

suitable for aquatic disposal (e.g., within the Delta east of Sherman Island), so the recommended actions are not necessarily appropriate in those areas. In addition, areas in the Delta that are outside the Planning Area are included. Restrictions noted for these areas are suggested and could be superseded based on consultation between the resource agencies and other parties.

Potential Impact

Table J-3 identifies the potential impacts of dredged material disposal on the species of concern. Impacts in many respects are similar to those associated with dredging and include the degradation of water quality; loss or degradation of aquatic habitat for various life stages (larval, juvenile, spawning adult); interference with foraging and loss of food resources or important foraging habitats utilized by fish and bird species of concern; interference with the respiration, feeding, and migration of sensitive fishes; disturbance that results in the abandonment of nesting, foraging, or roosting sites by sensitive bird species; and the potential loss of salt marsh habitat and adjacent refugial cover for the endangered salt marsh harvest mouse.

Disposal Restrictions/Consultation and Permit Requirements

In the "Disposal Restriction" column, the resource agencies propose restricting disposal in the critical area for the time outlined in the next column. Permit and Construction Requirements are also identified (see Table J-4 for explanations). The final column identifies a designated period of time when aquatic disposal activity in that critical location may adversely affect the species. *Activities conducted outside the restricted period can proceed without contacting the resource agencies, thereby precluding the need to conduct a formal consultation with federal and state resource agencies.* If an activity is proposed within the restricted period for federal or state-listed threatened or endangered species, then the appropriate agencies must be contacted, unless the project can proceed according to the specified consultation and permit requirements.

J.4 THREATENED AND ENDANGERED AND OTHER SPECIAL STATUS SPECIES THAT COULD BE AFFECTED AT UPLAND/WETLAND REUSE SITES

Introduction

The preceding section focused on special status species that could be affected by dredging and disposal projects in the aquatic environment. This section describes some of the special-status species that could potentially be affected by implementation of the proposed policy as it relates to upland/wetland reuse (UWR) projects. The LTMS agencies have not prepared a comprehensive list of special status species related to the development of UWR sites. Any potential impacts would depend on the number and exact locations of such sites, which are not defined in this EIS/EIR. The effects on endangered species from the development of specific UWR sites are appropriately addressed in site-specific environmental reviews. However, some non-aquatic species that could be impacted by UWR projects are discussed below.

Evaluation of the proposed action alternatives and regional biological resources indicates that changes to the landscape will affect the following types of species: (1) species associated with the Baylands of the Planning Area; (2) species associated with the levees of the Delta; and (3) species associated with the following habitats of the Planning Area: intertidal mudflats, rocky shores, seasonal wetlands, tidal marshes, and riparian habitat.

Previous studies have identified 44 species of animals and 32 species of plants that meet the criteria of special status (including federally listed species, federally listed candidate species, California Species of Special Concern, and species designated by the state of California as Fully Protected) and that occur within the Planning Area (San Francisco Estuary Project [SFEP] 1992c; CNDDDB 1995; SFEP 1991b). Of these special status species, the following state and/or federally listed threatened and endangered animal species were determined to occur within the upland habitat restoration areas that could be affected by implementation of the proposed action alternatives in this EIS/EIR: Aleutian Canada goose, American peregrine falcon, California black rail, California brown pelican, California

clapper rail, California least tern, giant garter snake, salt marsh harvest mouse, Swainson's hawk, valley elderberry longhorn beetle, and western snowy plover.

Threatened and Endangered Animals

The following discussion focuses on the regional populations of these species, including biology, abundance and seasonal occurrence in the Planning Area, and relevant planning efforts for the recovery of these species.

Aleutian Canada Goose. The Aleutian Canada goose nests on the Aleutian Islands and winters primarily in the Central Valley. Key wintering and staging areas have been identified in California, including Castle Rock in Del Norte County, Butte Sink Wildlife Refuge in the Sacramento Valley, the Faith and Maples ranches in Stanislaus County, and the Los Banos area of Merced County. These birds have been sighted at several locations within the Planning Area, including the Delta and South Bay (SFEP 1992c; Wetlands Research Associates, Inc. 1995). With the exception of a few birds that winter on Grizzly Island in Suisun Marsh and a few local reservoirs in the East Bay, most observations in the Planning Area are usually flocks moving through the area.

American Peregrine Falcon. The peregrine falcon is a wide ranging bird that can occur throughout western North America. Peregrine falcons are not known to nest within the Planning Area, but this area is considered a major wintering area for raptors including the peregrine falcon. The wetland habitats of the Planning Area support large flocks of waterfowl and shorebirds in the region that provide an abundant prey base.

California Black Rail. The California black rail is a year-long resident of the tidal marshes of the San Francisco Bay and Sacramento-San Joaquin Delta. These rails are highly secretive and generally located only by call. Recent surveys have located populations in Suisun Marsh, on instream islands within the Delta, and at various sites surrounding San Pablo Bay (Napa River, Petaluma River, and Novato Creek) (CNDDDB 1995). Within these marshes, the high marsh habitat is critical for nesting habitat and high tide refugia. Without such refugia, black rails are taken during high tides by several predatory species, including northern harriers, black-shouldered kites, egrets, herons, red fox, and feral cats (SFEP 1992c). Within the south and central portions of the Bay, black rail breeding and nesting has not been confirmed, however, black rails have been located in these areas during the winter when this species is more widely distributed. The population trend for California black rail is one of decline, due to losses of habitat (SFEP 1992c).

California Brown Pelican. The California brown pelican nests on the Channel Islands and disperses to coastal locations throughout the Pacific Coast during the non-breeding season. These post-breeding season roost sites generally occur in association with breakwaters, jetties, and/or estuarine environments. The San Francisco Bay has generally been recognized as an important post-breeding roosting area for brown pelicans, however no specific sites have been identified of critical importance in the California brown pelican recovery plan. The trend for populations nesting in California is one of decline (USFWS 1983).

California Clapper Rail. The California clapper rail is a year-round resident of tidal salt marshes surrounding the San Francisco Bay. Within the Planning Area, clapper rails have been observed in the South Bay, Suisun Marsh, and from San Pablo Bay along the Petaluma and Napa rivers. These populations are generally limited by reductions in habitat and predation due to the introduced red fox (USFWS 1984). The population trend for California clapper rails was declining until 1992. Based on the results of less than 2 years of red fox control, the trend can presently be described as stable/declining (Wetlands Research Associates, Inc. 1995).

California Least Tern. The California least tern is a migratory shorebird that nests in a widely discontinuous range extending from San Francisco Bay southward through San Diego to Baja California. The least tern usually nests in open expanses of light colored substrate, including sand, dirt, pavement, and/or dried mud in close proximity to foraging areas with an abundance of small fish. Within the Planning Area, birds arrive in April and May to begin courtship and defend nest sites. Nesting colonies are known from Alameda Island, Bay Farm Island, Coyote Hills, Bair Island, Alameda Naval Air Station, Oakland Airport, Alvarado Salt Ponds, Redwood City Salt Ponds, Leslie salt ponds and the PG&E Plant in Pittsburg (USFWS 1980; CNDDDB 1995; Wetlands Research Associates, Inc. 1995). Some of these nest sites are historical sites that are not currently used. In addition, important post breeding sites have

been identified for the California least tern in the Planning Area. These sites including Charleston Slough, Moffett Field, Braumberg salt ponds, and Leslie salt ponds in Santa Clara County (CNDDDB 1995). The recovery plan for this species focuses on protection of existing nesting sites and foraging habitat, restoration of former nesting habitat and degraded coastal wetlands, creation of nesting islands, and protection of nesting colonies from excessive human disturbance and predation (USFWS 1980).

Giant Garter Snake. The giant garter snake is a permanent resident of freshwater marsh and aquatic habitats. Within the Planning Area, populations are known from the western and eastern portions of the Delta and the northern portions of Suisun Marsh. These snakes are active from March to October and forage for small fish, tadpoles, frogs, and other prey in marshes and open water habitat. From October to March, giant garter snakes hibernate in abandoned rodent burrows above the high-water line. While no recovery plan has been prepared for this species, interim guidelines for impact assessment and mitigation focus on maintenance of existing populations and habitat creation with concerns for habitat disturbance, buffers, hibernaculas, and water quality.

Salt Marsh Harvest Mouse. The salt marsh harvest mouse is endemic to the salt and brackish marsh habitat of the San Francisco Bay Area. This species occurs in the middle and upper parts of tidal marshes and in dense stands of pickleweed in diked wetlands. Within the Planning Area, the salt marsh harvest mouse frequently occurs in areas of suitable habitat. Trapping programs have located populations in all regions of the San Francisco Bay Area (CNDDDB 1995). Stable populations are generally associated with high-tide refugia, including upland areas with adequate escape cover. The recovery plan for this species includes protection of existing habitat and expansion of habitat by tidal marsh creation (USFWS 1984).

Swainson's Hawk. The Swainson's hawk is a migratory species that nests in the Central Valley in association with riparian habitats and cropland areas that provide foraging habitat during the nesting season. Currently the population is declining within the state (CDFG 1993b). These birds are not expected to be affected by the use of dredged material in Delta levee rehabilitation projects.

Valley Elderberry Longhorn Beetle. The Valley elderberry longhorn beetle occurs throughout the Central Valley endemic to valley oak woodlands and riparian habitats. Valley elderberry longhorn beetles are dependent on their foodplant, the elderberry. Within the range of the beetle, two species of elderberry are used by female beetles for egg laying and subsequently by developing larva. Within the Planning Area, the valley elderberry longhorn beetle are known to occur on elderberry shrubs on the levees of the Delta.

Western Snowy Plover. Breeding populations of the western snowy plover have been designated as "threatened" under the federal Endangered Species Act. These coastal populations are distinct from the inland populations that may also winter along the Pacific Coast. Coastal populations of snowy plovers nest in loose colonies from March through September in flat open expanses with sandy or saline substrates. Nesting has also been observed on salt pans, coastal dredged material disposal sites, dry salt ponds, and salt pond levees (USFWS 1993). The western snowy plover has nested sporadically at scattered locations throughout the Planning Area. Nest sites have been reported from the north and south portions of the bay (Wetlands Research Associates, Inc. 1995; CNDDDB 1995). No recovery plan has been prepared for this species.

Additional Special Status Animal Species

The following section describes the species that occur within the Planning Area that are not considered threatened or endangered species, but are listed as federal species of concern, California Species of Special Concern, or California Fully Protected. These species may be "locally designated" in several of the local jurisdictions within the Planning Area. With the exception of some wide-ranging species, these species are discussed in the context of local habitats to illustrate the ecological relationship between habitat and species. This discussion is based on the habitats described in the vegetation and wildlife discussions in Chapter 4 of this EIS/EIR. Given the number of special status species, complexity of habitat relations, and relatively low level of sensitivity, this approach is most appropriate to evaluate the effects of policy implementation on species considered "locally designated."

Within the Planning Area, several special status species are very wide ranging and occur in many habitat types. These species include the golden eagle, ferruginous hawk, northern harrier, black-shouldered kite, osprey, merlin, Cooper's hawk, prairie falcon, burrowing owl, loggerhead shrike, Townsend's western big-eared bat, California mastiff bat, and San Joaquin pocket mouse (Williams 1986; Remsen 1978). Alternatively, other species occur in specific habitats, including intertidal, mudflat, and rocky shore; tidal marshes; seasonal wetlands; salt ponds; and riverine and riparian habitats. Each of these habitats and unique species are discussed, in turn, in the following.

Intertidal Mudflat and Rocky Shore. Intertidal mudflats occur throughout the Bay and provide valuable foraging habitat for several special status species, including the long-billed curlew, California gull, and elegant tern. Rocky shores also occur throughout the Bay Area and provide important resting and roosting habitat for the following special status bird species: the California gull, elegant tern, American white pelican, and double-crested cormorant.

Tidal Marshes. Several types of tidal marshes have been identified in the Planning Area, including tidal salt marsh, tidal brackish marsh, and tidal freshwater marsh. These habitats are described in detail in the vegetation and wildlife section of the Policy EIS/EIR.

Within the Planning Area tidal salt and brackish marshes provide habitat for a diverse array of special status species, including the salt marsh common yellowthroat, Suisun song sparrow, Alameda song sparrow, San Pablo song sparrow, yellow rail, short-eared owl, salt marsh-vagrant shrew, Suisun ornate shrew, and San Pablo vole (CNDDB 1995; SFEP 1991b; Williams 1986).

Within the Delta portion of the Planning Area, freshwater tidal wetlands may provide suitable nesting and foraging habitat for the tricolored blackbird, double-crested cormorant, western least bittern, and white-faced ibis. These species may also occur in freshwater habitats at other locations within the Planning Area, in conjunction with the yellow rail, short-eared owl, salt marsh common yellowthroat, and western pond turtle (SFEP 1991b, 1992c).

Seasonal Wetlands. As described above, within the Planning Area several types of seasonal wetlands have been identified, including freshwater non-tidal marsh, diked wetlands, seasonal ponds, and farmed wetlands. The following is a brief description of the special status species associated with these habitats.

Freshwater non-tidal marshes are known to provide foraging habitat and nesting sites for the following birds: the tricolored blackbird, double-crested cormorant, western least bittern, white-faced ibis, and yellow rail. In addition, western pond turtles are common residents of these habitats. Seasonal ponds may also support the western pond turtle and California tiger salamander (SFEP 1992c).

Diked wetlands and seasonal ponds provide nesting and/or foraging habitat for several special status bird species, including the California gull, American white pelican, elegant tern, and double-crested cormorants that use these habitats for roosting and foraging during the fall (SFEP 1992c).

Farmed wetlands provide foraging habitat for several special status species that nest and roost in adjacent habitats. These species include the tricolored blackbird, California gull, long-billed curlew, and short-eared owl (SFEP 1991b, 1992c).

Salt Ponds. Salt ponds support a variety of special status wildlife, including resident and migratory species. Species observed at salt ponds in the Planning Area include the California brackish water snail, Barrow's goldeneye, western least bittern, long-billed curlew, salt marsh common yellowthroat, tricolored blackbird, and Alameda song sparrow (Wetlands Research Associates, Inc. 1995). Other species known to occur at these sites include the California gull, American white pelican, elegant tern, and the double-crested cormorant (SFEP 1992c).

Riverine and Riparian Habitats. Riparian habitats within the Planning Area are known to support rookery sites for several heron species and double-crested cormorants, nesting cover for colonies of tricolored blackbirds, basking sites for western pond turtles, and den habitat for ringtails. These species all forage in or adjacent to riverine habitat. Other special status species may use this habitat for migration corridors and/or perch sites, but are not generally dependent on riparian habitat.

Threatened and Endangered Plants

Evaluation of the proposed policy and regional biological resources indicate that five threatened and endangered plant species may potentially be affected by policy implementation. These include the following species: soft-bird's beak, Mason's lilaepsis, delta button celery, swamp sandwort, and California seablite. Each of these species is discussed below.

Soft Bird's-beak. Soft bird's-beak is a semi-parasitic annual plant that occurs in salt and brackish marshes in the North Bay and Suisun Bay areas. The plant is named after the soft hairs that cover the stems. Several historical populations are known from the Planning Area, but only four surviving populations are known (Skinner and Pavlik 1994).

Mason's Lilaepsis. Mason's lilaepsis is a small mat-forming perennial that is limited to the intertidal zone of brackish and freshwater marshes of the North Bay, Suisun Bay, Suisun Marsh and Delta. Mason's lilaepsis generally occurs on eroding substrates, but may also colonize pilings and ripped levees. While the trend for this species has been designated as one of decline due to several factors, recent survey efforts have increased the number of the known populations from 39 in 1991 to over 100 in 1995 (Golden and Fiedler 1991; CNDDDB 1995).

Delta Button Celery. Delta button celery is a slender perennial species that occurs on clay substrates in riparian floodplains. The historic distribution of this species included Calaveras, Merced, Stanislaus, and San Joaquin counties. All known populations from the Delta have been removed by agricultural development and levee reinforcement projects (CNDDDB 1995). For these reasons, it is likely that policy implementation will have no effect on Delta button celery.

Swamp Sandwort. Swamp sandwort is a perennial species that was historically known from freshwater marshes in coastal regions. There is discrepant information on the current distribution of this species within the Planning Area as various sources conflict as to whether the only known population from the Presidio is extant or extirpated (CNDDDB 1995).

California Seablite. California seablite is an evergreen shrub species that occurs in coastal salt marshes. Within the Planning Area, historical populations were known from Sonoma, Solano, and Alameda counties (Skinner and Pavlik 1994). Because California seablite is generally believed to be extirpated from the Planning Area, it is unlikely that policy implementation will affect this species.

Other Special Status Plants

The following describes those species within the Planning Area that are not designated as rare, threatened, or endangered, but are considered federal candidates for listing or are listed in the *Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik 1994). Within the Planning Area, these species may be locally designated by local jurisdictions.

The varied geology, topography and climate of the 11-county Planning Area provides optimal conditions for a variety of special status plant species. The habitats of the Planning Area that will be affected by policy implementation support a unique subset of these species. Those special status plant species that are known from or are expected to occur in the habitats that would be affected by policy implementation are discussed below.

Tidal Marshes. The various tidal marshes of the Planning Area include salt, brackish, and freshwater types. These habitats support several special status species, including Marin knotweed, Suisun Marsh aster, Point Reyes bird's-beak, hispid bird's-beak, San Francisco gumplant, rose-mallow, delta tule-pea, marsh gumplant, delta mudwort, mad-dog skullcap, small spikerush, hairless popcorn flower, Petaluma popcorn flower, Sanford's arrowhead, slough thistle, slender-leaved pondweed, and eel-grass pondweed.

Seasonal Wetlands. Within the Planning Area, farmed wetlands and diked wetlands are not associated with special status plant species, because of the high levels of disturbance associated with these areas. Naturally occurring

seasonal wetlands in the area, however, may support a variety of species, including Contra Costa goldfields, heart-leaf saltbush, San Joaquin spearscale, alkali milk-vetch, brittlescale, dwarf downingia, fragrant fritillary, and Carquinez goldenbush.

Salt Ponds. Because of the high salinity and disturbed nature of salt pond habitats, no special status plant species are associated with these environments. Although, some special status species may occur in less disturbed adjacent habitats.

Riverine and Riparian Habitats. Riparian habitats within the Planning Area may support populations of rose-mallow and delta tulle pea.

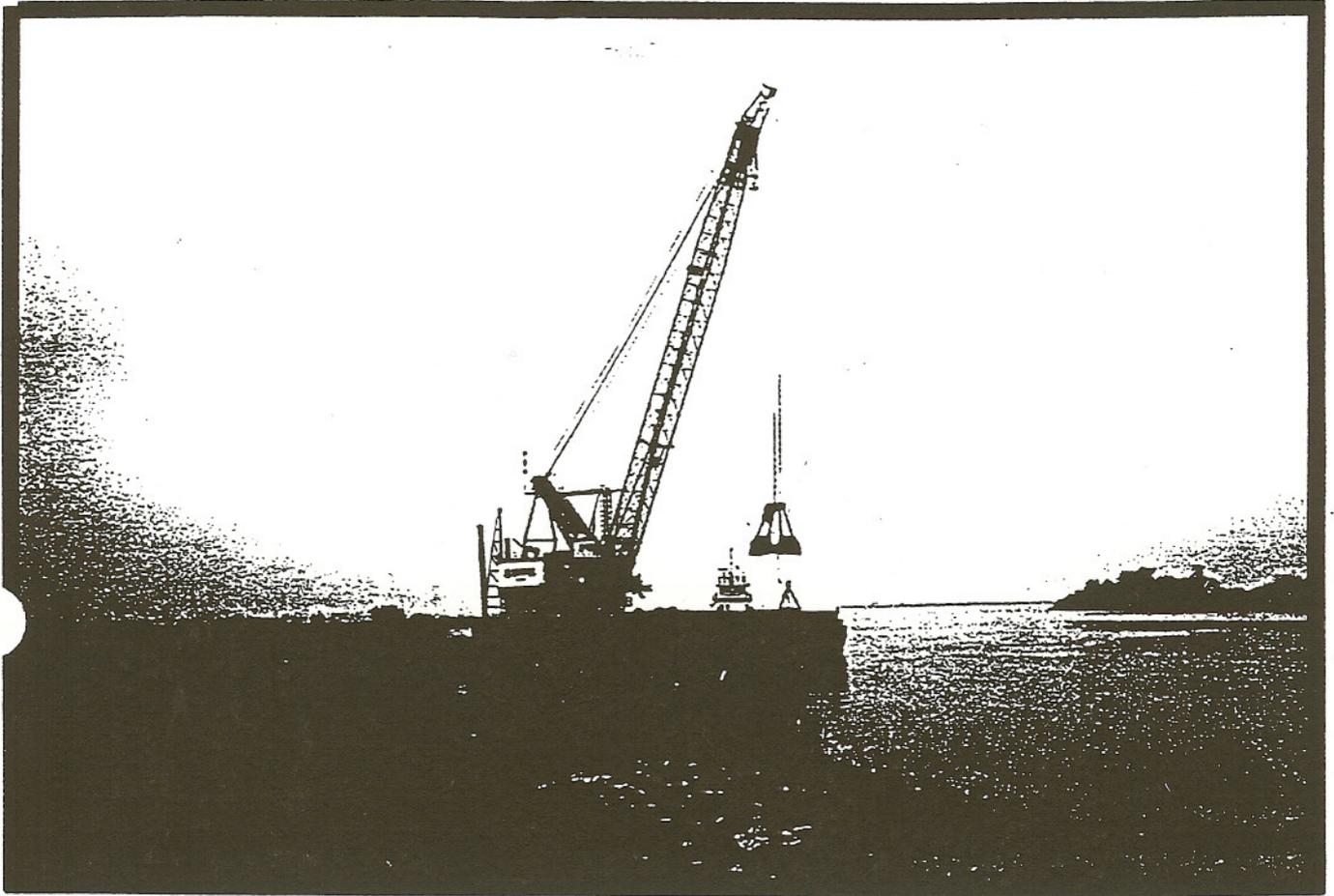
Appendix K

**Information on the
Jersey Island Levee Maintenance Demonstration Project and the
Sonoma Baylands Wetland Demonstration Project**

Appendix K.1

Lessons Learned from the Jersey Island Levee Maintenance Demonstration Project

**FINAL
LESSONS LEARNED
FROM THE JERSEY ISLAND
DEMONSTRATION PROJECT**



MAY 1997

Prepared For:

The San Francisco Bay Regional Water Quality Control Board

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FINAL
LESSONS LEARNED
FROM THE JERSEY ISLAND
DEMONSTRATION PROJECT

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ABSTRACT

This "Lessons Learned" report has been prepared by the United States Army Corps of Engineers, San Francisco District (COE), pursuant to the Special Studies and Monitoring condition outlined within the San Francisco Bay Regional Water Quality Control Board's Waste Discharge Order Number 95-040 for the Corps' 1995-96 Maintenance Dredging Program. This report outlines the challenges of implementing a levee rehabilitation project with sandy dredged material from the Federal navigation channel at the Suisun Bay Channel and New York Slough. One of the COE's missions is to routinely maintain these channels for safe navigation of deep draft vessels.

The demonstration (or pilot) project discussed in this paper examines in detail a wide array of issues: the environmental impacts to sensitive habitats and water quality; an analysis of the costs related to the dredging, transport and the final placement of the dredged material upon Jersey Island levees and what entity would bear those costs; and the regulatory requirements which must be achieved in order to successfully implement such a project.

Another purpose of this report is to identify the feasibility of long-term beneficial reuse of dredged material from future Operations and Maintenance dredging projects specifically located within the Suisun Bay portion of the San Francisco Bay/Delta Estuary. Since some of the regulatory agencies have typically viewed this sandy dredged material as a valuable resource for levee rehabilitation/commercial sand mining, their desire is to have the material reused for one of these beneficial purposes rather than continuing to dispose of the dredged material back into the aquatic environment at the Suisun Bay. Furthering of this ideal envisions a "turn key" operation that would be cooperatively implemented by the various agencies having regulatory oversight. Perhaps within the context of a Memorandum of Understanding, the responsible agencies could act within a reasonable time frame (less than one year) to achieve this goal.

However, as outlined within this report, the time constraint is not the only obstacle to be overcome. Significant issues arise with the source(s) of future project funding, environmental concerns and regulatory demands. The findings and conclusions presented are intended to be useful for formulating policies designed to facilitate/expedite future beneficial reuse of dredged material for the purpose of levee rehabilitation.

1.0 INTRODUCTION

The Jersey Island Demonstration Project incorporated the use of sandy dredged material obtained from the Federal navigation channels in Suisun Bay, Solono County, and New York Slough, Contra Costa County. Disposal of the dredged material occurred at the northern portion of Jersey Island, Contra Costa County (See Figure 1). The dredged material was used to reinforce the landward side of Jersey Island levees weakened from subsidence.

The Federal navigation project (which includes the Suisun Bay and New York Slough Channels) extends from the Benicia Bridge to the Port of Stockton and is authorized at a depth of minus 35 feet Mean Lower Low Water (MLLW).

Historically, the Suisun Bay Channel is maintenance dredged once every year and New York Slough every fourth year. Both channels contain medium to fine sand transported to Suisun Bay by the Sacramento and San Joaquin Rivers. In past practice this sandy material is dredged and disposed of aquatically at the COE's Suisun Bay Channel Disposal Site adjacent to the Suisun Bay Channel. However, the COE and other agencies are interested in identifying and studying the feasibility of beneficial uses for this sandy material, rather than to continue disposing the material into the aquatic environment.

Specifically; the COE, the San Francisco Bay Conservation and Development Commission (BCDC), the United States Environmental Protection Agency (EPA), and the California Regional Water Quality Control Board (RWQCB) have joined efforts to address and reduce dredging impacts within the San Francisco Estuary from a regional perspective for the next 50 years via the Long Term Management Strategy (LTMS).

One phase of the 5-year LTMS study was to outline the Beneficial Reuse/Non-Aquatic Disposal of dredged material. This study considered a full range of measures to reduce dredging requirements, manage existing disposal sites to extend their life; and various combinations of new disposal sites involving different disposal methods, locations and periods of use.

The Suisun Bay Channel and New York Slough were both identified as potentially feasible for beneficial reuse of dredged material by the above study. As such, the COE agreed to investigate alternative disposal methods for the Suisun Bay Channel material and to take the New York Slough material to an upland site, pursuant to the FY 1993-94 two-year water certification granted by the RWQCB and the two-year consistency determination as concurred by the BCDC. Subsequently, as required under the current FY 1995-96 two-year water certification, the COE agreed to analyze and report on the "Lessons Learned" resulting from implementation of the project.