlife habitat in and around the southern end of San Diego Bay as part of the Refuge. The proposed South San Diego Bay Unit of the San Diego National Wildlife Refuge is located within the political jurisdictions of the cities of Imperial Beach, Chula Vista, Coronado, National City, and San Diego.

This draft environmental assessment (EA) evaluates the alternatives for and the effects of establishing an approved Refuge boundary, then acquiring and managing lands within this boundary as wildlife habitat. This assessment will be used by the Service to encourage public input in the acquisition planning process, and to determine whether the proposed establishment of the South San Diego Bay Unit would have a significant effect on the quality of the human environment. The environmental assessment is part of the Service's decision-making process in accordance with the National Environmental Policy Act.

1.2 Proposed Action

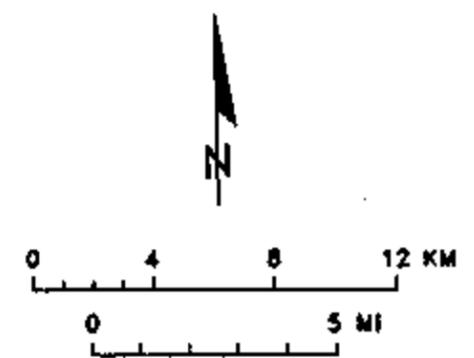
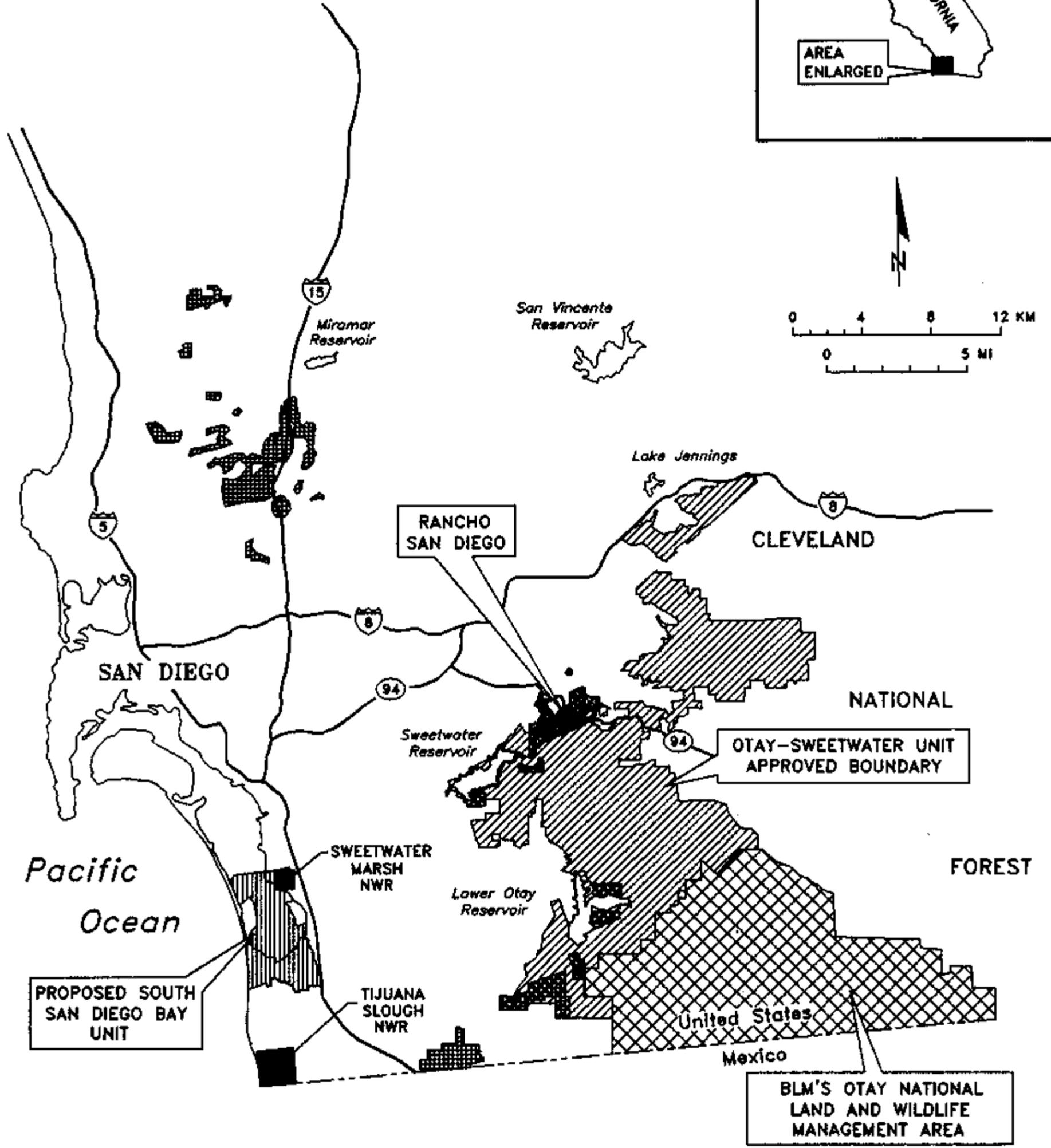
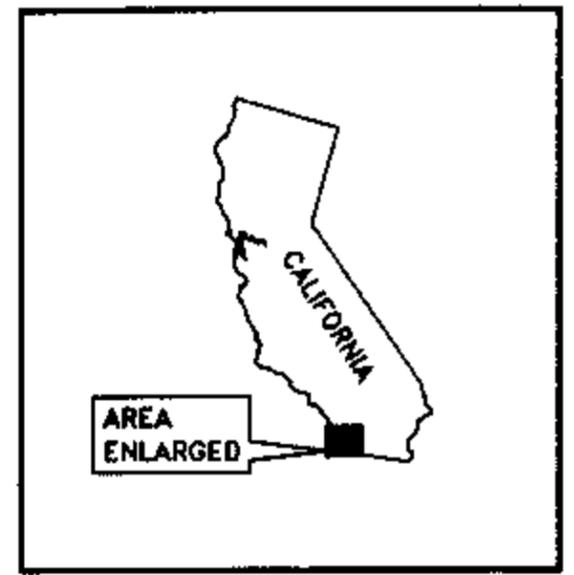
The U.S. Fish & Wildlife Service proposes to establish an approved boundary for the South San Diego Bay Unit of the San Diego National Wildlife Refuge. Once the boundary is approved, the Service would negotiate with willing participants to acquire land within this boundary. Lands acquired or managed under special agreement would, as permitted and negotiated, be added to the National Wildlife Refuge System and managed accordingly (see section 2.3.2). Lands not added to the National Wildlife Refuge System would continue to be managed by their owners.

MAP 1

LEGEND



VERNAL POOLS
STEWARDSHIP PROJECT
APPROVED BOUNDARY



Project location, proposed South San Diego Bay Unit, San Diego National Wildlife Refuge

1.3 Need for the Proposed Action

Since the 1850s, the upper two-thirds of San Diego Bay has been converted from a fertile, shallow, flat-bottomed bay surrounded by extensive mudflats and salt marshes to a series of dredged navigational channels edged by wharves, shipping berths, docks, and urban development (Port 1990). In the past 70 years, urban development and navigational projects have greatly altered or eliminated the natural habitats of San Diego Bay. Ninety to one hundred percent of the shallow submerged lands, intertidal/mudflats, and salt marshes have been eliminated in the north and central Bay areas. About 65 percent of the South Bay's original shallow submerged lands and 39 percent of its original intertidal/mudflats remain; only small remnants of salt marsh still exist (Port 1990).

A major calving area for gray whales until the advent of whaling, the Bay once teemed with edible fish and shellfish. Hundreds of thousands of brant, surf scoter, and other waterfowl wintered on the Bay (Port 1990). Similar numbers of migrating shorebirds and nesting seabirds arrived each year to nest, rest, and feed in the Bay's shallow water, eelgrass, mudflats, and salt marshes.

Development drastically changed the health and productivity of the Bay. Decades of industrial pollution and raw-sewage dumping destroyed the water quality and the fragile, shallow-water/bay-floor ecosystem. Shellfish and edible fish populations were greatly reduced. The numbers of some wintering waterfowl dwindled by up to 90 percent (Port 1990). Nesting seabirds and migrating shorebirds still arriving found suitable nesting sites restricted to the salt ponds and other remnant patches on the south end of the Bay.

Hundreds of thousands of migrating shorebirds, nesting seabirds, and wintering waterfowl depend on the South Bay, a vital link in the Pacific Flyway. Massive numbers of birds fly back and forth between the Bay and the agricultural fields, riparian woodlands, and salt marsh of the Tijuana River National Estuarine Research Reserve, which lies a short distance to the south.

Nearly all of San Diego's shallow water, eelgrass, mudflats and salt marshes—crucial habitat for many species of birds and invertebrates—have been eliminated except in the South Bay area. These South Bay habitats now receive some indirect protection because of their status as wetlands or navigable waters. Many types of activities and development cannot occur without regulatory review and restrictions. However, wildlife needs are not proactively protected from disturbance unless a federally listed threatened or endangered species is present. These needs include food sources, hiding places, nesting and rearing sites, and safe resting places. All habitats left in the South Bay have been damaged as a result of ongoing development; recreational and commercial activities; air, water and noise pollution; disturbance from predators and other intruders; and invasion by nonnative species. Habitats are threatened with further degradation.

These remaining ecosystems must be proactively protected as wildlife habitat if San Diego Bay is to maintain its native wildlife into the 21st Century and beyond. Existing habitats need to be proactively managed, protected, and enhanced to continue to meet the needs of the species that depend on them. Undeveloped areas too damaged to provide good habitat need to be restored to

provide homes for the species displaced by development elsewhere in the Bay.

Not all of the original habitat functions of the Bay can be restored. For example, it is unlikely that gray whales would return to the Bay to give birth. However, the remaining shallow waters, mudflats, and salt marshes could become more hospitable for remaining wildlife. Native species with little remaining habitat, such as light-footed clapper rail, would have the opportunity to increase in numbers if areas that once sustained them are recreated. The Service has an opportunity to counterbalance the heavy development and use of most of the Bay by protecting and reviving the small portion of the Bay where native habitats remain.

San Diego, renowned for its beautiful bay setting, attracts over 35 million visitors annually. Hundreds of thousands of people come to San Diego County specifically to view wildlife, particularly birds. The largest and densest concentration of birds in the study area is found in the artificially diked ponds that are owned by the Western Salt Company and used to produce salt (see map 2). It is difficult for Western Salt to accommodate visitors wanting to view this massive bird gathering, and viewing locations with adequate nearby parking are limited. The Service would have an opportunity to work with Western Salt and local community groups, as willing, to establish one or more viewing sites where public access would not damage the area's nesting, resting, and feeding habitat for birds and other wildlife.

1.4 Purpose of the Proposed Action

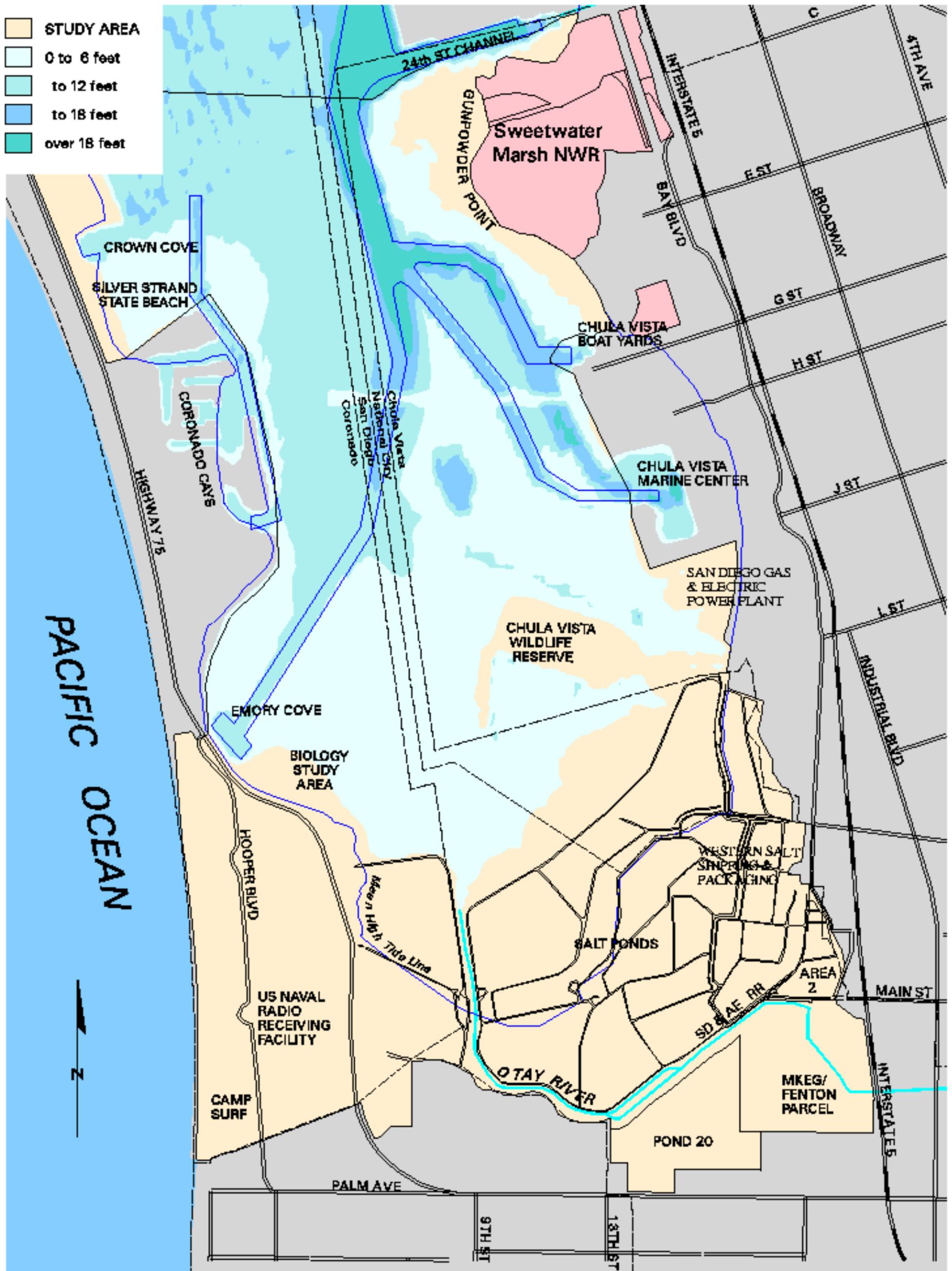
The proposed action has three purposes:

- 1) To provide the Service with authority to acquire or otherwise protect wildlife habitat under the National Wildlife Refuge System. Protection would follow acquisition (from willing participants) or negotiated agreements (see land protection plan, chapter IV).
- 2) To provide the Service with the opportunity to manage, enhance, restore, and protect Refuge areas for the benefit of federally listed and other trust species. Specific management activities involving more than minor change will not be addressed by this document (see section 2.3.2).
- 3) To provide opportunity for the Service to develop compatible wildlife-dependent recreational activities in partnership with local communities (see sections 1.11.1 and 2.3.2).

1.5 Background

Service planning for this Refuge Unit began in 1978, but has been intermittent since then. The Service completed an environmental assessment for protection of south San Diego Bay, with a Map 2

Map 2. LOCAL LANDMARKS AND PLACE NAMES, SOUTH SAN DIEGO BAY



signed Finding of No Significant Impact, in 1979 (FWS 1979a). The Service implemented a portion of this decision as Sweetwater Marsh National Wildlife Refuge, which protects high marsh areas. However, the Service did not implement the lower Bay portions addressing the salt ponds and vicinity (see appendix A). The Service will not implement the 1979 decision without reevaluating the project and updating information.

The Service began revisiting the establishment of a Refuge in the South Bay beginning in 1990. In response to input provided at many public meetings, the Service proposed three Refuge boundary alternatives. The Service widely circulated these boundary alternatives in one of the three San Diego Bay Refuge Planning Updates mailed to interested parties over the last two years (see appendix B). While these boundaries were not finalized, they were based on the best information available at the time and were presented to the public during scoping meetings. These boundaries represent the areas of concern to both the Service and the public and appear in the Planning Updates for general discussion and information.

In 1995, the Service published two reports on bird use of the South Bay (FWS 1995a, 1995b). As staff analyzed the reports in preparation of this document, it became clear that Alternative 2 (see appendix B), as presented in the updates, would not protect any more important open water habitat than Alternative 3. The information from these reports indicated that the open waters of the South Bay were important habitat for feeding and resting waterfowl and seabirds (see section 3.2.1). The open waters include submerged land, eelgrass, and inundated mudflat habitats.

As the Service reevaluated conservation needs, the full study area became Alternative A. Then the Service removed potential restoration areas that had more conflict with other land uses to form a preferred alternative, Alternative B. The Service used the proposed Refuge Unit boundary from the 1979 decision to form Alternative C. Alternative C is included in this EA to contrast the levels of protection provided for the South Bay by the 1979 decision and the 1997 proposal.

1.6 Project Area

The project area for the proposed South San Diego Bay Unit lies at the southern end of San Diego County, approximately 5 miles north of the border between the United States and Mexico (see map 1). San Diego Bay is a crescent-shaped estuary located about 5 miles north of the Mexico/U.S. border along the California coastline. The Bay is about 14 miles long and nearly 3 miles across at its widest point. Its watershed covers 415 square miles.

The 5-000-acre project area stretches westward from the 24th Street Channel to just north of Crown Cove, southward around the salt ponds, and then northward along the Bay's edge. It extends through the jurisdictions of several local governments, including the cities of Imperial Beach, Chula Vista, Coronado, National City, and San Diego.

1.7 Decisions To Be Made

Based on the analysis documented in this environmental assessment, the following decisions will be made by the Regional Director, Region 1, Portland, Oregon:

1. Determine whether or not the Service should establish a South San Diego Bay Unit of the San Diego National Wildlife Refuge.
If so,
2. Select an approved Refuge boundary that, based on the assessment, best fulfills the purposes for establishing the Unit.
3. Determine whether the selected alternative would have a significant impact upon the quality of the human environment.

1.8 Issue Identification

1.8.1 Issue Identification Process

In the development of this draft environmental assessment, the Service has complied with the purpose and intent of the National Environmental Policy Act (NEPA) of 1969, as amended. Before the Service developed the draft, scoping activities were undertaken with a variety of Federal, State, County, and local governments, as well as private groups and individuals (see also chapter 5). Early in the planning process for the South San Diego Bay proposal, the Service conducted nine public meetings and organized a citizens' working group and policy working group to solicit comments and help define the boundaries of the alternatives. The Service also used ongoing biological research begun in 1992 to identify issues and help define the boundaries of the alternatives. Public notices, public meetings, personal contacts, telephone interviews, and correspondence were used to gather input on the proposed project.

1.8.2 Issues to be Addressed in Detail

These issues are discussed in detail in chapters 3 and 4.

Biological Issues

Coastal Ecosystems have degraded to the point that many plant and animal species have been harmed.

Eighty percent of California's coastal wetlands have been converted to urban or agricultural use, and many native plant and animal species have disappeared from South San Diego Bay. Remaining wetlands and wildlife habitats need restoration and protection from incremental degradation or outright destruction. While South San Diego Bay is internationally important to

nesting seabirds, migrating shorebirds, and wintering waterfowl, intensive recreation and urban activities are disturbing the last remaining habitat.

Several threatened and endangered species are confined to a small percentage of their original ranges due to land and marine development practices.

Loss of native habitat has led to the decline of several native species that are now federally listed as threatened or endangered. The South Bay is part of the remaining native habitat that must be protected to help recover the populations of these species. The study area contains nesting, resting, and feeding habitat for six listed bird species, and feeding habitat for one listed sea turtle. One listed plant, salt marsh bird's beak, is also found here. The County of San Diego is home to more federally listed species than any other county in the continental U.S.

Economic and Social Issues

Existing salt works could be affected by the proposal.

Western Salt Company contributes to the local economy. There is a concern that the salt works could be affected by the Refuge proposal.

The quality of life and familiar activities could be affected by the proposal.

Many respondents are concerned about how the Refuge might affect the character of adjacent communities. Of specific concern are effects on existing recreational activities, including ecotourism, the YMCA Camp Surf, the Bayside Bikeway, and the railroad.

Wildlife protection measures could restrict winter boating activities in some portions of the proposed Refuge.

Wintering waterfowl need resting and feeding areas that are undisturbed by boat traffic from November through March. The Service would determine where seasonal restrictions on boating would be necessary (see section 3.2.1). These restrictions would, in time, lead to a decrease in areas open to recreational boaters using South Bay waters at certain times of year.

The public, especially residents of Imperial Beach, lacks access to the south end of the Bay to fish, to use nonmotorized boats, and to experience the ecosystem.

During public meetings and in subsequent correspondence, residents said they wanted a public access point in the south end of the Bay. This document discusses the concept of an access point or points; however, any actual proposals would be developed in a separate planning effort (see section 1.9.2). Any access point(s) and wildlife-dependent recreational activities would need to be compatible with the purposes for which the Refuge was established (see section 1.11.1).

1.8.3 Issues Not Selected for Detailed Analysis

The following issues are discussed in this section only, and are not carried through in chapters 3 and 4. These issues do not warrant more detailed analysis because the potential for impact is minimal or nonexistent.

The proposed Refuge could stop marine development projects.

No Service action under any alternative would affect existing navigational projects. Inclusion within a Refuge boundary would not increase Service authority over these projects beyond existing Federal and State protections such as the Endangered Species Act, various sections of the Clean Water Act, Section 10 of the Rivers and Harbors Act, the Coastal Zone Management Act, the State Environmental Quality Act, the National Environmental Policy Act, and State and local land use regulations. Existing channels and marine developments would continue to be maintained and dredged by the responsible parties to the depths agreed to in applicable permits and decision documents. The Service's authority would increase only if the U.S. Coast Guard, State, and the San Diego Unified Port District (Port) entered into formal agreements with the Service.

This report will not analyze the effects of inclusion within the proposed Refuge boundary on speculative projects. In the last three decades, several proposals have been made that involve massive dredging in previously undisturbed shallow submerged lands, placing fill in the waters of the United States in areas exceeding 10 acres, potential take of endangered or threatened species, or breaching the barrier strand that separates the most shallow part of the Bay from the ocean. Such projects will continue to be scrutinized by all levels of government and the public under existing environmental review processes, and under economic and technical feasibility analyses by private and governmental funding sources, before receiving the permits and funding necessary to proceed.

It is not known if any of these projects are feasible, since none are being formally pursued at this time. None are expected to become active in the reasonably foreseeable future. Any such proposals would have difficulty gaining approval, regardless of the presence or absence of a refuge, because of their significant environmental impacts. Tidal wetlands and special aquatic sites would be destroyed, water quality could be degraded, and the existence of some federally listed species could be jeopardized.

The proposed Refuge could stop commercial net and commercial sport fishing.

No commercial net fishing occurs in the South Bay. The limited commercial fishery that recently used gill nets to catch striped mullet in the South Bay is now gone. This fishery was conducted under experimental gear permits issued by the Fish and Game Commission, since the set gill nets once used by the industry are now illegal. As many as five gill-net fishermen were issued permits; only one fisherman received a permit in 1995 (Ca. DFG, in conversation, 1995). In 1996, this last individual did not acquire a permit (Ca. DFG, in conversation, 1996).

Although little data are available on charter boats for sport fishing in south San Diego Bay, the shallowness of the water significantly limits the size of boat that can be used and the areas that can be navigated. South San Diego Bay is not a significant commercial charter fishing boat attraction (ibid).

The proposed Refuge could harm local public finances by decreasing the amount of taxable land base.

An economic study conducted for the Service in 1994 indicated that the action alternative would benefit local public finances over time (Niehaus, 1994). A variety of taxes provide funding for local governments. The basic property tax rate is one percent of the assessed value of land and improvements. The County collects the tax and then distributes the collections among the taxing jurisdictions within the County. Property tax collections amounted to \$1.3 billion in all jurisdictions within the County, exclusive of levies for voter-approved bonded indebtedness (Niehaus 1994). Ownerships associated with Western Salt Company and Egger and Ghio are the sole source of property taxes paid in the study area.

Table 1 provides general information on general revenues and tax revenues. In comparison to the total general fund for each community, revenues generated by the private land within the study area are very small.

Table 1. Property Tax Revenue for Affected Jurisdictions in the Study Area for 1992-93*

Jurisdiction	General Fund Revenue FY 1993	Western Salt Property Taxes	Egger & Ghio/Fenton	H.G. Fenton Co.
Chula Vista	\$45.2 million	\$0	\$0	\$0
Coronado	\$15.4 million	\$1,578	\$0	\$0
Imperial Beach	\$6.8 million	\$352	\$0	\$0
National City	\$16.5 million	\$707	\$0	\$0
San Diego	\$420 million	\$2,323	\$792	\$260
County of San Diego	\$1.8 billion	\$3,273	\$729	\$240
Other¹		\$14,539	\$ 3,274	\$ 1,077

*Source: Niehaus, 1994

¹Other jurisdictions include special districts, such as school districts.

Although the Federal government does not pay property taxes on its own land, several factors offset the potential hardship for local governments from loss of property tax revenue. First, refuge lands and waters demand little in the way of expensive infrastructure or services. Second, when the Service acquires private land in fee, Congress allocates payments to the Service to pay counties under the Refuge Revenue Sharing Act to partially compensate for the loss of property taxes. Third, refuge status typically results in larger numbers of visitors, and local governments benefit from increased sales and lodging taxes. According to Niehaus (1994), the annual net gains

from sales and lodging taxes would total at least \$57,300 for the smallest South San Diego Bay protection area, and as much as \$147,400 for the largest proposal, not including Revenue Sharing Act funds.

In South San Diego Bay, the economic contributions of ecotourism under the most conservative estimates would be more than twice the value of the property tax losses should all private property owners in the study area choose to sell their property to the Service (Niehaus, 1994). In addition, the counties would receive Refuge Revenue Sharing funds if private lands, or lands belonging to the cities of San Diego and Imperial Beach are purchased outright. (Until such parcels are purchased and appraised, the amount of offset is unknown, so these funds have not been included in this discussion.) While these benefits are not significant in comparison to the \$1.8 billion in tax revenues collected within the County of San Diego, they do represent a net gain for each community in the study area.

1.9 San Diego National Wildlife Refuge Planning Efforts

1.9.1 Conceptual Management and Land Protection Plans

The *Conceptual Management Plan for the San Diego National Wildlife Refuge*, which included the proposed South Bay Unit, was reviewed by landowners, agencies, and interested citizens. The Service has considered the public comments in finalizing this document, which is referenced as a planning document. The conceptual management plan gives a general overview of how the proposed Refuge would be operated and managed, but it does not provide extensive detail, pinpoint where facilities would be located, or show where public use would be allowed.

The draft land protection plan for the proposed South San Diego Bay Unit, which identifies land acquisition strategies, is bound behind this environmental assessment.

1.9.2 Comprehensive Conservation Plan

As lands are acquired by the Service, a comprehensive conservation plan and step-down Refuge management plans would be prepared. The comprehensive conservation plan would provide details for the management of the San Diego National Wildlife Refuge and would specify the types and locations of public use activities and habitat management activities. This plan, developed through the public involvement process, would include detailed environmental analysis and the identification of compatible public uses that would be permitted within the San Diego National Wildlife Refuge.

The comprehensive conservation plan, step-down Refuge management plans, and associated National Environmental Policy Act compliance documents would analyze the environmental impacts and project alternatives for public use and wildlife-dependent recreational activities within the proposed South San Diego Bay Unit. These documents would address proposed and potential public use activities such as environmental education and interpretation. The Service would use comments received during the public review period that identified public use activities and management issues to develop the comprehensive conservation plan and step-down Refuge management plans for the proposed South San Diego Bay Unit.

Since the comprehensive conservation planning process would require years and may not be started for years, the Service would address public use separately, soon after lands are acquired. The Service would propose a public access plan. The plan would be developed with input from all interested parties and would be conducted in compliance with National Environmental Policy Act (NEPA) requirements.

1.10 Other Related Actions

Several related actions, initiated by a variety of government agencies and private organizations, would complement the establishment of the proposed South San Diego Bay Unit. These independent actions include the Otay Valley Regional Park, Memorandum of Understanding between the Navy and the Service, Sweetwater Marsh National Wildlife Refuge, Tijuana Slough National Wildlife Refuge, and Multiple Species Conservation Program. These related agency actions are stand-alone projects that would continue to be planned, funded, and implemented independently of the Service's action and decision on the South San Diego Bay Unit. As applicable, these actions are analyzed as part of the no action alternative and cumulative impacts (see chapter 4).

1.10.1 Otay Valley Regional Park

The cities of Chula Vista and San Diego and the County of San Diego propose to create an Otay Valley Regional Park that stretches along the Otay River from South San Diego Bay to the Upper and Lower Otay reservoirs. In 1990, the jurisdictions entered into a Joint Exercise of Power Authority Agreement for coordinated planning, acquisition, and design for the Otay Valley Regional Park. In 1997, they presented the *Preliminary Draft Otay Valley Regional Park Concept Plan*. The draft concept plan identifies study areas for an open space core/preserve area, recreation areas adjacent to the open space preserve, a loop trail system, and interpretive centers for environmental and educational programs.

The concept plan proposes an Otay Valley Regional Park study area that overlaps approved and proposed portions of the San Diego National Wildlife Refuge. In the Vernal Pools Unit, the overlap occurs near Lower Otay Reservoir and Otay Mesa. The boundary of the Regional Park study area overlaps the proposed South San Diego Bay Unit in the salt ponds (see map 2). The overlap occurs between the railroad bed (the tideward boundary of the park study area) and the landward limits of parcels owned by Western Salt or its subsidiaries (the landward boundary of

the Refuge study area). At the Otay-Sweetwater Unit, overlap occurs at the Upper and Lower Otay reservoirs and the eastern Otay River Valley. The proposed Regional Park is an important regional conservation initiative that would protect a significant riparian corridor between the proposed South San Diego Bay Unit and the Otay-Sweetwater Unit.

1.10.2 Memorandum of Understanding between Naval Computer and Telecommunications Station, San Diego; Commander, Naval Base San Diego; and United States Fish & Wildlife Service

This Memorandum of Understanding (MOU) was signed on December 12, 1996 and is valid for 20 years, with five-year review intervals. The agreement implements a policy of coordination and cooperation between the Navy and the Service to develop a habitat bank and implementation plan for effective conservation, long-term protection, and management of the natural communities and sensitive species at the Naval Radio Receiving Facility at Imperial Beach. The purpose of the habitat bank is to provide compensation opportunities to offset future Naval impacts to natural resources and sensitive species in the San Diego Bay area. An implementation plan is being completed. When the plan is complete and approved by both parties, it will be signed and become part of the MOU.

Approximately 350 acres of natural and disturbed vegetation are included in the MOU, representing protection of a key zone connecting Bay and ocean habitats, as well as protection and enhancement of native habitats for targeted native species. Targeted species include, but are not limited to, California least tern, western snowy plover, salt marsh bird's beak, Belding's savannah sparrow, burrowing owl, loggerhead shrike, short-eared owl, San Diego coast barrel cactus, Nuttall's lotus, San Diego blacktail jack rabbit, coast woolly heads, globose dune beetles, and two species of tiger beetles.

The parties agree that a) functional ecosystems will be maintained and restored; b) viable populations of target species will be maintained and restored; c) existing wildlife corridors and habitat linkages between critical resource areas on site will be maintained or improved; d) native vegetation areas will be maintained or expanded in ecologically significant areas with a focus on regional habitat needs; and e) term, mitigation ratios, and success criteria will be established in the implementation plan. The MOU has no effect on Camp Surf, which is not included in the MOU boundaries.

1.10.3 Sweetwater Marsh National Wildlife Refuge

Sweetwater Marsh consists of 316 acres of salt marsh and coastal uplands on the South Bay in the City of Chula Vista and National City. The Refuge is located at the northeastern boundary of the study area. The Nature Interpretive Center is operated by the City of Chula Vista. The Center offers extensive interpretive programs including formal environmental education classes. The Refuge provides habitat for California least tern, light-footed clapper rail, salt marsh bird's beak, Palmer's frankenia, and a variety of migrating shorebirds and wintering waterfowl. Over 200 species of birds have been recorded at Sweetwater Marsh.

1.10.4 Tijuana Slough National Wildlife Refuge

Tijuana Slough consists of 1,056 acres of open water, tidal salt marsh, beach dune, riparian, and upland habitat in the City of Imperial Beach. The Refuge is part of the 2,530-acre Tijuana River National Estuarine Research Reserve. The Reserve is operated jointly by the California Department of Parks and Recreation, the San Diego County Parks Department, and the Service. The Refuge provides habitat for California least tern, light-footed clapper rail, least Bell's vireo, brown pelican, salt marsh bird's beak, and a variety of migrating shorebirds and wintering waterfowl. To date, 378 species of birds have been recorded.

The Service is in the process of updating the Refuge's comprehensive management plan. The plan is available on the world wide web at <http://www.r1.fws.gov/planning/plnhome.html>.

1.10.5 Multiple Species Conservation Program (MSCP) and Habitat Conservation Plans

The City of San Diego and the U.S. Fish & Wildlife Service completed an *EIR/EIS Issuance of Take Authorizations for Threatened and Endangered Species Due to Urban Growth Within the Multiple Species Conservation Program (MSCP) Planning Area* (City of San Diego and U.S. Fish & Wildlife Service 1997) and Record of Decision. The MSCP identifies the most important remaining habitats for 85 species to be protected. By protecting the most important areas, all participants hope to create an opportunity for the listed species to continue or grow in number, and to prevent other species from becoming threatened or endangered by loss of their homes. The Secretary of the Interior regulates take of listed species on non-Federal land under Section 10(a)(1)(B) of the ESA.

Normally, the Service reviews site-specific proposals for direct take or incidental habitat disturbance under the Endangered Species Act in the Section 10(a)(1)(B) permit process, which includes preparing a habitat conservation plan. The MSCP will streamline the process. The process will allow participating cities to apply once for a permit for all proposed habitat disturbance within their jurisdictions. Once a city has a permit, the city must decide where, when, and how the legal amount of development will occur, guided by land use plans, subdivision regulations, and zoning.

The MSCP Plan covers 85 species (20 of which are listed), with emphasis on the federally endangered California gnatcatcher. The subregional (programmatic) MSCP Plan covers the southwestern portion of San Diego County (582,243-acre planning area or roughly 900 square miles). Of the 582,243-acre MSCP planning area, 171,917 acres are proposed to be conserved and up to 410,326 acres may be disturbed once all the cities obtain permits and implement their subarea plans.

Only the City of San Diego currently has an incidental take permit. Within the 582,243-acre MSCP planning area, the City of San Diego Subarea Plan covers 206,124 acres (all areas within

the jurisdiction of the City of San Diego, plus the Cornerstone Lands owned by the City Water Utilities Department). Of this 206,124-acre planning area, the City of San Diego will conserve 52,012 acres and disturb up to 154,112 acres.

A small but important part of the San Diego Bay and environs (two percent) is conserved in the MSCP Plan. This includes the privately owned portions of Western Salt Company ponds that have been diked off from the Bay, as well as Pond 20, the MKEG/Fenton Parcel, and Area 2 (see map 2). (The Fenton Parcel belongs to the City of San Diego.) A majority of the Bay is outside the MSCP planning boundary because the tidally influenced portions of the Bay fall within State and Port jurisdiction, not the jurisdiction of any of the participating communities. By establishing the South San Diego Bay Unit, the U.S. Fish & Wildlife Service would augment and complement the MSCP protection of the salt works and the rest of the MSCP area. This environmental assessment incorporates the analysis of effects from MSCP EIS/EIR for South Bay and overall cumulative effects in San Diego County.

Because submerged lands administered by the San Diego Unified Port District and the State Lands Commission are not included in the MSCP, both must prepare a separate habitat conservation plan and permit application for any proposed activities that would cause take of federally listed species. Navy lands are also not included in the MSCP planning area since Federal agencies apply to the Service for take authorization under Section 7 of the Endangered Species Act, not Section 10.

In addition to the MSCP, the Service has issued three permits for take of listed species in San Diego County based on the habitat conservation plans (HCP) and Natural Community Conservation Plans (NCCP):

1. Fieldstone/La Costa and City of Carlsbad HCP. This permit covers adverse effects to 63 species and any take of the 4 species that are listed. The permit includes a 1,955-acre planning area, of which 942 acres will be conserved and up to 1,013 acres will be disturbed, in the southeast portion of the City of Carlsbad.
2. SDG& E Subregional NCCP. This permit covers adverse effects to 110 species and any take of the 18 species that are listed. This permit includes the entire service area: San Diego County west of the desert, portions of Orange County, and the Moreno Compressor Station in Riverside County. They anticipate adversely affecting 124 acres. A block of 240 acres of off-site habitat will be conserved.
3. Poway Subarea HCP. This permit covers adverse effects to 43 species and any take of the 7 species that are listed. It covers the area under the jurisdiction of the City of Poway, located in the center of the coastal slope of San Diego County, approximately midway between the cities of San Diego and Escondido. The permit includes a 25,000-acre

planning area, of which 10,800 acres will be conserved and up to 14,200 acres will be disturbed.

1.11 National Wildlife Refuge System and Authorities

The mission of the U.S. Fish & Wildlife Service is to conserve, protect, and enhance the Nation's fish and wildlife and their habitats for the continuing benefit of the American people. The Service is the primary Federal agency responsible for migratory birds, endangered plants and animals, certain marine mammals, and anadromous fish. This responsibility to conserve our Nation's fish and wildlife resources is shared with other Federal agencies and State and Tribal governments.

As part of this responsibility, the Service manages the National Wildlife Refuge System (NWRS). The NWRS is the only nationwide system of Federal land managed and protected for wildlife and their habitats. The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (16 USC 668dd et. seq.).

Unlike other Federal lands that are managed under a multiple-use mandate (e.g., national forests administered by the U.S. Forest Service and public lands administered by the BLM), units of the National Wildlife Refuge System are managed as primary-use areas. That is, they are managed primarily for the benefit of fish, wildlife, and their habitats, and secondarily for other uses. In addition, refuges are closed to uses other than conservation and management of fish, wildlife and plants, including public use, unless specifically and formally opened.

Before secondary uses are allowed on national wildlife refuges, Federal law requires that they be formally determined to be "compatible" with the purpose for which the refuge was established. For recreational uses to be allowed, a refuge manager must further determine that adequate funding and staffing are available for the development, operation, and maintenance of the activity.

A refuge purpose may be specified in or derived from Federal law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum. In addition to providing a basis for making compatibility determinations, a refuge's purpose also serves as a vision or broad mission statement for refuge management and the public.

Guiding Principles of the National Wildlife Refuge System

1. **Habitat.** Fish and wildlife will not prosper without high-quality habitat, and without fish and wildlife, traditional uses of refuges cannot be sustained. The Refuge System will continue to conserve and enhance the quality and diversity of fish and wildlife habitat within refuges.
2. **Public Use.** The Refuge System provides important opportunities for compatible wildlife-dependent recreational activities involving hunting, fishing, wildlife observation and

photography, and environmental education and interpretation.

3. **Partnerships.** America's sportsmen and women were the first partners who insisted on protecting valuable wildlife habitat within wildlife refuges. Conservation partnerships with other Federal agencies, State agencies, local government, Tribes, organizations, industry, and the general public can make significant contributions to the growth and management of the Refuge System.
4. **Public Involvement.** The public should be given a full and open opportunity to participate in decisions regarding acquisition and management of our national wildlife refuges.

Goals of the National Wildlife Refuge System

1. To preserve, restore, and enhance in their natural ecosystems (when practicable) all species of animals and plants that are endangered or threatened with becoming endangered.
2. To perpetuate the migratory bird resource.
3. To preserve a natural diversity and abundance of fauna and flora on refuge lands.
4. To provide an understanding and appreciation of fish and wildlife ecology and the human's role in the environment; and to provide refuge visitors with high quality, safe, wholesome, and enjoyable recreational experiences oriented toward wildlife to the extent these activities are compatible with the purposes for which the refuge was established.

The San Diego National Wildlife Refuge, including the Vernal Pools, Otay-Sweetwater, and proposed South San Diego Bay Units, would be managed as part of the National Wildlife Refuge System in accordance with the National Wildlife Refuge System Administration Act of 1966, Refuge Recreation Act of 1962, and Executive Order 12996 (Management and General Public Use of the National Wildlife Refuge System), the National Wildlife Refuge System Improvement Act of 1997 and other relevant legislation, executive orders, regulations, and policies.

Purpose of the San Diego National Wildlife Refuge

The purpose of the San Diego National Wildlife Refuge is to protect, manage, and restore habitats for federally listed endangered and threatened species and migratory birds and to maintain and enhance the biological diversity of native plants and animals.

Interim Goals of the San Diego National Wildlife Refuge

The following goals of the San Diego Refuge reflect the core mission of the Fish & Wildlife Service to protect wildlife resources of national importance while providing compatible

opportunities for the public to appreciate and enjoy the natural heritage of the region.

1. **Endangered Species/Essential Habitats:** To protect, restore, and enhance native habitats to aid in the recovery of federally listed endangered and threatened species and to prevent the listing of additional species.
2. **Biodiversity:** To protect, manage, and restore the rare coastal sage scrub, chaparral, riparian woodland, vernal pool, coastal dune, and wetland habitats representative of the biological diversity of the southwestern San Diego region.
3. **Cooperative Programs:** To create partnerships and provide leadership in coordinating the land management activities of Federal, Tribal, State, and local governments and agencies, and with academia, private conservation organizations, and citizens in support of the Multiple Species Conservation Program preserve system.
4. **Migratory Birds:** To provide breeding, migration, and wintering habitat for migratory birds, with emphasis on nesting seabird and migrating shorebird breeding habitat, and wintering waterfowl habitat.
5. **Public Use:** To provide safe and high quality opportunities for compatible wildlife-dependent educational and recreational activities that foster public appreciation of the unique natural heritage of the San Diego region.

The authorities for the establishment of the San Diego National Wildlife Refuge are the Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j), as amended; Endangered Species Act of 1973 (16 U.S.C. 1531-1543), as amended; Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715d, 715e, 715f-715r), as amended; Emergency Wetlands Resources Act of 1986 (PL 99-645) and Refuge Recreation Act of 1962 (16 U.S.C. 460k-460-k-4), as amended. The Endangered Species Act of 1973, Fish and Wildlife Act of 1956, Emergency Wetlands Resources Act of 1986, Emergency Wetlands Resources Act of 1986, and Refuge Recreation Act of 1962 authorize the Service to use funds made available under the Land and Water Conservation Fund Act of 1965 (U.S.C. 4601-4601-11), as amended, to acquire lands, waters, or interests therein for fish and wildlife conservation purposes. The Emergency Wetlands Resources Act of 1986 authorizes the Service to use funds allocated by the Migratory Bird Conservation Commission from the Migratory Bird Conservation Fund. Federal monies used to acquire private lands through the Land and Water Conservation Fund are derived primarily from oil and gas leases on the outer continental shelf, excess motorboat fuel tax revenues, and the sale of surplus Federal property.

1.11.1 Wildlife-Dependent Recreational Activities and Compatible Refuge Uses

A compatible use on a refuge is a secondary use that will not materially interfere with or detract

from the purpose(s) for which the refuge was established. Some compatible uses may be supportive of refuge purposes, while others may be of a nonconflicting nature. All secondary uses, such as public use of trails for observing wildlife, must be compatible with the purposes of the refuge. Compatibility determinations also require an analysis of the availability of Service funding and staff to oversee the activity pursuant to the Refuge Recreation Act. If the proposed use is found compatible, the use may be authorized by the refuge manager if management funds and staff are available and other laws and regulations are satisfied. All secondary uses are discretionary even if the use is compatible and funding and staffing are available. Compatibility determinations ensure that the natural resources are protected while providing for uses on the refuges that are consistent with wildlife management.

The Service completed an interim compatibility determination for the South San Diego Bay study area on June 30, 1997. Five of the six priority wildlife-dependent recreational activities identified in 1997 occur in the study area: fishing, wildlife observation, wildlife photography, environmental interpretation, and environmental education. All five were determined to be compatible.

The continuation of wildlife-dependent recreational activities would also require the determination of the Service's authority to regulate the activity, availability of funds and staff to oversee the activity, and an analysis of any environmental impacts pursuant to the National Environmental Policy Act. Hunting does not occur in the study area.

Potential new public access points at the southern end of the Bay would be identified during the management plan process. Public access planning and final site selection would consider public need and input, parking and accessibility, wildlife inventory and species-needs data, and Refuge resources to determine where, when, and what types of access are compatible with the purposes for which the Refuge was established, and feasible for the Service to implement. Protection of wildlife habitat, especially for feeding, resting, and nesting birds and their young, would define the types of visitor activities and access allowed. The Service would seek partnerships with local governments and entities in operation and maintenance of any public access points.

1.11.2 Implications of Refuge Designation on Neighboring Lands

The designation of a national wildlife refuge acquisition boundary does not effect regulatory environmental compliance requirements for neighboring lands. Compliance requirements for proposed development projects for unacquired lands within the refuge boundary, and for lands adjacent or in proximity to the approved boundary, do not change when the acquisition boundary is approved.

All projects and landowners must comply with regulatory provisions of the Clean Water Act, River and Harbors Act, Endangered Species Act, Coastal Zone Management Act, and other Federal, State and local environmental laws. Whether lands are adjacent to or included within an approved national wildlife refuge boundary is not relevant to the requirements to comply with those laws protecting wetlands and endangered species.

There is no regulatory buffer zone around national wildlife refuges. Landowners do not have to

clear a higher level of review or additional regulatory requirements because of the acquisition of neighboring lands into the National Wildlife Refuge System.

Chapter 2. ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

This chapter describes the four alternatives considered by the Service for the proposed South San Diego Bay Unit (see map 3). The alternatives address the purposes and needs identified in sections 1.3 and 1.4.

2.1 Range of Alternatives

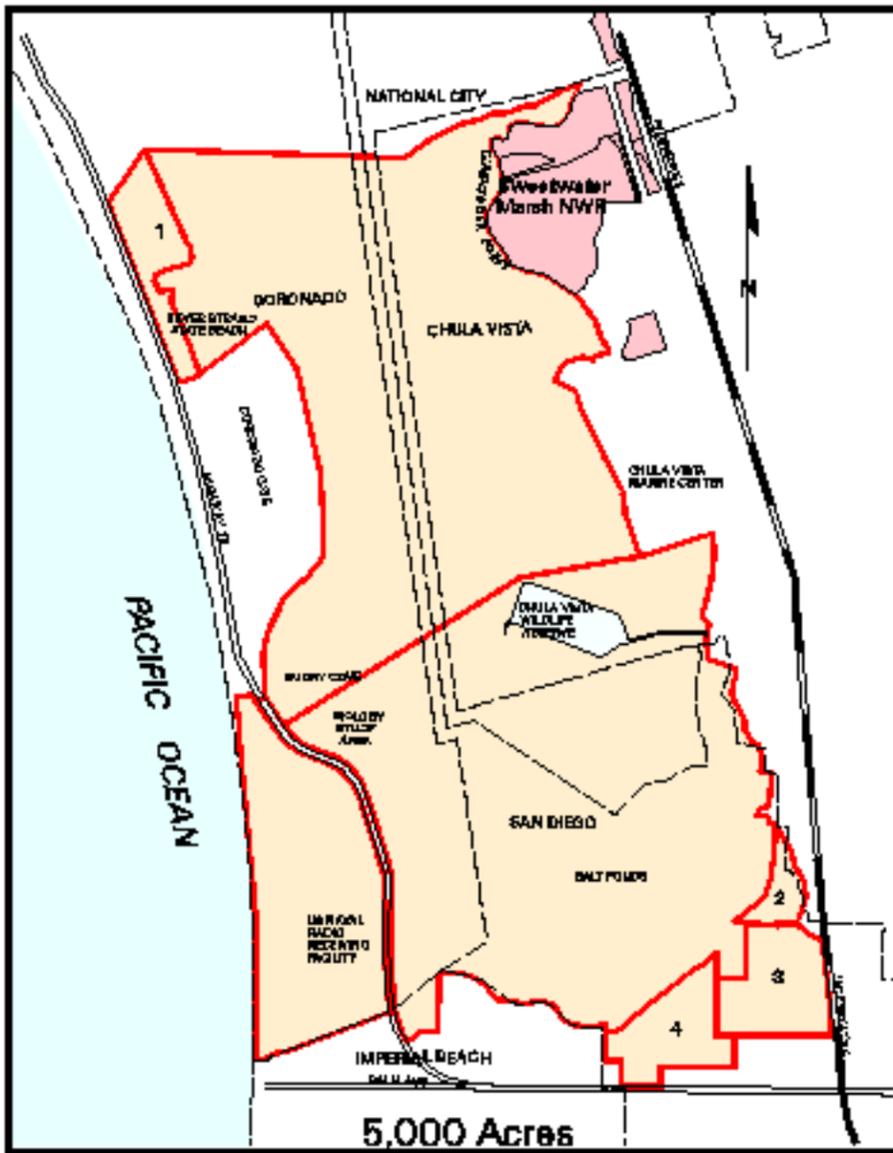
The Service identified a variety of habitat protection options through meetings with Federal, State, and local agencies; private groups and individuals; and through wildlife research and other relevant studies. The alternatives differ in the acreage of land proposed for Service acquisition and management. As part of the no action alternative, the Service would not acquire or manage any land within the South San Diego Bay Unit. Acquisition methods are determined by Federal law and policy, and whether the owner is private, or local, State, or Federal government.

2.2 Actions Common to All Alternatives

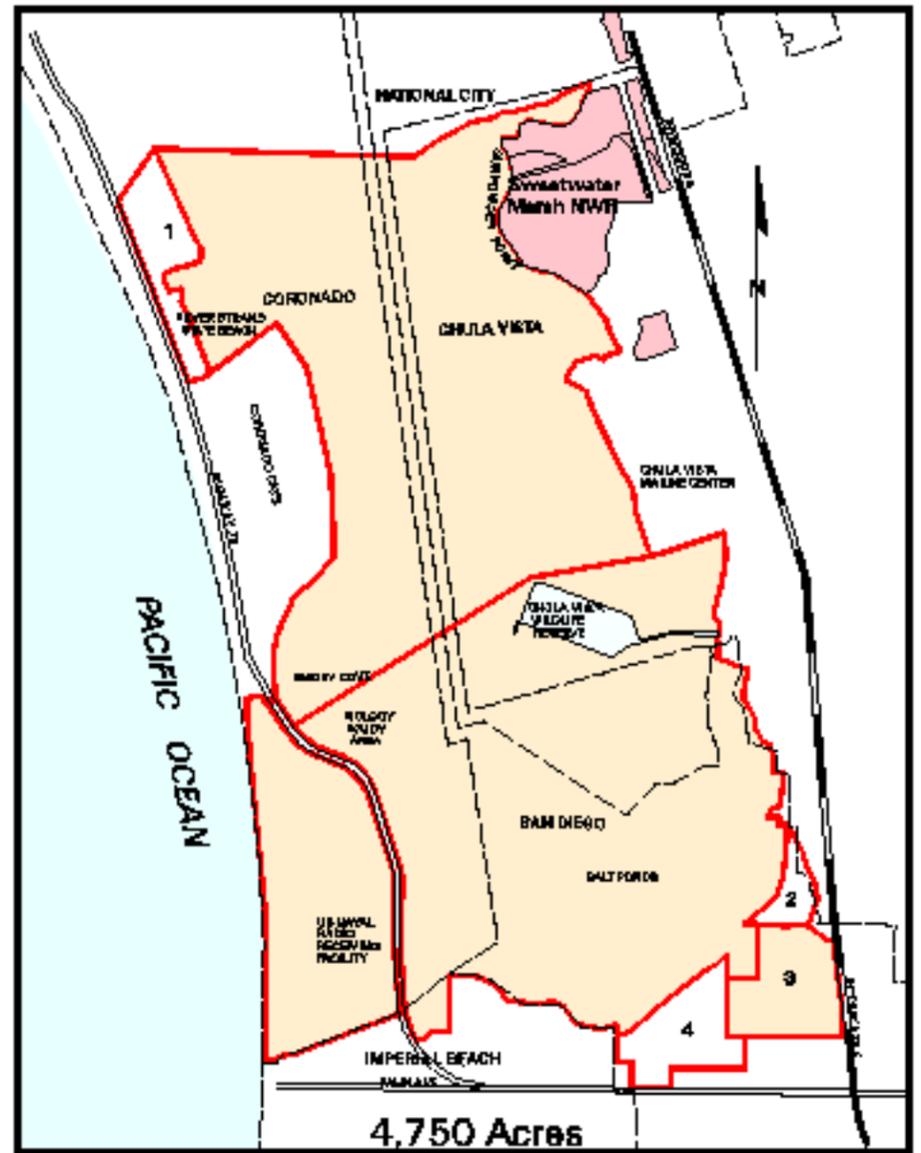
The following types of protection and habitat enhancement are in effect throughout the study area:

1. The Federal Endangered Species Act (ESA) prohibits harassment, harm, or killing of individuals; destruction of habitat; or any other form of take of federally listed species without first applying for a Section 10 permit. The ESA prohibits take of plant species on Federal land. Belding's savannah sparrow is not a federally listed species, and no ESA protection applies.
2. The Navy prevents damage from trespass and development at the Naval Radio Receiving Facility. It also enhances habitat for native and listed species, as part of the Memorandum of Understanding between the Department of the Navy and the Service.
3. California Environmental Quality Act requires a full public analysis of certain proposed projects and their environmental effects.
4. Existing Federal and State laws and regulations and State and local land use development standards limit wetland fill or dredging activities.
5. The Federal Coastal Zone Management Act requires that the California Coastal Commission review any project proposed in the coastal zone. Projects cannot proceed unless they are consistent with this Act.
6. The California Department of State Parks and Recreation is restoring the Silver Strand parcel with native vegetation. Public uses that do not compromise the restoration goals of this project could be allowed.
7. The Port enforces a 5-mph speed limit for the South Bay between March 16 and October 14 annually.

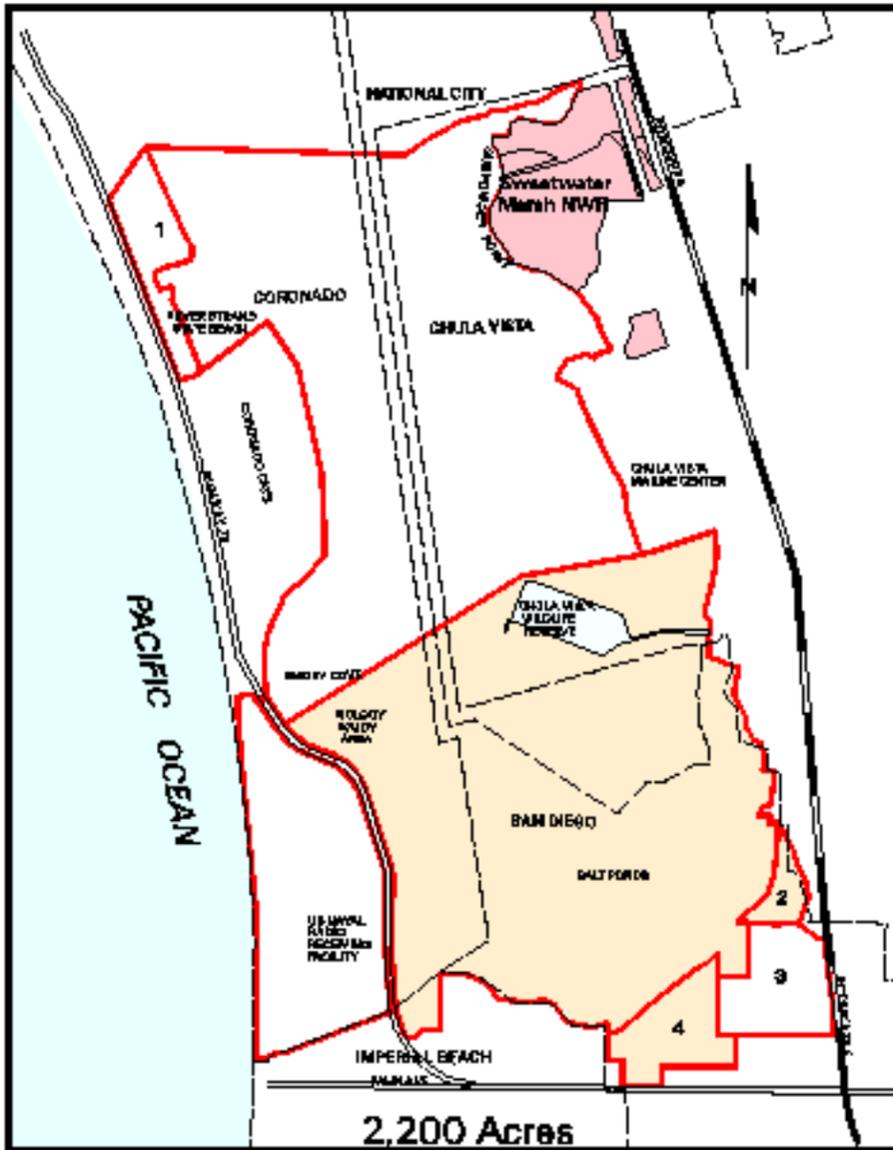
MAP 3. BOUNDARY ALTERNATIVES, PROPOSED SOUTH SAN DIEGO BAY UNIT



Alternative A



Alternative B - Preferred Alternative



Alternative C

- 1 Silver Strand State Beach**
- 2 Area Two**
- 3 MKEG / Fenton Parcel**
- 4 Pond 20**



2.3 Features Common to Alternatives A, B, and C, but Lacking in the No Action Alternative

2.3.1 Land Protection and Acquisition Options

The Service has no authority to acquire land or negotiate agreements on behalf of the National Wildlife Refuge System (NWRS) except within an approved refuge boundary. Therefore, the boundary provides opportunities for the landowners and the Service to work cooperatively. Once a boundary is approved, the Service still has no authority to protect or manage wildlife or habitat on a given property as part of the NWRS unless and until a property owner willingly enters into an agreement with the Service. Protection as part of the NWRS begins when a refuge boundary has been approved and a property owner has willingly signed a contract with the Service. Types of agreements include sale, easement, lease, or in the case of a State or Federal agency, cooperative agreement.

The Service could protect and manage land using several different mechanisms, depending upon the landowner's and the Service's interest in the land. The South San Diego Bay land protection plan, included at the end of this document, further describes Service policies on land acquisition and management inside Refuge boundaries.

Federal land. The Service is limited to pursuing a cooperative agreement or land exchange with the Navy. Under a cooperative management agreement, the Service could conduct specific wildlife management activities on specific land, as mutually agreed. Such an agreement could result in an overlay refuge on Navy land. Current leases between the Navy and other State and local agencies would not be affected by cooperative agreements with the Service. In the unlikely event that the land is declared excess and disposed of as part of the Base Relocation and Closure Act, the Department of the Navy could ultimately transfer the land to the Service.

State land. By policy, the Service is not permitted to purchase State land. The Service's habitat protection options on State-administered land are limited to leases, exchanges, or cooperative agreements. (This State land is submerged and best recognized as open water.)

Port land. For land under the jurisdiction of the San Diego Unified Port District (Port), the Service could pursue a number of habitat protection options, including cooperative agreements, conservation easements, or fee title purchase. The Service is not permitted to purchase in fee title any State-owned tidelands under Port trusteeship. The Port and the Service would mutually determine habitat protection agreements.

Private land and land owned by local governments. On private land, the Service has the greatest number of acquisition options: 1) acquisition of all (fee title) or some property rights (easements), and 2) acceptance of donated land, fee title, or easement. Privately owned land within the proposed Refuge boundary would be unaffected by inclusion within the boundary until and unless landowners choose to participate. Local government lands are public, but the Service's acquisition options on local government-owned lands are similar to those for private

lands. The City of San Diego recently purchased the Fenton parcel (see map 5), and the City of Imperial Beach owns a .14-acre parcel within the proposed boundary that is too small to be shown on map 5.

The San Diego Metropolitan Transportation Development Board (SDMTDB) owns the railroad right-of-way, which is the alternative route for the Bayshore Bikeway. The bikeway and railroad line are both included in the proposed Refuge boundary. The Service will not seek to acquire, operate, maintain, or manage either. The inclusion of both, however, is an opportunity for the Refuge to work in partnership with other community activities.

2.3.2 Management as Part of the National Wildlife Refuge System

The Service would manage acquired land within the approved boundary as a unit of the National Wildlife Refuge System (see section 1.11). The NWRS is the only nationwide system of federally owned land dedicated to protection of fish, wildlife, and plants. There are over 500 national wildlife refuges across the United States. The first refuges were designated by President Theodore Roosevelt in 1903. The National Wildlife Refuge System has several unique characteristics that separate Refuge System protection from any other Federal, State, local, or private programs that protect wildlife or habitat.

- 1) Refuge land is protected for fish, wildlife, plants, and their habitats in perpetuity. No other form of protection has equal assurance of being there “forever” for wildlife.
- 2) Under the National Wildlife Refuge Improvement Act of 1997, the single mission of the National Wildlife Refuge System—protection of wildlife and habitat—is unequivocal. It does not provide for multiple, competing purposes.
- 3) Each refuge is part of the 510-unit, 92 million-acre system that stretches nationwide for wildlife protection. Migratory birds that would be protected at this Refuge would also be protected at many other refuges along their flyways. People all over the country recognize that any refuge is a haven for wildlife. This recognition is very helpful for communities seeking to attract visitors to view birds and wildlife.
- 4) As part of the agency responsible for listing, protecting and recovering species in danger of becoming extinct, the NWRS has a strong focus on and commitment to protecting listed plants and animals, protecting and enhancing the habitat used by these species, and actively using refuge land and agency expertise in wildlife biology to help increase populations of these species enough so that they may recover from the threat of extinction.
- 5) The NWRS is managed and operated by an agency staffed by professional wildlife managers whose sole task is the inventory, protection, and management of fish, wildlife, plants, and their habitats. Refuge staff frequently move to three or more refuges in their careers, often in different parts of the country, bringing a breadth and depth of experience unequalled by other protection networks of smaller geographic scope. Other fish, wildlife, plant, or habitat specialists working in other programs within the Service apply their expertise, research, and assistance to refuges regularly.

6) While refuges are closed to public use except where specifically opened, national wildlife refuge status allows the Service to bring Federal dollars and other resources to a refuge to promote compatible wildlife-dependent recreation. Thus, overall recreational opportunities are frequently increased on land brought into the Refuge System.

7) Refuges are responsive to local needs and interests regarding protection of fish, wildlife, and habitats when implementing fish, wildlife, and plant management activities. Over the next 15 years, every refuge in the country will prepare or update a 15-year comprehensive conservation plan to guide the management and operation of the refuge. Each plan will be developed with the participation of citizens, elected leaders, and interested groups.

Management activities on national wildlife refuges generally include 1) monitoring the status and recovery of endangered, threatened, and candidate species; 2) controlling nonnative species; 3) restoring and enhancing native habitats; 4) protecting migratory birds and their habitats; and 5) providing high-quality wildlife-dependent recreational opportunities. Information on habitats and wildlife is shared throughout the NWRs to coordinate management efforts as necessary.

This environmental assessment describes potential management actions in very general terms because this is a decision-making document for a proposed Refuge boundary and land protection plan (attached) only. The Service would examine different management alternatives during the management plan process once land is acquired (see section 1.9.2). The Service has authority under 50 CFR to provide basic refuge management actions and to implement small-scale, individual activities on acquired land.

During subsequent management planning, the Service would address proposals for two issues raised by the Refuge proposal: 1) public access points, and 2) effects on boaters from protecting migratory waterfowl and seabirds from disturbance in fall and winter. The Service is introducing both issues for public discussion now in preparation for the management planning process.

If the Refuge boundary is approved, the Service would identify, then select, one or more potential new public access points at the southern end of the Bay. The Service would seek partnerships with local governments and entities in operation and maintenance of the access point or points.

Service acquisition of publicly owned tidelands of South San Diego Bay would be limited to the negotiation of cooperative agreements, permits, or leases, with the existing trustees—San Diego Unified Port District (Port) and the State Lands Commission. These acquired tidelands would become part of the National Wildlife Refuge System.

Some restrictions on recreational boating would likely be required for the Refuge to meet its goal of protecting concentrations of wintering waterfowl. Restrictions could include establishing boat-free sanctuary areas from November to March, continuing existing speed limits, and possibly creating no-wake zones. Restrictions on boat operation adjacent to salt pond dikes during the seabird nesting period may also be necessary. Restrictions could be as great as restricting boats to

existing navigation channels only, but could also include establishing smaller sanctuaries closed to boating during the fall and winter. Boat use of navigation channels that serve existing South Bay marina facilities would not be affected.

Establishment of a Refuge boundary does not provide the Service with authority to unilaterally impose boating restrictions. That authority would depend on the willing participation of the existing trustee agencies. Regulations establishing boating restrictions would have to be promulgated by State and Port authorities and the U. S. Coast Guard. They would be part of, or subsequent to, negotiated agreements to establish national wildlife refuge status on State or Port lands. The Service would assimilate any new boating regulations as Refuge regulations, which would be enforceable by Refuge law enforcement personnel. Refuge enforcement personnel would cooperate with other enforcement agencies to a mutually agreeable extent, which could include joint patrolling or cross-deputization.

2.4 Alternatives for the Proposed South San Diego Bay Unit, Including the Preferred Alternative

2.4.1 Alternative A: 5,000-acre Unit

Acquisition Area and Methods. Alternative A would include about 4,994 acres of public and private land within the proposed South San Diego Bay Unit Boundary (map 3). Table 2 shows current landowners and the acreage of important habitats identified for protection as part of the proposed Refuge Unit.

The following areas would be **excluded** from the alternative:

1. Land and water areas and commercial operations of the Chula Vista harbor area and boat yards, and any portion of the City of Chula Vista above the mean high water level (see map 2).
2. All of the Coronado Cays area.
3. All property of San Diego Gas & Electric above the mean high water level.
4. An 11-acre crystallizer pond adjacent to the packaging and shipping area.
5. The 4-acre salt packaging and shipping area adjacent to Bay Boulevard (includes buildings and other improvements at Western Salt Company).

Table 2. Acres of Habitats, by Ownership, Proposed for Acquisition under Alternative A, South San Diego Bay Unit.

Habitat	Ownership				Total
	Navy	State	Port	Private/Local Gov't*	

Submerged Land	8	766	912	35	1,721
Eelgrass	1	297	366	27	691
Mudflat/intertidal	0	9	309	174	492
Salt Marsh**	14	0	33	10	57
Salt Pond	13	0	2	1,160	1,175
Beaches, Dunes, and Created Land	574	0	70	52	696
Riparian	0	0	0	8	8
Fallow Agricultural Land	0	0	0	154	154
Total Acres	610	1,072	1,692	1,620	4,994

* Includes cities of San Diego and Imperial Beach, and San Diego Metropolitan Transportation Development Board's railroad holdings.

** Does not include acreage along dikes in salt ponds.

2.4.2 Alternative B: 4,750-acre Unit (Preferred Alternative)

Alternative B would be very similar to A, but would exclude three areas on the perimeter of the study area. The southern boundary would include a 100-foot buffer of the Otay River in the Pond 20 area, from the high-water line on the landward side.

Acquisition Areas and Methods. Alternative B would include about 4,772 acres of public and private land within the proposed South San Diego Bay Unit (map 3). Alternative B would cover about 96 percent of Alternative A. Table 3 shows important habitats identified for protection as part of the proposed Refuge Unit boundaries, and the current landowners.

The following areas would be **excluded** from the alternative:

1. Land and water areas and commercial operations of the Chula Vista Marine Center harbor area and boat yards, and any portion of the City of Chula Vista above the mean high water level (see map 2).
2. All of Coronado Cays area.
3. All property of San Diego Gas & Electric above the mean high water level.
4. Western Salt Area 2 and Pond 20, except for the 100-foot buffer along the Otay River in Pond 20.

5. An 11-acre crystallizer pond adjacent to the packaging and shipping area.
6. A 4-acre salt packaging and shipping area adjacent to Bay Boulevard (includes buildings and other improvements at Western Salt Company).
7. Silver Strand State Beach.

Table 3. Acreage of Habitats, by Ownership, Proposed for Acquisition under Alternative B, South San Diego Bay Unit.

Habitat	Ownership				Total
	Navy	State	Port	Private/ Local Gov't*	
Submerged Land	8	766	912	35	1,721
Eelgrass	1	297	366	27	691
Mudflat/intertidal	0	9	309	174	492
Salt Marsh**	14	0	33	10	57
Salt Pond	13	0	2	1,023	1,038
Beaches, Dunes, and Created Land	488	0	62	39	589
Riparian	0	0	0	8	8
Fallow Agricultural Land	0	0	0	146	146
Total Acres	524	1,072	1,684	1,462	4,742

* Includes cities of San Diego and Imperial Beach, and San Diego Metropolitan Transportation Development Board's railroad holdings.

** Does not include acreage along dikes in salt ponds.

2.4.3 Alternative C: 2,200-acre Unit

Alternative C is the preferred alternative from the 1978 environmental assessment and Finding of No Significant Impact. This boundary encompasses the salt ponds and includes Pond 20, Area 2, and part of the MKEG parcel. The only parts of Emory Cove that are included are those south of Emory Channel. The Navy land is not included.

Alternative C has been modified for this document to include about 10 acres of created land south of the Otay River that provide a 100-foot buffer for the river. This buffer zone was added to simplify mapping and boundary lines.

Acquisition Areas and Methods. Alternative C would include about 2,203 acres of public and private land within the proposed South San Diego Bay Unit (map 3). The area proposed for protection is approximately 44 percent of Alternative A. Table 4 shows current landowners and important habitats identified for protection as part of the proposed Refuge Unit.

The following areas would be **excluded** from the alternative:

1. Land and water areas and commercial operations of the Chula Vista Marine Center harbor area and boat yards, and any portion of the City of Chula Vista above the mean high water level (see map 2).
2. All areas north of the Emory Channel and the Chula Vista Wildlife Reserve, including the land and water area and commercial operations of the Chula Vista harbor area, the area north to the boat yards, all of Coronado Cays, and Silver Strand State Beach.
3. A 4-acre salt packaging and shipping area adjacent to Bay Boulevard (includes buildings and other improvements at Western Salt Company).
4. An 11-acre crystallizer pond adjacent to the packaging and shipping area.
5. The U.S. Naval Radio Facility.
6. Silver Strand State Beach.
7. All but parcel 62103020 of the MKEG /Fenton property (shown, but not numbered, on map 3).
8. All property of San Diego Gas & Electric above the mean high water level.

Table 4. Acreage of Habitats, by Ownership, Proposed for Acquisition under Alternative C, South San Diego Bay Unit.

Habitat	Ownership				Total
	Navy	State	Port	Private/ Local Gov't*	
Submerged Land	0	62	283	35	380
Eelgrass	0	1	22	27	50
Mudflat/intertidal	0	9	246	174	429
Salt Marsh**	14	0	30	10	54
Salt Pond	13	0	2	1,160	1,175
Beaches, Dunes, and Created Land	7	0	30	52	89
Riparian	0	0	0	3	3
Fallow Agricultural Land	0	0	0	23	23
Total Acres	34	72	613	1,484	2,203

* Includes cities of San Diego and Imperial Beach, and San Diego Metropolitan Transportation Development Board's railroad holdings.

** Does not include acreage along dikes in salt ponds.

2.4.4 Alternative D (No Action)

Acquisition Areas and Methods. As part of the no action alternative, the Service would not acquire, manage, or protect any land as part of the National Wildlife Refuge System in the South Bay. Protection and habitat enhancement described in section 2.2 would occur.

2.5 Comparative Summary of the Direct Actions and Effects of the Alternatives

Table 5 provides a comparison of the number of acres potentially acquired for Alternatives A through D. Table 6 summarizes the effects of Alternatives A through D. These effects are analyzed in detail in chapter 4.

Table 5. Comparison of Acres Potentially Acquired under Alternatives A-D

	Study Area	Alternative A 5,000 acres	Alternative B 4,750 acres	Alternative C 2,200 acres	Alternative D 0 acres
Submerged Land	1,721	1,721	1,721	380	0
Eelgrass	691	691	691	50	0
Mudflat/intertidal	492	492	492	429	0
Salt Marsh*	57	57	57	54	0
Salt Pond	1,175	1,175	1,038	1,175	0
Beaches, Dunes, and Created Land	696	696	589	89	0
Riparian	8	8	8	3	0
Fallow Agricultural Land	154	154	146	23	0
Total Acres	4,994	4,994 (round to 5,000)	4,742 (round to 4,750)	2,203 (round to 2,200)	0

* Does not include acreage along dikes in salt ponds.

Table 6. Comparative Summary of Effects of Refuge Boundary Extension and Acquisition

for Alternatives A-D.

Issue	Alternative A 5,000 acres	Alternative B 4,750 acres (Preferred Alternative)	Alternative C 2,200 acres	Alternative D 0 acres
Coastal Ecosystem	In addition to Alternative D, provides NWRS protection and management in perpetuity for up to 100% of study area coastal ecosystem habitats, including up to *807 acres of potential Refuge restoration areas. Would increase quality and quantity of habitat, create an opportunity for increase in population.	In addition to Alternative D, provides NWRS protection and management in perpetuity for up to 96% of coastal ecosystem habitats, including up to **584 acres of potential Refuge restoration areas. Would increase quality and quantity of habitat, create an opportunity for increase in population.	In addition to Alternative D, provides NWRS protection and management in perpetuity for up to 44% of coastal ecosystem habitats, including up to ***169 acres of potential Refuge restoration areas. Would increase quality and quantity of habitat, create an opportunity for increase in population.	Provides NWRS protection and management for 0% of all coastal ecosystem habitats. Non-NWRS protection and management includes Endangered Species Act, MOU between Navy and Service, MSCP Plan, Federal, State, and local wetland and waterway development standards, CA CEQA, Coastal Zone Management Act, and State habitat restoration projects. Incremental loss of habitats expected to occur over time, decreasing the quality and quantity of resting, nesting and feeding habitat in the South Bay. Migratory waterfowl, especially surf scoter and scaup, at greatest risk.
Threatened and Endangered Species, Belding's Savannah Sparrow	Above protection and management would create an opportunity for increase in population for rail, tern, pelican, plover, plant, and sparrow. Addresses recovery plan components for rail, four areas for tern, the full extent possible in South Bay for pelican, three areas for plant.	Above protection and management, with effects similar to Alternative A. Alternative B would have 238 fewer acres of potential Refuge habitat restoration.	Above protection and management provide opportunity for population of plover to stabilize, and populations of rail, sparrow, plant to increase; would not provide opportunity for tern and pelican to stabilize or increase. Addresses recovery plan components for rail, two areas for tern, a portion of pelican habitat in the Bay, two areas for plant.	Alternative D expected, over time, to decrease the quality and quantity of feeding, nesting, and/or resting habitat for listed animals due to disturbance from incremental development, and increased winter recreational boating. Salt marsh bird's beak provided opportunity to increase population by Navy management. No recovery plan components met at this time for the rail, tern, pelican, and plant.

* includes Silver Strand State Beach, all of MKEG/Fenton, Radio Facility, 10 acres buffering Otay River and Pond 20 and Area 2.

** includes all of MKEG/Fenton, Radio Facility and 10 acres buffering Otay River .

***includes 23 acres of MKEG parcel, 10 acres buffering Otay River and Pond 20 and Area 2.

(Page 2) Issue	Alternative A	Alternative B	Alternative C	Alternative D
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Salt Works	Possible restructuring or phase-out on salt production from active ponds; potential decrease in development on Pond 20 and MKEG/Fenton parcel.	Same as Alternative A, except Pond 20 same as no action.	Same as no action alternative.	Salt production expected to continue at existing levels. Development of 7 acres on Fenton parcel expected, adding up to 172 jobs. Unknown degree of development of Pond 20 until it is determined whether jurisdictional wetlands exist, and if so, the amount.
Quality of Life	Same as Alternative D, except biodiversity and intrinsic value increase associated with Refuge protection and management is between \$32 million and \$325 million annually.	Same as Alternative D, except biodiversity and intrinsic value increase associated with Refuge protection and management is between \$32 million and \$325 million annually.	Same as Alternative D, except biodiversity and intrinsic value increase associated with Refuge protection and management is between \$11 million and \$108 million annually.	Silver Strand State Beach parcel, bikeway, railroad and excursion train all proceed as owner and public interest and funding allow. Camp Surf continues as long as the Navy extends its lease. No increase in biodiversity and intrinsic value associated with Refuge protection and management, since none would occur.
Winter Boating	Seasonal waterfowl sanctuary would move fall and winter boating from undetermined portions of South Bay (as a destination) to other portions of the Bay. Areas considered for sanctuary would be south of Crown Cove and 24th St. Channel. Five-mile-per-hour speed limit would continue. Navigational channel traffic would continue.	Same as Alternative A.	Same as A, but areas under consideration as sanctuary would occur south of Emory Cove and Chula Vista Marina only.	Five mile per hour speed limit continues; no seasonal waterfowl sanctuary area proposed.
Public Access	Greatest number of options for new public access to the Bay.	Same as Alternative A.	Several options for new public access to the Bay.	No opportunity for additional public access to the Bay.

Chapter 3. AFFECTED ENVIRONMENT

3.1 Introduction

This chapter describes the physical, biological, and social and economic factors within the South San Diego Bay area that are relevant to the issues described in chapter 1 (see section 1.8.2). The South San Diego Bay study area includes the Bay from south of the Sweetwater Channel to Imperial Beach and south San Diego (See map 2).

The South Bay continues to serve as a vital link in the Pacific Flyway. San Diego Bay is recognized as an important wintering area for waterfowl such as surf scoter, scaup, brant, and bufflehead, and for shorebirds such as northern phalarope and red knot. The study area is an important breeding ground for black skimmer and several species of tern. The agricultural fields, riparian woodlands, and salt marshes of the Tijuana River Valley and Tijuana National Estuarine Sanctuary all lie a short distance to the south of San Diego Bay, and casual observations indicate massive movement of birds back and forth between these nesting and foraging areas (FWS, in conversation, 1996).

Much of the discussion of birds in this chapter is based on two bird observation counts. These bird counts are snapshots of one year's Bay use, rather than predictors of where types of birds or individual species will always be found. In a 1993-1994 year-long program of weekly surveys, the Service recorded more than 522,000 bird observations, representing 3.7 million bird-use days, in the salt ponds alone (FWS 1994a). In mid-August and early December, almost 200,000 birds at a time were found in South San Diego Bay (ibid). In a separate study, the Service (FWS 1995b) counted an additional 80,000 waterfowl sightings, representing about 628,000 bird-use days, in the open waters of the South Bay during the same time period. These numbers of observations are not a census of each bird counted once; they are direct counts of birds present in specific locations, once a week for a year, and some birds are counted more than once. The counts are likely an underrepresentation of bird use due to the geographic and temporal limits of the inventories.

An example of a similar type of inventory of people would result by counting individuals in Old Town San Diego every Friday night over the course of the year. The cumulative count would include full-time residents, employees, vacationers, and people from greater San Diego out for dinner or shopping. At the end of the year, some people would be counted only once, some a few times, and some every week. When counts are analyzed and mapped, overall patterns would appear, showing the locations of the most popular restaurants and shops, the number of dining and shopping trips, the busiest seasons, and the relative importance of the area for dining and shopping for that year. The numbers would not, however, tell you exactly how many individuals set foot in Old Town over the year.

For the purpose of deciding which alternative to select, discussion will be limited to the four groups of birds the Service is most concerned with protecting under this proposal: migrating shorebirds, wintering waterfowl, nesting seabirds, and federally listed birds and other species.

Because other categories of birds and other fish and wildlife that use the Bay are not central to the decision of whether to create a Refuge in South Bay, they are not discussed in detail. The boundaries of the Service bird inventory area were slightly larger than the study area. This environmental assessment only uses counts for areas within the study area boundaries, so the bird numbers that follow are smaller than those from the total study of the South Bay.

3.2 Biological Environment—Coastal Ecosystems

Map 4 shows habitats of greatest concern. Shallow South Bay waters do not always form distinct habitat boundaries. The size and shape of eelgrass beds change from year to year in response to currents, tidal variations, major floods or storms, or other disturbances. An area that is at the seaward edge of a mudflat one year may be inundated the next, and may or may not be covered with eelgrass. As the tide recedes, pools supporting eelgrass occur in the mudflats. Salt marsh can also be gained or lost depending on fluctuations in water levels.

3.2.1 Submerged Lands Habitat and Wildlife Species

Submerged lands provide crucial wintering habitat for migratory waterfowl, especially surf scoter, scaup, bufflehead, and brant. Both resident and migratory birds use the open waters of the study area. Many of these birds rest and feed together on the open water, congregating in large groups called rafts.

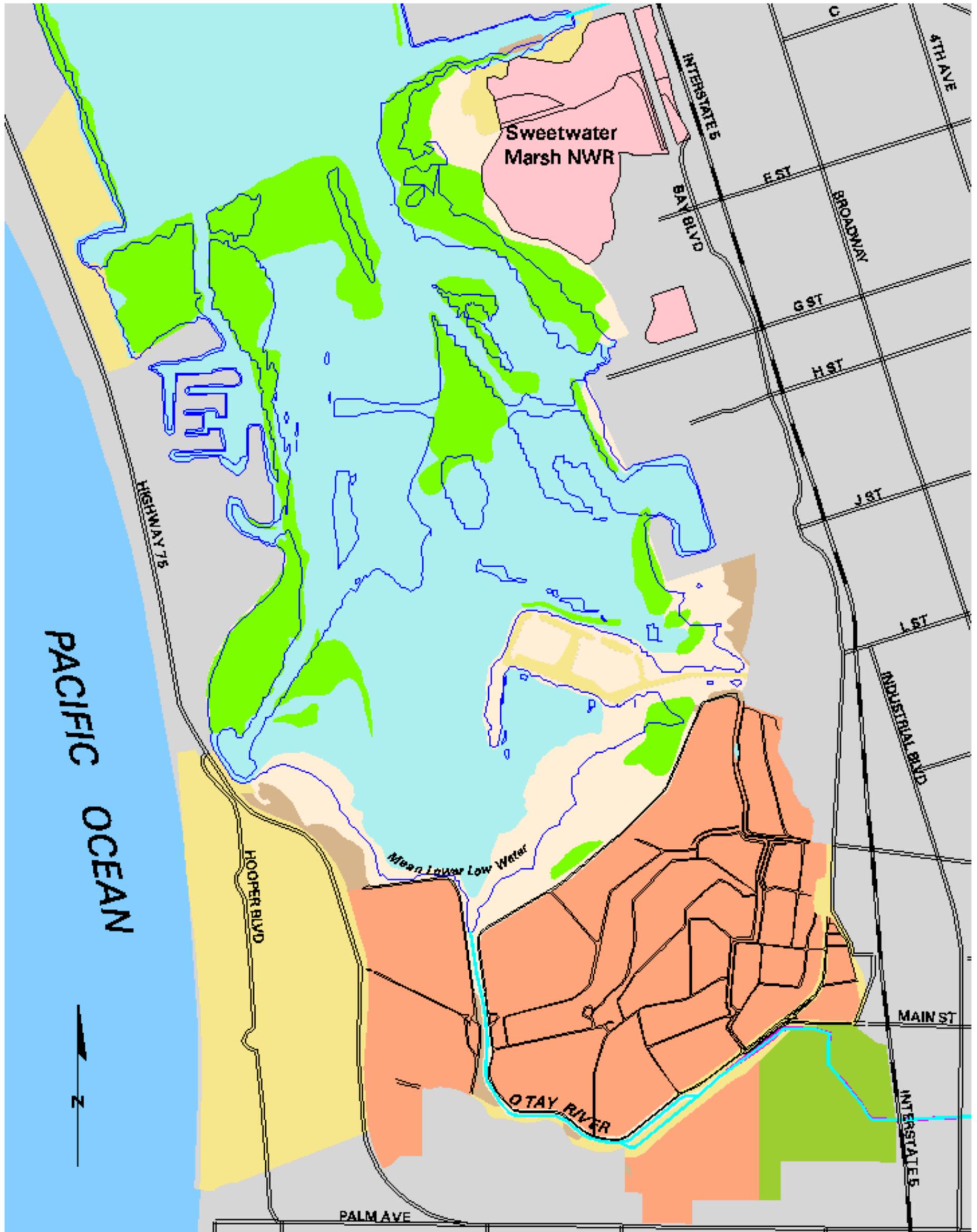
The study area contains about 2,454 acres of submerged lands and eelgrass, which appear as open water. All of the undredged submerged lands in the study area are 12 feet in depth or less. About 57 percent are also under 6 feet in depth, and 26 percent are under 3 feet in depth.

During the 1993-1994 bird survey, at least 54 species of waterbirds were observed to use the submerged lands for feeding and resting (FWS 1995b). The Service made just under 80,000 waterfowl observations, representing about 628,000 bird-use days (95 percent surf scoter and scaup) (FWS 1995b). The Service counted the highest number of waterfowl observations on January 21, 1994, when 7,605 waterfowl were sighted.

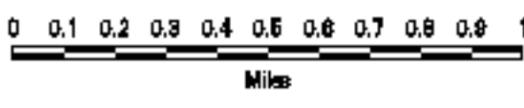
Submerged land, eelgrass, mudflat, and salt marsh habitats from Emory Cove south to the salt ponds supported at least 63 bird species, primarily seabirds and shorebirds, that were feeding, staging, or courting. Observations totaled 50,205 (FWS 1994a). The close proximity of these habitats increases the use of the area by birds by providing a “one-stop shopping” area, with feeding, nesting, and resting available for a wide variety of birds, especially terns and black skimmer.

Unrelated to the weekly surveys, the Service also conducts once-annual counts of waterfowl in San Diego Bay as a whole, without distinguishing between observations made in Central or South Bay. These counts are made in midwinter by the Office of Migratory Bird Management to

Map 4. HABITATS, SOUTH SAN DIEGO BAY



- | | | | | |
|----------------|------------|------------|-------------------------------|---------------------------------------|
| Submerged Land | Mudflat | Salt Ponds | Beaches, Dunes & Created Land | Mean Lower Low Water and 6 foot depth |
| Eelgrass | Salt Marsh | Riparian | Fallow Agricultural Land | |



estimate peak waterfowl populations throughout the nation. These counts allow comparisons of waterfowl use in different locations because the counts are all done in the same time period, and many are done from airplanes, thereby reducing the double-counting of birds. In 1994, the Central and South Bay provided habitat for 52 percent of the south coast region's midwinter duck population, including 72 percent of the surf scoter, 66 percent of the brant, and 44 percent of the bufflehead (1994b). The Service did not survey scaup in the south coast region in 1993-1994; in 1992, however, central and South Bay provided habitat to 44 percent of the south coast region's midwinter scaup population (ibid). Surf scoter observations indicated that 15 percent of the State's midwinter population and 10 percent of the entire flyway's midwinter population were found in Central and South Bay (ibid). Thirty-one percent of the State's midwinter brant population was observed in Central and South Bay (ibid).

California least tern, brown pelican, peregrine falcon, green sea turtle, and bald eagle, all listed and protected under the Endangered Species Act, forage in the Bay. From a species survival perspective, the eagle uses the Bay incidentally and infrequently, and the Bay is one of tens of thousands of potential foraging areas nationwide. No eagles were counted by the Service (FWS 1995b). Peregrine falcon, also found nationwide, forages in the study area and has established nesting sites adjacent to the study area. Two peregrines were tallied by the Service (1995b) in the submerged lands and eelgrass areas. Sea turtles occasionally feed in the Bay, but do not reproduce here.

In contrast, California least tern and brown pelican rely more heavily on South Bay habitats for their survival. California least tern feeds near one of the few nesting areas available in southern California. Brown pelican uses the submerged lands for resting and foraging, as well as a staging area for fall migration. Juvenile pelicans scatter from the Bay to find new territory.

Nearly 300 species of invertebrate animals, ranging from worms and snails to clams, crabs, and shrimp, occur in the Bay. These invertebrates provide a food source for seabirds, shorebirds, and waterfowl. At least 22 fish species, including seven that are important to people for recreational fishing, spend some portion of their life cycle in the South Bay. Notable species include barred sand bass, spotted sand bass, diamond turbot, California halibut, and black croaker. Sardine and anchovy populations, once decimated by the bait fishery, are again increasing, providing abundant food for birds (Port 1990).

Waterfowl congregate into rafts of hundreds, even thousands, of birds. Over 95 percent of the scaup and scoter counted in the South Bay were observed from November through March (FWS 1994b).

Wildlife studies on the effect of disturbance to migratory birds in other areas show that boat disturbances during spring and fall migrations decrease waterbird access to feeding areas, especially for waterfowl (FWS, correspondence 1992).

In addition to interfering with feeding, disturbance can harm waterfowl and seabirds behaviorally. A study conducted at Point Loma National Monument evaluated human disturbance to a group of 208 pelicans. At pelican nesting colonies and roost sites, sudden disturbance caused rapid

flushing of the entire group, confused flight around the roost, scattering and disappearance of some birds, and return of remaining birds generally within five minutes at the same site or nearby (Jacques, et al. 1987). Subsequent disturbances generally resulted in stronger reactions; a greater proportion of birds left the area each time. After the first disturbance, 85 percent returned. After the second disturbance, 13 percent returned. After the third disturbance, only three percent returned (Jacques, et al. 1987).

Two marine mammal species, California sea lion and Pacific bottle-nosed dolphin, are found in the study area's submerged lands (FWS, unpublished data 1995d). The Service (1995d) noted five dolphins and four sea lions as incidental observations during the waterbird survey. All of the sea lions and two of the dolphins were seen in the northern half of the study area, but three of the dolphins were observed in the southernmost end of the Bay.

3.2.2 Eelgrass Habitats and Species

Eelgrass is thick green vegetation submerged through most of the ebb and flow of the tides, but sometimes exposed at lowest tide. Eelgrass beds are an extremely important component of the Bay food web. They provide food and cover for many species of Bay invertebrates and fish, which in turn are eaten by many other species of fish and birds. In addition, numerous fish species rely on eelgrass for spawning, rearing, and feeding areas. Eelgrass beds are moderately to heavily used by both seabirds and waterfowl for feeding.

The study area contains 691 acres of eelgrass beds—over 90 percent of the eelgrass remaining in San Diego Bay. Shallow water areas on the east and west sides of the South Bay support eelgrass beds (see map 4). These beds have been expanding in South Bay since cities and industry stopped dumping raw sewage and industrial pollution into the water (Port 1990). The largest areas are in the vicinity of Sweetwater Marsh National Wildlife Refuge between navigational channels; and in Crown and Emory Coves, connected by a band following the edge of Coronado Cays, and between Crown Cove and Sweetwater Marsh.

Waterfowl, especially surf scoter, scaup, and brant, are present in high numbers from late fall through winter (as noted under the description of submerged lands, see section 3.2.1). Migrating and wintering brant feed extensively on eelgrass when available. During weekly surveys conducted in 1993-1994, the Service made a total of 5,667 brant observations, representing 43,812 bird-use days, with a peak count of 714 on March 29, 1994 (FWS 1994b).

A small population of Pacific green sea turtle, a federally threatened species, has been sighted at the San Diego Gas & Electric power plant. This is the only area on the west coast of the United States where sea turtles are known to congregate, and their use appears to be incidental. They seem to be attracted to the warm water discharged by the power plant, but their origins and migratory habits are unknown. The turtles feed on eelgrass growing in beds near the San Diego

Gas & Electric channel. This population will be discussed only in general terms, similar to discussions on bald eagle and peregrine falcon.

3.2.3 Mudflats (Intertidal) Habitats and Species

Mudflats, or intertidal areas, are important resting or feeding locations for many birds. These seemingly barren stretches of mud, exposed during low tides, are rich in organic matter and invertebrates. The study area contains about 492 acres of mudflats.

Mudflats provide abundant food for a vast array of fish and bird species, and serve as crucial foraging habitat for the shorebirds when the tide is out. Western snowy plover, Belding's savannah sparrow, western sandpiper, dunlin, marbled godwit, and willet are just a few of the species that forage on the mudflats during low tide (FWS 1994a). California least tern, other terns, and black skimmer forage in the waters over submerged mudflats during high tide.

Most of the South Bay shoreline in the study area, with the exception of the Coronado Cays, is bordered by at least a thin band of mudflat. Emory Cove and the area south to the salt ponds support extremely high populations of birds (see section 3.2.1). In the mudflats that adjoin the salt ponds, the Service made 50,000 bird observations, primarily seabirds and shorebirds, during the 1993-94 surveys. Sixty-seven species were represented (FWS 1994a).

3.2.4 Salt Marsh Habitats and Species

Salt marsh habitat provides nesting, feeding, and high-tide escape area for a variety of species, including the light-footed clapper rail and Belding's savannah sparrow. Salt marsh in the study area is characterized by low-growing vegetation, thick in some patches and sparse in others, dominated by pickleweed. Salt marsh habitat is particularly rare due to losses from shoreline development. Salt marsh is the driest tidally-influenced habitat in the continuum from open water to dry upland.

The study area contains at least 57 acres of salt marsh in six locations: adjacent to Sweetwater Marsh National Wildlife Refuge, Chula Vista Wildlife Reserve, the J Street fill, the salt ponds, the Otay River channel, and the biology study area. Salt marsh areas at the salt ponds and Chula Vista Wildlife Reserve are too small to be visible on the maps in this analysis.

Critical salt marsh acreage exists in long, narrow strips along some of the dikes in the salt ponds and along the tidally-influenced portions of the Otay River. These salt marsh areas are not included in the 57 acres. No separate bird count data are available for salt marsh strips along the dikes. Eelgrass, mudflat, and salt marsh habitats within an area from Emory Cove south to the salt ponds have extremely high concentrations of birds (see section 3.2.1).

The last 300-foot stretch of the Otay River is tidally influenced and has a riparian zone of salt marsh vegetation, primarily pickleweed, that supported nesting light-footed clapper rail until recently. This Otay River salt marsh provides resting, nesting, or foraging habitat for at least 56 species, representing 7,807 bird observations, counted during weekly surveys (FWS 1994a). Six

pairs of nesting Belding's savannah sparrow were counted along the Otay River and the J Street marsh in 1996 (FWS, in conversation, 1996).

The federally endangered light-footed clapper rail spends its life in the salt marsh, and depends upon it entirely for feeding, resting, and nesting. Because the rails are losing habitat and being killed by predators, populations have greatly declined in the San Diego area. Statewide, only 325 light-footed clapper rails, nesting in 14 wetlands, were known to exist in 1996 (ibid).

Belding's savannah sparrow nests exclusively in patches of pickleweed, feeding in the salt marsh and in the mudflats. In 1996, the Service counted 71 nesting pairs of Belding's savannah sparrow in the salt marsh strips along the dikes at the salt ponds, and 31 nesting pairs in the 27-acre biology study area on the southeast corner of the study area between Emory Cove and the salt ponds (see map 2).

3.2.5 Salt Pond Habitat and Species

Salt ponds in the South Bay provide habitat for over-migrating shorebirds, wintering waterfowl, and nesting seabirds. The Service made 312,000 shorebird observations, 64,000 seabird observations, and 70,000 waterfowl observations (see section 3.1) at the salt ponds in 1993-1994 during weekly surveys (FWS 1994a). Gulls do not nest at the salt works. The salt ponds are particularly important for shorebirds and seabirds because they represent one of the few large feeding, resting, and nesting areas remaining along the highly urbanized southern California coast. The salt ponds on the south end of the Bay are a specialized habitat type in South San Diego Bay, interspersing shallow open water with mudflats, dry dikes, and salt marsh. The study area contains about 1,175 acres of salt ponds, consisting of diked open water cells of differing levels of salinity, plus Pond 20, which is not inundated.

The diked ponds allow escape from rising tides while providing large amounts of food in the form of brine shrimp and brine flies. A wide variety of birds migrate here from both the northern and southern hemispheres; shorebirds stay in the salt ponds before returning to nesting grounds, and seabirds arrive at the salt ponds to nest. Salt pond dikes support nesting western snowy plovers (federally listed as threatened), Belding's savannah sparrows, and colonies of Caspian, Forster's, gull-billed, California least (federally listed as endangered), and royal terns, in addition to one of only two nesting colonies of elegant terns in the United States (FWS 1995a and c). The South Bay is one of three primary locations in California where black skimmers nest (FWS 1993). In 1993, double-crested cormorants made 43 nests on an abandoned barge at the salt ponds; this increased to 47 in 1997 (FWS 1993, 1997b). In 1993, 10 western snowy plover nests and 62 California least tern nests were initiated along the salt ponds dikes (FWS 1993). In 1995, 18 California least tern nests were initiated at the salt ponds (Ca. DFG unpublished 1995).

There are a variety of nesting seabirds and two listed birds of concern to the Service that nest at the salt ponds. Table 7 indicates the numbers of the species for which the most data are available for the last five years.

Table 7. Number of Breeding Pairs of Listed Birds and Several Seabirds of Concern at the Salt Ponds, 1993 and 1994.

Birds	1993¹	1994²
Elegant Tern	312	80
Royal Tern	10	0
Caspian	280	320
Gull-billed Tern	10	9
Black Skimmer	326	310
Western Snowy Plover	7	1
California Least tern	62 nests	52 ³

1. FWS 1993
2. FWS 1995c
3. California Department of Fish and Game 1994

Twenty-seven species of shorebirds account for 70 percent of the overall abundance, with the red-necked phalarope and western sandpiper the most abundant species (FWS 1994a). Counts include birds located in Emory Cove, adjacent to the salt ponds. Shorebirds use the ponds for feeding and resting during high tides. Other shorebird species found here include willet, marbled godwit, dowitcher, black-bellied plover, and black-necked stilt. The ponds are used for resting and foraging by many species of waterfowl, including lesser scaup, bufflehead, American wigeon, ruddy duck, brant, surf scoter, red-breasted merganser, mallard, and gadwall. Gulls, terns, black skimmers, and pelicans, including the federally endangered brown pelican, use dikes for evening roosts after feeding at sea or in other parts of the Bay.

Although the habitat provides abundantly for some of the birds' needs, the pressure of the surrounding urban areas prevents their reproduction rate from reaching full potential. Threats to nesting and resting birds in the salt ponds include documented instances of disturbance, injury, and death by predators; death and injury from entanglement in fishing line; disturbance from trespassers (FWS 1993, FWS, in conversation 1996, FWS 1995a); and inadvertent disturbance from salt pond operation and maintenance activities.

Disturbance to nesting birds can harm a species' ability to reproduce and increase its population. Eggs may be crushed or eggs and chicks may be exposed to the elements and predators. As a result, the parents may abandon the nest or the chicks may die. In some species, brooding birds and chicks depend upon food brought by the other parent. If the mate is killed by predators, or unable to supply the brooding bird or young with food because people or animals are at the nest site, the chances of raising young successfully are greatly decreased. As discussed in the

submerged lands section, disruptions of feeding and resting add additional stresses in adult birds, particularly for birds using these areas for "refueling" during migration.

3.2.6 Beaches, Dunes, and Coastal Created Lands and Species

Coastal created land was formed from repeated deposits of dredged material from other locations in the Bay. These lands provide important habitat for listed species, migrating shorebirds, and nesting seabirds. Created land is found at the D-Street fill adjacent to the Sweetwater Marsh National Wildlife Refuge, at the Chula Vista Wildlife Reserve, and at Silver Strand State Beach. Beaches and dunes are found at the Naval Radio Receiving Facility, which is a composite of several other habitats including vernal pools, nontidal wetlands, and old fields. For the purposes of this study, the Naval Radio Receiving Facility is loosely described as beaches and dunes. All amounts of created land are also found in the salt ponds and along the Otay River.

Naval Radio Receiving Facility. The Naval Radio Receiving Facility occupies the southern end of the coastal barrier beach and dune system, known as the Silver Strand, that separates the Bay from the Pacific Ocean. Bounded to the north and south by urban development, the Naval Radio Receiving Facility is one of the last relatively large, undeveloped coastal habitats in San Diego County.

Approximately 120 acres of the Receiving Facility have been developed for facilities operations and roads, leaving about 428 acres of undeveloped, vegetated land. The majority of undeveloped land is in the northern, eastern, and western sides of the Receiving Facility infrastructure. This area consists of a variety of native and introduced grasses, shrubs, and scattered trees (Navy 1989). Several natural plant communities are interspersed, including Diegan coastal sage scrub, maritime succulent scrub, southern fore dunes, vernal pools, southern coastal salt marsh, and freshwater marsh. Large portions of the undeveloped area are degraded and dominated by ice plant, an invasive nonnative species.

The Naval Radio Receiving Facility supports a variety of native and nonnative vegetation. The federally endangered salt marsh bird's beak, a species of saline and alkaline habitats, has been documented on Naval Radio Receiving Facility lands at the YMCA Camp Surf. Federally listed animal species using facility lands include California least tern, western snowy plover, brown pelican, and American peregrine falcon (Navy 1989). Belding's savannah sparrow is found at the site. The facility's population of Nuttall's lotus, a rare coastal plant found throughout the site, is reportedly the second largest known in the nation.

The ocean dunes provide habitat for a variety of seabirds and shorebirds. The interior habitats support common bird species: mourning dove, house finch, western meadow lark, and white-crowned sparrow. Raptors such as red-tailed hawk, northern harrier, sharp-shinned hawk, Cooper's hawk, merlin, and osprey roost in inland cypress trees and forage in open areas. Created lands formed by deposition of dredged sediments occur in several areas. These areas are vegetated or unvegetated, a mosaic of uplands and wetlands, small depressions and hummocks, with varying degrees of disturbance and wildlife habitat management.

D-Street Fill. The D-Street fill is created land originally intended as part of a shoreline development project that was never completed. The majority of the fill area became part of Sweetwater Marsh National Wildlife Refuge and the remainder is owned by the Port. The Service grades both the Service-owned and Port-owned portions of the fill annually to remove vegetation. The grading is conducted to preserve suitable nesting habitat for two ground-nesting species, the endangered California least tern and the threatened snowy plover. These species prefer sparsely vegetated sand for nesting sites. In 1994, eight pairs of California least tern fledged three young; in 1995, 26 pairs fledged eight young, and in 1996, 25 California least tern pairs produced 26 young that matured to flight. In 1994, five western snowy plover nests were initiated, and all were unsuccessful in fledging young; in 1995, 11 nesting attempts resulted in seven young, and in 1996, seven plover nests produced seven fledglings (Ca.DFG 1994-1996; FWS 1997).

Chula Vista Wildlife Reserve. Created land is also found at the Chula Vista Wildlife Reserve, where dredged material was used to develop new habitat for wildlife, including a colony of California least tern, that are dependent on mudflats and salt marsh. The area is a popular feeding and resting area for nesting seabirds, migrating shorebirds, and wintering waterfowl. Nesting California least terns have failed in some years because predators killed adults and young and destroyed eggs (FWS 1993). However, the Service has documented some nesting (FWS 1994a).

Silver Strand State Beach. Silver Strand State Beach consists of 87 acres of beach and dune land leased by the California Department of State Parks from the Naval Amphibious Base. Originally part of the Bayside beach shoreline, the area was expanded and raised with dredged material. Characterized by a few low sand dunes and a wide, flattened sandy terrace, Silver Strand State Beach presently supports a variety of native and nonnative vegetation. Native vegetation is patchily distributed; nonnative ice plant dominates much of the site. Despite its disturbed nature, this area supports a number of listed and/or sensitive species. Four western snowy plover nested there in 1995 (Powell, 1996). The area also supports wandering skipper, a sensitive butterfly species associated with southern California coastal dune ecosystems where its host plant, salt grass, is present.

The Silver Strand State Beach site historically supported several animal and plant species that might be established through appropriate management. These species include California least tern, western snowy plover, California horned lark, silvery legless lizard, tiger beetle, coastal dunes milk vetch, Palmer's frankenia, and coast wallflower (Ca. DFG 1992).

3.2.7 Fallow Agricultural Lands and Species

The MKEG/Fenton area consists of former wetlands that were diked and drained decades ago and mostly converted to agricultural use. The MKEG/Fenton area lies between the southernmost extension of the salt ponds and the Interstate Highway. Although this area supports limited numbers of wildlife, it possesses high potential for wetland restoration by virtue of its low elevation, past history as tidal wetlands, and relatively undeveloped nature. The site is also suitable for other less intensive types of habitat enhancement measures using existing surface water patterns.

Although agriculture was discontinued in 1986, most of the area is occasionally disked to control weeds. The fallow agricultural land includes soils classed as prime farm land. The area contains wetlands, disturbed fields, and shrubby areas that support modest numbers of wildlife. No surveys or censuses of wildlife for the MKEG/Fenton parcel are available.

3.2.8 Riparian Habitats and Species

Riparian vegetation established on the berms along the Otay River in the MKEG/Fenton area supports several migratory songbird species. The river channel also contains salt marsh and mudflat areas. The Service included the Otay River from the mouth upstream to Area 2 in the 1993-94 bird census. The Service noted over 6,000 shorebird observations, 1,400 waterfowl observations, and 500 seabird observations (FWS 1994a). Up to six nesting Belding's savannah sparrow pairs have been counted, and until recently, light-footed clapper rail were observed nesting in the salt marsh along the Otay River (FWS, in conversation, 1996). The habitat is degraded and the tallest trees are an exotic species, eucalyptus; however, the riparian functions of shading some of the river and buffering disturbances from nearby development are intact.

3.3 Threatened and Endangered Species and Belding's Savannah Sparrow

3.3.1 Summary of Species' Uses of Study Area

Eight species listed under the Endangered Species Act occur in the area and are shown, along with their status, in table 8.

Table 8. Federally Listed Threatened and Endangered Species That Occur Within the South San Diego Bay Unit.

Species	Habitat	Listing Status
Light-footed Clapper Rail	Salt marsh	Endangered
California Least Tern	Salt ponds, mudflats, submerged lands, beaches, dunes, and coastal created land	Endangered
Western Snowy Plover	Salt ponds, mudflats, beaches, dunes, and coastal created land	Threatened
American Peregrine Falcon	Created lands, salt ponds	Endangered
Bald Eagle	Submerged lands	Threatened
Brown Pelican	Submerged lands, salt ponds, mudflats, beaches, dunes, and coastal created land	Endangered
Green Sea Turtle	Eelgrass, submerged lands	Threatened
Salt Marsh Bird's Beak	Beaches, dunes, and coastal created land, salt marsh	Endangered

Source: 50 CFR 17.11 & 17.12 1996, FWS 1994a and b, FWS 1995a and b, San Diego Unified Port District 1990.

3.3.2 Recovery Plans for Federally Threatened or Endangered Species with Components in the Study Area

These federally listed species are further discussed under their associated habitats. Most of these species have little remaining habitat in San Diego Bay, and the proposed Refuge Unit is one of the last places left for them to winter, migrate to, or nest.

Bald eagle, green sea turtle and American Peregrine falcon are not analyzed in detail, since the study area is such a minuscule portion of the two species' continental ranges. Of the remaining listed species, recovery plans have been completed for light-footed clapper rail, California least tern, brown pelican, and salt marsh bird's beak. The recovery plans for western snowy plover and green sea turtle are not finalized, and the plan for the California least tern is being updated. Table 9 summarizes the recovery plan components that pertain, or could pertain, to the South Bay. For more detail, please refer to the plans (FWS 1985a, 1980, 1983, 1985b).

Table 9. Applicable Recovery Plan Components for Rail, Tern, Pelican, and Plant, South San Diego Bay.

Plan Components	Light-footed Clapper Rail	California Least Tern	Brown Pelican	Salt Marsh Bird's Beak
Primary Objective (In entirety, not just applicable components)	DOWN LIST AS THREATENED by: Increasing the California breeding populations to at least 800 pairs in 30 marshes with 10,000 acres total.	DELIST by: Maintaining at least 1,200 breeding pairs in at least 20 coastal wetlands while preserving the Baja, California terns.	DELIST by: Restoring and maintaining stable, self-sustaining populations of the California brown pelican throughout its range.	DELIST by: Protecting plants in 12 major marshes of at least 20 acres within the historic range of the plant in the U.S., for 10 years in a row.
Primary Actions	<ol style="list-style-type: none"> 1. Manage habitat to enhance numbers. 2. Reestablish rails in San Diego area. 3. Obtain data on the rail's ecosystem. 4. Measure progress of management. 5. Maintain habitat maps. 6. Solicit necessary public support. 7. Use laws to protect rail. 	<ol style="list-style-type: none"> 1. Provide nesting and feeding habitat in California. 2. Protect non-nesting, feeding and resting areas. 3. Encourage protection outside the U.S. 4. Measure progress of management. 5. Designate "critical habitat." 	<ol style="list-style-type: none"> 1. Maintain existing Mexican populations. 2. Protect feeding, nesting, resting, and offshore habitat. 3. Restore population size and productivity to a self-sustaining level in the Southern California Bight. 	<ol style="list-style-type: none"> 1. Protect plants and habitats on Service and military land. 2. Revise amount of habitat to delist as needed. 3. Reestablish plant in suitable marshes. 4. Monitor plants and habitats. 5. Enforce laws. 6. Educate public about plant and habitat.
Essential or Otherwise Identified Habitat	Sites to preserve and enhance: The J street marsh, the mouth of the Otay River, and the biology study area.	On page 55 of the recovery plan, South San Diego Bay is identified as a key habitat unit.	No portion of the study area is specifically identified in the recovery plan, partially due to the plan not identifying essential habitat.	Known sites for plant: Silver Strand near Emory Channel, and Otay River. South San Diego Bay is identified as suitable habitat not known to contain plant.

3.4 Economic and Social Environment

The project area is located entirely within San Diego County, California, and straddles the jurisdictions of the cities of San Diego, Coronado, National City, Chula Vista, and Imperial Beach. San Diego County encompasses approximately 2.7 million acres (4,261 square miles) and 18 incorporated cities.

Population

The rate of population growth in the San Diego region during the past decade is among the highest in the nation. Between 1980-1990, the nation's population increased 10.2 percent, while California showed a 25.7 percent gain. In comparison, the San Diego region grew by 34.2 percent, from 1,861,846 to 2,498,016 people. The San Diego metropolitan statistical area ranked 15th in population in the nation, according to the 1990 census.

San Diego County has a diverse economic base that includes a strong government sector (due in part to the presence of U.S. Navy installations throughout the area) and active tourism-related industries. This economic base has sheltered the region to a degree from the recessionary effects experienced elsewhere throughout the southern California region. The services industry, which includes both personal and business services, employs the largest percentage of people in the region. In South San Diego Bay, the manufacturing sector dominates the employment picture. Retail trade and services industries are the other main employment sectors in South San Diego Bay. The following table highlights the population, area, and leading industry of each community.

Table 10. Population, Areas, and Leading Industries of Communities.*

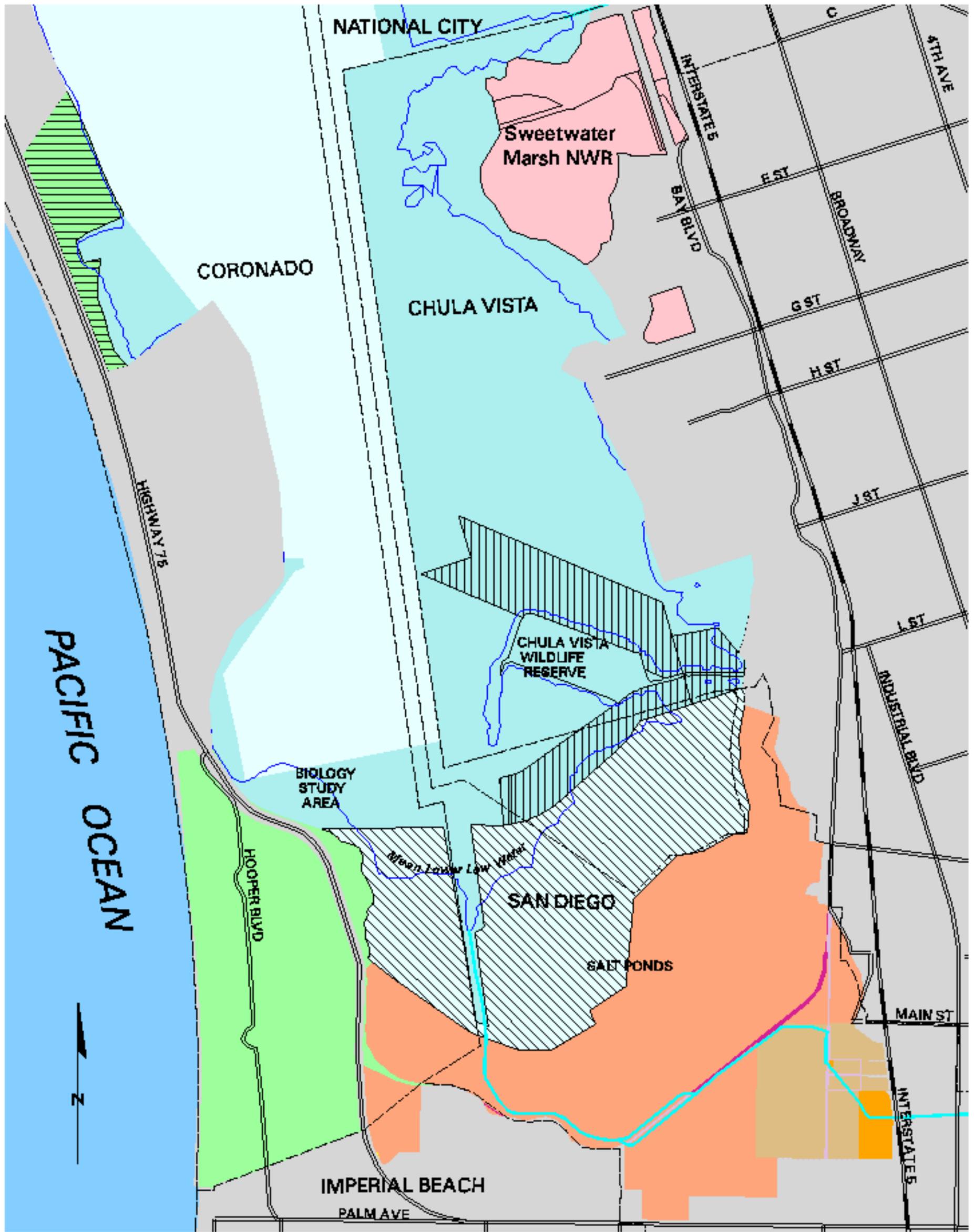
Jurisdiction	Population 1990	Change in Pop. 1980 to 1990	Area (in acres)	Leading Industry
County of San Diego	2,500,000	up 34%	2.7 million	Services
City of Imperial Beach	26,512	up 17%	2,845	Government, military
City of Coronado	26,540	up 41%	5,300	Government, military
National City	54,249	up 11%	5,536	Government, military
City of Chula Vista	135,163	up 61%	16,960	Retail trade
City of San Diego	1,110,549	up 27%	210,560	Services

*Source: Niehaus 1994

Ownership and Land Use

Map 5 shows the general land ownership pattern within the South Bay area. Navy-administered lands include the Naval Radio Receiving Facility and a 87-acre parcel north of Crown Cove. The State of California and the Port own the majority of the submerged lands and tidelands. The salt ponds are owned by the Western Salt company. The MKEG/Fenton area consists of two adjacent parcels. The MKEG parcel is owned by Egger and Ghio Corporation and the Fenton parcel is owned by the City of San Diego.

Map 5. LAND OWNERSHIP, SOUTH SAN DIEGO BAY



San Diego Gas & Electric Lease	City Boundary	UNITED STATES NAVY	CITY OF SAN DIEGO
Department of State Parks Lease	UNIFIED PORT DISTRICT	EGGER+GHIO CO INC	SAN DIEGO+ARIZONA EASTERN
Western Salt Co Lease	WESTERN SALT CO	STATE OF CALIFORNIA	

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1
Miles

Navy-Administered Land s The Naval Radio Receiving Facility is located on 549 acres at the southern end of San Diego Bay on the coastal barrier peninsula known as the Silver Strand, within the City of Coronado's boundary. The 87-acre parcel (included in Alternative A) located north of Crown Cove is the southern end of the Naval Amphibious Base.

About 120 acres of the Naval Radio Receiving Facility land are intensively developed with the Wullenweber antenna and associated infrastructure and facilities. Because operating the Wullenweber antenna requires large, unrestricted open areas, height restrictions are imposed on development within a specified area surrounding the antenna. The Navy's Naval Radio Receiving Facility Master Plan recommends that the remaining undeveloped lands remain as such.

The Navy has granted land easements to various State, local, and public agencies. The YMCA Surf Camp leases 80 acres along the Pacific Ocean; the San Diego County Department of Education leases 27 acres at the south end of Emory Cove as an education ecological preserve, biology study area, and wildlife sanctuary; and CalTrans leases a 10 foot right-of-way for a bikeway along the easement for State Highway 75 (see map 2). In addition, the Navy has granted a 30-foot wide water main easement, running north and south, to the California Water and Telephone Company, and easements to Imperial Beach for a beach groin and various other utility and street improvements.

A 87-acre parcel at the southern end of the Naval Amphibious Base is leased to the California Department of State Parks (State Parks) as part of Silver Stand State Beach. Originally part of the bayside beach shoreline, the area was expanded and the elevation raised with dredged material. The area is now characterized by a few low sand dunes and a wide, flattened, sandy terrace.

State-Administered Land s The State of California claims nearly all tidelands within the State. These lands are administered by the California State Lands Commission, which holds these lands in trust for the people of California. The California Coastal Commission is another key agency in the administration of these trust resources. As the implementing agency for the California Coastal Act, it is responsible for regulating, monitoring, and planning land and water uses in and around the Bay. The Port has jurisdiction over all navigation occurring in the Bay. A host of other Federal, State, and local agencies also have regulatory authority, mainly focused on protection of human health or the environment, in the Bay.

Navigational channels are located on State submerged lands (see map 2). The Service currently comments on proposals to change dredging patterns, or create new fills, under Section 10 of the Rivers and Harbors Act, Section 404 of the Clean Water Act, and the Fish and Wildlife Coordination Act.

The lands held in trust by the State of California are used for a variety of activities, ranging from defense (military activities) and commerce (navigational channels, commercial fishing, etc.), to recreation and aesthetic appreciation. Approximately 612 acres of State-owned tidelands are leased to the Western Salt company.

Port-Administered Lands. The Port was created by the California State Legislature, which conveyed certain tidelands to the Port to act as trustee for administration. The Port has regulatory duties and proprietary rights over the tidelands under its jurisdiction, as provided by the legislature. The Port has a wide variety of responsibilities ranging from the acquisition, construction, maintenance, operation, development, and regulation of harbor works and improvements to the promotion of commerce, navigation, fisheries, and recreation. The Port provides law enforcement patrols of Bay waters. Although its main emphasis is development of the Bay for commerce, the Port has obligations to preserve and enhance important natural resources within its jurisdiction.

Navigational channels are located on Port submerged lands. The Service currently comments on proposals to change dredging patterns, or proposals for new fills from dredging, under Section 10 of the Rivers and Harbors Act, Section 404 of the Clean Water Act, and the Fish and Wildlife Coordination Act.

Salt Works. The salt works is operated by Western Salt Company, a subsidiary of Fenton-Western Properties, Inc. Approximately 791 acres of the salt works are owned by Fenton-Western. Another 612 acres, two-thirds of which are used to produce sodium chloride and magnesium chloride for industrial use, are leased from the State of California. The remainder is estuary.

Portions of the salt works tideward of the railroad right-of-way are zoned open space, and portions landward of the railroad right-of-way are zoned open space with a special study area overlay (City of San Diego, in conversation, 1997; City of San Diego 1997). Two categories of overlays exist, one for the magnesium ponds in Area 2, and a second type for the remainder of the salt ponds. The open space designation means that commercial, residential, or industrial structures are not permitted in any sensitive areas. The special study area overlay means that the City of San Diego would delineate exactly where and how much of the property is sensitive, and how much is not. The delineation would be provided by Western Salt Company and be subject to City review. The areas outside the boundaries of the sensitive areas may be given permits for residential, commercial or industrial development. Until the study is complete, and the City has issued permits, the amount and type of development potential for the salt works is unknown (City of San Diego, in conversation, 1997).

Railroad. The railroad ownership in the study area is not completely known, and apparently, not completely resolved. According to County of San Diego Tax Assessor's records, about 8 acres are owned by the San Diego and Eastern Arizona Railroad, and the ownership of about 2 acres is unknown. The portion running between the City of Imperial Beach and the biology study area is owned by the Navy. The San Diego Metropolitan Transportation Development Board (SDMTDB) has stated that it owns portions of the railroad (SDMTDB, in conversation, 1996). It

is not the purpose of this document to determine ownership, rather to report the best available information. For the purposes of this discussion, however, SDMTDB will be assumed to be the owner.

The portion of the railroad in the City of San Diego is used for rail car storage and for salt shipping. The portion of the railroad that adjoins the City of Imperial Beach has been converted to a bike trail by that City. The Transportation Development Board has a long-range plan to develop an excursion train along the San Diego route.

Fallow Agricultural land. The MKEG/Fenton Area contains 146 acres: the 126-acre MKEG property owned by the Egger and Ghio Corporation, and the 20-acre Fenton parcel, which was recently purchased by the City of San Diego (see map 5). An additional 8 acres of fallow agricultural land, located to the south of the MKEG parcel, is owned by Western Salt. Until 1986, the MKEG/Fenton parcel was primarily used for the production of truck crops. Now the area remains fallow and is periodically disked to control weed growth.

The MKEG/Fenton area is included within City of San Diego Otay Mesa–Nestor Community Plan, designating the MKEG/Fenton area as community open space with a special study area overlay. Portions subject to inundation from a 100-year frequency flood are zoned Floodway; immediately adjacent lands are zoned as Floodway Fringe. Development potential is unknown (see discussion in preceding Salt Works section).

In addition to zoning restrictions, 25 property easements within the area restrict or prohibit certain land use activities. The fallow agricultural land is included within the Otay Valley Regional Park study area boundaries, as presented in the conceptual plan.

3.4.1 Western Salt Company Operations

Western Salt Company employs 20 to 30 people, depending on production levels (Niehaus 1994). Payroll earnings for these employees were considered proprietary information and not reported by the firm; however, based on average earnings per job in the County, \$26,637 in constant 1992 dollars, total earnings for employees of Western Salt Company were estimated at \$665,900 (based on an average of 25 employees) (Niehaus 1994). Gross sales figures for the firm were also considered proprietary and not reported by Western Salt Company. However, based on average gross output per job in the salt production sector (U.S. Bureau of Economic Analysis 1993) of \$195,471 in 1992 dollars, gross sales for Western Salt Company were estimated at \$4.9 million (assuming an average of 25 employees) (ibid).

3.4.2 Quality of Life and Popular Activities

San Diego is an established tourist destination. According to the San Diego Convention and Visitors Bureau, the greater San Diego Bay area registered 35.6 million visitors in 1992 (Niehaus 1994). No known surveys show the type and amount of outdoor recreational activities in which San Diego Bay area residents and visitors participated. However, the California Department of Parks and Recreation surveyed California residents in 1992 and found that Californians tend to prefer natural and undeveloped areas or nature-oriented recreation areas for their outdoor recreational activities, rather than highly developed parks and recreation areas (ibid). Participation is greatest in activities that require less expense, less equipment, and less technical skill. Map 6 shows the general locations of several types of popular recreation found in the South Bay and adjoining area.

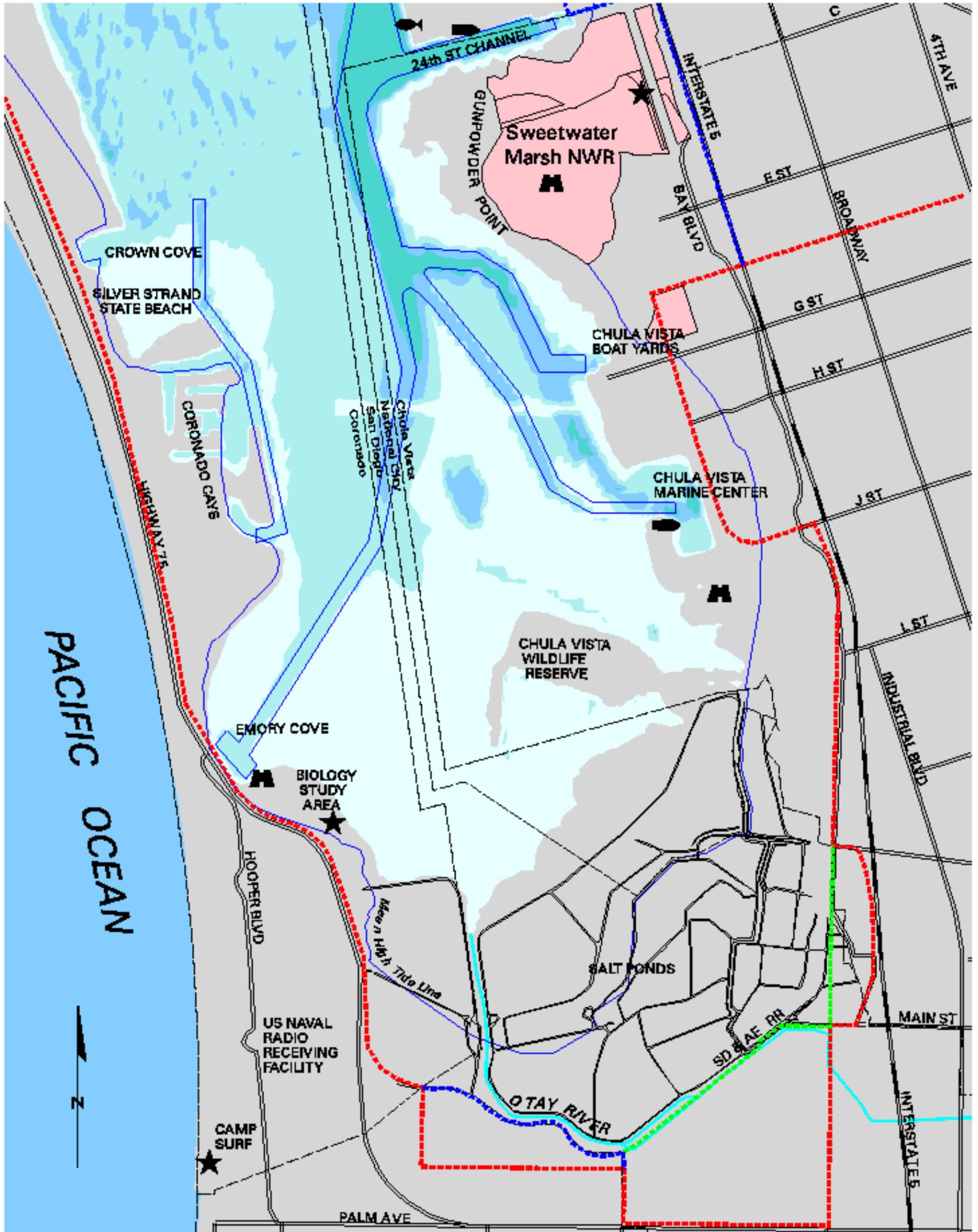
Principal attractions in South San Diego Bay area include the Chula Vista Nature Center at the Sweetwater Marsh National Wildlife Refuge, and Silver Strand State Beach. In addition, the Chula Vista harbor provides small-boat marina services, with about 890 slips. The Silver Strand State Beach area is not presently open to public use east of highway 75, but a small day use/picnic site is open immediately to the south. State Parks has a proposal and approved funding for native habitat restoration and possibly development of a public boardwalk. Baywide, fishing is popular, especially during the spring and summer (Ca. DFG 1992). Boat fishing primarily occurs outside the study area within three miles of the Bay entrance (Ca.DFG 1990, Ca. DFG1995a). Public pier fishing occurs on the Sweetwater Channel, at Coronado, and at the Chula Vista Marine Center. Tijuana Slough National Wildlife Refuge and Border Field State Park lie further south of the project area.

In 1997, two annual bird watching festivals debuted in the vicinity. The Salton Sea International Bird festival drew about 920 bird watchers (600 from out of state), who spent an estimated \$259,000, and the Imperial Beach Bird Fest drew about 700 people (23 percent from outside the County), who spent an estimated \$178,000 (Klein and Edwards, public presentation, 1997).

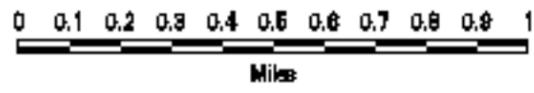
Remaining natural areas in the Bay represent home for both wildlife and people, providing wide-open views, recreational opportunities, environmental education, beautiful vistas, flood control, and water-quality enhancement. The proximity and availability of these public benefits contribute to the San Diego metropolitan area's high quality of life.

The YMCA Camp Surf, the biology study area, and the bikeway along Highway 75 all serve outdoor and educational needs for residents of all ages. All occur as leased activities on Navy land.

Map 6. RECREATION IN AND NEAR STUDY AREA, SOUTH SAN DIEGO BAY



- | | | | | | | | | | | | | | |
|--|------------------|--|---------------------|--|------------------|--|-------------|--|--------------|--|---------------|--|--------------|
| | PROPOSED BIKEWAY | | PUBLIC FISHING PIER | | BIRD WATCHING | | 0 to 6 feet | | 6 to 12 feet | | 12 to 18 feet | | over 18 feet |
| | IMPROVED BIKEWAY | | PUBLIC BOAT RAMP | | ENVIRONMENTAL ED | | | | | | | | |
| | EXISTING BIKEWAY | | | | | | | | | | | | |



3.4.3 Boating

San Diego is famous for water-dependent recreation. Boating is a popular activity, especially in the summer, and the Bay is known world-wide as a premier year-round boating resource. One company leads kayaking tours through the South Bay that highlight views of sea turtles near the Chula Vista Wildlife Reserve. No boat inventories are available to depict actual usage by season or by day of the week, but the Service noted boats using the South Bay during the 1993-94 weekly bird inventory. About 73 percent of the boats were power boats, about 14 percent were sail boats, 6 percent were jet skis, and 8 percent were sailboards (windsurfers). About 40 percent of all boating occurred from November through March. Fifty-four percent of the sail boat and jet ski use, 38 percent of the powerboat use, and 27 percent of the windsurfing occurred during this time period.

About 81 percent of the Service-counted boats were seen north of the Chula Vista Marina and the southern end of the Coronado Cays. The study did not note whether boats were recreating all around South Bay or using navigational channels to travel to and from the area. Speed limits throughout South Bay are 5 miles per hour at all times, and no wake is permitted.

3.4.4 South San Diego Bay Public Access Points

Several types of public access points exist in or adjacent to the study area on the east and west sides of the Bay. Boat ramps are located at National City, Chula Vista, and Coronado. Public pier fishing and wildlife observation points occur on the Sweetwater Channel, Sweetwater Marsh National Wildlife Refuge, the biology study area, at Coronado, and at the Chula Vista Marine Center.

Chapter 4. ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

This chapter analyzes and compares the environmental impacts that would be expected to occur with the implementation of each alternative. The effects of Alternatives A through D are analyzed using the physical, biological, and social and economic factors that are relevant to the issues described in chapter 1 (see section 1.8.2 and chapter 3). Environmental impacts that would likely occur if the Service does not acquire any additional lands for the South San Diego Bay Unit are described under the no action alternative (Alternative D) (see section 2.2).

This EA refers to Refuge protection and management throughout chapter 4. As explained in section 2.3.1, the existence of a refuge boundary around a property alone does not provide any additional protection or management for wildlife or habitat. Only when the property owner and the Service willingly enter into an agreement to safeguard habitats or species can the Service manage the land as part of a national wildlife refuge. Types of acquisition include sale, donation, exchange, lease, easement, agreement, and cooperative agreement. Chapter 4 analyzes the effects of the Service acquiring land.

Under Alternatives A, B, and C, the six characteristics unique to National Wildlife Refuge System protection (see Section 2.3.2) would provide benefits to wildlife and habitats not available under any other protection alternatives. The effects of these benefits will be identified under each of the issues. Please refer to section 2.3.2 for the typical management activities used in this analysis as a basis for estimating the effect of Refuge protection and management on habitats, and on the economic and social environment.

4.2 Coastal Ecosystems

The effects of Refuge acquisition and management provided by each of the alternatives are described and compared both by types of habitats and by the uses of those habitats by species or types of birds. Refuge management would occur when the Service acquires lands or enters into cooperative agreements for the actions described in section 2.3.1. Please refer to the actions described under each alternative: Alternative A, section 2.4.1; Alternative B, section 2.4.2; Alternative C, section 2.4.3; and Alternative D, section 2.4.4.

In summary, Service acquisition and management proposed under Alternatives A and B would permit the Service to protect, enhance, or restore all of the remaining habitats left in the study area. National Wildlife Refuge System (NWRS) management of the area would maintain or increase the value of the entire South Bay as habitat for wintering waterfowl, migrating shorebirds, and nesting seabirds. Refuge management such as habitat enhancement and control of exotic plants would create an opportunity for these birds to increase in population, to the extent that South Bay habitat is the limiting population factor. Refuges actively monitor and inventory the wildlife habitat for the listed plant and animals and Belding's savannah sparrow. The Service may control predators at key nesting areas, during the breeding season only, to protect nesting birds that are federally listed and seabirds that nest in colonies.

Under Alternative C, the Service would acquire and manage only the salt ponds and the adjoining mudflats and shallow water, a total of about 2,200 acres, as part of the National Wildlife Refuge System. The Service would focus on habitat acquisition and management at the salt ponds for migrating shorebirds and nesting seabirds, listed species, and Belding's savannah sparrow. Refuge management such as exotic plant species control and habitat enhancement would create an opportunity for these birds to increase in population.

Since only a small portion of the submerged lands and eelgrass would be national wildlife refuge, mudflats outside the Refuge would be expected to decrease in value over time to the detriment of wintering waterfowl, nesting seabirds, and migrating shorebirds. Habitat for the listed plant and animals could be protected by actions of other agencies or through non-refuge agreements between the Service and landowners. A majority of the submerged land used by wintering waterfowl would not be managed as part of the NWRS, and little other direct management of the habitat exists.

Under Alternatives A, B, and C, inclusion in the NWRS would bring permanent protection, a single mission to protect fish, wildlife and habitats, an extensive agency network of wildlife management expertise and a nationwide connection to other important habitat, a strong commitment to protecting and recovering federally listed species, Federal funding, and sanctuary areas dedicated to wildlife. These actions have the effect of making the proposed protection permanent, effective, focused, and consistent throughout the range of birds that migrate many thousands of miles.

Chapter 4 includes estimates of the portions of each boundary area that the Service considers poor habitat or even unusable by most wildlife without restoration. The boundaries of Alternative A include authority for the Service to restore (or help restore) up to 807 acres that are now nonproductive for wildlife, for a total protection area of about 5,000 acres. Alternative B would restore up to 584 acres (of the approximately 4,750-acre total) that are nonproductive for wildlife. The boundary of Alternative C includes about 169 acres a (of the 2,200-acre total) that would potentially be restored as wildlife habitat. If the Refuge is established, the Service would determine the details of restoration activities during the comprehensive conservation planning process.

Under Alternative D, the no action alternative, the Service would not seek acquisition or management of any South Bay habitat as part of the NWRS. Habitat for the listed plant and animals would be protected by actions of other agencies or through non-refuge agreements between the Service and landowners. Under Alternative D, habitat protection would continue for an unknown length of time, at an unknown level, and be conducted by a variety of agencies operating under a variety of missions not necessarily related to wildlife protection or recovery of federally listed species. The quality of habitat and opportunity for species to thrive that exist today is not expected to remain at current levels and is expected to incrementally deteriorate. The geographic scope of the wildlife management would not be expected to reach beyond the County of San Diego.

4.2.1 Effects on Submerged Lands

Alternatives A and B. Refuge acquisition and management would decrease boating disturbance to wildlife during fall and winter. A decrease in disturbance would maintain or increase the value of up to 1,721 acres of submerged land (whether designated winter sanctuary or not) as feeding and resting habitat for nesting seabirds, wintering waterfowl, and listed species. Until a separate public planning process is completed, however, the Service will not know the exact locations or time periods that would be set aside for bird protection. Refuge management would be adequate to maintain populations, or possibly create an opportunity for these birds to increase in population, to the extent that the South Bay is the limiting factor for population growth. Birds most benefitting from acquisition and protection of submerged lands are wintering brant, surf scoter, scaup and other wintering waterfowl, and nesting terns, black skimmer, and other seabirds that forage in the South Bay (see map 7). Benefitting listed species are California least tern and brown pelican. All of Emory Cove would be protected and managed (see section 3.2.1).

Alternative C. Acquisition and management as part of the NWRS would maintain or decrease boating disturbance to wildlife during fall and winter. The decrease in disturbance would maintain or increase the value of up to 380 acres of submerged land (22 percent) as habitat for foraging seabirds and wintering waterfowl (see map 7). Refuge protection of about 22 percent of the submerged land is not expected to be adequate to maintain current populations in the study area for the long term. Submerged lands in the southern third of Emory Cove would receive Refuge protection.

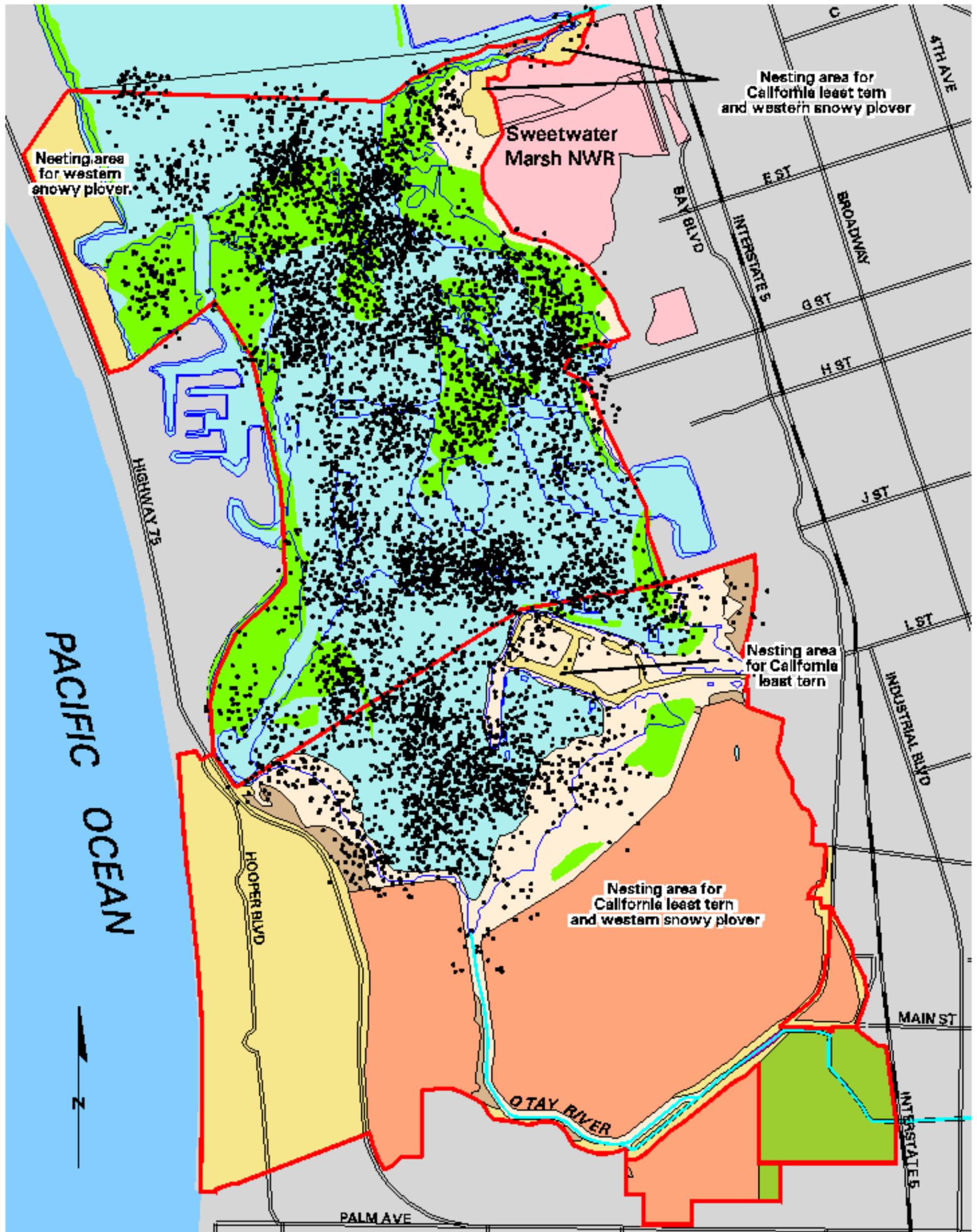
Alternative D (no action). No existing submerged land habitats would be protected from recreational boating disturbance beyond current levels of enforcement of a 5-mile-per-hour speed limit throughout the South Bay. Over time, continued disturbance from fall and winter boating would decrease the value of 1,721 acres of submerged land as feeding and resting habitat for nesting seabirds and wintering waterfowl. As the San Diego area's population increases, more boating during the winter months is expected to increase disturbances and stress for birds. Should disturbances increase, the species most likely to lose feeding and resting habitat are brown pelican, California least tern, wintering waterfowl, and nesting seabirds.

4.2.2 Effects on Eelgrass

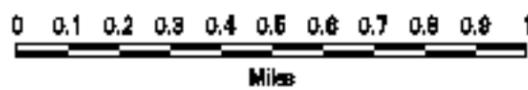
Alternatives A and B. Implementation of Alternatives A and B would result in effects on eelgrass similar to the effects on submerged land (section 4.2.1). Refuge status would maintain or increase the value of all of the eelgrass beds in the study area (up to 691 acres), almost all that remain in the entire San Diego Bay. It would also create an opportunity for populations of invertebrates (worms, snails, clams, shrimp, and crabs) and fish to expand, benefitting species that are most dependent on the eelgrass such as brant and sea turtle. Wildlife most benefitting from decreased disturbance of eelgrass are wintering waterfowl and nesting seabirds (see map 7).

Alternative C. Refuge protection would decrease boating disturbance in fall and winter on 50 acres of eelgrass, and maintain or increase the value of the habitat for feeding and resting seabirds and wintering waterfowl (see map 7). Since only seven percent of the South Bay

MAP 7. LOCATION OF NESTING AREAS, AND WATERFOWL OBSERVATIONS



- | | | | | |
|----------------|------------|------------|-------------------------------|--|
| Submerged Land | Mudflat | Salt Ponds | Beaches, Dunes & Created Land | Mean Lower Low Water and 6 foot depth |
| Eelgrass | Salt Marsh | Riparian | Fallow Agricultural Land | One dot per ten waterfowl observations |



eelgrass beds would be protected under the National Wildlife Refuge System, the value of the eelgrass beds outside the boundaries of Alternative C is not known. Eelgrass in the southern third of Emory Cove would receive protection.

Alternative D (no action). The eelgrass beds would be expected to remain the same size or expand. If the Service takes no action, however, continued boating disturbance over time would decrease the value of 691 acres of eelgrass as habitat for sea turtle, nesting seabirds, and wintering waterfowl. Populations of eelgrass-dependent wildlife would not be expected to have an opportunity to expand without protection and management of the eelgrass. Eelgrass habitats would receive the same protection as submerged land habitats under the no action alternative. Should disturbances increase, the species most likely to lose feeding and resting habitat are brown pelican, California least tern, brant, other wintering waterfowl, and nesting seabirds.

4.2.3 Effects on Mudflat/Intertidal Areas

Alternatives A and B. Refuge protection and management would maintain or increase the value of 492 acres of mudflats as feeding and resting habitat for migrating shorebirds and nesting seabirds. Birds most benefitting from protection and management of mudflat/intertidal areas are western snowy plover, brown pelican, nesting seabirds, wintering waterfowl, and migrating shorebirds. These are the last remaining mudflats in San Diego Bay. Refuge acquisition and management of a 100-foot buffer (about 10 acres) on the landward side of the Otay River would also enhance the value of mudflats along the Otay River channel. All of Emory Cove would be protected.

Alternative C. Refuge protection and management would maintain or increase the value of 429 acres of mudflats, similar to the effects of Alternatives A and B. Refuge acquisition and management of a 100-foot buffer (10 acres) on the landward side of the Otay River would also enhance the value of mudflats along the Otay River channel. The southern third of Emory Cove would receive protection.

Alternative D (no action). With no Refuge protection and management, the value of 492 acres of mudflats would decrease over time as feeding and resting habitat for nesting seabirds and wintering waterfowl. Should additional mudflats be filled, dredged, or otherwise made unusable by wildlife, the species most likely to lose feeding and/or resting habitat are western snowy plover, brown pelican, nesting seabirds, wintering waterfowl, and migrating shorebirds.

4.2.4 Effects on Salt Marsh

Alternative A. Refuge protection and management would maintain or increase the value of 57 acres of salt marsh as habitat for salt marsh bird's beak, and as feeding, resting, or nesting habitat for light-footed clapper rail, California least tern, Belding's savannah sparrow, nesting seabirds, migrating shorebirds, and wintering waterfowl. Refuge acquisition and management of a 100-foot buffer (10 acres) on the landward side of the Otay River would also enhance the value of salt marsh along the Otay River channel.

Enhancement and restoration of habitat, combined with active Refuge management, could enhance nesting success and allow for population increases. Potentially, the Service could restore up to 282 acres more salt marsh than under the no action alternative. In addition, an undetermined portion of the 428 acres at the Naval Radio Receiving Facility would be restored as salt marsh with Service participation. Habitat would be protected for 71 nesting pairs of Belding's savannah sparrow in the salt ponds, and 31 nesting pairs in the biology study area. Refuge management would also improve salt marsh along the Otay River that supported nesting light-footed clapper rail until recently. With additional Refuge safeguards and management, light-footed clapper rail may again nest in the salt marsh along the Otay River.

Refuge protection and management would maintain habitat continuity from the submerged lands to eelgrass to mudflat/intertidal to salt marsh in all six areas: D-Street fill, Chula Vista Wildlife Reserve, J Street, the salt ponds, the Otay River channel, and the biology study area.

Alternative B. The effects of Refuge protection and management would be the same as in Alternative A, except with up to 146 acres of potential habitat restoration instead of 282 acres, plus Service participation in restoring an undetermined portion of the 428 acres of the Naval Radio Receiving Facility that are undeveloped.

Alternative C. The effects of Refuge protection and management would be similar to effects of Alternative A, except that acquisition and management would maintain or increase the value of 54 acres (95 percent). The riparian buffer would include three acres. Refuge management would potentially restore up to 159 acres of salt marsh.

Refuge protection and management would maintain or enhance the continuum from submerged land to eelgrass to mudflat/intertidal to salt marsh in five of the six remaining areas: Chula Vista Wildlife Reserve, J Street, the salt ponds, the Otay River channel, and the biology study area.

Alternative D (no action). Without Refuge protection and management, the value of 57 acres of salt marsh as feeding, nesting, and resting habitat would decrease over time for light-footed clapper rail, nesting seabirds, migrating shorebirds, Belding's savannah sparrow, and wintering waterfowl. Habitat values in these 57 acres would also be degraded for salt marsh bird's beak. Disturbance from people is expected to increase, since salt marshes in the South Bay adjoin upland, high-population, urban areas. Should additional salt marsh habitat be filled, the plant and birds most likely to lose habitat are salt marsh bird's beak, light-footed clapper rail, western snowy plover, Belding's savannah sparrow, nesting seabirds, and migrating shorebirds. The salt marsh at the biology study area is protected from development by the County of San Diego.

4.2.5 Effects on Salt Ponds

Alternatives A and C. Refuge protection and management would maintain or increase the value of 1,175 acres of salt pond as nesting, feeding, and/or resting habitat for nesting seabirds, migrating shorebirds, western snowy plover, California least tern, brown pelican, Belding's savannah sparrow, and wintering waterfowl. Refuge management would create the opportunity for these birds to increase their populations, to the extent that the South Bay is the limiting factor

for population growth. The Service would have authority to enter into habitat management agreements on 1,175 more acres than under the no action alternative.

Refuge management would protect western snowy plover nests, California least tern nests (Ca. DFG unpublished 1995), one of three primary locations in California where black skimmers nest (FWS 1993), and one of only two nesting colonies of elegant terns in the United States (ibid).

Alternative B. The effects of Refuge protection and management would be the similar to Alternative A, protecting 1,175 acres of salt pond. Pond 20 and Area 2, which are potential habitat restoration areas, would be excluded, the same as under the no action alternative.

Alternative D (no action). The quality of the habitat for migrating shorebirds, wintering waterfowl, and nesting seabirds at the salt ponds is expected to decrease over time, with inadvertent disturbance from salt extraction processes. Current levels of protection and management provided by Western Salt would be expected as long as salt extraction continues.

4.2.6 Effects on Beaches, Dunes, and Coastal Created Land

Alternative A. Refuge protection and management such as active wildlife management, control of exotic species, and habitat enhancement would maintain or increase the value of 696 acres of beaches, dunes, and coastal created land. The species and birds most benefitting would be salt marsh bird's beak, light-footed clapper rail, Belding's savannah sparrow, nesting seabirds, migrating shorebirds, and wintering waterfowl. Populations of the plant and these birds would have the opportunity to increase, to the extent that the South Bay is the limiting population factor. Refuge acquisition and management would increase the value of all four sites: the area adjoining Sweetwater Marsh National Wildlife Refuge, the Chula Vista Wildlife Reserve, the Naval Radio Receiving Facility, and the Silver Strand State Beach area.

Naval Radio Receiving Facility. By extending Refuge protection and management to the Naval Radio Receiving Facility, the Service would reinforce existing habitat protection and management programs pursuant to the Navy's memorandum of understanding with the Service. Programs would include protecting and enhancing nesting habitat for the western snowy plover and California least tern, protecting and enhancing habitat for salt marsh bird's beak and light-footed clapper rail, and protecting beach feeding habitat for the brown pelican.

Silver Strand State Beach Area. The habitat restoration plan for native species currently being implemented by California at Silver Strand State Beach area would be complemented by Refuge management activities.

D-Street fill and the Chula Vista Wildlife Reserve. The D-Street fill area adjoining Sweetwater Marsh National Wildlife Refuge and the Chula Vista Wildlife Reserve would receive increased protection and management under the National Wildlife Refuge System. Additional management would include habitat enhancement, control of exotic plants, and active wildlife management.

Both sites could better support nesting California least tern or nesting western snowy plover and create opportunity for improved nesting success. The Service may control predators at these two sites during nesting season to decrease the number of adults and young killed on the nest, and to increase the number of fledglings that survive.

Benefitting species at the four sites would include migrating shorebirds, nesting seabirds, and all listed species except the sea turtle. Protection and management of these areas would provide an opportunity for populations of brown pelican, California least tern, western snowy plover, and salt marsh bird's beak to stabilize or increase.

Alternative B. The level of Refuge protection and management would be similar to that in Alternative A, except that Alternative B excludes the Silver Strand State Beach. Alternative B would maintain or increase the habitat value of 589 more acres than the no action alternative.

Alternative C. Refuge management would maintain or increase the value of 89 acres (13 percent) of beaches, dunes, and coastal created land as habitat for nesting seabirds, migrating shorebirds, light-footed clapper rail, Belding's savannah sparrow, wintering waterfowl, and salt marsh bird's beak. The Chula Vista Wildlife Reserve would be protected with Refuge status, which would benefit feeding and resting seabirds, migrating shorebirds, and brown pelican. Refuge status would also improve the quality of nesting habitat for western snowy plover and California least tern and create opportunity for improved nesting success at the Chula Vista Wildlife Reserve, similar to Alternative A.

Alternative D (no action). No land would be protected under the National Wildlife Refuge System. A lack of Refuge protection and management for beaches, dunes, and coastal created land would be expected to decrease the value of these habitats for nesting seabirds, migrating shorebirds, light-footed clapper rail, Belding's savannah sparrow, wintering waterfowl, and salt marsh bird's beak. Populations of these birds and plant would decrease over time.

4.2.7 Effects on Fallow Agricultural Lands

Alternatives A and B. Refuge protection and management would maintain or increase the value of 154 acres and 146 acres, respectively, of fallow agricultural lands as wildlife habitat. Wildlife numbers and diversity would increase over time. The Service would, dependent upon willing landowners and adequate staffing and funding, seek acquisition sufficient to restore up to 154 more acres and 146 more acres, respectively, than the no action alternative. Any habitat enhancement proposals would first be coordinated with State, Coastal Zone Management, local, and regional plans. If the Service enhances habitat for native species, these species would have an opportunity to increase their numbers in the region.

The fallow agricultural land includes soils classified as prime farm land. The Service leases refuge land for agricultural production in situations that benefit wildlife and meet specific refuge management goals. Protection and management as part of the NWRS would not prevent future use of the land for agriculture; however, the urban setting would make agriculture difficult, if not

impossible, to implement. Agricultural use of the land ended in 1986. The management plan process would be the forum for deciding whether to change the current fallow state of the land by beginning new agricultural uses.

Alternative C. Refuge protection and management would maintain or increase the value of 23 acres (15 percent) of fallow agricultural lands as wildlife habitat. The effects would be similar to Alternatives A and B, but would involve much less land and therefore, provide much less benefit to wildlife.

Alternative D (no action). With no Refuge protection and management, the value of wildlife habitat would remain the same or decrease on 154 acres of fallow agricultural land. Current zoning and potential flood hazards suggest that the MKEG parcels may have limited development potential. Land use may change to agricultural or recreational use permitted under local standards. The wetlands, disturbed fields, and shrubby areas would continue to support modest numbers of wildlife, and the small area outside the floodplain probably would be developed and lost as wildlife habitat.

The present zoning of open space allows no development on about 7 acres of the 20-acre Fenton parcel. A second layer of zoning notes that this area is also a special study area, and may have developable portions of unknown size. Considering the value and limited availability of developable land in the San Diego area, it is likely that this land will be developed to its full potential. The development would be limited because the remaining portion of the property is within the Otay River floodplain.

Other agencies or organizations may initiate protective actions to conserve open space on this parcel. The MKEG/Fenton site might be restored to salt marsh in the course of developing the proposed Otay Valley Regional Park. Restoration or protection from development without restoration would increase habitat diversity and benefit wildlife populations.

4.2.8 Effects on Riparian Habitats and Species

Alternatives A and B. Refuge protection and management would maintain or increase the value of 8 acres of existing habitat plus another 10 acres of created land within 100 feet of the Otay River. This buffer would provide a physical buffer in and along the Otay River (see sections 4.2.3 and 4.2.4) between high-use areas for birds and high-use areas for people. These alternatives would protect 8 acres more existing riparian habitat than the no action alternative. In time, riparian vegetation within the overall 100-foot wide buffer would mature into woodlands, and wildlife habitat value in the riparian area and in the River would be expected to increase.

Alternative C. The level of Service protection and management would be the same as in Alternatives A and B, except that riparian zone protection and management would end at Area 2, protecting about 3 acres more than the no action alternative. The effects of the 100-foot wide buffer would be the same.

Alternative D (no action). With no Refuge protection and management, the 8 acres of riparian habitat would be expected to decrease in value due to development. Development in the 100-foot buffer area would likely result in increased disturbance from people, or in clearing and redevelopment with nonnative, ornamental vegetation. The result would be a decrease in habitat value in the riparian area and the river for nesting seabirds, migrating shorebirds, Belding's savannah sparrow, and wintering waterfowl in and along the River. The existing degraded riparian habitat would be expected to support little wildlife in its present state even if development does not occur.

4.3 Effects on Threatened and Endangered Species and Belding's Savannah Sparrow

This section consolidates and summarizes the overall effects to listed species described under each habitat type (see section 4.2). Under Alternatives A, B, and C, inclusion in the NWRs would bring permanent protection, a single mission to protect fish, wildlife and habitats, an extensive agency network of wildlife management expertise, a nationwide connection to other important habitat, a strong focus on protecting and recovering federally listed species, Federal funding, and sanctuary areas dedicated to wildlife alone. These actions would make the proposed action permanent, effective, focused, consistent, and protective throughout the range of migratory birds that use South Bay. Under Alternative D, protection would continue for an unknown length of time and be conducted by a variety of agencies operating under a variety of missions not necessarily related to wildlife protection or recovery of federally listed species. The geographic scope would not be expected to reach beyond the County of San Diego.

Effects on listed species and Belding's savannah sparrow are described by alternative in table 11. Descriptions of the recovery plan components addressed by each alternative follow in tables 12 through 15. Please refer to table 9 in chapter 3, or to the plans themselves, for more recovery plan detail. Recovery plans do not exist for all of the species.

Table 11. Effects on Listed Species And Belding’s Savannah Sparrow by Alternative.
(Note: All acreages are estimates)

Species	Alternative A	Alternative B	Alternative C	Alternative D
Light-footed Clapper Rail	Would maintain or increase quality and quantity of habitat, create an opportunity for increase in population. 57 acres of habitat would have Refuge protection and management and up to 282 acres could potentially be restored, plus an undetermined portion of the 428 acres at the Radio Facility.	Same as A, except that up to 146 acres could potentially be restored in addition to restored areas at the Radio Facility.	Would maintain or increase quality and quantity of habitat, create an opportunity for increase in population. 54 acres of habitat would have Refuge protection and management and up to 159 acres could potentially be restored.	Would maintain or decrease the quality and quantity of habitat and potential for population success of the light-footed clapper rail in the South Bay over time, due to birds being disturbed, injured or killed by predators, and incremental loss to development.
California Least Tern	Would maintain or increase the quality and quantity of habitat, and create opportunity for increase in population and number of viable nesting colonies. Refuge protection and management for remaining habitat in the study area.	Same as Alternative A.	Would maintain or increase the quality and quantity of habitat, and create opportunity for increase in population and number of viable nesting colonies. Open water foraging areas not protected. Refuge protection and management for southern nesting habitat in South Bay.	Would not increase the quality and quantity of habitat, and would not create opportunity for increase in population and number of viable nesting colonies. Habitat would not receive protection from predators and would become increasingly unable to support tern over time.
Brown Pelican	Would permit opportunity for increase in population by protecting and managing open water and salt pond habitat. Refuge protection and management for all of habitat in study area.	Same as Alternative A.	Would permit limited opportunity for increase in population by protecting and managing salt pond habitat, but not open water habitat. Refuge protection and management of 2,203 acres of habitat.	Would not permit opportunity for expansion of population numbers since the quality and quantity of habitat would not be enhanced over time. Habitat would not receive protection from recreational boats, and would become increasingly unable to support pelican over time.

(Page 2) Species	Alternative A	Alternative B	Alternative C	Alternative D
Western Snowy Plover	Would maintain or increase quality and quantity of habitat, create an opportunity for increase in population and number of viable nests. Refuge protection and management for all nesting habitat in the study area and all potential restoration areas, up to 87 acres, plus an undetermined portion of the 428-acre Radio Facility.	Similar to A, with Refuge protection and management for all nesting areas in the study area. An undetermined portion of the 428-acre Radio Facility would potentially be restored.	Would maintain or increase quality and quantity of habitat, create an opportunity for increase in population and number of viable nests. Refuge protection and management for nesting habitat in the southern end of South Bay. No potential restoration areas are identified at this time.	Would decrease quality and quantity of habitat, and not create an opportunity for increase in population. Habitat would not receive protection from predators, and would become increasingly unable to support plover over time.
Salt Marsh Bird's Beak	Would maintain or increase quality and quantity of habitat, create an opportunity for increase in population. Refuge protection and management for 57 acres of habitat. Restoration would occur on up to 282 acres, for 3 to 5 new colonies, and on an undetermined portion of the 428 acres at the Naval Radio Receiving Facility.	Same as A, except that 146 acres could potentially be restored, plus an undetermined portion of the 428 acres at the Radio Facility.	Similar to A, with 54 acres of Refuge protection and management and 159 acres that could potentially be restored.	Navy actions would increase quality and quantity of habitat, create an opportunity for increase in population at the Naval Radio Receiving Facility under the MOU, possibly 3 or 4 additional colonies established in the study area.
Pacific Green Sea Turtle	Would maintain or increase quality of habitat. Refuge protection for 2,412 acres of eelgrass and submerged land.	Same as Alternative A.	Refuge protection for 430 acres of eelgrass and submerged land, including the eelgrass where turtle is found.	Turtle would be increasingly disturbed by boat traffic and may decrease its use of the South Bay.
Bald Eagle	Would improve quality of habitat.	Same as Alternative A.	Would maintain quality of habitat.	Would maintain quality of habitat.
American Peregrine Falcon	Same as bald eagle.	Same as Alternative A.	Same as bald eagle.	Same as bald eagle.

(Page 3) Species	Alternative A	Alternative B	Alternative C	Alternative D
Belding's Savannah Sparrow	Would maintain or increase quality and quantity of habitat, create an opportunity for increase in population. Refuge protection and management for 108 nesting pairs, 57 acres of nesting habitat. Up to 282 acres would potentially be restored as nesting habitat, plus an undetermined number of acres at the Radio Facility.	Same as Alternative A, except that up to 146 acres of habitat could potentially be restored as nesting habitat.	Similar to A, except Refuge protection and management of acres of habitat plus 159 acres that could potentially be restored as nesting habitat.	Would decrease quality and quantity of habitat over time and not create an opportunity for increase in population. Belding's savannah sparrow is not a federally listed species and would not be protected under the Endangered Species Act. Other protection and management described in the introduction to section 4.2.8 would apply. State endangered species protection and management would be provided for 108 nesting pairs.

Table 12. Components of the Light-Footed Clapper Rail Recovery Plan Met by Alternatives A through D, South San Diego Bay Refuge Proposal

Plan Components	Alternative A	Alternative B (Preferred Alternative)	Alternative C	Alternative D (No Action)
Contribution to Primary Objective	Acquisition would contribute to down listing requirement by increasing the number of breeding pairs and the acreage of protected coastal wetlands. Refuge protection and management for 57 acres of salt marsh and 282 acres that could potentially be restored, plus an undetermined number of acres at the Naval Radio Receiving Facility.	Same as A, but with 156 acres of habitat that could potentially be restored.	Same as A, but with 54 acres under Refuge protection and management plus 159 acres that could potentially be restored.	Navy would contribute to down-listing by restoring habitat at the Naval Radio Receiving Facility.
Contribution to Primary Actions (Please see Table 9 for specific actions).	Would contribute to action 7; actions 1 through 6 would occur during management.	Same as A.	Same as A.	Navy would contribute to actions 1, 3, 4, 5, and 7.
Protection and Management of Essential or Otherwise Identified Habitat	All three sites identified would be preserved and enhanced.	Same as A.	Same as A.	The biology study area, one of the three sites, would be preserved and enhanced.

Table 13. Components of the California Least Tern’s Recovery Plan Met by Alternatives A through D, South San Diego Bay Refuge Proposal

Plan components	Alternative A	Alternative B (Preferred Alternative)	Alternative C	Alternative D (No Action)
Primary Objective	Acquisition would contribute to delisting by creating an opportunity for increasing the number of breeding pairs throughout South San Diego Bay at all known sites in the study area. Both nesting and feeding habitat would be protected.	Same as A.	Acquisition would contribute to the number of breeding pairs found in the salt ponds and immediate vicinity. Only nesting habitat and nominal feeding habitat would be protected.	Navy would contribute to the number of breeding pairs on Navy land under the MOU.
Primary Actions (Please see Table 9 for specific actions)	Would contribute to 1, 2, 4, and 5 throughout South Bay and immediate vicinity.	Same as A.	Would contribute to 4 and 5.	Navy would contribute to actions 1, 3, and 4 on Navy land under the MOU.
Essential or Otherwise Identified Habitat	Would contribute protection and management for all of South San Diego Bay.	Same as A.	Would contribute protection and management to the salt ponds and vicinity.	Navy would contribute land covered under the MOU.

Table 14. Components of the Brown Pelican’s Recovery Plan Met by Alternatives A through D, South San Diego Bay Refuge Proposal

Plan components	Alternative A	Alternative B (Preferred Alternative)	Alternative C	Alternative D (No action)
Primary Objective	Acquisition would contribute to delisting by protecting and managing all habitat in the study area, creating an opportunity for populations to be restored and maintained throughout South San Diego Bay.	Same as A.	Similar to A, but protecting 45 % of habitat in study area.	Does not contribute adequate habitat protection and management necessary to restore and maintain population in South Bay.
Primary Actions (Please see Table 9 for specific actions)	Would contribute toward 2 except for nesting habitat throughout South San Diego Bay.	Same as A.	Similar to A, but would contribute nominal open water feeding areas toward 2.	Limited Navy contribution toward 2, except for nesting habitat. Protection and management exclusively on Navy land affected by MOU.
Essential or otherwise identified habitat	No portion of study area specifically identified.	No portion of study area specifically identified.	No portion of study area specifically identified.	No portion of study area specifically identified.

Table 15. Components of the Salt Marsh Bird’s Beak Recovery Plan Met by Alternatives A through D, South San Diego Bay Refuge Proposal

Plan components	Alternative A	Alternative B (Preferred Alternative)	Alternative C	Alternative D (No action)
Primary Objective	Acquisition would contribute to delisting by protection and management of plant colonies on Navy land; up to 282 acres of habitat could potentially be restored, plus an undetermined portion of the 428 acres at the Radio Facility. Enhancement/restoration would provide 3-5 more major marsh areas.	Same as A, except that 146 acres of habitat could potentially be restored.	Same as A, except that 159 acres of habitat could potentially be restored.	Navy would contribute by protecting and enhancing existing colonies on the Naval Radio Receiving Facility.
Primary Actions (Please see Table 9 for specific actions)	Acquisition would contribute to 1 and 5. Management activities would contribute to 2, 3, 4, 6.	Same as A.	Would address 2, 3, 4, 5, 6.	The Navy MOU plan is expected to address all but action 6 on Navy land. These documents have not been completed or released for review.
Essential or otherwise identified habitat	All remaining suitable habitat in South San Diego Bay would be protected as part of the Refuge and available for reintroduction.	Same as A.	Suitable habitat in the salt ponds and vicinity would be protected as part of the Refuge and available for reintroduction.	None of the remaining suitable habitat would be protected as part of the Refuge or available for Refuge-sponsored reintroduction.

4.4 Effects on the Social and Economic Environment

Under Alternatives A, B, and C, the proposed inclusion in the National Wildlife Refuge System would bring permanent protection of wildlife habitat, national recognition as a wildlife haven, opportunity for citizen input in management planning, professional operation by wildlife experts, Federal funding, and no Service-sponsored activities competing with wildlife. Effects would be expected to include some increase in tourists attracted for birdwatching (due to NWRS name recognition), more active public participation in the operation of the area for wildlife, and more opportunities for compatible, wildlife-dependent recreational activities.

4.4.1 Effects on Salt Works

The salt works, for the discussion of section 4.3.2, includes the MKEG/Fenton parcel and Western Salt Pond 20. These two parcels, which are entirely or partially owned by Western Salt or associates, once produced salt, but are no longer doing so.

Alternative A.

Active salt production ponds and Area 2: If the Service acquires Western Salt Company in fee (purchase, transfer, or donation), and salt production activities are phased out over time, an estimated 25 jobs could be lost (Niehaus 1994). Annual losses of earnings and sales are projected at \$670,000 and \$4.9 million, respectively (ibid). Since this is the only viable area for salt production in the region, this activity would not be able to relocate to another site nearby.

If the Service instead enters into an agreement with Western Salt that allows salt production to continue, Alternative A would have no effect on the annual salt output, earnings, sales, and payment of property taxes.

MKEG/Fenton: This area is not being used for salt production, so there would be no effect on the salt works regardless of the fate of the parcels. If the Service acquired and managed the parcel, development would not occur on areas that have development potential. Because of the special study area zoning overlay, the amount of foregone development is unknown. Until the special study area process establishes otherwise, no development is permitted (City of San Diego, in conversation 1997).

Pond 20: Western Salt Pond 20 is not being used for salt production; therefore, acquisition of Pond 20 by the Service would have no effect on salt production. If the Service acquires the parcel, the company would receive the same amount of reimbursement as if the parcel were sold to any other buyer, since the Service would pay appraised market value. Development potential, and potential foregone development that would result if the Service acquired Pond 20, is unknown for the same reasons as for the MKEG/Fenton parcel.

Alternative B.

Active salt production ponds and Area 2: The effects would be the same as under Alternative A.

MKEG/Fenton: The effects would be the same as under Alternative A.

Pond 20: Pond 20 is not included in Alternative B. This alternative would have no effect on the operation of the salt works.

Alternative C.

Active salt production ponds and Area 2: The effects would be the same as under Alternative A.

MKEG/Fenton: This area is not being used for salt production, so there would be no effect on the salt works regardless of the fate of the parcels. Only 23 acres of the MKEG parcel, and none of the Fenton parcel, would be included within the boundary.

Pond 20: The effects would be the same as under Alternative A.

Alternative D.

Active salt production ponds and Area 2: Alternative A would have no effect on the annual salt output. Expansion of the salt works onto Western Salt's currently leased but inactive parcels, though unlikely, would result in an additional 5 to 10 jobs (Niehaus 1994).

MKEG/Fenton: This area is not being used for salt production, so effects on the salt works would be the same regardless of the fate of the parcels. Under the no action alternative, however, development could occur on the 7 acres of the Fenton property designated for commercial/industrial use. This development would result in up to an estimated 172 additional jobs, depending on the type and extent of the development allowed (Niehaus 1994).

Pond 20: Western Salt Pond 20 is not being used for salt production, so effects on the salt works would be the same regardless of the fate of the parcels. The Army Corps of Engineers has not determined whether federally regulated wetlands exist on Pond 20, or how much of the site is upland. Development potential would be affected by this determination.

4.4.2 Effects on Quality of Life

Issues include whether the surf camp would continue, and how boating, the proposed Bayshore Bikeway trail, and the railroad and potential excursion train would be affected. The Service also analyzed the effects of the proposed Refuge on overall desirability of living in the San Diego area. This desirability is often referred to as quality of life.

A more abstract measure of the effects of alternatives on quality of life is to estimate monetary values associated with habitat protection and management in the South San Diego Bay area. The two interdependent measures are monetary values associated with biodiversity and intrinsic (existence and bequest) values (Niehaus, 1994). Biodiversity is a measure of the variety of living things and their processes, including the variety of plants and animals, the genetic differences among them, and the communities in which they are found.

Biodiversity values in a community's natural areas are a measure of quality of life in a community. Intrinsic values represent the amount users would be willing to pay, over and above what they would need to pay, in order to enjoy the recreational experiences associated with habitat and wildlife protection and management. These values are a measure of how desirable a community is as a place to live. The intrinsic values are reflected in property values, ratings of livability by national publications, and community reputation.

Biodiversity and intrinsic values are determined by the amount and type of area protected. This relationship is not a simple one. In general, however, the greater the area protected under an alternative, the greater the biodiversity, and the greater the expected intrinsic value. While any additional habitat protection program would increase this community value, the National Wildlife Refuge System would provide the most permanent increase.

The existing biodiversity value in the San Diego area would be expected to decline without additional protection and management under the National Wildlife Refuge System. A precise measure of the rate of decline of South San Diego Bay resources is not possible, since it depends on complicated biological, ecological, and human interactions over a long period of time into the future. Niehaus (1994) provides a comparative description, estimating that Alternative A would hold these values at 100 percent of their current level. Intrinsic values, another more quantitative measure of quality of life, are those values associated simply with the presence of a resource, regardless of values derived from direct or indirect use.

Alternative A. The Service would not seek any changes in current leases and agreements between the Navy and other entities. This includes continued operation of the 80-acre YMCA Surf Camp, the 27-acre biology study area, and the easement for State Highway 75 with additional 10-foot right-of-way for a bikeway. The Service would also not seek any changes to utility and infrastructure easements: a 30-foot-wide water main easement running north and south to the California Water and Telephone Company; and easements to Imperial Beach for beach groin and various other utility and street improvements. All of these leases and agreements would continue to be the full responsibility of the Navy. The Service would acquire land subject to existing easements and leases.

The Bayshore Bikeway and railroad line are both included within the proposed Refuge boundary. The Service would not seek to acquire or operate, maintain, or manage either. The inclusion of both, however, would be an opportunity for the Refuge coordinate with other community activities. The legal use of either the bikeway or the railroad, whether the railroad is used for freight or excursion trains, would be unaffected by the fact that they would pass through a refuge boundary.

Since the Silver Strand parcel is administered by the Navy and leased to State Parks, the Service's only habitat protection and management option would be a cooperative agreement with these administering agencies. State Parks has begun its efforts to restore native, coastal vegetation at the Silver Strand parcel, a project that is benefitting coastal habitat-associated wildlife. With an overlay refuge, the Service could cooperate with the State on its habitat restoration efforts.

Intrinsic values under Alternative A are likely to be greater than the other alternatives, although not in direct proportion to the various areas protected. The public's willingness to pay for these non-use values is discussed in section 3.3.5, with values on the order of \$10 to \$100 per household per year identified as representative of the value California households place on the protection of resources such as South San Diego Bay. Alternative A would add \$3 to \$30 per household per year to this valuation.

For Alternative A, the incremental biodiversity and intrinsic value associated with habitat conservation can be approximated by multiplying the 10,830,000 households in California by \$3 to \$30 per household per year (Niehaus 1994). This results in a representative estimate of \$32 million to \$325 million per year of additional value added as a result of the Refuge's presence. These amounts benefit the regional economy but would not be a significant change.

Alternative B. Alternative B would have the same effects on the bikeway, the railroad, and the Naval Radio Receiving Facility as Alternative A. Alternative B excludes the Silver Strand parcel, Pond 20, and Area 2. Alternative B would add a combination of biodiversity and intrinsic values similar to Alternative A, \$32 million to \$325 million per year. These amounts would benefit the regional economy but would not be a significant change.

Alternative C. Alternative C excludes the Naval Radio Receiving Facility, and would not affect operations there (see map 5). Alternative C would add \$1 to \$10 per household per year of intrinsic value. Alternative C would keep biodiversity at 80 percent of Alternative A, plus intrinsic values, together estimated to be \$11 million to \$108 million annually (Niehaus, 1994). These amounts would benefit the regional economy but would not be a significant change.

Alternative D (no action). The no action alternative would not affect the YMCA Surf Camp, the biology study area, and the CalTrans easement for State Highway 75 with additional 10-foot right-of-way for a bikeway. There would be no effect on the Radio facility's utility and infrastructure easements: a 30-foot-wide water main easement, running north and south to the California Water and Telephone Company; and easements to Imperial Beach for beach groin and various other utility and street improvements.

Since no Refuge would be approved under Alternative D, no direct project-related increases in biodiversity or intrinsic values would accrue. The project area is expected to continue to support some level of environmental amenities (recreational use values, biodiversity values, and intrinsic values) for people living in the immediate area, in California, and elsewhere. These amenities, however, are likely to decline over time as development and other actions reduce the scale or environmental productivity of area resources.

A precise measure of the rate of decline is not possible. For this discussion, Niehaus estimated that biodiversity would be expected to decline to 70 percent of Alternative A.

4.4.3. Effects on Recreational Boating

Alternatives A and B. The primary effect on recreation would be the potential to seasonally restrict recreational boating during the waterfowl wintering season. This action would protect internationally significant fall migration and wintering habitat for migrating shore birds, wintering waterfowl, and nesting seabirds.

Alternative A is expected to affect the largest number and types of watercraft, since it covers the greatest area. Most of the boats using this area are already limited to navigational channels because the waters outside the channels are extremely shallow (see map 6). Jet skis and sailboards would be more affected by any restrictions because they are able to navigate in these shallow areas. With the exception of the dredged channels, 100 percent of the study area is less than 12 feet deep; 57 percent is also under 6 feet deep, and 26 percent is under three feet deep.

The Service would work closely with the public to identify the times and locations of the restricted areas during the management plan process. About 40 percent of the boats counted by the Service (FWS 1994a) were sighted between November and March, the peak period of wintering waterfowl use. The Service does not know, however, how many of these boats were using the navigational channels to travel to another location for recreation, versus those whose owners had chosen the South Bay as their destination. Boaters' use of the navigational channels would be unaffected.

Alternative C. Boating restrictions under Alternative C would cover a smaller area than under the other action alternatives, and would require the concurrence of the U.S. Coast Guard, State, and Port. Restrictions would be expected to affect very few boaters because most of the waters within this alternative are less than three feet deep. Jet skis and sailboards would be more likely to be affected by restrictions than other watercraft because they are able to navigate in these shallow areas.

Alternative D (no action). Boating activities would continue in the Bay, and would be expected to increase, unless the U.S. Coast Guard, State, or Port further restrict boat traffic.

4.4.4 Effects on Public Access to the Bay

The development of new public access points in the South Bay is limited by the lack of public land. Residents in the South Bay area have indicated the need for access to the Bay. While the particulars of new access points would be developed in the planning process, this section will look briefly at general effects of increasing Bay access.

Alternatives A. and B. These alternatives offer the most options. The existing access point at Chula Vista would be unaffected. Service staff and expertise would be used to develop a public access point and public use program. Resources would include Federal funding and the experience and expertise of Service wildlife managers and outdoor recreation professionals in developing access points and public use programs.

Alternative C. Alternative C is similar to Alternatives A and B, with a smaller area and fewer potential access point sites. The existing access point at Chula Vista would be unaffected.

Alternative D (no action). The no action alternative would not provide an opportunity for additional public access to the Bay. The existing access point at Chula Vista would be unaffected.

4.5 Unavoidable Adverse Impacts

No direct or indirect actions to the environment would result from Alternatives A, B, or C. Refuge boundary approval in itself has no effect on property. Once land is acquired, the Service would prevent incremental adverse impacts, such as degradation and loss of habitat over time, to the lands and their associated native plants and animals.

4.6 Irreversible and Irrecoverable Commitments of Resources

There would be no irreversible or irretrievable commitments of resources (see descriptions in chapter 3) associated with the proposed habitat protection and management or the other action alternatives. Under the no action alternative, if habitats are not protected and continue to decline, some plant and animal species would become extirpated over time, causing an irreversible and irretrievable loss.

4.7 Short-term Uses versus Long-term Productivity

The private lands in the study area are closed to public use. If these lands are added to the Refuge System, some would remain set aside exclusively for wildlife, while some areas would be opened to the public for wildlife-dependent recreation compatible with the Refuge's purposes. If seasonal protection areas are designated in State and Port waters in South San Diego Bay, boats (including personal watercraft) would be required to stay within navigational channels in some areas during the fall and winter. This designation would be dependent upon U.S. Coast Guard, State, and Port agreement, and the restricted area would be determined in a public forum in full compliance with the National Environmental Policy Act (NEPA) and rule-making procedures under the Administrative Procedures Act. The restriction of boats to navigational channels would be a short-term recreational activity cost balanced against the Bay's long-term ability to support waterbird populations.

The proposed habitat protection and management program proposed as part of the National Wildlife Refuge System is permanent and exclusively dedicated to maintain the long-term productivity of South San Diego Bay habitats for fish and wildlife. The local short-term uses of the environment following acquisition and management of the proposed Refuge Unit could include wetland restoration and enhancement and the development of administrative and public use facilities. The resulting long-term productivity would include increased protection and management of threatened and endangered species, wintering waterfowl, nesting seabirds, migrating shorebirds, and a myriad of wetland-dependent species. This protection and management could result in population increases for these species. The public would also gain

long-term opportunities for wildlife-oriented recreation and education and enhanced quality of life.

4.8 Cumulative Impacts

The proposed South San Diego Bay Unit would be one of three units of San Diego National Wildlife Refuge and one of five refuge system units in San Diego County. National wildlife refuges complement a number of other Federal, State, and local habitat conservation projects and proposals in the area (see Section 1.9 and 1.10). Without these cumulative actions, the last pieces of native, natural habitat could be converted into roads, houses, malls, ranches and other developments. Remaining habitats could be made unusable by wildlife due to destructive recreational uses or trespass. Several species could become lost to the County of San Diego or even become extinct without these protective commitments. The MSCP environmental impact statement (see section 1.10.5), which has been incorporated into this environmental assessment, analyses the potential loss of species under the no-action alternative.

The cumulative effects of the proposed South San Diego Bay Unit, along with the other conservation projects (MSCP, other refuges, regional parks, etc.) should be sufficient to maintain the open space, quality of life, and biodiversity of southwestern San Diego County, prevent significant losses of species and populations, and prevent listing of additional species as threatened or endangered with extinction. Hence, the cumulative impact of these projects is to prevent rather than cause significant changes in the human environment. For additional detail, please refer to the MSCP EIS.

San Diego County has a large and diverse economy, with tourism contributing \$3.67 billion (Niehaus 1994). Cumulative effects of this Refuge Unit proposal on the economy, in combination with other conservation proposals, are projected to be an increase in the number of tourists seeking to view wildlife, especially birds. The addition of a Refuge in South Bay would bolster efforts to maximize ecotourism in the vicinity, in particular the new birding festivals begun this year in Salton Sea and Imperial Beach. In relation to the rest of the economy, the economic impact of changes to property taxes, sales and lodging taxes, the overall economy, and increased ecotourism would be beneficial but slight, and would not significantly effect the economy of the region.

The combination of local land protection proposals would slightly decrease potential development in some areas, and some land would also be removed from tax roles in some cases. These effects were discussed in detail in the MSCP EIS. The proposed Refuge in South Bay would have no effect on development or ownership of any properties outside but adjoining or near the proposed Refuge boundary (see section 1.11.2).

Residential tax revenues rarely cover the costs of infrastructure (water, roads, parks, sewers), schools, law enforcement, and other public services. Commercial and industrial tax revenues often provide a larger percentage of these infrastructure and service costs. A Refuge unit would require none of these services at the expense of local government. Cumulatively, the foregone

local tax base, new housing base, new commercial property base, and governmental expense is not significant in light of the large scale of the County of San Diego's housing base and economy. Cumulatively, by the scale of the County's economy, the expenses to local governments that would be avoided by managing land as wildlife habitat instead of developing it also are not significant.

Chapter 5. COORDINATION, CONSULTATION, AND COMPLIANCE

5.1 Coordination With Other Agencies and Public Involvement

In planning for the proposed South San Diego Bay Refuge Unit, the Service is coordinating with the following Federal agencies: U.S. Coast Guard, U.S. Navy, and International Boundary and Water Commission. The Service is similarly coordinating with the following State agencies: California Department of Fish and Game, California State Lands Commission, California Coastal Conservancy, California Coastal Commission, California Department of State Parks and Recreation, and California Environmental Protection Agency.

The Service consulted with local agencies including the Unified Port of San Diego, San Diego County Supervisor's Office, San Diego County Department of Parks and Recreation, San Diego County Planning Department, San Diego Area Governments, and the cities of Chula Vista, Coronado, Imperial Beach, National City, and San Diego.

This document has been distributed to the following Native American Tribes: Campo Mission, Jamul, LaPosta, Manzanita, Mesa Grande, San Pasqual, Sycuan, Torres-Martinez, and Viejas.

The Service has invited and continues to encourage public participation through an extensive public involvement program consisting of public information meetings, working groups, and project planning updates. Since the summer of 1990, seven public information meetings have been conducted in the South San Diego Bay area in an effort to identify issues and concerns associated with the proposed project.

Working Groups

The Service formed a Citizens Working Group and Policy Review Group to represent affected publics and jurisdictions during the development of habitat protection alternatives. The Citizens Working Group and the Policy Review Group helped develop alternatives for this draft environmental assessment.

Planning Updates

The Service prepared and mailed three *South San Diego Habitat Protection Program Planning Updates* (November 1992, April 1993, October 1993) to keep interested publics informed of progress with this project. The *San Diego National Wildlife Refuge Planning Update* (October 1995, March 1996, November 1997) replaced the planning update for the South San Diego Bay Habitat Protection Program. The Service mailed another planning update for the South San Diego project in November 1997. All of the agencies and interested parties mentioned above received copies of the San Diego conceptual management plan, planning updates, and this draft environmental assessment.

Distribution and Availability

The Service sent this draft environmental assessment (EA) to interested agencies, organizations, groups, landowners, and individuals for review and comment (see appendix C). The EA is also available on the World Wide Web from the planning website at the following address:

<http://www.r1.fws.gov/planning/plnhome.html>. Comments received by the Service will be considered and, as appropriate, addressed in the final environmental assessment.

5.2 Environmental Consultation and Compliance

In undertaking the proposed action, the Service would comply with a number of Federal laws, regulations, and executive orders, including the Coastal Zone Management Act of 1972, as amended; Endangered Species Act of 1973, as amended; National Historic Preservation Act of 1966, as amended; Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970; Intergovernmental Review of Federal Programs (Executive Order 12372); Protection of Wetlands (Executive Order 11990); Floodplain Management (Executive Order 11988); Hazardous Materials Determinations (Secretarial Order 3127); and Executive Orders 12898 and 12966.

Key consultations include Environmental Justice, Coastal Zone Management Act, National Historic Preservation Act, and Hazardous Materials determinations. These consultations are briefly discussed below.

Environmental Justice

The proposed Refuge Unit directly benefits low and moderate-income residents in the study area by maintaining or improving natural areas near their homes, a standard measure of quality of life in any community. Lack of formal status of the area as a public wildlife resource prevents a sense of ownership. A refuge would help residents feel that the Bay is for everyone. Refuge protection would help ensure that wildlife and habitat endure to provide environmental education opportunities for all ages.

The Refuge Unit would increase opportunities for families to view wildlife and natural areas without driving long distances, and neighborhood schools would have an additional environmental education resource close at hand. The Refuge Unit would allow San Diego and Imperial Beach youth to experience natural areas and wildlife as a part of their community and their growing-up experience.

Land use within the proposed Refuge Unit area would be consistent with County and City zoning and land-use plans. The proposed action promotes reasonable and appropriate uses of the land and waters that preserve the natural character and protect the natural resources and ecology of the area. Refuges do not release chemical or other pollutants into the air or water, create noise pollution, or present new safety dangers.

Coastal Zone Management Act

The Service has made an application to the California Coastal Commission concurrent with the release of this EA. The application requests a determination that designating a national wildlife refuge in the South Bay would be a use consistent with the California Coastal Management Program.

Cultural Resources

A review by the San Diego State University Department of Anthropology indicates that several historic and archaeological sites have been recorded in South San Diego Bay. Early military use in the vicinity of the Radio Facility is considered historically significant. Numerous early Native American camp sites have been recorded around the Bay. Federal agencies are required to protect such resources under Executive Order 11593, Protection of Historic, Archaeological, and Scientific Properties. State agencies are likewise required to avoid impacts to historic and archaeological properties under the California Environmental Quality Act.

Hazardous Materials

Environmental contaminants occur throughout San Diego Bay, primarily from toxic chemicals from industry on the Bay and in the watershed, and from nonpoint source pollution throughout the watershed. San Diego Bay's watershed drains into five creeks, which collect nonpoint source pollutants generated within the watershed and deliver them to the Bay. Urban runoff also delivers nonpoint source pollutants through the storm drain system, which ultimately empties into the Bay.

Nonpoint source pollutants include petroleum products, tire dust, asbestos, pesticides, fertilizers, phosphates, nitrates, coliform bacteria and other pathogens, sediment, and trash. The Navy has operated a shipyard in the Bay for decades, contributing oil, paint and related chemicals, metals, and solvents into the water. Operation and maintenance of over 8,000 recreational boats on San Diego Bay contributes contaminants such as oil, sewage, and antifouling paint to the Bay. Discharges of groundwater are also a source of contamination to the Bay due to the many plumes of toxic and hazardous chemicals that have contaminated the groundwater underneath San Diego.

The San Diego Regional Quality Control Board's major problems of concern are PCBs, petroleum wastes, copper, organotin compounds, and a variety of other trace metal toxins and chemicals. The primary areas of concern are the more industrialized central and outer portions of San Diego Bay; there are contaminant concerns in South San Diego Bay as well.

Service contaminant surveys were conducted in August 1990. Potential problems described in the 1990 survey included trace elements originating from urban runoff, marinas, and the San Diego Gas and Electric power plant. In addition, the area had documented concerns about metals, organotins, and petroleum hydrocarbons (SDIWQP 1989), elevated DDE levels in terns nesting in South San Diego Bay (Ohlendorf 1985), and unexplained gull mortality in that area.

In 1992, the Service conducted contaminant sampling in South Bay and reviewed data from several other contaminant studies conducted in San Diego Bay during 1991-1992. Sediments at three sites contained metals (copper, nickel, zinc, and lead) exceeding certain guidelines for the protection of aquatic organisms, but no levels were considered high enough to require cleanup.

PCBs were not detected in sediment samples, but were detected in biota samples at levels below hazard thresholds. Aliphatic hydrocarbons, PAHs, organotins, and most organochlorine pesticides were largely nondetectable in sediments and food chain biota or were at levels below most hazard thresholds. However, the eggs of all bird species had elevated concentrations of DDT-related compounds, likely as a result of DDE contamination previously documented in coastal southern California. The Service study concluded that no site-specific contamination issues were identified that would require remedial action, nor were any identified that should prohibit acquisition of the areas under consideration for the proposed South San Diego Bay Unit.

Limited environmental contaminant sampling has been conducted in the MKEG/Fenton area, as reported in the *Lower Otay River Wetlands Enhancement Plan*. Results from this contaminant survey indicated that hazardous materials were used and are stored in the area. Soil samples indicated elevated concentrations of organochlorine pesticides (DDT, DDD, DDE). Hazardous materials stored on site included items typical of farming operations such as fuels, oils, grease, and pesticides.

The only potential contaminant problem on the Radio Facility was cleaned up in 1993. A total of 76 underground fuel tanks were removed from the former barracks site. The cleanup has been certified as complete by the U.S. Environmental Protection Agency and responsible State and local agencies. There are no contaminant concerns associated with the 40-acre Navy site at Silver Strand State Park.

Compatibility Determination of Interim Public Uses

In compliance with Executive Order 12996 and the National Wildlife Refuge System Improvement Act of 1997, the Service has identified the wildlife-dependent public activities now occurring on the potential acquisition area, and analyzed them for compatibility with the purposes for which the Refuge was created (see section 1.11.1). The Service completed its interim compatibility determination on June 30, 1997. Refuge land is closed to public access until opened. Areas to be open for public use would be determined after land with an existing public use is acquired. The compatibility determination covers the interim period between the time the Service acquires a parcel until a plan has been formally adopted for long-term management. The Service would prepare a public use plan, using public input, to determine exactly what types of activities would be permitted and where they would be allowed.

Table 16. Interim Compatibility Determination Summary of Wildlife-dependent Recreational Activities

Wildlife-dependent Recreational Activity	Existing Activity?	Compatible for Interim Period?	Funds and Staff Available to Manage?	Interim Use Allowed?
Wildlife Observation	Yes	Yes	Yes	Yes
Environmental Interpretation	Yes	Yes	Yes	Yes
Wildlife Photography	Yes	Yes	Yes	Yes
Environmental Education	Yes	Yes	Yes	Yes
Hunting	No	No	No	No
Fishing	Yes	Yes	Yes	Yes

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Appendix C

Distribution List for Environmental Assessment

Federal and State Congressional Offices

U.S. Senator Dianne Feinstein
U.S. Senator Barbara Boxer
U.S. Congressman Ron Packard
U.S. Congressman Brian P. Bilbray
U.S. Congressman Bob Filner
U.S. Congressman Randy "Duke" Cunningham
U.S. Congressman Duncan Hunter
State Senator Ray Haynes
State Senator David G. Kelley
State Senator William A. Craven
State Senator Lucy Killea
State Senator Steve Peace
State Assemblyman Howard Kaloogian
State Assemblyman Jan Goldsmith
State Assemblyman Susan Davis
State Assemblyman Steve Baldwin
State Assemblywoman Dede Alpert
State Assemblywoman Denise Moreno
Ducheny

Federal Agencies

Department of Agriculture

U.S. Forest Service

Department of Defense

U.S. Army Corps of Engineers

U.S. Navy

U.S. Marine Corps

Department of Interior

Bureau of Indian Affairs

Bureau of Land Management

Bureau of Mines

Bureau of Reclamation

National Park Service

U.S. Fish and Wildlife Service

U.S. Geological Survey

Department of Transportation

Federal Aviation Administration

South San Diego Bay Unit
San Diego NWR

Federal Highway Administration

Environmental Protection Agency

Immigration and Naturalization Service

Native American Tribes

Campo Mission

Jamul

La Posta

Manzanita

Mesa Grande

San Pasqual

Santa Ysabel Mission

Sycuan

Torres-Martinez

Viejas

State and Local Agencies

State of California

California Coastal Commission

California Energy Commission

California Environmental Protection Agency

Department of Fish and Game

Department of Forestry and Fire Protection

Department of Parks and Recreation

Department of Transportation

Department of Water Resources

Environmental Protection Agency

Fish and Game Commission

Native American Heritage Commission

Office of Historic Preservation

Office of Planning and Research

Regional Water Quality Control Board

Resources Agency

State Coastal Conservancy

State Lands Commission

Wildlife Conservation Board

San Diego County

Board of Supervisors

Draft Environmental Assessment
Appendix C

Department of Parks and Recreation
Department of Planning and Land Use
Department of Public Works
Environmental Health Service
Valle de Oro Planning Group
Jamul/Dulzura Planning Group
Spring Valley Planning Group
Sweetwater Planning Group
Lakeside Planning Group

City of San Diego

Airport Division
City Council
City Manager
Department of Parks and Recreation
Department of Water Utilities
Office of the Mayor

City of Chula Vista

City of Coronado

City of El Cajon

City of La Mesa

City of Imperial Beach

City of National City

San Diego Association of Governments

Public Libraries

San Diego County Branch Libraries

Alpine
Bonita-Sunnyside
Campo-Moreno Village
Casa de Oro
Crest
Del Mar

San Diego County Branch Libraries

(continued)

South San Diego Bay Unit
San Diego NWR

Descano
East County Bookmobile
El Cajon
Fletcher Hills
Imperial Beach
Lakeside
La Mesa
Lemon Grove
Poway
Spring Valley

City of San Diego Libraries

Central
Mira Mesa
North Clairemont
Otay Mesa
Rancho Penasquitos
San Ysidro
Scripps-MiraMar
Serra Mesa
Skyline Hills
Tierrasanta
University Community
Valencia Park

City Libraries

Chula Vista
National City
El Cajon

Landowners

Private Individuals and Groups

Media

Appendix D Glossary

Acquisition

The method by which land is brought into the National Wildlife Refuge System. Types of acquisition agreements include sale, easement, lease, or in the case of a State or Federal agency, cooperative agreement.

Alternative

A reasonable way to fix the identified problem, satisfy the stated need, or take advantage of the stated opportunity.

Approved refuge boundary

A project boundary that the Regional Director of the U.S. Fish & Wildlife Service approves upon completion of the planning and environmental compliance process. An approved refuge boundary only designates those lands that the Fish & Wildlife Service has authority to acquire and/or manage through various agreements. Approval of a refuge boundary does not grant the Fish & Wildlife Service jurisdiction or control over lands within the boundary, and it does not make lands within the refuge boundary part of the National Wildlife Refuge System. Lands do not become part of the National Wildlife Refuge System until they are purchased or are placed under an agreement that provides for management as part of the Refuge System.

Beach groin

A rigid structure built out at an angle from a shore to protect the shore from erosion by currents, tides and waves; or to trap sand for making a beach.

Biological diversity or biodiversity

The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.

Bird-use day

A way to convert counts of birds in order to accurately compare bird use in different areas or the same area in two or more time periods. A bird-use day estimates the equivalent amount of use one bird would get from one day in an area. A bird-use day is based on the number of birds using an area and the number of times birds were counted and over what period of time. Bird-use days do not account for differences in bird sizes or habitat needs, nor for differences in the areas surveyed. The formula used for calculating bird-use days is as follows: Total number of birds multiplied by the total number of days of the bird count, divided by the number of times the survey was taken.

Candidate species

A species for which the Service has on file sufficient information on biological vulnerability and threat(s) to support a proposal to list as a threatened or endangered species.

Categorical Exclusion

A category of actions that do not individually or cumulatively have a significant effect on the human environment and have been found to have no such effect in procedures adopted by a Federal agency pursuant to the National Environmental Policy Act.

Compatible use

A use that, in the sound professional judgment of the Director of the U.S. Fish & Wildlife Service, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of a refuge.

Comprehensive Conservation Plan (CCP)

A document that identifies the management actions that will occur on a refuge. The CCP provides a description of the desired future conditions and long-range guidance for the refuge. CCPs establish management direction to achieve refuge purposes.

Concept Plan

A document developed early in the establishment a new refuge, designed to provide the public with a vision of what the refuge may accomplish.

Conceptual Management Plan

A document that presents a broad overview of the Service's proposed management approach to lands included within the National Wildlife Refuge System. Management actions are finalized only after additional planning and public input, generally in the form of a CCP.

Conservation easement

A legal document that conveys (transfers) specific land-use rights to a secondary party for a specified length of time. For example, a conservation easement granted in perpetuity may convey development and management rights to the Service, while providing for continued use by the land owner for compatible purposes.

Cooperative agreement

A habitat protection action in which no property rights are acquired. An agreement is usually long-term and can be modified by either party. Lands under a cooperative agreement do not necessarily become part of the National Wildlife Refuge System.

Created land

Land made by repeatedly layering dredged materials on low or submerged lands until the desired or maximum possible elevation is achieved.

Donation of land

A citizen or group may wish to give land or interests in land to the Service for the benefit of wildlife. Aside from the cost factor, these acquisitions are no different than any other means of land acquisition. Gifts and donations have the same planning requirements as purchases.

Ecoregion

A territory defined by a combination of biological, social, and geographic criteria, rather than geopolitical considerations. Frequently, major river basins, mountain ranges, characteristic vegetation, or other major landforms define the basic extent of an ecoregion.

Eminent domain

The authority given to Federal agencies to condemn land for the public good. Although it is Service policy to purchase land only from willing sellers, the Service does have this authority and occasionally uses it.

Endemic species

A species native to and restricted to a particular locality, habitat, or geographical area.

Endemism

The extent to which the plants and animals of a region are unique to that region.

Ecosystem

A dynamic and interrelating complex of plant and animal communities and their associated nonliving environments.

Endangered species

A species officially recognized by Federal and State agencies to be in immediate danger of extinction throughout all or a significant portion of its range.

Environmental Assessment (EA)

A concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action, offers alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or Finding of No Significant Impact.

Environmental Impact Statement (EIS)

A detailed written statement required by section 102(2)(C) of the National

Environmental Policy Act, analyzing the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources.

Fee title

The acquisition of most or all of the rights and interest to a tract of land.

Finding of No Significant Impact (FONSI)

An agency decision prepared in compliance with the National Environmental Policy Act, supported by an environmental assessment, to proceed with a proposed action. The FONSI briefly describes the Federal action to take place and presents why the action will have no significant effect on the human environment.

Flyway

A migration corridor plus northern and southern end destinations used by migratory birds. Habitat within flyways must provide adequate food, water and safe resting spots, including spring and summer nesting areas. Habitat within flyways also must provide wintering areas with enough food in fall and winter to allow the birds to put on weight for the spring flight back with enough strength to immediately nest and rear young. Small side flyways used by a few birds merge into larger and larger flyways used by more and more birds. In North America, the four greatest routes are the Atlantic Flyway, the Mississippi Flyway, Central Flyway, and Pacific Flyway. Individual birds may not always use the same flyway from year to year.

Forage

The entire process of a wild animal finding and eating food. Foraging can include activities such as searching for, locating, digging, gathering, chasing and capturing, and carrying food back to a nest, den or different location to eat.

Habitat

The environment in which a plant or animal lives (includes vegetation, soil, water, and other factors).

Intrinsic value

The value of a thing for its own sake without being compared to or measured by anything else; the extent to which a thing is good in itself.

Land Protection Plan (LPP)

A document that identifies and prioritizes lands for potential willing-seller acquisition, and also describes other methods of providing protection. Landowners within project boundaries will find this document, which is released with the environmental assessments, most useful.

Lease

An agreement for full or specified use for a specified length of time in return for a rental payment. A lease generally includes occupancy rights. The rights revert back to the owner at the termination of the lease. This device is useful when the objectives are not perpetual or the owners are unable to provide other forms of land transfer. The property remains on the tax rolls during the term of the lease.

Multiple Habitat Planning Area (MHPA)

An area in southwestern San Diego County where habitat is conserved for wildlife uses as part of the Multiple Species Conservation Program.

Multiple Species Conservation Program (MSCP)

A habitat protection plan for 85 species' habitat needs and the protection of natural communities for a 900-square-mile area in southwestern San Diego County. The MSCP resulted in the Service issuing a Section 10 permit under the Endangered Species Act to the State of California. The permit allows unintentional harm occurring to 85 species during the course of other activities, within the boundaries identified in the MHPA. The most likely harm would be the destruction of habitat and the most likely activity would be building construction.

National Environmental Policy Act (NEPA) (4.2 USC S4321 et seq.)

The law that requires a Federal agency to 1) consider every significant aspect of the environmental impact of a proposed action, 2) involve the public in its decision-making process when considering environmental concerns, 3) use a systematic, interdisciplinary approach to decision-making, and 4) consider a reasonable range of alternatives, in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment.

National Wildlife Refuge System

A national network of lands and waters administered by the U.S. Fish & Wildlife Service for the conservation and management of fish, wildlife, and plants of the United States for the benefit of present and future Americans.

Natural Community Conservation Planning (NCCP) Program

A habitat conservation program instituted by the State of California in 1991 to encourage the preservation of natural communities before species within those communities are threatened with extinction.

Overlay national wildlife refuge

Lands and waters that are under the primary jurisdiction of one Federal agency where a refuge purpose is superimposed as a secondary interest in the property by the U.S. Fish & Wildlife Service. Primary administration is retained by the host agency. Wildlife management must be compatible with those uses for which the primary agency acquired the land.

Public involvement

The process by which interested and affected individuals, organizations, agencies, and governmental entities participate in the planning and decision-making process.

Refuge purposes

The purposes specified in or derived from document that created the refuge. Types of documents include the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge subunit.

San Diego Association of Governments (SANDAG)

A Joint Powers Agency that undertakes regional planning on behalf of its 19 members: 18 cities and the County of San Diego.

Step-down management plans

Plans that describe management strategies and implementation schedules. Step-down management plans deal with specific management subjects (e.g., crop lands, wilderness, and fire).

Study area

The limits of the area analyzed in the environmental assessment as shown on Map 2.

Take

Under the Federal Endangered Species Act, take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any endangered or threatened wildlife species (or plant species on Federal land), or to attempt to engage in any such conduct. By Supreme Court decision, take also includes destruction of a listed species' habitat.

Threatened species

Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Wildlife-dependent recreation

A legal use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation.

Uniform Relocation Assistance and Real Property Act

A law (Public Law 91-646, as amended) that provides certain benefits and payments to persons displaced as a result of FWS acquisition of land.