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South San Diego Bay Enhancement Plan

Executive Summary

San Diego Unified Port District

California State Coastal Conservancy

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FOR THE

SOUTH SAN DIEGO BAY ENHANCEMENT PLAN

The San Diego Unified Port District and the California State Coastal Conservancy contributed to the preparation of the Report which was prepared by Michael Brandman Associates, Inc., as prime contractor.

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The South San Diego Bay Enhancement Plan (hereafter Report) consists of four volumes:

Volume I:	Resources Atlas on Bay History, Physical Environment and Marine Ecological Characterization
Volume II:	Resources Atlas on Birds of San Diego Bay Historical Data and 1988-89 Surveys
Volume III:	Enhancement Goals and Concepts Literature Cited
Volume IV:	Field Data Appendix

In its totality the Report comprises more than 490 pages of text, 56 Tables, 191 Figures and 750 pages of Field Data. Since the material is both comprehensive and extensive, an Executive Summary was deemed necessary to provide an overview.

This Executive Summary was written by Port staff, excerpting material extensively from "Enhancement Goals and Concepts", Volume III.

INTRODUCTION

The Report concerns development of a Conceptual Enhancement Plan for the habitats and natural resources of South San Diego Bay, San Diego County, California. The study area generally includes the portion of San Diego Bay lying south of the Sweetwater Channel, between National City and Chula Vista, see Figure 1.

San Diego Bay is a crescent-shaped body of water located about five miles north of the boundary between the United States and Mexico. The bay is approximately 14 miles long and 2-1/2 miles across at its widest point. San Diego Bay is a center of trade, shipping, commercial fishing and recreation. Ecologically it is also considered one of the most important embayments of the California coast. San Diego Bay is a major spawning area for ocean and bay fish and is a significant part of the Pacific flyway for annual migratory birds which use the bay for feeding, nesting or resting.

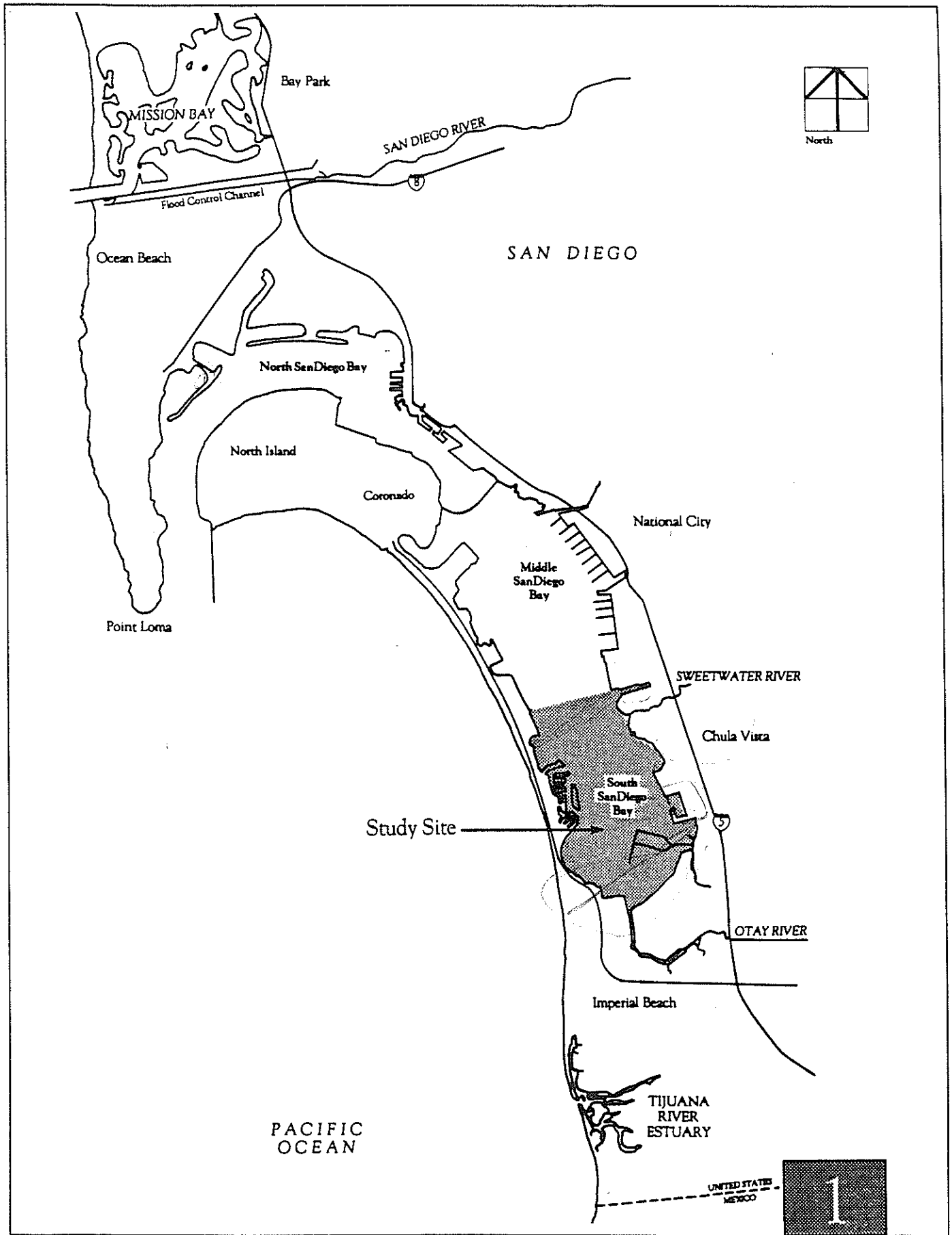
South San Diego Bay is less developed than north or central San Diego Bay and contains several thousand acres of shallow baywaters, some 600 acres of mudflats, approximately 200 acres of salt marsh, over 1,250 acres of salt ponds and a riparian corridor along the Otay River, but not all of these are in the Port's jurisdiction.

Seven state or federal endangered or rare bird species have all been found in south San Diego Bay habitats: Belding's Savannah sparrow, California brown pelican, California least tern, Light-footed clapper rail, Long-billed curlew, Peregrine falcon, and Western snowy plover. Also found are the Eastern Pacific green/black sea turtle and one endangered and one rare plant species, Salt marsh bird's beak, and Palmer's frankenia respectively.

SAN DIEGO UNIFIED PORT DISTRICT

The San Diego Unified Port District, governed by a Board of Port Commissioners, was established by the California Legislature in 1962 as trustee of San Diego Bay Tidelands for the people of California with overall planning responsibilities:

> "A port district for the acquisition, construction, maintenance, operation, development, and regulation of harbor works and improvements, including rail, water, and air terminal facilities, for the development, operation, maintenance, control, regulation, and management of the Harbor of San Diego upon the tidelands and lands lying under the inland navigable waters of San Diego Bay, and for the promotion of commerce, navigation, fisheries, and recreation thereon..."



Regional Location Map

Figure No. 1

The final clause, focusing on the promotion of commerce, navigation, fisheries, and recreation, clearly gives the Port District quite different responsibilities from general-purpose local governments.

The impact of port developments on natural resources is one of the most difficult issues of coastal zone management. San Diego's Port District has pursued a policy of commercial and industrial development and public use of the tidelands under its control. However, it has also clearly recognized the natural resource values of San Diego Bay and worked to maintain existing valuable natural resource areas and to actively enhance areas which are presently degraded.

The Port District's principal interests in supporting this study are: 1) preserving and enhancing important natural resource areas within its jurisdiction and 2) identifying sites that could provide mitigation for projects that could be developed in conformance with the Port District Master Plan.

STATE COASTAL CONSERVANCY

The State Coastal Conservancy was created in 1978 as an implementation agency for the 1976 California Coastal Act. As a primary mandate of its authorizing legislation, the Conservancy is responsible for resolving coastal land use issues and for planning and implementing habitat enhancement projects. The Conservancy also provides funds for construction of public accessways and provides planning and implementation assistance for watershed management programs. State bond acts provide funding for these various programs. Funding grants and/or matching funds are provided to local governments including the Port District and nonprofit organizations. The Conservancy has developed similar Enhancement Plans elsewhere. A plan has recently been completed for the lower Otay River, immediately adjacent to the South San Diego Bay salt ponds. The Port District has undertaken a Planning Study just westerly of this area, in the City of Imperial Beach.

The Coastal Conservancy's principal interests in supporting the study were generally similar, but with a greater emphasis on the implementation of overall habitat enhancement projects such as: 1) to refine and update specific regional habitat enhancement goals; 2) to use these goals to identify potential enhancement and habitat mitigation projects; and 3) establish mitigation banks to provide functioning habitat in advance of any potential losses of fish and wildlife values; and 4) to develop enhanced natural resources in San Diego Bay.

STUDY ORIGIN AND GOALS

In October, 1986, the Board of Port Commissioners requested from the California State Coastal Conservancy a matching study grant to develop a South San Diego Bay Enhancement Plan. The grant was approved by the Conservancy in October, 1987 and accepted by the Port Commission in November.

Enhancement Plan Study Area

San Diego Bay Tidelands ownership and administration is complex, with the Federal Government (U.S. Navy, Marine Corps, and Coast Guard), the State of California (State Lands Commission, Toll Bridge Authority, and Department of Parks and Recreation), the San Diego Unified Port District and other jurisdictions, all playing various roles.

San Diego Bay, south of the Sweetwater Channel presently encompasses subtidal and intertidal bay-bottom habitats, adjacent intertidal saltmarshes, and salt ponds. The Conceptual Enhancement Plan identifies enhancement and mitigation opportunities in South San Diego Bay for tidelands and submerged lands that lie within the Port of San Diego's jurisdiction and are not designated for development in the Port's Master Plan.

Study Elements

The Report includes a review and synthesis of historical information describing the natural resources and biological values of south San Diego Bay and generally focuses on saltmarsh habitats, the larger species of benthic invertebrates, fisheries resources, and bird populations.

A comprehensive, seasonal, field-sampling inventory of present natural resources values emphasized the larger, intertidal and subtidal benthic invertebrates, fish populations, and birds. Additional studies included inspection of saltmarsh habitats, aerial mapping of eelgrass resources, and measurement of selected physical environmental variables during biological field sampling.

The Conceptual Enhancement Plan identifies a broad range of biological community-based and species-specific habitat enhancement opportunities which are reviewed in terms of their engineering feasibility, general regulatory agency permitting policies, and their potential to meet the mitigation requirements of future Port developments.

Organization of Report

The first volume reviews the principal historical changes that have impacted San Diego Bay, and particularly the South Bay study area, from early european contacts (Juan Cabrillo, 1542) to recent times. This review includes a quantitative analysis of changes in the areas of different marine habitats represented throughout San Diego Bay and in adjacent Mission Bay and the Tijuana River Estuary, over the period 1856 through 1987 and is followed by a summary of available data describing the physical and chemical marine environment of south San Diego Bay. An account of marine benthic invertebrates and fish previously documented from the South Bay follows. Comparable data from this study's seasonal (July and November 1988, February and May 1989) field sampling program concludes this volume.

The second volume of the study is devoted entirely to the distribution and abundance of birds. The overview of available historical data on bird use is followed by a detailed annotated bibliography that draws together all relevant prior studies. The remainder summarizes the results of six censuses (June, August and November 1988; February, April and June 1989) of South San Diego Bay birds conducted during this study.

The third volume contains the Conceptual Enhancement Plan. Generalized enhancement goals for the South Bay is reviewed and habitat conservation and regulatory frameworks within which the proposed enhancement activities must be accomplished are described. Various alternative general approaches to habitat enhancement are outlined and a broad range of site-specific enhancement alternatives are presented. The Enhancement Plan concludes with a review of potential future Port development mitigation needs and enhancement options available to meet these needs. A consolidated bibliography of all relevant references consulted during this study completes the third volume.

The fourth volume of the Report brings together all of the original data sets collected during the study. A number of additional data sets are included that have not previously been readily available to either the scientific community or the general public. These original data deserve a much broader distribution, for they offer tremendous potential for additional detailed analyses that could yield new insights into the protection and enhancement of South San Diego Bay resources.

Report Pagination: Successive Report Sections (i.e., chapters) are numbered consecutively through Volume I to Volume IV. Single-page and fold-out illustrative Figures are also numbered consecutively throughout the Report, but have not been assigned page numbers. The Figures are indexed according to the preceding numbered text page; due to their insertion as un-numbered pages, odd and even numbers occur on both righthand and lefthand pages.

SAN DIEGO BAY MARINE HABITATS

It is important to consider the general types of natural or relatively natural marine habitats found in South San Diego Bay and in the outer portions of the bay. These are most readily characterized by depth or tidal elevation, by bottom sediment characteristics, and by the presence of associated vegetation and masses of the ectoproct (moss-like animals).

Major marine habitat types categorized by depth or tidal elevation include intertidal habitats which occur within the elevation range of the tides, shallow subtidal habitats at depths from Mean Lower Low Water (MLLW) to 18 ft below MLLW, and deeper subtidal habitats at depths greater than 18 ft below MLLW. Mean Lower Low Water (0 ft, the base elevation for National Ocean Survey tide tables) and -18 ft MLLW are convenient and practical depth limits at which to separate major habitats for they are uniformly included on bathymetric charts of the bay. It is important to note, however, that these depths are <u>not</u> precise boundaries separating distinctly different biological communities. Rather, they represent areas of transition where both the physical environment and associated biota exhibit a variety of general changes -- emergent intertidal to permanently submerged subtidal conditions, or sunlit shallow waters to dimly-lit deeper water conditions, for example.

Natural habitats characterized primarily by sediment type include mud and silt, fine or coarse sand and rocky areas, or combinations of these. For the most part intertidal and subtidal areas in South San Diego Bay consist primarily of mud and silt. Man-made structures, including pier pilings, bulkheads, rock rip-rap, floating docks and a variety of derelict items such as sunken parts of vessels and metal drums also form extensive artificial habitats in the central portion of the bay and to a lesser extent in the southern part. Major habitat types characterized by their dominant vegetation or other cover include salt marshes, eelgrass beds and subtidal bottom areas supporting large masses of algae and ectoproct.

The primary natural marine habitat types considered throughout this study are: (1) intertidal salt marshes; (2) intertidal mudflats; (3) tidal creeks associated with salt marshes; (4) tidal channels associated with mudflats; (5) intertidal sandy beaches or flats; (6) shallow subtidal bottom habitats of various sediment characteristics; (7) deeper subtidal bottom habitats of various sediment characteristics; (8) subtidal bottom habitats supporting algae and ectoprocts.

This Executive Summary can not properly do justice to the breadth and depth (no pun intended) of the "Bay History, Physical Environmental and Marine Characterization" --Resources Atlas Volume I-- of the Report. Not only does this portion of the Report present the characterization of marine resources from actual field work 1988-1989, which was integrated with the field work for avian resources, but also incorporates extensive prior data a well as historical information. Port staff believes that this is the first time such consolidated compendium is being made available for consideration by civic decision makers and the public-at-large.

Instead of attempting to summarize the highlights in this Executive Summary, a limited outline of the content of Volume I is presented. Topics covered are:

- Pre-1900 History of San Diego Bay

- The Period 1900-1963, including dredging, filling, and shoreline changes. Also sewage and industrial pollution.

- The Period 1963-1989
    - Recovery from Sewage Pollution.
    - Power Plant Cooling Water Studies 1968-1988.
    - Storm water runoff effects on bay sediments and water quality.
    - Shoreline development and Constructed Wetlands
    - Eelgrass Status.

- Physical and chemical characteristics of the marine environment
    - Physiography and Bathymetry
    - Tidal Characteristics
    - Water conditions, temperature, salinity, dissolved oxygen
    - Sediment characteristics

- Marine Ecological Characterization
    - Food Web Relationships
    - Saltmarshes and plants
    - Bay Bottom plants and eelgrass
    - Marine Ecological Sampling Methods (eight)
    - Field Data for 1988-89 Seasonal Study: Benthic Invertebrates; Plankton and Nekton; Demersal and Open Water Fishes.
    - Comparison of Fish Species 1892-1989 and Fish Populations 1968, 1979-80, 1988-89.
    - Sea Turtles
    - Interviews with longtime residents about marine life.

BIRDS OF SAN DIEGO BAY

Volume II of the Report is devoted to data describing bird use of bay habitats. The limited available historical data are considered first in an annotated bibliography. The remainder of the volume consists of the results of quantitative censuses of South Bay bird populations conducted in June, August and November 1988, and February, April and June 1989.

Historical Overview

A comprehensive overview of ornithological research in San Diego Bay includes all important and many minor references to birds in the bay that are currently available in the libraries of public institutions or agencies. The annotations summarize and evaluate the "hard data" included in the references, emphasizing original research when appropriate.

The Nineteenth Century: The earliest scientific research on birds in San Diego Bay is attributable to doctors in the U. S. Army, primarily A. L. Heermann. Other ornithologists visiting the area in the mid to late 1800s were John G. Cooper, H. W. Henshaw, and Lyman Belding. Most material published by them consisted of original descriptions of species, reports of occurrence, or general assessments of relative abundance. They conducted no systematic surveys or counts. One instance of change in a species' status was noted during the nineteenth century: Cooper (1868) wrote that "large numbers" of the Black Brant occurred in the bay; Belding (1892) wrote that the Brant "was until recently abundant in San Diego Bay in winter." McGrew (1922) reported "50,000 to 100,000" Brant in Spanish Bight (now filled and part of Coronado) in the 1880s, and contrasted this to the species' rarity by the 1920s.

The Early Twentieth Century: From the turn of the century through the 1940s local observers and collectors continued publishing brief notes reporting the occurrence of various species, almost all rare visitors such as the Louisiana Heron and Oldsquaw. Common species were mentioned only incidentally if at all. During this period many of the common birds were mentioned only in comprehensive regional lists, and for many of these birds there is no mention specific to San Diego Bay. For the most part, the brief notes established patterns of distribution that remain the same today, although there are no recent records for the Northern Fulmar or Black-footed Albatross, pelagic species reported from the bay by Anthony (1895, 1924) and Linton (1908). For example, Henshaw (1885) described the relative abundance of the species of gulls in general terms, Linton (1907) noted several hundred Eared Grebes wintering on the bay, and Abbott (1939) reported the discovery that the Red Knot is a common bird around the bay.

The Black Rail: The one resident species on which substantial information was published was the California Black Rail. Egg collectors searched diligently for this species' nests because in the early twentieth century San Diego Bay was the only locality where this subspecies was known to breed. It was estimated that in 1908 there were 30 pairs in the Sweetwater River estuary, the best-known locality for the species, while during the 1930's some seasons had an estimated breeding population of twenty-five to thirty pairs, during other seasons one was unable to locate the species at all. The Black Rail was reported also from the foot of 14th Street in San Diego and the south end of the bay, but no bay-wide survey for the species was ever made. The Black Rail disappeared as a breeding species from coastal San Diego County in the 1950s (most recent nest collected 1955), and the only more recent report for the bay is of a presumably nonbreeding winter visitor seen in February 1964. The Black Rail has been designated a threatened species by the California Department of Fish and Game, but this recognition has come too late for the population extirpated from San Diego Bay. Pollution and habitat loss are generally credited for this extirpation.

The Black Brant: The Black Brant is one of the very few species of birds for which some early San Diego Bay (and Mission Bay) census data are available. The California Department of Fish and Game censused the Black Brant on San Diego Bay from 1931 to 1942. During this time the numbers counted increased from none in 1931, 1932, 1933, and 1936 to 1100 in 1942. In 1938 this increase was interpreted as a response to the recovery of eelgrass beds buried by silt during the floods of 1927, but in 1943 it was noted that there was no eelgrass in San Diego Bay and presumed that the birds were feeding on sea lettuce (as they do in the bay to this day). Despite this increase, which was perhaps a response to decreased hunting, the numbers of Brant in San Diego Bay in 1952 were considered too small for the area to merit inclusion in the rangewide study of the species' winter distribution. No agency or institution has paid any attention to the Black Brant in San Diego Bay since.

Contributions of Amateurs

Audubon Field Notes/American Birds: The number of birdwatchers in southern California increased substantially after World War II, and quarterly reports in the magazine Audubon Field Notes, inaugurated in 1946, became the primary medium of publication for birdwatchers' observations. Since 1963 these reports for southern California have been written by Guy McCaskie, and the journal is now named American Birds. The quarterly summaries often include reports from San Diego Bay, reports almost entirely of sightings of rare birds.