

**TIJUANA ESTUARY TIDAL RESTORATION PROGRAM II PHASE I  
DRAFT ENVIRONMENTAL IMPACT REPORT/  
ENVIRONMENTAL IMPACT STATEMENT  
San Diego County, California**

**APPENDICES**

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**Lead CEQA Agency:** California Department of Parks and Recreation, San Diego Coast District, 4477 Pacific Highway, San Diego, CA 92110; Chris Peregrin (619) 688-3260

**NEPA Cooperating Agency:** U.S. Army Corps of Engineers, Los Angeles District, 5900 La Place Court, Suite 100, Carlsbad, CA 92008; (760) 602-4829

**August 2022**

Prepared under the direction of the Lead and Cooperating Agencies by: AECOM  
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# **Appendix A**

## **Acronyms and Abbreviations**





## **APPENDIX A**

### **ACRONYMS AND ABBREVIATIONS**

°F	degrees Fahrenheit
AB	Assembly Bill
ADT	average daily trips
APE	area of potential effects
ASR	Archive Search Report
ATCMs	Airborne Toxic Control Measures
B.P.	years before present
BIS	Border Infrastructure System
BMPs	Best Management Practices
BOD	biochemical oxygen demand
BSA	Biological Study Area
Btus	British thermal units
CAAQS	California Ambient Air Quality Standards
California State Parks	California Department of Parks and Recreation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CBP	U.S. Customs and Border Protection
CCA	California Coastal Act
CCC	California Coastal Commission
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDP	Coastal Development Permit
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CFU	colony forming units
CH <sub>4</sub>	Methane
CIP	Capital Improvement Project
CLOMR	Conditional Letter of Map Revision
CMP	Comprehensive Management Plan
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide

COD	chemical oxygen demand
Conservancy	California State Coastal Conservancy
Corps	U.S. Army Corps of Engineers
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CURRV	Climate Understanding and Resilience in the River Valley
CWA	Clean Water Act
cy	cubic yards
CZMA	Coastal Zone Management Act
dB	decibels
DDT	Dichlorodiphenyltrichloroethane
DEIR	Draft Environmental Impact Report
DHS	U.S. Department of Homeland Security
EIR/EIS	Environmental Impact Report /Environmental Impact Statement
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ERLs	Effects Range-Low
ERMs	Effects Range-Median
FESA	Federal Endangered Species Act
FR	Federal Register
FTA	Federal Transportation Administration
GHG	greenhouse gas
GWh	gigawatt-hours
GWP	Global warming potential
HFCs	Hydrofluorocarbons
HHS	Health and Human Services
Hz	hertz
I-5	Interstate 5
I-805	Interstate 805
in/s	inches per second
INPR	Inventory Project Report
ky	thousand cubic yards
kWh	kilowatt-hours
LCP	Local Coastal Plan
LOMR	Letter of Map Revision
LOS	level of service
m	meters
MC	munitions constituents
mcy	million cubic yards
MD	munitions debris

MEC	munitions and explosives of concern
mg/kg	milligrams per kilogram
MHPA	Multi-Habitat Planning Area
MLPA	Marine Life Protection Act
MMT	million metric tons
mph	miles per hour
MSCP	Multiple Species Conservation Program
MW	megawatts
MWh	megawatt-hours
MWWD	Metropolitan Waste Water District
N <sub>2</sub> O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NAVD 88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NERR	National Estuarine Research Reserves
NMFS	National Marine Fisheries Service
NO	nitric oxide
NO <sub>2</sub>	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOLF IB	Naval Outlying Landing Field Imperial Beach
NOP	Notice of Preparation
NO <sub>x</sub>	nitrogen oxide
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge
NWRS	National Wildlife Refuge System
O <sub>3</sub>	Ozone
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Office of Planning and Research
PCEs	primary constituent elements
PDFs	project design features
PFCs	Perfluorocarbons
PM	particulate matter
PM <sub>10</sub>	Particulate Matter, 10 micrometers or less in diameter
PM <sub>2.5</sub>	Particulate Matter, 2.5 micrometers or less in diameter
ppb	parts per billion
ppm	parts per million
PPV	peak particle velocity
PRC	California Public Resources Code

RAQS	Regional Air Quality Strategy
RBSPs	Regional Beach Sand Projects
ROG	reactive organic gases
ROI	region of influence
RWQCB	San Diego Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SAT	Science Advisory Team
SB	Southbound
SBIWTP	South Bay International Wastewater Treatment Plant
SBOO	South Bay Ocean Outfall
SCA	Society for California Archaeology
SCAQMD	South Coast Air Quality Management District
SCC	California State Coastal Conservancy
SCIC	South Coast Information Center
SDAB	San Diego Air Basin
SDAPCD	San Diego Air Pollution Control District
SDCAS	San Diego County Archaeological Society
SDG&E	San Diego Gas & Electric
SF <sub>6</sub>	Sulfur hexafluoride
SHPO	State Historic Preservation Officer
SI	Site Inspection
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District's
SMCA	State Marine Conservation Area
SO <sub>2</sub>	sulfur dioxide
SPCC	Spill Prevention Control and Containment
SQGs	Sediment Quality Guidelines
SVOCs	Semi-volatile Organic Compounds
SWPPP	Storm Water Pollution Prevention Plan
TACs	toxic air contaminants
TETRP EIR/EIS	Tijuana Estuary Tidal Restoration Program EIR/EIS
TETRP II Phase I	Tijuana Estuary Tidal Restoration Program II Phase I
THPO	Tribal Historic Preservation Officer
TOC	Total Organic Carbon
TRF	Tijuana River Floodway
TRNERR	Tijuana River National Estuarine Research Reserve
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
USIBWC	U.S. International Boundary and Water Commission
VdB	vibration dB

VMT	vehicle miles traveled
VOCs	Volatile Organic Compounds
WQOs	Water Quality Objectives

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## **Appendix B**

### **Comments Received During the Scoping Process**







**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**REGION IX**  
**75 Hawthorne Street**  
**San Francisco, CA 94105-3901**

July 12, 2021

Brian Collins  
U.S. Fish and Wildlife Service  
San Diego National Wildlife Refuge Complex  
1080 Gunpowder Point Drive  
Chula Vista, California 91910

**Subject:** Scoping Comments for the Proposed Tijuana Estuary Tidal Restoration Program II, Phase I (TETRP II Phase I), San Diego County, California

Dear Brian Collins:

The U.S. Environmental Protection Agency has reviewed the Notice of Intent published on May 27, 2021 regarding the U.S. Fish and Wildlife Service's decision to prepare an Environmental Impact Statement for the subject project. Our comments are provided pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508) and our NEPA review authority under Section 309 of the Clean Air Act.

The Tijuana Slough National Wildlife Refuge, along with the California Department of Parks and Recreation's Border Field State Park, will prepare a joint draft environmental impact statement/environmental impact report (DEIS/EIR) to evaluate impacts related to restoring coastal wetlands within the Tijuana River National Estuarine Research Reserve. TETRP II Phase I would restore approximately 80 to 85 acres of salt marsh, mudflat, tidal channel, and transitional/upland habitats on portions of both Border Field State Park and the Tijuana Slough National Wildlife Refuge that have been degraded over the past several decades in order to increase the tidal prism of the estuary.

The EPA supports wetlands restorations for the benefit of water quality, wildlife and to create resilience to climate change effects. The Notice of Preparation indicates that the following resources will be evaluated: Land Use, Recreation and Public Access, Tidal and Fluvial Hydrology and Water Quality, Hazards Materials and Public Safety, Biological Resources, Geology/Soils, Cultural Resources, Tribal Cultural Resources, Paleontological Resources, Visual Resources, Transportation, Air Quality, Greenhouse Gas Emissions, Noise, Socioeconomics/Environmental Justice, Public Services and Utilities, and Energy. We agree these resources are appropriate for evaluation and have the following additional suggestions for your consideration when preparing the Draft EIS/EIR:

### **Water Quality**

As the project website notes, the Tijuana Estuary has been degraded by decades of uncontrolled discharges of raw sewage, sediment, and trash, and indeed, the Tijuana River and Estuary are listed as impaired waters pursuant to Section 303d of the Clean Water Act. The restoration will increase the

estuary's tidal prism to improve water quality and keep the river mouth open to the ocean. We recommend the water quality discussion differentiate potential water quality effects between the alternatives as much as possible. Include a discussion of the adaptive management monitoring programs that will be implemented before and after proposed restoration actions to confirm potential impacts on water quality and beneficial uses.

#### **Clean Water Act, Section 404**

The DEIS/EIR should provide maps and a description of the impacts to waters of the U.S. from the alternatives. The project website indicates that the FWS will seek coverage under Clean Water Act Section 404 Nationwide Permit # 27 from the U.S. Army Corps of Engineers. Discuss compliance with the relevant nationwide permit conditions in the DEIS/EIR. If such discharges are expected to be authorized by an Individual Permit, the DEIS/EIR should discuss how the project will comply with the Clean Water Act 404(b)(1) Guidelines. EPA's CWA Section 404 point of contact for this project is Sarvy Mahdavi. Sarvy can be reached at 213-244-1830 or [mahdavi.sarvy@epa.gov](mailto:mahdavi.sarvy@epa.gov).

#### **Air Quality**

The DEIS should provide a discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS) and nonattainment areas, and potential air quality impacts of the project for each fully evaluated alternative. Emissions should be estimated for the construction phase, including emissions from the transportation of dredged sediment or import of upland fill. If sediments will be exported offsite, identify possible disposal areas and the assumptions for estimating emissions. Identify probable routes for construction traffic on the roadways within the Tijuana River Valley and indicate whether project truck traffic will pass near or through communities with environmental justice concerns.

The project area is in severe nonattainment for the 8-hour ozone NAAQS; therefore, we recommend measures to mitigate construction emissions of oxides of nitrogen (NOx) and volatile organic compounds (VOCs) be included in all construction contracts. In general, NOx emissions can be minimized by requiring the use of high-efficiency equipment (i.e. require nonroad trucks and construction equipment to meet, or exceed, the U.S. EPA Tier 4 exhaust emissions standards for heavy-duty nonroad compression-ignition engines), proper maintenance of equipment, shutting off engines when not in use and prohibiting idling for more than 5 minutes or within 1000 feet of sensitive receptors, and exploring the use of lower-emitting equipment, engines and fuels, including electric, liquified gas, hydrogen fuel cells, and/or alternative diesel formulations if feasible. Other mitigation measures could include timing construction activities to not coincide with peak-hour traffic and reducing construction-related trips of workers by encouraging ridesharing and transit use.

Additionally, we recommend using lighting systems that are energy efficient, such as LED technology, locating equipment staging areas as far as possible from residential areas and other sensitive receptors such as schools, and avoiding the routing of truck traffic near sensitive land uses to the fullest extent feasible.

#### **General Conformity**

Because the proposed project is located in a nonattainment area, the DEIS/EIR should address the applicability of Clean Air Act Section 176 and EPA's general conformity regulations at 40 CFR Parts 51 and 93. Federal agencies need to ensure that their actions, including construction emissions subject to state jurisdiction, conform to an approved implementation plan. When determining conformity applicability, note that the de minimis threshold is 25 tons per year for NOx and VOCs.

### **Reasonably Foreseeable Future Actions**

The description of the affected environment should include reasonably foreseeable environmental trends and planned actions in the area (40 CFR 1502.15). We are aware of the following actions for your consideration:

#### ***U.S. Mexico Canada Agreement (USMCA) projects***

The EPA is currently evaluating the effects of implementing several projects intended to reduce transboundary flows of untreated wastewater (sewage), trash, and sediment under the proposed USMCA Mitigation of Contaminated Transboundary Flows project. Some of the projects will divert water from the Tijuana River and reduce flows, while others will capture trash and sediment at the border or prevent sediment and trash from entering the Tijuana River. The several projects being considered are identified at <https://www.epa.gov/sustainable-water-infrastructure/usmca-tijuana-river-watershed>. We recommend coordinating with the EPA to ensure potential impacts from implementing these projects are considered when planning for the Tijuana Estuary Tidal Restoration Program. The EPA point of contact is Ami Cobb. Ami can be reached at 202-564-0996 or [cobb.ami@epa.gov](mailto:cobb.ami@epa.gov).

#### ***Long-term Sediment Management Activities***

The Tijuana Estuary sediment management planning effort, facilitated by the City of Imperial Beach, is developing a sediment management plan intended to serve as a guidance document for a programmatic approach to sustainable, long-term and cost-effective sediment management in the Tijuana River Valley. The purpose of this effort is to develop environmentally sustainable and cost-efficient processes to capture, handle, and beneficially reuse Valley sediment and support project planning and/or capital project development activities in the Tijuana River watershed.

#### ***Tijuana River Border Wall System Project***

U.S. Customs and Border Protection solicited public comment in August 2020 on constructing a new border wall system across the Tijuana River. While all border wall projects are paused and currently undergoing review, CBP recently indicated that it is still a potential project. See <https://www.cbp.gov/document/environmental-assessments/tijuana-river-border-wall-system-project-august-2020>.

The EPA appreciates the opportunity to comment on preparation of the DEIS/EIR. Once the DEIS/EIR is released for public review, please send one electronic copy to me at [vitulano.karen@epa.gov](mailto:vitulano.karen@epa.gov). If you have any questions, please contact me by email or at 415-947-4178.

Sincerely -

Karen Vitulano  
Environmental Review Branch



State of California – Natural Resources Agency  
 DEPARTMENT OF FISH AND WILDLIFE  
 South Coast Region  
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**GAVIN NEWSOM, Governor**  
**CHARLTON H. BONHAM, Director**



July 12, 2021

Governor's Office of Planning & Research

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 United States Fish and Wildlife Service  
 San Diego NWR Complex  
 1080 Gunpowder Point Drive  
 Chula Vista, CA 91910  
[fw8plancomments@fws.gov](mailto:fw8plancomments@fws.gov)

**July 13 2021**

## STATE CLEARINGHOUSE

**Subject: Comments on the Notice of Preparation of a Draft Environmental Impact Report for Tijuana Estuary Tidal Restoration Program II Phase I (TETRP II Phase I); Environmental Impact Report/Environmental Impact Statement (Project); #2021050599**

Dear Mr. Collins:

The California Department of Fish and Wildlife (CDFW) received a Notice of Preparation/Notice of Intent (NOP/NOI) of a Draft Environmental Impact Report/Draft Environmental Impact Statement (DEIR/DEIS) from the California Department of Parks and Recreation (Department of Parks and Recreation) for the Project pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines, and in coordination with the U.S. Fish and Wildlife Service (USFWS) as Lead Agency for the National Environmental Policy Act (NEPA).

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, CDFW appreciates the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

### CDFW ROLE

CDFW is California's **Trustee Agency** for fish and wildlife resources and holds those resources in trust by statute for all the people of the state. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a).) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (*Id.*, § 1802.) Similarly for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW is also submitting comments as a **Responsible Agency** under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), related authorization as provided by the Fish and Game Code will be required.

Brian Collins  
 USFWS, San Diego NWR Complex  
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## PROJECT DESCRIPTION SUMMARY

**Proponent:** California Department of Parks and Recreation and the United State Fish and Wildlife Service (USFWS).

**Objective:** TETRP II Phase I is the first phase of a multi-phase restoration of the southern arm of the Tijuana Estuary as first evaluated in the overall Restoration Project component of the 1991 Tijuana Estuary Tidal Restoration Program EIR/DEIR. TETRP II Phase I builds upon the revised conceptual restoration plan developed in the Tijuana Estuary – Friendship Marsh Restoration Feasibility and Design Study completed in 2008, which proposed multi-phase restoration of approximately 250 acres of the estuary. TETRP II Phase I has been designed to restore approximately 80 to 85 acres within the study area to increase the tidal prism (amount of water coming and going with the tides) of the estuary by restoring salt marsh, mudflat, and tidal channels, as well as transitional and upland habitats that have been degraded over the past several decades.

The NOP describes two alternatives:

1. Alternative 1: (Maximum Tidal Prism) is currently identified as the proposed action. This alternative, which would restore approximately 85 acres of coastal habitat, would maximize deeper intertidal habitats, by expanding tidal channels and intertidal mudflat.
2. Alternative 2: (Reduced Impact Alternative), which would restore approximately 80 acres of coastal habitat, has been designed to preserve existing native plant communities, including high salt marsh and transition zone throughout the project site. The primary tidal connection to Alternative 2 is the existing South Beach Slough, which would be deepened to increase tidal flows into the proposed restoration site.

**Location:** TETRP II Phase I project site is in the southern arm of the Tijuana Estuary in southwestern San Diego County, California and located just south of the main channel of the Tijuana River. The Project is encompassed by the Tijuana River National Estuarine Research Reserve (TRNERR), which includes Border Field State Park and the Tijuana Slough National Wildlife Refuge (NWR).

**Biological Setting:** Preliminary biological analysis identifies the following sensitive habitats on site: subtidal; southern coastal marsh, including intertidal low marsh and intertidal high marsh; mud flat; sand flat; salt flat; alkali meadow; tidal channel; beach; coastal dune; and upland transitional.

Special status bird species with the potential to occur near the Project include: the federally and State endangered and California Fully Protected California least tern (*Sterna antillarum browni*), the federally endangered and California Fully Protected light-footed Ridgway's rail (*Rallus obsoletus levipes*), State endangered Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), the federally threatened western snowy plover (*Charadrius alexandrinus nivosus*), and California Species of Special Concern (SSC) burrowing owl (*Athene cunicularia*). The California threatened and Fully Protected California black rail (*Laterallus jamaicensis coturniculus*) was historically reported from lagoons in coastal San Diego County but there have been no detections for approximately 40 years and this species is not believed to be potentially affected by the Project,

Sensitive mammal species with the potential to occur near the Project includes the San Diego black-tailed jackrabbit (*Lepus californicus bennettii*).

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There is potential for SSC western spadefoot (*Spea hammondi*) within the vicinity of the Project area and the species may be found within road pools along access roads required for the Project.

Sensitive reptiles in the vicinity of the Projects include but are not limited to SSC California glossy snake (*Arizona elegans occidentalis*), SSC Baja California coachwhip (*Masticophis fuliginosus*), SSC two-striped garter snake (*Thamnophis hammondi*), and SSC Blainville's horned lizard (*Phrynosoma blainvillii*).

Sensitive marine reptiles offshore of the proposed beach fill Project include but are not limited to the State Candidate Endangered Leatherback sea turtle (*Dermochelys coriacea*).

Sensitive marine fish species and their habitat such as California grunion (*Leuresthes tenuis*, grunion) spawn on the sandy upper intertidal beach. Important commercial and recreational fish species and their habitat, such as barred sand bass (*Paralabrax nebulifer*), California halibut (*Paralichthys californicus*), and rockfish (*Sebastes spp.*) have the potential to spawn, shelter, and forage in the nearshore sensitive habitats such as cobble reef, rocky reef, surfgrass, eelgrass, and kelp adjacent to the beach proposed fill Project.

Sensitive invertebrates in the vicinity of the Projects include but are not limited to western tidal-flat tiger beetle (*Habroscelimorpha gabbii*; State Rank (S)1), senile tiger beetle (*Cicindela senilis frosti*; S1), western beach tiger beetle (*Cicindela latesignata*; S1), globose dune beetle (*Coelus globosus*; S1S2), sandy beach tiger beetle (*Cicindela hirticollis grvida*; S2), wandering skipper (*Panoquina errans*; S2), and mimic tryonia (California brackish water snail; *Tryonia imitator*; S2).

Sensitive marine invertebrates in the Project vicinity may include but are not limited to California spiny lobster (*Panulirus interruptus*), abalone (*Haliotis spp.*), and Pismo clams (*Tivela stultorum*). Their habitat includes surfgrass, eelgrass, marine algae, kelp, cobble reef, rocky reef, macrophyte beach wrack, and the sandy intertidal and subtidal.

Sensitive terrestrial and estuarine plants in the vicinity of the Projects include but are not limited to: Federally and State endangered salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*), State endangered Baja California birdbush (*Ornithostaphylos oppositifolia*), California Native Plant Society (CNPS) Rare Plant Rank 1B.1 Nuttall's acmispon (*Acmispon prostrates*), Orcutt's dudleya (*Dudleya attenuata* ssp. *orcuttii*), CNPS 1B.1 beach goldenaster (*Heterotheca sessiliflora* ssp. *sessiliflora*), CNPS 1B.1 Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*), CNPS 1B.1 Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*), CNPS 1B.1 Brand's star phacelia (*Phacelia stellaris*), CNPS 1B.2 coast woollyheads (*Nemacaulis denudata* var. *denudata*), CNPS 1B.2 San Diego sand aster (*Corethrogyne filaginifolia* var. *incana*), CNPS 1B.2 estuary seablite (*Suaeda esteroa*), CNPS 1B.2 south coast saltscale (*Atriplex pacifica*), CNPS 1B.2 aphanisma (*Aphanisma blitoides*), and CNPS 2B.2 sea dahlia (*Leptosyne maritima*).

Sensitive marine plants and algae in the vicinity of the beach fill Project may include but are not limited to: eelgrass (*Zostera marina*) and (*Zostera pacifica*), surfgrass (*Phyllospadix scouleri* and *Phyllospadix torreyi*), and giant kelp (*Macrocystis pyrifera*).

**Timeframe:** A time frame was not provided for the Project.

## COMMENTS AND RECOMMENDATIONS

CDFW offers the comments and recommendations below to assist the Department of Parks and Recreation and the USFWS in adequately identifying and/or mitigating the Project's significant, or

Brian Collins  
 USFWS, San Diego NWR Complex  
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potentially significant, direct, and indirect impacts on fish and wildlife (biological) resources. Based on the potential for the Project to have a significant impact on biological resources, CDFW agrees that an EIS/DEIR is appropriate for the Project.

### **Listed Species and California Species of Special Concern**

#### **CESA-listed species**

1. A review of the California Natural Diversity Database (CNDDDB) indicates the presence of State-listed species, including Belding's savannah sparrow, leatherback sea turtle, Baja California birdbush, and salt marsh bird's-beak in the Project vicinity. Project related activities may adversely impact potential habitat for this species. CDFW considers adverse impacts to a species protected by CESA to be significant without mitigation under CEQA. Take of any endangered, threatened, candidate species, or State-listed rare plant species that results from the Project is prohibited, except as authorized by state law (Fish and Game Code, §§ 2080, 2085; Cal. Code Regs., tit. 14, §786.9). As identified in the NOP, if the Project, Project construction, and Project-related activities during the life of the Project may result in take of a species designated as endangered or threatened, CDFW recommends that the Project Proponent seek appropriate take authorization under CESA prior to implementing the Project. Appropriate authorization from CDFW may include an Incidental Take Permit (ITP) or a Consistency Determination in certain circumstances, among other options (Fish & G. Code, §§ 2080.1, 2081, subds. (b) and (c)). CDFW encourages early consultation because significant modification to a Project and mitigation measures may be required to obtain a CESA Permit. Revisions to the Fish and Game Code, effective January 1998, may require that CDFW issue a separate CEQA document for the issuance of an ITP unless the Project CEQA document addresses all Project impacts to CESA-listed species and specifies a mitigation, monitoring, and reporting program that will meet the requirements of an ITP. For these reasons, biological mitigation, monitoring, and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA ITP.

#### **California Fully Protected species**

2. Light-footed Ridgway's rails and California least terns are both federally and State endangered, as well as Fully Protected per section 3511 of the Fish and Game Code. Due to the Fully Protected status of this species, CDFW is unable to authorize take of these species, as defined by section 86 of the California Fish and Game Code.

CDFW recommends avoidance of occupied habitat to the extent practicable. For unavoidable impacts to occupied habitat CDFW recommends avoidance measures be included in the EIS/DEIR. These measures should include but are not limited to:

- a. When initiating activities within 500 feet of California least tern suitable habitat, a qualified biologist shall conduct focused species-specific surveys prior to activity initiation. If light-footed Ridgway's rail, California black rail, or least terns are noted on-site or immediately adjacent within 500 of Project impacts, CDFW and USFWS, collectively known as the Wildlife Agencies, will be contacted; no work shall begin until the Wildlife Agencies have been notified and appropriate buffers are established (i.e. a minimum of 500 feet). The buffer shall remain in place until the nest has fledged or is no longer active.



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 USFWS, San Diego NWR Complex  
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- b. When conducting work within suitable habitat the Project biologist or designated biological monitor shall be on-site during construction to ensure that buffers are maintained and that listed or Fully Protected species and/or their nests are avoided.

#### Federally listed species

3. Western snowy plovers are known to use salt flat habitat within the Tijuana Estuary (Zedler *et al* 1992). Loss of suitable nesting habitat, due to the type conversion of salt flat openings has the potential to impact the species. Although salt marsh is a desirable habitat for many species, the Project may lead to a net loss of acres of suitable nesting habitat for western snowy plovers. Loss of occupied or suitable habitat may affect and would likely adversely affect the species and therefore be considered take under the Federal Endangered Species Act (FESA). Focused species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required to determine species presence under FESA. If present, the EIS/DEIR should disclose potential impacts to the species as well as proposed avoidance and mitigation measures. CDFW considers impacts to federally threatened species a significant direct and cumulative adverse effect without the implementation of appropriate avoidance and/or mitigation measures. If impacts are proposed to occupied or suitable habitat or adjacent habitats, CDFW recommends that the EIR/DEIS include consultation with the USFWS at the earliest opportunity as take authorization may be required.
4. Southern California steelhead (*Oncorhynchus mykiss irideus*; distinct population segment 10) are federally endangered and are considered extirpated from the Tijuana River Watershed; however, efforts are being made to recover the species where it has been historically present. The Project may impact future access to upstream habitat for the species. Restoration of the mouth of the Tijuana River should consider fish passage for anadromous fishes and other issues such as sedimentation and turbidity.
5. Federally endangered abalone species that may occur in nearshore rocky habitat includes Black abalone (*Haliotis cracherodii*) and White abalone (*Haliotis sorenseni*). Additionally, CDFW considers them rare, and they are managed by CDFW Abalone Recovery and Management Plan. Black abalones are found in rocky habitat in the low intertidal zone, up to 6 m deep. White abalone are found at 24-to-60-meter depths in low and high relief rock or boulder habitat (<https://wildlife.ca.gov/Conservation/Marine/ARMP>).

#### California Species of Special Concern

6. Burrowing owls are known to occupy areas near potential Project impacts. The CDFW Staff Report on Burrowing Owl Mitigation Appendix D: Breeding and Non-breeding Season Surveys and Reports contains the recommended survey requirements including suitable avoidance buffers (2012). Early coordination with CDFW and USFWS, collectively known as the Wildlife Agencies, is recommended if burrowing owls are detected within the Project area.
7. Sensitive reptiles have been identified within the vicinity of the Project, CDFW recommends that the Project incorporate avoidance and minimization measure that include exclusion methods to prevent these species from entering construction areas.
8. There is potential for western spadefoot within the vicinity of Project areas and the species may be found within road pools along access roads required for the Projects. Western spadefoot typically breed in vernal pools and other seasonal water basins and spend much of the year in



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earth-filled burrows. Vernal pools are considered a rare resource, as it is estimated over 95% of vernal pools in San Diego County have been destroyed (USFWS 1998). CDFW considers the loss of these pool complexes to be regionally and biologically significant. To the extent practicable, vernal pools and depressions, and the entire sub-watershed that supports the hydrology of the pool/depression, should be avoided. The DEIR should identify any existing vernal pool habitat, analyze potential impacts, and propose avoidance and mitigation measures should vernal pools be identified on site. If vernal pools, including road pools are identified within the Project areas, surveys for western spadefoot should be conducted between February and May when potential breeding pools are present (Fisher 2004). If the species is found, an avoidance, minimization, and mitigation plan should be developed.

#### Other Sensitive Terrestrial Wildlife Species

9. Black-tailed jackrabbits have the potential to be present in and around Project areas, and Project personnel should be made aware of Rabbit Hemorrhagic Disease (RHD), which can cause 70 to 100 percent mortality in individuals. CDFW recommends that Best Management Practices, such as disinfecting equipment and work boots with a ten percent bleach solution, be employed to help prevent the spread of the disease.
10. Sensitive terrestrial invertebrates have been identified in the vicinity of the Project. Surveys should be conducted according to the best available methods, disclosed in the DEIR/DEIS, and species avoided to the extent practicable.

#### California Rare Plant Rank 1B.1 and 1B.2 plants

11. CNDDDB also documents the presence of California Rare Plant Rank 1B.1 and 1B.2 plants. The DEIR should include a report of seasonally appropriate surveys in all areas with suitable habitat for sensitive plants, conducted within the last two years. If present, the DEIR should disclose potential impacts to the species as well as proposed avoidance and mitigation measures.

#### Sensitive Marine Species

12. The California marine fisheries management plans including Pelagic, Highly Migratory, and Near-shore management plan have fish species that utilize the coastal nearshore adjacent to the Project area for their habitat. Many important commercial and recreational fish species, use the Project area for breeding, shelter, spawning, foraging, and resting. California fisheries management plans should be addressed in the DEIR/DEIS. Potential impacts to marine fish should be identified and any significant impacts should be avoided and minimized to below a level of significance. A list and description of fish species and the fisheries management plans can be found on the Department's website (<https://wildlife.ca.gov/Conservation/Marine>).
13. Grunion is a sensitive species and vulnerable to beach fill projects within the intertidal, and nearshore. This species is ecologically, recreationally, and culturally important in southern California. They are vulnerable to human disturbances during their reproductive cycle because they spawn out of water on the upper intertidal where they bury their eggs. Additionally, they are not an abundant species, and they have a limited spawning habitat range within southern California and northern Baja California, much of which is disturbed or degraded. Grunion is also an important prey species for fishery management plan species and protected marine wildlife. Published documents and literature can be found at <https://wildlife.ca.gov/Fishing/Ocean/Grunion#28352307-grunion-facts-and-faqs>, and at [www.grunion.org](http://www.grunion.org). The placement of beach sand and other construction activities during the

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grunion spawning season could result in significant localized impacts since grunion have the potential to spawn on the sandy beach within the proposed beach fill footprint during spawning season. The CDFW recommends that impacts during the grunion season be avoided, and that monitoring and minimization strategies include, but not be limited to, the following:

- a. Sediment deposition, beach driving, or bulldozing in the intertidal should be conducted outside of the grunion spawning season from March 1<sup>st</sup> to August 31<sup>st</sup>.
  - b. If avoiding the grunion spawning season is not feasible, then the CDFW recommends the development of a CDFW-approved spawning and egg nest mitigation and monitoring plan.
14. The California spiny lobster, a California marine invertebrate fisheries management plan species, may utilize the coastal nearshore adjacent to the beach fill Project because their habitat, consisting of rocky and cobble reef, kelp, and surfgrass, is present in the nearshore. This species and their habitats are vulnerable to indirect burial and sedimentation impacts. Abalone species populations found in San Diego County are considered rare due to human disturbances and coastal development. California invertebrate management plans should be identified and discussed in the DEIR/DEIS, and if appropriate, surveys should be conducted according to the best available methods. If abalone and lobster and/or their habitat is identified, impacts to the species and/or their habitat should be avoided and/or minimized to below a level of significance. A list and description of invertebrate species management plans can be found on the Department's website (<https://wildlife.ca.gov/Conservation/Marine>).
15. Pismo clams are a state recreationally managed species that tends to develop high concentrations on wide, relatively flat intertidal areas of beaches and at the mouths of bays, rivers, and estuaries. Established Pismo clam beds are historically known to exist in San Diego County and Imperial Beach beaches in the intertidal and subtidal zones, and they are vulnerable to direct and indirect burial impacts from beach fill projects. Pismo clam surveys should be conducted according to the best available methods. If the species and/or their habitat is identified, pre-and post-construction surveys and biological monitoring should be conducted as applicable, and impacts should be avoided and/or minimized to insignificant.

### **Project Description and Alternatives**

16. To facilitate meaningful review of the Project from the standpoint of the protection of plants, fish, and wildlife, CDFW recommends the following information be included in the DEIR:
- a. the document should contain a complete discussion of the purpose and description of the Project, including all staging areas and access routes to the construction and staging areas;
  - b. the DIER should include a range of feasible alternatives to ensure that alternatives to the Project are fully considered and evaluated; the alternatives should avoid or otherwise minimize impacts to sensitive biological resources. And,
  - c. all Project Alternatives should consider the effects of potential future sea level rise on habitat modifications.

### **Biological Baseline Assessment**

17. CDFW has responsibility for wetland and riparian habitats. CDFW strongly discourages development in wetlands or conversion of wetlands to uplands. CDFW opposes any

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development or conversion that would result in a reduction of wetland acreage or wetland habitat values, unless, at a minimum, project mitigation assures there will be “no net loss” of either wetland habitat values or acreage. Development and conversion include but are not limited to conversion to subsurface drains, placement of fill or building of structures within the wetland, and channelization or removal of materials from the streambed. All wetlands and watercourses, whether ephemeral, intermittent, or perennial, should be retained and provided with substantial setbacks that preserve the riparian and aquatic values and maintain their value to on-site and off-site wildlife populations. Mitigation measures to compensate for impacts to aquatic resources must be included in the DEIR.

- a. The Project site includes aquatic features that have a bed, bank, or channel. As a Responsible Agency under CEQA, CDFW has authority over a) activities in streams and/or lakes that will divert or obstruct the natural flow; b) changes in the bed, channel, or bank (including vegetation associated with the stream or lake) of a river or stream; and, c) use of material from a streambed. For any such activities, an entity must provide written notification to CDFW pursuant to Fish and Game Code section 1600 *et seq.* The NOP does not specify which organization will be the lead for conducting the groundwork within the tidal channels. CDFW suggest early coordination to determine if notification to CDFW is appropriate.
- b. CDFW’s issuance of a Lake or Streambed Alteration Agreement (LSAA) for a project that is subject to CEQA will require CEQA compliance actions by CDFW as a Responsible Agency. As a Responsible Agency, CDFW may consider the Environmental Impact Report of the local jurisdiction (Department of Parks and Recreation) for the Project. To minimize additional requirements by CDFW pursuant to section 1600 *et seq.* and/or under CEQA, the DEIR should fully identify the potential impacts to the stream or riparian resources and provide adequate avoidance, mitigation, monitoring, and reporting commitments for issuance of the LSAA.
- c. A preliminary delineation of the streams and associated riparian habitats should be included in the DEIR. The delineation should be conducted pursuant to the USFWS wetland definition adopted by CDFW (Cowardin *et al.* 1979). Be advised that some wetland and riparian habitats subject to CDFW’s authority may extend beyond the jurisdictional limits of the U.S. Army Corps of Engineers’ section 404 permit and Regional Water Quality Control Board section 401 Certification.
- d. In Project areas which may support ephemeral streams, herbaceous vegetation and woody vegetation also serve to protect the integrity of these resources and help maintain natural sedimentation processes; therefore, CDFW recommends effective setbacks be established to maintain appropriately sized vegetated buffer areas adjoining ephemeral drainages. If these buffer areas are proposed for impact, they should be included in the sensitive habitat impact analysis.
- e. Project-related changes in drainage patterns, runoff, and sedimentation should be included and evaluated in the DEIR.
- f. As part of the LSAA Notification process, CDFW requests a hydrological evaluation of the 100-, 50-, 25-, 10-, 5-, and 2-year frequency storm event for existing and proposed conditions. CDFW recommends the DEIR evaluate the results and address avoidance, minimization, and/or mitigation measures that may be necessary to reduce potential significant impacts.

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- g. The Project should also analyze the restoration with respect to potential future sea level rise and consider a range of future sea level conditions.
18. The NOP includes a brief discussion of the flora and fauna within the Project's area of potential effect. CDFW recommends the DEIR provide a complete assessment of the flora and fauna within and adjacent to the Project area, with particular emphasis upon identifying endangered, threatened, sensitive, and locally unique species and sensitive habitats. This should include a complete species compendium of the entire Project site, undertaken at the appropriate time of year. The DEIR should include the following information:
- a. CEQA Guidelines, section 15125(c), specifies that knowledge of the regional setting is critical to an assessment of environmental impacts and that special emphasis should be placed on resources that are rare or unique to the region [CEQA Guidelines, § 15125(c)]. The DEIR should include measures to fully avoid and otherwise protect Sensitive Natural Communities from Project-related impacts. Project implementation may result in impacts to rare or endangered plants or plant communities that have been recorded adjacent to the Project vicinity. CDFW considers these communities as threatened habitats having both regional and local significance. Plant communities, alliances, and associations with a state-wide ranking of S1, S2, S3, and S4 should be considered sensitive and declining at the local and regional level. These ranks can be obtained by visiting <https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities#sensitive%20natural%20communities>;
  - b. a complete, recent, assessment of the biological resources associated with each habitat type on site and within adjacent areas that could also be affected by the Project. CNDDDB should be reviewed to obtain current information on any previously reported sensitive species and habitat. CDFW recommends that CNDDDB Field Survey Forms be completed and submitted to CNDDDB to document survey results. Online forms can be obtained and submitted at <https://wildlife.ca.gov/Data/CNDDDB/Submitting-Data>;
  - c. an inventory of rare, threatened, endangered, and other sensitive species on site and within the area of potential effect. Species to be addressed should include all those which meet the CEQA definition (see CEQA Guidelines, § 15380). This should include sensitive wildlife and plant species. Seasonal variations in use of the Project area should also be addressed. Focused species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with CDFW and USFWS;
  - d. a thorough, recent, floristic-based assessment of special status plants and natural communities, following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (see <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline>); floristic, alliance- and/or association-based mapping and vegetation impact assessments conducted at the Project site and within the neighboring vicinity. *A Manual of California Vegetation*, second edition, should be used to inform this mapping and assessment. Alternately, for assessing vegetation communities located in western San Diego County, the *Vegetation Classification Manual for Western San Diego County* (Sproul et al. 2011) may be used; and,
  - e. adjoining habitat areas should be included in this assessment where site activities could lead to direct or indirect impacts off site. Habitat mapping at the alliance level will help

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establish baseline vegetation conditions.

### Marine Biological Species and Habitat Baseline Assessments

- f. if beach placement of excavated sediment is chosen for beneficial re-use, the sediment placement areas within, and adjacent to, the beach fill footprint, should be included in a site-specific baseline marine resources survey and impacts assessment. This would include the Tijuana River mouth, sandy beach intertidal areas, and nearshore below the mean high tide to identify sensitive or vulnerable beach species, macrophyte wrack habitat, beach spawning fish and their egg nests, and marine habitats and species within the potential areas of impacts. This should be performed to accurately assess direct and indirect beach fill impacts to fish and wildlife. Historical marine biological species and habitats for the Project area may be found in the Marine BIOS database on the CDFW's website (<https://wildlife.ca.gov/Conservation/Marine/GIS/MarineBIOS>). CDFW recommends the marine biological survey and impact assessment reports include a summary table listing each Project component affecting each habitat, the total area of habitat impacted, and proposed mitigation measures for avoiding and minimizing impacts.
- g. Tijuana River Mouth State Marine Conservation Area (Tijuana River Mouth SMCA) west boundary line (mean high tide line) is located within and/or adjacent to the entire length of the proposed beach fill footprint where direct or indirect impacts are likely to occur depending on how and where the beach fill Project is constructed. The marine habitats and species should be identified with comprehensive baseline surveys and impact assessments. Additionally, CDFW recommends Tijuana River Mouth SMCA sediments, and water quality within the beach fill footprint, be sampled pre-construction to identify baseline conditions. Pre-and post-construction eelgrass or surfgrass surveys should be conducted if eelgrass or surfgrass is found in the potential area of impact including Tijuana River mouth, and the estuary where suitable habitat may exist. Potential direct and indirect construction and sediment placement impacts below or adjacent to the mean high tide line boundary should be identified with maps and diagrams. The CDFW defines the Tijuana River Mouth SMCA as having an area of 3.02 square miles, a shoreline span of 2.2 miles, a depth range of 0 to 55 feet, and has identified the following key habitats:
  - i. Sandy Beaches: 2.09 square miles
  - ii. Rock: 0.59 square mile
  - iii. Unidentified/other: 0.34 square mile
 (<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=98231&inline>)

### Biological Direct, Indirect, and Cumulative Impacts and Proposed Mitigation Measures

19. To facilitate meaningful review of the Project's potential impacts on biological resources, CDFW recommends the DEIR/DEIS provide a thorough discussion on direct, indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts.
  - a. Marine Impacts: Regarding marine biological impacts, the beach fill Project activities may have direct and indirect impacts to marine species and habitats such as short and long-term burial, turbidity, sedimentation, scouring, and reduced water quality (e.g., harmful

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algal blooms). Specifically, beach fill activities may have significant impacts to sensitive and/or special-status resources including rocky reefs, cobble reefs, and associated reef community, benthic and epibenthic invertebrates, fish, marine algae, and seagrasses. Additionally, the Tijuana River mouth could be indirectly impacted if beach fill sediment volumes placed on the beach are significant enough to cause shoaling and/or complete closing of the river mouth which may cause an emergency dredge condition.

Contaminated or inappropriately high silt and organic content sediments may be placed on the beach that are not clean, beach compatible sediment causing beach sand compaction impacts to the intertidal benthic invertebrate prey base and the higher trophic level fish and shorebirds that forage in the intertidal. Long-shore and cross-shore sediment transport will eventually begin once sediment volumes are placed onto the beach. Large volumes of sediment placed on the beach can have significant marine habitat and river mouth impacts such as burial, river mouth shoaling and closures, scouring, turbidity, reduced water quality and sedimentation depending on the sediment volumes, beach placement locations, and methods.

- b. Indirect Impacts: a discussion of potential adverse impacts from lighting, noise, exotic species, and human activity and proposed mitigation measures to alleviate such impacts.
  - i. Adjacent Resources: the DEIR should include a discussion regarding indirect Project impacts on biological resources, including resources in nearby public lands, open space, adjacent natural habitats, riparian ecosystems, and any designated and/or proposed or existing reserve lands (e.g., preserve lands associated with NCCPs). Impacts on, and maintenance of, wildlife corridor/movement areas, including access to undisturbed habitats in adjacent areas, should be fully evaluated in the DEIR.
- c. Mitigation Measures: the DEIR should include mitigation measures for adverse Project-related impacts to sensitive plants, animals, and habitats. Mitigation measures should emphasize avoidance and reduction of Project impacts. For unavoidable impacts, on-site habitat restoration or enhancement should be discussed in detail and should include measures to provide compensation for temporal losses.
  - i. Sensitive Bird Species: to avoid impacts to nesting birds, the DEIR should require that, when biologically warranted, construction (especially clearing and rough grading) would occur outside of the peak avian breeding season which generally runs from February 1 through September 1 (as early as January 1 for some raptors). If Project construction is necessary during the bird breeding season, a qualified biologist with experience in conducting bird breeding surveys should conduct weekly bird surveys for nesting birds, within three days prior to the work in the area, and ensure no nesting birds in the Project area would be impacted by the Project. If an active nest is identified, a buffer shall be established between the construction activities and the nest so that nesting activities are not interrupted. CDFW generally recommends the buffer be a minimum width of 100 feet for general passerine birds, 300 feet from state or federal listed bird species, and 500 feet for State fully protected species and raptor species. The buffer should be demarcated by temporary fencing, and remain in effect as long as construction is occurring or until the nest is no longer active. No Project construction shall occur within the fenced nest zone until the young have fledged, are no longer being fed by the parents, have left the nest, and will no longer be impacted by the Project. Reductions in the nest buffer distance may be appropriate depending on the avian species involved, except for Fully Protected Species, ambient levels of human activity, screening vegetation, or possibly other factors.

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- ii. Translocation: CDFW generally does not support the use of relocation, salvage, and/or transplantation as mitigation for impacts to rare, threatened, or endangered species. Studies have shown that these efforts are experimental in nature and largely unsuccessful.
- iii. Biological Monitor: a biological monitor shall be present on site during all initial grubbing and clearing of vegetation to ensure that perimeter construction fencing is being maintained and to minimize the likelihood that nests containing eggs or chicks are abandoned or fail due to construction activity. A biological monitor shall also perform of the construction site during all initial and major grading to ensure that impacts to sensitive plants and wildlife are minimized. These inspections should take place once or twice a week, as defined by the Wildlife Agencies, depending on the sensitivity of the resources. The biological monitor shall notify the Wildlife Agencies immediately if clearing is done outside of the Project footprint

d. Marine Protected Area Mitigation Measures

The following Marine Protected Area (MPA) mitigation measures should be incorporated into a MPA Impact Avoidance, Minimization and Monitoring plan for the proposed sediment placement work within or adjacent to the Tijuana River Mouth SMCA and the Tijuana River inlet.

- i. Avoidance and Minimization Measures: Construction work and staging within or adjacent to the MPA should be identified and described either above the mean high tide (outside the MPA boundary) or below the mean high tide (inside the MPA boundary). Additionally, equipment, vehicle routes, dump trucks, bulldozers, and workers should travel, set up and operate outside the MPA boundaries to the extent feasible to avoid and minimize significant Project impacts to marine habitat, species, and water quality. All driving, dumping, bulldozing routes and locations should be geo-referenced on maps and diagrams in relation to the MPA boundaries showing potential areas of impact and avoidance and minimizing mitigation measures. The Project proponent should consult with CDFW regarding the MPA boundaries, allowable uses, and MPA mitigation measure plans should be submitted for CDFW review and approval. MPA information can be found on CDFW's website, <https://wildlife.ca.gov/Conservation/Marine/MPAs/Network/Southern-California>).
- ii. Avoidance Measures: To the extent feasible, CDFW recommends using other sediment disposal options for clean sediments such as the dune restoration option of the Project, and choosing construction methods within the MPA designed to fully avoid significant fish and wildlife habitat and community impacts. To protect Tijuana River Mouth SMCA from daily construction impacts, biological monitoring should take place on site during construction to avoid or minimize significant sensitive habitat damage or water degradation below the mean high tide boundary line. If necessary, long-term habitat monitoring should be conducted to identify indirect and long-term impacts. A separate Marine Protected Area Protection, Mitigation and Monitoring plan should be developed in collaboration with the CDFW to address MPA marine habitat, species, water quality protection, mitigation, monitoring and reporting. The CDFW should review and approve all draft and final MPA surveys, and protection and mitigation plans.
- iii. If beach fill is chosen for sediment disposal, a sediment assessment sampling plan



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should be developed, and only clean, beach compatible sand placed, which is similar to receiver beach sediment size, color, and percent silt content.

- iv. Long-shore and cross-shore sediment transport modeling should be done to identify appropriate sediment placement volumes and locations to avoid or minimize significant marine habitat and river mouth impacts.
- e. Cumulative Effects: a cumulative effects analysis should be developed as described under CEQA Guidelines, section 15130. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to the DEIR impacts on similar wildlife habitats.
  - i. The Project should consider coordination with the Environmental Protection Agency (EPA) on United States Mexico Canada Agreement (USMCA) Mitigation of Contaminated Transboundary Flows Project number Six to prevent potential overlap and conflict.
  - ii. Cumulative marine habitat and species beach fill Project impacts should be considered.

## ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a data base which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to the CNDDDB. The CNDDDB field survey form can be found at the following link: [http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/CNDDDB\\_FieldSurveyForm.pdf](http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/CNDDDB_FieldSurveyForm.pdf). The completed form can be mailed electronically to CNDDDB at the following email address: [CNDDDB@wildlife.ca.gov](mailto:CNDDDB@wildlife.ca.gov). The types of information reported to CNDDDB can be found at the following link: [http://www.dfg.ca.gov/biogeodata/cnddb/plants\\_and\\_animals.asp](http://www.dfg.ca.gov/biogeodata/cnddb/plants_and_animals.asp).

## FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying Project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.)

## CONCLUSION

CDFW appreciates the opportunity to comment on the NOP to assist the Department of Parks and Recreation and USFWS in identifying and mitigating Project impacts on biological resources.

Questions regarding this letter or further coordination should be directed to Jennifer Turner, at [Jennifer.Turner@wildlife.ca.gov](mailto:Jennifer.Turner@wildlife.ca.gov) or Loni Adams for marine region comments at [Loni.Adams@wildlife.ca.gov](mailto:Loni.Adams@wildlife.ca.gov).



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Sincerely,

DocuSigned by:



D700B4520375406...

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## References

California Department of Fish and Wildlife. 2019. Available from:  
<https://wildlife.ca.gov/Conservation/Marine/MPAs/Network/Southern-California>.

California Department of Fish and Wildlife. 2021. Available from:  
<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=98231&inline>.

California Department of Fish and Wildlife. 2021. Available from:  
<https://wildlife.ca.gov/Conservation/Marine/ARMP>.

California Department of Fish and Wildlife. 2019. California Natural Diversity Database.  
Available from: <https://apps.wildlife.ca.gov/marine/>.

California Department of Fish and Wildlife. 2020. California Natural Diversity Database.

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Available from: <https://wildlife.ca.gov/Data/CNDDDB>.

California Department of Fish and Wildlife. 2020. Lake and Streambed Alteration Program. Available from: <https://wildlife.ca.gov/Conservation/LSA>.

California Department of Fish and Wildlife. 2021. Available from: <https://wildlife.ca.gov/Fishing/Ocean/Grunion#28352307-grunion-facts-and-faqs>.

California Department of Fish and Wildlife. 2021. Available from: <https://wildlife.ca.gov/Conservation/Marine>.

Cowardin, M.L., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. United States Fish and Wildlife Service

Fish & Game Code §1600, §2080, §3503, §3511

Samuel Safran, Sean Baumgarten, Erin Beller, Jeff Crooks, Robin Grossinger, Julio Lorda, Travis Longcore, Danielle Bram, Shawna Dark, Eric Stein, Tyler McIntosh. 2017. Tijuana River Valley Historical Ecology Investigation. San Francisco Estuary Institute-Aquatic Science Center Publication #760. California State Coastal Conservancy.

Sawyer, J. O., Keeler-Wolf, T., and Evens J.M. 2008. A manual of California Vegetation, 2nd ed. ISBN 978-0-943460-49-9.

Sproul, F., T. Keeler-Wolf, P. Gordon-Reedy, J. Dunn, A. Klein and K. Harper. 2011. Vegetation Classification Manual for Western San Diego County. First Edition. Prepared by AECOM, California Department of Fish and Game Vegetation Classification and Mapping Program and Conservation Biology Institute for San Diego Association of Governments.

United States Fish and Wildlife Service. 1998. Vernal Pools of Southern California Recovery Plan. United States. Fish and Wildlife Service, Portland, Oregon. 113 pp.

Zedler, J., Nordby, C., Kus, B. 1992. The Ecology of the Tijuana Estuary, California A National Estuarine Research Reserve. Pacific Estuarine Research Laboratory Biology Department. San Diego State University San Diego, CA.



## NATIVE AMERICAN HERITAGE COMMISSION

June 8, 2021

Governor's Office of Planning &amp; Research

June 11 2021

STATE CLEARINGHOUSE

Lorena Warner-Lara  
California State Parks  
301 Caspian Way  
Imperial Beach, CA 91932

**Re: 2021050599, Tijuana Estuary Tidal Restoration Program II Phase I Project, San Diego County**

Dear Ms. Warner-Lara:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, § 15064.5 (b) (CEQA Guidelines §15064.5 (b))). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines § 15064 (a)(1))). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

**Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.**

CHAIRPERSON  
**Laura Miranda**  
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VICE CHAIRPERSON  
**Reginald Pagaling**  
Chumash

SECRETARY  
**Merri Lopez-Keifer**  
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AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

**1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project:**

Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

- a. A brief description of the project.
- b. The lead agency contact information.
- c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
- d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

**2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report:** A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1 (b)).

- a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

**3. Mandatory Topics of Consultation If Requested by a Tribe:** The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

- a. Alternatives to the project.
- b. Recommended mitigation measures.
- c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

**4. Discretionary Topics of Consultation:** The following topics are discretionary topics of consultation:

- a. Type of environmental review necessary.
- b. Significance of the tribal cultural resources.
- c. Significance of the project's impacts on tribal cultural resources.
- d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

**5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process:** With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

**6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document:** If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

- a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
- b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

- 7. Conclusion of Consultation:** Consultation with a tribe shall be considered concluded when either of the following occurs:
- The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
  - A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).
- 8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document:** Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).
- 9. Required Consideration of Feasible Mitigation:** If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).
- 10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:**
- Avoidance and preservation of the resources in place, including, but not limited to:
    - Planning and construction to avoid the resources and protect the cultural and natural context.
    - Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
  - Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
    - Protecting the cultural character and integrity of the resource.
    - Protecting the traditional use of the resource.
    - Protecting the confidentiality of the resource.
  - Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
  - Protecting the resource. (Pub. Resource Code §21084.3 (b)).
  - Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).
  - Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).
- 11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource:** An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
- The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.
  - The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
  - The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: [http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation\\_CalEPAPDF.pdf](http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf)

## SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: [https://www.opr.ca.gov/docs/09\\_14\\_05\\_Updated\\_Guidelines\\_922.pdf](https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf).

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
  - a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
  - b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: <http://nahc.ca.gov/resources/forms/>.

## NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center ([http://ohp.parks.ca.gov/?page\\_id=1068](http://ohp.parks.ca.gov/?page_id=1068)) for an archaeological records search. The records search will determine:
  - a. If part or all of the APE has been previously surveyed for cultural resources.
  - b. If any known cultural resources have already been recorded on or adjacent to the APE.
  - c. If the probability is low, moderate, or high that cultural resources are located in the APE.
  - d. If a survey is required to determine whether previously unrecorded cultural resources are present.
2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
  - a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
  - b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
  - a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
  - b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.
4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
  - a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, § 15064.5(f) (CEQA Guidelines § 15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
  - b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
  - c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code § 7050.5, Public Resources Code § 5097.98, and Cal. Code Regs., tit. 14, § 15064.5, subdivisions (d) and (e) (CEQA Guidelines § 15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address:  
[Andrew.Green@nahc.ca.gov](mailto:Andrew.Green@nahc.ca.gov).

Sincerely,



Andrew Green  
Cultural Resources Analyst

cc: State Clearinghouse





# County of San Diego

**KATHLEEN A. FLANNERY**  
ACTING DIRECTOR

PLANNING & DEVELOPMENT SERVICES  
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**VINCE NICOLETTI**  
ACTING ASSISTANT DIRECTOR

July 12, 2021

Brian Collins  
U.S. Fish and Wildlife Service  
1080 Gunpowder Point Drive  
Chula Vista, CA 91910

Sent via email to: [fw8plancomments@fws.gov](mailto:fw8plancomments@fws.gov)

## **REQUEST FOR COMMENTS ON THE TIJUANA ESTUARY TIDAL RESTORATION PROGRAM II PHASE I FOR THE U.S. FISH AND WILDLIFE SERVICE**

Dear Mr. Collins,

The County of San Diego (County) reviewed the U.S. Fish and Wildlife Service's (USFWS) Notice of Intent/Notice of Preparation (NOI/NOP) for the Tijuana Estuary Tidal Restoration Program II Phase I, a.k.a. TETRP II Phase I (Project), received on May 27, 2021.

The County appreciates the opportunity to review the Project and offers the following comments for your consideration. Please note that none of these comments should be construed as County support for this Project.

### **GENERAL**

1. The County's Land Use and Environment Group has developed Guidelines for Determining Significance that are used to determine the significance of environmental impacts and mitigation options for addressing potentially significant impacts in the unincorporated portions of the county. Project impacts that could have potentially significant adverse effects to the unincorporated county or County facilities should be evaluated using the County's Guidelines for Determining Significance. These guidelines are available online at: <http://www.sandiegocounty.gov/pds/procguid.html>.

### **PARKS AND RECREATION**

1. The County Department of Parks and Recreation (DPR) owns and manages the Tijuana River Valley Regional Park (TRVRP), which is approximately 1,800 acres and is located within the Tijuana River Valley. Please ensure the environmental analysis evaluates potential impacts on the TRVRP and its associated recreational amenities.
2. In March 2020, the County of San Diego completed the Tijuana River Valley Needs and Opportunities (NOA) Report, which can be found at:



<https://www.sdparks.org/content/sdparks/en/AboutUs/Plans/public-review-documents.html>. The NOA Report provides a review and assessment of current and potential management strategies that could be implemented in the United States to address the transboundary flows of sewage, trash, and sediment into the Tijuana River Valley. The proposed Project was identified as Project 27 in the County's NOA Report. Because the proposed Project could impact the hydrology of the area and surrounding County-owned areas, please send any technical reports, especially hydrological analyses, prepared for the Project to Crystal Benham at [crystal.benham@sdcounty.ca.gov](mailto:crystal.benham@sdcounty.ca.gov).

3. County DPR requests close coordination with County DPR to ensure the Project does not adversely affect any existing or planned community trails in the vicinity. Our Trail Coordinator is Lizzy Bendrick and can be reached via email at [lizzy.bendrick@sdcounty.ca.gov](mailto:lizzy.bendrick@sdcounty.ca.gov). The proposed site is adjacent to community trails and regional trails such as the California Coastal Trail. Please see COSD Community Trails Master Plan for details of the exact locations of existing or planned trails (<https://www.sandiegocounty.gov/content/sdc/pds/community-trails-master-plan.html>).
4. The TRVRP also contains preserve lands that are part of the County's Multiple Species Conservation Program (MSCP). A Resource Management Plan for this preserve is available on our website at the following link:  
<https://www.sandiegocounty.gov/content/sdc/parks/openspace/RMP.html#TRVRP>
5. Please share information collected from surveys conducted in the Tijuana River Valley with the County. You may send to Crystal Benham at [crystal.benham@sdcounty.ca.gov](mailto:crystal.benham@sdcounty.ca.gov). We appreciate the ability to collaborate on data collection and will find this data useful in our efforts to move other projects forward in the Tijuana River Valley.

## **BEACH & BAY WATER QUALITY PROGRAM**

1. The San Diego County Department of Environmental Health and Quality (DEHQ), Beach & Bay Water Quality Program, requests a Project contact and notification prior to dredging proposed as part of the Project in order to coordinate any beach management activities and decisions, including public swimming advisories and sampling access. Please direct notifications to Ms. Farnaz Farhang. She can be reached at (858) 518-7385 or at [Farnaz.Farhang@sdcounty.ca.gov](mailto:Farnaz.Farhang@sdcounty.ca.gov).

## **VECTOR CONTROL**

The County of San Diego Vector Control Program (VCP) is responsible for the protection of public health through the surveillance and control of mosquitoes that are vectors for human disease including West Nile virus (WNV). The VCP has the following comments regarding the proposed Project.

1. The VCP respectfully requests that the Project design features address potential impacts from possible mosquito breeding sources created by the Project and that the Project is constructed in a manner to minimize those impacts. Specifically, ensure construction-related depressions created by grading activities and vehicle tires do not result in depressions that will hold standing water. In addition, ensure that created and modified wetland areas do not exacerbate potential mosquito breeding sources. Any area that is capable of accumulating and holding at least ½ inch of water for more than 96 hours can support mosquito breeding and development.

2. Please note, the VCP has the authority pursuant to State law and County Code to order the abatement of any mosquito breeding that does occur either during construction or after the Project is completed that is determined to be a vector breeding public nuisance. The VCP will exert that authority as necessary to protect public health if the Project is not designed and constructed to prevent such breeding.
3. For your information, the County of San Diego Guidelines for Determining Significance for Vectors can be accessed at:  
[http://www.sandiegocounty.gov/content/dam/sdc/pds/docs/vector\\_guidelines.pdf](http://www.sandiegocounty.gov/content/dam/sdc/pds/docs/vector_guidelines.pdf) and the California Department of Public Health Best Management Practices for Mosquito Control in California is available at:  
<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/MosquitoesandMosquitoBorneDiseases.aspx#>

If you have any questions regarding these comments, please contact Daniel Valdez at 858-688-3722 or by e-mail at [Daniel.Valdez@sdcounty.ca.gov](mailto:Daniel.Valdez@sdcounty.ca.gov).

## FLOOD CONTROL

1. The NOI/NOP states that based on the initial evaluation of the proposed restoration activities one of the expected impacts would be the changes to the area's existing fluvial hydrology. The San Diego County Flood Control (FC) department is in general agreement with the NOI/NOP's initial evaluation impact assessment to fluvial hydrology and water quality resources.
2. Figure 2 included in the NOI/NOP shows that the majority of the Project footprint is located within a Floodplain and Floodway mapped by the Federal Emergency Management Agency (FEMA). For any projects occurring within a FEMA-mapped Floodplain/Floodway, a Conditional Letter of Map Revision/Letter of Map Revision (CLOMR/LOMR) application would have to be prepared and submitted to FEMA - the CLOMR application prior to the commencement of any grading activities, and the LOMR prior to the completion of the proposed restoration activities.

The County appreciates the opportunity to comment on this Project. We look forward to receiving future documents related to this Project and providing additional assistance, at your request. If you have any questions regarding these comments, please contact Timothy Vertino, Land Use / Environmental Planner, at (858) 495-5468, or via e-mail at [timothy.vertino@sdcounty.ca.gov](mailto:timothy.vertino@sdcounty.ca.gov).

Sincerely,



Scott Christman  
Group Program Manager  
Planning & Development Services

cc: Rosa Olascoaga, Policy Advisor, Board of Supervisors, District 1  
Lara Barrett, CAO Staff Officer, LUEG  
Emmet Aquino, Park Project Manager, DPR  
Mary Bennett, Administrative Analyst, DEH  
Sue Waters, Land Use/Environmental Planner, DPW

July 12, 2021

Brian Collins  
USFWS, San Diego NWR Complex  
1080 Gunpowder Point Drive  
Chula Vista, CA 91910

Subject: **CITY OF SAN DIEGO COMMENTS ON THE NOTICE OF PREPARATION AND THE NOTICE OF INTENT FOR THE TIJUANA ESTUARY TIDAL RESTORATION PROGRAM II PHASE I PROJECT**

Dear Mr. Collins:

The City of San Diego (City) Planning Department has received the joint Notice of Preparation/Notice of Intent (NOP/NOI) prepared by the California Department of Parks and Recreation (State Parks) and the U.S. Fish and Wildlife Service (USFWS) and distributed it to applicable City departments for review. The City, as a Responsible Agency under CEQA, has reviewed the NOP/NOI and appreciates this opportunity to provide comments to State Parks and the USFWS. Continued coordination between the City, State Parks, USFWS, and other local, regional, state, and federal agencies will be essential, especially if future ministerial or discretionary actions on behalf of the City are required. In response to this request for public comments, the City has the following comments on the NOP/NOI for your consideration.

● ● ●

Planning Department – Myra Herrmann, Senior Planner, [MHerrmann@sandiego.gov](mailto:MHerrmann@sandiego.gov), (619) 446-5372

1. **Project Description**

It is unclear from the information provided in the NOP/NOI and Scoping Meeting, if the project will require any discretionary or ministerial actions by the City in their role as a Responsible Agency under CEQA for issuance of permits and/or approvals in accordance with the City's Municipal Code and Land Development Code. If so, the City will rely on the joint Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for review of the project components under our permitting authority, specifically as they relate to project impacts to City-owned land, public rights-of-way, and open space; and if adequately covered, will adopt any applicable mitigation measures from the joint EIR/EIS for any project-related resource impacts.

Furthermore, the joint EIR/EIS Project Description should include a discussion of any possible discretionary actions or permits, such as, but not limited to right of entry permits, access easements or temporary staging within areas under the land use authority of the City and such actions could then be covered by the joint EIR/EIS as described above.

Please note that as part of the City's permitting authority, if the EIR/EIS does not provide adequate mitigation for a particular resource under our jurisdiction, we can condition the project permit or adopt additional mitigation measures which would be implemented as part of any construction permit or notice to proceed issued to the Project proponent.

2. **Tijuana River Valley Plan and Local Coastal Program**

According to the Tijuana River Valley Plan (TJRV) and Local Coastal Program, the Tijuana River National Estuarine Research Reserve (TETRP) encompasses approximately 2,531 acres of tidally flushed wetlands, riparian and upland habitats extending immediately north of the U.S. and Mexico border. The Research Reserve, while located within the jurisdictional boundaries of the cities of Imperial Beach and San Diego, the lands are owned and managed cooperatively by State Parks, USFWS, the City, the County of San Diego and the U.S. Navy.

The TETRP is also within the City's Multiple Species Conservation Program (MSCP) Multi-Habitat Planning Area (MHPA). Comments regarding compliance with the City's MSCP are provided under the Planning-MSCP heading.

The joint EIR/EIS should include a discussion of how the project complies with the overall goals and objectives of the TJRV Plan and Local Coastal Program. A link to the Plan is provided here for reference:

<https://www.sandiego.gov/sites/default/files/trvprint.pdf>

3. **Cultural (Archaeology) and Tribal Cultural Resources**

The City acknowledges the rich and culturally sensitive areas within the TJRV, especially those sites which are likely associated with the Kumeyaay village of Milejo, that could be directly impacted and/or adversely affected by the project. As stated above, it is unclear from the NOP/NOI and Scoping Meeting if any project components fall within the land use and permitting authority of the City, including haul roads, secondary staging areas, access easements or City facilities that could be temporarily or permanently affected by the project. It is with this in mind that the City as a Responsible Agency under CEQA would take an interest in the avoidance and protection of cultural resources, and/or minimization of impacts through feasible mitigation measures.

Because the locations of cultural resources are protected by State law and therefore confidential maps of each location would not be included in reports prepared for public review of the EIR/EIS, qualified City staff are uncertain which sites within the City's jurisdictional boundaries in the TJRV, including those within City-owned/managed open space will require further analysis and subject to data recovery and monitoring. Please also note that within the City, archaeological sites that have been determined to be significant under CEQA are automatically eligible for local designation by the City's Historical Resources Board and could require a Site Development Permit if mitigation cannot be accomplished in accordance with the Historical Resources Regulations, Historical Resources Guidelines or the Secretary of the Interior Standards for Archaeological Resources. As such, qualified archaeological staff respectfully request a copy of any confidential maps (under separate cover from public facing documents) so we can determine which sites within our jurisdiction and permitting authority, if applicable will require further oversight as noted below. Of specific concern is the City's ability to coordinate with the State Parks for the treatment of any sites that are within our jurisdiction in accordance with the City's Historical Resources Regulations.

Although State Parks is the Lead Agency under for CEQA for this project, if human remains are encountered within City-owned public rights-of-way or open space during any phase of the archaeological evaluation and mitigation program (data recovery or monitoring), consultation in accordance with the California Health and Safety Code and the Public Resources Code must include qualified archaeological staff from the City in order to assure that resources under our jurisdiction are being treated in accordance with City requirements. The treatment of human remains, associated artifacts and soils discovered on projects within the City's jurisdiction may result in a different recovery, repatriation, or curation process than that described for other areas of the project under the State Park's authority. This is true not only for Native American human remains, but any archaeological site within the City's jurisdiction. For this reason, it should be noted that the two agencies will need to coordinate on any archaeological issues when the project is within our public rights-of-way and open space. This may require modification to the archaeological mitigation program or acknowledgment that additional measures may be adopted by the City for resources within our permitting authority.

If any discretionary actions are required by the City for this project, the City would likely adopt the State Park's Mitigation Program for archaeology, tribal cultural resources, and paleontology in order to facilitate project implementation. Early coordination with qualified City staff is recommended to ensure resources under our purview are being adequately evaluated, preserved, protected and/or mitigated in accordance with all applicable local, state, and federal laws and regulations.

**Planning Department-Multiple Species Conservation Program (MSCP) – Elena Pascual, Associate Planner, [EPascual@sandiego.gov](mailto:EPascual@sandiego.gov), (619) 533-5928**

1. The proposed project site is located within the City's Multi-Habitat Planning Area (MHPA) boundary. The City's MHPA was developed by the City in cooperation with the Wildlife Agencies, Property Owners, Developers, and Environmental Groups. The Preserve Design Criteria contained in the MSCP Plan and the City Council adopted criteria for the creation of the MHPA were used as guides in the development of the City's MHPA. The MHPA delineates core biological resource areas and corridors targeted for conservation.
2. The EIR/EIS should fully analyze all direct and indirect impacts to biological resources and MHPA boundaries. The MHPA Guidelines, as described in the MSCP Subarea Plan, that apply to the Tijuana River Valley (Sections 1.2.1 and 1.5.5) conserved as MHPA/open space should also be discussed in the EIR/EIS.
3. The EIR/EIS should assess the potential for narrow endemic species on the project site. Focused spring surveys should be required in any areas of the site showing a moderate to high potential for occurrence of these species/features. Avoidance of these species/features within the MHPA should be required.
4. The EIR/EIS should fully analyze the project against Section 1.4.1, Compatible Land Uses of the MSCP Subarea Plan. The following land uses are considered conditionally compatible with the biological objectives of the MSCP and thus will be allowed within the City's MHPA:
  - Passive recreation
  - Utility lines and roads in compliance with policies in 1.4.2 below
  - Limited water facilities and other essential public facilities

- Limited low density residential uses
  - Brush Management (Zone 2)
  - Limited agriculture
5. The EIR/EIS should include MSCP consistency analysis against Section 1.4.2 of the MSCP Subarea Plan, General Planning Policies and Design Guidelines; Section 1.5.2, General Management Directives; and Section 1.4.3, Land Use Adjacency Guidelines. In particular, lighting, drainage, landscaping, grading, access, and noise must not adversely affect the MHPA. Please address these issues in the EIR/EIS:

#### Lighting

Lighting should be directed away from the MHPA, and shielded if necessary. Please see Municipal Code §142.0740 for further information if needed.

#### Drainage

Drainage should be directed away from the MHPA, or if not possible, must not drain directly into the MHPA. Instead, runoff should flow into sedimentation basins, grassy swales or mechanical trapping devices prior to draining into the MHPA.

#### Landscaping

No invasive plant species shall be planted in or adjacent to the MHPA.

#### Grading

All manufactured slopes must be included within the development footprint and outside the MHPA.

#### Access

Access to the MHPA, if any, should be directed to minimize impacts and reduce impacts associated with domestic pet predation.

#### Noise

Due to the site's location adjacent and within the MHPA, construction noise will need to be avoided, if possible, during the breeding season of the California gnatcatcher (3/1-8/15), least Bell's vireo (3/15-9/15), southwestern willow flycatcher (5/1-8/30). If construction is proposed during the breeding season for the species, USFWS protocol surveys will be required in order to determine species presence/absence. If the species *is/are* not identified within the MHPA, no additional measures will be required. If present, measures to minimize noise impacts will be required and should include temporary noise walls/berms. If a survey is not conducted and construction is proposed during the species' breeding season, presence would be assumed and a temporary wall/berm would be required. Noise levels from construction activities during the bird breeding season should not exceed 60 dBA hourly LEQ at the edge of the occupied MHPA, or the ambient noise level if noise levels already exceed 60 dBA hourly LEQ.

**Stormwater Department - Mark Stephens, Associate Planner – [MGStephens@sandiego.gov](mailto:MGStephens@sandiego.gov), (858) 541-4361 and Ernesto Rios, Associate Planner – [RiosE@sandiego.gov](mailto:RiosE@sandiego.gov), (619) 527-3495**

1. The coordinated approach in jointly addressing National Environmental Policy Act (NEPA) and CEQA requirements is appreciated, as are efforts to involve a wide variety of



other stakeholders. Relevant source documents should include the Tijuana River Watershed Management Area Water Quality Improvement Plan (<http://www.projectcleanwater.org/download/tijuana-river-tjr-water-quality-improvement-plan-wqip/>).

2. Alternatives to be assessed include Alternative 1 (Maximum Tidal Prism), Alternative 2 (Reduced Impact Alternative), and a No Action/No Project Alternative. The City recommends that the impact analysis be structured so that if some hybrid of the two action alternatives is determined to be preferred, it can be pursued in a manner minimizing the need for additional analysis and processing.
3. There may be possible concern down the line with regards to the Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) announcing the Intent to revise definition for waters of the US as well as the general measures regarding wetlands. It is possible that it might create stricter measures for upstream/surrounding TJ projects.

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Thank you for the opportunity to provide comments on the NOP/NOI. Please feel free to contact Rebecca Malone, Senior Planner, directly via email at [RMalone@sanidiego.gov](mailto:RMalone@sanidiego.gov) or by phone at (619) 446-5371 if there are any questions regarding the contents of this letter or if State Parks and USWFS would like to meet with City staff to discuss these comments.

Sincerely,



Seth Litchney, Program Manager  
Planning Department

RM/ep

cc: Reviewing Departments (via email)  
Review and Comment online file



Brian Collins  
USFWS  
1080 Gunpowder Point Drive  
Chula Vista, CA 91910

July 9, 2021

RE: Tijuana Estuary Tidal Restoration Program II Phase I (TETRP II Phase I)

Dear Mr. Collins:

Thank you for the opportunity to comment on the TETRP II Phase I Project (Project), and for providing the Public Scoping Meeting on June 16, 2021, which we were able to attend. The San Diego Audubon Society (SDAS) is a 3,000+ member non-profit organization with a mission to foster the protection and appreciation of birds, other wildlife, and their habitats, through education and study, and to advocate for a cleaner, healthier environment. We have been involved in conserving, restoring, managing, and advocating for wildlife and their habitat in the San Diego region since 1948. Our work has included invasive removal and revegetation events, training community scientists, advocating for developments and park management, educating students about the importance of natural habitats, making comments on environmental documents, advocating for environmentally superior improvements for many public and private projects, and many other roles. Over the years we have engaged with thousands of volunteers in carrying out these goals. We have done many of these activities for the protection of wildlife and habitat in the Tijuana River Valley and Estuary. The following are concerns we hope will be considered as the project moves forward.

We strongly support the design and implementation of this project. Many of our nation's wetlands are likely to be diminished in size and quality due to Climate Change and Sea Level Rise. It is very rewarding to see this project being designed with the full knowledge of these factors and what it will take to be resilient to them. This project is also being designed with the realization of the carbon sequestration value of coastal wetlands. Previous wetland restoration projects in the Tijuana Estuary have provided information that has been used throughout our nation and on other continents. We urge and hope that this restoration will provide information that will be used widely about how to restore wetlands that will be resilient to the changes we anticipate and will also provide significant sustained carbon sequestration to help reduce those changes.

An Environmental Impact Statement (EIS) or Environmental Impact Report (EIR) often performs a Biological Survey of the project site to report on current state of conditions. Then impacts are determined for any species protected by the Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA) and other State or County protection ordinances. Due to the ecologically sensitive and isolated habitat of the project site, an expanded survey to protect **all species present** should be included. With this information, a current biological survey can be compared to conditions in the 1991 EIR/EIS and report on the changes in habitat value for all species in the project area. This will provide clear empirical data on changing conditions and be used in the current EIR/EIS to provide a strategy to provide for increasing habitat values for as many native species as possible, **not just threatened and endangered**





**species.** This data should be provided in the EIR/EIS so future studies/surveys can identify wildlife habitat value for a large variety of species.

A question was asked at the scoping meeting about the project working in conjunction with the USMCA Transboundary Flow Project that will have concurrent effects on the Project's goals. The answer given was the project was working with the EPA. It is often believed that agencies are working together and the right hand knows what the left hand is doing. To be informed at a later date that this was not the case causes unneeded harm and waste of valuable resources. This is relevant in the study of sedimentation related issues historically and providing beneficial solutions moving forward. The 1991 EIR/EIS provided data of reduced tidal prism, sediment loads, disturbed uplands, and inland migration of the barrier beach among others. The new EIR/EIS should identify what has been learned in the last 20 years since those earlier findings and what is being applied to this project and mitigation measures. It should also identify what information is being applied from other federal, state and local agencies and projects (USMCA) to this project so it is clear that all interested parties are sharing information and working in unison to create the best solutions for this ecologically sensitive habitat.

The City and County Climate Action Plans (CAP) provide strategies to combat Greenhouse Gas Emissions (GHG) and encourage the use of nature based carbon sinks are relevant to this project. The EIR should identify the current GHG sequestration or discharge from the project site. The study should determine how much and by what mechanisms is carbon being currently discharged and sequestered within the project site. The EIR/EIS should identify what amount of GHGs can be sequestered by the restoration of the marsh without compromising the projects wildlife support values. The Project should work to provide resilient design and long-term adaptive management measures that can sustain that sequestration value in the face of Climate Change and Sea Level Rise. The EIR should quantify the long-term atmospheric carbon impacts of various designs, construction, and management scenarios to allow decision makers to optimize long-term carbon sequestration without compromising the performance of the project for sensitive species and for biodiversity goals. This should be done for a representative set of projected sea level rise scenarios released by the IPCC.

The Project should allow different species and habitat to migrate and move within the system to adapt to increasingly changing environmental factors as discussed above. The Project should provide for how the project and alternatives will survive the effects of varying levels of increased intense storms up to a devastating ARKStorm (for atmospheric river 1,000 storm). With increasing extreme weather events and cycles, the project designs should have provisions to accommodate major droughts and the EIR/EIS should evaluate the effectiveness of those provisions for a variety of scenarios.

Thanks for the opportunity to comment on the TETRP II Phase I Project. Please keep us informed of future presentations, comment opportunities and decision points for this project. We are very interested in it moving forward.

Fostering the protection and appreciation



of birds, other wildlife, and their habitats...

Sincerely,

A handwritten signature in dark ink, reading "James A. Peugh". The signature is written in a cursive style with some capital letters.

James A. Peugh, Conservation Chair

and

A handwritten signature in dark ink, reading "John Riedel". The signature is written in a cursive style with some capital letters.

John Riedel, Conservation Committee

## Public Comment Tijuana Estuary Tidal Restoration Program (TETRP II Phase I)

Why should the South Bay public ask this plan to be Re-Submitted?

By Leon Benham, C4CC

July 11, 2021

As a local resident who has some experience in environmental restoration projects, I must ask that this project be restudied and resubmitted to the public for review for the following reasons.

First, the TRNERR public outreach documentation is unreadable, lacks the proper scope of work and the project should have a more detailed maps which describe the work and the existing current conditions of the site ecology.

Second the meeting materials on the links called Final Script only has verbiage with no slides so the public who would go to this website has no way to offer review drawings and conduct a proper consideration of this project because the drawings not there. Many of the public who would look at this (especially the elderly and first level computer users) out of frustration would stop searching and so this segment of the public cannot comment. At the first glance look of the TRNEER (TETRP II Phase I) website I did this and quickly did not look at again for a week.

Third there is no documentation of the count of existing in mud species that would be permanently exterminated if this project is to go forward. Without this kind of front-end basic knowledge there is a high chance that this project would do more damage than good and dramatically eliminate the biodiversity of species of the Imperial Beach Slough. For example, this area is currently one of the extreme low flow tidal areas in the Slough and has been untouched by any grading or mechanical disturbance for the 100 years or more.... there are just no photos past 1922. But in 1922' it looked much as it does now.

Low flows areas have a different ecology than that exists at the mouth of the slough which has fresh seawater flushing action. In low flow areas you have purple Sea Slugs, bright neon yellow slugs, large, shelled snails, clams, leaf type seagrass, and other mud dwelling organisms who do not exist in the mouth of the Slough. Since this site has been most likely undisturbed it may contain many creatures that are desirable to retain.

In management of public open space there are two types of lands: pristine habitat and compromised lands. **Pristine habitat** is Yellowstone/Yosemite and **compromised lands** are those lands that have been changed so much they no longer hold native species or resemble what naturally existed.

As a best management practice, you never touch Pristine Habitat because there is a 95 percent chance you will lose the biodiversity. Recently, scientific studies have been critical of river habit restoration in the United States and Europe. These studies review

the results of hundreds of restoration projects and report there probably of success. In 2015, the findings were made public that in the United States over the last 20 years environmental restoration projects have about 90 percent chance to fail and reach their stated goals. The odds in fact are bleaker than that. Of the 78 river restoration projects examined “only two showed statistically significant increases in biodiversity”. That is only a 2.5 percent “success rate”.

There are three points here to be made. One is that if you destroy this pristine habitat with a rich area of biodiversity in the Tijuana Sloughs you have a 98 percent chance that you will be replacing it with dead zone of habitat that may never recover or will take decades to recover. Two is that this area because it may represent untouched “pristine” habitat it also serves as a nursery which constantly populates the surrounding compromised habitat with viable repopulation of native species. Third, why would we spend taxpayer’s money and risk the destruction of pristine habitat when the estuary has abundant compromised habitat to conduct these types of high-risk restoration experiments.

A recent example of this type of project that has this same type is the Oneonta Slough restoration project completed in 1997. In the 1960’s and 1970’s this slough had deep channels and each day the tide would rush in and out of this back bay area. Fish were abundant and a birds would dive and eat the surface smelt that would come in with the incoming tide. In the years following because of this restoration project the volume of water has been restricted and the outcome of the project is that the fish and the diving birds who would eat them no longer are present in this environment.

I ask that this project to be better documented and considered for another site or at a minimum this project be restudied and resubmitted to the public with more information and the other factors cited above..

Thank you,

Leon Benham, Executive Director  
Phone 619-964-9153



CITIZENS FOR COASTAL CONSERVANCY

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<sup>1 1</sup> <http://www.takepart.com/article/2015/07/17/developers-false-promise-ecological-restoration-projects>



**Tijuana Estuary Tidal Restoration Program II Phase I DEIR/EIS**  
**Public Scoping Comments Provided via Email**

June 21, 2021

"TETRP NOI" - NEPA Scoping Brian, I am questioning the validity and veracity of the TRNERR input to the City of Imperial Beach's Sediment Management Working group... DDT has been illegal for agriculture use in the US since 1972 (and internationally since 2004) - Additionally, the soil half-life of DDT is less than 15 years...How are your testing results still showing the presence of DDT in 2018??? Can we verify the TRERR data (testing dates and locations) on this claim? How old is this study and it's test samples? What is TRNEER's scientific/legal definition for "legacy local agriculture operations"? Without full study disclosure, I will request this input be immediately deleted from the City of Imperial Beach's Sediment Management Working group "library" of data/documents.

Respectfully, Mitchell McKay

June 16, 2021

Hi All, Thanks for the overview. The introduction stated that the aerial map showed the mouth opening further north than it currently is? Why not use the most current configuration - which I assume the plans are based on?

If you post the presentation for later reference, and in all supporting documentation, put dates on all of the aerial photos so that the mouth and estuarine configurations are clearly understood. You also should provide some discussion on what/why the mouth "moves" and how that dynamic could affect the TETRP II, Phase I marsh/wetland functions.

Regards, Bill Tippetts



Tijuana Estuary Tidal Restoration Program II Phase I  
Scoping Meeting Chat Transcript  
June 16, 2021  
2 p.m. Meeting

06/16/2021: 14:04:38 PM from Tijuana River NERR to Everyone: TETRP Final Script English: <https://trnerr.org/wp-content/uploads/2021/06/TETRP-Final-Script.pdf>; TETRP Guión Final (Español): [https://trnerr.org/wp-content/uploads/2021/06/TETRP-Final-Script\\_Spanish.pdf](https://trnerr.org/wp-content/uploads/2021/06/TETRP-Final-Script_Spanish.pdf)

06/16/2021: 14:05:14 PM from Tijuana River NERR to Everyone: <https://trnerr.org/about/public-notices/>

06/16/2021: 14:08:18 PM from Tijuana River NERR to Everyone: Fw8plancomments@fws.gov – be sure to include “TETRP NOI” in the email subject line, or via mail to Brian Collins, USFWS, San Diego NWR Complex, 1080 Gunpowder Point Drive, Chula Vista, CA 91910

06/16/2021: 14:42:41 PM from Tijuana River NERR to Everyone: [Fw8plancomments@fws.gov](mailto:Fw8plancomments@fws.gov); Please be sure to include “TETRP NOI” in the email subject line.

06/16/2021: 14:42:45 PM from Tijuana River NERR to Everyone: Brian Collins, USFWS, San Diego NWR Complex, 1080 Gunpowder Point Drive, Chula Vista, CA 91910

06/16/2021: 14:42:59 PM from Tijuana River NERR to Everyone: [www.fws.gov/refuge/Tijuana\\_Slough/what\\_we\\_do/resource\\_management.html](http://www.fws.gov/refuge/Tijuana_Slough/what_we_do/resource_management.html)

06/16/2021: 14:43:07 PM from Tijuana River NERR to Everyone: <https://trnerr.org/about/public-notices/>

06/16/2021: 14:43:17 PM from Tijuana River NERR to Everyone: Brian Collins, Refuge Manager, at brian\_collins@fws.gov or 760-431-9440 extension 273

06/16/2021: 14:44:48 PM from Tijuana River NERR to Everyone: Please note that we will now be allowing people to turn on their cameras, if they so choose. A reminder that our meeting is being recorded and will be posted to our project website, so please turn off your camera if you are not comfortable with that. Thank you. I will be flipping the switch in approximately 15 seconds. In Spanish: Por favor tenga en cuenta que ahora permitiremos que las personas prendan sus cámaras, si desean. Un recordatorio de que nuestra reunión se está grabando y se publicará en el sitio web de nuestro proyecto, así que apague su cámara si no se siente cómodo con su aparacer en la grabación. Gracias. Permitiremos que se prendan las camaras in aproximadamente 5 segundos.

06/16/2021: 14:52:34 PM from Mark Stephens to Everyone: Thanks for the informative presentations and program!

06/16/2021: 14:52:57 PM from Andrew Yuen to Everyone: Thank you all for joining us!

06/16/2021: 14:53:26 PM from Tijuana River NERR to Everyone: TETRP Final Script (English): <https://trnerr.org/wp-content/uploads/2021/06/TETRP-Final-Script.pdf> ; TETRP Guión Final (Español): [https://trnerr.org/wp-content/uploads/2021/06/TETRP-Final-Script\\_Spanish.pdf](https://trnerr.org/wp-content/uploads/2021/06/TETRP-Final-Script_Spanish.pdf)

06/16/2021: 14:53:33 PM from Tijuana River NERR to Everyone: <https://trnerr.org/about/public-notice/>

06/16/2021: 14:53:49 PM from Jim Peugh to Everyone: The presentations were very helpful.

06/16/2021: 14:53:54 PM from Tijuana River NERR to Everyone: [www.fws.gov/refuge/Tijuana\\_Slough/what\\_we\\_do/resource\\_management.html](http://www.fws.gov/refuge/Tijuana_Slough/what_we_do/resource_management.html)

06/16/2021: 14:54:21 PM from John Riedel to Everyone: Is there coordination with the USMCA Transboundary Flow Project and how their proposed, projects influence this project? There are sediment flow studies needed for both projects and a need for coordination. Thanks.

06/16/2021: 14:54:54 PM from Viviane Marquez-Waller to Everyone: Can you tell me how this restoration/dredging project will keep the area from being filled by sediment in the future?

06/16/2021: 14:55:52 PM from Tijuana River NERR to Everyone: We are coordinating with EPA on both projects.

06/16/2021: 14:58:16 PM from Tijuana River NERR to Everyone: Viviane thank you for your question. Sedimentation is being evaluated in the EIR/EIS.

06/16/2021: 14:59:00 PM from Tijuana River NERR to Everyone: As a reminder, to provide public comment after the meeting: Email: [Fw8plancomments@fws.gov](mailto:Fw8plancomments@fws.gov), Please be sure to include "TETRP NOI" in the email subject line. Or send by mail: Brian Collins, USFWS, San Diego NWR Complex, 1080 Gunpowder Point Drive, Chula Vista, CA 91910

06/16/2021: 15:00:38 PM from Tijuana River NERR to Everyone: Project websites: [www.fws.gov/refuge/Tijuana\\_Slough/what\\_we\\_do/resource\\_management.html](http://www.fws.gov/refuge/Tijuana_Slough/what_we_do/resource_management.html) <https://trnerr.org/about/public-notice/>

06/16/2021: 15:02:30 PM from Tijuana River NERR to Everyone: Regarding the sedimentation question. It won't reduce sedimentation from upstream but it will remove historic deposition. Increased tidal prism may tend to make the system more resilient to sedimentation.



06/16/2021: 15:06:04 PM from Tijuana River NERR to Everyone: Project websites:  
[www.fws.gov/refuge/Tijuana\\_Slough/what\\_we\\_do/resource\\_management.htm](http://www.fws.gov/refuge/Tijuana_Slough/what_we_do/resource_management.htm);  
<https://trnerr.org/about/public-notices/>

06/16/2021: 15:06:30 PM from Viviane Marquez-Waller to Everyone: Thanks Everyone!  
Special thanks to Dr. Mike McCoy for his unrelenting efforts on behalf of our estuary!

06/16/2021: 15:06:49 PM from Tijuana River NERR to Everyone: Thank you, Viviane.

06/16/2021: 15:06:58 PM from Andrew Yuen to Everyone: Thank you for re-posting the  
information.

06/16/2021: 15:07:06 PM from Andrew Yuen to Everyone: Thank you Viviane!

06/16/2021: 15:07:15 PM from Tijuana River NERR to Everyone: To provide public  
comment after the meeting: Email: [Fw8plancomments@fws.gov](mailto:Fw8plancomments@fws.gov) - Please be sure to  
include "TETRP NOI" in the email subject line. Or send by mail: Brian Collins, USFWS,  
San Diego NWR Complex, 1080 Gunpowder Point Drive, Chula Vista, CA 91910.

06/16/2021: 15:08:11 PM from Andrew Yuen to Everyone: Mike, thank you for joining  
us today! We always appreciate your participation and support!

**Tijuana Estuary Tidal Restoration Program II Phase I**  
**Scoping Meeting Chat Transcript**  
**June 16, 2021**  
**6 p.m. Meeting**

06/16/2021: 18:04:14 PM from Tijuana River NERR to Everyone: Transcripts in English and Spanish: TETRP Final Script (English): <https://trnerr.org/wp-content/uploads/2021/06/TETRP-Final-Script.pdf>; TETRP Guión Final (Español): [https://trnerr.org/wp-content/uploads/2021/06/TETRP-Final-Script\\_Spanish.pdf](https://trnerr.org/wp-content/uploads/2021/06/TETRP-Final-Script_Spanish.pdf)

06/16/2021: 18:04:52 PM from Tijuana River NERR to Everyone: Video recording can be found at: <https://trnerr.org/about/public-notices/>

06/16/2021: 18:07:56 PM from Tijuana River NERR to Everyone: To provide public comment after the meeting. Email: [Fw8plancomments@fws.gov](mailto:Fw8plancomments@fws.gov) - Please be sure to include "TETRP NOI" in the email subject line. Or send by mail: Brian Collins, USFWS, San Diego NWR Complex, 1080 Gunpowder Point Drive, Chula Vista, CA 91910

06/16/2021: 18:42:06 PM from Tijuana River NERR to Everyone: To provide public comment after the meeting: Email: [Fw8plancomments@fws.gov](mailto:Fw8plancomments@fws.gov) - Please be sure to include "TETRP NOI" in the email subject line. Or send by mail: Brian Collins, USFWS, San Diego NWR Complex, 1080 Gunpowder Point Drive, Chula Vista, CA 91910

06/16/2021: 18:42:31 PM from Tijuana River NERR to Everyone: Project websites: [www.fws.gov/refuge/Tijuana\\_Slough/what\\_we\\_do/resource\\_management.html](http://www.fws.gov/refuge/Tijuana_Slough/what_we_do/resource_management.html); <https://trnerr.org/about/public-notices/>; Questions? Please Contact: Brian Collins, Refuge Manager, [brian\\_collins@fws.gov](mailto:brian_collins@fws.gov), 760-431-9440 extension 273

06/16/2021: 18:43:20 PM from LCCSuRESoS to Everyone: Will either alternative protect the cities to the east?

06/16/2021: 18:43:58 PM from Lesley Handa to Everyone: Please email me a copy of the presentation. Thank you. [lesley.handa@gmail.com](mailto:lesley.handa@gmail.com)

06/16/2021: 18:44:46 PM from Tijuana River NERR to Everyone: Please note that we will now be allowing people to turn on their cameras, if they so choose. A reminder that our meeting is being recorded and will be posted to our project website, so please turn off your camera if you are not comfortable with that. Thank you. I will be flipping the switch in approximately 15 seconds.

06/16/2021: 18:45:04 PM from Tijuana River NERR to Everyone: In Spanish: Por favor tenga en cuenta que ahora permitiremos que las personas prendan sus cámaras, si desean. Un recordatorio de que nuestra reunión se está grabando y se publicará en el sitio web de nuestro proyecto, así que apague su cámara si no se siente cómodo con su aparacer en la grabación. Gracias. Permitiremos que se prendan las camaras in aproximadamente 5 segundos.

06/16/2021: 18:45:52 PM from Lesley Handa to Everyone: To what level of sea level rise are the alternatives planned for?

06/16/2021: 18:48:24 PM from Tijuana River NERR to Everyone: Project websites: [www.fws.gov/refuge/Tijuana\\_Slough/what\\_we\\_do/resource\\_management.html](http://www.fws.gov/refuge/Tijuana_Slough/what_we_do/resource_management.html); <https://trnerr.org/about/public-notices/>

06/16/2021: 18:48:47 PM from LCCSuRESoS to Everyone: Do the agencies responsible for implementing either alternative have sufficient funding to complete either alternative?

06/16/2021: 18:50:15 PM from Tijuana River NERR to Everyone: Meeting resources can be found at: <https://trnerr.org/about/public-notices/>

06/16/2021: 18:50:23 PM from Lesley Handa to Everyone: Great, thank you.

06/16/2021: 18:51:03 PM from Tijuana River NERR to Everyone: I believe the prompt should be \*6 after you press \*3 to unmute.

06/16/2021: 18:52:44 PM from Tijuana River NERR to Everyone: To provide public comment after the meeting: Email: [Fw8plancomments@fws.gov](mailto:Fw8plancomments@fws.gov) - Please be sure to include "TETRP NOI" in the email subject line. Or send comments by mail: Brian Collins, USFWS, San Diego NWR Complex, 1080 Gunpowder Point Drive, Chula Vista, CA 91910.

06/16/2021: 18:52:55 PM from LCCSuRESoS to Everyone: Thank you for your response to the funding question.

06/16/2021: 18:53:19 PM from Tijuana River NERR to Everyone: Project websites: [www.fws.gov/refuge/Tijuana\\_Slough/what\\_we\\_do/resource\\_management.html](http://www.fws.gov/refuge/Tijuana_Slough/what_we_do/resource_management.html); <https://trnerr.org/about/public-notices/>. Questions? Please Contact: Brian Collins, Refuge Manager, [brian\\_collins@fws.gov](mailto:brian_collins@fws.gov), 760-431-9440 extension 273

06/16/2021: 18:53:26 PM from Tijuana River NERR to Everyone: Regarding funding, a completed EIR/EIS is a necessary step to secure funding.

06/16/2021: 18:55:48 PM from Andrew Yuen to Everyone: Thank you everyone for joining us tonight.

06/16/2021: 18:56:05 PM from LCCSuRESoS to Everyone: Some people think the estuary is complete as is; nothing more needs to be done. You could let the public know how much more is need for preservation.

06/16/2021: 18:57:10 PM from LCCSuRESoS to Everyone: Will the EIR describe what will happen if no action is taken?

06/16/2021: 18:58:33 PM from Tijuana River NERR to Everyone: Yes, we analyze the no action alternative.

06/16/2021: 19:00:33 PM from Tijuana River NERR to Everyone: To provide public comment after the meeting: Email: [Fw8plancomments@fws.gov](mailto:Fw8plancomments@fws.gov) - Please be sure to include "TETRP NOI" in the email subject line. Or send comments by mail: Brian Collins, USFWS, San Diego NWR Complex, 1080 Gunpowder Point Drive, Chula Vista, CA 91910.

06/16/2021: 19:01:14 PM from Tijuana River NERR to Everyone: Project websites: [www.fws.gov/refuge/Tijuana\\_Slough/what\\_we\\_do/resource\\_management.html](http://www.fws.gov/refuge/Tijuana_Slough/what_we_do/resource_management.html); <https://trnerr.org/about/public-notices/>. Questions? Please Contact: Brian Collins, Refuge Manager, [brian\\_collins@fws.gov](mailto:brian_collins@fws.gov), 760-431-9440 extension 273

06/16/2021: 19:03:42 PM from LCCSuRESoS to Everyone: Suggestion: please review the importance of this work with communities near the estuary such as Tijuana, Imperial Beach, San Diego and Coronado.

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## **Appendix C**

### **Draft Conceptual Restoration Plan**



# **TIJUANA ESTUARY TIDAL RESTORATION PROGRAM II PHASE I DRAFT CONCEPTUAL RESTORATION PLAN**

## **Prepared for:**

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November 2021





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## 1.0 INTRODUCTION

### 1.1 PROJECT BACKGROUND

Tijuana Estuary Tidal Restoration Program II - Phase I (TETRP II Phase I or project) is the first phase of a multi-phase restoration of the southern arm of Tijuana Estuary, San Diego County, California. TETRP II Phase I builds upon the conceptual restoration plan developed for Tijuana Estuary – Friendship Marsh Feasibility and Design Study (Feasibility Study; Tierra Environmental Services 2008), which proposed multi-phase restoration of approximately 200–250 acres of degraded habitat in the southern arm of the estuary. TETRP II Phase I has been designed to increase tidal prism and hydrologic function of the southern portion of Tijuana Estuary, including restoring hydraulic connections to the river mouth (also referred to as the tidal inlet), removing sand as needed to allow an open river mouth to support water quality and reduce potential hypoxic conditions, and enhancing sediment transport through the estuary to the nearshore. This would be accomplished by lowering elevations and restoring intertidal habitat in areas that have been impacted by excessive sediment loading from the eroding hillsides of Tijuana. This habitat restoration includes establishment of approximately 80–85 acres of salt marsh, mudflat, tidal channel, and transitional habitats in an area where these habitats types were once extensive. The project takes place within Tijuana River National Estuarine Research Reserve (TRNERR) and is the next major step in coupling science with management to improve our ability to restore this system and others like it in the region. Restoration of hydraulic connections to the Tijuana River channel, and periodic removal of material from the river mouth (also referred to as the tidal inlet), as necessary, is also a feature of the project.

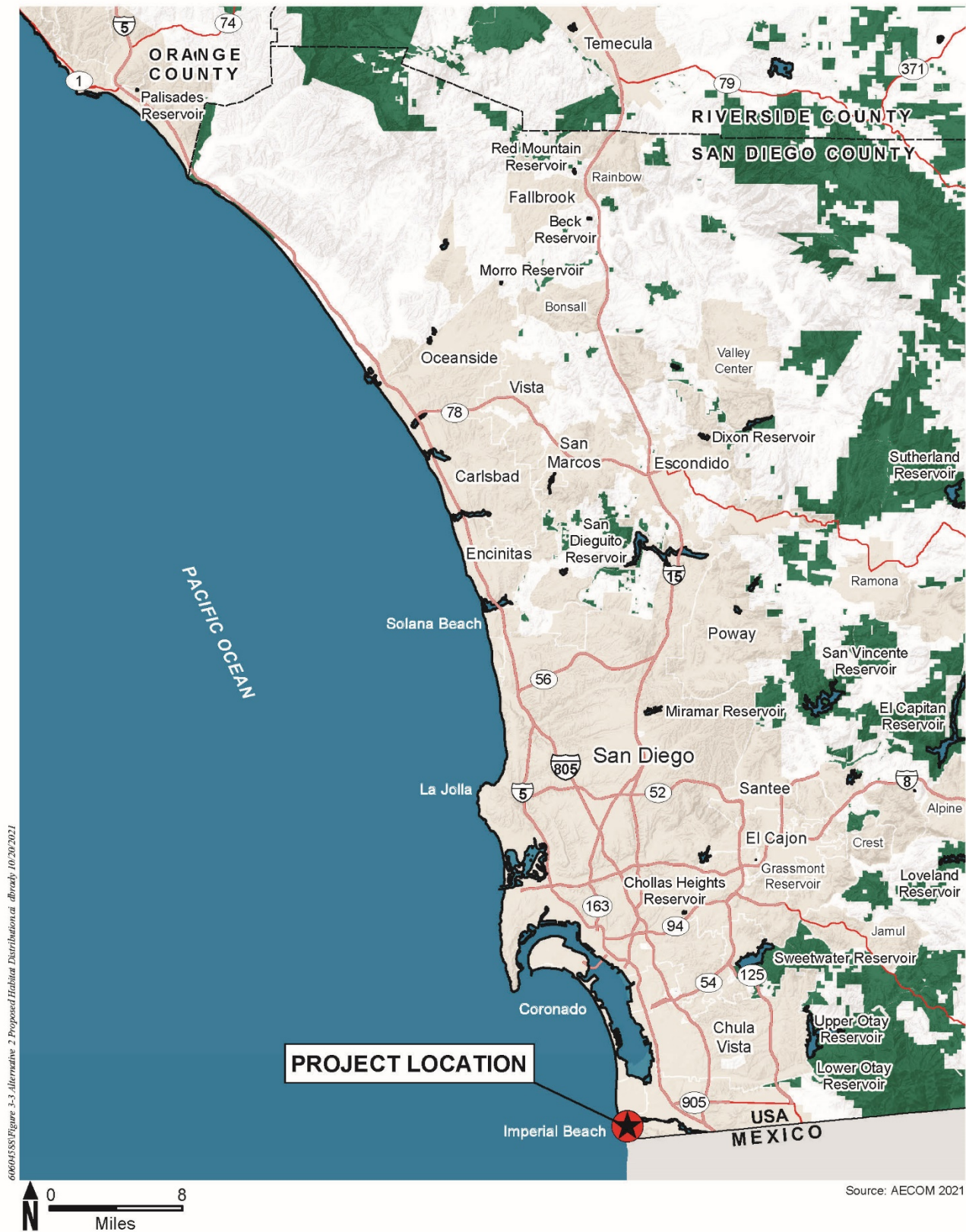
The purpose of TETRP II Phase I is to restore a portion of the southern arm of Tijuana Estuary to functioning estuarine and wetland habitats consistent with the recommendations presented in the Feasibility Study and generally within the area recommended for restoration in the 1991 TETRP Environmental Impact Report/Environmental Impact Statement (EIR/EIS; ENTRIX et al. 1991)). As an iterative, adaptive program, this restoration incorporates lessons from past phases and is designed to ask, and answer, new scientific questions to be applied in the future (here and elsewhere). The preferred restoration program identified in the Feasibility Study would be completed in phases, of which the proposed project represents Phase I. Of the acreage identified for restoration in the Feasibility Study, TETRP II Phase I would expand on the success of the 20-acre Model Marsh, restored in 2000, and restore approximately 80–85 additional acres of the estuary to tidal marsh and associated subtidal, and transitional habitats. Implementation of TETRP II Phase I would help to achieve the goals of the Southern California Wetlands Recovery Project Regional Strategy, in particular Goal 1 Preserve and Restore Resilient Tidal Wetlands and

The impetus for restoring the southern arm of the estuary has been the loss of tidal prism and degradation of wetland habitats from anthropogenic sediment inputs into the estuary. Sedimentation from trans-border canyons, especially Goat Canyon, has resulted in the transformation of salt marsh/salt panne habitat into disturbed habitat, and has filled areas of former channel, resulting in the loss of substantial acreages of mid- and high salt marsh. Sediment accretion in channels and embayments has resulted in the loss of mudflat habitat, as well as a reduction of the tidal prism within the estuary. The Feasibility Study estimated the tidal prism at 330 acre-feet, an approximate 80% reduction in tidal exchange based on the 1852 U.S. Coastal Geological Survey map. In recent years, the mouth of the estuary has migrated dramatically south of known previous locations, and historically is shallow, narrow, and subject to closure as a result of sedimentation associated with extreme events such as high tides and storm waves (such as occurred during the El Niño of 2016). Inlet closure can have devastating effects on the flora and fauna of the estuary, as was documented during inlet closure in 1984. The effects of that 8-month closure included desiccation of tidal channels resulting in the loss of benthic invertebrate species, some of which failed to recover following inlet opening; loss of substantial areas of low salt marsh; and loss of animal species associated with low salt marsh, such as the light-footed Ridgway's rail (*Rallus obsoletus levipes*; Zedler and Nordby 1986). Restoration would help to increase stability of the mouth by increasing the spring flood tidal prism through the river mouth by approximately 24%; maintain tidal exchange within the restored portion of the estuary; and counteract losses of channel, mudflat, salt marsh, and salt panne acreage.

TETRP II Phase I restoration objectives focus on increasing and maintaining tidal prism and habitat types, and include species-focused restoration goals. For example, establishment of low salt marsh habitat would benefit a suite of wetland birds, including the light-footed Ridgway's rail; mudflat would benefit resident and migratory shorebirds; and intertidal channel habitat would benefit fishes and invertebrates and species that prey upon them. Given these broad guidelines, the project objectives for TETRP II Phase I were derived from the Feasibility Study and are described further in Section 3.1.

## **1.2 LOCATION AND SETTING**

Tijuana Estuary is located at the southwest corner of the United States in San Diego County (Figure 1-1). The estuary encompasses tidal and non-tidal land. The majority of remaining salt marsh exists in the northern portion of TRNERR, while the southern arm of the estuary remains in a degraded



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state in comparison to the north (Tierra Environmental Services 2008). The estuary is bordered to the west by the Pacific Ocean and to the north, east, and south by commercial and residential development in Imperial Beach and San Diego, and Tijuana, Mexico (Figure 1-2). The Tijuana River Valley, which consists of developed land for commercial and residential uses, recreational uses, agriculture, and undeveloped land, extends to the southeast relative to the estuary.

Despite serious anthropogenic stressors, Tijuana Estuary remains one of the most intact coastal wetland systems in southern California. The majority of the estuary is natural open space where the river mouth remains unconstrained from hardscape or infrastructure, unlike many coastal wetlands located in the region. The Tijuana Estuary Visitor Center is located at the northern end of TRNERR. The California Department of Parks and Recreation (CSP) manages Border Field State Park, while the U.S. Fish and Wildlife Service (USFWS) manages the Tijuana Slough National Wildlife Refuge (Refuge) that make up TRNERR. A series of trail networks extend throughout the Refuge and Border Field State Park for pedestrian, bike, and equestrian users. Restrooms, picnic areas, and interpretive displays are provided in the southernmost portion of Border Field State Park. Visitors can enjoy bird watching, hiking, and horseback riding at the southwest corner of the continental United States. The County of San Diego has constructed a campground in the river valley to provide additional recreational opportunities.

Historically, agricultural and military activities occurred within the western end of the Tijuana River Valley (Tierra Environmental Services 2008). Military presence continues to the north within Naval Base Coronado Naval Outlying Landing Field Imperial Beach. Today, agricultural operations occur on smaller parcels in the eastern portion of the lower Tijuana River Valley watershed on the U.S. side of the international border.

### **1.3 TIJUANA RIVER NATIONAL ESTUARINE RESEARCH RESERVE COMPREHENSIVE MANAGEMENT PLAN**

TRNERR encompasses approximately 2,293 acres of federal, state, County of San Diego, and City of Imperial Beach and City of San Diego lands. These entities cooperate in an Advisory Council that helps coordinate activities within TRNERR and the broader River Valley. Two agencies manage most of lands and the biological resources of TRNERR. These are the CSP, which owns and manages the 761-acre Border Field State Park, and the USFWS, which manages the Refuge. The Refuge includes 505 acres owned by the USFWS, 606.42 acres owned by the Navy, and tidelands leased from the California State Lands Commission. The Navy land is managed for refuge purposes in accordance with a 1992 Memorandum of Understanding between the USFWS and the Navy.





0604588 Figure 1-2 Project Location at library 07/14/2022

Source: GoogleEarth 2021

Note: The Tijuana River mouth location is not fixed. Impacts were calculated based on the inlet position when the hydraulic modeling was conducted and may shift again before the project is constructed.



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Tijuana Estuary was designated as a National Estuarine Sanctuary, later changed to a National Estuarine Research Reserve (NERR) in 1982, by the National Oceanic and Atmospheric Administration (NOAA). Designation as an NERR established a federal-state cooperative effort for long-term research, education, and stewardship, where NOAA serves as the federal component under this designation, with CSP as the State partner. The Southwest Wetlands Interpretive Association (SWIA) is a non-governmental organization (NGO) that is also a cooperating partner in the operations of TRNERR.

Under the National Wildlife Refuge System and NERR requirements, a Comprehensive Management Plan (CMP) was first approved by CSP, the USFWS and NOAA in 2000 and updated in 2010 to fulfill the requirements of both land designation systems to prepare and update management plans. The goal of the CMP is to guide TRNERR in its mission to protect estuarine resources, and outlines key guiding principles including the administrative framework; resource protection, management, and restoration; research and monitoring program; and education and interpretation opportunities within TRNERR. The CMP includes a comprehensive proposal to improve land stewardship including through large-scale habitat restoration through implementation of TETRP II Phase I.

The CMP includes the following goals for Tijuana Estuary:

- Goal I: To protect, restore and enhance the viability of key coastal habitats and species and preserve the region's cultural heritage while encouraging compatible public use, education and research.
- Goal II: To fully integrate the Reserve's research, stewardship and education programs and provide a model of excellence in all three areas.
- Goal III: To engage coastal decision-makers and the general public in the Reserve's stewardship mission by promoting awareness, a sense of pride in the resource and an enhanced capacity to improve the Tijuana River coastal and watershed ecosystems in general.
- Goal IV: To assume a regional leadership role for science-based natural resource enhancement and urban ecosystem management.

The CMP for Tijuana Estuary identifies the overall TETRP II Phase I as a component of habitat restoration goals within TRNERR. The comprehensive program outlines restoration of approximately 250 acres of intertidal wetland habitat at the south end of the Reserve with the intent of increasing tidal prism; improving water and habitat quality; and increasing tidal channel,

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mudflat, and salt marsh habitat needed to support healthy fish and wildlife populations. The USFWS, CSP, and TRNERR Advisory Council have endorsed restoration of TETRP II Phase I, and have agreed to partner with SWIA on restoration planning and implementation.

#### **1.4 RESPONSIBLE PARTIES**

SWIA and its contractors, in coordination with the USFWS and CSP, would be responsible for obtaining required permits for oversight of the construction contractor to ensure that the project is constructed according to project plans and specifications. Once appropriate site elevations have been achieved and excavated soils have been appropriately reused or disposed of, the restoration site would be planted in accordance with final design documents. In addition, SWIA, as well as project contractors and partners, would be responsible for maintenance and monitoring activities of the restored site in accordance with this Restoration Plan. The contractors would be a qualified, licensed company with experience in coastal wetland restoration implementation and maintenance. During the planting phase, the contractors would be responsible for tasks including nonnative plant removal, soil preparation (e.g., topsoil salvage, grading, soil removal), planting/seeding, and erosion control. During the maintenance and monitoring period, the contractors would be responsible for monitoring, weed and pest control, and trash removal. The USFWS and CSP would be responsible for long-term management of the restoration site as part of TRNERR's CMP.

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## **2.0 RESTORATION SITE EXISTING CONDITIONS**

### **2.1 SOILS**

The channels and marsh plain of the southern estuary have been filled with sediment from Mexico via trans-border canyons (i.e., Goat Canyon) and other sources, resulting in a substantial reduction in the estuary's tidal prism. Areas that were formerly seasonal wetlands and salt pannes have been buried by sediment and are now succeeding to disturbed upland habitats.

Restoration of the southern estuary requires control of sediment input to the system and excavation of former wetland habitats that have been buried and have succeeded to weedy upland habitats. The construction of sediment detention basins in Goat Canyon in 2005 has helped to accomplish control of sediment input. Implementation of TETRP II Phase I would return a substantial portion of the southern estuary to tidal influence with the attendant increase in ecosystem function.

A major component of TETRP II Phase I involves the determination of the current physical and chemical characteristics of the soils and sediments to be excavated. The characteristics of the material to be removed would determine where it can be disposed of and by what methods. The goal of these types of programs is to maximize the beneficial reuse of excavated materials for beach restoration. Sediment analysis has indicated that the soils of the site are a heterogeneous mixture of uncontaminated sands, silts, and clays (Bodhi 2021). A strategy for handling excavated soils ranging from maximizing beneficial reuse of appropriate material on the beach to disposal at a commercial landfill is outlined in the Construction Methods and Soil Management plan (Anchor QEA 2021a). The plan would be finalized pending completion of 100% plans and specifications and input from regulatory agencies.

### **2.2 HYDROLOGY**

TETRP II Phase I is located south of the current main channel of the Tijuana River and adjacent to Model Marsh. In the last century, the Tijuana River has been severely disturbed by human activities. Physical modifications to stream channels include upstream dams, channelization in the United States and Mexico, sand and gravel channel mining, and flow dissipation devices. These features alter watershed function and result in a dynamic river channel system with the potential to affect the restoration project.

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A comprehensive analysis of the effects of TETRP II Phase I on tidal and fluvial hydrology and hydraulics was conducted by Anchor QEA and is presented in the Tidal Hydraulics and Fluvial Flood Modeling report (Anchor QEA 2021b).

### **2.2.1 Major Watershed and Channel Characteristics**

The Tijuana River drains about 1,700 square miles, 73% of which lies in Mexico. Three reservoirs regulate 71% of the total drainage area: Morena and Barrett Reservoirs within the United States (combined capacity of 96,000 acre-feet) and the Rodriguez Dam in Mexico (capacity of 110,000 acre-feet). Below these dams, and throughout the watershed, channels flow through both natural and human-modified landscapes, including the cities of Tecate and Tijuana, Mexico. In urban Tijuana, the river also flows for many miles in a concrete channel until it reaches the international border. Immediately upon entering the U.S. side of the border, the river enters an energy dissipater system before reaching Tijuana Estuary, and finally the Pacific Ocean.

The Tijuana River watershed is an intermittent watershed typical of semi-arid areas (Pryde 2004). Precipitation is seasonal and extremely variable, with the majority of rain events occurring in the winter, between November and April. Precipitation is sometimes delivered in intense storms lasting only a few days (Wright 2005). In contrast, for most of the summer and fall, precipitation and stream flow is normally absent.

Since 1980, human activity has resulted in abnormal perennial flows in the lower Tijuana River. These are primarily the result of Rodriguez Reservoir leakage coupled with sewage flows that are released to the river from the City of Tijuana sewage treatment facility. These flows, in turn, have produced a seasonally variable freshwater aquifer (PWA 1987). Billions of gallons of untreated sewage have crossed the international border via the Tijuana River. These flows also emanate from north-trending tributary canyons, particularly Goat Canyon and Smuggler's Gulch. The construction of sewage interceptors in these north-trending canyons and the construction of the International Wastewater Treatment Plant in 1999 has reduced the flow of sewage to the estuary and ocean. However, during the winter rainy season and times of infrastructure failure combined with sewer system functional disruptions, untreated sewage still flows across the international border into Tijuana Estuary and the Pacific Ocean. It should be noted that the City of Tijuana regularly discharges untreated sewage to the Pacific Ocean south of Tijuana Estuary at the San Antonio de los Buenos outfall.

During the winter and spring, the Tijuana River can produce severe flooding. Such floods occurred in 1980, 1983, 1993, and more recently in 2008, with devastating physical effects on natural habitats and infrastructure in the Tijuana River Valley. Some urban tributaries of the Tijuana River,

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such as Goat Canyon and Smuggler's Gulch, are especially subject to flash flooding during heavy rainfall events (Wright 2005).

The influence of dams also interrupts natural sediment distribution within the watershed. Normal distributions result in a slight decrease in sediment grain size moving from the upper floodplain of the river toward the river mouth. The lower Tijuana River bed holds clay, silt, sand, and gravel, but the dominant bed material is sand. Soil investigations and grain size distributions are presented in detail in the Sampling and Analysis Report (Bodhi 2021) and Section 5.4.7 of the EIR/EIS.

## **2.3 CULTURAL RESOURCES**

Eighteen previously recorded archaeological sites are located within the Area of Potential Effects (APE) associated with TETRP II Phase I. A subsurface sampling plan was developed by CSP in areas that have the highest potential for subsurface archaeological deposits. The sampling was conducted in 2019 by ASM Affiliates and consisted of excavating 23 trenches using a backhoe with a 24-inch bucket. The trenches were 15–20 feet long with a target depth of 4 meters (m), water table and soil characteristics permitting. The water table was at times encountered at 2 m with trench walls collapsing, so the 4 m depth goal was abandoned at some trenches. Of the 23 trenches excavated within the APE, only two contained identified cultural material. ASM identified a small discrete clam bake feature consisting primarily of Venus clam (*Chione californiensis*) in those two trenches. The authors concluded that the presence of this cultural material would not preclude advancing TETRP II Phase I to the next step in restoration.

## **2.4 BIOLOGICAL RESOURCES**

This section summarizes biological resources in the Biological Study Area (BSA), which encompasses areas identified for restoration, improved channel and inlet connections, and materials disposal/reuse sites located within TRNERR. Information in this section is primarily derived from the Feasibility Study (Tierra Environmental Services 2008), Biological Technical Report prepared for the proposed project (AECOM 2021), and the 1991 TETRP EIR/EIS (ENTRIX et al. 1991). Overall, the biological resources of Tijuana Estuary have been the focus of numerous studies throughout the years; however, much of the data presented in these publications was collected from studies in the northern arm of the estuary. Relatively recent efforts to collect information within the southern arm of the estuary to inform the Feasibility Study and proposed project have been conducted by a variety of consulting firms and technical specialists. Results of these survey efforts are summarized below and are included in more detail within the Biological Technical Report (AECOM 2021).

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### **2.4.1 Existing Vegetation Communities and Land Use Designations**

Initial vegetation mapping efforts were conducted by TRNERR in 2016–2018 using the San Diego Association of Governments' (SANDAG) *Vegetation Classification Manual for Western San Diego County* (SANDAG 2011). Using this information and elevational data made available by the U.S. Geologic Survey (USGS) for TRNERR, existing vegetation communities were combined into the habitat types described below and shown in Figure 2-1.

- Beach
- Dune
- Subtidal/Intertidal Channel
- Low Marsh
- Mid-High Marsh
- Transitional
- Salt Panne/Disturbed
- Upland
- Nonnative Upland

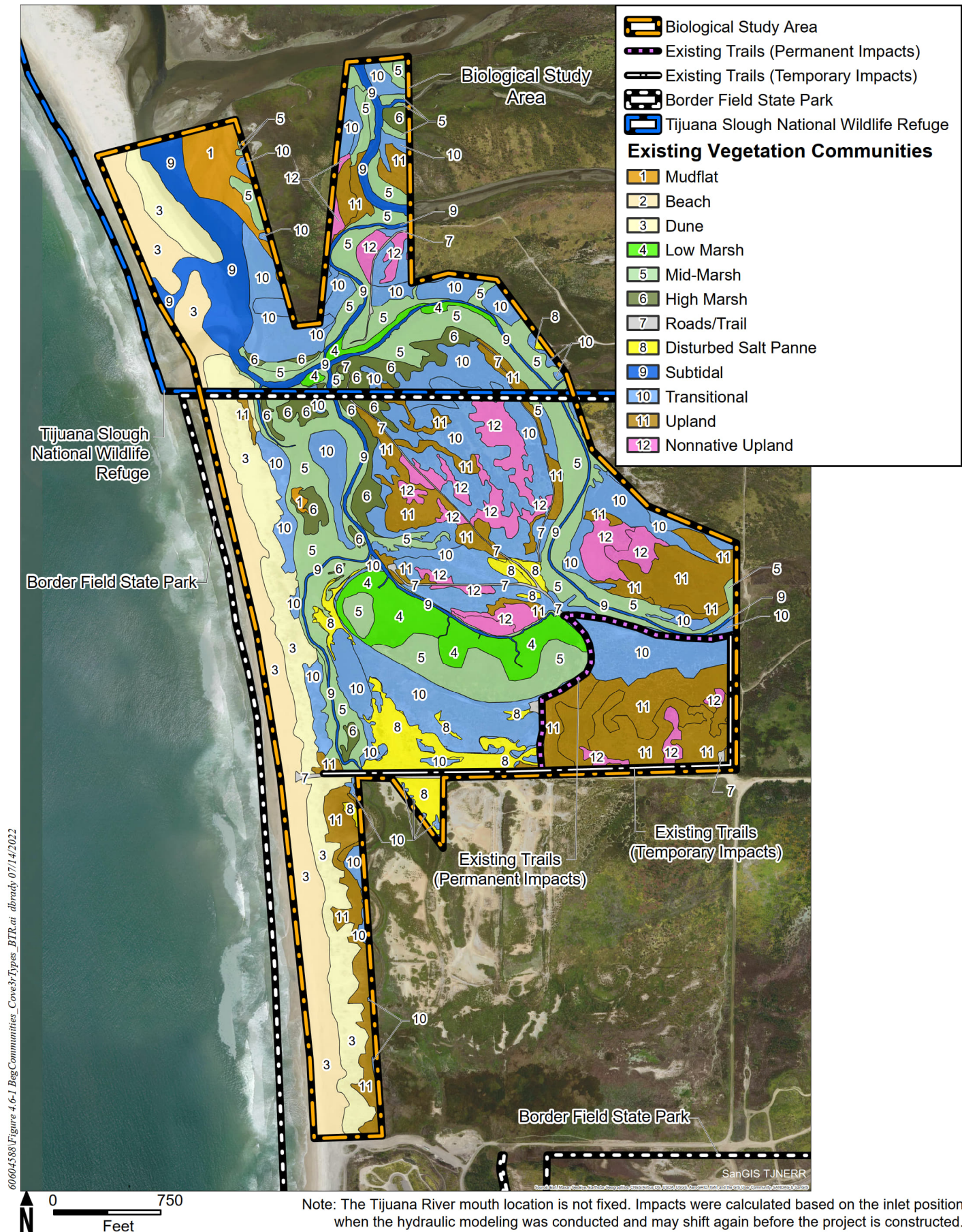
Although it has been subject to much disturbance in the recent past, Tijuana Estuary supports a diversity of native vegetation communities and wildlife. Vegetation observed in the project area includes salt water and freshwater marsh communities as well as those typical of more xeric habitats.

Within each habitat type, the proportion of native and exotic plant species varies greatly, from relatively undisturbed native communities to habitats that support monotypic stands of exotic species. However, most of the habitats described below are either dominated by or support some nonnative species, a situation compounded by freshwater inflows and sediment deposition.

#### **Beach**

Beaches are dynamic environments with little to no vegetation due to winds and waves, salt spray, shifting sands, high temperatures, and desiccation. Beaches have the potential to support specialized invertebrates, as well as serve as important habitat for nesting, roosting, and foraging birds.





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## **Dune**

Dune habitat is a sparsely vegetated plant community that is dominated by suffrutescent plants. Plant species that are characteristic of this community include red sand-verbena (*Abronia maritima*), beach sand-verbena (*Abronia umbellata*), and beach-bur (*Ambrosia chamissonis*). Within the project area, this vegetation community is dominated by beach-bur, beach sand-verbena, beach evening-primrose (*Camissoniopsis cheiranthifolia*), and nonnative species such as sea rocket (*Cakile maritima*) and ice-plant (*Carpobrotus edulis*).

## **Subtidal/Intertidal Channel**

Subtidal habitat is a continuously submerged aquatic community that provides important foraging and resting areas for many bird species and also provides important fish and invertebrate habitat. Existing tidal channels are designated as subtidal, rather than intertidal, because a sill at the mouth of the estuary prevents the ebb tide from fully draining the channels. Subtidal/intertidal channels are unvegetated and may be considered intertidal mudflat if exposed during the lowest tide. Intertidal channels provide important foraging and resting areas for many bird species and also provide important fish and invertebrate habitat.

## **Southern Coastal Salt Marsh**

Southern coastal salt marsh occurs within Tijuana Estuary but very little occurs within the excavation footprint of either Alternative 1 or 2. Impacts to this valuable vegetation community from project construction have been minimized, especially under Alternative 2. Historically, this vegetation community extended over a greater area than it does today and was much more pristine. Much of the coastal salt marsh community that remains today is a remnant of the days before sedimentation impacted the area. The majority of this remnant community within the excavation footprint has been impacted by sediment deposition and has converted to ruderal upland and has been invaded by weedy, nonnative species. As such, the function of this typically productive community has been severely compromised.

For the purpose of this Restoration Plan, southern coastal salt marsh has been further segregated by elevational bands ranging from 4.5 feet to 7.0 feet National American Vertical Datum 1988 (NAVD 88). The two sub-communities are further defined by elevation, which influences the frequency of tidal inundation as well as soil salinity, with low marsh establishing in areas receiving more frequent tidal inundation at lower elevations than mid- and high marsh.

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## **Low Marsh**

Low marsh in southern California salt marshes is dominated by California cordgrass (*Spartina foliosa*), which forms a dense canopy approximately 3 feet in height. This is the preferred nesting habitat of light-footed Ridgway's rail, a federal- and state-listed endangered bird.

## **Mid-High Marsh**

Although mid-high is typically dominated by Pacific pickleweed, several other plant species are associated with this community, including marsh rosemary (*Limonium californicum*), alkali heath (*Frankenia salina*), and marsh jaumea (*Jaumea carnosa*). Within the higher zone of this habitat, typical species include alkali heath, glasswort (*Arthrocnemum subterminale*), shoregrass (*Distichlis littoralis*), and saltgrass (*Distichlis spicata*).

## **Transitional**

The term transitional is used to describe vegetation associations above the highest tide elevations but still influenced by the saline soils within the salt marsh wetland. This term has been used by numerous wetland biologists to describe a community that supports a mix of high elevation coastal salt marsh plant species and upland plant species. Typically, this community occurs as a narrow band where the distribution of upland and wetland plant species overlap at or just above the elevation of the highest tides (Zedler et. al. 1992). Within the project area, the transitional community occurs as a large area that once supported salt marsh or where grading has created transitional community from degraded marsh and salt panne. As a result of sedimentation and past agricultural practices, native shrub species have colonized these areas. Plant species observed in this community included glasswort, California desert thorn (*Lycium californicum*), spreading goldenbush (*Isocoma menziesii* var. *menziesii*), bush seepweed (*Suaeda nigra*), big saltbush (*Atriplex lentiformis*) and alkali-heath. Invasive species include crown daisy (*Glebionis coronaria*), five-hook bassia (*Bassia hyssopifolia*), crystalline iceplant (*Mesembryanthemum crystallinum*), and black mustard (*Brassica nigra*).

## **Disturbed Salt Panne**

Disturbed salt panne represents a land use designation because these areas are often unvegetated or support primarily nonnative plant species. Salt panne can be described as a basin or small depression that traps marine waters during the highest spring tides and rainfall during wet periods.

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During the summer months, the water in these basins rapidly evaporates, resulting in hypersaline soils devoid of vegetation. During the winter, the pannes hold water and support algae and aquatic insects (Zedler et al. 1992). Typically, salt pannes hold water only for a short period each year. Consequently, the productivity and complexity of the communities associated with this habitat are not well understood (Zedler et al. 1992). These areas can support nesting and foraging shorebirds, most notably black-necked stilts (*Himantopus mexicanus mexicanus*) and American avocet (*Recurvirostra americana*).

Salt panne in the project area includes both naturally formed habitats, but also large expanses of anthropogenic, sparsely vegetated area caused by sediment deposition and compaction (e.g., due to former military activity). Much of the salt panne in the BSA is gradually succeeding to disturbed upland habitat and has been invaded by nonnative grasses.

## **Upland**

Upland communities in the BSA occur at elevations that are higher than transitional communities and include a mix of native and nonnative plant species. Some upland areas are dominated by native plant species while others are primarily nonnative species. Native plant species typical within these areas include big saltbush, spreading goldenbush, bush seepweed, and arrow weed (*Pluchea sericea*). In addition to the native species that make up the upland communities, some nonnative species exist as well and include tree tobacco (*Nicotiana glauca*), annual beard grass (*Polypogon monspeliensis*), ripgut grass (*Bromus diandrus*), and crystalline iceplant.

## **Nonnative Upland**

Nonnative uplands occur at elevations similar to other upland communities but are composed primarily of nonnative plant species. Much of this community is composed of nonnative grasslands and ruderal areas (areas that are highly disturbed and may have been used for agriculture in the past). These areas support crystalline iceplant, ripgut grass, soft chess (*Bromus hordeaceus*), foxtail chess (*Bromus madritensis* ssp. *rubens*), dock (*Rumex* sp.), wild radish (*Raphanus sativus*), crown daisy, tree tobacco, and star thistle (*Centaurea* sp.). Within the nonnative upland community, some native species also found in these areas have been identified and include spreading goldenbush, broom baccharis (*Baccharis sarothroides*), and four-winged saltbush (*Atriplex canescens* ssp. *canescens*).



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## Sensitive Plant Species

The sensitive species addressed below are known to occur on the site or have been the subject of focused surveys conducted within the restoration site and surrounding areas.

### Plants

Surveys for rare plants were conducted by qualified botanists (i.e., Conservation Biology Institute [CBI] contracted under AECOM) for the San Diego Management and Monitoring Program in September 2019 (SDMMP 2019). The following California Rare Plant Rank (formerly known as California Native Plant Society List species) and threat indication were used to classify rare plants identified during the survey.

- California Rare Plant Rank 1B are plants that are rare, threatened, or endangered in California and elsewhere (CNPS 2021).
- California Rare Plant Rank 2B are plants that are rare, threatened, or endangered in California but more common elsewhere (CNPS 2021).
- The threat rank of 0.1 indicates that these plants are seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat) (CNPS 2021).
- The threat rank of 0.2 indicates that these plants are moderately threatened in California (20%–80% of occurrences threatened/moderate degree and immediacy of threat) (CNPS 2021).

One plant species listed as California Rare Plant Rank 1B.1 species was observed during the September 2019 site visit:

- Nuttall's acmispon (*Acmispon prostratus*)

Nuttall's acmispon was recorded at the southwestern end of Monument Road along the barrier beach. During the September 2019 survey for rare plants, salt marsh birds-beak (*Chloropyron maritimum* ssp. *maritimum*) designated as federally and state listed as endangered, Orcutt's birds-beak (*Dicranostegia orcuttiana*) Rank 2B.1, and Shaw's agave (*Agave shawii* var. *shawii*) Rank 2B.1 were also identified within the Refuge and Border Field State Park but not within areas to be affected by project implementation. Biological field surveys were also conducted in 2004 and 2005 within the southern arm of the estuary to inform the Feasibility Study. During these surveys, other California Rare Plant species, estuary sea-blite (*Suaeda esteroa*) Rank 1B.2, and Coulter's salt

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marsh daisy (*Lasthenia glabrata* ssp. *coulteri*) Rank 1B.1, were documented in the immediate vicinity of the restoration site in similar habitats. There is potential for these California Rare Plant species and others to occur in the restoration site area, but to date they have not been detected within the proposed restoration site during focused botanical surveys.

## **Wildlife**

The TETRP II Phase I project area supports a rich assemblage of wildlife, including insects and arthropods, aquatic invertebrates, fish, reptiles, amphibians, birds and mammals. A detailed description of the fauna of the BSA is presented in the Biological Technical Report (AECOM 2021). For the purposes of this Restoration Plan, only special-status species are considered as they influence regulatory guidance, for example, the Federal Endangered Species Act. The following discussion is excerpted from the Biological Technical Report.

Of the 41 special-status wildlife species with potential to occur in the estuary, three species are listed as federally threatened or endangered, were detected on-site during previous studies, and are considered resident/breeding within the BSA. One additional species, least Bell's vireo (*Vireo bellii pusillus*), is included because it is located east of the BSA along the materials transport route:

- Least Bell's vireo
- Light-footed Ridgway's rail
- Western snowy plover (*Charadrius nivosus nivosus*)
- California least tern (*Sterna antillarum browni*)

## **Federally Listed Species**

### Least Bell's Vireo

The least Bell's vireo was federally listed as endangered in 1986 and state listed as endangered in 1980. Federally designated critical habitat exists for the species. The least Bell's vireo is the westernmost subspecies of the Bell's vireo and breeds entirely within southern California and Baja, California.

The least Bell's vireo breeding season extends from March through September. During the breeding season, the least Bell's vireo is restricted to riparian woodland and riparian scrub. In San Diego County, it occurs mainly in the coastal lowlands, rarely up to 3,000 feet elevation. Territory size ranges from 0.5 to 7.5 acres and there is evidence of high site fidelity among adults (Kus 2002). Early to mid-successional riparian habitat is typically used for nesting by this vireo because

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this habitat supports the dense shrub cover required for nest concealment as well as a structurally diverse canopy for foraging (Kus 2002).

The nearest least Bell's vireo habitat is located in the alluvial delta associated with Goat Canyon east of the BSA. While the species is located outside of the BSA, it is included because territories are located along the portion of Monument Road within TRNERR that is identified as part of the material transport route under the soil management options for the project. Up to nine breeding pairs were documented in the area along Monument Road during multi-season spot-mapping surveys conducted for the Goat Canyon Enhancement Project (Tierra Environmental Services 2000, 2008). In 2016, protocol least Bell's vireo presence/absence surveys were conducted at Border Field State Park in support of the Monument Road Renovation Project (Alfaro 2016). During these surveys, nine breeding pairs of least Bell's vireo were detected east of the BSA, north of Monument Road. Within this area, habitat consists of a stand of willow scrub and mulefat scrub. In 2019, protocol least Bell's vireo surveys detected 12 pairs with definitive evidence of nesting observed within seven locations (Blackhawk 2019).

#### Light-footed Ridgway's Rail

The light-footed Ridgway's rail is federally and state listed as endangered. It was listed as endangered on October 13, 1970 (35 FR 16047). This listing status applies to the entire U.S. population of the species. The state listed the subspecies as endangered on June 27, 1971. The USFWS has not designated critical habitat for this species.

The species is restricted to coastal salt marshes in southern California where vegetation is dominated by cordgrass and pickleweed. It can also be found in brackish and freshwater marshes with cattails (*Typha* sp.) and bulrushes (*Schoenoplectus* sp.). In fresh/brackish water, light-footed Ridgway's rails build nests in dense cattail or bulrush. Light-footed Ridgway's rails forage in higher marsh vegetation and along tidal creeks and at the interface between vegetation and adjacent mudflats. Light-footed Ridgway's rail is a reclusive species and will nest and utilize relatively small patches of its preferred habitat when isolated from external anthropogenic disturbances (Zemba et al. 2011; Zemba and Hoffman 2012).

Within Tijuana Estuary, the light-footed Ridgway's rail is a rare, year-round resident and can be heard calling, particularly in the early morning and evening. Breeding territories are usually focused in established coastal salt marsh habitats, such as in Model Marsh and the northern arm of the estuary. Since 1980, the light-footed Ridgway's rail population of Tijuana Estuary has been monitored with the number of nesting pairs gradually increasing over that period of time; however, much fluctuation also has been observed from year to year (Tierra Environmental Services 2008).

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In 1983, 41 pairs were observed at Tijuana Estuary. The population declined drastically following closure of the river mouth in 1984 and no birds were observed during focused surveys that year. It's possible that rails migrated temporarily in response to hyper saline conditions created by inlet closure. Subsequently in 1986, two pairs were observed and, by 1987, numbers were increasing once again when the population in 1991 reached 47 pairs (Tierra Environmental Services 2008). Approximately 94 pairs of light-footed Ridgway's rails were detected during a census conducted at the Refuge in 2020 (Zembal et al. 2020).

In 2016, protocol light-footed Ridgway's rail surveys were conducted for the Border Field State Park Monument Road Project in appropriate breeding habitat. During these surveys, 20 individual light-footed Ridgway's rails were detected within salt marsh and transitional habitats (Blackhawk 2016), including within northern portions of the BSA.

### Western Snowy Plover

The western snowy plover is listed as federally threatened and a species of special concern by the state. The western snowy plover was listed by the USFWS on March 5, 1993 (58 FR 12874). A recovery plan has been adopted for this species (USFWS 2007). Critical habitat was designated on September 29, 2005 (USFWS 2005).

Western snowy plover occurs along the Pacific coast from southern Washington to Baja California. It is a common winter migrant, a winter visitor, and a declining and local resident in San Diego County. It nests on undisturbed, flat areas with loose substrate such as sandy beaches and dried mudflats along the California coast. Western snowy plovers forage primarily on the wet sand at the beach-surf interface where they feed on small crustaceans, marine worms, insects, and amphipods. Nesting generally occurs between April 1 and September 15 but attempts as early as February have been documented. Overall, this species is in decline due to increased human disturbance, loss of feeding and nesting areas, and increased predation by birds and mammals.

Within the BSA, the beach, sandy dunes, and mudflats provide breeding and foraging habitat. Focused western snowy plover surveys are conducted each year during the nesting season at Tijuana Estuary. Monthly monitoring from early March through October 2020 was conducted at Border Field State Park and the Refuge in potential western snowy plover nesting areas (Patton 2020). Approximately 57 individuals were observed on March 5 with post-breeding roosting flocks reaching a high of 97 individuals on September 7.



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## California Least Tern

The California least tern is federally and state listed as endangered. The California least tern was listed by the USFWS on October 13, 1970 (35 FR 16047). This listing status applies to the entire population of California least tern. Critical habitat has not been determined by the USFWS, although there is an approved recovery plan for the species. The state listed the subspecies as endangered on June 27, 1971.

The species breeds from San Francisco Bay south to Baja California. In San Diego County, it is a fairly common summer resident from early April to the end of September (Unitt 2004). Significant nesting sites in the county include Mission Bay, Aliso Creek, Batiquitos Lagoon, mouth of Tijuana estuary, Chula Vista, North Island Naval Air Station, San Elijo Lagoon, and Lindbergh Field. Wintering areas are thought to be along the Pacific coast of South America. The species historically nested colonially on beaches that are undisturbed, sparsely vegetated, flat areas with loose, sandy substrate. Few beach nesting areas remain and least terns are now found in varied habitats ranging from mudflats to airports. Adults roost primarily on the ground. They typically forage in areas with water less than 60 feet in depth and within 2 miles of roosting sites, although they are considered opportunistic and often shift their behavior in response to local prey patterns (Atwood and Minsky 1983). This small migratory tern begins nesting in mid-May and is present at nesting colonies from April through August. The species nests in loose colonies in areas relatively free of human or predatory disturbance. Nests are on barren to sparsely vegetated sites near water, usually with a sandy or gravelly substrate.

Much of the least tern's habitat has been lost because of human development and disturbance, and there are likely few opportunities to create or restore habitat to increase the number of nesting sites (USFWS 2006). Subsequent management of nesting sites, including fencing and predator control at nesting colonies, contributed to an increase in the population in California to approximately 7,100 pairs in 2005 (USFWS 2006). In San Diego County, the least tern population has increased from approximately 500 pairs in the 1970s, to 2,100 to 2,800 pairs in 1997–2002, and to nearly 4,000 pairs in 2003 (Unitt 2004).

Within the BSA, California least terns have been observed breeding and foraging in available beach, dune, and intertidal habitats. Weekly focused surveys of California least tern colonies have been conducted each year during the nesting season, with the highest recorded population ranging between 358 and 400 pairs in 2003 (Tierra Environmental Services 2008). In 2005, surveys estimated approximately 326 to 391 nesting pairs (Tierra Environmental Services 2008). Weekly monitoring within the BSA in 2020 documented at least 203 nests initiated by 128 to 145 pairs between May 15 and July 16 (Patton 2020). Sixty-two to 67 estimated pairs established 97 nests

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on the upper beach immediately north of the mouth of the estuary, south of the barrier dune, while 66 to 78 pairs established 106 nests between the beach parking lot and Horse Trail at Border Field State Park.

### **State-Listed Species**

Of the 41 special-status wildlife species with potential to occur in the BSA, three species are listed as state threatened or endangered, were detected during previous studies, and are considered resident/breeding within the BSA. As noted above, least Bell's vireo is also included due to presence east of the BSA along the material transport route:

- Least Bell's vireo
- Light-footed Ridgway's rail
- California least tern
- Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*)

Least Bell's vireo, light-footed Ridgway's rail, and California least tern are also federally listed and are discussed above. Belding's Savannah sparrow is discussed in detail below.

#### Belding's Savannah Sparrow

The Belding's Savannah sparrow is a state-listed endangered species. Belding's Savannah sparrow is a resident from Santa Barbara County to northern Baja California. In San Diego County, populations are known from Tijuana Estuary, San Diego Bay, Mission Bay, San Dieguito Lagoon, Peñasquitos Lagoon, San Elijo Lagoon, Batiquitos Lagoon, Agua Hedionda Lagoon, Santa Margarita River mouth, and Aliso Creek mouth (Unitt 2004). Its preferred habitat is pickleweed-dominated coastal salt marsh associations. This habitat is where the species forages and breeds; however, it can also be found foraging on mudflats and beaches in the vicinity of its preferred habitat. The primary threat to the species is the massive loss of coastal salt marsh habitat that has occurred in recent years.

Appropriate habitat for this species, including salt marsh, mudflats, and beach, occurs throughout much of the BSA. Surveys conducted in 2004 in the southern arm of the estuary estimated approximately 116 to 179 pairs of Belding's Savannah sparrow (Tierra Environmental Services 2008). A portion of this survey area, south of Monument Road, accounted for approximately 75% of these observations. The BSA is considered north of Monument Road and therefore accounts for 25% of the total observations observed in 2004 (approximately 29 to 45 pairs). It should be noted that heavy rainfall during January 2005 resulted in the deposition of large amounts of sediment

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within the survey area located south of Monument Road. In particular, the southeast area lost approximately 70% of the pairs of Belding's Savannah sparrows observed within this same area during 2004 surveys (Tierra Environmental Services 2008). It is assumed pairs were displaced by sedimentation from the storm, and either perished or moved to survey areas north of Monument Road.

Surveys were conducted in April 2016 in support of the Border Field State Park Renovation Project. Approximately 107 to 118 Belding's Savannah sparrow territories were recorded in 2016 (Patton et al. 2016). Overall, surveys detected an increase in territories both north and south of Monument Road from 2015 to 2016, including territories within the BSA and extending east along Monument Road.

### **Nonlisted Special-Status Species**

In addition to the federally and state-listed species discussed above, four nonlisted special-status wildlife species were detected during previous studies and are considered resident/breeding within the BSA. Nonlisted special-status species with potential to occur in the BSA, but not detected during historic surveys, are not addressed further in text.

Nonlisted special-status wildlife species detected during previous studies and considered resident/breeding within the BSA include wandering skipper (*Panoquina errans*), Baja California coachwhip (*Colubur fuliginosus*), coast horned lizard (*Phrynosoma blainvillii*), and northern harrier (*Circus cyaneus*). These species are discussed below.

### **Insects**

#### Wandering Skipper

The wandering skipper is considered a species of special concern by CDFW (CDFW 2020c). The wandering skipper is distributed along the coast from near the mouth of the Santa Clara River to San Diego County (Emmel and Emmel 1973). It is restricted to estuarine and tideland habitats where adults are often associated with saltgrass. Adults are dull brown in color with a wingspan of about an inch. Emergence appears to occur from July through September but it is uncertain whether there is an earlier brood. Larvae utilize saltgrass as a food plant but females reportedly will deposit their eggs on other grass species and the larvae will occasionally feed on other thin-bladed grasses such as cordgrass and Bermuda grass (*Cynodon dactylon*; Williams et al. 1989; Emmel and Emmel 1973). Native nectar sources include deerweed (*Acmispon glaber*), marsh jaumea (*Jaumea carnosa*), heliotrope (*Heliotropium curassavicum*), and frankenia (*Frankenia*

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spp.). Adults have been observed using introduced species such as sea rocket (*Cakile maritima*), iceplant (*Carpobrotus* sp.), and chrysanthemum (*Chrysanthemum coronarium*) as nectar sources at Tijuana Estuary (Williams et al. 1989).

The wandering skipper has been historically detected within the BSA (Williams et al. 1989). Suitable breeding and foraging habitat is present throughout the BSA in areas where widespread coastal salt marsh is located. Given historical occurrences, it is a conservative assumption that the wandering skipper may inhabit coastal salt marsh within the BSA. Impacts to areas of existing salt marsh within the BSA have been avoided or minimized to the extent possible.

## **Reptiles and Amphibians**

### Baja California Coachwhip

The Baja California coachwhip is a CDFW species of special concern. This species generally occurs throughout Baja California and occurs mainly in coastal sand dunes, shrubland, and grassland habitats. In California, this species range is limited to the extreme southern edge of San Diego County (Fisher et al. 2000).

This species was historically detected within the estuary (Fisher et al. 2000). Because this is a historical record, it is unclear if this species occurred within the BSA or adjacent habitats of the estuary. Suitable coastal sand dune habitat for this species occurs within the BSA.

### Coast Horned Lizard

The coast horned lizard is a CDFW species of special concern. Historically, this species' range in California was along the Pacific coast from Baja California to about San Francisco Bay, west of the deserts and the Sierra Nevada. This species inhabits a wide variety of habitats including coastal sage scrub, chaparral, grassland, coniferous forest, oak woodland, and riparian forest. Loss of habitat and fragmentation have contributed to this species' decline.

This species has been historically detected in the dunes along the western portion of the BSA (Fisher et al. 2000). Suitable habitat for this species occurs in sandy or friable soils within open habitat areas. Given historical occurrences, it is a conservative assumption that the coast horned lizard may inhabit coastal salt marsh throughout the BSA.

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## **Birds**

### Northern Harrier

The northern harrier is a state species of special concern (CDFW 2020c). San Diego County lies at the southwest edge of the harrier's breeding range in North America (Johnsgard 1988). Northern harrier is an uncommon to fairly common winter visitor and rare and local summer resident in the coastal lowlands of San Diego County (Unitt 2004). Since the mid-1970s, some documented nesting locations in San Diego County include Marine Corps Base Camp Pendleton and Sweetwater River Estuary, Otay Ranch, and Proctor Valley (Unitt 2004). Harriers breed in marshes and grasslands and forage in grasslands, agricultural fields, wetlands, and open coastal sage scrub.

Home ranges and breeding territories are variable in size and probably reflect differing habitat resources (Johnsgard 1988). This species responds to local prey abundance and can therefore be spatially unpredictable. Reproduction is similarly flexible, with no long-term pair bonds and little site fidelity between years. Males are facultatively polygamous under conditions of abundant food.

Much of the BSA provides suitable nesting and foraging habitat for northern harriers. At Tijuana Estuary, at least three nests were documented within the BSA during Belding's Savannah sparrow surveys conducted in 2004 (Tierra Environmental Services 2008).

### **Potential Jurisdictional Wetland Areas**

#### Waters of the U.S. and State

For the purposes of this Restoration Plan, potential federal (U.S. Corps of Engineers [Corps]) and state (Regional Water Quality Control Board [RWQCB], CDFW and California Coastal Commission [CCC]) jurisdictional wetlands and waters are estimated using the single parameter of vegetation/habitat type. By using a single wetland parameter to determine potential jurisdictional resources, it is acknowledged that this assessment may result in an overestimation of federal jurisdictional wetlands and waters. Therefore, the estimate is conservative, and accounts for state jurisdictional waters and wetlands as well as federal jurisdictional waters and wetlands. The jurisdictional assessment was conducted in April 2021 and consisted of an informal mapping assessment of the BSA to identify the presence and/or absence of potential jurisdictional waters of the U.S. and state. Potential jurisdictional waters include subtidal and intertidal habitats as well as habitats that may be above the high tide elevation that are characterized by hydrophytic vegetation. Federal jurisdictional waters as regulated by the Corps also exist at the potential beach placement site below the high tide line.

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Within the restoration site, existing potential jurisdictional waters of the U.S. and state include approximately 110 acres of the following habitat types: subtidal, intertidal channels, low marsh, and mid-high marsh. It should be noted that the majority of existing habitats within the project limits are transitional, upland, nonnative upland, and salt panne/disturbed salt panne habitats, which are not anticipated to be jurisdictional resources. A formal jurisdictional delineation would be conducted following the completion of 100% design plans and specifications and prior to regulatory permit applications.

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## 3.0 RESTORATION PLAN OVERVIEW

### 3.1 PROJECT OBJECTIVES

The overall goals of this Restoration Plan are to improve ecosystem function (e.g., tidal prism), restore native salt marsh habitats, and advance the science of marsh restoration within the southern arm of Tijuana Estuary. Ultimate goals would be identified by the restoration alternative that is implemented. Overall project objectives include:

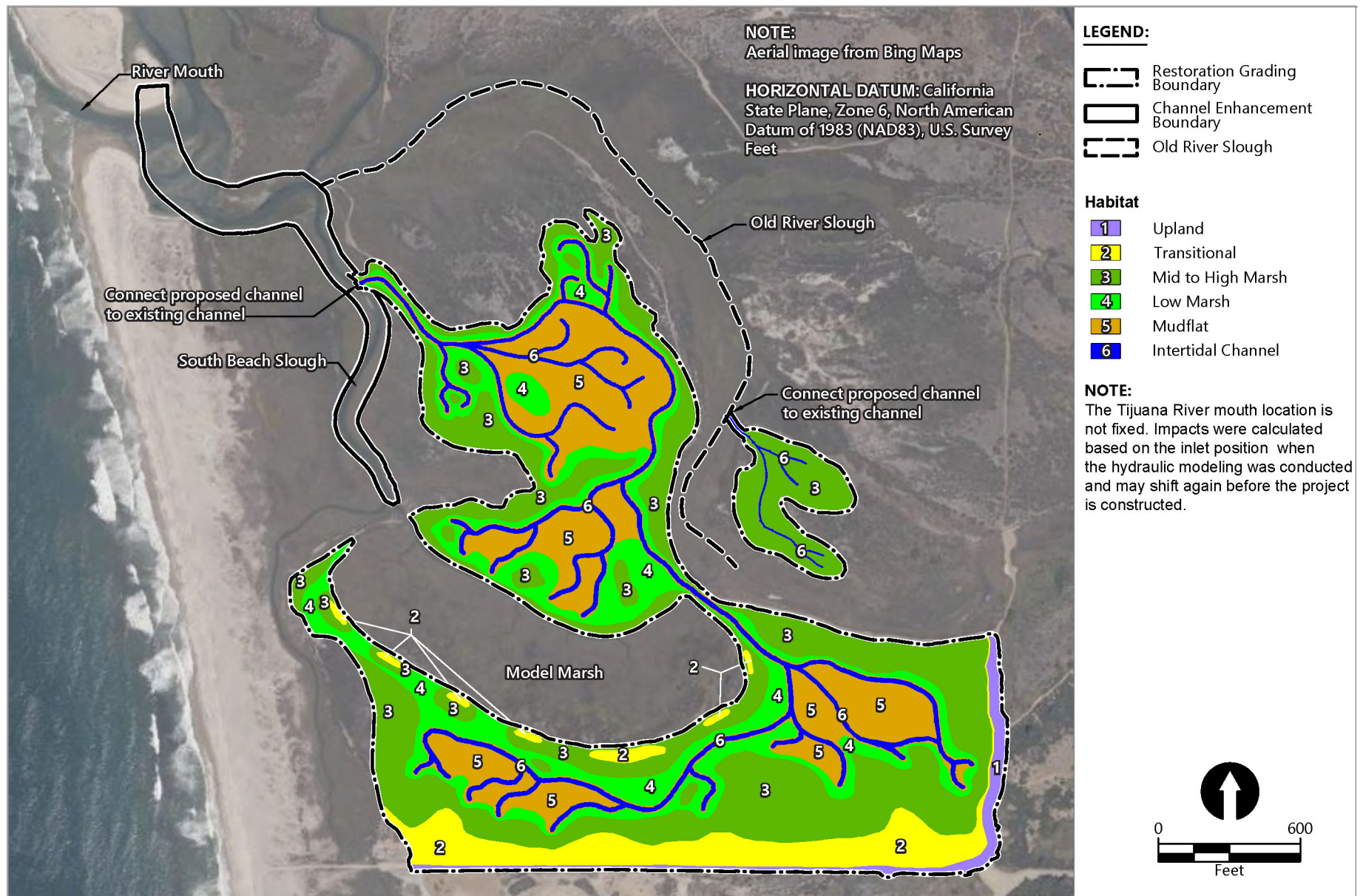
- Increase tidal prism.
- Restore areas of former salt marsh, tidal channel, and mudflat affected by sedimentation.
- Remove sand as needed to allow an open inlet to support water quality and reduce potential hyponix conditions.
- Restore barrier beach.
- Increase habitat for endangered species.
- Increase areas of undisturbed transition zone.
- Incorporate research and adaptive management into project design, implementation, and monitoring.

### 3.2 RESTORATION ALTERNATIVES

#### 3.2.1 Alternative 1

Alternative 1 was designed to maximize deeper intertidal habitats, such as mudflat, that would contribute to increasing tidal prism in the south arm of the estuary—a primary goal of TETRP II Phase I. Alternative 1 is shown in Figure 3-1 and includes the following major features:

- A network of intertidal channels to convey tidal flows;
- An emphasis on areas of intertidal mudflat, low salt marsh, and mid- to high salt marsh; and
- Transitional habitat (wetland to upland) along the southern boundary of the restoration site and on the south side of Model Marsh.



Source: Anchor QEA, 2021  
60604588 3-1 Alternative 1 Proposed HabitatDistribution.ai dbrady 04/07/2022

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San Diego County, California  
TETRP II Phase I Conceptual Restoration Plan

**FIGURE 3-1**  
**ALTERNATIVE 1 - PROPOSED HABITAT DISTRIBUTION**



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Alternative 1 would establish a network of intertidal channels to connect with existing tidal channels and the Tijuana River mouth. The primary tidal connection would be to the existing South Beach Slough, which feeds Model Marsh, extending south of the river mouth (Figure 3-1). This connection would be deepened to increase tidal flows into the proposed restoration area and would provide adequate tidal influence for the intertidal habitat restored under this alternative. A smaller tidal connection located to the north and east of the main restoration would connect to the existing Old River Slough to provide tidal influence for restored salt marsh habitat. To facilitate drainage of the restored wetlands during low tide, Alternative 1 would deepen the existing South Beach Slough to approximately +0.75 feet NAVD 88. This work may be done using hydraulic equipment, conventional equipment, amphibious equipment, or a combination of these construction methods.

The restored wetland area would be connected to the existing Model Marsh, providing hydraulic and functional connectivity between the two areas. Alternative 1 would provide refugia for roosting and nesting marsh bird species by establishing islands of mid- to high salt marsh and transition zone habitats within the low salt marsh (Figure 3-1). These would be placed in areas adjacent to channels to discourage terrestrial predators. The transitional area in the southern portion of the restoration area would provide a buffer between human/recreational uses and the wetland and would protect the wetland to some extent from sedimentation coming from upstream.

Research elements would be incorporated into Alternative 1 that (1) build off lessons learned in past modules, (2) better inform potential adaptive management of this phase, and (3) offer opportunities to learn lessons to apply to future restoration trajectories (both here and elsewhere). Such research elements include variations in slope of restored transition areas and establishment of “starter channels.” The slopes of transition zone habitat would be varied from flatter to steeper within the restoration area to test the effects of slope on plant establishment. Starter channels would be constructed as shallow depressions as opposed to fully excavated channels to test whether, over time, erosion could yield a similar land form with lower initial cost. Starter channels would be paired with fully excavated channels and are depicted as dashed blue lines in Figure 3-1.

Alternative 1 was originally designed with an emphasis on those habitats that contribute the most to tidal prism: intertidal channel, mudflat, low salt marsh and mid- to high salt marsh. The design target habitat areas, based on the historical elevation breaks for each habitat, are illustrated in Table 1. However, after an iterative process of hydraulic modeling (Anchor QEA 2021b), it was determined that tidal muting would occur in portions of the restored site depending upon position relative to tides at the estuary mouth. Such muting resulted in relative small changes in elevation breaks of each habitat but substantial differences in predicted habitat areas (Table 1). Originally designed to maximize mudflat and low salt marsh, the model predicts that Alternative 1 would instead maximize mudflat and mid- to high salt marsh. The Project Design Team decided, rather

than increase excavation to try and make up the predicted decrease in low salt marsh, to accept the model results for the increase in mid- to high salt marsh as this may act as a buffer for predicted sea level changes. It should be noted that the total for target low salt marsh plus mid- to high salt marsh (49.5 acres) is similar to the total for the modeled habitats (50.4 acres).

**Table 1**  
**Target Habitat Elevations and Target and Modeled Acreages for Alternative 1**

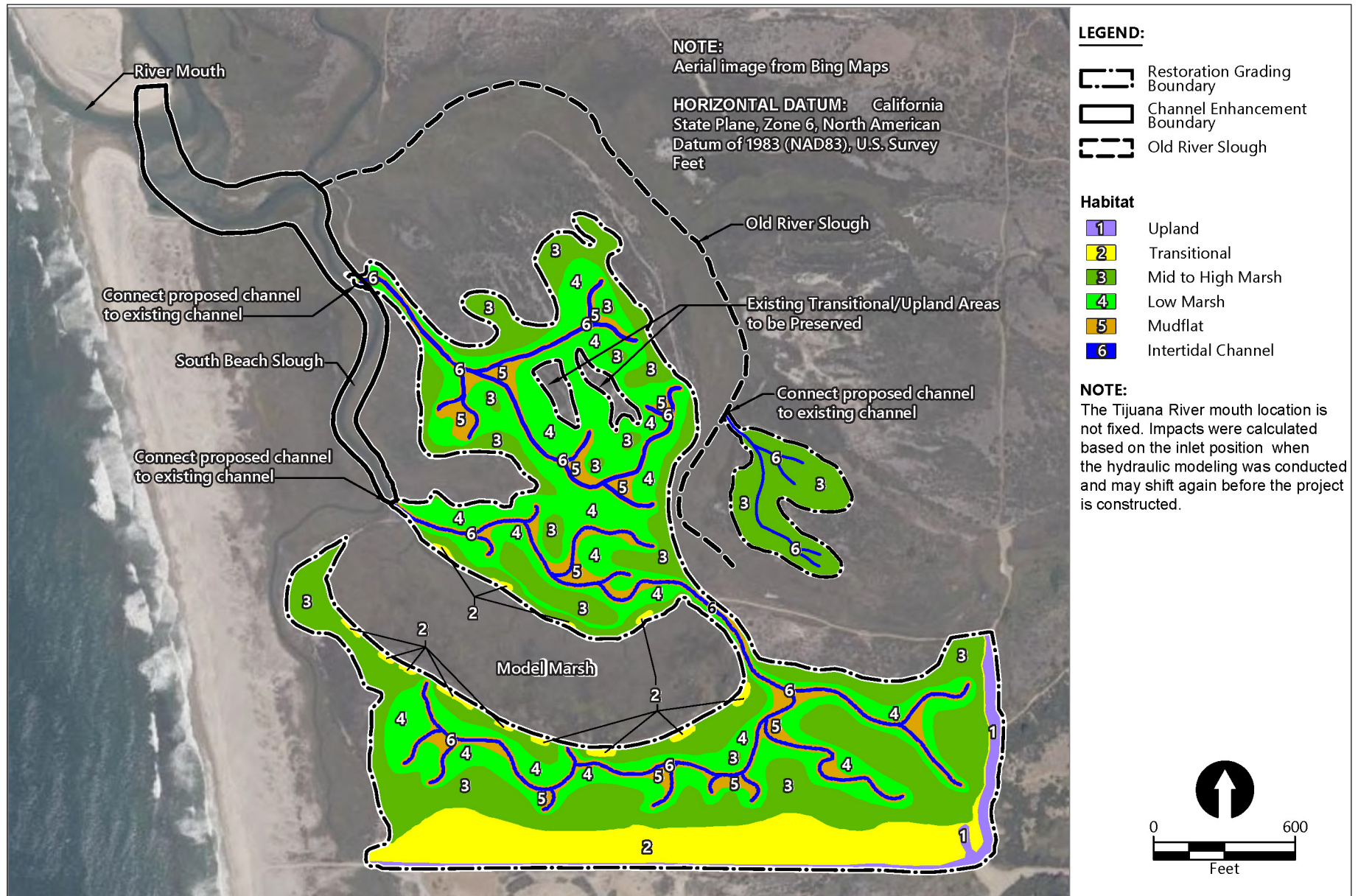
<b>Habitat Type</b>	<b>Target Elevation (feet NAVD 88)</b>	<b>Target Habitat Area (acres)</b>	<b>Modeled Habitat Area (acres)</b>
Upland	9.0 to 20.0	1.3	2.6
Transitional	7.0 to 9.0	9.1	9.0
Mid- to High Marsh	5.0 to 7.0	21.1	34.8
Low Marsh	4.5 to 5.0	28.4	15.6
Mudflat	3.5 to 4.5	20.4	18.0
Intertidal Channel	2.0 to 3.5	4.9	6.8
Total		85.2	86.8

Excavation to restore wetland habitats under Alternative 1 would generate approximately 585,000 cubic yards (cy) of sediment. Excavation may entail the use of aquatic-based equipment (e.g., dredge) and/or land-based equipment (e.g., excavator). Depending on the characteristics of excavated material, it could be used beneficially as a source of beach nourishment, or on-site as fill for transitional upland areas. The remainder of the sediment would be transported off-site.

### **3.2.2 Alternative 2**

Alternative 2 has been designed to preserve additional existing native plant communities compared to Alternative 1, including high salt marsh and transition zone in the northern portion of the restoration site and along the Old River Slough. Compared to Alternative 1, less area is devoted to restoration of mudflat, with an emphasis on restoration of low and mid- to high salt marsh.

Under Alternative 2, a network of tidal channels similar to Alternative 1 would be established, with connections to existing tidal channels at three points as compared to two connections for Alternative 1. These connections include two along the South Beach Slough and one at the Old River Slough (Figure 3-2). The primary tidal connection to Alternative 2 is the existing South Beach Slough, which would be deepened to increase tidal flows into the proposed restoration site. In addition, transition zone habitat would be restored along the southern portion of the restoration area and intermittently around the perimeter of Model Marsh. The primary differences between the two alternatives are the amount of mudflat restored versus low salt marsh; the total acreage of



Source: Anchor QEA, 2021  
60604588/Figure 3-3 Alternative 2 Proposed Habitat Distribution.ai dbrady 04/07/2022

**FIGURE 3-2**  
**ALTERNATIVE 2 - PROPOSED HABITAT DISTRIBUTION**

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restored versus preserved habitats; and the number of connections to existing tidal channels, resulting in a larger tidal prism overall within the estuary. The elevation and acreage of each habitat proposed for restoration under Alternative 2 are presented in Table 2.

**Table 2**  
**Target Habitat Elevations and Target and Modeled Acreages for Alternative 2**

<b>Habitat Type</b>	<b>Target Elevation (feet NAVD88)</b>	<b>Target Habitat Area (acres)</b>	<b>Modeled Habitat Area (acres)</b>
Upland	9.0 to 20.0	1.4	2.8
Transitional	7.0 to 9.0	11.8	11.8
Mid- to High Marsh	5.0 to 7.0	25.2	33.5
Low Marsh	4.5 to 5.0	30.9	22.9
Mudflat	3.5 to 4.5	7.4	6.4
Intertidal Channel	2.3 to 3.5	4.1	5.1
Total		80.8	82.5

Excavation to restore native habitats under Alternative 2 would generate approximately 521,000 cy of sediment. Depending on the characteristics of excavated material, it could be used beneficially as a source of beach nourishment, or on-site as fill for transitional upland areas. The remainder of the sediment would be transported off-site.

To facilitate drainage of the restored wetlands during low tide, Alternative 2 would deepen the existing South Beach Slough to approximately +0.75 feet NAVD 88, similar to Alternative 1. This work may be done using hydraulic equipment, conventional equipment, amphibious equipment, or a combination of these construction methods.

Alternative 2 would provide refugia for roosting and nesting marsh bird species during high tide conditions, by establishing islands of mid- to high salt marsh and transition zone habitats within the low salt marsh areas (Figure 3-2). These have been placed in areas adjacent to channels to discourage terrestrial predators. Like Alternative 1, research elements have been included in the design. These include experimental manipulation of restored transitional areas and experimental “starter” channels.

Hydraulic modeling determined that Alternative 2 is more hydraulically efficient (less muted) than Alternative 1 due to the three channel connections compared to two connections for Alternative 1. Furthermore, Alternative 2 provides a slightly greater tidal prism than Alternative 1, again due to greater hydraulic efficiency.

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## **4.0 RESTORATION PLAN IMPLEMENTATION**

The following section describes duties of responsible parties in more detail. In addition, access and staging, implementation steps and potential schedule, contour grading including construction drawings, site preparation, temporary irrigation, and the planting plan are discussed.

### **4.1 QUALIFICATIONS**

SWIA, in association with project partners CSP and the USFWS, is responsible for construction, maintenance, and monitoring in accordance with this Restoration Plan to successfully complete the restoration program. TRNERR staff would be responsible for long-term monitoring efforts. AECOM has been contracted by SWIA to prepare this Restoration Plan, as well as the EIR/EIS pursuant to the California Environmental Quality Act and National Environmental Policy Act, respectively. The EIR/EIS tiers off the previously certified 1991 TETRP EIR/EIS (SCH #881130221), where the larger restoration project was considered.

SWIA, in association with CSP and the USFWS, would retain contractors to implement remaining phases of restoration, including but not limited to preparation of final construction plans, drawings, specifications and bid documents; construction management; and restoration installation/maintenance (planting and irrigation). Post-construction monitoring would be conducted by TRNERR staff to carry out the provisions of this Restoration Plan. The contractors must meet the minimum requirements described below.

The following permits and approvals are likely to be required prior to project implementation:

- CCC Coastal Development Permit for work done on Border Field State Park and a Coastal Consistency Determination for work done on Tijuana Slough National Wildlife Refuge
- Corps Clean Water Act (CWA) Section 404 Nationwide Permit 27 (and others if appropriate)
- San Diego RWQCB CWA Section 401 Water Quality Certification
- USFWS Refuge Special Use Permit and Consultation pursuant to Section 7 of the Federal Endangered Species Act
- Consultation with CDFW pursuant to Section 2081 of the California Endangered Species Act

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- State Historic Preservation Officer /Tribal Historic Section 106 Consultation with the Corps and the USFWS
  - National Marine Fisheries Service Section 7 Consultation and Consultation pursuant to the Magnuson-Stevens Fishery Conservation Management Act

### **Restoration Ecologist**

The restoration ecologist would be an individual or team of individuals with a degree in botany, ecology, or related field, and a minimum of 5 years of experience with tidal wetland restoration in southern California. The lead restoration ecologist would have knowledge of the salt marsh vegetation associations proposed for the restoration effort and nonnative plant species of concern. The restoration ecologist, in coordination with the installation/maintenance contractor, would oversee protection of existing biological resources; nonnative plant removal; grading; site preparation; planting and seeding; and maintenance, monitoring, and reporting.

The restoration ecologist would be responsible for the following:

- Supervision of phases of restoration including contractor education, site protection, site preparation, plant installation, seeding, and final installation inspection and approvals as delineated in this section (Section 4) of this Restoration Plan; and
- The authority to stop work by the restoration contractor where the provisions of this Restoration Plan or permit conditions are not being adhered to until such times as the inconsistency is resolved with SWIA.

After planting and the required plant establishment period the restoration ecologist would be responsible for monitoring and remedial actions (regarding weeding, irrigation frequency, erosion control, and other issues) for ongoing maintenance activities performed by the maintenance contractor as specified in Sections 5 and 6 of this Restoration Plan.

Typically, the restoration ecologist would be responsible for carrying out the biological monitoring and reporting program delineated in Sections 6 and 8 of this Restoration Plan. However, for TETRP II Phase I, TRNERR has been tasked with post-construction monitoring. The program would include the following tasks: qualitative and quantitative data collection as required to measure success progress, photo documentation, post-installation monitoring reports documenting progress, consultation with regulatory agencies regarding project permits and agreements, and a final assessment and report of restoration success at the end of the 10-year monitoring period.

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## **Restoration Contractor**

The restoration contractor would be responsible for site protection, grading, contouring, planting, irrigation, and maintenance in accordance with the provisions of this Restoration Plan, as approved by SWIA, CSP, and the USFWS. In addition, the contractor would prepare a Storm Water Pollution Prevention Plan (SWPPP) and implement other requirements of the restoration program permits. These responsibilities would include those delineated in this section. The responsibilities of the restoration contractor would end with the completion of the requirements for the 120-day plant and hydrology establishment period.

The restoration contractor would verify in writing to SWIA prior to starting work the following minimal qualifications: a C-27 California Landscape Contractor's license and proof of certification as a California Pest Control Applicator for herbicide application to control nonnative plant species.

## **Maintenance Contractor**

After the 120-day plant and hydrology establishment period, the maintenance contractor (under contract with SWIA) would maintain plantings for the remaining balance of the 5 years according to the provisions of Section 5 of this Restoration Plan. SWIA may choose to use the same contractor for both planting and post-planting maintenance if the contractor meets project qualifications. Prior to starting work, the maintenance contractor would demonstrate the same qualifications as the restoration contractor.

## **4.2 IMPLEMENTATION SCHEDULE**

Implementation of the restoration effort would include demarcation of the work limits, removal and disposal of native and nonnative vegetation (e.g., clearing and grubbing), excavation and grading to restore tidal hydrology and drainage patterns, disposal or reuse of excavation soils, decompaction, site preparation, and planting and seeding. Active construction is anticipated to require approximately 12 to 19 months, depending on whether construction occurs during the bird breeding season. While construction has been scheduled to occur outside of the special-status breeding season (February 15–September 1) as feasible, construction may need to occur during the breeding season to some extent. Beach nourishment associated with soil management and periodic river mouth excavation activities would be restricted to outside the breeding season or after confirmation of no active nesting.

Erosion control measures would be implemented in accordance with the SWPPP during construction. Planting and seeding of native species should occur during the fall/winter months to

take advantage of winter rains to maximize germination success. A preliminary implementation schedule is proposed as shown in Table 3. Table 4 shows the preliminary monitoring schedule. The final implementation and monitoring schedules may vary based on funding availability, and agency review and approval.

**Table 3**  
**Preliminary Implementation Schedule**

<b>Task</b>	<b>Timeframe</b>
TETRP II Phase 1 EIR/EIS	2020–2022
Project Design and Construction Documents	2022–2024
Approved Final Restoration and Monitoring Plan	2022–2024
100% Plans and Specifications	2022–2024
Permitting	2023–2024
Contractor Selection	2024–2025
Demarcation of Work Limits and Staging Areas	Fall 2025
Excavation and Contour Grading	Fall 2025–2027
Site Decompaction	Winter 2028
Initial Container Planting and Seeding	Winter 2028
10-Year Maintenance and Monitoring Period	2029–2039

**Table 4**  
**Preliminary Monitoring Schedule**

<b>Task</b>	<b>Completed</b>
Construction/Implementation Monitoring	Fall/Winter 2025 through 2028
Qualitative Monitoring	Monthly Year 1 (2029), Quarterly Years 2 and 3 Semi-Annually Years 4 and 5 (late winter and late summer)
Quantitative Monitoring	Annually Years 1 through 10 (late summer)
Photographic Documentation	Semi-Annually Years 1 and 2 Annually Years 3 through 10
Performance Standards and Success Criteria	Annually Years 1 through 10 (late summer)

### 4.3 CONSTRUCTION PLANS

Construction drawings and specifications would be prepared concurrent with the Final Restoration Plan. Construction plans would incorporate the most current existing restoration site information available and be in accordance with aspects of the Final Restoration Plan; project design features and avoidance, minimization, and mitigation measures included in the EIR/EIS; and permit conditions required by regulatory agencies. Construction plans would include a restoration site plan showing proposed work areas and final site layout, special-status plant salvage and relocation guidelines (if necessary), grading plans, construction details, irrigation plans, and planting plans.



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#### **4.4 AS-BUILT CONDITIONS**

Once the site has been planted and the 120-day plant and hydrology establishment period is complete, the restoration ecologist and restoration contractor would prepare a summary of as-built information detailing changes (if applicable) in the restoration limits, contour grading, or planting or seeding (i.e., species and quantities) as compared to the approach and specifications provided in the Final Restoration Plan.

#### **4.5 MINIMIZATION AND AVOIDANCE MEASURES FOR SENSITIVE RESOURCES**

##### **Water Quality**

Grading for construction activities would remove vegetation and expose soil to erosion from wind and water. Erosion can result in sediment transport that ultimately flows into surface waters. A SWPPP that outlines best management practices (BMPs) to minimize erosion and sedimentation risks would be prepared to satisfy requirements of the RWQCB for 401 Certification and the Construction General Permit.

##### **Biological Resources**

A seasonally focused rare plant survey would be conducted to document sensitive plant populations on-site prior to construction. If sensitive plant species are identified within the proposed restoration footprint and avoidance is not feasible, salvage of plants and/or seeds and replanting within the restoration area would occur to the extent feasible.

Prior to restoration excavation, grading, or hauling, site boundary staking would be completed. Vegetation clearing would occur outside of the nesting season (February 15 through September 30) to avoid disturbance to birds protected by the Migratory Bird Treaty Act that may nest on-site, as well as the numerous sensitive bird species (e.g., California least tern, Belding's Savannah sparrow, light-footed Ridgway's rail) known to nest in the vicinity. A pre-construction survey would be conducted, and this construction window may be adjusted if nesting activities begin later or conclude earlier in the season, or non-disturbance buffers can be implemented to adequately protect nesting birds. Once the site is cleared of vegetation, restoration construction activities would be authorized. Due to the length of time required for construction, it may not be feasible or desirable to temporarily discontinue construction during the avian breeding season, which could result in an extended overall construction duration. If ground nesting birds nest within the restoration project during construction, a non-disturbance buffer would be established by the

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project restoration ecologist in coordination with the USFWS and Refuge Manager. The Final Restoration Plan would be updated to meet resource agency permitting requirements in regard to minimization and avoidance of sensitive species. Biological monitoring and other relevant avoidance measures outlined in the TETRP II Phase 1 EIR/EIS would be implemented during construction for nesting birds and other species of concern.

## **Cultural Resources**

Although no known significant cultural resources are present within the project APE, there is potential that subsurface cultural resources may be encountered during grading and excavation.

A series of cultural monitoring and mitigation measures would be implemented in accordance with applicable federal and state laws, regulations, and policies in order to avoid impacts to cultural resources or reduce unavoidable impacts to a less than significant level. These treatment measures include, but are not limited to, the following:

- Preparation of an Archaeological Monitoring Plan will be required to outline the monitoring requirements and procedures for the protection of known archaeological and cultural resources and the proper handling of inadvertent discoveries. A qualified archaeological monitor and cultural monitor will monitor excavation in areas with the potential for resources. Measures for actions to be taken in the event of discoveries will be outlined in the plan. The plan will also include protocols pursuant to the California Public Resources Code and the Native American Grave Protection and Repatriation Act depending upon the land ownership in the event that human remains are encountered during project implementation.

CSP and the USFWS would coordinate with cultural/tribal cultural contacts to ensure cultural resources requirements of the restoration program are implemented during planning, construction, and post-construction monitoring phases, as required.

## **4.6 SITE ACCESS**

Prior to commencement of restoration activities, the limits of work within the restoration site would be surveyed and marked in the field. These limits would be checked and confirmed by the restoration ecologist before the contractor begins vegetation clearing in preparation for restoration construction.

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Vehicle and equipment access to the restoration site would be available to contractors who would be conducting restoration construction, installation, maintenance, and monitoring activities. Access and staging at the restoration site would be conducted in a manner that avoids direct and indirect impacts to adjacent native habitat areas.

To protect against contaminant leakages during access and staging, the contractor would be responsible for implementing required BMPs, as presented in applicable mitigation measures and the contractor's SWPPP, to prevent chemicals, fuels, oils, and other hazardous materials from entering public water, air, and soils. Disposal of materials, wastes, effluent trash, garbage, oil, grease, and chemicals would be done in accordance with state and federal regulations.

#### **4.7 NATIVE AND NONNATIVE PLANT REMOVAL AND CONTROL**

Treatment of nonnative plant species would begin when vegetation removal on the restoration site is initiated, and would occur on a monthly basis or as needed during construction activities. Initial removal of vegetation would occur primarily through mechanical clear and grub activities prior to excavation and contour grading. Nonnative vegetation biomass within the restoration footprint would be properly disposed of off-site to prevent nonnative propagules (i.e., seed or vegetative material) from spreading to adjacent areas. Native species may be salvaged for replanting or propagation, if appropriate. The excavation and contour grading phase would begin once above-ground vegetation is removed and sensitive native plants are salvaged as confirmed by the restoration ecologist. Once contouring and decompaction of the restoration site are completed, nonnative control during the planting phase and post-construction maintenance period would occur, primarily through physical means and herbicide treatment.

#### **4.8 GRADING, EXCAVATING, AND SOIL MANAGEMENT**

The scope of work for the restoration contractor would include soil excavation, grading to prepare the restoration site for salt marsh installation, and removal and disposal of excavated material. Proposed grading for Alternative 1 or 2 would improve physical and hydrological conditions for the establishment of desired habitats. Grading would improve drainage patterns; increase areas appropriate for salt marsh, transitional, and upland habitat establishment; and establish primary tidal flow and low-flow channels within the restoration site. As the proposed site elevation ranges from +2 to +20 feet NAVD 88, substantial grading would be required to restore tidally influenced habitat areas. Generally, habitats range in decreasing elevation from transitional, mid-high salt marsh, low salt marsh, mudflats, and intertidal habitats. Reconfiguring the restoration area may be accomplished by dredging in some areas and the use of land-based equipment in others.

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Approximately 585,000 cy of sediment would be excavated to achieve the desired elevations within the restoration site under Alternative 1. Depending on the characteristics of excavated material, it could be used beneficially as a source of beach material, or on-site as fill for transitional areas where site elevations need to be higher. In the process of sediment removal, Alternative 1 would reuse excavated material to create higher elevation areas to the extent feasible. The remainder of the sediment would be beneficially reused as beach replenishment or transported off-site for disposal at a suitable site.

Approximately 521,000 cy of sediment would be excavated to achieve the desired elevations within the restoration site under Alternative 2. As with Alternative 1, the remainder of the sediment would be beneficially reused as beach replenishment or transported off-site.

To facilitate drainage of the restored wetlands during low tide, both alternatives would deepen the existing South Beach Slough to approximately +0.75 feet NAVD 88. This work may be done using hydraulic equipment, conventional equipment, amphibious equipment, or a combination of these construction methods.

#### **4.9 EROSION CONTROL AND BEST MANAGEMENT PRACTICES**

To minimize erosion from the restoration site during construction, silt fences, fiber rolls, and/or straw wattles and other BMPs would be implemented in accordance with the SWPPP. BMPs damaged or lost due to storm events or construction activities would be replaced or repaired at the direction of the qualified SWPPP practitioner provided by the contractor. Minimal erosion from the restoration site is expected during implementation; however, the appropriate BMPs would be installed, if needed, to prevent siltation from entering existing salt marsh or other wetland areas adjacent to the restoration site.

#### **4.10 TEMPORARY IRRIGATION**

Irrigation is essential to establish native plant species in habitats other than low and mid-salt marsh and to prevent stress. Stress may be due to lack of water and high salt content within restoration site soils. Hand watering via a portable water truck is not feasible for the proposed project due to the size of the restoration area and because access routes to the majority of the restored marsh would not be retained post-construction. A temporary on grade irrigation system would be installed within much of the restoration site, including portions of the upper mid-high marsh and transitional habitats. A water point of connection (POC) would be identified in the construction plans. The POC is anticipated to be located near Monument Mesa where a POC has been used for past projects. No irrigation would be installed within the lower mid- and low salt marsh because tidal

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influence is expected to support the salt marsh vegetation. Irrigation is proposed to facilitate plant establishment depending on local climatic conditions, such as temperature, rainfall, and potential extended drought conditions.

#### **4.11 PLANTING PLAN**

Implementation of TETRP II Phase 1 would result in the restoration of approximately 75.2 or 67.9 acres of wetland habitats (Alternatives 1 and 2, respectively) as predicted by hydraulic modeling (see Tables 1 and 2). Wetland habitats are defined as intertidal channel, intertidal mudflat, and low and mid-high salt marsh. Currently, the majority of habitats within the proposed restoration site can be best described as disturbed to highly disturbed. This habitat would be temporarily impacted, as presented in Section 4.12. Once the restoration process is complete, the quality of vegetation, proportion of total vegetation cover, and proportion of open space in the restored marsh would be improved relative to current conditions. The restoration project would restore intertidal wetland habitats and transition habitat and return essential tidal flushing to the project area. Restoration goals for the establishment of native vegetation within the restoration site are outlined below.

##### **Restored Habitats**

Intertidal channel and mudflat areas do not support vegetation and, therefore, would not be planted.

Low marsh in southern California salt marshes is dominated by California cordgrass (*Spartina foliosa*), which forms a dense canopy approximately 3 feet in height. This is the preferred nesting habitat of light-footed Ridgway's rail, a federally and state-listed endangered bird. Creation of this habitat is critical to the recovery of this species in the region.

Although mid-high marsh is typically dominated by Pacific pickleweed, several other plant species are associated with this community. In past restoration projects in the San Diego region, the natural recruitment of pickleweed has been highly successful, and this species may even become excessively dominant if planted. Therefore, this species would not be planted but allowed to colonize the restoration site naturally (Nordby 2018).

Transitional habitat is the zone of habitat that represents an elevational gradient from infrequently tidally influenced marsh to non-tidal upland. Due to the loss of this habitat on the periphery of most southern California wetlands, and the variation that can occur from within this habitat type and between different wetlands, the function is not well understood. Some researchers believe it is an important connection between wetlands and upland habitats, even if disjunct from adjacent salt marsh habitat. For example, Belding's Savannah sparrow may nest in the transition zone but

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depend on both the upland and wetland habitats for foraging, and light-footed Ridgway's rail may use this habitat as refugia during high tides. For TETRP II Phase I, the transition zone is that area between the high marsh and the disturbed habitats that currently typify the restoration site. Transitional habitat supports a variety of wetland plant species and some upland species.

## **Habitat Planting Plan**

To achieve the project restoration goals, tidal and non-tidal habitats must be established within the restored areas. These areas are divided into habitat zones: intertidal channels and starter channels, mudflat, low marsh, mid-high marsh, and transitional. As stated previously, intertidal and starter channels and mudflat would not be planted. Detailed descriptions of planting plans for each habitat zone are provided below.

### Low Marsh

The restored low marsh areas would be planted exclusively with California cordgrass. It is proposed that cordgrass be obtained from existing low marsh habitat within Tijuana Estuary to maintain genetic integrity.

Cordgrass reproduces primarily asexually from new shoots produced at the nodes of rhizomes and the base of culms. Seed produced through sexual reproduction has very low viability. Therefore, establishment of low marsh habitat would include collection and planting of cordgrass root divisions, or “plugs.” Cordgrass plugs are obtained by dividing existing stands of cordgrass into small divisions composed of two to five growing stems and attached rhizomes. Each cordgrass plug is approximately 4 to 6 inches in diameter and includes attached native soil to buffer the plant from transplant shock. Plugs are harvested by hand, transported to the transplant site, and replanted within 24 hours. Cordgrass plantings would receive tidal inundation and would not require irrigation. Cordgrass plantings would be spaced at 6 feet on center (o.c.) and would be only obtained from Tijuana Estuary to avoid unintentionally introducing nonnative soil organisms that are present in other wetlands such as San Diego Bay (Table 5).

### Mid-High Marsh

The mid-high marsh zone would be planted with equal proportions of saltwort, saltgrass, alkali heath, marsh jaumea, sea lavender (*Limonium californicum*), shoregrass, Parish's pickleweed (*Arthrocnemum subterminale*), estuary sea-blite, and arrow grass (*Triglochin concinna*). Species would be propagated from cuttings or seed harvested from the existing salt marsh in Tijuana

**Table 5**  
**Plant Species to Be Planted within Each Habitat**  
**Zone with Propagule Type and Method of Establishment**

Habitat Type	Elevation (Feet, NAVD 88)	Spacing	Plant Species (Scientific Name)	Propagule Type and Method of Establishment
Low Marsh	4.5 to 5.0	3 feet on center (o.c.)	<i>Spartina foliosa</i>	Rooted plugs Allow to naturalize
Mid-High Marsh	5.0 to 7.0	3 feet o.c.	<i>Arthrocnemum subterminale</i> <i>Batis maritima</i> <i>Distichlis littoralis</i> <i>Distichlis spicata</i> <i>Frankenia salina</i> <i>Jaumea carnosa</i> <i>Limonium californicum</i> <i>Suaeda esteroa</i> <i>Triglochin concinna</i>	Rosepots Allow to naturalize
Transition Zone	7.0 to 9.0	3 feet o.c.	<i>Arthrocnemum subterminale</i> <i>Cressa truxillensis</i> <i>Frankenia salina</i> <i>Distichlis littoralis</i> <i>Distichlis spicata</i> <i>Lycium californicum</i> <i>Suaeda nigra</i> <i>Atriplex canescens</i>	Rosepots and seed Allow to naturalize

Estuary. Individual plants would be grown to suitable size in 2.25-inch-wide, 3-inch-deep “rosepot” liners (Table 5). Rosepots would be planted at 3 feet o.c. spacing and irrigated as described above.

#### Transition Zone

The transition zone would be planted with equal proportions of alkali weed (*Cressa truxillensis*), saltgrass, boxthorn (*Lycium californicum*), shoregrass, Parish’s pickleweed, and bush seepweed (Table 5). Species would be propagated from cuttings or seed harvested from the existing salt marsh in Tijuana Estuary. Individual plants would be grown to suitable size in rosepot liners. Supplemental seeding of the same species would also occur in the transition zone. Rosepots would be planted at 3 feet o.c. spacing and irrigated as described above.

#### **Plant Layout and Installation**

To ensure adequate establishment and balanced representation of each species within the mid-high marsh and transition zones, plantings would occur in groupings. Specifically, each species would be planted in groupings of three to nine individuals in a reasonably random grouping pattern within the planting zone. To ensure that large monoculture plant groupings do not result, each species

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grouping would not occur immediately adjacent to another grouping of the same species. This method should result in a mosaic of species within each habitat zone that mimics the distribution of species in natural marsh systems.

When initiating the planting pattern, care would be taken to ensure that the first row of plants is spaced 2.5 to 3 feet from the edge of the planting zone. This measure would ensure adequate spacing is maintained between adjacent planting zones. Initially these plantings would appear sparse, but plantings are expected to establish quickly and naturalize within 3 to 4 years to form dense cover typical of undisturbed native salt marsh habitats.

The majority of plant material would be provided in rosepot liners that have been used in previous salt marsh restoration projects at Tijuana Estuary. Plants would be planted in holes of sufficient depth to accommodate the root mass and attached soil. Holes would then be back-filled with native soil. Care would be taken to ensure that the entire root mass is buried and not exposed to air and sunlight.

Many of the wetland plants selected for restoration planting already occur within the restoration site. These plants can be a valuable source of propagules for use in replanting. Where possible, these existing plants may be salvaged and stored on-site for subsequent replanting in the restoration site. If plant salvage occurs early in the restoration process, plants would be maintained on-site in shallow, plastic-lined trenches and watered using a water truck. This method has been successfully employed at other regional wetland restoration projects.

Experiments involving container plants or planting may be incorporated into the large-scale planting efforts.

#### **4.12 IMPACTS TO JURISDICTIONAL WATERS**

Historically, the Tijuana River valley was dominated by an array of wetland habitat types, including perennial, seasonal, or ephemeral habitats, which when combined covered more than 75% of the river valley (Safran et al. 2017). A narrow strip of beach and dune separated the estuary from the ocean, excluding the inlet (Safran et al. 2017). Tijuana Estuary extended approximately 2.8 miles along the coastline and 1.25 miles inland with a variety of estuarine habitat types, including salt marsh, salt flats, intertidal mudflat, and subtidal channels (Safran et al. 2017). The salt marsh plain was historically dominated by pickleweed where vegetated areas covered the estuary more than three times as compared to unvegetated tidal habitats. Increasing development within the watershed has led to a loss of dune habitat along the coastline and salt marsh vegetation within the estuary. In more recent years, deposition of sediment borne flows of trans-border



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canyons have contributed to the degradation of the southern arm of the estuary. Impacts to jurisdictional waters are identified below; impacts to non-jurisdictional vegetative cover types would also occur and are detailed in the EIR/EIS.

Approximately 110 acres of potential federal (Corps) and state (RWQCB and CCC) jurisdictional wetlands and waters exist within the biological study area. Alternative 1 would potentially result in up to 20.5 acres of disturbance to potential federal and state jurisdictional wetlands and waters (including up to 12.7 acres of beach that may be used for beach nourishment during soil management or periodic excavation of material from the river mouth). Alternative 1 would include approximately 75.2 acres of salt marsh, intertidal mudflat, and intertidal channel within the restoration site after construction is complete.

Alternative 2 would potentially result in up to 20.8 acres of disturbance to potential federal and state jurisdictional wetlands and waters, including 12.7 acres of beach as noted for Alternative 1. Alternative 2 would include approximately 67.9 acres of salt marsh, intertidal mudflat, and intertidal channel within the restoration site after construction is complete.

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## **5.0 MAINTENANCE ACTIVITIES DURING THE 120-DAY PLANT AND HYDROLOGY ESTABLISHMENT PERIOD AND 5-YEAR MAINTENANCE PERIOD**

The following section outlines maintenance activities that would occur during the 120-day plant and hydrology establishment period and 5-year maintenance period. After planting and irrigation installation has been completed, a 120-day (4-month) plant and hydrology establishment period would begin. At the completion of planting, the contractor would request a pre-maintenance inspection by the restoration ecologist. The restoration ecologist would prepare a “punchlist” of correction items for completion by the contractor. After “punchlist” items are corrected, the restoration ecologist would recommend to SWIA that the landscape phase is complete and that the 120-day plant and hydrology establishment period has begun. During the plant establishment period, the contractor would provide regular maintenance of the restoration site, including trash removal, erosion control, and nonnative plant treatment.

The hydrology of the restoration site would be observed throughout the 120-day plant and hydrology establishment period to determine that the site is functioning as intended. Monitoring during the 120-day plant and hydrology establishment period is described further in Section 6.

### **5.1 MAINTENANCE SCHEDULE**

The plant and irrigation installation contractor would be responsible for maintenance during the 120-day plant and hydrology establishment period, and the maintenance contractor would be responsible for the remainder of the scheduled 5-year maintenance period. The contractor would perform maintenance approximately once a month during the first 4 months (i.e., 120-day plant and hydrology establishment period). The maintenance contractor would perform maintenance approximately monthly during the next 8 months of Year 1; every 2 months during Year 2; and quarterly during Years 3, 4, and 5. Maintenance may be needed more frequently, for example, to perform remedial measures (e.g., replanting, erosion control, protection from herbivores). The contractor would coordinate with the restoration ecologist on a regular basis to determine priority maintenance activities during different periods of the restoration program. The primary maintenance obligations are presented below.

### **5.2 NONNATIVE PLANT SPECIES CONTROL**

Nonnative plants would be eradicated wherever they occur within the restoration area. Based on the species observed during future site monitoring, the restoration ecologist would update the list

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of the species that need to be removed. Nonnative plant species would be removed from the restored habitats until the native plants are established.

Nonnative plants would be removed either before they become 12 inches high or they set seed. Nonnative plants, including invasive exotics, would be hand-pulled, cut, and treated with herbicide, or just treated with herbicide. No mechanical methods or hand tools (such as a shovel) would be used to excavate nonnative species, as the soil disturbance often results in additional nonnative recruitment. If root systems of particular nonnative plants that are in a young/small stage cannot be feasibly removed with hand pulling, herbicides may be applied under the supervision of a licensed Pest Control Advisor by a licensed applicator with permission of the USFWS. Weed debris would be properly disposed of off-site. If nonnatives reach maturity (indicating inadequate maintenance frequency) and have either flowered or set seed, they would be cut and transported off-site. The remaining vegetative base would be treated with herbicide.

Herbicides would be used judiciously in accordance with label instructions and in compliance with state and federal laws. If weed ecology information indicates herbicide application is necessary to eradicate certain species, then it is recommended that direct application (instead of foliar sprays) and selective herbicides be used.

### **5.3 TRASH AND DEBRIS REMOVAL**

The maintenance contractor would remove trash and debris from the restoration area during regular maintenance visits and properly dispose of it off-site. The maintenance contractor would exercise care so that trash removal activities minimize or avoid impacts to plantings in the restoration area. Organic debris such as dead limbs provides habitat value for wildlife and may be left in place.

### **5.4 PEST CONTROL**

During monitoring site visits, the restoration ecologist would inspect plants for evidence of insect damage and diseases. Only minor pest control efforts, if necessary, are expected to be required to achieve restoration success. Plants that are severely diseased would be removed and replaced to prevent the spread of disease and insects. Pesticides would be largely avoided unless recommended for special problems by the restoration ecologist.. Pest control measures that require pesticide use would be recommended by a licensed Pest Control Advisor with review and input by the restoration ecologist and the USFWS.

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## 5.5 IRRIGATION

The goal of the low marsh restoration is to match the grades of the adjacent salt marsh that is inundated by diurnal tides. Therefore, much of the site should not require irrigation. However, the higher marsh, and transition zone would be less influenced by tides. In portions of the restoration receiving infrequent or no tidal inundation, supplemental watering would be required to support the establishment within these higher elevational zones.

Irrigation of new plantings is most critical within the first 6 months after planting and becomes less critical as plants develop greater root mass over time. The restoration ecologist would coordinate with the planting or maintenance contractor on appropriate times to water during different times of the year. Modest watering would promote the establishment of hearty plants with well-developed root systems. The schedule for watering would be adjusted accordingly during the maintenance period, depending on factors such as plant size and health, and weather conditions. Generally, watering would be used to supplement rainfall (to simulate an average to above-average rainfall year) and would be used modestly during the summer months. As habitat becomes established, the watering schedule would be reduced and would eventually phase out supplemental watering. It is expected that some of the different habitat areas would be self-sufficient by the end of Year 2 and would not require additional supplemental irrigation. However, some areas, most likely discrete locations within high marsh, would require some additional irrigation after the second year. These discrete locations are areas that may also require adaptive management such as supplemental planting. If additional supplemental irrigation is necessary, it would most likely be the result of periods of prolonged drought, as have occurred periodically within the last 10 years in San Diego County. Irrigation systems would be removed once an area or habitat is determined self-sufficient, likely 3 to 4 years after installation. This may occur in different areas at different times.

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## **6.0 RESTORATION SITE MONITORING**

The following section outlines the monitoring program from installation to successful performance completion. In addition, success standards are proposed.

### **6.1 CONSTRUCTION/IMPLEMENTATION MONITORING**

The restoration ecologist would coordinate with the construction contractor and SWIA to monitor the restoration site's implementation, as described in Section 2, including initial grading, contouring, native planting and seeding, irrigation installation, and the 120-day plant and hydrology establishment period, to ensure that restoration is performed in accordance with the Final Restoration Plan. During this period, the restoration ecologist would prepare a brief weekly memorandum that reviews implementation progress, which would be submitted to SWIA. The construction contractor would be responsible for the 120-day plant and hydrology establishment period after grading, erosion control, and native plant installation and irrigation system installation are completed to ensure that the restoration site meets certain success criteria and is established in a desirable manner prior to the start of the 5-year maintenance period and 10-year monitoring program. The construction contractor would receive approval from the restoration ecologist and SWIA to indicate a successful implementation and 120-day plant and hydrology establishment period before the start of the 5-year maintenance period and 10-year monitoring program. As stated in Section 4.1 of this Restoration Plan, TRNERR would be responsible for the 10-year monitoring program. The restoration ecologist would inspect and approve progress at the following times:

- During demarcation of the restoration site boundaries;
- During grading and contouring of the restoration site;
- At the end of grading and contouring of the restoration site;
- Two months prior to plant inspection at the nursery;
- After completion of soil decompaction before the start of planting;
- After installation of the irrigation system;
- At the time of container plant delivery for inspection by the restoration ecologist to confirm the receipt of the correct species and that the plants are healthy, disease free, and of proper size prior to planting;

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- At the time of final container plant layout to ensure correct ecological positioning;
  - At the time the contractor requests inspection to confirm installation is complete; and
  - At completion of the 120-day plant and hydrology establishment period.

## **6.2 120-DAY PLANT AND HYDROLOGY ESTABLISHMENT PERIOD**

After planting and irrigation installation is completed, a 120-day plant and hydrology establishment period would begin.

The hydrology of the restoration site would be observed throughout the 120-day establishment period to determine that the site is functioning as intended. Inundation of the salt marsh would be observed on neap and spring high and low tides to qualitatively assess whether the elevations of the restored marsh have been correctly attained and whether there has been shoaling at tidal creek connections. Inundation at the restored marsh would be compared to natural salt marsh north of the restoration site. Should tidal connections begin to shoal and cause tidal muting within the restoration area, remedial excavation may be necessary. Such excavation would likely require a wetland excavator, barge-mounted excavator, or a small dredge.

At the end of the 120-day plant and hydrology establishment period, the restoration ecologist would flag dead and diseased plant materials requiring replacement, and prepare a final maintenance “punchlist” of correction items. After the installation contractor has satisfactorily completed the “punchlist,” the restoration ecologist would recommend acceptance of the 120-day plant and hydrology establishment period to SWIA.

## **6.3 QUALITATIVE MONITORING**

A restoration ecologist would direct the restoration program’s qualitative monitoring. The goal of this monitoring is to proactively assess site conditions to address issues before they become a problem. Qualitative monitoring would include performing pre-construction environmental education and performing required construction inspections described above. An important feature of qualitative monitoring is effective coordination with the construction and maintenance contractor(s) to exchange information, provide feedback, and agree on priority maintenance items and potential remedial measures during different stages of the restoration. The restoration ecologist would perform qualitative monitoring throughout the installation period and the 5-year maintenance period and 10-year monitoring program. Each qualitative visit would focus on soil conditions (e.g., moisture and fertility), container plant health and growth, seed germination rates,



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presence of native and nonnative plant species, significant disease or pest problems, and erosion problems.

The restoration ecologist would inspect progress on a daily basis during construction, and then at least once a month during the 120-day plant and hydrology establishment period. The restoration ecologist would monitor the restoration area quarterly during the first 2 years of the 10-year monitoring program, semi-annually during Years 3 and 4, and annually during Years 5 through 10. During each qualitative site visit, the restoration ecologist would conduct a site overview of the restoration site to evaluate the following:

- Overall site conditions;
- Overall hydrological functions;
- General condition of plants, including plant health/vigor and mortality;
- Seed germination rates;
- Native plant recruitment; and
- Potential issues, including hydrology, irrigation (too much or too little), invasive nonnative species of concern), vandalism, and other problems that need to be addressed by the construction or maintenance contractor.

It is unrealistic to require a formal plant count, as plant installation comprises primarily large quantities of small rosepot (liner) plantings. As such, the restoration ecologist would be responsible for a visual estimate of plant survival and condition during qualitative visits. During each annual late-summer site visit, the restoration ecologist would assess the need for potential remedial planting during the winter. Recommendations may include container planting and broadcast seeding.

Following each qualitative site visit, the restoration ecologist would prepare a short memorandum, as described in Section 8. These memoranda would focus on issues such as replacement of dead or diseased plants, weeding, irrigation scheduling, trash removal, and pest control. In addition, the restoration ecologist would coordinate with the construction or maintenance contractor for the following:

- Scheduling upcoming maintenance based on the maintenance needs and priorities at the restoration site;

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- Walking the restoration site to identify potential problems, including erosion, irrigation damage, occurrence of invasive nonnative species, and potential human impacts such as from vehicles and vandalism;
  - Providing support to field maintenance crew in the identification of native and nonnative species; and
  - Determining an irrigation schedule (for a given period of time) based on seasonal and annual variation in rainfall, native plant water requirements, and site-specific conditions (e.g., soil condition and slope).

## **6.4 QUANTITATIVE MONITORING**

The quantitative monitoring methods and performance standards presented in this section should be considered recommendations that may be subject to refinement or change in the future depending upon the requirements of potential funding sources and regulatory permit conditions. This Restoration Plan may be revised once funding has been secured and permits acquired.

TETRP II Phase I is being implemented as a restoration project and, thus, does not have specific mitigation requirements. Therefore, while quantitative monitoring includes a number of variables, only vegetative cover and tidal prism have been established as performance standards to confirm project success (success criteria). As the primary goals of the project are to increase tidal prism and restore valuable wetland habitats that can support a suite of ecologically valuable plants and animals, monitoring of these variables would indicate the success of the project, provide information that can help drive adaptive management decisions, and contribute to overall understanding of marshes and their restoration. Variables to be monitored include hydrology, topography/bathymetry, tidal regime, water quality, soil salinity, aquatic invertebrates, birds, and fish. While these resources would be monitored to demonstrate that the project has achieved its objectives, for example an increase in tidal prism, and to inform potential adaptive management measures, they are not presented with specific success criteria, for example, absolute numerical criteria, such as percent increase compared to pre-project conditions or relative criteria, such as comparison with reference sites.

The sampling protocol described below should be considered a general guideline to be potentially refined in a Final Restoration Plan. Furthermore, once the Final Restoration Plan is implemented, it should be reviewed and modified annually to ensure that the monitoring program is addressing the intended issues. This would be done in consultation with the TETRP Science Advisory Team and would be in the context of prior work at Tijuana Estuary and the region. This includes pre-

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restoration monitoring at the TETRP site and SONGS mitigation monitoring in the northern arm of the estuary, as well as the EPA Wetlands Monitoring Manual for Southern California.

## **Vegetative Cover**

Vegetative cover would be monitored annually at the end of the growing season, typically August and September. Vegetative cover can be assessed from aerial photographs and/or through collection of cover data along permanent transects. Transect data may be used to ground-truth the results of aerial photography analysis. Permanent transects would be established within low marsh, mid-high marsh, and transitional.

### Aerial Photogrammetric Analysis

A number of methods can be used to assess vegetative cover remotely. Some involve fixed-wing aircraft that photograph the site in red, green, blue, and infra-red wave lengths that are then analyzed using computer programs. Others include drone over-flights that can provide very detailed images that can be similarly analyzed. In both cases, ground-truthing using transects is desirable.

### Point-Intercept and Diversity Belt Transects

Using transects to determine vegetative cover, permanent 50-meter-long point-intercept transects would be placed at a density of one per acre and would be used to determine native and nonnative cover across the restoration site. At 0.5-meter intervals along each transect, each plant species that intercepts the transect would be recorded. This sampling method is based on the field sampling protocol designed by the California Invasive Plant Council (Sawyer and Keeler-Wolf 1995). During Year 1, each transect would be permanently marked at the higher elevation end with a 4-foot-tall PVC T-post. The location of permanent transects would be marked using a global positioning system (GPS) unit and displayed on a map in the annual report. Data would be collected each year during late summer (August/September), and sampling times would be consistent from year to year to minimize variation in the data. In addition, percent cover is often estimated along the transect using 0.25-square meter quadrats placed every 5 m. Cover is then estimated using cover classes (1%, 1–5%, 6–25%, 26–50%, 51–75% and 76–100%). The mid-points of each cover class are summed for a final cover estimate. This represents a quick method for estimating cover that accounts for potential error by the monitor.

A list of additional species occurring within a 5-m belt along each 50-m long permanent transect would also be recorded to document species richness and diversity. Additionally, one end of each

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vegetation transect would be used as a permanent photo station to visually record the progress of the restoration over the 10-year monitoring period.

### Sampling Design and Statistical Rigor

After Year 2, a power analysis using paired (permanent) data would be conducted to ensure 90% power is being achieved for the restoration area, with a sample size of 4 or 3 (dependent on the area), alpha of 0.1, and a minimum detectable change of 15% native cover. If 90% power is not being achieved, additional transects may be added. The Final Restoration Plan would include detailed methodology for all monitoring variables.

### Photographic Monitoring

In addition to the photo stations associated with the permanent vegetation transects, fixed photo stations would be set up at representative points for the restoration site. These photo stations would be established during the implementation phase and used to document the installation process. After installation, photos would be collected twice per year for the first 4 years of the 10-year monitoring program and once for the remaining years. Representative photos taken from these points would be included in annual reports to document progress of the restoration site. Photo stations would be marked using GPS units and displayed on a map in the annual report.

### **Hydrology and Topography**

Hydrology and topography are interrelated and would be used to inform adaptive management and future restoration activities. For example, deposition of sediment within tidal channels could result in shoaling that decreases desired water levels and affects the establishment and persistence of desired habitats. Adaptive measures, such as localized dredging, could then be implemented. As the primary goal of the project is to increase tidal prism, attainment of the modeled increase in tidal prism would be used to determine project success.

### **Tidal Regime**

Tidal regime would be measured remotely using data loggers that measure depth and duration of the tidal cycle. Data loggers would be deployed across a gradient, such as from the mouth of the estuary to the restored site; the data loggers would measure tidal lags and attenuation of tidal amplitude. The precise placement of data loggers would be determined by TRNERR prior to construction.

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In addition to data loggers, tidal prism would be measured using an Acoustic Doppler Current Profiler. This device is towed across the inlet channel (South Beach Slough) at regular intervals over a full tidal cycle to estimate the volume of water entering and exiting the restored site. The results would be compared to the results of hydraulic modeling to determine if the project had successfully achieved its goal.

## **Channels and Tidal Creeks**

Channel and tidal creek monitoring would be used to inform adaptive management and future restoration activities; there are no success criteria associated with this monitoring component. Channels and tidal creeks are important fluvial geomorphological features in the constructed marsh. They provide habitat for fishes and invertebrates; provide an interface between vascular plants and algae, and fish and invertebrate assemblages; and convey nutrients and dissolved oxygen, as well as sediment. Development of tidal creeks within the marsh plain would be assessed through analysis of high-resolution aerial photographs and ground-based surveys, including surveys of cross sections of selected creeks and channels. Certain channels and tidal creeks would be engineered and excavated, while others would be only partially excavated as an experiment to test the cost effectiveness and function of such creeks. Should creeks that are only shallow notches be shown to develop into fully tidal, functional creeks, future restorations may benefit from reduced excavation and soil disposal resulting in cost savings. Fully excavated tidal creeks have been paired with “starter” or shallow excavated creeks for comparison.

## **Elevation**

Monitoring of elevations within the marsh would be used as an indirect assessment of tidal regime as well as to inform adaptive management and future restoration activities; thus, attainment of the habitat distribution predicted by the hydraulic model would be used as a measure of project success. Evidence from the Model Marsh project suggests that the elevations of the newly created marsh plain and tidal channels are likely to change following construction. Sediment loosened during construction can migrate into channels and may result in the loss of those channels. Sediment may also be deposited on the marsh plain, effectively raising it beyond its target elevation. A potential reduction in the capacity of creeks and channels to convey flows can reduce the available habitat for fishes and invertebrates. It can also reduce tidal prism, attenuate tidal exchange, and reduce nutrient and oxygen influx. Thus, elevation monitoring is a vital component of the long-term program.

Elevation on the marsh plain and tidal channels can be monitored using a combination of field and remote sensing methods, including Real Time Kinematic Positioning, LiDAR, marker horizons,

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and Structure from Motion Imagery. Detailed methodology would be developed for the Final Restoration Plan in associated with TRNERR.

### **Water Quality**

Water quality monitoring would be used to inform adaptive management and future restoration activities; there are no success criteria associated with this monitoring component. The physical and chemical constituents of tidal water are important indicators of water quality. Poor water quality may indicate impaired functioning of constructed tidal channels and creeks. Temperature is important in its relationship to dissolved oxygen and in properly evaluating water column stratification and the effects of tidal residence time. Low dissolved oxygen levels can be stressful, even fatal, for estuarine organisms. Although many estuarine organisms are euryhaline, fluctuations in salinity can also result in changes in the population structure of fishes and invertebrates (Nordby and Zedler 1991). Data loggers can measure the target water quality parameters, including temperature, dissolved oxygen, salinity, pH, and turbidity. Data loggers would also be used to measure water levels (which can inform understanding of tidal regime).

### **Soil Salinity**

Monitoring of soil salinity would be used to inform adaptive management and future restoration activities; there are no success criteria associated with this monitoring component. Soil salinity is very important in the early stages of wetland restoration. Newly exposed soils often concentrate salts resulting in soil salinities that are three to four times as saline as salt water (34 parts per thousand). These hypersaline soils often cause a high mortality of salt marsh vascular plants installed as part of an active restoration project. Soil salinity is highly variable over time and space, changing in response to tidal inundation, rainfall, and evaporation. Soil salinity would be measured at the beginning and the end of the growing season, along transects established for vegetation monitoring. Field measurements of salinity would be taken at the beginning and end point of each transect. Salinity would be measured in the laboratory using soil pastes prepared from soil cores collected in the field. It is assumed that high salinities in the salt marsh would be eventually moderated by prolonged exposure to tides. High salinities in the transition zone can be ameliorated using compounds such as gypsum and organic mulch prior to planting. Using this process, testing of the soil by a certified soils laboratory would be conducted prior to planting with amendments incorporated as directed by the laboratory.

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## **Invertebrates**

Invertebrates monitoring would be used to inform adaptive management and future restoration activities; there are no success criteria associated with this monitoring component. Monitoring of benthic invertebrate assemblages can be used to evaluate the health and function of restored wetlands due to their importance in estuarine food webs. Benthic invertebrates can affect, and be affected by, benthic processes such as erosion, sedimentation, and nutrient cycling. While it is obvious that a sudden deposition of sediment may have a negative effect on a benthic invertebrate population, it is less obvious that these organisms may contribute to the suspension and redistribution of sediment.

Like salt marsh vascular plants, invertebrate assemblages vary in composition and abundance over spatial and temporal scales, and monitoring should be designed to accommodate these shifts. For example, in southern California lagoons and estuaries, many invertebrates are reduced in abundance during winters with unusually heavy rainfall that affects water salinity. Conversely, such assemblages often peak in terms of abundance during summer months, when factors such as salinity and temperature are more constant. Monitoring of benthic invertebrates would be conducted in both summer and winter to document potential extremes in composition and abundance. In addition, monitoring of invertebrates in fully excavated tidal creeks would be compared to those in “starter” creeks to determine whether these two types of constructed creeks function similarly.

The methods proposed here for assessing benthic invertebrates follow those used previously by the Pacific Estuarine Research Laboratory (PERL) and TRNERR in other parts of Tijuana Estuary and other southern California lagoons and estuaries. Use of the same methods allows direct comparison with past data and provides reference for future comparisons.

In collecting data, depth of the sediment sample and methods used to separate invertebrates from the sediment are equally important. Benthic infauna are collected from sediments using coring devices. In most cases, the majority of infauna are collected from within the upper 2 to 5 centimeters (cm) of the sediment surface. Some larger, more mobile organisms can burrow to 60 cm, and longer coring devices are required for their capture.

Mesh size and sieving techniques influence density estimates. Previous sampling at Tijuana Estuary has employed two types of cores (5 cm and 20 cm in depth) and two mesh sizes for sieving (0.5–1.0 millimeters [mm] and 3 mm). This allows for estimates of both shallow and deep-dwelling organisms. The 20-cm deep cores are sorted in the field with bivalves and crustaceans counted and released. Smaller cores are fixed in the field in 10% ethanol and later identified in the laboratory.

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Collection of replicate cores within each sampling station would be necessary to accurately sample invertebrate densities; five cores per station are considered sufficient (Zedler 2001).

Sorting and identification conducted in the laboratory may be time consuming. These activities have been estimated to take up to 12 times that of initial sample collection (Saila et al. 1976 as cited in Zedler 2001). Identification to genus and species increases the time and complexity of sorting. For the purposes of this restoration, taxa should be identified to at least the Family level to allow for comparison with PERL/TRNERR studies.

## **Fishes**

Fish monitoring would be used to inform adaptive management and future restoration activities; there are no success criteria associated with this monitoring component. Like invertebrates, fish can serve as useful indicators of the health of a system, both natural and constructed. Systems with impaired tidal circulation, high temperatures, increased freshwater input, and other associated physical attributes often support a depauperate fish assemblage. Typically, restoration projects assess fish habitat function by measuring fish occurrence or density. Although Zedler (2001) points out that measuring species occurrence and abundance may not always accurately indicate habitat value, other measurements, such as growth rates, are labor intensive and expensive.

Fish assemblages also vary in terms of composition and abundance over temporal scales. Like benthic invertebrates, species diversity and abundance are often lowest in winter months and highest in summer. Sampling should be planned to account for extremes in population structure. Therefore, it is recommended that sampling for fish be conducted during both the winter and summer concurrent with benthic invertebrate sampling. As with invertebrates, monitoring of fish in fully excavated tidal creeks would be compared to those in “starter” creeks to determine whether these two types of constructed creeks function similarly.

In main tidal channels 0–2 meters in depth, fish assemblages would be quantitatively sampled with large beach seines. Beach seines have been used historically to sample the tidal channels of Tijuana Estuary. At each sampling site, two “blocking nets” (13.7 m long, 1.8 m deep, 3-mm mesh) would be used to confine fishes within a section of the channel. A beach seine (13.7 m long, 1.8 m deep, with a 2 X 2 m bag with 3-mm mesh) is drawn in a circular manner within the two blocking nets and pulled to shore. Hauls are repeated until the number of fish captured declines to near zero, usually four to five hauls. The blocking nets are then drawn together in a semi-circle to catch fish that were hiding in the blocking nets (Nordby and Zedler 1991). These methods would be employed in the tidal channels created for this project.



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Large fish would be identified, a subsample measured, and then released. Small fish, such as arrow goby (*Clevelandia ios*) can be problematic. Arrow gobies are extremely abundant in Tijuana Estuary at certain times of the year (spring and summer). However, there are other sympatric gobiid species that closely resemble arrow goby. These include shadow goby (*Quietula y-cauda*) and cheekspot goby (*Ilypnus gilberti*). As the three species may occur in the same habitat and total gobiids collected at a site may number in the thousands, it is recommended that a visual estimate of total gobiids be made and a subsample fixed in the field for later identification in the laboratory. Once the ratio of the three species in the subsample has been determined, it can be applied to the total estimated catch, avoiding unnecessary destructive sampling.

## **Birds**

It is recommended in this Restoration Plan that birds in the restored area be monitored using the secretive marsh bird methods presented in Conway (2011). Standardized monitoring protocol recommends focused monitoring for the following secretive marsh bird species: light-footed Ridgway's rail (federally and state endangered), Virginia rail (*Rallus limicola*), least bittern (*Ixobrychus exilis*) (CDFW of Special Concern), American bittern (*Botaurus lentiginosus*), common gallinule (*Gallinula galeata*), and pied-billed grebe (*Podilymbus podiceps*).

Each of the six species noted above would be monitored through pre- and post-construction surveys. The species of primary interest is the light-footed Ridgway's rail, a federally and state listed endangered marsh bird species known to be present in Model Marsh. This species' sensitivity status and range, restricted to coastal salt marshes in southern California where vegetation is dominated by cordgrass and pickleweed (*Salicornia* sp.), make it an important species to monitor at the restored site. The remaining five species would be monitored because of their utility as "indicator species" for assessing wetland ecosystem quality (Conway 2011). Additional species observed during secretive bird monitoring would be noted.

The primary objectives of breeding marsh bird surveys are as follows:

- Compare presence and distribution of breeding marsh birds between pre-construction and construction/post-construction conditions.
- Compare density and abundance of breeding marsh birds between pre-construction and construction/post-construction conditions.
- Estimate the construction/post-construction population trend for breeding marsh birds in the restored area.

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## 6.5 SUCCESS CRITERIA FOR VEGETATIVE COVER

As noted in Section 6.3, quantitative monitoring, aside from vegetation cover, would be used to inform adaptive management and future restoration efforts and do not have success criteria associated with them. However, success criteria for container plant survival and both native vegetation and nonnative cover are provided to verify that the restoration achieves the goal of similar vegetation densities and structure within the restoration area typical of natural salt marsh habitats at Tijuana Estuary. Restoration would be evaluated by assessing survivorship of new plantings, plant establishment rates, and general health and vigor of restored vegetation.

The project seeks to achieve at least 80% survivorship of plantings in the first year and 100% survivorship thereafter. Mortality exceeding 20% would result in remedial replanting. Percent cover is expected to increase gradually each year, reaching 90% or higher cover within three to 5 years. Nonnative cover is not expected to be high within tidally influenced salt marsh but within transitional habitats could pose a threat to native plant establishment and would be managed to minimize effects to habitat function within the restoration site. Nonnative vegetative cover success would be met when the cover of perennial exotic weed species is 0% cover and the cover of annual weed species is less than 5% cover. Success criteria as identified for vegetative cover are summarized in Table 6.

Based on monitoring results, the restoration ecologist and SWIA would determine when restoration goals have been achieved and adaptive management efforts deemed successful. Monitoring results of the restoration would be communicated to the resource agencies in annual reports that document qualitative and quantitative survey results.

**Table 6**  
**Vegetative Cover Success Criteria**

<b>Success Criteria</b>	<b>120-day Plant and Hydrology Establishment Period</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
Container Plant Survival	100%	80%	100%	100%	100%	100%
Native Vegetative Cover	N/A	15%	30%	55%	80%	90%
Nonnative Vegetative Cover	<10% annual, <1% perennial invasive species on-site	<10% annual, <2% perennial invasive species on-site	<10% annual, <2% perennial invasive species on-site	<10% annual, <1% perennial invasive species on-site	<5% overall, <0% perennial invasive species on-site	<5% overall, <0% perennial invasive species on-site

N/A = not applicable

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## **7.0 CONTINGENCY MEASURES**

If success criteria for vegetative cover are not met by the end of the 10-year monitoring period, the restoration ecologist would examine the cause(s) of failure within the annual report and propose remedial action or adaptive management.

### **7.1 REMEDIAL MEASURES**

The quantitative data collected annually and the success criteria discussed in Section 6.5 would also be used to determine whether to implement remedial measures to correct issues impacting the potential success of the restoration site. The restoration ecologist would have discretion to have the installation and maintenance contractors implement appropriate measures or determine whether additional measures not discussed here are necessary. Different remedial measures or a combination of measures would be implemented depending on the condition of a particular location within the restoration site. Appropriate measures would be determined by the restoration ecologist in consultation with the maintenance contractor, and measures would be approved by SWIA in consultation with CSP and the USFWS. Potential remedial measures may include minor modifications to tertiary channels, excavation/dredging of shoals, treatment of nonnative/invasive species; frequency and duration of irrigation; replacement planting or seeding; erosion control; and/or removal of trash.

### **7.2 ADAPTIVE MANAGEMENT**

Due to the complexity of natural ecosystems, a flexible management strategy would be implemented to ensure an effective long-term management approach to biological resources. Adaptive management measures would be implemented to help drive management decisions in the event that unexpected events cause damage to the restoration site. Consistent, ongoing monitoring is key to developing a successful adaptive management plan; therefore, the qualitative assessments conducted during the habitat restoration effort would help to evaluate the status of vegetation communities within the restoration site to achieve self-sustaining ecosystems. Following an unforeseeable event that causes damage to the restoration site, the monitoring data would be used to develop management actions to repair the damaged areas and ensure that future management decisions are based on accurate assessments. Some potential issues that may require adaptive management measures to be implemented are the lack of salt marsh establishment or mudflat development, and changes to the site topography or bathymetry to the extent that habitat establishment is affected.

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## **8.0 REPORTING**

### **Restoration Installation**

The restoration ecologist would supervise the installation contractor during the planting phase and would prepare a brief weekly memorandum documenting installation progress. At the end of the 120-day plant and hydrology establishment period, the restoration ecologist would write a letter to SWIA, CSP, and the USFWS verifying the completion of the restoration installation and the beginning of the 10-year monitoring program. The 120-day installation completion letter would also summarize significant changes made to the Final Restoration Plan during installation, if applicable, and would include final as-built figures.

### **Annual Report**

The restoration ecologist would prepare annual monitoring reports that would include qualitative and quantitative methods and monitoring results, photographic documentation, assessment of salt marsh restoration progress, and review of maintenance activities and remedial measures that have occurred (e.g., supplemental planting). A draft of the annual report would be submitted to SWIA for review. Once the report has been reviewed and approved by SWIA, it would be submitted to the appropriate land managers and resource agencies.

### **Project Early Release**

If the restoration ecologist, SWIA, land managers, and resource agencies concur that the restoration program has met its success standards ahead of schedule, the maintenance period may be discontinued prior to 5 years. Conversely, if success standards have not been met after 5 years, then maintenance may be extended beyond 5 years until standards are met, or until approved by the resource agencies. After the restoration program has reached the end of its 10-year monitoring period and/or met its success standards, the restoration ecologist would write a notification letter to resource agency representatives documenting the successful completion of the restoration program and requesting final approval.

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## 9.0 REFERENCES

- AECOM. 2021. *Biological Technical Report for the Tijuana Estuary Tidal Restoration Program, San Diego County, California*. Prepared for Southwest Wetlands Interpretive Association. November.
- Alfaro, Monica. 2016. 2016 Least Bell's Vireo (*Vireo bellii pusillus*) Protocol Survey Results for the Monument Road Renovation Project, Border Field State Park. September.
- Anchor QEA, LLC. 2021a. *Tijuana Estuary Tidal Restoration Program II Phase I Construction Methods and Soil Management*. Prepared for Southwest Wetlands Interpretive Association. November.
- Anchor QEA, LLC. 2021b. *Tijuana Estuary Tidal Restoration Program II Phase I Tidal Hydraulics and Fluvial Flood Modeling*. Prepared for Southwest Wetlands Interpretive Association. November.
- Atwood, J. L., and D. E. Minsky. 1983. Least Tern Foraging Ecology at Three Major California Breeding Colonies. *Western Birds* 14:57–72.
- Blackhawk Environmental Inc. (Blackhawk). 2016. *Border Field State Park Monument Road Project Light-footed Ridgway's Rail Survey Results*. June.
- Blackhawk Environmental Inc. (Blackhawk). 2019. *2019 Least Bell's Vireo USFWS Protocol Survey Results for the Border Field State Park Bird Monitoring Project, City of San Diego, San Diego County, California*. September.
- California Coastal Commission (CCC). 2006. Suggestions for the Development of Restoration and Monitoring Plans for the California Coastal Commission. Prepared by John Dixon. October 10.
- California Department of Fish and Wildlife (CDFW). 2020c. Special Animals List. November. Available at <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline>. Accessed February 3, 2021.
- California Native Plant Society (CNPS). 2021. *CNPS Rare Plant Ranks*. Available at <https://www.cnps.org/rare-plants/cnps-rare-plant-ranks>. January.

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- California Natural Diversity Data Base (CNDDDB). 2011. California Department of Fish and Game. Database Query. October.
- Carbone, L. A. 1991. Early Holocene Environmental and Paleoecological Contexts on the Central and Southern California Coast. In *Hunter-Gatherers of Early Holocene Coastal California*, edited by J. M. Erlandson and R. H. Colton, pp. 11–17. Perspectives in California Archaeology, Vol. 1, Institute of Archaeology, University of California, Los Angeles.
- City of San Diego. 1997. *City of San Diego Multiple Species Conservation Program Subarea Plan*. March.
- Coastal Conservancy. 2011. *Guidance for Addressing Climate Change in California Coastal Conservancy Projects*. Available at [http://scc.ca.gov/files/2013/11/20110404-Guidance-Purpose-Intro-finalclean\\_CR\\_logo.pdf](http://scc.ca.gov/files/2013/11/20110404-Guidance-Purpose-Intro-finalclean_CR_logo.pdf).
- Conway, C. J. 2011. Standardized North American Marsh Bird Monitoring Protocol. *Waterbirds* 34(3):319–346.
- Dudek. 2010. *Draft Conceptual Habitat Replacement and Monitoring Plan for the L-Ditch Remediation Project, Chula Vista, California*. January.
- Emmel, T. C., and J. F. Emmel. 1973. The Butterflies of Southern California. *Natural History Museum of Los Angeles County, Science Series* 26:1–148.
- ENTRIX, Pacific Estuarine Research Laboratory, and Phillip Williams & Associates. 1991. *EIR/EIS Report, Tijuana Estuary Tidal Restoration Program*. October.
- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station. Vicksburg, Mississippi.
- Environmental Laboratory. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0).
- Fisher, Robert, Ph.D., and T. Case, Ph.D.. 2000. *Final Report on Herpetofauna Monitoring in the Tijuana Estuary National Estuarine Research Reserve*. February.



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- Grossinger., R. M., E. D. Stein, K. N. Cayce, R. A. Askevold, S. Dark, and A. A. Whipple. 2011. *Historical Wetlands of the Southern California Coast: An Atlas of U.S. Coast Survey T-Sheets, 1851–1889*. San Francisco Estuary Institute Contribution #586 and Southern California Coastal Water Research Project Technical Report #589.
- Holland, R. F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California State of California*. Prepared for the California Department of Fish and Game.
- Johnsgard, P.A. 1988. *North American Owls: Biology and Natural History*. Washington, D.C.: Smithsonian Institution Press. 339 pp.
- Kus, B. 2002. Least Bell's Vireo (*Vireo bellii pusillus*). In *The Riparian Bird Conservation Plan: A strategy for Reversing the Decline of Riparian-associated Birds in California*. California Partners in Flight. Available at [http://www.prbo.org/calpif/htmldocs/riparian\\_v-2.html](http://www.prbo.org/calpif/htmldocs/riparian_v-2.html).
- MacDonald, K. B. 1977. Coastal Salt Marsh. In Barbour, M., and J. Major (eds), *Terrestrial Vegetation of California*. John Wiley and Sons, New York. Pp. 263–275.
- Masters, P. M., and D. Gallegos. 1997. Environmental Change and Coastal Adaptations in San Diego County during the Middle Holocene. In *Archaeology of the California Coast during the Middle Holocene*, edited by J. M. Erlandson and M. A. Glassow, pp. 11–22. Perspectives in California Archaeology 4. University of California, Los Angeles.
- Merkel and Associates. 2008. *National City Wharf Extension Project, San Diego, California*. 48-Month Mitigation Monitoring Report.
- National Oceanic and Atmospheric Administration (NOAA). 2011. Available at <http://tidesandcurrents.noaa.gov/>. Accessed October 19, 2011.
- Nordby, C. 2018. *40 Years of Restoration at Tijuana Estuary, California – Lessons Learned*. Night Star Publisher. 174 pp.
- Nordby, C. S., and J. B. Zedler. 1991. Responses of Fish and Macrobenthic Invertebrate Assemblages to Hydrologic Disturbances in Tijuana Estuary and Los Peñasquitos Lagoon, California. *Estuaries* 14(1):80–93.
- Oberbauer, Thomas, Meghan Kelly, and Jeremy Buegge. 2008. Draft Vegetation Communities of San Diego County. March. Based on *Preliminary Descriptions of the Terrestrial Natural Communities of California*, Robert F. Holland, October 1986.

- 
- Patton, Robert, M. Alfaro, L. Squires, and M. Sadowski. 2016. *Belding's Savannah Sparrow Surveys 2016 – Border Field State Park Renovation Project*. July.
- Patton, Robert. 2019. *The Status of Western Snowy Plovers and California Least Terns at Border Field State Park and Tijuana Slough National Wildlife Refuge in 2019*. November. Prepared for State of California, Department of Parks and Recreation and U.S. Fish and Wildlife Service, San Diego National Wildlife Refuge Complex.
- Patton, Robert. 2020. *The Status of Western Snowy Plovers and California Least Terns at Border Field State Park and Tijuana Slough National Wildlife Refuge in 2020*. November. Prepared for State of California, Department of Parks and Recreation and U.S. Fish and Wildlife Service, San Diego National Wildlife Refuge Complex.
- Philip Williams and Associates (PWA). 1987. *Tijuana Estuary Enhancement Hydrologic Analysis*, Prepared for the Tijuana Estuary Tidal Restoration Program.
- Pryde, P. R. 2004. The Most Essential Resource: Water Supply for the County. Pp. 125–140. In P.R. Pryde, editor, *San Diego: an Introduction to the Region*. Sunbelt Publications, San Diego, CA.
- Regional Water Quality Control Board, San Francisco Bay Region. 2008. Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, revised May.
- Safran S. M., S. A. Baumgarten, E. E. Beller, J. A. Crooks, R. M. Grossinger, J. Lorda, T. R. Longcore, D. Bram, S. J. Dark, E. D. Stein, and T. L. McIntosh. 2017. *Tijuana River Valley Historical Ecology Investigations*. Prepared for the State Coastal Conservancy. A Report of SFEI-ASC's Resilient Landscapes Program, Publication #760, San Francisco Estuary Institute-Aquatic Science Center. January.
- Saila, S. B. et al. 1976. Optimum Allocation Strategies for Sampling Benthos in the New York Bight. *Estuarine, Coastal and Marine Science* (4):119–128.
- San Diego Association of Governments (SANDAG). 2011. Vegetation Classification Manual for Western San Diego County. February. Available at [https://sdmmp.com/upload/projects/20160330\\_2357\\_94.pdf](https://sdmmp.com/upload/projects/20160330_2357_94.pdf). Accessed January 27, 2021.

- 
- San Diego Management and Monitoring Program (SDMMP). 2019. Tijuana Slough National Wildlife Refuge and Border Field State Park Surveys. September. Conducted by Conservation Biology Institute under contract with AECOM for SDMMP. Available at [https://sdmmp.com/gis\\_viewer.php](https://sdmmp.com/gis_viewer.php). Accessed January 27, 2021.
- Sawyer, J. O., and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society.
- Smith, R. D., A. Ammann, C. Bartoldus, and M. M. Brinson. 1995. *An Approach for Assessing Wetland Functions Using Hydropeomorphic Classification, Reference Wetlands, and Functional Indices*. Technical Report WRP-DE-9, U.S. Army Corps of Engineers, Waterway Experiment Station, Vicksburg, Mississippi.
- Southern California Wetlands Recover Project. 2018. *Wetlands on the Edge: The Future of Southern California's Wetlands*. Regional Strategy 2018. Prepared by the California State Coastal Conservancy, Oakland, Ca.
- Stebbins, R. C. 1985. *A Field Guide to Western Reptiles and Amphibians*. Second Edition. Peterson Field Guide Series.
- Tierra Environmental Services. 2000. *Working draft Environmental Impacts Statement and Environmental Impact Report for the Goat Canyon Enhancement Plan Project*.
- Tierra Environmental Services. 2008. *Tijuana Estuary – Friendship Marsh Restoration Feasibility and Design Study*. Prepared for Coastal Conservancy and Southwest Wetlands Interpretive Association. March.
- U.S. Army Corps of Engineers (Corps). 2007. *Review and Synopsis of Natural and Human Controls on Fluvial Channel Processes in the Arid West*. Corps ERDC/CRREL TR-07-16.
- U.S. Army Corps of Engineers (Corps). 2008. *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual*. Engineering Research and Development Center.
- U.S. Fish and Wildlife Service (USFWS). 2005. *Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover; Final Rule*. 70 FR 56969.

- 
- U.S. Fish and Wildlife Service (USFWS). 2006. San Diego Bay National Wildlife Refuge – Sweetwater Marsh and South San Diego Bay Units. *Final Comprehensive Conservation Plan and Environmental Impact Statement*. August.
- U.S. Fish and Wildlife Service (USFWS). 2007. *Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (Charadrius alexandrinus nivosus)*. Volume 1: Recovery Plan. California/Nevada Operations Office. U.S. Fish and Wildlife Service, Sacramento, California.
- U.S. Fish and Wildlife Service (USFWS). 2011. Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Pacific Coast Population of the Western Snowy Plover. Federal Register Proposed Rules. Vol. 76, No. 55. March 22.
- U.S. Fish and Wildlife Service (USFWS). 2012. Personal Communication from Brian Collins to Chris Nordby regarding suitability of proposed restoration site for California least tern nesting. January.
- U.S. Geological Survey (USGS). 2014. LiDAR contours for the Tijuana Estuary. Available at [https://www.usgs.gov/faqs/what-lidar-data-and-where-can-i-download-it?qt-news\\_science\\_products=0#qt-news\\_science\\_products](https://www.usgs.gov/faqs/what-lidar-data-and-where-can-i-download-it?qt-news_science_products=0#qt-news_science_products). Accessed January 27, 2021.
- Unitt, P. 2004. *San Diego County Bird Atlas*. San Diego Natural History Museum, Ibis Publishing Co.
- Williams, K. S., M. Busnardo, D. W. Gibson, K. M. Johnson, and S. A. Snover. 1989. *Terrestrial Arthropods of Tijuana Estuary*. Report Prepared for Pacific Estuarine Research Laboratory for the Tijuana Estuary Tidal Restoration Program.
- Wright R. W. 2005. *Tijuana River Atlas*. Joint Project between the Department of Geography and the Institute for Regional Studies of the Californias, San Diego State University, San Diego, CA.
- Zedler, J. B., ed. 2001. *Handbook for Restoring Tidal Wetlands*. CRC Marine Science Series, CRC Press, Boca Raton, FL.
- Zedler, J. B., Nordby, and B. Kus. 1992. *The Ecology of Tijuana Estuary: A National Estuarine Research Reserve*. Pacific Estuarine Research Laboratory (PERL). San Diego State University, San Diego, CA.

- 
- Zedler, J.B., and C.S. Nordby. 1986. *The Ecology of Tijuana Estuary, California: An Estuarine Profile*. U.S. Fish Wild. Serv. Biol. Rep. 85 (7.5) 104 pp.
- Zemba, R., and S. M. Hoffman. 2012. Status and Distribution of the Light-footed Clapper Rail in California, 2012 Season. California Department of Fish and Game, Nongame Wildlife Program Report, 2012-02.
- Zemba, R., S. M. Hoffman, J. Konecny, L. Conrad, C. Gailband, and M. Mace. 2011. *Light-footed Clapper Rail Management, Study, and Propagation in California, 2011*. California Department of Fish and Game, Wildlife Management, Nongame Wildlife Unit Report, 2011-02. Sacramento, CA 29 pp.
- Zemba, R., S.M. Hoffman, and J. Konecny. 2020. Light-footed Ridgway's (Clapper) Rail in California 2020 Season. November 27.

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