

# Final Programmatic Environmental Impact Statement

## Improvements to the Tijuana River Flood Control Project



*Lead Agency:*

**United States Section  
International Boundary  
and Water Commission**  
*El Paso, Texas*

*Cooperating Agency:*

**U.S. Army Corps of Engineers**  
*Los Angeles District, California*



*Technical Support:*

**PARSONS**  
Austin, Texas

**May 2008**

## Cover Sheet

# PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT IMPROVEMENTS TO THE TIJUANA RIVER FLOOD CONTROL PROJECT

Draft

Final

### Lead Agency

United States Section, International  
Boundary and Water Commission  
(USIBWC)  
El Paso, Texas

### Cooperating Agency

U.S. Army Corps of Engineers  
Los Angeles District

### Abstract

The USIBWC anticipates a need for changes in current operation and maintenance of the Tijuana River Flood Control Project. Potential changes would include measures to improve water quality, and to support local or regional initiatives for increased utilization of the flood control project, or to improve environmental conditions. Those measures were incorporated into a Multipurpose Project Management (MPM) Alternative.

This Programmatic Environmental Impact Statement (PEIS) evaluates potential environmental consequences of measures under consideration for improved operation of the flood control project. The USIBWC will apply the programmatic evaluation as an overall guidance for future environmental evaluations of individual improvement projects whose implementation could be possible within a 20-year timeframe.

### Other Requirements Served

This PEIS is intended to serve other environmental review and consultation requirements pursuant to 40 CFR 1502.25(a).

### Date of Final PEIS availability to USEPA and the Public:

May 14, 2008

Comments should be directed to:

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## EXECUTIVE SUMMARY

### ***Purpose of and Need for Action***

The USIBWC operates and maintains the Tijuana River Flood Control Project (FCP) located in southern San Diego County, California (Figure ES-1). The Tijuana River FCP represents a continuation of the International Tijuana River FCP that begins in Mexico and provides flood protection to areas in both the United States and Mexico. The flood control project, constructed in 1978, consists of a levee system that runs along a modified stream channel 2.3 miles long, extending from the international border to the start of the natural Tijuana River channel. The floodway between the north and south levees encompasses approximately 400 acres.

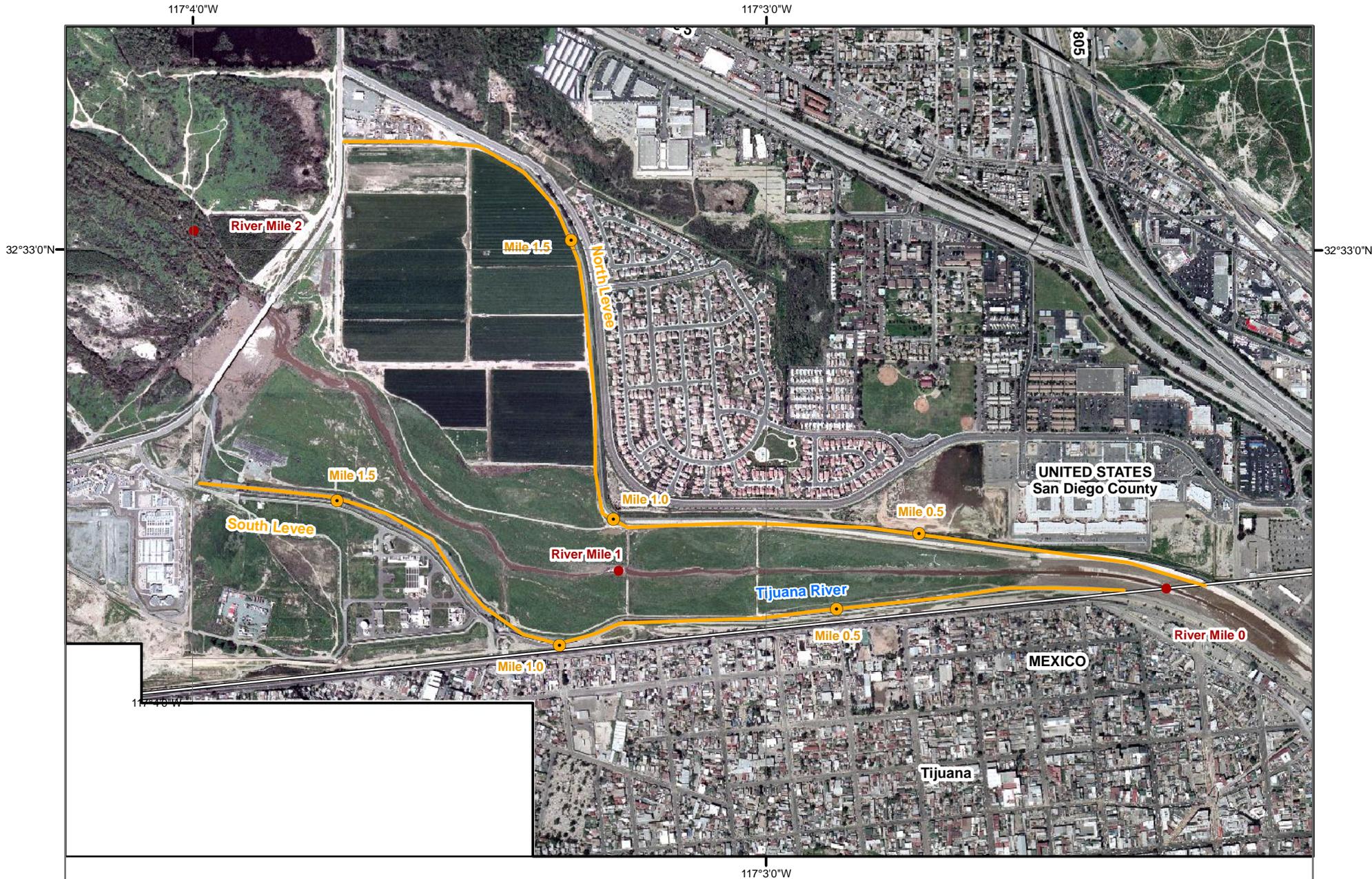
The USIBWC is evaluating alternatives for maintenance activities and future improvements to the Tijuana River FCP. This *Programmatic Environmental Impact Statement* (PEIS) was prepared to evaluate maintenance improvement alternatives that would allow USIBWC to minimize potential environmental impacts and take advantage of environmental opportunities while meeting its mandate for flood protection and boundary stabilization.

The USIBWC anticipates a need for improvements in operation and maintenance of the Tijuana River Flood Control Project. Potential changes would include measures to support local or regional initiatives to improve environmental conditions or water quality, incorporated into a Multipurpose Project Management (MPM) Alternative. Most potential improvements have been developed only at a conceptual level, or represent measures considered feasible but not currently envisioned for implementation. Known or anticipated improvements are typically associated with multipurpose utilization of the projects in support of local or regional initiatives for environmental improvement.

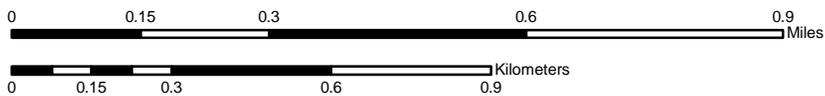
The USIBWC will apply the programmatic evaluation of potential impacts as an overall guidance for future environmental evaluations of individual improvement projects whose implementation is anticipated or possible within a 20-year timeframe. Once any given improvement project is identified for future implementation, site-specific environmental documentation will be prepared based on project specifications and PEIS findings.

### ***Alternatives Considered in Detail***

For the PEIS evaluation, measures identified as feasible were organized into an action alternative that incorporates measures in support of local or regional initiatives for increased utilization of the project or to improve environmental conditions, evaluated under the Multipurpose Project Management Alternative.



Scale = 1: 24,000



**Fig. ES-1**  
**Tijuana River Flood Control Project**

Programmatic EIS  
 International Boundary and Water Commission,  
 United States Section

### ***Summary of Environmental Consequences***

The PEIS compares potential environmental consequences of the action alternative with those expected from continued use of current management and operational practices evaluated under the No Action Alternative. Impacts were evaluated for the following resource areas: water, biological, cultural resources, socioeconomic resources; land use; and environmental health (noise, air quality, environmental hazards). A summary comparison of potential environmental consequences of the alternatives by resource area is presented in Table ES-1.

The Multipurpose Project Management Alternative was selected as the preferred option for implementation of improvements to the Tijuana River FCP. This selection is consistent with the core project mission of flood control, and supports regional initiatives for habitat improvement and management of natural resources. Participation in such initiatives would be largely conducted as cooperative agreements with the proposing agencies or organizations.

**Table ES-1 Summary of Potential Environmental Consequences of Alternatives for Improvement of the Tijuana River FCP**

	<b>No Action Alternative</b>	<b>Multipurpose Project Management Alternative</b>
<b>Water Resources</b>		
	Current maintenance practices for the Tijuana River FCP would continue to provide current flood protection in accordance with the cooperative agreement with the U.S. Border Patrol.	Small-scale changes in extent or timing of vegetation removal, possibly including modification of the Memorandum of Understanding with (USBP), which would not have any effect on the ability to control floodwaters or result in changes to hydrology or groundwater resources. No changes to hydrology, groundwater resources or water quality would be expected as a result of additional use of best management practices for trash and sediment removal, or increased restrictions to of public access.
<b>Biological Resources</b>		
Vegetation	No changes would be made; current floodway maintenance practices would continue, including long-term lease for the sod farm to the northern side of the Tijuana River FCP area.	Small-scale changes in the extent or timing of vegetation removal would occur. If riparian vegetation were to develop, would be along river channel. Initiate of a program to improve watershed management for better sediment control would possibly improve vegetation communities. The portions of the watershed affected would likely become non-native grasslands.
Wildlife	Wildlife habitat under the No Action Alternative is not expected to further degrade, nor would habitat be improved.	USIBWC participation in regional wildlife habitat conservation initiatives may improve habitat for wildlife in the vicinity of the Tijuana River FCP.
Threatened and Endangered Species	The present habitat is generally too disturbed to support T&E species, and no changes are expected relative to current conditions.	Watershed initiatives to improve sediment control and regional wildlife habitat conservation initiatives may also improve habitat for T&E species in the project's vicinity.
Wetlands and Aquatic Ecosystems	The dry streambed does not support wetlands or aquatic ecosystems within the floodway.	Watershed initiatives to improve sediment control could improve aquatic ecosystems downstream from the Tijuana River FCP.
Unique or Sensitive areas	No changes would be made to the vegetation communities in the project area.	Regional wildlife habitat conservation initiatives may also improve sensitive areas, including riparian areas and grassland areas in the project vicinity.
<b>Land Use</b>		
Residential Uses	Existing residential communities near the river corridor would not be affected.	Cooperative agreements that promote watershed management and habitat conservation initiatives may change surrounding land uses. If new land uses are adopted in the region, they may affect adjacent land uses as well.
Agricultural Uses	The Sod farm within the floodway would not be affected under the No Action Alternative.	Increases in agricultural use in the project vicinity are not anticipated.
Recreational Uses	Recreational and natural areas including the Tijuana River Valley Regional Park and neighborhood and communities parks would not be affected.	Greater restrictions to public use/access of the floodway may limit recreational opportunities, while cooperative agreements may promote recreational opportunities in the project vicinity.
Other Uses	Other land uses in the project vicinity, such as sand and gravel extractive operations and U.S. Military lands, would not be affected.	Similar to the No Action Alternative, other land uses in the project vicinity, would not be affected.

<b>Cultural Resources</b>		
Historical and Archeological Resources	Continued operation of the Tijuana River FCP would not have adverse effects on historical or archaeological resources.	No adverse effects are anticipated within the flood control project area; cooperative projects, depending on extent or location, could have impacts on historical or archaeological resources.
<b>Socioeconomic Resources</b>		
Regional Economics and Social Issues	No impacts are expected by the continued Tijuana River FCP operation on anticipated population increases and other socioeconomic issues in San Diego County.	No impact on anticipated population increases and other socioeconomic from floodway management; participation in cooperative initiatives could improve urban land use and create recreational opportunities.
Environmental Justice	Flood control would continue protection to the entire project vicinity. Disproportionately high and adverse human health and environmental effects on minority and low-income populations would not be expected.	Participation in cooperative initiatives could improve urban land use and recreational opportunities for resident in the project vicinity, including minority and low-income populations.
<b>Environmental Health</b>		
Air Quality	No increases in air pollutant emissions are anticipated from continued USBWC operation and maintenance activities.	Cooperative agreements for environmental improvements or recreational opportunities would likely maintain or improve air quality in the project vicinity. Changes would be insignificant at a regional level.
Noise	Continuation of existing operations would not result in any changes in the noise environment. Noise level of equipment in operation for maintenance activities would not be expected to exceed the City of San Diego noise standard at any sensitive receptors in the project area.	Similar to the No Action Alternative, modified maintenance operations would not be expected to exceed the City of San Diego noise standard at any sensitive receptors in the project area.
Public Health and Environmental Hazards	Continued operation of the Tijuana River FCP would continue to comply with applicable health and environmental compliance requirements.	Cooperative agreements for environmental improvements or recreational opportunities would follow applicable health and environmental compliance requirements.
<b>Indirect and Cumulative Impacts</b>		
Natural Resources Management Areas	No cumulative impacts are anticipated from continued USBWC operation and maintenance activities	Cooperative agreements would support additional local environmental improvements outside the flood control project area.
Water Quality and Sediment Control Projects	No cumulative impacts are anticipated from continued USBWC operation and maintenance activities	Cooperative agreements for erosion control in Tijuana River tributary canyons would reduce sediment load reaching the Tijuana River estuary. Storm water quality improvements would result from participation in additional binational plans for upstream control of point and non-point pollution sources.
U.S. Border Patrol Activities	No cumulative impacts are anticipated from continued USBWC operation and maintenance activities	Participation in local initiatives would support, to various degrees, development of vegetation and wildlife habitat outside the floodway.

# **FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT**

## **IMPROVEMENTS TO THE USIBWC TIJUANA RIVER FLOOD CONTROL PROJECT**

*Lead Agency:*

**UNITED STATES SECTION,  
INTERNATIONAL BOUNDARY AND WATER COMMISSION  
UNITED STATES AND MEXICO**

*Cooperating Agency:*

**U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT**

*Technical Support:*

**PARSONS**  
Austin, Texas

**MAY 2008**

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- A. Detailed Maps of the Tijuana River FCP and Historical Aerial Photographs
- B. Written and Public Hearing Comments on Draft PEIS
- C. Responses to Draft PEIS Comments
- D. Programmatic PEIS Documentation
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## ACRONYMS AND ABBREVIATIONS

ac-ft	acre feet
ac-ft/yr	acre feet per year
AQCR	Air Quality Control Region
BMP	best management practice
CESPT	Comision Estatal de Servicios Publicos de Tijuana
cfs	cubic feet per second
dba	A-weighted sound level in decibels
DNL	Day-night average sound level
EIS	environmental impact statement
E.O.	executive order
IBWC	International Boundary and Water Commission
JTF-6	Joint Task Force-Six
LOS	level of service
mgd	million gallons per day
mg/L	milligrams per liter
MHPA	multi-habitat planning area
MOU	memorandum of understanding
MPM	Multi-purpose project management
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NERR	National Estuarine Research Reserve
O&M	operation and maintenance
PEIS	Programmatic Environmental Impact Statement
PM <sub>10</sub>	particulate matter greater than 10 micrometers
SANDAG	San Diego Association of Governments
SBIWTP	South Bay International Wastewater Treatment Plant
SDAB	San Diego Air Basin
SPCC	spill prevention, control, and countermeasures
T&E	threatened and endangered
Tijuana River FCP	Tijuana River Flood Control Project
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USBP	U.S. Border Patrol
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USIBWC	United States Section, International Boundary and Water Commission

## SECTION 1 PURPOSE OF AND NEED FOR ACTION

This section provides background information of the Programmatic Environmental Impact Statement (PEIS), describes the purpose of and need for the action and scope of the environmental evaluation, gives a summary description of the Tijuana River Flood Control Project (Tijuana River FCP), and presents the PEIS organization. Figure 1 indicates the location of the Tijuana River FCP.

### 1.1 BACKGROUND

#### 1.1.1 Scope of the Environmental Review

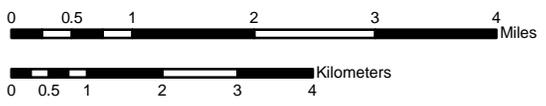
Federal agencies are required to take into consideration environmental consequences of proposed and alternative actions in the decision-making process under the National Environmental Policy Act (NEPA) of 1969, as amended. The President's Council on Environmental Quality issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. In 1978, the Council on Environmental Quality issued regulations implementing the process (40 Code of Federal Regulations 1500-1508).

The United States Section, International Boundary and Water Commission (USIBWC) regulations for implementing NEPA are specified in *Operational Procedures for Implementing Section 102 of the National Environmental Policy Act of 1969, Other Laws Pertaining to Specific Aspects of the Environment and Applicable Executive Orders* (46 FR 44083, September 2, 1981). These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action.

This PEIS evaluates alternatives for maintenance activities and potential future improvements to the Tijuana FCP, located in San Diego County, California. The Tijuana FCP consists of a levee system that runs along a modified stream channel 2.3 miles long that extends from the United States and Mexico border to the start of the natural Tijuana River channel.

The PEIS evaluates, at a programmatic level, potential environmental consequences that may result from implementation of a No Action Alternative and one Action Alternative. The following environmental resources are assessed in the PEIS: water resources, biological resources, land use, cultural resources, socioeconomic resources and transportation, environmental health issues (air quality, noise, public health, and environmental hazards), and cumulative impacts.

The PEIS is prepared by the USIBWC as the lead agency, in cooperation with the U.S. Army Corps of Engineers (USACE), Los Angeles District.



**Figure 1 USIBWC Tijuana River Flood Control Project Location**  
Programmatic EIS for Improvements to the Tijuana River Flood Control Project

### **1.1.2 USIBWC Authority**

The International Boundary and Water Commission (IBWC), which before 1944 was known as the International Boundary Commission, was created by the Convention of 1889, and consists of a United States Section (the USIBWC) and a Mexican Section (MxIBWC). The IBWC was established to apply the rights and obligations the Governments of the United States and Mexico assumed under the numerous boundary and water treaties and related agreements. Application of the rights and obligations is accomplished in a way that benefits the social and economic welfare of the people on both sides of the boundary and improves relations between the two countries. The mission of the USIBWC has five components, as follows:

- Regulation and conservation of waters of the Rio Grande for use by the United States and Mexico through joint construction, operation, and maintenance of international storage dams and reservoirs and plants for generating hydroelectric energy at the dams, and regulation of the Colorado River waters allocated to Mexico;
- Distribution of waters of the Rio Grande and the Colorado River between the two countries;
- Protection of lands along the border from floods through levee and floodway projects and solution of border sanitation and other border water quality problems;
- Preservation of the Rio Grande and Colorado River as the international boundary; and
- Demarcation of the land boundary

## **1.2 PURPOSE OF AND NEED FOR ACTION**

The USIBWC is evaluating alternatives for maintenance activities and future improvements to the Tijuana FCP located in southern California. The PEIS is being prepared to evaluate these maintenance improvement alternatives that would allow USIBWC to minimize potential environmental impacts and take advantage of environmental improvement opportunities while fulfilling the project goal of flood protection. Those improvements represent additional goals adopted by the USIBWC in support of the flood control projects' core mission, such as multipurpose utilization of the project in support of local and regional initiatives.

In compliance with NEPA, the USIBWC integrates the environmental evaluation process with other planning at the earliest possible time to ensure that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts. The USIBWC routinely identifies environmental effects of alternative actions in the form of an Environmental Assessment or, when warranted by significance of potential effects, an Environmental Impact Statement (EIS). This environmental documentation and analyses are based on site specific and project specific alternatives. Because of the long range planning needs, the USIBWC has taken a broad programmatic look at the potential environmental implications of operation and maintenance (O&M) and improvement measures to be considered for future implementation. The PEIS documents the affected environment in the Tijuana River FCP area, and assesses potential environmental consequences of the alternatives.

The USIBWC would apply the programmatic analyses of potential impacts as an overall guidance for future individual improvement projects whose implementation is anticipated or possible within a 20-year timeframe. Once any given improvement project is identified for site- and time-specific implementation, action-specific environmental documentation would be developed based on project specifications and PEIS findings.

The Multipurpose Project Management (MPM) Alternative, selected as the Action Alternative, incorporates measures in support of local or regional initiatives for increased utilization of the project, or for improvement of environmental conditions. The PEIS compares potential environmental consequences the MPM Alternative with continued use of current management and operational practices, evaluated under the No Action Alternative.

### **1.3 FLOOD CONTROL PROJECT DESCRIPTION**

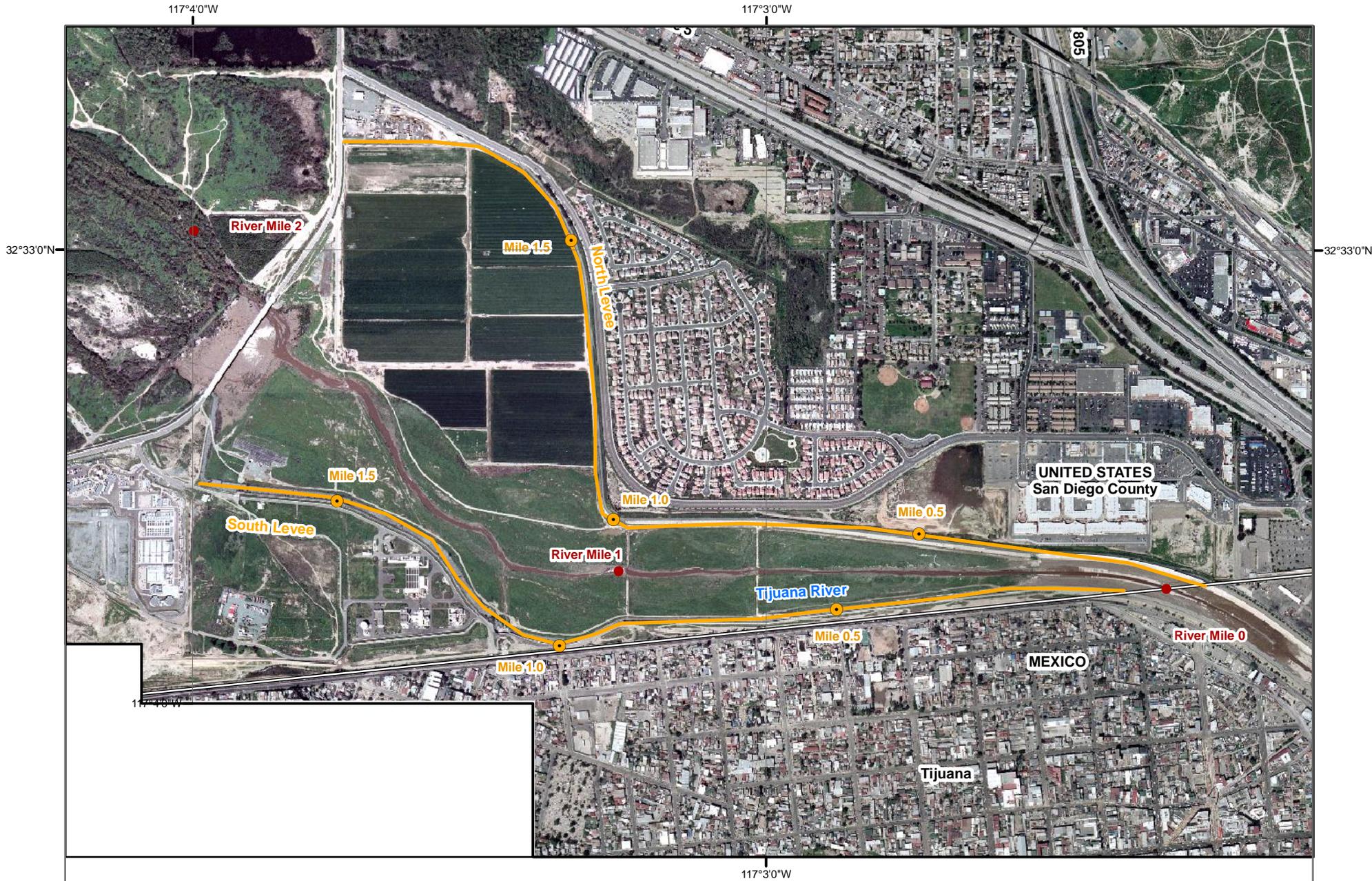
The Tijuana River FCP represents a continuation of the International Tijuana River FCP that begins in Mexico and provides flood protection to areas in both the United States and Mexico. The flood control project was constructed in 1978 by partially re-routing the stream channel across agricultural areas. It consists of a levee system that runs along a modified stream channel 2.3 miles long, that extends from the United States and Mexico border to the start of the natural Tijuana River channel. The south levee (approximately 1.7 miles long) runs along the international boundary, and the north levee (approximately 2 miles long) extending along the southern boundary of the municipality of San Ysidro (Figure 2).

The floodway between the north and south levees encompasses approximately 400 acres. The upstream, east section is a narrow corridor along a concrete and riprap-covered stream channel. The north section of the floodway, comprising approximately 40 percent of the total area, is leased for agricultural use, as a sod farm. The southwestern section of the floodway, approximately 20 acres, is leased for use by a model airplane club. The western boundary of the project is the Tijuana River Valley Regional Park operated by the County of San Diego. Detailed maps of the flood control project are presented in Attachment A, including aerial photographs illustrating land use prior to construction (1953, 1964 and 1974).

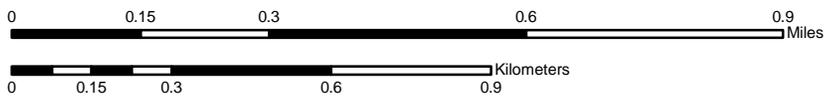
#### **1.3.1 History and Development**

The Tijuana River drains an area of approximately 1,731 square miles within Mexico and the United States. The river flows through the City of Tijuana, crosses the international boundary into California and continues westward about 5.3 miles to empty into the Pacific Ocean about 1.5 miles north of the international boundary. Most of the Tijuana river valley in the United States is within the City of San Diego; a smaller section, 0.4 to 0.8 miles wide coastal strip almost 3 miles long adjacent to the Pacific Ocean, is within the City of Imperial Beach.

In 1964, the City of San Diego asked the USIBWC to plan and construct an international flood control project for the Tijuana River to provide flood protection for practically the entire Tijuana River Valley, approximately 4,800 acres, so that these lands could be developed for



Scale = 1: 24,000



**Figure 2**  
**Tijuana River Flood Control Project**

Programmatic EIS  
International Boundary and Water Commission,  
United States Section

recreation, urban, and commercial use. The City Council of San Diego adopted resolutions in 1964, 1965 and 1971 endorsing the project and agreeing to participate financially in the United States portion of the FCP.

On a December 21, 1971 resolution, the City Council suspended support of the channel project because of economic considerations, environmental concerns, and a desire to reconsider future land uses. In October 1972, the city asked the USIBWC to provide alternate plans which would eliminate the original concrete-lined channel while satisfying the United States obligation to Mexico. The USIBWC, with the assistance of the USACE, submitted alternative plans to the city in February 1973. In October 1973, after public hearings, the city asked the USIBWC to proceed with the alternate plan, which proposed a short segment of concrete channel connecting to the channel in Mexico, a flared energy-dissipating structure, and use of the natural channel to convey flood waters from the structure to the ocean.

A draft EIS on the revised plan was prepared, circulated in April 1974, and commented on; a public meeting held on April 8, 1976 and the final statement was dated May 1976. The City Council of San Diego, the Resources Agency of California, and the California Legislature each took actions involving their participation in the modified project. The Congress took action to modify the 1966 authorization to permit United States participation in rights-of-way costs. These actions were accomplished in September 1976.

Because of the delay encountered in construction in the United States, and to accommodate Mexico, the International Boundary and Water Commission agreed by Minute No. 236 that either Government might proceed with its part of the Project, except within the 1312-foot reach upstream and downstream from the boundary. Mexico began construction in August 1972. Construction in the United States began in March 1978 and was completed in December 1978. The project was dedicated on January 22, 1979.

### **1.3.2 Project Features**

The original plan for the authorized project provided for about 5.3 miles of concrete-lined trapezoidal channel between the international boundary and the ocean, connecting to the approximately 9.5-mile long concrete channel in Mexico. The trapezoidal channel would have a base width of 230 feet and levee heights would have ranged from 20 to 27.5 feet to control an internationally agreed upon design flood of 135,000 cfs. The United States portion of the original plan, which was not constructed, would have required 430 acres of land.

The portion of the modified project on the United States side was planned in accordance with San Diego's land use plans to provide protection for the urban area around the San Ysidro portion of San Diego, and to leave the remaining part of the Tijuana Valley an open space area. The velocity reduction structure serves to slow down the high velocity flows from the concrete channel before discharge onto the open space area, which is the natural floodplain of the river.

The Mexican segment of the Tijuana River project extends approximately 9.5 miles through the city and consists of a concrete-lined channel with a 230-foot wide bottom. The United States portion of the project, the USIBWC Tijuana River FCP, has the same cross-section as at the Mexican border, and extends westerly in the United States approximately 1,223 feet.

This channel segment is followed by a 3,700-foot long, flared energy dissipator with grouted stone and dumped stone to reduce velocities of the flows. The flared section bottom widens from 230 feet to 830 feet in a length of 2,495 feet and then has parallel levees for 1,205 feet. From the ends of the dissipator section, earth levees extends 5,287 feet to Dairy Mart Road; it provides flood protection to an area of 400 acres in the vicinity of San Ysidro.

The south levee extends 2,565 feet along the boundary to high ground to protect the City of Tijuana. Levee heights along the 1,223 feet of concrete channel range from 23.0 to 20.5 feet; along the energy dissipator levee heights vary from 20.5 to 12 feet. The north and south levees have heights up to 21 feet, a crest width of 16 feet and side slopes ranging from 1 vertical to 2 horizontal on the riverside, to 1 vertical to 3 horizontal on the landside. The concrete-lined channel and energy dissipator have a triangular low flow channel one meter deep. An unlined, trapezoidal, low flow channel with a 50-foot bottom width extends 7,021 feet from the energy dissipator through the sediment deposition area and under Dairy Mart Road to the Tijuana River channel. Detailed maps of the flood control project are presented in Attachment A.

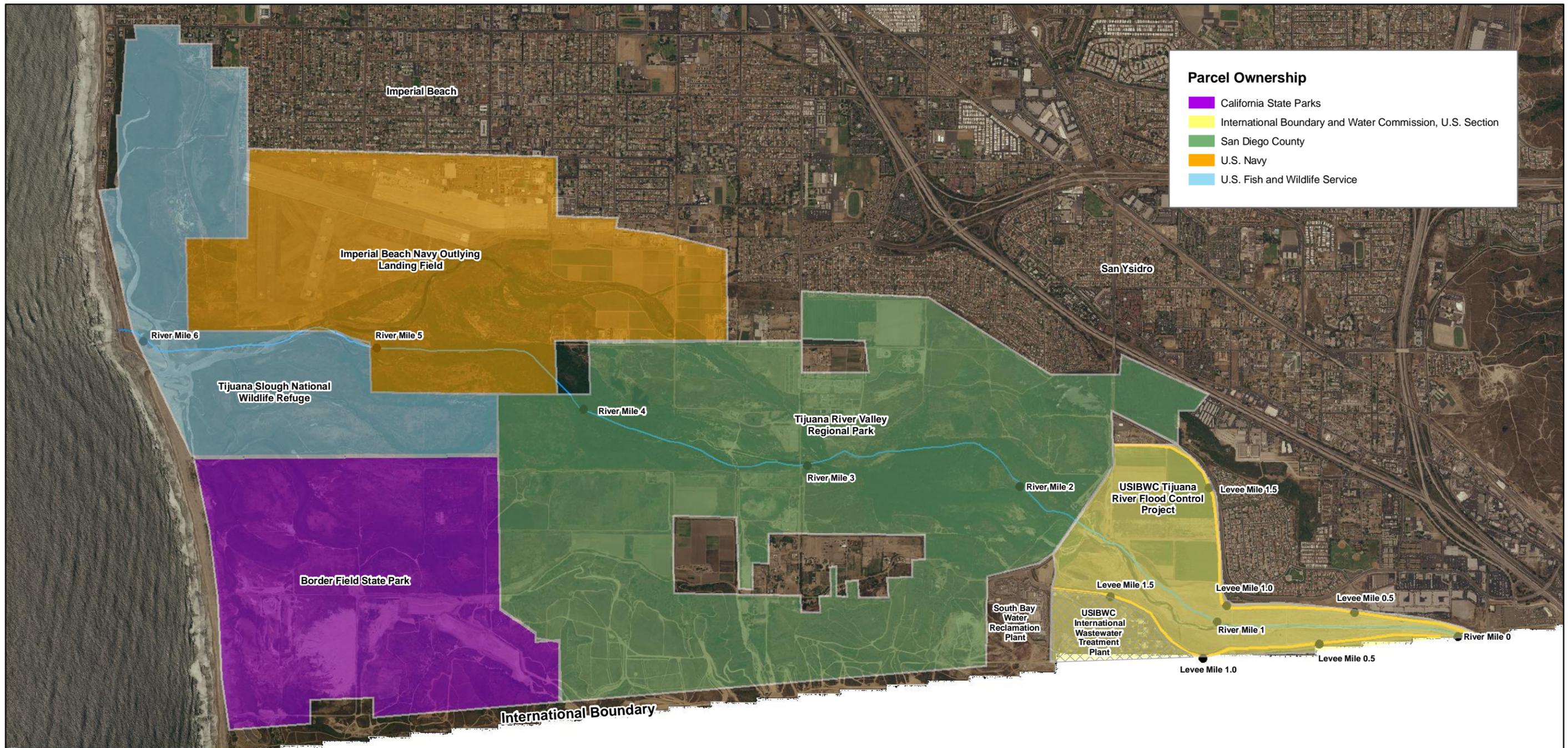
The USACE Los Angeles District prepared the plans and specifications for the United States portion of the project, and supervised its construction for the USIBWC. The total cost of the part of the project in the United States, including land acquisition, design, and construction was approximately \$12.1 million.

### **1.3.3 Regional Significance**

The Tijuana River is an ephemeral stream formed by the confluence of Cottonwood Creek (*Río El Alamar*) and Palm Creek (*Río de las Palmas*), about 4.5 miles southeast of the City of Tijuana. The river flows northward through a 6.6-mile concrete flood control channel across the City of Tijuana, crosses the international border and continues westward to the Pacific Ocean, about 1.5 miles north of the boundary. The river forms an approximate 2,500 acre estuary that represents valuable habitat for conservation of terrestrial and marine species. A 3-mile-long barrier beach separates its western boundary from the Pacific Ocean.

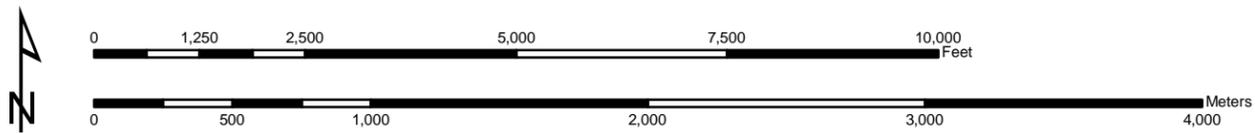
Flow in the Tijuana River is intermittent, and primarily associated with storm events. The capacity of the low-flow channel along the Tijuana River FCP is approximately 2,000 cubic feet per second. The channel is normally dry because dry-weather flows are intercepted upstream of the border. Intercepted flows are sent to the South Bay International Wastewater Treatment Plant operated by the USIBWC (Figure 3), or re-routed within the City of Tijuana for treatment and disposal south of the border. The USIBWC-operated treatment plant is located immediately west of the Tijuana River FCP south levee.

The Tijuana River drains an area of approximately 1,731 square miles, of which approximately 30 percent are in the United States. The fan-shaped drainage area downstream from the international border is approximately 5.5 miles in length, and approximately 3 miles wide at the Pacific Ocean (Figure 3). It constitutes the single non-developed area between extensive urban development in the San Diego metropolitan area and the City of Tijuana. The Tijuana River FCP represents the upstream reach of the drainage area located in San Diego County.



**Parcel Ownership**

- California State Parks
- International Boundary and Water Commission, U.S. Section
- San Diego County
- U.S. Navy
- U.S. Fish and Wildlife Service



**Figure 3 Overview Map**  
 Programmatic EIS for Improvements to the  
 Tijuana River Flood Control Project

The Tijuana River FCP is located upstream of natural resources conservation areas managed by the County of San Diego, State of California, and U.S. Fish and Wildlife Service (USFWS). These conservation areas are of great regional value as they contain a diversified plant and animal species assemblage that includes various animal and plant protected species.

County, state, and federal natural resources management areas located downstream of the Tijuana River FCP, shown in Figure 3, are:

- The Tijuana River Valley Regional Park, managed by the Parks and Recreation Department of the County of San Diego. An Environmental Impact Report for a Trails and Habitat Enhancement Project was recently completed by the County for the Regional Park (County of San Diego 2006);
- The Tijuana Slough Wildlife Refuge, managed by the USFWS;
- The Border Field State Park, managed by the California State Parks; and
- A 551-acre section of the Imperial Beach Navy Outlying Landing Field managed by USFWS under a 1984 Memorandum of Understanding with the U.S. Navy.

In addition to natural resources management areas, the City of San Diego has implemented a Multi-Habitat Planning Area (MHPA) that includes the Tijuana River FCP. The planning area delineates core biological resource areas and local corridors along the Tijuana River watershed targeted for conservation. The MHPA is a component of a state-wide Multiple Species Conservation Program developed by USFWS and the California Department of Fish and Game.

#### **1.4 PEIS ORGANIZATION**

Section 1 provides background information on the PEIS objectives.

Section 2 presents an overview of alternatives and actions for evaluation in the PEIS, as well as the process followed to formulate alternatives.

Section 3 provides a description of existing conditions, or affected environment.

Section 4 evaluates environmental consequences of continued project operation under current O&M practices (No Action Alternative), and implementation of proposed action alternative described in Section 2.

Sections 5 discusses environmental compliance and coordination, including information on PEIS preparation and review.

Sections 6 presents a list of cited references.

## SECTION 2 DESCRIPTION OF ALTERNATIVES

This section describes how the alternatives were initially identified and processed through the USIBWC, interested stakeholders and government agencies. It further identifies the formulation process used to arrive at the alternatives evaluated in the PEIS.

### 2.1 ALTERNATIVES AND BASIS FOR FORMULATION

#### 2.1.1 Alternatives Formulation Process

Potential actions and alternatives identified for the Tijuana River FCP, along with three Rio Grande flood control projects, were initially identified by the Engineering, Operations and Environmental Divisions of the USIBWC. A summary description of those actions and alternatives was provided for comment to agencies, state and local governments, organizations, and other potential stakeholders as part of a public scoping process. A public scoping meeting was held in the City of Imperial Beach, California on January 27, 2005.

Findings and conclusions of the scoping process, described in Section 5, were compiled by the USIBWC in the 2005 document, *Scoping Meeting Summary, Programmatic Environmental Impact Statement, Rio Grande and Tijuana River Flood Control Projects*. Comments and recommendations submitted during the scoping process were then incorporated into a revised set of preliminary alternatives for evaluation in the PEIS. The alternatives formulation process, and features of alternatives selected for PEIS evaluation, are described in the document *Alternatives Report, Programmatic Environmental Impact Statement of the Rio Grande and Tijuana River Flood Control Projects* (Parsons 2007). This document is provided in CD-ROM format in Appendix D.

The PEIS scoping meeting pointed out three main issues with regard to the USIBWC jurisdictional reach of the Tijuana River:

- Effects of storm water originating in the City of Tijuana on downstream natural resources management areas and Tijuana River estuary.
- Potential impacts on threatened and endangered (T&E) species in the project vicinity.
- Trash and sediment in runoff entering the United States.

#### ***Flood Control Mission***

Flood control is the core mission of the Tijuana River FCP. No levee deficiencies have been identified, nor a need for an improved flood control capability. The flood control mission of the project precludes, to a large extent, uncontrolled vegetation growth or development of any wooded vegetation along the 2.3-mile stream segment.

## **Environmental Initiatives and Cooperative Agreements**

Although the Tijuana River FCP is limited in geographic area, there is the potential that this segment may provide beneficial environmental enhancements to the downstream natural resources managed under the Tijuana River National Estuarine Research Reserve (NERR). In an area with limited natural resources, even small areas may become important to managing natural resources through cooperative agreements and environmental initiatives.

Natural resources management areas downstream from the Tijuana River FCP include the Tijuana River Valley Regional Park (owned and managed by the County of San Diego), Tijuana Slough National Wildlife Refuge (U.S. Fish and Wildlife Service), Border Field State Park (State of California), and the Imperial Beach Navy Outlying Landing Field (owned by the U.S. Navy, and 514 acres of the landing field managed by the USFWS). All this land is jointly managed under the Tijuana River NERR program. The Tijuana River NERR is valuable coastal wetlands habitat that is impacted by chronic pollution from domestic and industrial discharges associated with adjacent urban communities.

While many discharges and continuous freshwater flows are generated along the United States segment of the watershed, chronic pollution is also associated, to various degrees, with runoff from the Mexican reach of the river. There are no dry-weather flows along the Tijuana FCP as flows from the Mexican reach of the Tijuana River are intercepted one-half mile upstream of the border for treatment in two wastewater treatment plants, one located in Tijuana and a second one in San Diego, the South Bay International Wastewater Treatment Plant operated by the USIBWC.

### **2.1.2 Definition of Alternatives**

Measures initially identified during the PEIS scoping process were consolidated into a No Action Alternative and one Action Alternative (Parsons 2007). Main features of each alternative are summarized below.

#### *No Action Alternative*

The No Action Alternative is the continuation of current management and O&M practices, including actions planned or identified for short-term implementation.

#### *Multipurpose Project Management Alternative (MPM Alternative)*

The MPM Alternative incorporates improved floodway maintenance activities, namely channel maintenance and sediment removal and disposal. The MPM Alternative also incorporates measures for multiple use of the floodway and initiatives for environmental improvement. Those measures include additional floodway utilization for purposes other than optimization of flood control, as well as participation through cooperative agreements in local environmental initiatives to be implemented and managed by other agencies or organizations.

## 2.2 NO ACTION ALTERNATIVE

Tijuana River FCP management practices are described below in the categories of levee system maintenance, floodway maintenance, and stream channel maintenance. These practices are evaluated in the PEIS for improvements to the Tijuana River FCP as the No Action Alternative, indicating that current operation and maintenance activities will be continued without changes in management practices.

### *Levee System Maintenance*

The levees of the Tijuana River FCP are maintained by the U.S. Border Patrol (USBP), under a 1980 Memorandum of Understanding (MOU) with the USIBWC. The USBP conducts levee inspections annually, or as required (for example, after large storm events). The USBP grades the surface of the levees, and then adds base material mixed with an environmentally friendly binder agent to the surface of the levee. The base material acts as a sealant and a cap for the levee. Grading of the levees and placement of base material are performed on an as-needed basis depending on usage and rainfall. Maintenance operations generally occur twice per year. In addition to levee maintenance, the USBP mows the exterior bank of the levee, outside the floodway.

### *Floodway Maintenance/Vegetation Control*

The floodway requires periodic maintenance to ensure flood control objectives are met, and are primarily conducted under the 1980 MOU with the USBP. Routine floodway maintenance, conducted by the USBP at its expense, includes vegetation control or eradication on the flood channel starting on the east side, where the concrete lining ends.

Maintenance extends north and south of the levee bases and to approximately 200 yards west of the new Dairy Mart Road Bridge. The work is performed on about a quarterly basis, or as deemed necessary for surveillance purposes, typically when the vegetation is approximately two feet tall. In addition to areas actively managed by the USBP, vegetation maintenance includes a large section of the floodway, nearly 40 percent, leased as a sod farm. The sod farm was included in the 1980 MOU as part of the USBP maintenance area, but because the sod farm is already in low vegetation, it is not actively mowed.

A substantial amount of trash enters the Tijuana River FCP from the City of Tijuana, particularly during storm events. There is not an active program by the USBP or USIBWC for removal of trash accumulated in the floodway. Occasionally, the San Diego Sheriff's office uses inmates to gather and stack discarded tires for removal from the floodway. During high flow events, a large amount of trash is transported downstream from the floodway to downstream natural resources management areas.

### *River Channel Maintenance/Sediment Removal*

USIBWC personnel remove sediment from the river channel segment downstream of the gaging station (see Appendix A, Figure A.2). Sediment removal to keep the gaging station operational is typically conducted annually during the summer when there is no flow in the channel. Sediment removal extends from the low flow channel downstream of the gaging station and upstream of the energy dissipator (Figure A.2).

The sediment, primarily sand, is moved downstream of the dissipator to the north of the low flow channel in an elevated terrain within the Tijuana River FCP but above the river floodplain (Figure A.2). Removal takes a 3-person crew (one loader operator and two dump truck drivers) working for one to two weeks, depending on sediment accumulation. Based on the number of dump trucks, it's estimated that annual sediment removal normally ranges from 2,500 to 5,000 cubic yards, with an estimated maximum of approximately 7,000 cubic yards per year. Removal is not conducted when little sediment accumulation has occurred.

## **2.3 MULTIPURPOSE PROJECT MANAGEMENT**

### **2.3.1 Basis for Alternative Formulation**

The MPM Alternative previously evaluated in the Draft PEIS incorporated measures for multipurpose use of the Tijuana River FCP. Measures were initially identified during the PEIS scoping process and consolidated into alternatives for evaluation in the PEIS. The alternative formulation process is described in the document *Alternatives Report, Programmatic Environmental Impact Statement of the Rio Grande and Tijuana River Flood Control Projects* (Parsons 2007).

Following public and agency review of the Draft PEIS, a need was identified to better define the potential extent of measures included in the MPM Alternative. With this objective, the USIBWC conducted on November 15, 2007 a work session at the USIBWC San Ysidro Field Office to discuss concerns and options for modified Tijuana River FCP management. The work session was attended by representatives of the USIBWC, County of San Diego, State of California, U.S. Fish and Wildlife Service, San Diego Chapter Audubon Society, and Parsons, technical consultant for PEIS preparation.

During the session, a number of recommendations were made for modified flood control project management that would have a positive impact on environmental conditions adjacent to, and downstream of, the Tijuana River FCP managed by the USIBWC. The discussion focused on the extent that maintenance activities could be modified for habitat improvements while still maintaining the primary objective of effective flood control.

Prior to the work session, a site visit was conducted with personnel representing natural resources management agencies with land located downstream of the Tijuana River FCP. The field evaluation was conducted to have a better description of vegetation and extent of maintenance practices, assess potential for modified management, and identify key issues to be subsequently evaluated during the work session. Findings of the site visit and work session were summarized in the February 2008 document *Framework Document for Multipurpose Use of the Tijuana River Flood Control Project*, provided in Appendix D.

### **2.3.2 Improvement Measures Under Consideration for the MPM Alternative**

The MPM Alternative, initially formulated in the Draft PEIS (USIBWC 2007), was modified to incorporate recommendations from the November 15, 2007 work session attendees, and to address agency and individual comments reviewers received during the Draft PEIS public review period. Measures included in the revised MPM Alternative were organized in

three general categories: potential changes in current O&M practices of the Tijuana River FCP; regional cooperation, and bi-national initiatives.

### ***Potential Changes in Current Management Practices***

- Coordination with the USBP on changes to timing or method of vegetation removal, currently done by disking. Changes in removal may be more closely coordinated with representatives of adjacent natural management areas.
- Modification of vegetation removal practices west of Dairy Mart Road, including no clearing, or reduced clearing activities in this area adjacent to the San Diego County Park. The changes in the mowing regime to the west of Dairy Mart Bridge may be coordinated with management personnel of the park.
- Potential development of trash catchment basins to reduce accumulation of trash carried out, primarily from Tijuana during storm events.

### ***Increased Regional Cooperation***

- Cooperation with other agencies or organizations to support development of a multi-agency River/Estuary Management Plan.
- Consultation with natural resources management agencies to determine how vegetation along the river channel may be maintained to allow development of riparian vegetation. This evaluation would include areas west of Dairy Mart Road, adjacent to an existing parking and trailhead area under consideration for the County Park.
- Coordination with the County of San Diego to develop an existing parking and trailhead area west of Dairy Mart Road to support recreational use of the County Park.
- Coordination with other agencies on trash removal operations and construction of trash collection structures.
- Consultation with the National Resources Conservation Service on potential for native vegetation development in portions of the sod farm adjacent to the stream channel.

### ***Bi-national Initiatives***

Currently, the USIBWC coordinates with the Mexican Section of the IBWC on several ongoing or proposed environmental initiatives, primarily associated the interception of wastewater flows from the City of Tijuana for treatment and disposal. This coordination and cooperation may be expanded to include other agencies and/or organizations, and cover other types of environmental improvement projects. This bi-national coordination may include such USIBWC actions such as:

- Development and coordination of a binational watershed and river/estuary management plan to improve storm water quality.

- Formal or informal agreements with local governments and municipalities to further address erosion control (and therefore, sediment control) and trash control, on both sides of the border.

## **2.4 MEASURES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY**

### **2.4.1 Structural Modifications to the Flood Control Project**

Structural modifications to the Tijuana River FCP, such as lateral levee relocation or acquisition of additional flood control easements, are neither anticipated nor considered viable for future implementation. Current and increasing urban development along the flood control project severely restricts lateral expansion of the floodway.

A previously considered alternative covering potential engineering changes presented in the Draft PEIS, the Enhanced Operation and Maintenance Alternative, was eliminated from the Final PEIS analysis because those changes are not anticipated within the time frame considered in the PEIS.

### **2.4.2 Improvement of Storm Water Quality**

The Tijuana River FCP was specifically designed for flood control and does not have a capability to remove storm water pollutants. While control of dry-weather flows is currently in place under bi-national agreements to control point sources, improvements in storm water quality would require large-scale control of non-point pollution sources upstream of the Tijuana River FCP, outside the USIBWC jurisdiction.

Control of trash carried by storm events, previously described, was incorporated as a main component of the MPM Alternative.

## **2.5 OTHER ACTIONS WITH POTENTIAL CUMULATIVE IMPACTS**

### **2.5.1 Natural Resources Management Areas**

County, state, and federal natural resource management areas are located downstream of the Tijuana River FCP. Those management areas could be affected by changes in floodway management, or water flow within the flood control project. Those areas are:

- The Tijuana River Valley Regional Park, managed by the Parks and Recreation Department of the County of San Diego. An Environmental Impact Report for a Trails and Habitat Enhancement Project was recently completed by the County for the Regional Park (County of San Diego 2006).
- The Tijuana Slough Wildlife Refuge, managed by the USFWS;
- The Border Field State Park, managed by the California State Parks; and

- A 551-acre section of the Imperial Beach Navy Outlying Landing Field managed by USFWS under a 1984 MOU with the U.S. Navy (USFWS 1999).

In addition to natural resources management areas, the City of San Diego developed an MHPA that delineated core biological resource areas and local corridors targeted for conservation. A conservation corridor designated by the City along the Tijuana River runs along the three county, state, and USFWS management areas, and extends upstream into the Tijuana River FCP.

## **2.5.2 Water Quality and Sediment Control**

### ***Water Quality Improvement***

Bi-national initiatives are currently underway to improve water quality of the Tijuana River upstream of the international border. A major ongoing project is expansion of the wastewater collection system of the Tijuana area, and construction of secondary wastewater treatment plants to reduce contaminant loads entering the United States.

In March 2003 the Comision Estatal de Servicios Publicos de Tijuana (CESPT) and the U.S. Environmental Protection Agency (USEPA) issued a comprehensive master plan addressing sanitation problems in the San Diego-Tijuana border region. The plan was developed in response to the 2000 Tijuana River Valley Estuary and Beach Sewer Cleanup Act of 2000 (Public Law 106-457) that allows construction of wastewater treatment plants in the upper reach of the Tijuana River watershed with partial United States funding. Potential impacts of alternatives for wastewater collection and treatment were evaluated by the USIBWC as part of the Supplemental EIS for Clean Water Act Compliance at the South Bay International Wastewater Treatment Plant (SBIWTP). Those alternatives included expansion of wastewater collection systems in the Tijuana region, increased treatment capacity at the SBIWTP, and construction of new treatment facilities within the Mexican section of the Tijuana River watershed (USIBWC 2005b).

### ***Sediment and Erosion Control***

Five canyons located along the international border drain directly into the U.S. reach of the Tijuana River, primarily within the Tijuana River Valley Regional Park boundary. In addition to direct wastewater flow control, initiatives have been developed to increase control of erosion and storm water flows downstream of the Tijuana River FCP. While dry-weather wastewater flow from the canyons is currently intercepted by the USIBWC for treatment at the SBIWTP, extensive erosion and contaminated runoff are considered a significant source of sediment and pollution reaching the Tijuana River estuary (USFWS 1999).

An ongoing initiative for increased control of erosion and storm water flows is the Goat Canyon Enhancement Project developed by the California State Parks and the National Oceanic and Atmospheric Administration. The project, located downstream of the Tijuana River FCP, is intended to reduce sediment loads reaching the Tijuana River Estuary by placement of a series of retention basins within the watershed, and two or three larger avulsion basins in the alluvial fan to reduce sediment supply to the estuary (USFWS 1999).

### **2.5.3 U.S. Customs and Border Protection Activities**

#### ***Regional Plans***

Cumulative impacts considered for the Tijuana River FCP include greater restrictions to public use/access of the floodway due to increased USBP operations and designation of restricted use zones. Anticipated changes in future USBP operations were evaluated in terms of potential environmental consequences in an updated Programmatic EIS prepared by USACE in 1994 for the Immigration and Customs Enforcement (formerly known as Immigration and Naturalization Service) and Joint Task Force North (formerly known as Joint Task Force-Six), and updated in 2001 (USACE 1994a; 2001).

Actions for Joint Task Force North support to enforcement activities cover a 50-mile corridor along the United States-Mexico border. Enforcement activities would allow to maintain control of the border by enhancing prevention, deterrence, and detection of illegal activities. The support to enforcement activities would include two major categories with potential cumulative effects on the Tijuana River FCP: operational measures such as increased ground patrols and access restrictions, and engineering measures such as placement fences, lighting, and installation of remote sensing systems such as ground sensors (Integrated Surveillance and Intelligence System).

#### ***Local Plans***

At the local level, the USBP would implement the *U.S. Customs and Border Protection 14-Mile Border Infrastructure System Project*. The project is the construction of a triple fence along the international border to control illegal border crossings, extending 14 miles from the Pacific Ocean to the foothills of the San Ysidro Mountains. The project includes two additional fences, patrol and maintenance roads, lights, and components of the Integrated Surveillance and Intelligence System. This project has been exempted from environmental review and permitting (County of San Diego 2006).

## **2.6 PREFERRED ALTERNATIVE**

The MPM Alternative was selected over the No Action Alternative as the preferred option for future improvements to the Tijuana River FCP. This selection is consistent with the core project mission of flood control, and supports regional initiatives for management of natural resources and water quality improvements. Participation in such initiatives would be conducted by the USIBWC as cooperative agreements with the proposing agency or organization. The MPM Alternative is also the environmentally preferred alternative.

## SECTION 3 AFFECTED ENVIRONMENT

This section describes resources in the potential area of influence of the Tijuana FCP. The sequence of resource areas presented in this section is identical to that presented in Section 4, Environmental Consequences. The baseline conditions along this corridor have been thoroughly described in the following documents that are incorporated herein by reference, as allowed by 40 CFR 1508.02.

*Documents prepared in support of the PEIS preparation (provided in Appendix D)*

- A Cultural Resources Overview for the Rio Grande and Tijuana River Flood Control Projects (Geo-Marine, Inc. 2005).
- Biological Resources Survey, Rio Grande and Tijuana River Flood Control Projects, New Mexico, Texas and California (CDM 2005).

*Other technical support documents (provided in Appendix E)*

- Trails and Habitat Enhancement Project, Recirculated Draft Environmental Impact Report for the Tijuana River Valley Regional Park (County of San Diego 2006).
- Final Supplemental Environmental Impact Statement, Clean Water Act Compliance at the South Bay International Wastewater Treatment Plant (USIBWC 2005b).
- Biological Resources Technical Report, Tijuana River Valley Regional Park Trails and Habitat Enhancement Project (County of San Diego 2005).
- Multiple Species Conservation Program, City of San Diego MSCP Subarea Plan, March 1997 (City of San Diego, 1997a).
- Environmental Baseline, Region 5, California Border (USACE 1994b) prepared for the Supplemental Programmatic Environmental Impact Statement for U.S. Customs and Border Protection activities (USACE 2001).

The data presented in these documents are on a county-level basis and by physiographic province. These discussions summarize detailed descriptions provided in the documents mentioned above. Descriptions of the affected environment are presented for the following resource areas:

Section 3.1: Water resources;

Section 3.2: Biological resources;

Section 3.3: Land use;

Section 3.4: Cultural resources;

Section 3.5: Socioeconomic resources and transportation;

Section 3.6: Environmental health.

## 3.1 WATER RESOURCES

### 3.1.1 Flood Control

Flood conditions in the Tijuana River FCP have been summarized by the USIBWC (2005a) and USACE (1994b). Flood peaks on the Tijuana River show extreme annual variability. Peak flow events were estimated for the period between 1884 and 1937 by the USACE, and peak flow events were measured between 1937 and 1984. During these periods, the highest estimated historical flow occurred in 1916, with an estimated peak flow of 75,000 cubic feet per second (cfs). An event of this magnitude is expected to have approximately a 1 percent chance of occurring in any given year. During the floods of 1993, an equivalent flow of 33,000 cfs was recorded in the Tijuana River at the United States-Mexico border.

In the 1970s, Mexico constructed a concrete flood control channel from the international border upstream approximately 6.5 miles to the confluence with the Alamar River. The channel was designed to convey up to 500-year flood flows of 135,000 cfs. The channel has 3 feet of freeboard. The United States constructed an energy dissipator at the downstream end of the flood channel. Mexico designed and completed environmental review to extend the flood control channel upstream an additional 4 miles to below the Abelardo L. Rodriguez Reservoir. This project would control flooding for approximately 1,034 acres of the floodplain. In addition to providing additional flood protection in Mexico, the channel extension would address problems of surface and groundwater contamination.

During the rainy season, the Tijuana River is subject to flooding from surface water runoff. The Tijuana River is channelized for flood protection in this reach and the channel is designed for a 500-year flood.

The south levee of the Tijuana River in the United States has been modified to protect the SBIWTP from flood flows. Additional modifications to the floodplain and low-flow channel are proposed by the City of San Diego for its South Bay Treatment Plant adjacent to the SBIWTP site, and Dairy Mart Road bridge crossing improvements to accommodate a 333-year flood (City of San Diego 1997b).

### 3.1.2 Hydrology

*Tijuana River.* The Tijuana River is an ephemeral stream draining an area of about 1,731 square miles, of which 470 square miles (about 30%) are in the United States and 1,261 square miles (about 70%) are in Mexico. The fan-shaped drainage area is about 75 miles long and 50 miles wide.

The Tijuana River is formed by the confluence of Cottonwood Creek (Rio El Alamar) and Palm Creek (Rio de las Palmas), about 11 miles southeast of the City of Tijuana. The river flows northward through a 6.6-mile concrete flood control channel in the Tijuana Municipality and crosses the international boundary into California. The USACE in 1995 constructed for the USIBWC a half-mile concrete channel, 2 miles of levees, and an energy dissipator immediately downstream of the international border. After the river crosses into the United States, it

continues westward for 5.3 miles and empties into the Pacific Ocean about 1.5 miles north of the boundary.

The Tijuana River can be characterized as a braided alluvial stream that shifts widely across the valley floor during flood stage. An alluvial floodplain forms the floor of the Tijuana River valley. North-trending ephemeral drainages from Mexico enter the valley at Canyon del Sol, Smugglers Gulch, and Goat Canyon.

Predominant soil along the Tijuana River belongs to the Chino and Tujunga series. Chino soil has a considerable clay content, low infiltration rates, and higher available waterholding capacity. Tujunga soil is noted for high infiltration rates and low available water-holding capacity. Flood control structures and channelization between the international border and Hollister Street have diverted the river westward, away from Tujunga soil and into the finer silty loam of the Chino soil.

*Tijuana River Estuary.* The Tijuana River estuary is approximately 2,500 acres, is bisected by the Tijuana River into northern and southern arms, and is bounded by coastal uplands to the north and south, and the alluvial floodplain of the Tijuana River to the east. A 3-mile-long barrier beach separates the estuary from the Pacific Ocean at its western boundary. From the estuary entrance channel, tidal flows are distributed by four channels.

The Tijuana River basin is classified as a Mediterranean, dry summer, subtropical climate. The average annual rainfall across the watershed ranges from about 11 inches near the coast to 25 inches at higher inland elevations, resulting in aquifer recharge of up to 4,500 acre feet (ac-ft) of water in the 5,000-acre alluvial aquifer.

*Stream Flow.* As described in detail in USIBWC 2005b, the Tijuana River is an ephemeral stream characterized by low or no flow for many months each year in the United States. Intermittent flood flows are highly variable and are dependent on rainfall quantity and intensity across the watershed. Brief periods of very high flows, primarily during the rainy season (November through April), are often followed by low or no summer flows. During periods of groundwater overdraft, surface waters provide recharge to the aquifer in direct proportion to the available storage. When the aquifer is full or overflowing, however, groundwater seepage into the lower Tijuana River creates “gaining” stream conditions. These conditions are apparent when ponds and stream flows in the valley are maintained in the absence of surface water input from Mexico.

According to the U.S. Geological Survey (USGS), the average annual discharge in the Tijuana River at the international boundary from 1936 through 1981 was approximately 33,000 ac-ft per year (ac-ft/yr), compared to a “median” discharge of 659 ac-ft/yr. The maximum annual discharge was recorded during the 1979 to 1980 water year when 586,000 ac-ft flowed through the lower Tijuana River valley.

A hydraulics study to determine the low-flow characteristics of river flows was conducted (Boyle Engineering 1996). Flow rates ranging from 1.7 to 34.8 million gallons per day (mgd) have been modeled to determine the travel times from Stewart’s Drain to the Tijuana River estuary for the selected flows. The predicted travel times vary from a minimum of 4.6 hours at 34.8 mgd to a maximum of 14.4 hours at 1.7 mgd.

### 3.1.3 Groundwater Resources

As summarized in USACE 1994b and USIBWC 2005b, groundwater in the lower Tijuana River valley occurs in three zones: (1) beneath the Nestor Terrace north of the valley, (2) in the alluvial fill underlying the Tijuana River valley, and (3) in the San Diego Formation beneath the alluvium (Dudek & Associates, Inc. 1994). Of these three zones, the Tijuana River valley alluvium has been studied and used the most.

The Tijuana River valley aquifer is recharged primarily by direct rainfall, subsurface inflow from adjacent areas, and intermittent flood flows (State of California 1967; USACE 1990; Rempel 1992). Surface flows in the river may also provide groundwater recharge (Dudek & Associates 1994). The amount of groundwater inflow from across the international border has been estimated by various sources at 1,580 ac-ft/year (State of California 1952); 1,208 ac-ft/yr (USACE 1965); and 1,160 ac-ft/yr (USIBWC 1976). There is also potential recharge from water-bearing zones east of Interstate Highway 5 that has not been estimated.

The chief factors contributing to the reduction of groundwater in storage are agricultural pumping and evapotranspiration from phreatophytes (*i.e.*, deep-rooted plants notable for their ability to obtain water from groundwater or the overlying capillary fringe). There is the possibility of minor outflow from the basin toward the north during periods of high groundwater. The amount of groundwater discharging either directly to the ocean or to the lower reaches of the river has been estimated to be 2,090 ac-ft/yr during dry years and 2,827 ac-ft/yr during wet years (Dudek & Associates 1994).

It is only when the amount of groundwater removed from a basin chronically exceeds natural recharge from rainfall, subsurface inflow, and intermittent flood flows that the groundwater table levels will begin to decline. The record for the lower Tijuana River valley from 1965 to 1978 shows that groundwater levels can recover from drier-than-normal rainfall and less-than-normal runoff as long as groundwater extraction is reduced. This observation is supported by data collected between 1965 and 1978.

Depending on stream flow, accumulated rainfall, and groundwater pumping, water table elevations vary from year to year and between wet and dry seasons. Sustained high rates of groundwater extraction during the 1950s resulted in a decline in groundwater levels of 23 to 30 feet or more in the Tijuana River valley. By the early 1960s, groundwater table elevations across much of the valley had fallen below sea level, resulting in the intrusion of seawater and highly saline groundwater from underlying and adjacent marine sediments into the alluvial aquifer (Rempel 1992). By 1967, seawater intrusion had affected most wells up to the United States-Mexico border. This saltwater degradation of the aquifer contributed to the declining demand for groundwater from the Tijuana River valley. As rates of natural recharge exceeded rates of consumption, the resulting annual surplus of water began to overcome years of accumulated deficits, and water levels began recovering.

Increased annual precipitation and runoff between 1978 and 1984, and greatly reduced groundwater pumping for irrigation since 1970 appear to have raised the groundwater levels to within 0 to 15 feet of the ground surface throughout the river floodplain (Rempel 1992). Groundwater levels at the SBIWTP site have been reported to be between 28.5 to 35 feet mean

average sea level (Woodward-Clyde 1994). The mean average sea level elevation at the SBIWTP, adjacent to the Tijuana River FCP, is about 50 feet.

### 3.1.4 Water Quality

During wet weather, river flows through Tijuana are degraded by sewage, affecting the water quality of the Tijuana River in the United States and its coastal waters. Various studies have been conducted to assess the water quality of the Tijuana River estuary. A study by Gersberg, *et al.* (1989) found that, despite continued inflow of sewage containing heavy metals, elevated levels of only cadmium were found in the sediments of both the Tijuana River and southern estuary sites. The study also concluded that only lead was found in levels above an international standard in fish.

Groundwater in the Tijuana River valley is characterized by high levels of sodium chloride and total dissolved solids. These high salinity levels prevent the current use of well water for the irrigation of salt-sensitive crops cultivated within the valley. As a result of lowered groundwater levels and seawater intrusion, groundwater total dissolved solids concentrations along the coast have exceeded 27,000 milligrams per liter (mg/L) (concentration generally ranges between 1,000 and 1,500 mg/L). In the Department of Water Resources Bulletin 106-2 (State of California 1967), the Tijuana River valley groundwater was rated generally inferior for domestic use because of its high sulfate and high fluoride concentrations. It was also rated generally inferior for irrigation purposes because of high electrical conductivity, high chloride levels, and high percentage of sodium in the vicinity of Spooner's Mesa. In addition to seawater intrusion problems, the poor quality of the groundwater is also attributed to sodium chloride leaking from the San Diego Formation, irrigation return, and groundwater movement from beyond the international boundary (USEPA 1988).

## 3.2 BIOLOGICAL RESOURCES

Biological resources along the project corridor have been described in *Final Supplemental Environmental Impact Statement, Clean Water Act Compliance at the South Bay International Wastewater Treatment Plant* (USIBWC 2005b); *Biological Resources Survey, Rio Grande and Tijuana River Flood Control Projects, New Mexico, Texas and California* (CDM 2005); *Trails and Habitat Enhancement Project, Recirculated Draft Environmental Impact Report for the Tijuana River Valley Regional Park* (County of San Diego 2006); *Biological Resources Technical Report, Tijuana River Valley Regional Park Trails and Habitat Enhancement Project* (County of San Diego 2005); and *Multiple Species Conservation Program, City of San Diego MSCP Subarea Plan* (City of San Diego 1997a). Information from these documents is incorporated by reference. In addition to these references, vegetation descriptions were taken from Holland (1986) and Lightner (2006).

### 3.2.1 Vegetation

Historically, the vegetation in the region of the USIBWC Tijuana River FCP was similar to the riparian vegetation and the coastal sage scrub/chaparral communities that occur to the west of the FCP. The cottonwood-willow riparian communities probably included such species as Fremont cottonwood (*Populus fremontii*), Gooding's black willow (*Salix goodingii*), and

arroyo willow (*Salix lasiolepis*). The understory of the riparian forest is typically composed of shrubby arroyo willows and mule fat (*Baccharis salicifolia*). Invasive species such as giant reed (*Arundo donax*) and tamarisk (*Tamarix* spp.) also occur along the margins of the riparian communities (County of San Diego 2005). Coastal Sage Scrub/Chaparral communities typically include such species as coastal sagebrush, California buckwheat, laurel sumac, and white sage (County of San Diego 2005).

The Tijuana River FCP is 2.3 miles long, and has been impacted by urban development, vegetation clearing for border patrol operations, and agricultural practices. Currently, the northern portion of the FCP is leased for agricultural production as a sod farm. Based on a review of historical aerial photographs (Appendix A, Figure A.5), the northern section of the current FCP and lands to the east of the current north levee have been under agricultural production since at least 1953. It is not known what crops were grown. As recently as 1980, the agricultural areas extended to the east of the current FCP. Since 1980, the area to the east of the current FCP has been developed into the community of San Ysidro. The historical aerial photograph from 1980 shows a much wider, more braided river channel, that appears to have encroached on some of the agricultural land, perhaps reducing the agricultural land under production by as much as a third. Since the development of the USIBWC Tijuana River FCP, the community of San Ysidro has been extensively developed, and is immediately adjacent to the north levee of the FCP. Since the development of the USIBWC Tijuana River FCP, the USIBWC has been operated under an MOU with the USBP; the USBP clears the vegetation to improve sight lines throughout the area (see Section 2.2).

The low-flow channel is normally dry as dry-weather flows are currently intercepted at the border for treatment at the USIBWC-operated SBIWTP, and the Tijuana River is considered ephemeral. Despite the ephemeral nature of the Tijuana River, dense riparian vegetation is present in areas immediately to the west of the FCP, which indicates that vegetation development is possible. However, the vegetation within the FCP is generally degraded, primarily due to extensive and seasonal clearing by the USBP to improve visibility in the area. Within the FCP, vegetation is generally kept at less than two feet tall for flood control purposes.

Vegetation within the FCP can be described using Hollands Plant Classification (Holland 1986). The vegetation within the FCP may be considered non-native grassland or disturbed/ruderal communities. Non-native grasslands are generally represented by species such as mustards (*Brassica* spp.), Russian thistle (also known as Tumbleweed; *Salsola tragus*) and non-native grasses. Ruderal communities are generally represented by patches of bare ground and species such as Russian thistle, mustards and crown daisy (*Chrysanthemum coronarium*).

### **3.2.2 Wildlife**

#### ***Reptiles and amphibians***

Tijuana River Valley Regional Park and the Tijuana River National Estuarine Research Reserve, downstream of the Tijuana River FCP, contains a number of reptiles and amphibians (County of San Diego 2005; USFWS 1999). The Tijuana River Valley Regional Park amphibian fauna include non-native American bullfrogs (*Rana catesbiana*) and African clawed

frogs (*Xenopus laevis*), and native species such as California tree frogs (*Hyla cadaverina*) and Pacific chorus frogs (*Hyla regilla*) (County of San Diego 2005). The reptiles of the Regional Park include species that use rodent burrows in non-native grasslands for cover and within riparian areas. The species documented in the Regional Park include coastal whiptail lizards (*Cnemidophorus tigris*), side-blotched lizards (*Uta stansburiana*), and western fence lizards (*Sceloporus occidentalis*) in drier habitats, as well as San Diego gopher snakes (*Pituophis melanoleucus*), glossy snakes (*Arizona elegans occidentalis*), southern Pacific rattlesnakes (*Cratalus oreganos helleri*), and other snakes in lower abundance (County of San Diego 2005). Two California species of special concern, the orange-throated whiptail (*Aspidoscelis hyperythrus beldingi*) and the San Diego horned lizard (*Phrynosoma coronatum blainvillei*), and a federal species of special concern, the silvery legless lizard (*Anniella pulchra pulchra*), have been documented in the area (USFWS 1999; USFWS 2007). Within the Tijuana River National Estuarine Research Reserve, farther downstream of the Regional Park, at least four species of frogs, six species of lizards, and three species of snakes have been documented.

Within the FCP, no focused reptile and amphibian surveys have been conducted, but it is anticipated that species that can occur in disturbed, open habitats will occur within the FCP.

### **Mammals**

Small mammals in the region include species typical of fields and lowlands, including several species of mice and rats, California ground squirrel (*Spermophilus beechyi*), California jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus auduboni*), and opossum (*Didelphis virginianus*). Carnivores in the area may include coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), and the long-tailed weasel (*Mustela frenata*) (USEPA 2006; Zedler *et al.* 1992). Bats are likely to be present in the region, but have not been well studied. Bat species that may potentially occur in the area include the Pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), California leaf-nosed bat (*Macrotus californicus*), and Small-footed myotis (*Myotis ciliolabrum*).

Within the FCP, no focused mammal surveys have been conducted, but it is anticipated that species that can occur in disturbed, open habitats will occur within the FCP. No mammals were identified immediately upstream of the FCP at the SBIWTP (USIBWC, 2005b), but no focused surveys occurred in this area. Given that raptors are regularly observed foraging in the area, there must be some small mammals that provide a food source.

### **Birds**

Small terrestrial mammals are prey for a number of raptor species. Raptors are protected as special status under the Migratory Treaty Bird Act, and are often state and federal species of concern. Wintering raptors in the region may include peregrine falcon (*Falco peregrinus*), prairie falcon (*Falco mexicanus*), and sharp-shinned hawks (*Accipiter striatus*). Breeding raptors in the region may include northern harrier (*Circus cyaneus*), White-tailed kite (*Elanus leucurus*), Cooper's hawk (*Accipiter cooperi*), Red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), barn owls (*Tyto alba*), and western screech owl (*Otus kennicottii bendirei*) (Zedler *et al.* 1992; County of San Diego 2005; USFWS 2007; USEPA 2006).

Bird species in addition to raptors are also well represented in the region. Within the Tijuana Regional Park, there is a large diversity of nesting and foraging habitat available for both migratory and resident birds. The agricultural and uplands areas of the Regional Park provide habitat for wintering and breeding raptors, and several species that are typically residents of coastal sage scrub habitat. Ponds and associated riparian wetlands provide habitat for rails, waterfowl and shorebirds (County of San Diego 2005). Other sensitive species known to have large populations in the Regional Park immediately downstream of the Tijuana River FCP include the yellow warbler (*Dendroica petechia*), the yellow-breasted chat (*Icteria virens*), and rufous-crowned sparrow (*Aimophila ruficeps canescens*) (County of San Diego 2005; USFWS 2007). Within the Estuary Reserve, farther downstream of the Tijuana River FCP, as many as 370 species have been documented (USFWS 1999).

Within the FCP, there has not been a focused bird study; however, immediately upstream of the FCP at the SBIWTP, the white-tailed kite, a California fully protected species, has been observed, and other raptors are expected to occur, including the northern harrier (*Circus cyaneus*), red-tailed hawk, and red-shouldered hawk. The sod farms of the FCP provide foraging habitat for a number of coastal birds. Other bird species are likely present within the FCP, but probably only use the FCP for foraging, as the disturbances precludes suitable nesting sites.

### 3.2.3 Threatened and Endangered Species

There are a number of state and federally listed threatened and endangered (T&E) species present in the area of the Tijuana River FCP. In addition to the state and federally listed T&E species present in the area, there are a number of species that are considered uncommon and are listed as species of concern. Within the County of San Diego Regional Park, state and federally endangered species include breeding populations of the least Bell's vireo (*Vireo bellii pusillus*), migrant individuals of the southwestern willow flycatcher (*empidonax traillee extimus*), pairs of the light-footed clapper rail (*Rallus longirostris levipes*) within the ponds to the west of Dairy Mart Road, and California Species of Concern (CSC) species include breeding populations of the yellow warbler (*Dendroica petechia*) and the yellow-breasted chat (*Icteria virens*). These species generally occur in well-developed riparian areas, or in the case of the light-footed clapper rail, in ponded areas adjacent to riparian habitats. In the upland areas of the County of San Diego Regional Park support breeding populations of the CSC rufous-crowned sparrow (*Aimophila ruficeps canescens*) and the federally threatened coastal California gnatcatcher (*Polioptila californica californica*).

In addition to bird species, T&E species that occur in the County of San Diego Regional Park adjacent to the Tijuana River FCP include at least one CSC reptile the orange-throated whiptail (*Aspidoscelis hyperythrus beldingi*), and up to 13 special-status plant species. The special-status plant species that are eligible for state listing as threatened include the San Diego sagewort (*Artemisia palmeri*), golden-spined cereus (*Bergerocactus emoryi*), wart-stemmed ceanothus (*Ceanothus verrucosus*), sea-dahlia (*Coreopsis maritima*), cliff spurge (*Euphorbia misera*), San Diego barrel cactus (*Ferocactus viridescens*), southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*), Baja California birdbush (*Ornithostaphylos oppositifolia*), ashy spike-moss (*Selaginella cinerascens*), woolly sea-blight (*Suaeda taxifolia*), and San Diego County viguiera (*Viguiera laciniata*). In addition, two California listed threatened species within the

County of San Diego Regional park include two populations of Nuttall's scrub oak (*Quercus dumosa*) and one population of Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*).

No focused studies of the state and federally listed T&E species and species of concern have been conducted at the Tijuana River FCP. The listed bird species generally use riparian and/or upland areas for nesting and foraging, and are not likely to utilize the disturbed habitats characteristic of the FCP. It is not known if individuals or populations of plant species of concern have established in some sections of the FCP, but the only area subject to less disturbance would be the area to the west of the Dairy Mart Bridge, and even this area is periodically mowed and disked.

### 3.2.4 Aquatic Ecosystems

The Tijuana River is an ephemeral stream draining an area of about 1,731 square miles, of which 470 square miles (about 30%) are in the United States and 1,261 square miles (about 70%) are in Mexico.

The Tijuana River is formed by the confluence of *Rio El Alamar* and the *Rio de las Palmas* about 4.5 miles southeast of the City of Tijuana. The river flows northward through a 6.6-mile concrete flood control channel in the Tijuana Municipality and crosses the international boundary into California. The USACE in 1995 constructed for the Tijuana River FCP by building a half-mile concrete channel, 2 miles of levees, and an energy dissipator immediately downstream of the international border. After the river crosses into the United States, it continues westward for 5.3 miles and empties into the Pacific Ocean about 1.5 miles north of the boundary (USIBWC 2005b).

The Tijuana River can be characterized as a braided alluvial stream that shifts widely across the valley floor during flood stage. An alluvial floodplain forms the floor of the Tijuana River valley. North-trending ephemeral drainages from Mexico enter the valley at Canyon del Sol, Smugglers Gulch, and Goat Canyon.

Downstream of the Tijuana River FCP, the Tijuana River receives water from canyons lining the river, and maintains baseflow through much of the year. The river flows to the Pacific Ocean, where it feeds the Tijuana River Estuary. The Tijuana River estuary is approximately 2,500 acres, is bisected by the Tijuana River into northern and southern arms, and is bounded by coastal uplands to the north and south, and the alluvial floodplain of the Tijuana River to the east. A 3-mile-long barrier beach separates the estuary from the Pacific Ocean at its western boundary. From the estuary entrance channel, tidal flows are distributed by four channels.

The Tijuana River basin is classified as a Mediterranean, dry summer, subtropical climate. The average annual rainfall across the watershed ranges from about 11 inches near the coast to 25 inches at higher inland elevations, resulting in aquifer recharge of up to 4,500 ac-ft of water in the 5,000-acre alluvial aquifer.

Freshwater aquatic fisheries are apparently very limited in the area, and have not been well described. There are several reasons that freshwater fish may be limited in the Tijuana River, including a discontinuity between the Tijuana River and other coastal streams of southern

California has prevented movement of freshwater fish between the systems. In addition, the long standing aridity of the region has prevented the coastwise dispersal of fish via estuaries (Follett 1960).

Marine aquatic resources in the area include the Tijuana estuary. The estuary supports a diverse population of fish (USFWS 1999). The fish species in the estuary have been dominated by topmelt (*Atherinops affinis*), longjaw mudsucker (*Gillichthys mirabilis*), arrow goby (*Clevelandia ios*), and California killifish (*Fundulus parvipinnis*) and striped mullet (*Mugil cephalus*). The tidal channels of the estuary provide nursery habitat for several recreational fish, including the diamond turbot (*Hypsopetta guttulata*) and California halibut (*Paralichthys californicus*) (USFWS 1999; Zelder et al. 1992).

### 3.2.5 Unique or Sensitive Areas

Non-native annual grasslands, both disturbed and undisturbed, may be considered a sensitive biological resource because it provides foraging habitat for raptors, including such species as northern harrier, red-tailed hawk, and red-shouldered hawks, and a white-tailed kite has been observed in the general area of the project. Non-native grasslands are generally dominated by wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), foxtail chess (*Bromus madritensis ssp. rubens*), rye-grasses (*Lolium spp.*), and fescues (*Vulpia spp.*), with non-native grasses comprising 50% or more of the cover during the growing season (County of San Diego 2006).

In addition to raptor foraging habitat, non-native grasslands may support the federally listed endangered Quino checkerspot butterfly (*Euphydryas editha quino*). The principal larval host plant of this species in the San Diego region is dot-seed plantain. Potential habitat for Quino checkerspot in the region includes vegetation communities with relatively open areas that typically include patches of dot-seed plantain, owl's clover, and nectaring plants. These habitats include vernal pools, lake margins, non-native grassland, perennial grassland, disturbed habitat, disturbed wetlands, and open areas within shrub communities. While some of these habitats occur within the study area, they are probably too disturbed to support this species (USIBWC 2005b).

Riparian areas are considered sensitive areas because of the large number of species that utilize the riparian areas. There are well-developed riparian areas downstream of the Tijuana River FCP, but the FCP per se, is mowed frequently to prevent the establishment of woody vegetation, including riparian species such as willow or mule fat.

### 3.2.6 Wetlands

All wetland areas are considered sensitive, as are wetland buffer areas. The USACE regulates the discharge of dredged or fill material into waters of the United States (wetlands and non-wetlands jurisdictional waters) according to Section 404 of the Clean Water Act. The California Department of Fish and Game regulates all changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife.

While the Tijuana River runs through the Tijuana River FCP, no jurisdictional waters or wetlands are present due to the lack of a baseline flow. As baseline flow increases downstream

of the project area, wetlands are associated with ponded areas, primarily along a portion of the northern side-channel of the Tijuana River, in the Tijuana River Valley Regional Park (County of San Diego 2005). The mouth of the Tijuana River, downstream of the project area, supports diverse wetland habitat.

### **3.3 LAND USE**

This section characterizes land uses in the immediate and general vicinity Tijuana River FCP. This section includes a description of the existing public and private land uses in this portion of the Tijuana River Valley area of the United States, as well as a general discussion of land uses in Tijuana, Baja Mexico.

#### **3.3.1 Residential Uses and Population**

The municipality of Tijuana, Baja Mexico, is located south of the proposed levee improvements, and has fully developed neighborhoods directly adjacent to the south levee area. To the north and east of the levees is the community of San Ysidro, in San Diego County, California. Immediately adjacent to the north levee is a single-family residential neighborhood and an indoor shopping mall (Google Earth 2006-2007). To the west of the project is Tijuana River Valley Regional Park (USIBWC 2005b).

In addition to the residential neighborhood immediately northeast of the project, the project area is transitioning from rural to suburban with a growing number of single-family neighborhoods and older private ranches (Google Earth 2006-2007). According to the 2000 U.S. Census Bureau, the population within an approximate 3.5-mile radius of the project location is 101,730 on the U.S. side of the border. Most of these residents live north of the project location, nearer to the densely populated metropolitan centers of the City of San Diego and San Diego County.

The San Diego Association of Governments (SANDAG) performed an in-depth analysis in 2004 of the Tijuana River Valley Community Planning Area, which includes the floodway area bounded by the two levees and extends east. For the SANDAG Planning Area, 2004 population estimates were only 62 persons. Population growth is expected to be minimal and reach 63 by 2030. An estimated 19 housing units are within the Planning Area, with an average of 3.3 persons per household. This area represents a much more rural residential character than the suburban areas to the north (USIBWC 2005b).

#### **3.3.2 Agricultural Use**

While the majority of the region has become urbanized, some areas to the west and east of the project site are still used for agriculture. Row cropping, organic sprouts production, and horse breeding and boarding are documented agricultural uses in this area (USIBWC 2005b). The Tijuana River FCP floodway includes leased areas for sod farming and a model airplane club. The sod farm area is identified as Prime Farmland (County of San Diego 2006).

### 3.3.3 Recreational Use

Major recreational and natural areas near the Tijuana River FCP include the Tijuana River Valley Regional Park. Several smaller neighborhood and community parks are also located in the project area. The Tijuana River Valley Regional Park consists of approximately 1,800 acres, of which 1,638 acres are owned by the County of San Diego. Other land uses in the park are under the jurisdiction of the City of San Diego and the California Department of Fish and Game. The park is generally bounded on the east by Dairy Mart Road, the Tijuana River Estuary on the west, the United States/Mexico international border on the south and Sunset Avenue and the residential community to the north. The park includes a mixture of recreational uses, agriculture and native habitats (USIBWC 2005b).

Several neighborhood and community parks are located in the general vicinity of the project area. An unnamed neighborhood park is located in the residential subdivision adjacent to the north levee, and the San Ysidro Athletic Area is approximately one-quarter mile north of the east end of the project area. Other parks within 2 miles of the Tijuana River FCP include the San Ysidro Community Area, Vista Terrace Park, Howard Lane Park, Berry Park, Nestor Park and several unnamed neighborhood parks (Google Earth 2006-2007).

Within the boundaries of the FCP, a portion of the FCP along the south levee (approximately 20 acres) are leased to a model airplane club. There is limited parking and runways for use with the model planes. There are few other recreational opportunities within the FCP, due in part to the presence of border patrol officers.

### 3.3.4 Other Significant Land Uses in the Project Vicinity

Another land use in the region is sand and gravel extractive operations. Sand mining had been ongoing in the Tijuana River until flooding occurred in 1993. The Border Highlands area, south of Monument Road and east of Border Field State Park, was one area of extractive operations. In compliance with the Surface Mining and Reclamation Act of 1975, the deposits have been mapped as Mineral Resource Zone Category 2. These zones represent areas where significant mineral aggregate deposits are present, or where a high likelihood for their presence exists (USIBWC 2005b).

United States military land uses are also located in the area. Navy Outlying Field-Imperial Beach is a U.S. Navy helicopter air station located on 1,100 acres adjacent to Imperial Beach and the Tijuana estuary. The field is the only exclusive-use naval helicopter airfield on the west coast. Navy Outlying Field-Imperial Beach serves as a practice field for Pacific Fleet helicopters and is utilized by 11 squadrons of combat and patrol helicopters (USIBWC 2005b).

The international border between the United States and Mexico is adjacent to the southern levee of the project. A steel border fence has been constructed along the southern boundary of the United States from the ocean to the International Crossing at San Ysidro and eastward. On the United States side, west of the San Ysidro crossing, the area north of the fence is cleared of vegetation and night lighting stanchions have been installed. The USBP is responsible for the interdiction of smuggling, drug traffic and persons attempting to enter the United States illegally. U.S. Customs and Border Protection agents from the Imperial Beach station

continuously monitor entry across the fenced areas and activity in the river valley by vehicle and aerial patrols (USIBWC 2005b).

An additional two sections of fence have been constructed at the border, extending approximately 100 feet north of the old fence. The SBIWTP, west of the Tijuana River FCP, has a perimeter screen of narrowly spaced pillars topped with razor wire that provide security and restrict access to the plant (USIBWC 2005b).

### **3.3.5 Planned Land Uses in the Project Area**

The Tijuana River Valley Community Planning Area that was mentioned above is within the Coastal Zone. The Coastal Zone Management Program for the area is governed by the California Coastal Act Policies and Plan, Local Coastal Program, and Tijuana River National Estuarine Sanctuary Management Plan. The California Coastal Plan identifies the coastal area of the Tijuana River valley as Subregion 12 of the San Diego Coast Region. The Tijuana River Valley Plan and Local Coastal Program Addendum address the major portion of the Tijuana River valley and provide land use policies and goals for portions of the area within the City of San Diego and coastal zone (USIBWC 2005b).

The City of San Diego and other regional jurisdictions, in cooperation with the United States Fish and Wildlife Service and the California Department of Fish and Game, have prepared an overall *Multi-Species Conservation Plan* to implement the requirements of the California Natural Communities Conservation Planning Act of 1992 and Section 10a of the Endangered Species Act. The MSCP includes locally specific Subarea Plans for each covered jurisdiction. The Subarea Plan for the City of San Diego identifies the Tijuana River valley and estuary as a preserve area (USIBWC 2005b).

San Diego County Department of Parks and Recreation has developed the *Tijuana River Valley Regional Park*, which includes a mixture of recreational activities, sustainable agriculture and native habitats. The park is immediately west of the project area. Development of the park is governed by the County's Management Framework, which contains the conceptual framework for design and management of the park. The primary goal of the Tijuana River Valley Regional Park is agricultural and wildlife preservation. Its location provides protection for that portion of the river system, which lies within the jurisdiction of the United States. The County is implementing a Trails and Habitat Enhancement project within the Tijuana River Valley Regional Park. This project would include a network of trails to facilitate recreational access and allow for the rehabilitation of degraded and natural habitat within the regional park (County of San Diego 2006).

## **3.4 CULTURAL RESOURCES**

In the Tijuana River FCP, previous cultural resources surveys have been carried out, as summarized by the cultural resources report prepared for the USIBWC in support of the PEIS preparation (GeoMarine 2005).

Cultural resources in the Tijuana River FCP are defined as historic properties that are archeological sites or historic structures. One archeological site also contains historic

structures. Archeological sites in the project area range in date from the Late Prehistoric to the Historic period (A.D. 500/800 to 1539; Geo-Marine 2005). Historic structures are defined as those constructed 50 or more years ago. For these cultural resource types, the project area encompasses all areas that could be directly affected by the project, or areas where a change could result in indirect effects to cultural resources.

The following description of the affected environment is based primarily on cultural resources data for the Tijuana River FCP prepared in support of the PEIS (GeoMarine 2005). The results of the study, which identified cultural resources within one-half mile from the Tijuana River FCP, found 20 cultural properties or historic districts. All these cultural resources are located in San Diego County. Sixteen of the 20 sites are prehistoric, three are historic (including historic archeological sites and standing structures; one archeological site also contains standing structures), and one site is multicomponent (prehistoric and historic). Of those sites identified, the eligibility status for listing in the National Register of Historic Places or as historic districts is unknown (GeoMarine 2005).

Within the Tijuana River FCP, there is one cultural resource containing historic structures. These standing structures are within a known archeological site (GeoMarine 2005).

Within the Tijuana River FCP, 95 percent of the previously recorded temporal components are within the floodplain, 85 percent are within the prehistoric floodplain, 15 percent are within the prehistoric terrace/fan, 50 percent are within the historic floodplain, and 50 percent are within the historic terrace/fan (GeoMarine 2005).

### **3.5 SOCIOECONOMIC RESOURCES AND TRANSPORTATION**

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Economic activity typically encompasses employment, personal income, and industrial growth. Depending on local economic and demographic characteristics, the proposed action at the Tijuana River FCP could potentially have some influence on socioeconomic activity within the surrounding region of influence.

#### **3.5.1 Regional Economics**

For the purposes of this PEIS, regional economics includes population, employment/income, and housing.

##### ***Population***

The Tijuana River FCP is located within San Diego County. San Diego County consists of numerous cities and communities. The closest cities/communities that may be affected by flood control management alternatives being considered for the Tijuana River FCP is the community of San Ysidro and the city of Imperial Beach.

Table 2 presents population characteristics, including populations in 2000, as well as projected populations for 2005 and 2030 and the percent change for these statistical areas. As

shown in Table 2, the total county population is projected to increase 37 percent from 2000 to 2030. Imperial Beach and San Ysidro expect similar increases of 34 and 27 percent, respectively.

**Table 2**  
**Population Growth in San Diego County and Relevant Communities**  
**Adjacent to the Tijuana River FCP**

Jurisdiction	2000	2005	2030	Percent Change 2000-2030
San Diego County	2,813,800 <sup>1</sup>	3,039,277 <sup>2</sup>	3,855,100 <sup>1</sup>	37% <sup>1</sup>
Imperial Beach (zip codes 91923, 91933)	26,992 <sup>3</sup>	27,604 <sup>2</sup>	36,125 <sup>3</sup>	34% <sup>3</sup>
San Ysidro (zip code 92173)	28,346 <sup>4</sup>	29,662 <sup>5</sup>	36,240 <sup>1</sup>	27%

<sup>1</sup> SANDAG 2006b

<sup>2</sup> State of California Department of Finance 2006

<sup>3</sup> SANDAG 2007a and b

<sup>4</sup> SANDAG 2006a

<sup>5</sup> Extrapolated from 2030 projected value

### **Employment and Income**

The economy of the San Diego region is based primarily on the service, retail trade, government, and manufacturing sectors of the economy. The estimated total employment for San Diego County, and relevant communities is shown in Table 3. The estimated total employment for the county is expected to increase 14.8 percent from 2000 to 2010.

**Table 3**  
**Estimated Total Employment for San Diego County and Relevant Communities**  
**Adjacent to the Tijuana River FCP**

	2000	2010	Percent Change 2000-2010
San Diego County	1,384,673 <sup>1</sup>	1,590,206 <sup>1</sup>	14.8%
Imperial Beach	3,731 <sup>2</sup>	4,021 <sup>2</sup>	7.8%
San Ysidro	8,918 <sup>1</sup>	11,369 <sup>3</sup>	2.7%

<sup>1</sup> U.S. Census Bureau 2004a

<sup>2</sup> SANDAG 2007c

<sup>3</sup> SANDAG 2006b

Median household income for San Diego County (reported in 1999 dollars) was \$47,067 (U.S. Census Bureau 2004a). Median family income (reported in 1999 dollars) was \$53,438. Per capita income was \$22,926 (reported in 1999 dollars).

Approximately 4 percent of the total county households surveyed were reported to be on public assistance income (35,533 of 995,492 households). In addition, approximately 9 percent of all families (59,221 of 669,102 families) were reported to be below the poverty level in the 2000 Census (U.S. Census Bureau 2004b).

### Housing

According to the 2000 U.S. Census, the housing stock in San Diego County was 1,040,149. The largest portion of the housing stock in 2000 was composed of single-family units (60%). Multifamily units accounted for 35 percent of the housing stock in the county. As shown in Table 4, the number of housing units for the county increased 12 percent from 2000 to 2010.

**Table 4**  
**Estimated Total Housing Units for San Diego County and Relevant Communities Adjacent to the Tijuana River FCP**

	2000	2010	Percent Change 2000-2010
San Diego County	1,040,149 <sup>1</sup>	1,161,259 <sup>1</sup>	12%
Imperial Beach	9,739 <sup>2</sup>	9,830 <sup>2</sup>	1%
San Ysidro	7,584 <sup>1</sup>	7,665 <sup>3</sup>	1%

<sup>1</sup> U.S. Census Bureau 2004a

<sup>2</sup> SANDAG, 2007a and c

<sup>3</sup> SANDAG 2006b

### 3.5.2 Environmental Justice

Executive Order (E.O.) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, encourages federal facilities to achieve “environmental justice” by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. Accompanying E.O. 12898 was a Presidential transmittal memorandum that referenced existing federal statutes and regulations to be used in conjunction with E.O. 12898. One of the items in this memorandum was the use of the policies and procedures of NEPA, specifically that, “Each Federal agency shall analyze the environmental effects, including human health, economic, and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 USC, Section 4321, *et seq.*” In this subsection, relevant data regarding environmental justice are presented, along with an analysis of census tracts that would be affected by flood control management alternatives being considered by the USIBWC for the Tijuana River FCP in San Diego County, California.

*Demographic Data.* An analysis of demographic data was conducted to derive information on the approximate locations of low-income and minority populations in the community of

concern. In developing statistics for the 2000 Census of Population and Housing, the U.S. Department of Commerce, Bureau of the Census, identified small subdivisions used to group statistical census data. In metropolitan areas, these subdivisions are known as census tracts.

Since the analysis considers disproportionate impacts, two areas must be defined to facilitate comparison between the area actually affected and a larger regional area that serves as a basis for comparison and includes the area actually affected. The larger regional area is defined as the smallest political unit that includes the affected area and is called the community of comparison. For purposes of this analysis, the community of comparison is San Diego County.

Three U.S. census tracts (100.09, 101.09 and 102) were identified in the potential region of influence for the Tijuana River FCP. To determine whether an individual census tract contains a disproportionately high low-income or minority population, data for each tract were compared to data for the community of concern.

*Minority Populations.* The percentage of the population represented by minorities and the poverty rate for each of the selected census tracts in the project area are shown on Table 5.

Census tracts 101.09 and 100.09 have a disproportionately high minority population, exceeding 50 percent. Census Tract 102 does not have a disproportionately high minority population. The average minority population of the three census tracts is 36.3 percent. The minority population in the region of comparison is 42.2 percent. Minority populations of Hispanic nationality dominate in the potential region of influence with an average of 34.3 percent. The population of Hispanic persons in Census Tract 100.09 is exceptionally high at 56.7 percent.

**Table 5 Percentage of Minority Populations and Poverty Rates in the Project Area**

	California	San Diego County	Census Tract			Average
			100.09	101.09	102	
White <sup>a</sup>	46.7	55.0	4.6	11.8	59.0	11.8
Hispanic or Latino (of any race)	32.4	26.7	86.7	56.7	27.1	34.3
Black	6.7	5.7	3.8	5.3	5.1	24.6
Asian <sup>b</sup>	10.9	8.9	3.9	23.0	3.9	28.3
American Indian <sup>c</sup>	1.0	0.9	0.8	0.5	1.4	9.6
Total Minority	51.0	42.2	95.2	85.5	37.5	36.3
Poverty <sup>d</sup>	14.2	12.4	31.6	5.4	21.9	30.5

Source: U.S. Census Bureau 2004a  
<sup>a</sup> White persons, not of Hispanic or Latino origin  
<sup>b</sup> Asian includes Pacific Islander and Non-Native Hawaiian  
<sup>c</sup> American Indian includes Alaska Native persons  
<sup>d</sup> Poverty rates reflect persons living below the poverty level (1999)

*Poverty Rates.* The U.S. Census Bureau poverty assessment weighs income before taxes and excludes capital gains and non-cash benefits (such as public housing, Medicaid, and food stamps). Poverty rates indicate low-income populations are relatively high in census tracts

100.09, 101.09, and 102 (U.S. Census Bureau 2004a). The average low-income population is 19.6 percent for the region of influence. The percentage of persons living below the poverty level in the region of influence is greater than the 12.4 percent in the region of comparison. The project area exhibits a disproportionately high population of persons with low income in relation to the community of comparison and region.

### 3.5.3 Transportation

The primary public roads in the project area are Dairy Mart Road, Camino de la Plaza, and Monument Road. Maintenance roads alongside the north and south levee are used by the USIBWC and the USBP. Dairy Mart Road is a two-lane collector road that has a maximum Level of Service (LOS) C capacity of 5,000 average daily traffic volume. For the Dairy Mart Road this volume is 1,500 vehicles per day (County of San Diego 2005). Average weekday traffic volumes recorded in 2005 (SANDAG 2007d) are shown on Table 6.

**Table 6 Average Weekday Traffic Volumes for Roads in the Project Area**

Primary Street	First Cross Street	Second Cross Street	Average Weekday Traffic Volume (2005)
Dairy Mart Road	Interstate 5	Servando Avenue	4,400 (northbound)
	Servando Avenue	Monument Road	12,600
Camino de la Plaza	Willow Road	Interstate 5 Southbound Ramp/Camiones Way	17,400 (northbound)
Monument Road	Hollister Street	Dairy Mart Road	700 (northbound)

Source: SANDAG 2007d

## 3.6 ENVIRONMENTAL HEALTH

### 3.6.1 Air Quality

The Clean Air Act, Title 42, Section 7407 of the U.S. Code, states that Air Quality Control Regions (AQCR) shall be designated in interstate and major intrastate areas as deemed necessary or appropriate by a federal administrator for attainment and maintenance of concentration-based standards called National Ambient Air Quality Standards (NAAQS). The USEPA classifies the air quality within an AQCR according to whether the concentration of criteria air pollutants in the atmosphere exceeds primary or secondary NAAQS. All areas within each AQCR are assigned a designation of attainment, nonattainment, unclassifiable attainment, or not designated attainment for each criteria air pollutant. An attainment designation indicates that the air quality within an area is as good as or better than the NAAQS. Nonattainment indicates that air quality within a specific geographical area exceeds applicable NAAQS. Unclassifiable and not designated indicates that the air quality cannot be or has not been classified on the basis of available information as meeting or not meeting the NAAQS and is therefore treated as attainment. Before a nonattainment area is eligible for reclassification to attainment status, the state must demonstrate compliance with NAAQS in the nonattainment area for three consecutive years and demonstrate, through extensive dispersion modeling, that attainment status can be maintained in the future even with community growth.

Generally, areas in violation of one or more of the NAAQS are designated nonattainment and must comply with stringent restrictions until all the standards are met. In the case of ozone (O<sub>3</sub>), carbon monoxide (CO), and particulate matter greater than 10 micrometers in size (PM<sub>10</sub>), USEPA divides nonattainment areas into different categories, depending on the severity of the problem in each area. Each nonattainment category has a separate deadline for attainment and a different set of control requirements under the applicable State Implementation Plan.

The USIBWC Tijuana River FCP is located in San Diego County within the San Diego Interstate AQCR for the San Diego Air Basin (SDAB). The local agency responsible for air quality within this AQCR is the San Diego Air Pollution Control District. The California Air Resources Board is the state-level agency responsible for administration of state and Federal air quality regulations.

The air quality in San Diego County is considered better than national standards for Sulfur dioxide. Total suspended particulates in the east portion of San Diego County cannot be classified, and does not meet primary standards in the west portion. Carbon monoxide is in attainment within a part of the San Diego area, and is considered unclassifiable or in attainment for the remainder of the SDAB. PM<sub>10</sub> in San Diego County is considered unclassifiable. Nitrogen dioxide in the SDAB cannot be classified or better than the national standard. San Diego County is classified as serious nonattainment for ozone (1-hour standard) (USEPA 1998).

The emissions data for the San Diego AQCR are as follows (California Air Resources Control Board 2007):

- Carbon monoxide, 342,261 tons per year;
- Volatile organic compounds, 67,800 tons per year;
- Nitrogen dioxide, 69,131 tons per year;
- Sulfur oxides, 1,351 tons per year; and,
- PM<sub>10</sub>, 30,990 tons per year.

Existing maintenance activities by USIBWC personnel consists of routine inspections of levees and access roads. Periodic maintenance activities at the levees, channels and floodway results in the use of heavy equipment including scrapers, mowers, bulldozers and dump trucks. Use of these heavy equipment and associated vehicles is typically limited to once every three months or less and does not represent a significant source of air pollutants.

### **3.6.2 Noise**

The characteristics of sound include parameters such as amplitude (loudness), frequency (pitch), and duration. Sound varies over an extremely large range of amplitudes. Noise is defined as sound that is undesirable because it interferes with speech and hearing, is intense enough to damage hearing, or is otherwise annoying.

The decibel, a logarithmic unit that accounts for the large variations in amplitude, is the accepted standard unit for describing levels of sound. Different sounds have different frequency contents. Because the human ear is not equally sensitive to sound at all frequencies,

a frequency-dependent adjustment (*i.e.*, A-weighted sound level in decibels, or dBA) has been devised to measure sound similar to the way the human hearing system responds. The adjustments in amplitude, established by the American National Standards Institute (1983), are applied to the frequency content of the sound.

The day-night average sound level (DNL) is a measure of the total community noise environment. DNL is the average dBA over a 24-hour period, with a 10 dBA adjustment added to the nighttime levels (between 10:00 p.m. and 7:00 a.m.). This adjustment is an effort to account for increased human sensitivity to nighttime noise events. DNL was endorsed by the USEPA for use by federal agencies.

Potential adverse effects of noise include annoyance, speech interference, and hearing loss. Noise annoyance is defined by the USEPA as any negative subjective reaction to noise by an individual or group. Typically, 15 to 25 percent of persons exposed on a long-term basis to DNL of 65 to 70 dBA would be expected to be highly annoyed by noise events, and over 50 percent at DNL greater than 80 dBA (National Academy of Sciences 1977).

In a noisy environment, understanding speech is diminished when speech signals are masked by intruding noises. Based on a variety of studies, DNL 75 dBA indicates there is good probability for frequent speech disruption. This level produces ratings of “barely acceptable” for intelligibility of spoken material. Increasing the level of noise to 80 dBA reduces the intelligibility to zero, even if the people speak in loud voices.

Hearing loss is measured in dBs and refers to a permanent auditory threshold shift of an individual’s hearing. The USEPA (USEPA 1974) recommended limiting daily equivalent energy value of equivalent sound level of 70 dBA to protect against hearing impairment over a period of 40 years. Hearing loss projections must be considered conservative as the calculations are based on an average daily outdoor exposure of 16 hours.

It is recommended that no residential uses, such as homes, multi-family dwellings, dormitories, hotels, and mobile home parks, be located where the noise is expected to exceed a DNL of 65 dBA. Some commercial and industrial uses are considered acceptable where the noise level exceeds DNL of 65 dBA. For outdoor activities, the USEPA recommends DNL of 55 dBA as the sound level below which there is no reason to suspect that the general population will be at risk from any of the impacts of noise (USEPA 1974).

Land use and zoning classifications surrounding the project areas provide an indication of potential noise impact. The predominant land uses in the immediate vicinity of the USIBWC flood control levees are an inactive quarry, sod farms, residential, and the Tijuana River Valley Regional Park. The Coral Gate housing area (a planned residential community) is located directly across the Street along Camino de la Plaza (approximately 15 feet) northeast of the north levee. The nearest school is Willow Elementary School, approximately 0.45 mile north of the north levee. Sensitive noise receptors in the project area include residences, educational facilities, libraries, and the Tijuana River Valley Regional Park which includes habitat for three federally listed bird species.

The noise environment in the project area is periodically influenced by intermittent aircraft activity originating from the Imperial Beach Naval Auxiliary Landing Field, Brown Field

Municipal Airport and the Tijuana International Airport. Major regional noise sources from airfields in the surrounding area include helicopters, propeller and jet aircraft, and commercial airlines. To a lesser extent, model aircraft operations off Dairy Mart Road adjacent to the north levee also contribute to temporary increases in ambient noise.

Motor vehicle traffic is another source of noise near busy intersections and during morning and afternoon commute times. These noise levels are typical for moderately sized suburban residential developments and industrial areas. Interstate Highway 5, located approximately 0.2 miles north of the project area, is a major north-south transportation route in San Diego and a major access route to Mexico. Freeway noise from Interstate Highway 5 contributes to the ambient noise level northeast of the project area. U.S. Border Patrol Agents and personnel use off-road vehicles and four-wheel all terrain vehicles for patrolling in locations where road access is not possible.

Hourly sound levels measured in August and September 2004 along Monument Road ranged from approximately 40 dBA to 61 dBA. Higher noise levels at this location and throughout the project area are the result of intermittent aircraft overflight. All terrain vehicles noise levels generally exceed 80 dBA at 25 feet depending on the activity and type of vehicle, and represent a major noise source in the project area (County of San Diego 2005).

Existing maintenance activities by USIBWC personnel consists of routine inspections of levees and access roads. Periodic maintenance activities at the levees, channels and floodway results in the use of heavy equipment including scrapers, mowers, front-end loaders and dump trucks. Use of these heavy equipment and associated vehicles is typically limited to once every 3 months or less and does not represent a significant source of noise.

### **3.6.3 Public Health and Environmental Hazards**

This subsection addresses those aspects of existing conditions in the vicinity of the Tijuana FCP that could cause public health and environmental hazards. This subsection also describes the regulatory setting and hazardous materials.

#### **Public Health**

A public health issue would be associated with public contact with contaminated water in the Tijuana River related to untreated sewage discharges into the Tijuana River from Mexico. This discharge would include pathogens (bacteria, viruses, and parasites), heavy metals, and organic compounds. Additionally, it is likely that floodwaters containing sewage pollutants have impacted soil within the floodplain of the river.

Previous investigations of physical conditions on or near the project site are summarized to determine compliance with applicable laws and regulations for protection of public health and environmental hazards (USIBWC 2005).

The Tijuana River is considered highly contaminated by continuing spills from the Tijuana sewer system and by drainage of sewage from large populated areas within the Tijuana Municipality not served by any sewer system. River water was characterized as black in color, foul smelling, and indistinguishable from raw sewage at Dairy Mart Road in 1991. Although

this situation has since improved, continuing sewage flows during wet weather pose environmental and health concerns, including vector-borne disease, from potential exposure to hazardous wastes (RECON 1994).

### **Environmental Hazards**

Hazardous materials are those substances defined by the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act and the Toxic Substances and Control Act. Hazardous wastes are defined under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. In general, both hazardous substances and wastes include substances that, because of their quantity, concentration, and physical, chemical, or infectious characteristics, may present a danger to public health and/or welfare and to the environment when released or improperly managed.

Waste disposal activities at or near the Tijuana River Flood Control Project area were reviewed to identify areas where industrial processes occurred, solid and hazardous wastes were stored, disposed, or released; and hazardous materials or petroleum or its derivatives were stored or used. A data search on waste storage and disposal sites was conducted on January 9, 2007 using EnviroMapper for Envirofacts, an internet service provided by USEPA (USEPA 2007a). EnviroMapper combines interactive maps and aerial photography to display facility-based environmental information as filed with state agencies and reported to the USEPA. The facility types that were queried for the Tijuana River Flood Control Project area included a list of the following facility types.

- Superfund Sites: Indicates the specific facilities designated as Superfund sites by the USEPA.
- Toxic Release Sites: Indicates specific facilities regulated by the USEPA that release toxic substances into the environment, listed in the Toxics Release Inventory database.
- Water Dischargers: Indicates USEPA regulated municipal and industrial wastewater treatment facilities discharging water into rivers, streams, lakes, and other waterways.
- Hazardous Waste Sites: Indicates USEPA-regulated Resource Conservation and Recovery Act sites and/or facilities that handle materials designated as hazardous waste.
- Multi-Activity Sites: EnviroMapper allows you to query sites that show up on multiple databases for facility information.

The search extended along the Tijuana River Flood Control Project area, including the interior floodway system, up to 1 mile from the levee corridor centerline. No Superfund sites, toxic release sites, nor water dischargers were identified for the Tijuana River Flood Control Project area. Within 1 mile of the levee centerline, nine hazardous waste sites, and one multi-activity sites were identified during the query.

The USIBWC has spill prevention, control, and countermeasures (SPCC) and storm water pollution prevention plans for its operations at the SBIWTP. These plans require routine inspections (using checklists included in the plan) of a range of areas, tanks, and containers at the facility (USIBWC 2006). The USIBWC does not have separate SPCC or other management plans for flood control operations.

## SECTION 4 ENVIRONMENTAL CONSEQUENCES

This section analyzes environmental consequences of improvement measures associated with the Multipurpose Management Alternative, relative to current operation and maintenance practices evaluated under the No Action Alternative.

### 4.1 WATER RESOURCES

The following discussion is a summary of the water resources potentially affected by the alternative flood control practices. This discussion includes a description of the Tijuana River Watershed and a description of stream flow conditions and water quality of the receiving water.

Impacts to water resources would be considered significant if any of the following were to occur: substantial flooding or erosion; adverse effects on any significant water body (such as stream, lake, or bay); exposure of people to reasonably foreseeable hydrologic hazards such as flooding; or, adverse effects to surface or groundwater quality or quantity. Impacts on water quality would be considered significant when concentrations of indicator parameters exceeded regulatory values, including federal freshwater quality criteria for the Tijuana River.

#### 4.1.1 No Action Alternative

Under the No Action Alternative, O&M of the Tijuana River FCP would not change from the current management practices.

##### ***Flood Control***

Impacts to flood control would not be expected as this alternative would not result in any changes to flood control practices. Current maintenance practices, including clearing of vegetation, for the Tijuana River FCP would continue to provide flood protection and maintain open sight lines for USBP operations.

##### ***Hydrology***

No changes to the existing hydrology of the river would occur. For these reasons, impacts to hydrology of the Tijuana River would not be expected.

##### ***Water Supply and Water Management***

The Tijuana River FCP does not have a water supply or water management component. Water from the Tijuana River is not used for domestic purposes.

##### ***Groundwater Resources***

Recharge potential of the Lower Tijuana River aquifer would not change as a result of the No Action Alternative. The aquifer has very limited utilization due, among other factors, to

extensive saline intrusion. Overall, current aquifer conditions are likely to continue in the future in terms of aquifer recharge and water quality.

### **Water Quality**

All dry weather flows from the Tijuana River are currently diverted at the international border for subsequent treatment at the SBIWTP and/or the San Antonio de los Buenos Wastewater Treatment Plant in Mexico. While Tijuana River flows during dry weather conditions are currently intercepted upstream of the international boundary, stream flows during storm events are allowed to continue into the Tijuana estuary. Wet-weather flows include contaminated runoff from areas not currently served by Tijuana's wastewater collection system, overflows from an aging sewer system, and partially treated wastewater from the City of Tecate. The No Action Alternative would not modify water quality of runoff entering the Tijuana River FCP from Mexico.

#### **4.1.2 Multipurpose Management Alternative**

Under the MPM Alternative, vegetation removal operations may be altered (either in timing or extent of removal). Under cooperative agreements, it is possible that riparian vegetation may be managed and developed south of the sod farm, along the river channel.

### **Flood Control**

Impacts to flood control would not be expected as this alternative would not result in any changes to flood control practices. Further, any changes in the timing or extent of vegetation removal, or additional riparian vegetation along the river channel would be addressed from an engineering standpoint, such that flood control of the area would not be compromised. If the vegetation removal to the west of Dairy Mart road was reduced or halted, there are no anticipated changes to flood control, as this section is downstream of the energy dissipator, which is expected to control flooded during even extreme flood events.

### **Hydrology**

No changes to the existing hydrology of the river would occur. For these reasons, impacts to hydrology of the Tijuana River would not be expected under the MPM Alternative.

### **Water Supply and Water Management**

The Tijuana River FCP does not have a water supply or water management component. Water from the Tijuana River is not used for domestic purposes. This will continue under the MPM Alternative.

### **Groundwater Resources**

Recharge potential of the Lower Tijuana River aquifer would not change as a result of the MPM Alternative. The aquifer has very limited utilization due, among other factors, to extensive saline intrusion. Overall, current aquifer conditions are likely to continue in the future in terms of aquifer recharge and water quality.

## **Water Quality**

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## **4.2 BIOLOGICAL RESOURCES**

Impacts on biological resources would be considered significant if the alternative diminishes habitat for plant or animal species; reduces population sizes of regionally important plant or animal species; or interfere with movement of animal species.

### **4.2.1 No Action Alternative**

#### **Vegetation**

Floodway maintenance, including mowing within 200 to 300 yards of the river on the north and south sides would continue. The levee slopes would remain primarily invasive grasses that rapidly re-grow after disturbances such as mowing. The sod farm to the northern side of the project area is under a long-term lease. Therefore, no changes would be made to the vegetation under the No Action Alternative.

The vegetation under the No Action Alternative would remain as primarily heavily disturbed habitat containing non-native grasslands and ruderal communities. The vegetation would not be managed differently, and would not be expected to be altered through seral succession.

#### **Wildlife**

The project area contains non-native grasslands, and provides limited habitat for raptor foraging, but no changes would be made to the vegetation communities, and therefore wildlife species that utilize the area would continue to do so under the No Action Alternative. The wildlife habitat under the No Action Alternative is not expected to further degrade, nor would additional habitat through seral succession be developed.

### **Threatened and Endangered Species**

There is no habitat currently present within the FCP that is considered valuable for T&E species. The current habitat would be maintained through mowing and disking, and would not convert to a different type of habitat through seral succession. No changes would be made to change the timing of the mowing regime or other habitat improvements that would provide suitable habitat for T&E species.

### **Aquatic Ecosystems**

The Tijuana River is generally dry except during very high flows. Under the No Action Alternative, the flow regime would not be modified, and therefore the aquatic ecosystems would not be altered under the No Action Alternative.

### **Unique or Sensitive Areas**

The degraded non-native grasslands in the southern portion of the project area may provide some foraging habitat for raptors, but no changes would be made to the vegetation communities in the project area. Therefore, if foraging habitat is available, it would remain in present condition under the No Action Alternative.

### **Wetlands**

There are no jurisdictional wetlands in the project area, and therefore under the No Action Alternative, there would be no changes. The wetlands within the Tijuana River Valley Regional Park and the wetlands at the mouth of the Tijuana River, outside the Tijuana River FCP area, would not be affected under No Action Alternative. These wetlands would continue to provide habitat for migratory and resident bird species, amphibian and reptile species.

## **4.2.2 Multipurpose Management Alternative**

The MPM Alternative would include actions within the floodway and actions that are considered regional alternatives, outside the USIBWC jurisdiction. These latter actions would require multi-agency cooperation to achieve. A Framework Document was developed to better define measures associated with the MPM Alternative (Parsons 2008). The document describes three key components of the alternative that have the potential to positively benefit both the FCP and the downstream communities. The three components are sediment removal and spoil placement of sediment within the river channel; vegetation management within the FCP, and; trash removal. These three components will be addressed in the context of each of the biological resources described below.

### **Vegetation**

Vegetation management within the floodway is currently done by the USBP, under a MOU with the USIBWC. Possible changes in the vegetation management that would not require modification of the MOU may include:

- Coordination with the USBP on changes to timing or method of vegetation removal, currently done by disking. Changes in removal may be more closely coordinated with representatives of adjacent natural management areas.
- Modification of vegetation removal practices west of Dairy Mart Road, including no clearing, or reduced clearing activities in this area adjacent to the San Diego County Park. The changes in the mowing regime to the west of Dairy Mart Bridge may be coordinated with management personnel of the park.
- Potential development of a trash catchment basin similar to the one developed in Goat Canyon, west of the Tijuana River FCP. This would help capture trash primarily at the boundary line.

There is little coordination of floodway vegetation management with personnel of other natural resources management areas. Further, trash removal does not regularly occur within the USBWC floodway. Possible changes in vegetation management by the USBWC and trash removal, likely to require a modification of the MOU with the USBP, may include:

- Cooperation with other agencies or organizations to support development of a multi-agency River/Estuary Management Plan.
- Consultation with natural resources management agencies to determine how vegetation along the river channel may be maintained to allow development of riparian vegetation. This evaluation would include areas west of Dairy Mart Road, adjacent to an existing parking and trailhead area under consideration for the County Park. If riparian vegetation is developed, it is possible it would collect trash moved from the river channel. Therefore, any development of additional riparian vegetation would also have to have a concurrent and on-going trash removal program within the riparian vegetation.
- Coordination with the County of San Diego to develop an existing parking and trailhead area west of Dairy Mart Road. This would support recreational and enhance the use of the County Park. While the parking area is already there, the County would like to get approval for making improvements to the site and making it an “official” trailhead under its control. Further, it is expected that restoration of the vegetation in the area surrounding the trailhead would occur, including the area to the west of Dairy Mart road, providing additional habitat.
- Coordination with other agencies on trash removal operations and construction of trash collection structures.
- Consultation with the National Resources Conservation Service on potential for native vegetation development in portions of the sod farm adjacent to the stream channel. Development of native vegetation would be coordinated with Natural Resources Management Personnel, to obtain the palette of plants most suitable for the species present. Active management of riparian vegetation would have to occur to prevent the areas from becoming dense stands of non-native vegetation (*i.e.*, Russian thistle, tamarix) that are generally less desirable habitat communities.

Sediment removal occurs within the river channel as described above. Currently the sediment spoil is deposited downstream of the energy dissipator, at an elevation higher than the

remaining floodway. Sediment is only transported to downstream communities during extreme high flows. If sediment spoil is placed within an area within the Hoffer site, sediment would not be transported downstream, even under extreme conditions. While the amount of sediment transported downstream from the FCP during flood events is only a small fraction of the sediment transported through the adjacent canyons, sedimentation in general has reduced the area occupied by native vegetation. Any reduction in sedimentation will benefit downstream communities

### **Wildlife**

As described above, changes to the timing and extent of vegetation removal may occur under the MPM Alternative, and any changes to the vegetation that creates more riparian habitat, or prevents further degradation of the habitat, would benefit wildlife species, including raptors who use the non-native grasslands for foraging, to bird species who utilize riparian vegetation for nesting and foraging.

Trash removal operations, both in the form of a sediment/trash catchment, and ongoing trash removal that may occur in newly developed riparian areas would benefit wildlife both in the project area and within downstream communities. Wildlife is often negatively impacted by trash in the landscape, and removal of some would provide at least limited benefits.

Changes in sediment removal and spoil placement practices would likely benefit wildlife species. If the vegetation in the area where sediment is currently placed develops into non-native grassland vegetation through seral succession in this location, that change would benefit raptor species and possibly other species. Further, although the impact of sediment transport from the FCP to downstream communities is a small percentage of the total sediment load, any reductions in sedimentation would improve vegetation communities, which would therefore improve wildlife communities.

### **Threatened and Endangered Species**

There is no habitat currently present within the FCP that is considered valuable for T&E species. The T&E species (particularly the bird species) that occur in the area generally rely on riparian vegetation for breeding and foraging. If riparian vegetation were developed in small portions of the FCP, and the newly developed riparian vegetation were adjacent to existing habitats, this may provide enough habitat for extension of ranges or establishment of additional nesting sites for T&E bird species. Coordination with Natural Resources Management personnel would also need to occur to actively manage the riparian vegetation (*e.g.*, to remove non-native species) when the management activities would not negatively affect the T&E species in the area.

### **Aquatic Ecosystems**

The Tijuana River is generally dry except during very high flows. Under the MPM Alternative, the flow regime would not be modified, and therefore the aquatic ecosystems would not be altered under the MPM Alternative. Additional best management plans (BMP) under the MPM Alternative and additional trash and sediment collection management options are expected to improve aquatic habitats downstream of the FCP to some degrees. If riparian vegetation is developed along the western boundary of the property, and if this riparian

vegetation provides some biological filtering of water, downstream aquatic ecosystems are anticipated to benefit, to a limited extent.

### **Unique or Sensitive Areas**

The non-native grasslands currently present would not be substantially altered under the MPM Alternative. Changes in timing or extent of vegetation removal may allow additional areas (*e.g.*, on the levee slopes, on the western boundary of the project area) to develop into non-native grasslands through seral succession. Changes in the placement of sediment spoil may allow the area currently used for spoil disposal to develop into non-native grasslands through seral succession. Any additional non-native grassland development would provide additional habitat for raptor foraging. Any additional development of riparian vegetation would provide habitat for other wildlife, bird, and T&E species. In

### **Wetlands**

There are no jurisdictional wetlands in the project area, and therefore under the MPM Alternative, there would be no changes. The wetlands within the Tijuana River Valley Regional Park have undergone extensive sedimentation in recent years, due primarily to sediment transport through the adjacent canyons during storm events. However, some sediment may also be transported from the FCP during extreme flood events. It is anticipated that the sediment contribution from the FCP would be a small percentage of the total during these extreme events. However, if sediment spoil is disposed at the Hoffer site, that may prevent at least the small percentage contribution from the FCP during extreme storm events. Reducing, even by a small percentage, of the sediment loading in wetlands will likely provide benefit to the wetlands, or at a minimum, cause no further degradation due to the FCP.

## **4.3 LAND USE**

Impacts to land use would be considered significant if implementation of the alternative would result in substantial in agricultural land use or recreational use at a regional level.

### **4.3.1 No Action Alternative**

Under the No Action Alternative, O&M of the Tijuana River FCP would not change from the current management practices. If no improvements are made to the levee system and floodplain area, it does not appear likely that any significant impacts would occur to surrounding land uses.

### **4.3.2 Multipurpose Management Alternative**

Land uses in the immediate vicinity of the FCP may occur under the MPM Alternative. A key emphasis of the MPM Alternative is multi-jurisdictional, regional, cooperative agreements that promote watershed management and habitat conservation initiatives. Under the MPM Alternative, one possible land use change would be on the western boundary of the project areas, where vegetation clearing may be halted or modified, and coordination with the County of San Diego to develop an existing parking and trailhead area west of Dairy Mart

Road. This would support recreational opportunities and enhance the use of the County Park. While the parking area is already there, the County would like to get approval for making improvements to the site and making it an “official” trailhead under its control.

#### **4.4 CULTURAL RESOURCES**

Impacts to cultural resources would be considered during the planning of the Tijuana River FCP; those impacts would be considered significant if they have a potential to affect the historic integrity of valuable cultural resources, or affect archaeological sites.

##### **4.4.1 No Action Alternative**

Under the No Action Alternative, O&M of the Tijuana River FCP would not be modified. No adverse affects are anticipated on historical or archaeological resources.

##### **4.4.2 Multipurpose Management Alternative**

Under the MPM Alternative, the need for levee height increases or structural improvements is not anticipated, and changes in the floodway use would be limited to surface disturbances. For this reason, impacts to historical or archaeological resources would not be considered significant. Cooperative agreements outside the floodway could affect cultural resources to some extent depending on the nature of proposed initiatives.

#### **4.5 SOCIOECONOMIC RESOURCES**

A socioeconomic impact would be considered significant if the federal action resulted in substantial growth or concentration of population or the need for substantial new housing or public services.

##### **4.5.1 No Action Alternative**

###### ***Population, Employment/Income, and Housing***

Under the No Action Alternative, O&M of the Tijuana River FCP would not change from the current management practices. This alternative would not generate additional business sales, income or employment from construction. Current maintenance practices for the Tijuana River FCP would continue to provide a steady, long-term benefit by continuing to add some revenue in wages and expenditures into the regional economy every year. The Tijuana River FCP currently employees a permanent staff of three persons in the USIBWC San Diego Field Office. Assistance from other USIBWC field offices is provided for recurring maintenance operations.

The low-intensity land use in the Tijuana River Valley area and the fact that the majority of the existing channel, floodways, and levees have been constructed on undeveloped and public lands tends to minimize socioeconomic impacts from the continued operation of the Tijuana River FCP .

## **Environmental Justice**

Executive Order 12898 requires that each federal agency analyze the human health, economic, and social effects of federal actions, including the effects on minority communities and low income communities. An impact to environmental justice would be considered significant if the federal action had disproportionately high and/or adverse human health or environmental effects on minority and low income populations.

The affected area is the footprint of land where potential adverse impacts could result from a planned activity. For this project, these are the United States census tracts that could be affected by flood waters of the Tijuana River from the U.S./Mexico border to the Pacific Ocean.

Environmental justice impacts can arise as a result of the uncontrolled flood waters that may cause damage to property. The No Action Alternative would result in the continued control of flood waters using current maintenance practices in accordance with applicable regulatory requirements and, therefore, would not result in any increased in flood and associated health hazards to the immediate community.

Impacts to biological resources, geologic resources (*e.g.*, soil), air quality, noise, and cultural resources would not be expected as a result of the No Action Alternative. For these reasons, disproportionately high and adverse human health and environmental effects on minority and low-income populations would not be expected.

## **Transportation**

Under the No Action Alternative, O&M of the Tijuana River FCP would not change from the current management practices. This alternative would not result in any changes to existing traffic patterns or volumes on Dairy Mart Road, Camino de la Plaza, and Monument Road. No changes to maintenance roads alongside the north and south levee used by USIBWC and the USBP personnel would occur. The No Action Alternative would not result in any impacts to transportation.

### **4.5.2 Multipurpose Management Alternative**

#### **Population, Employment/Income, and Housing**

Changes to the vegetation management and development of new riparian habitat under the MPM Alternative would not result in significant impacts to population, employment/income, or housing. If BMPs and additional measures for trash and sediment removal are implemented under the MPM Alternative, this would benefit users of adjacent recreational areas (*e.g.*, the Regional Park). However, there may be greater restriction of public use/access of the floodway associated with increasing USBP operations. Any additional operations for improved habitat use or wildlife enhancements under cooperative agreements with the USIBWC are not anticipated to have direct or indirect impacts to population, employment, or housing in the region.

### **Environmental Justice**

Changes in the timing and extent of vegetation clearing, additional BMPs and trash and sediment removal operations under the MPM Alternative are not anticipated to negatively impact biological resources, geologic resources (*e.g.*, soil), air quality, noise, and cultural resources. For these reasons, disproportionately high and adverse human health and environmental effects on minority and low-income populations would not be expected.

### **Transportation**

Change in timing or extent of vegetation clearing, and BMPs and trash and sediment removal operations under the MPM Alternative, and possible greater restrictions on the public use of the floodway due to USBP operations may occur under the MPM Alternative. This alternative would not result in any changes to existing traffic patterns or volumes on Dairy Mart Road, Camino de la Plaza, and Monument Road. No changes to maintenance roads alongside the north and south levee used by USIBWC and the USBP personnel would occur. The MPM Alternative would not result in significant impacts to transportation.

## **4.6 ENVIRONMENTAL HEALTH**

Potential impacts on environmental health issues would be considered significant if implementation of an alternative would result in the following:

- Generate *air emissions* that cause or contribute to a violation of any national, state, or local ambient air quality standard; represent 10 percent or more of the emissions inventory for the affected AQCR counties to be considered regionally significant; or cause non-conformance with the USEPA General Conformity requirements.
- *Noise generation* by construction activities above ambient noise levels; cause annoyance, speech interference, or hearing loss; or noise-sensitive receptors are located in the proximity of the noise source.
- Regarding *public health and environmental hazards*, violation of federal or state regulations for hazardous waste usage, storage, or disposal; use of materials that could not be accommodated by existing guidance; human exposure to hazardous wastes or materials; or hazardous waste generation that could not be accommodated by current waste management practices.

### **4.6.1 No Action Alternative**

#### **Air Quality**

Under the No Action Alternative, O&M of the Tijuana River FCP would not change from the current management practices. No construction activities would be performed on the levee system. This alternative would not result in any changes in the generation of air pollutant emissions during operations and maintenance activities. For this reason, impacts to air quality would not be considered significant. A USEPA General Conformity Determination would not be required.

## **Noise**

This alternative would not result in any changes in the noise environment during operations and maintenance activities. The resultant noise level of equipment in operation for flood control maintenance activities would not be expected to exceed the City of San Diego noise standard at any sensitive receptors in the project area. For this reason, impacts to noise would not be considered significant.

## **Public Health and Environmental Hazards**

Hazardous material practices of the USIBWC are in compliance with applicable standards under the current operations and maintenance practices. Storage of diesel fuel and refueling of vehicles and equipment is performed in compliance with applicable state and federal standards. No hazardous materials sites are currently affected by operations and maintenance activities. Therefore, current USIBWC practices would not affect hazardous materials handling, nor any facilities or sites in the project area.

The Tijuana River FCP would continue to implement current maintenance practices such as resurfacing roadways of the levee system and floodway maintenance activities. This alternative would not result in exposure to any contamination on the site, and there are no remediation activities ongoing at the Tijuana River FCP. For these reasons, impacts to public health and environmental hazards would not occur.

### **4.6.2 Multipurpose Management Alternative**

#### **Air Quality**

Changes in the extent and timing of vegetation removal and BMPs and trash and sediment removal operations under the MPM Alternative may occur. However, none of these aspects would be expected to result in any substantial change in the amount of air pollutants generated by USIBWC operations. For these reasons, impacts to air quality would not be considered significant.

#### **Noise**

Changes to the timing and extent of vegetation clearing may alter the noise environment under the MPM Alternative. If the amount of area cleared was reduced, it is anticipated that the noise associated with mowing operations would be reduced. The noise associated with levee maintenance operations would be expected to continue as under the No Action Alternative. Development of a sediment and trash catchment basin may generate noise for a short time period during construction activities. If the catchment basin were approved, noise generated during construction would have to be assessed to protect sensitive receptors in the vicinity. Further, construction activities would have to be coordinated with natural resources management personnel to have construction activities occur outside of the breeding season of sensitive ecological receptors (*e.g.*, T&E species). Long-term negative impacts due to noise under the MPM Alternative are not anticipated.

## **Public Health and Environmental Hazards**

The MPM Alternative would result in continuation of the existing operation of the Tijuana River FCP, and changes in the timing and extent of vegetation clearing have been identified as possible activities under the MPM Alternative. Hazardous and/or toxic products (*e.g.*, fuel, oil, grease, and hydraulic fluid) would be used from operating equipment for vegetation and sediment removal, and for construction projects related to sediment and trash catchment basins. Implementing established industry practices for controlling releases of these substances would reduce the possibility of accidental releases of these products. Preventive maintenance and daily inspections of the equipment would ensure that any releases of these hazardous materials are minimized. All visible dirt, grime, grease, oil, loose paint, *etc.*, would be removed from the equipment prior to use at the construction sites. Further, during construction activities, industry BMPs would be utilized to prevent the transport of sediment, trash, or construction debris during the construction activities, to prevent impacts to downstream plant, animal, and aquatic communities.

The Tijuana River FCP would continue to be managed in accordance with applicable health and environmental compliance requirements. Identified waste storage and disposal sites would not affect, nor be affected by, the proposed MPM Alternative due to their distance, and in some cases, the containment systems in place. None of the aspects of the MPM Alternative would be expected to result in any increases in exposure to contamination on the site, and there are no remediation activities ongoing at the Tijuana River FCP. For these reasons, impacts to public health and environmental hazards would not be expected to occur.

## **4.7 INDIRECT AND CUMULATIVE IMPACTS**

Indirect and cumulative impacts would be considered significant if the alternative would cause considerable incremental effects when evaluated in combination with relevant current and probable activities in the project area.

### **4.7.1 Natural Resources Management Areas**

No significant cumulative impacts were identified. Anticipated or probable changes in the timing and extent of vegetation clearing would remove less of the vegetation within the floodway than at present. Changes in the vegetation removal practices may provide additional raptor foraging habitat in some areas, and if riparian vegetation is developed on the western boundary of the project, the riparian vegetation would provide additional habitat for sensitive and T&E species, particularly birds. All anticipated and probably changes to the vegetation within the floodway will be coordinated with Natural Resources Management personnel, and taking into consideration the goals and requirements of the Multi-Habitat Planning Area developed the City of San Diego.

## **4.7.2 Water Quality and Sediment Control**

### ***Water Quality Improvement***

Binational initiatives currently underway to improve water quality of the Tijuana River upstream of the international border are expected to reduce sewer overflows, considered a major component of contaminant load reaching the Tijuana River estuary, and improve storm water quality by upstream watershed control of non-point pollution sources (USIBWC 2005). Formal and informal agreements with local governments and municipalities to further address erosion control (and therefore, sediment control) and trash control, on both sides of the border are anticipated under the MPM Alternative. The Tijuana River FCP has no capability to modify or control storm water quality directly, but there is a possibility that development of riparian vegetation along the western boundary of the project area will act as a biological filter for some of the contaminants in storm water.

### ***Sediment and Erosion Control***

The Tijuana River FCP will continue to undergo sediment removal and spoil disposal on an as-needed basis to maintain the integrity of the river channel. However, under the MPM Alternative, there may be changes to the location of the sediment spoil disposal, which in turn may reduce some the sediment transported downstream during extreme flood events. The beneficial impact of this change in spoil disposal is expected to be small, but would reduce at least a small percentage of cumulative sediment flow to natural communities downstream of the FCP.

## **4.7.3 U.S. Customs and Border Protection Activities**

The long-term strategy for enforcement activities by the U.S. Customs and Border Protection (USACE 2001), includes two major categories with a potential for cumulative effects on the Tijuana River FCP: operational measures, such as increased ground patrols and access restrictions, and engineering measures such as placement fences, lighting, and installation of a remote sensing system such as ground sensors.

At the local level, the Border Infrastructure System Project extends 14 miles from the Pacific Ocean to the foothills of the San Ysidro Mountains. The project includes a triple fence along the international border to control illegal border crossings, patrol and maintenance roads, lights, and components of the Integrated Surveillance and Intelligence System.

While the Border Infrastructure System Project and long-term enforcement activities by the U.S. Customs and Border Protection will continue in the future, under the MPM Alternative changes in implementation along the Tijuana River FCP may occur. Such changes, requiring modification of the MOU between the USBP and the USIBWC, would include modified maintenance of vegetation communities by the USBP, either in the timing and extent of maintenance activities, to improve environmental conditions.

## SECTION 5 ENVIRONMENTAL COMPLIANCE AND COORDINATION

This section describes the public involvement program that included public scoping meetings, and coordination with various agencies throughout the NEPA process. The environmental review was conducted in accordance with the requirements of Section 102(2)(c) of the National Environmental Policy Act of 1969, as amended, Council on Environmental Quality Regulations (40 CFR Parts 1500-1508), other appropriate regulations, and the USIBWC procedures for compliance with these regulations. The USIBWC regulations for implementing NEPA are specified in *Operational Procedures for Implementing Section 102 of the National Environmental Policy Act of 1969, Other Laws Pertaining to Specifics Aspects of the Environment and Applicable Executive Orders* (46 FR 44083, September 2, 1981).

Copies of the PEIS will be transmitted to federal and state agencies and other interested parties for their review and comment and will be filed with the USEPA in accordance with 40 CFR Parts 1500-1508 and USIBWC procedures.

### 5.1 PUBLIC AND AGENCY CONSULTATION

#### 5.1.1 Scoping Meetings

A public scoping meeting for the Tijuana River FCP was held in Imperial Beach, California on January 27, 2005.

The USIBWC conducted additional meetings for three Rio Grande flood control projects along the Texas border, held in the Cities of El Paso, Presidio, and McAllen, Texas (January 11, 13 and 19, 2005, respectively). These three projects (Rectification FCP, Presidio FCP, and Lower Rio Grande FCP) have been concurrently evaluated by the USIBWC under a separate PEIS. A fifth meeting was also held in Las Cruces, New Mexico on January 12, 2005 for the Rio Grande Canalization Project.

Findings and conclusions of the five scoping meetings were compiled by the USIBWC in the 2005 document, *Scoping Meeting Summary, Programmatic Environmental Impact Statement, Rio Grande and Tijuana River Flood Control Projects*. A Scoping Meeting Summary for this PEIS was prepared in March 2005 (USIBWC 2005a). This document, provided in Appendix D, is an administrative record of public comments received during the December 10, 2004 to February 7, 2005 scoping period.

Full public participation by interested federal, state, and local agencies and organizations as well as the general public was encouraged during the scoping process. Notification of the public meetings was made through letters to agencies, organizations, and individuals; newspaper announcements; and publication of the Notice of Intent in the Federal Register. Each mailing contained a response form on which comments could be written and submitted. An address to mail comment letters was provided in all communication to potential stakeholders. Discussion was encouraged during the scoping meetings and verbal comments

were noted. Comment forms were distributed during the meetings, and turned in during the meeting or mailed to the USIBWC after the meeting (USIBWC 2005a).

The Notice of Intent to prepare a PEIS was published in the Federal Register by the USIBWC on December 10, 2004. A copy of the Notice of Intent is included in the Scoping Meeting Summary report (Appendix A – Item 1 of the USIBWC 2005a).

### **5.1.2 Notifications to Agencies, Elected Officials, Organizations, and Individuals**

The USIBWC mailed a notification letter for the public scoping meetings to 1,647 elected officials, federal/state/local agencies, organizations, and individuals. The letter, mailed December 10, 2004, contained a description of the USIBWC flood control projects, example lists of potential alternatives, and example lists of potential criteria to be used for evaluating alternatives. Dates and times of scoping meetings, and instructions for submitting written comments were included. A response form was included for recipients to return stating their desire to continue or not continue receiving information on the project. A copy of the letter, a blank response form, and the mailing list for notification are included in Appendix A – Item 5 of the Scoping Meeting Summary report (USIBWC 2005a).

A Public Notice announcing the purpose, dates and locations of the scoping meetings was published in the legal section of the *San Diego Union-Tribune* on December 14, 15, and 16, 2004). Additional notices were posted for Rio Grande flood control projects in the *El Paso Times* (December 14, 15, and 16, 2004); *Las Cruces Sun News* (December 14, 15, and 16, 2004); *The International*, Presidio, Texas (December 16, 23, and 30, 2004); and *The Monitor*, McAllen, Texas (December 21, 22, and 23, 2004). Copies of the publisher's affidavits are provided in Appendix A - Item 4 of the Scoping Meeting Summary report (USIBWC 2005a).

## **5.2 PEIS PREPARATION AND TECHNICAL REVIEW**

### **5.2.1 Cooperating Agencies**

The USIBWC sent letters to federal agencies, state agencies, and tribal governments soliciting their participation as Cooperating Agencies during the NEPA process of the flood control projects. A total of 87 letters were sent on November 16, 2004, and seven responses were received. A sample copy of the request letter is provided in Appendix A - Item 2 of the Scoping Meeting Summary Report (USIBWC 2005a). Agencies receiving the request letter and copies of the responses received are shown in Appendix A - Item 3 of the Scoping Meeting Summary report (USIBWC 2005a). Five agencies agreed to serve as cooperating agencies in PEIS preparation, as follows:

- The United States Army Corps of Engineers, Los Angeles District, whose jurisdiction includes the Tijuana River FCP.
- Three agencies agreed to be cooperating agencies in the PEIS prepared concurrently for three Rio Grande flood control projects along the Texas border (Rectification

FCP, Presidio FCP, and Lower Rio Grande FCP), USACE Galveston District; United States Bureau of Reclamation, El Paso Area Office; and United States Fish and Wildlife Service, New Mexico Ecological Services Field Office,

- A fifth agency, the New Mexico Office of Cultural Affairs, Historic Preservation Division, agreed to be cooperating agency for evaluation of the Rio Grande Canalization Project, no longer included in the scope for Rio Grande FCPs.

## 5.2.2 PEIS Preparation

Technical personnel responsible for preparation and review of the PEIS for the Rio Grande flood control projects along the Texas border are listed in Table 7.

**Table 7 PEIS Preparation Technical Personnel**

Name	Organization	Role / or Resource Area	Discipline / Expertise	Experience
Daniel Borunda	USIBWC	PEIS oversight and coordination, impacts evaluation	M.S. Fisheries and Wildlife Science	12 years, Project Manager NEPA Compliance
Raymundo Aguirre	USIBWC	Document review	Ph.D. Civil Engineering	49 years, project engineering
Dawi Dakhil	USIBWC	Document review	M.S. Civil Engineering Tijuana River FCP Manager	31 years, civil engineering
Carlos Victoria-Rueda.	Parsons	Project management, scoping, impacts evaluation	Ph.D., Environmental Engineering	22 years NEPA and related environmental studies
R. C. Wooten	Parsons	Technical direction, quality assurance	Ph.D. Biology/Ecology	34 years NEPA and related environmental studies
Rosemarie Crisologo	Parsons	Socioeconomic resources	B.S. Biological Science M.S. Environmental Engineering	25 years NEPA and related environmental studies
Anthony Davis	Parsons	Water resources and environmental health	B.S. Civil Engineering	30 years NEPA and related environmental studies
James Hinson	Parsons	Biological resources, impacts evaluation	M.S. Wildlife Science	16 years vegetation and wildlife analyses; field studies supervision
Taylor Houston	Parsons	Wetlands, aquatic ecosystems	M.S., Geography-Environmental Resources	6 years wetlands and land use
Sherrie Keenan	Parsons	Technical editor	B.A., Journalism	30 years technical editor
Justin Kirk	Parsons	Environmental health issues	B.S., Environmental science	6 years environmental health
Namir Najjar	Parsons	Hydrology	Ph.D., Water Resources Engineering	9 years hydraulic modeling
Jill Noel	Parsons	Biological resources, impacts evaluation	M.S. Botany	8 years vegetation and community resources
Angela Schnapp	Parsons	Land Use	B.S. Nuclear Engineering M.S. Environmental Engineering	10 years NEPA and related environmental studies
Nicky de Freece	LGGROUP	Cultural resources	B.A., Archaeology	16 years Cultural resources evaluation

### 5.2.3 Draft PEIS Public Review

Copies of the Draft PEIS were distributed to agencies, regional legislative and management authorities, organizations, and individuals for a 45-day public review period ending September 24, 2007. The selection of recipients was based on a list of potential stakeholders identified during the initial public scoping process, responses received, and additional potential reviewers identified following the initial consultation process. Findings of the scoping process were summarized in the document *Scoping Meeting Summary, Programmatic Environmental Impact Statement, Rio Grande and Tijuana River Flood Control Projects, New Mexico, Texas and California* (USIBWC 2005a). A copy of this document is provided in electronic format in Appendix D.

In addition to the Draft PEIS distribution, a public hearing was held during the public review period. The public hearing transcript is provided in Appendix D. The hearing was held in the City of Imperial Beach on August 30, 2007, from 6 to 9 p.m. Pacific Daylight Time.

Comments on the Draft PEIS were received from four federal agencies, four California State agencies, the County of San Diego, the City of Imperial Beach, and two individual reviewers. Copies of comments received are provided in Appendix B, along with oral comments from three attendees to the August 30, 2007 Public Hearing. The Final PEIS addresses concerns and recommendations received, as discussed in the responses to comments presented in Appendix C. The list of reviewers submitting comments, identified as AG-1 to AG-11 and IND-1 to IND-5 for tracking purposes in Appendices B and C, is as follows:

- AG-1: U.S. Environmental Protection Agency, Region IX
- AG-2: U.S. Department of the Interior, Office of Environmental Policy and Compliance
- AG-3: National Oceanic and Atmospheric Administration
- AG-4: U.S. Fish and Wildlife Service
- AG-5: California Coastal Commission
- AG-6: California Environmental Protection Agency, San Diego Regional Water Control Board
- AG-7: State of California Native American Heritage Commission
- AG-8: California State Clearinghouse and Planning Unit
- AG -9: County of San Diego, Department of Planning and Land Use
- AG-10: County of San Diego, Department of Public Works
- AG-11: City of Imperial Beach

- IND-1: Mr. Bill Forbes (e-mail submittal)
- IND-2: Ms. Terry Thomas (letter submittal)
- IND-3: Mr. Roger Breham (public hearing attendee)
- IND-4: Mr. Jim Peugh (public hearing attendee)
- IND-5: Ms. Terry Thomas (public hearing attendee)

#### **5.2.4 Development of Framework Document for Potential Multipurpose Use of the USIBWC Floodway**

The Framework Document was developed in support of the PEIS to evaluate potential environmental impacts and benefits of potential long-term improvements and modified operation of the Tijuana River FCP. The Framework Document provided a description of current management practices, and discussed the potential modifications for multipurpose use of the flood control project, including natural resources management improvements, both within the floodway and downstream of the Tijuana River FCP (Parsons 2008). A copy of this document is provided in Appendix D.

As part of the Framework Document preparation, a work session was conducted on November 15, 2007 at the USIBWC San Diego Field Station to discuss the potential for multipurpose use of the Tijuana River FCP, and options for modified management. The work session was attended by representatives of the USIBWC, County of San Diego, State of California, U.S. Fish and Wildlife Service, San Diego Chapter Audubon Society, and Parsons, technical consultant for PEIS preparation.

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**Appendix A**

**Detailed Maps of the Tijuana River FCP and  
Historical Aerial Photographs**

## **Final Programmatic Impact Statement**

### **Tijuana River Flood Control Project**

#### **Appendix B**

#### **Written and Public Hearing Comments on Draft PEIS**

- AG-1: U.S. Environmental Protection Agency, Region IX
  - AG-2: U.S. Department of the Interior, Office of Environmental Policy and Compliance
  - AG-3: National Oceanic and Atmospheric Administration
  - AG-4: U.S. Fish and Wildlife Service
  - AG-5: California Coastal Commission
  - AG-6: California Environmental Protection Agency, San Diego Regional Water Control Board
  - AG-7: State of California Native American Heritage Commission
  - AG-8: California State Clearinghouse and Planning Unit
  - AG -9: County of San Diego, Department of Planning and Land Use
  - AG-10: County of San Diego, Department of Public Works
  - AG-11: City of Imperial Beach
- 
- IND-1: Mr. Bill Forbes (e-mail submittal)
  - IND-2: Ms. Terry Thomas (letter submittal)
  - IND-3: Mr. Roger Breham (public hearing attendee)
  - IND-4: Mr. Jim Peugh (public hearing attendee)
  - IND-5: Ms. Terry Thomas (public hearing attendee)

## **Final Programmatic Impact Statement**

### **Tijuana River Flood Control Project**

#### **Appendix C**

#### **Responses to Draft PEIS Comments**

- AG-1: U.S. Environmental Protection Agency, Region IX
  - AG-2: U.S. Department of the Interior, Office of Environmental Policy and Compliance
  - AG-3: National Oceanic and Atmospheric Administration
  - AG-4: U.S. Fish and Wildlife Service
  - AG-5: California Coastal Commission
  - AG-6: California Environmental Protection Agency, San Diego Regional Water Control Board
  - AG-7: State of California Native American Heritage Commission
  - AG-8: California State Clearinghouse and Planning Unit
  - AG -9: County of San Diego, Department of Planning and Land Use
  - AG-10: County of San Diego, Department of Public Works
  - AG-11: City of Imperial Beach
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- IND-1: Mr. Bill Forbes (e-mail submittal)
  - IND-2: Ms. Terry Thomas (letter submittal)
  - IND-3: Mr. Roger Breham (public hearing attendee)
  - IND-4: Mr. Jim Peugh (public hearing attendee)
  - IND-5: Ms. Terry Thomas (public hearing attendee)

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#### **Appendix D Programmatic PEIS Documentation**

*(Provided in CD-ROM)*

**D.1 DRAFT PEIS – JULY 2007**

**D.2 PEIS ALTERNATIVES REPORT – FEBRUARY 2007**

**D.3 PEIS SCOPING MEETINGS SUMMARY – MARCH 2005**

**D.4 CULTURAL RESOURCES REPORT – JULY 2005**

**D.5 BIOLOGICAL RESOURCES SURVEY – AUGUST 2005**

**D.6 FRAMEWORK DOCUMENT FOR MULTIPURPOSE USE OF THE USIBWC  
TIJUANA RIVER FLOOD CONTROL PROJECT – FEBRUARY 2008**

**D.7 TRANSCRIPT – AUGUST 30, 2007 PUBLIC HEARING**

## **Final Programmatic Impact Statement**

### **Tijuana River Flood Control Project**

#### **Appendix E**

#### **Technical Support Documents**

*(Provided in CD-ROM)*

- E1. Trails and Habitat Enhancement Project, Recirculated Draft Environmental Impact Report for the Tijuana River Valley Regional Park (County of San Diego 2006).**
- E2. Final Supplemental Environmental Impact Statement, Clean Water Act Compliance at the South Bay International Wastewater Treatment Plant (USIBWC 2005b).**
- E3. Biological Resources Technical Report, Tijuana River Valley Regional Park Trails and Habitat Enhancement Project (County of San Diego 2005).**
- E4. Multiple Species Conservation Program, City of San Diego MSCP Subarea Plan, March 1997 (City of San Diego, 1997a).**
- E5. Environmental Baseline, Region 5, California Border (USACE 1994b) prepared for the Supplemental Programmatic Environmental Impact Statement for U.S. Customs and Border Protection activities (USACE 2001).**