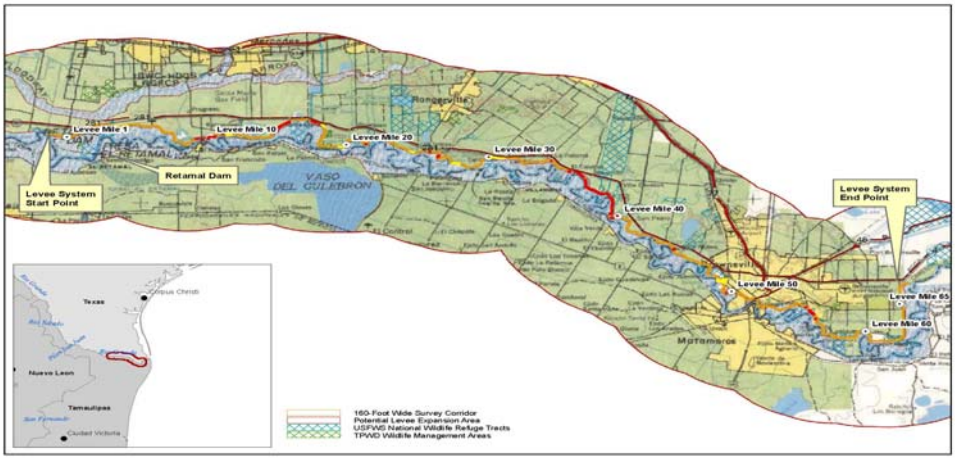
Final Environmental Assessment
Improvements to the Donna-Brownsville Levee System



Lead Agency:

United States Section,
International Boundary
and Water Commission

El Paso, Texas

Cooperating Agency:

United States Fish
and Wildlife Service

Technical Support:

PARSONS

Austin, Texas

September 2007

COVER SHEET

ENVIRONMENTAL ASSESSMENT
AND
FINDING OF NO SIGNIFICANT IMPACT

IMPROVEMENTS TO THE
DONNA-BROWNSVILLE LEVEE SYSTEM

Lead Agency: United States Section, International Boundary and Water Commission

Cooperating Agency: United States Fish and Wildlife Service

Proposed Action: Raising approximately 65 miles of the Donna-Brownsville Levee System to meet current requirements for flood control.

Report Designation: Environmental Assessment

Abstract: The USIBWC is considering raising sections of the 65-mile Donna-Brownsville Levee System to meet current flood control requirements. The proposed action would increase the height of the levee up to 2 feet depending on location. The height increase would also result in expansion of the levee footprint by lateral extension of the structure, up to a maximum of 12 feet. Along sections of the Donna-Brownsville Levee System, structural improvements such as slurry walls may be required in segments with seepage potential. A number of natural resources management areas are located near or adjacent to the levee system, including units of the Lower Rio Grande Valley National Wildlife Refuge System and Las Palomas Wildlife Management Areas.

The Environmental Assessment assesses potential environmental impacts of the Proposed Action and the No Action Alternative. Potential impacts on natural, cultural, and other resources were evaluated and mitigation measures were incorporated into the Proposed Action. A Finding of No Significant Impact was issued for the Proposed Action based on a review of the facts and analyses contained in the Environmental Assessment.

FINDING OF NO SIGNIFICANT IMPACT

IMPROVEMENTS TO THE DONNA-BROWNSVILLE LEVEE SYSTEM IN THE LOWER RIO GRANDE FLOOD CONTROL PROJECT HIDALGO AND CAMERON COUNTIES, TEXAS

LEAD AGENCY: United States Section, International Boundary and Water Commission, United States and Mexico.

BACKGROUND

The USIBWC is authorized to construct, operate, and maintain any project or works projected by the United States of America on the Lower Rio Grande Flood Control Project (LRGFCP), as authorized by the Act of the 74th Congress, Sess. I Ch. 561 (H.R. 6453), approved August 19, 1935 (49 Stat. 660), and codified at 22 USC Section 277, 277a, 277b, 277c, and Acts amendatory thereof and supplementary thereto. The LRGFCP was constructed to protect urban, suburban, and highly developed irrigated farmland along the Rio Grande delta in the United States and Mexico.

The USIBWC, in cooperation with the U.S. Fish and Wildlife Service (USFWS), prepared this Environmental Assessment for the proposed action of partially raising the Donna-Brownsville Levee System located in Hidalgo and Cameron Counties, Texas to improve flood control. This levee system is part of the LRGFCP that extends approximately 180 miles from the Town of Peñitas in south Texas to the Gulf of Mexico. The Donna-Brownsville Levee extends 65 miles along the Rio Grande, downstream from the Donna Pump Station in Hidalgo County to an area east of Brownsville, approximately 28 miles upstream of the Gulf of Mexico, in Cameron County.

PROPOSED ACTION

The Proposed Action would increase the flood containment capacity of the Donna-Brownsville Levee System by raising elevation of a number of levee segments to meet a 3-foot freeboard design criterion for flood protection. Height increases up to 2 feet are typically needed to reach the design freeboard value. The increase in levee height will result in an expansion to the levee footprint by lateral extension of the structure. Structural improvements may be required for some levee segments where seepage is a potential problem.

ALTERNATIVES TO THE PROPOSED ACTION

A No Action Alternative was evaluated for the Donna-Brownsville Levee System. This alternative will retain the existing configuration of the system, as designed over 30 years ago, and the current level of protection currently associated with this system. Under severe storm events, current containment capacity may be insufficient to fully control Rio Grande flooding, with risks to personal safety and potential property damage.

SUMMARY OF FINDINGS

Pursuant to NEPA guidance (40 Code of Federal Regulations 1500-1508), The President's Council on Environmental Quality issued regulations for NEPA implementation which included provisions for both the content and procedural aspects of the required Environmental Assessment. The USIBWC completed an EA of the potential environmental consequences of raising the Lateral A/Retamal Dike System to meet current requirements for flood control. The EA, which supports this Finding of No Significant Impact, evaluated the Proposed Action and No Action Alternative.

LEVEE SYSTEM EVALUATION

NO ACTION ALTERNATIVE

The No Action Alternative was evaluated as the single alternative action to the Proposed Action. The No Action Alternative will retain the current configuration of the Donna-Brownsville Levee System, with no impacts to biological and cultural resources, land use, community resources, or environmental health issues. In terms of flood protection, however, current containment capacity under the No Action Alternative may be insufficient to fully control Rio Grande flooding under severe storm events, with associated risks to personal safety and property.

PROPOSED ACTION

Biological Resources

Improvements to the Donna-Brownsville Levee System require excavation and fill activities that would affect plant communities within the expanded levee footprint area. Nearly all vegetation removal, 51.5 acres, would be limited to invasive-species grassland that is expected to be rapidly re-established. While approximately 17 percent of the 65-mile levee system is adjacent to conservation areas, those non-native grasslands are located within the right-of-way (ROW) and have very limited value as wildlife habitat. No significant effects are anticipated for any of the 15 threatened and endangered species with potential habitat in the vicinity of the levee system. No wetlands are located within the potential levee expansion area.

Cultural Resources

Improvements to the Donna-Brownsville Levee System may adversely affect known archaeological resources, by mechanical excavation or by burial under the expanded levee footprint. Resources potentially affected include eight areas that may contain historic or prehistoric archaeological materials, and one known archaeological site. Out of 65 historic-age resources located in the levee system vicinity, twelve could be affected by the proposed levee improvements. Those historic-age resources are mostly associated with irrigation structures and canals adjacent to the levee system.

Water Resources

Improvements to the levee system would increase flood containment capacity to control the design flood event with a negligible increase in water surface elevation. Levee footprint expansion would not affect water bodies.

Land Use

The expansion would take place almost completely within the ROW and would not affect urban or agricultural lands. A minimum removal of woodland from natural resources management areas, less that 1 acre, would be required.

Community Resources

In terms of socioeconomic resources, the influx of federal funds into Hidalgo and Cameron Counties from the levee improvement project would have a positive local economic impact limited to the construction period; the impact would represent less than 1 percent of the annual county employment, income and sales values. No adverse impacts to disproportionately high minority and low-income populations were identified for construction activities. Moderate utilization of public roads is required during construction; a temporary increase in access road use would be required for equipment mobilization to staging areas.

Environmental Health Issues

Estimated air emissions of five criteria pollutants during construction represent from 0.06 percent to 1.64 percent of the Hidalgo and Cameron Counties annual emissions inventory. There would be a moderate increase in ambient noise levels due to excavation and fill activities. No long-term and regular exposure is expected above noise threshold values. A database search identified a number of waste storage or disposal sites in the levee system vicinity, all located within the City of Brownville. None of those sites would affect, or be affected, by the levee improvement project.

Best Management Practices and Mitigation

Engineering design measures will be used, including optimization of the levee expansion alignment to avoid impacts on wooded vegetation, wetlands, and other natural resources. Best management practices during construction will include development of a storm water pollution prevention plan to avoid impacts to receiving waters, and use of sediment barriers and soil wetting to minimize erosion.

To protect vegetation, the construction corridor may be re-vegetated with herbaceous or woody vegetation, as agreed with the natural resources management organization where the levee expansion corridor is located. To protect wildlife, construction activities will be scheduled to occur, to the extent possible, outside the March to August bird migratory season.

To avoid significant impacts on cultural resources, an additional survey of archaeological and historical resources will be conducted following completion of the engineering design phase, and mitigation actions will be adopted as recommended by the Texas Historical Commission (THC). Measures to avoid or minimize potential impacts to historical or

archaeological resources will be specified in a Memorandum of Agreement between THC and the USIBWC.

DECISION

Based on my review of the facts and analyses contained in the Environmental Assessment, I conclude that implementation of the Proposed Action to improve the Donna-Brownsville Levee System will not have a significant impact. Accordingly, requirements of the National Environmental Policy Act and regulations promulgated by the Council on Environmental Quality are fulfilled and an environmental impact statement is not required.

Carlos Marin, Commissioner
International Boundary and Water Commission,
United States Section

9/10/07
Date

ENVIRONMENTAL ASSESSMENT

IMPROVEMENTS TO THE DONNA-BROWNSVILLE LEVEE SYSTEM

Lead Agency:

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

Cooperating Agency:

UNITED STATES FISH AND WILDLIFE SERVICE

Technical Support:

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USIBWC Contract IBM04D0002, Task Order IBM05T0022

SEPTEMBER 2007

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS v

SECTION 1 PURPOSE OF AND NEED FOR THE PROPOSED ACTION 1-1

1.1 Purpose of and Need for Action 1-1
1.2 USIBWC Authority 1-2
1.3 Scope of the Environmental Review 1-2
1.4 Environmental Coordination and Compliance Analysis 1-4
1.5 Organization of the Environmental Assessment 1-6

SECTION 2 DESCRIPTION OF PROPOSED ACTION 2-1

2.1 LRGRCP Levee System Description 2-1
2.1.1 Donna-Brownsville Levee System 2-2
2.1.2 Location of Conservation Lands 2-2
2.2 Proposed Action 2-4
2.3 No Action Alternative 2-5
2.4 Alternatives Considered and Eliminated from Detailed study 2-6
2.5 Other Actions With Potential Cumulative Impacts 2-6
2.6 Summary Comparison of Environmental Consequences of the Alternatives 2-6
2.6.1 No Action Alternative 2-6
2.6.2 Proposed Action 2-6

SECTION 3 AFFECTED ENVIRONMENT 3-1

3.1 Biological Resources 3-1
3.1.1 Vegetation 3-1
3.1.2 Wildlife 3-5
3.1.3 Threatened and Endangered Species 3-6
3.1.4 Wetlands and Aquatic Habitat 3-6
3.2 Cultural Resources 3-8
3.2.1 Previous Cultural Resources Studies 3-8
3.2.2 Historical and Prehistoric Archaeological Resources 3-10
3.2.3 Historic-age Resources 3-12
3.2.4 Cemeteries 3-12
3.3 Water Resources 3-14
3.3.1 Regional Flood Control 3-14
3.3.2 Water Flow 3-15
3.4 Land Use 3-15
3.4.1 Natural Resources Management Areas 3-16
3.4.2 Agricultural Land 3-16
3.4.3 Urban Areas 3-16

3.5 Community Resources 3-16
3.5.1 Socioeconomics 3-16
3.5.2 Environmental Justice 3-18
3.5.3 Transportation 3-18
3.6 Environmental Health 3-19
3.6.1 Air Quality 3-19
3.6.2 Noise 3-20
3.6.3 Hazardous and Toxic Waste 3-21

SECTION 4 ENVIRONMENTAL CONSEQUENCES 4-1
4.1 Biological Resources 4-1
4.1.1 Vegetation 4-1
4.1.2 Wildlife 4-1
4.1.3 Threatened and Endangered Species 4-4
4.1.4 Jurisdictional Wetlands and Aquatic Habitat 4-5
4.2 Cultural Resources 4-11
4.2.1 Historic and Prehistoric Archaeological Resources 4-11
4.2.2 Historic-age Resources 4-12
4.3 Water Resources 4-13
4.3.1 Flood Control 4-13
4.3.2 Water Flow 4-13
4.4 Land Use 4-13
4.5 Community Resources 4-14
4.5.1 Socioeconomics 4-14
4.5.2 Environmental Justice 4-16
4.5.3 Transportation 4-16
4.6 Environmental Health 4-17
4.6.1 Air Quality 4-17
4.6.2 Noise 4-18
4.6.3 Hazardous and Toxic Waste 4-18
4.7 Indirect and Cumulative Effects 4-18

SECTION 5 BEST MANAGEMENT PRACTICES AND MITIGATION ACTIONS 5-1
5.1 Engineering Measures 5-1
5.1.1 Best Management Practices 5-1
5.1.2 Engineering Design Measures 5-1
5.2 Natural Resources 5-2
5.2.1 Best Management Practices 5-2
5.2.2 Mitigation Measures 5-2
5.3 Cultural Resources 5-3
5.3.1 Best Management Practices 5-3
5.3.2 Mitigation Measures 5-3

SECTION 6 ENVIRONMENTAL COMPLIANCE AND COORDINATION 6-1
6.1 Cooperating agency 6-1
6.2 Consultation 6-1
6.3 List of Contributors 6-2
SECTION 7 REFERENCES 7-1

APPENDICES

Appendix A Detailed Maps of Levee Alignment, Right-of-Way and Potential Expansion Area
Appendix B Habitat of Threatened and Endangered Species Potentially Occurring Within Counties Intersecting the Levee System
Appendix C Detailed Maps of Cultural Resources along the Donna-Brownsville Levee Survey Corridor
Appendix D Draft Environmental Assessment Review Comments

LIST OF TABLES

Table 1.1 Summary of Environmental Coordination and Compliance 1-5
Table 2.1 Federal, State, and Non-governmental Conservation Tracts along the Donna-Brownsville Levee System 2-3
Table 3.1 Acreages of Vegetation Communities Along the Donna-Brownsville Levee System 3-4
Table 3.2 Wetlands along Donna-Brownsville Levee 3-7
Table 3.3 Known Archaeological Resources and HPAs Identified Within the Survey Corridor 3-11
Table 3.4 Historic-age Resources Identified Within or Near the Survey Corridor 3-13
Table 3.5 Cemeteries Identified Within or Near the Survey Corridor 3-13
Table 3.6 Racial Composition of Hidalgo County 3-17
Table 3.7 Racial Composition of Cameron County 3-17
Table 3.8 Summary Search Report for the Donna-Brownsville Levee System 3-23
Table 4.1 Impacts to Vegetation within the Donna-Brownsville Levee System 4-2
Table 4.2 Loaction of Federal, State, and Non-governmental Conservation Tracts Relative to the Donna-Brownsville Levee System 4-3
Table 4.3 Potential Impacts of Donna-Brownsville Levee Improvements on Federally Listed Threatened and Endangered Species 4-5
Table 4.4 Potentially Impacted Archaeological Resources and HPAs Identified Within the 160-Foot Survey Corridor 4-11
Table 4.5 Potentially Impacted Historic-age Resources Identified Within or Near the Survey Corridor 4-12
Table 4.6 Potential Economic Impacts of Improvements to the Donna-Brownsville Levee System for Hidalgo County 4-15
Table 4.7 Potential Economic Impacts of Improvements to the Donna-Brownsville Levee System for Cameron County 4-15
Table 4.8 Air Emissions for Improvements to the Donna-Brownsville Levee System 4-17
Table 6.1 Preparers of the Environmental Assessment and Technical Studies 6-2
Table 6.2 Technical Review of the Environmental Assessment 6-2

LIST OF FIGURES

Figure 1.1 Location of Donna-Brownsville Levee System 1-3
Figure 3.1 Donna-Brownsville Levee System – Cultural Resources Survey Corridor 3-9
Figure 4.1 Location of Wetlands Within 160-Foot Wide Survey Corridor Levee Miles 0-22, Donna-Brownsville Levee System 4-8
Figure 4.2 Location of Wetlands Within 160-Foot Wide Survey Corridor Levee Miles 22-40, Donna-Brownsville Levee System
Figure 4.3 Location of Wetlands Within 160-Foot Wide Survey Corridor Levee Miles 40-65, Donna-Brownsville Levee System 4-9
Figure 4.3 Location of Wetlands Within 160-Foot Wide Survey Corridor Levee Miles 40-65, Donna-Brownsville Levee System 4-10

ACRONYMS AND ABBREVIATIONS

AQCR	air quality control region
BMP	best management practices
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
dbA	A-weighted sound level in decibels
DNL	day-night average sound level
EA	environmental assessment
EIS	environmental impact statement
ERNS	Emergency Response Notification System of Spills
GENS	generator of hazardous waste
GIS	geographic information system
GPS	global positioning system
HPA	high probability area
IBWC	International Boundary and Water Commission
LRGFCP	Lower Rio Grande Flood Control Project
LRGV	Lower Rio Grande Valley
LUST	leaking underground storage tank
NAAQS	National Ambient Air Quality Standards
MxIBWC	Mexican Section, International Boundary and Water Commission
NEPA	National Environmental Policy Act
NFRAP	no further remedial action planned
NO_2	nitrogen dioxide
NPL	National Priority List
O_3	ozone
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to 10 micrometers
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers
RCRA	Resource Conservation and Recovery Act
RM	river mile
ROW	right-of-way
SH	state highway
SQG	small quantity generator
SWP3	storm water pollution prevention plan
TASA	Texas Archeological Sites Atlas
T&E	threatened and endangered
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission
TNRIS	Texas Natural Resource Information Service

TPWD	Texas Parks and Wildlife Department
TSD	transport, storage, and disposal
TxDOT	Texas Department of Transportation
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USIBWC	United States Section, International Boundary and Water Commission
UST	underground storage tank
WMA	Wildlife Management Area

SECTION 1
PURPOSE OF AND NEED FOR THE PROPOSED ACTION

This section discusses the purpose of and need for the proposed action; the authority of the United States Section, International Boundary and Water Commission (USIBWC) to conduct the project as part of its mission; the scope of the environmental review; a summary of environmental compliance requirements; and the organization of this document.

1.1 PURPOSE OF AND NEED FOR ACTION

The USIBWC, in cooperation with the U.S. Fish and Wildlife Service (USFWS), prepared this Environmental Assessment (EA) for the proposed action of raising and/or reconstructing the levee system from the Donna Pump Station in Hidalgo County downstream to Brownsville in Cameron County, Texas. Hereafter, this is referred to as the Donna-Brownsville Levee System. This levee system is part of the Lower Rio Grande Flood Control Project (LRGFCP) that extends approximately 180 miles from the Town of Peñitas in south Texas to the Gulf of Mexico.

The USIBWC identified the Donna-Brownsville Levee System as a priority area for improved flood containment. The levee system extends approximately 65 miles along the Rio Grande, downstream from the Donna Pump Station near the Retamal Dam to an area east of Brownsville, approximately 26 miles upstream of the Gulf of Mexico. The need for levee improvements was determined from hydraulic modeling results indicating that typical height increases of up to 2 feet would be required to meet current design criteria for flood protection along the Donna-Brownsville Levee System (USIBWC 2003a).

In addition to the flood containment evaluation, the Engineer Research and Development Center of the U.S. Army Corps of Engineers (USACE) was commissioned by the USIBWC to assess structural integrity of the entire LRGFCP levee system. The assessment identified a need for structural improvements along a number of segments of the Donna-Brownsville Levee System where seepage control would likely be required. According to the USACE assessment, a 5-mile segment upstream and downstream of the Progreso International Bridge would require structural improvements (USACE 2003).

Figure 1.1 presents an overview of the project area in south Texas. Levee miles along the levee are numbered starting from the upstream reach at the Donna Pump Station.

1.2 USIBWC AUTHORITY

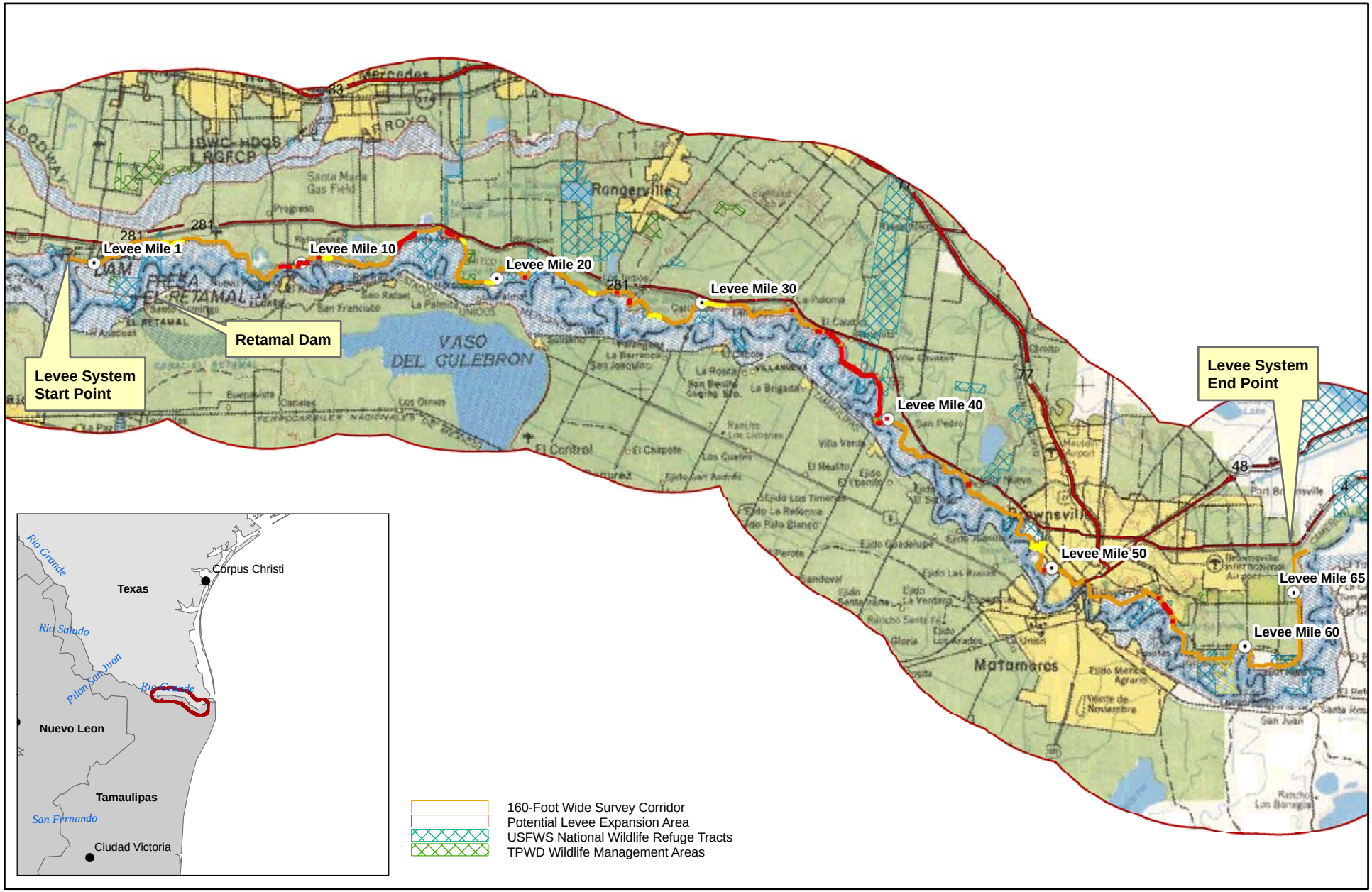
The International Boundary and Water Commission (IBWC), which before 1944 was known as the International Boundary Commission, was created by the Convention of 1889, and consists of a United States Section and a Mexican Section (MxIBWC). The IBWC was established to apply the rights and obligations the Governments of the United States and Mexico assumed under the numerous boundary and water treaties and related agreements. Application of the rights and obligations are 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, the third of which covers the proposed raising of the Donna-Brownsville Levee System:

- 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 land along the Rio Grande 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.

1.3 SCOPE OF THE ENVIRONMENTAL REVIEW

Federal agencies are required to take into consideration the 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 (CEQ) issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. In 1978, the CEQ issued regulations implementing the process (40 Code of Federal Regulations [CFR] 1500-1508).

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; Appendix 501-A). 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. The CEQ regulations require that an EA:



0 2 4 8 12 Miles

0 2.5 5 10 15 20 Kilometers

Figure 1.1
Location of the Donna - Brownsville Levee System

Donna - Brownsville Levee System EA
International Boundary and Water Commission,
United States Section

- Briefly provide evidence and analysis to determine whether the proposed action might have significant effects that would require preparation of an environmental impact statement (EIS). If analysis determines that the environmental impacts would not be significant, a Finding of No Significant Impact is prepared;
- Facilitate the preparation of an EIS, when required; or
- Aid an agency's compliance with NEPA when no EIS is necessary.

This EA identifies and evaluates the potential environmental consequences that may result from implementation of the Proposed Action and No Action alternative. It also characterizes the affected environment and describes, when required, mitigation measures to prevent or minimize impacts to environmental resources. The following resource areas are analyzed for potential environmental consequences: biological resources; cultural resources; water resources; land use; and community resources (socioeconomics, environmental justice, and transportation). Environmental health issues are also evaluated (air quality, noise, and hazardous and toxic waste).

Analyses of environmental resources for the affected environment and environmental consequences are based on a potential expansion corridor around the existing Donna-Brownsville Levee System.

Analyses of environmental consequences also include potential indirect impacts adjacent to the levee corridor and the region depending on the resource and its relationship to the proposed action and alternatives. Reference values for air quality, cultural resources, socioeconomics, and environmental justice are evaluated on a regional basis (county level).

Results of studies conducted in support of the EA preparation were reported in the document *Technical Support Studies for the Environmental Assessment of Flood Control Improvements to the Donna-Brownsville Levee System* (Parsons 2007). Findings of these studies were used to document baseline conditions for biological resources, cultural resources, wetlands, and waste storage and disposal. The report also documents potential performance of the levee system based on hydraulic model simulations, and an evaluation of environmental compliance requirements and coordination activities.

The most recent information is used for the impact analyses. Impacts are considered for the time period covered under the construction period and subsequent flood control improvement conditions. Potential environmental consequences of the Donna-Brownsville Levee System for each resource area evaluated are discussed separately in Section 4 of this EA.

1.4 ENVIRONMENTAL COORDINATION AND COMPLIANCE ANALYSIS

Table 1.1 is a summary of regulatory and/or permitting requirements potentially applicable to improvements under consideration, regulation or compliance issue, and anticipated level of environmental coordination.

Table 1.1 Summary of Environmental Coordination and Compliance

Agency or Organization	Regulation or Issue	Level of USIBWC Coordination
Biological Resources		
U.S. Fish and Wildlife Service (USFWS)	Endangered Species Act of 1973 (Public Law 93-205) and amendments of 1988 (Public Law 100-478) USFWS Coordination Act (916 USC 661, *et seq.)*	Section 7 of the Act requires formal consultation if significant adverse impacts to federally-listed threatened and endangered species, and migratory birds, could occur. Consultation with USFWS regarding impacts on various units of the Lower Rio Grande Valley (LRGV) National Wildlife Refuge adjacent to the levee systems.
Texas Parks and Wildlife Department (TPWD)	Chapters 67 and 68 of the TPWD Code, and Section 65.171-65.184 of the Texas Administrative Code	Coordination concerning potential impacts of the levee raising project to wildlife, including units of the Las Palomas Wildlife Management Areas
National Audubon Society	Sabal Palms Center	Coordination concerning potential impacts
Cultural Resources		
Texas Historic Commission (THC)	National Historic Preservation Act of 1966, as amended (16 USC 470, *et seq*.)	Compliance with Section 106 requirements for potential impacts to archaeological and historic resources.
Water Resources		
U.S. Army Corps of Engineers (USACE)	Section 10 of the Rivers and Harbors Act of 1899 Section 404 of the Clean Water Act (33 USC 1344)	Permit application if water of the United States are affected. Mitigation plan and permit application for potential impacts to wetlands.
Texas Commission on Environmental Quality (TCEQ)	Section 401 of the Clean Water Act (33 USC 1344); Section 26.040 of Texas Water Code	Section 401 Certification: conditions and mitigation measures may be stipulated for the 401 permit; coordination is typically a function of the USACE permitting process.
Other Issues		
Natural Resources Conservation Service	Farmland Protection Policy Act	Determination that no unique or prime farmland would be affected by the federal project.
U.S. Customs and Border Patrol	Levee Road Usage	Coordination during construction activities.
Hidalgo County	Progreso International Bridge	Coordination for construction work upstream and downstream of the bridge.
Irrigation Districts	Modifications to intake channels or construction along irrigation canals	Progreso Irrigation Districts in Hidalgo County: levee construction along segments of the Donna-Brownsville Main Canal. La Feria, Adams Garden, Harlingen, San Benito, Santa Maria, Cameron County Irrigation District No. 16, Los Fresnos, and Brownsville in Cameron County: levee construction along segments of the Donna-Brownsville Main Canal.

1.5 ORGANIZATION OF THE ENVIRONMENTAL ASSESSMENT

This Environmental Assessment is composed of the following sections:

Section 1 identifies the purpose of and need for the Proposed Action, defines the scope of the environmental review, and provides an environmental coordination and compliance analysis.

Section 2 describes the Proposed Action and No Action Alternative, and summarizes potential environmental impacts.

Section 3 presents information on the affected environment, providing a basis for analyzing the impacts of the Proposed Action.

Section 4 analyzes the environmental consequences of the flood control improvements of the Donna-Brownsville Levee System.

Section 5 describes best management practices for construction and potential mitigation actions.

Section 6 describes the consultation process and lists persons and agencies consulted, and contributors to the EA preparation.

Section 7 is a list of cited references and source documents relevant to preparation of the EA.

Support documentation is provided in Appendix A (detailed maps of levee alignment, right-of-way, and potential expansion area), Appendix B (list of threatened and endangered species potentially present within Hidalgo and Cameron Counties), and Appendix C (cultural resources maps). Appendices are provided in the attached CR-ROM, along with the following documents:

- *Technical Support Studies Report, Environmental Assessment of Alternatives for Improved Flood Control of the Donna-Brownsville Levee System*, February 2007. Document prepared by Parsons, Austin, Texas for the USIBWC in support of the EA preparation.

- *Archaeological and Historic Resources Evaluation of the Proposed Improvements to the Donna to Brownsville Levee System, Cameron and Willacy Counties, Texas.* April 2007. Scott A. Sundermeyer, Sherry N. DeFreece Emery, and Charles D. Neel, Document prepared by LopezGarcia Group, Dallas, Texas for Parsons in support of the EA preparation.

SECTION 2
DESCRIPTION OF PROPOSED ACTION

This section presents a description of the Proposed Action for improvements of the Donna-Brownsville Levee System. A summary of potential environmental impacts, subsequently discussed in Section 4, is provided at the end of Section 2. An overview of the Donna-Brownsville Levee System is presented in Figure 1.1. Appendix A presents detailed maps of levee alignment, right-or-way, and potential expansion area.

2.1 LRGFCP LEVEE SYSTEM DESCRIPTION

The LRGFCP consists of the river channel, flood levees in each country, two diversion dams, and off-river floodways in Mexico and the United States. Other components of the project include irrigation weirs, pump intakes, highway and railroad bridges, river gauges, and farm levees. Some river straightening took place between 1976 and 1977 on a 9,000-foot length of river upstream of Hidalgo and Reynosa.

The LRGFCP levee system extends approximately 180 miles from the Town of Peñitas in south Texas to the Gulf of Mexico. The LRGFCP was constructed to protect urban, suburban, and highly developed irrigated farmlands in the Rio Grande/Rio Bravo delta from floods, in both the United States and Mexico. The LRGFCP includes 102 miles of grass-covered earthen structures along the United States margin of the Rio Grande and Anzalduas Diversion Dam. The dam diverts floodwaters into a United States interior floodway system (Banker/Main Floodway) flanked by 168 miles of levees. A second dam, Retamal Diversion Dam, routes Rio Grande floodwaters into Mexico's interior floodway.

The distance between the United States and Mexican levees along the Rio Grande ranges from approximately 400 feet to 3 miles. The depth of the river channel varies from 1 to 15 feet. A total of 270 miles of levees have been built on the United States portion of the project: 102 miles along the Rio Grande, and 168 miles in the off-stream floodways system. The off-river levees have an average height of about 15 feet. The on- and off-river levees have an average base width of 90 to 120 feet, and an average crown width of 14 to 16 feet. Levee separation is between 600 feet to 1 mile.

The two diversion dams, Anzalduas and Retamal, were constructed with the objective of diverting flood flows in the off-river floodway systems of the United States and Mexico, respectively. Two diversion dams, Anzalduas Dam and Retamal Dam, are jointly operated by the USIBWC and MxIBWC. The interior floodway system in the United States has a total area of 27,013 acres between the levees in Hidalgo, Cameron, and Willacy Counties.

The LRGFCP contains a variety of features for protection of the LRGV of Texas, including the Rio Grande main stem, an Interior Floodway System, and the Anzalduas and Retamal Diversion Dams. The United States portion of the LRGFCP is operated to convey excess floodwaters of the Rio Grande Valley to the Gulf of Mexico through the river and

United States interior floodways. Anzalduas Dam is operated to divert water as required by the Treaty of February 3, 1944, "Utilization oSectionf Waters of the Colorado and Tijuana Rivers and of the Rio Grande" (TS994; 59 Stat. 1219). Flood operations of the LRGFCP also involve close coordination of the USIBWC and MxIBWC in the operation of two upstream reservoirs (Amistad and Falcon) to control floodwaters reaching the LRGFCP area. The two sections work closely on the division of excess floodwaters diverted into each country's interior floodway systems.

2.1.1 Donna-Brownsville Levee System

The Donna-Brownsville Levee extends 65 miles along the Rio Grande, downstream from the Donna Pump Station in Hidalgo County to an area east of Brownsville, approximately 28 miles upstream of the Gulf of Mexico, in Cameron County. The levee system is a component of the LRGFCP. The Donna-Brownsville Levee System is illustrated in Figure 1.1. More detailed information by individual levee segments is presented in Appendix A.

The levee ROW runs primarily through agricultural areas, and irrigation canals border significant reaches of the levee system. The Progreso Irrigation District is located in Hidalgo County. The Santa Maria; La Feria, Adams Garden, Harlingen, San Benito, Cameron County Irrigation District No. 16, Los Fresnos, and Brownsville irrigation districts are located in Cameron County. Several large tracts of land have been set aside for natural resource management activities. These include several tracts of the Lower Rio Grande Valley (LRGV) National Wildlife Refuge, managed by the USFWS, several tracts of the Las Palomas Wildlife Management Area (WMA), managed by the Texas Parks and Wildlife Department (TPWD), and the Sabal Palms Center, managed by the National Audubon Society. Refuge lands are found along 8.9 miles of levee system, primarily on the riverside of the levee. Additional land tracts near the levee have been acquired by various irrigation districts or residential subdivisions.

2.1.2 Location of Conservation Lands

Land set aside specifically for natural resource management activities are important for threatened and endangered (T&E) species recovery, habitat preservation, and the emerging eco-tourism economy in South Texas. The LRGV National Wildlife Refuge maintains the majority of tracts along the levee systems, as well as TPWD (WMAs and state park units), Texas Chapter of the Nature Conservancy, and National Audubon Society. Geographic Information System (GIS) information provided by USFWS and TPWD, as well as field observations during November 2006 and January 2007 surveys identified conservation lands along the 160-foot wide survey corridor. Table 2.1 lists various LRGV National Wildlife Area tracts, WMAs, and a single National Audubon Society tract along the Donna–Brownsville levee system. Only three LRGV National Wildlife Refuge tracts are adjacent to the potential levee expansion area (at mile markers 22.0, 37.5, and 38.5). No expansion adjacent to these refuge tracts would encroach beyond the existing areas with herbaceous vegetation.

Table 2.1 Federal, State, and Non-governmental Conservation Tracts along the Donna-Brownsville Levee System

Tract Size	Location Along Levee System	Approximate Length Adjacent to the Levee	Adjacent to Potential Levee Expansion Area
USFWS Lower Rio Grande Valley National Wildlife Refuge System*			
258-Acre Tract	Mile Marker 4.0, riverside	750 Feet	No
186-Acre Tract	Mile Marker 8.0, riverside	1,700 Feet	No
32-Acre Tract	Mile Marker 11.0, both sides	1,800 Feet	No
556-Acre Tract	Mile Marker 15.0, riverside	5,200 Feet	No
47-Acre Tract	Mile Marker 21.0, riverside	1,800 Feet	No
269-Acre Tract	Mile Marker 22.0 Riverside and landside	4,000 Feet	Yes; expansion is within levee ROW; in few locations acquisition maybe required for a 20-foot wide service corridor adjacent to the levee toe
38-Acre Tract	Mile Marker 27.5 Riverside and landside	1,200 Feet	No
1-Acre Tract	Mile Marker 34.5, riverside	470 Feet	No
1-Acre Tract	Mile Marker 34.5, riverside	450 Feet	No
175 Acre Tract	Mile Marker 37.5 Riverside and landside	1,000 Feet	Yes; expansion is within levee ROW except where some acquisition maybe needed for a service corridor
297-Acre Tract	Mile Marker 38.5 Riverside and landside	5,700 Feet	Yes; expansion is within levee ROW except where some acquisition maybe needed for a service corridor
30-Acre Tract	Mile Marker 46.0, riverside	1,500 Feet	No
339-Acre Tract	Mile Marker 48.0 Landside	7,800 Feet	No
297-Acre Tract	Mile Marker 55.0, riverside	1,500 Feet	No
423-Acre Tract	Mile Marker 58.0 Riverside and landside	4,500 Feet	No
184-Acre Tract	Mile Marker 62.0, landside	6,100 Feet	No
336-Acre Tract	Mile Marker 62.0, riverside	2,500 Feet	No
TPWD Wildlife Management Areas**			
Las Palomas WMA (3-Acre Champion Tract)	Mile Marker 2.5, landside	200 Feet	No
Las Palomas WMA (21-Acre Gonzales Tract)	Mile Marker 17.0, landside	600 Feet	No
Las Palomas WMA (62-Anacua Tract)	Mile Marker 17.5, landside	2,700 Feet	No
Las Palomas WMA (139-Acre Anacua Tract)	Mile Marker 18.5 Riverside and landside	5,200 Feet	No
National Audubon Society, Texas Chapter**			
Sabal Palms Center (557-Acre Tract)	Mile Marker 59.0, riverside	2,500 Feet	No

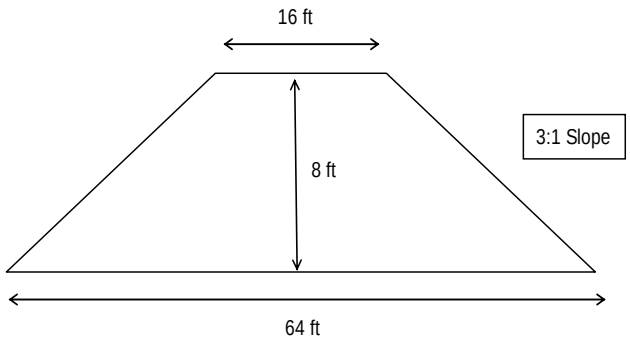
* *National Wildlife Refuge tract boundaries were obtained from USFWS GIS online data (USFWS 2003).*

** *WMA boundaries were obtained from Texas Natural Resource Information Service GIS data clearinghouse (TNRIS 2004).*

*** *Sabal Palms Center tract boundary was obtained from field verification (Ferrell 2007, personal communication)*

Urban development in the vicinity of the Donna-Brownsville Levee System is found primarily along the City of Brownsville and the unincorporated Towns of Progreso, Relampago, Santa Maria, Los Indios, Carricitos, La Paloma, El Calaboz, Ranchito, San Pedro, and Palm Grove. No residential developments are located or allowed, within the levee system ROW.

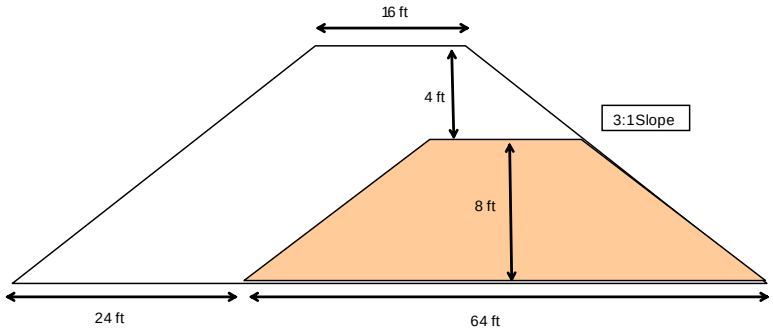
The existing levee is a raised trapezoidal compacted-earth structure with a crown width of 16 feet, a typical height ranging from 6 to 10 feet, and an approximate 3:1 side slope ratio (units of horizontal run in feet per foot of vertical rise). The existing levee footprint ranges from 50 to 80 feet, depending on location. A typical levee cross-section is shown in the diagram below.



The levee crown is an unpaved service road with restricted public access throughout most of the Donna-Brownsville Levee System.

2.2 PROPOSED ACTION

The Proposed Action would increase flood containment capacity of the Donna-Brownsville Levee System by raising the height of the existing compacted earth levee up to 2 feet to meet the 3-foot freeboard requirement. The increase in levee height would also expand the levee footprint by lateral extension of the structure. For a typical levee cross-section, shown in the diagram below (8 feet elevation, 3:1 slope, and 16-foot crown), a 4-foot increase in levee height would result in a 24-foot offset increase of the footprint. A current footprint width value of 64 feet would expand to 88 feet as a result of the increased levee height. In the EA, the expansion corridor refers to the maximum increase in footprint width, plus a 20-foot service area required for levee construction and subsequent maintenance activities.



The preferred option for enlarging the levee footprint is landside expansion to maximize flood containment capacity along the LRGFCP. Landside alignment would also minimize potential impacts to biological resources such as wetlands and wildlife, including T&E species populations and habitat. Riverside expansion (from the landside shoulder of the crown toward the river) would be required when constraints on landside expansion are present. These constraints include the presence of irrigation canals along reaches of the levee system. Right-of-way availability was identified as a restriction for levee expansion only in a few segments where acquisition maybe required to allow a 15-foot wide service corridor adjacent to the toe of the expanded levee.

Along with the increase in levee height, structural improvements may be required for levee segments. Structural improvements would consist of either a slurry cutoff barrier or a riverside impermeable liner. The slurry barrier would be installed at the riverside toe of the expanded levee, or along the levee centerline. The impermeable liner would be buried to a specified depth (18-30 inches) along the levee slope, and from some distance from the riverside toe to above the riverside shoulder of the levee.

Engineering considerations for improvements to the Donna-Brownsville Levee System are the following:

- Structural improvements required mostly along a 5-mile segment upstream and downstream of the Progreso International Bridge (liner and/or slurry wall barrier).
- Along the Brownsville reach, landside expansion would be required as this is a Restricted Use Zone due to narrow floodway (river mile [RM] 52.2 to 45; zone description in Minute 285). A former drainage canal, now used to route storm water, is located along the levee.
- Given a levee height increase of less than 2 feet, the centered/offset alignment of levee expansion is a minor issue in terms of changes to flood containment.
- Amigoland levee runs inside the LRGFCP levee, but is not tied to it (private ownership, from Brownsville intake to Gateway Bridge). Land along the levee is now owned/managed by the University of Texas at Brownsville.
- Known bridge projects: West Rail Bridge, at approximately RM 70, is not likely to be affected by levee height increase as it has enough vertical clearance.

2.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the LRGFCP operation and maintenance would not change from the current management practices. The levee system and current levels of protection would remain unchanged from current operations and maintenance practices. Under severe storm events, current containment capacity may be insufficient to fully control Rio Grande flooding with risks to personal safety and property.

2.4 ALTERNATIVES CONSIDERED AND ELIMINATED FROM DETAILED STUDY

Levee expansion beyond current ROW was ruled out as a viable, or needed, option for levee improvements.

2.5 OTHER ACTIONS WITH POTENTIAL CUMULATIVE IMPACTS

Complete environmental impact analysis of the alternatives must consider cumulative impacts due to other actions. A cumulative impact, as defined by the Council on Environmental Quality (40 CFR 1508.7), is the "...impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts will be evaluated, regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." The USIBWC reviewed a number of reasonably foreseeable actions with potential cumulative effects. One project was identified along the Donna-Brownsville Levee System.

The Brownsville Public Utilities Board is considering construction of the Brownsville Weir and Reservoir Project. This project anticipates the construction and operation of a weir structure spanning the river channel approximately 8 miles downstream of the International Gateway Bridge in Brownsville, Texas at RM 46.60. NEPA analysis for this project has been completed. Cumulative impacts for this project were discussed in detail in the Environmental Impact Statement for Alternatives Vegetation Management Practices for the Lower Rio Grande Flood Control Project in Cameron, Hidalgo, and Willacy Counties (USIBWC 2003bb).

2.6 SUMMARY COMPARISON OF ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

2.6.1 No Action Alternative

The No Action Alternative would retain the current configuration of the Donna-Brownsville Levee System with no impacts to biological and cultural resources, land use, community resources, or environmental health issues. In terms of flood protection, however, current containment capacity under the No Action Alternative may be insufficient to fully control Rio Grande flooding under severe storm events, with associated risks to personal safety and property.

2.6.2 Proposed Action

Table 2.2 summarizes potential environmental consequences of the proposed improvements to the Donna-Brownsville Levee System. The proposed increase in levee height would provide improved flood protection. The levee footprint would modify approximately 50.5 acres of herbaceous vegetation.

Table 2.2 Summary of Environmental Impacts for the Donna-Brownsville Levee Proposed Action

RESOURCE AREA	Environmental Impacts
Biological Resources *(Subsection 4.1)*	*Vegetation*. Improvements to the Donna-Brownsville Levee system would remove approximately 50.5 acres of herbaceous vegetation and 0.5 acres of Mesquite-Acacia woodland. No agricultural areas are located within the Donna-Brownsville expansion corridor. *Wildlife*. Although approximately 50.5 acres of herbaceous vegetation would be removed, the vegetation is considered relatively low-quality wildlife habitat. Non-native grasses are expected to rapidly re-establish at the completion of construction, and no overall herbaceous wildlife habitat would be lost. Loss of Mesquite-Acacia woodland may have a negative impact on wildlife habitat. None of the 25 threatened and endangered species with potential habitat near the ROW and levee expansion areas would likely be affected. *Wetlands*. A total of 80.8 acres of potentially jurisdictional wetlands are found within a 160-foot wide survey-corridor bounding the levee. None of the wetlands within the survey-corridor would be impacted by levee expansion activities.
Cultural Resources *(Subsection 4.2)*	*Historic and Prehistoric Archaeological Resources*. Proposed improvements to the Donna – Brownsville levee system segment may adversely affect one known archaeological site (41CF182) and eight HPAs that may contain historic archaeological materials. Archaeological resources may be adversely affected by mechanical excavation or by burial under the expanded levee footprint. *Historic-age Resources*. Resources located within levee expansion areas may be impacted by construction activities. Sixty-five potential historic-age engineering resources within the current ROW may be impacted by construction activities. Impacts to those resources are possible but not likely to be significant.
Water Resources *(Subsection 4.3)*	*Flood Control*. Improvements to the Donna-Brownsville Levee System would increase flood containment capacity to control the design flood event with a negligible increase in water surface elevation. *Water Flow*. Levee footprint expansion would not affect water bodies.
Land Use *(Subsection 4.4)*	*Natural Resources Management Areas.* The proposed expansion would take place within the ROW. Removal of up to 0.5 acres of woodlands adjacent to the levee would be required. *Agricultural Lands*. No agricultural areas are located within the Donna-Brownsville potential expansion corridor. *Urban Areas*. Urban development near the Donna-Brownsville Levee System is limited to Hidalgo and Brownsville and unincorporated towns located on the levee landside. The Proposed Action would not affect urban development in these areas.
Community Resources *(Subsection 4.5)*	*Socioeconomic Resources*. An influx of federal funds into Cameron and Hidalgo Counties from proposed levee improvement activities would have a positive local economic impact limited to the construction period and representing less than 0.5 percent and 0.25 percent of the annual county employment, income, and sales values for Cameron and Hidalgo Counties, respectively. *Environmental Justice*. No adverse impacts to disproportionately high minority and low-income populations were identified for construction activities. *Transportation*. Moderate utilization of public roads would occur during construction. A temporary increase in access road use would be required for equipment mobilization to staging areas.

RESOURCE AREA	Environmental Impacts
Environmental Health Issues *(Subsection 4.6)*	*Air Quality*. Estimated emissions for five criteria pollutants ranges from 0.06 percent to 1.64 percent of the Cameron and Hidalgo Counties annual emissions inventory and would not be considered regionally significant. *Noise*. There would be a moderate increase in ambient noise levels due to excavation and fill activities. No long-term and regular exposure is expected above noise threshold values. *Waste Storage and Disposal Sites*. A database search identified 60 waste storage or disposal sites within the expanded levee footprint and its vicinity; however, none of these sites would affect, or be affected, by the levee construction project.

SECTION 3
AFFECTED ENVIRONMENT

This section describes resources in the potential area of influence of the levee construction project. The sequence of resource areas presented in this section matches the sequence used in Section 4 to discuss environmental consequences potentially associated with implementation of improvements to the Donna-Brownsville Levee System. Baseline conditions are discussed in this section as follows:

- Biological resources;
- Cultural resources;
- Water resources;
- Land use;
- Community resources; and
- Environmental health.

3.1 BIOLOGICAL RESOURCES

3.1.1 Vegetation

Regional Vegetation

The Lower Rio Grande Valley covers an approximate 150-mile segment of the Rio Grande that extends from Falcon Reservoir Dam to the river opening into the Gulf of Mexico. The LRGV is part of the Tamaulipan region of southern Texas and northeastern Mexico where multiple vegetation communities and warm average temperatures provide a highly diversified wildlife habitat. Annual rainfall in the area, ranging from 16 to 35 inches, increases from west to east. Monthly rainfall is lowest in January and February, and highest in May and June.

Thorn woodland is predominant in the Tamaulipan region where areas of shallow soil and rapid drainage generally support that type of vegetation. A few species of plants account for the bulk of the brush vegetation, including mesquite (*Prosopis spp.*), various species of acacia (*Acacia spp.*), desert hackberry (*Celtis pallida*), javelina-brush (*Microrhamnus ericoides*), cenizo (*Atriplex canescens*), common bee-brush (*Lippia ligustrina*), Texas prickly pear (*Opuntia* spp.), and tasajillo or desert Christmas cactus (*Opuntia leptocaulis*). Parts of the region support grasslands of very diverse composition due to the highly variable soil and moisture conditions, while lines of riparian vegetation are present within the few river valleys (World Wildlife Fund 2001). Grassland vegetation was somewhat more extensive prior to the 19th century, but continuous grazing and other factors altered the plant communities (USIBWC 2003bb).

Potential Expansion Corridor

Vegetation within the levee ROW and potential expansion area of the Donna-Brownsville Levee System were evaluated in field surveys conducted to identify habitat and plant communities, as listed below. Results of studies conducted in support of this EA preparation are reported in the document *Technical Support Studies for the Environmental Assessment of Flood Control Improvements to the Donna-Brownsville Levee System* (Parsons 2007) provided in CD format with the EA (*Attached CD-ROM*).

- November 11, 2006. Vegetation surveys and habitat evaluation of land adjacent to the Donna-Brownsville levee.
- January 8, 2007. Delineation of potential jurisdictional wetlands in the immediate vicinity of the levee construction areas along the Donna-Brownsville levee.

Vegetation classifications for the project area are adapted from Diamond 1993 and the 1996 National Vegetation Classification System in use by USFWS and TPWD. Vora (1990) provided some baseline vegetation community information typical of intact riparian forest habitat areas of the Lower Rio Grande. Additional information was provided by vegetation inventories in South Texas by Taylor, *et al.* (1994) and Everitt, *et al.* (2002). Based on literature review and field surveys, the following four vegetation community classifications were identified as occurring within the project area: a) Woodlands/Thornscrub; b) Herbaceous; c) Wetlands/Riparian communities; and d) Agricultural, as described below. In addition to these four plant communities, open waters were also mapped, and developed areas were mapped, including roads, urban areas, and other impervious cover.

Woodlands / Thornscrub

Mesquite - Acacia Woodland. This woodland occurs over moderately to poorly drained soil, primarily in the south Texas Plains and the Coastal Prairie. It is a natural disturbance type of river floodplains and depressions that may succeed to Sugarberry (*Celtis laevigata*)-dominated forest, especially on floodplains of major streams. It is an even more widespread anthropogenic disturbance community, with introduced woody species such as Retama (*Parkinsonia aculeata*) and possibly Chinese tallow (*Sapium sebiferum*). In wet areas, Sweet acacia (*Acacia farnesiana*) often forms nearly pure stands or occurs as scattered individuals within a matrix of weedy grasses during the course of secondary succession. This woodland may grade into Black-brush (*Acacia rigidula*) or Guajillo (*Acacia berlandieri*) shrublands in south Texas and Little bluestem (*Schizachyrium scoparium*) grasslands in the Coastal Prairie.

Acacia – Remnant Sabal Woodland – This woodland is more prevalent in the extreme southern and downstream portions of the Donna – Brownsville levee system, as sabal palms (*Sabal mexicana*) increase. Diversity of acacias increase in downstream woodland portions, in contrast to upstream areas classed as Mesquite – Acacia Woodland, with increased occurrences of coma (*Sideroxylon celastrinum*), lime prickly-ash (*Zanthoxylum fagara*), anaqua (*Ehretia anacua)*, Texas ebony (*Pithecellobium ebano*), and devil's claw in remnant resaca beds.

Herbaceous

Bufflegrass – Dominant Grassland. This herbaceous community occupies levee slopes and open grassland area, and is dominated by Bufflegrass (*Cenchrus ciliaris*) and sand dropseed (*Sporobolus cryptandrus*). Occurrences of grasses once found in the Cane Bluestem – False rhodesgrass Grasslands include False rhodesgrass (*Chloris pluriflora*), Cane bluestem (*Bothriochloa barbinodis*), Buffalograss (*Buchloe dactyloides*), Curly mesquite (*Hilaria belangeri*), and Common speargrass (*Heteropogon contortus*). Woody species once common include Honey mesquite (*Prosopis glandulosa*), Sweet acacia (*Acacia farnesiana*), and Black-brush (*Acacia rigidula*).

Wetlands / Riparian Communities

Texas Ebony - Anacua Forest. Occurs in wooded borrow sites. The evergreen subtropical community once occurred as dense forests with 15-meter canopies and large diameter subtropical trees. Larger tree species (both in diameter and height) may include Texas ebony (*Pithecellobium ebano*), anacua (*Ehretia anacua*), and great leadtree (*Leucaena pulverulenta*). Snake eyes (*Phaulothamnus spinescens*), haujillo (*Havardia pallens*), spiny hackberry (*Celtis pallida*), lotebush (*Ziziphus obtusifolia*), and honey mesquite (*Prosopis glandulosa*) may occur as tall shrubs or small trees. In most of the former borrow areas within the project area, black willow (*Salix nigra*), sweet acacia, and retama dominate. Former borrow areas characterized by infrequent flooding exhibit a stronger mesquite component.

Typha/Phragmites Emergent Wetlands (former materials borrow sites). Typically found on borrow sites and storm water collection areas. Often dominated by giant reed (*Phragmites* spp. or *Arundo donax*) or cattail (*Typha* spp.) with a fringe of sea-oxeye daisy *(Borrichia arborescens)*, and spikerush (*Scirpus* spp.).

Drainage Ditches. Typically are irrigation ditches, mostly open vegetation, with emergent species such as cattail, and occasional honey mesquite.

Open Water. Can be found in irrigation channels and flooded borrow pits, where water depth exceeds 1 meter.

Agricultural

Active Agricultural Field. These areas are currently subject to cultivation of crops. Common crops include corn, cotton, and various garden crops.

Fallow Field. These agricultural areas are not currently under cultivation.

Vegetation communities were delineated from color infrared orthoimagery and field-verified using a global positioning system (GPS). Vegetation community maps were developed by interpreting and delineating recent (2004) 1-meter color infrared aerial photography. The software ArcGIS™ was used to "heads-up" digitize vegetation community boundaries from the color orthoimagery to create a vegetation community geospatial dataset.

Vegetation communities were determined within a 160-foot wide buffer centered on the levee centerline along the entire riverside length of the levee. This survey corridor extends

beyond the increased levee footprint width resulting from a potential levee height increase above current elevation. The potential expansion area of the levee was determined from USACE levee deficiency data, and following the field mapping efforts, this expansion area was analyzed using GIS to determine vegetation community composition, based on vegetation communities mapped within the survey corridor.

Table 3.1 lists acreage by plant community classes along the Donna - Brownsville Levee System for the entire potential levee footprint expansion area. Herbaceous communities predominate in the potential levee expansion area. Wetlands are discussed in detail in Subsection 3.1.4.

Table 3.1 Acreages of Vegetation Communities Along the Donna-Brownsville Levee System

Vegetation Community	Acreage	
	160-Foot Wide Survey Corridor	Potential Levee Expansion Area
Woodland / Thornscrub Communities		
Mesquite - Acacia Woodland	313.1	0.5
Acacia – Remnant Sabal Woodland	38.8	-
Total Woodland / Thornscrub	*351.9*	0.5
Herbaceous Community		
Bufflegrass Dominant Grassland	681.6	50.5
Wetlands / Riparian Communities		
Texas Ebony – Anauco Forest	19.4	-
Typha / Phragmites Emergent	38.3	-
Drainage Ditches	8.5	-
Open Water	14.6	-
Total Wetlands / Riparian	*80.8*	0
Agricultural		
Active Agricultural	120.5	-
Fallow Agricultural	52.3	-
Total Agriculture	*172.8*	0
Developed / Impervious Cover		
Lined Canal	7.4	0
Road	8.0	4.8
Residential	6.3	-
Commercial / Industrial	4.7	-
Total Developed / Impervious Cover	*26.4*	*4.9*
TOTAL	**1,313.5**	**55.8**

3.1.2 Wildlife

Regional Wildlife

From a regional perspective, the proposed levee improvement area is located within the Lower Rio Grande Valley. The levee system is adjacent to various units of the LRGV National Wildlife Refuge. The LRGV National Wildlife Refuge is a component of a multi-partner effort attempting to connect and protect blocks of habitat, known locally as a Wildlife Corridor (USFWS 2005). The Wildlife Corridor partnership includes USFWS, TPWD, National Audubon Society, and private owners, and extends over 25,000 acres within Hidalgo County. Additional blocks of habitat are located in Cameron, Willacy, and Starr Counties (USIBWC 2003bb). The Santa Ana National Wildlife Refuge is located upstream of the Donna Pump Station, and is managed by the USFWS for similar purposes as the LRGV National Wildlife Refuge. The Santa Ana National Wildlife Refuge is outside the project area and therefore not directly addressed in this EA.

Common LRGV wildlife species include whitetail deer (*Odocoileus virginianus*), turkey (*Meleagris gallopavo*), javelina (*Pecari tajacu*), bobwhite quail (*Colinus virginianus*), scaled quail (*Callipepla squamata*), white-winged dove (*Zenaida asiatica*), mourning dove (*Zenaida macroura*), cottontail rabbit (*Sylviagus floridanus*), jackrabbit (*Lepus californicus*), waterfowl, and a variety of nongame birds. The region also provides important wintering habitat for migratory birds, including many species of passerines, raptors, sandhill cranes (*Grus Canadensis*), ducks, and geese. In addition to the more common wildlife species, a number of unique and rare animals occur in the region (World Wildlife Fund 2001). The distribution of many wildlife species is limited, either partially or entirely, to the Tamaulipan Biotic Province, and some are found exclusively within the LRGV.

There are approximately 67 mammals of potential occurrence in the LRGV, including federally listed species, such as the jaguarundi (*Felis yagouaroundi cacomitli*) and ocelot (*Felis pardalis*). The mammals are dominated by rodents (24 species) and bats (13 species). Some common mammals which may be encountered in the LRGV are the common raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), Mexican ground squirrel (*Spermophilus mexicanus*), and the bobcat (*Felis rufus*), beaver (*Castor canadensisis*), and nutria (*Myocastor coypus*) (USIBWC 2003b).

There are approximately 500 species of birds that potentially occur in the LRGV. The dominant numbers of bird species are represented by wood warblers (44 species), geese and ducks (30 species), sparrows and towhees (26 species), raptors (25 species), and tyrant flycatchers (25 species). Many species pass through the LRGV on their way to summer breeding or wintering grounds because of the convergence of the Central and Mississippi Flyways. The LRGV is the point where many tropical birds reach their northernmost ranges (Fermata 2003).

Amphibians and reptiles are also well-represented in the LRGV, with approximately 76 species potentially occurring in Hidalgo County. The reptiles consist of snakes (29 species), lizards (19 species), turtles (six species), and one crocodile. The amphibians consist of frogs and toads (18 species), and three species of salamanders (USIBWC 2003b).

Potential Expansion Corridor

High quality wildlife habitat in the Donna-Brownsville Levee System is found primarily in tracts of the LRGV National Wildlife Refuge, Bentsen-Rio Grande Valley State Park, and the Chihuahua Woods Preserve, which is owned by The Nature Conservancy. Plant communities considered high quality habitat include thorn woodlands and wetlands/riparian areas. Grassland habitat and former agricultural sites are dominated by non-native species (primarily bufflegrass), and are considered low value habitat.

3.1.3 Threatened and Endangered Species

Habitat requirements and life history for each federal and state-listed species potentially occurring along the Donna-Brownsville Levee System were identified through literature review. Sources of information included T&E species fact sheets published by natural resource agencies, species recovery plans, and scientific literature (USFWS 2005). Texas Parks and Wildlife Department compiles a list of federal and state-listed species and species of concern. The lists are organized by county (TPWD 2007). Appendix B lists federal and state-listed species potentially occurring within Cameron and Hidalgo Counties where the levee system is located. For information on species of concern, which have no regulatory status, see TPWD (TPWD 2007). A detailed analysis is provided in Section 5 of the Technical Support Studies Report prepared in conjunction with this EA (Parsons 2007).

3.1.4 Wetlands and Aquatic Habitat

Twenty-one wetlands and open water areas identified as potential jurisdictional waters of the United States were identified within the Donna-Brownsville Levee ROW, and are shown in Appendix A. Potential wetlands areas were initially identified using aerial photography, soil maps, and National Wetlands Inventory data. Specific wetlands delineations and analysis is provided in Section 4 of the Technical Support Studies Report prepared in conjunction with this EA (Parsons 2007). Table 3.2 indicates the extent of potentially jurisdictional wetlands along the Donna-Brownsville Levee.

Table 3.2 Wetlands along Donna-Brownsville Levee

Wetlands Name	Description	Potential Jurisdictional Determination	Acreage Within 160-foot Wide Survey Corridor	Acreage Within Potential Expansion Area
Wetlands A2	Temporarily Flooded, emergent non-forested	Non jurisdictional water feature. Excavated borrow pit not in existence prior to levee construction	9.7	0.0
Wetlands A3	Resaca feature, Temporarily Flooded, emergent non-forested, with a forested fringe	*Potential jurisdictional wetlands (Regulated under Section 404 of the Clean Water Act)*	0.2	0.0
Wetlands D1	Resaca feature, Temporarily Flooded, emergent non-forested, with a forested fringe	*Potential jurisdictional wetlands (Regulated under Section 404 of CWA)*	0.2	0.0
Wetlands F1	Resaca feature, Temporarily Flooded, emergent non-forested, with a forested fringe	*Potential jurisdictional wetlands (Regulated under Section 404 of CWA)*	0.2	0.0
Wetlands G	Temporarily Flooded, emergent non-forested, with a forested fringe	*Potential jurisdictional wetlands (Regulated under Section 404 of CWA)*	0.1	0.0
Wetlands H1	Temporarily Flooded, emergent non-forested	Non-jurisdictional water body, associated with borrow sites	2.6	0.0
Wetlands H3	Resaca feature, Temporarily Flooded, emergent non-forested	*Potential jurisdictional wetlands (Regulated under Section 404 of CWA)*	0.1	0.0
Wetlands I1	Temporarily Flooded, emergent non-forested	Non jurisdictional water feature. Excavated borrow pit not in existence prior to levee construction	8.9	0.0
Wetlands I2	Temporarily Flooded, emergent non-forested	Non jurisdictional water feature. Excavated borrow pit not in existence prior to levee construction	10.3	0.0
Wetlands I3	Temporarily Flooded, emergent non-forested	Non jurisdictional water feature. Excavated borrow pit not in existence prior to levee construction	3.2	0.0
Wetlands I4	Temporarily Flooded, emergent non-forested	Non jurisdictional water feature. Excavated borrow pit not in existence prior to levee construction	1.6	0.0
Wetlands J	Temporarily Flooded, emergent non-forested	Non jurisdictional water feature. Excavated borrow pit not in existence prior to levee construction	1.9	0.0
Wetlands K3	Resaca feature, Temporarily Flooded, emergent non-forested	*Potential jurisdictional wetlands (Regulated under Section 404 of CWA)*	0.6	0.0
Wetlands L2	Temporarily Flooded, emergent non-forested	Non jurisdictional water feature. Excavated borrow pit not in existence prior to levee construction	15.2	0.0
Wetlands L3	*Resaca feature*	Non jurisdictional water feature. Excavated borrow pit not in existence prior to levee construction	12.6	0.0

3.2 CULTURAL RESOURCES

The proposed project lies within the Los Caminos del Rio Heritage Project corridor, an area of regional, national, and international prehistoric, historic, and architectural significance (Sánchez 1994). The corridor is located along the lower Rio Grande and lies entirely within Terminal Pleistocene and Holocene fluvial deposits of a wide delta plain. This plain extends from Los Ebanos to the Gulf of Mexico, a distance of approximately 180 miles (Cooper, *et al*. 2002). This delta plain is dominated by deposits of silt and sand, while deposits within old meander loops are dominated by mud (Brewton, *et al*. 1976).

Surface landforms within the delta plain are characterized by meandering distributary channels, crevasse splays and interdistributary basins. These landforms are believed to be no older than 4,500 years before present based on radiocarbon dates from a proposed terrace landform (Boyd, *et al*. 1994). The data are inconclusive, however, as Cooper, *et al*. (2002) suggest that the proposed terrace is, in fact, a natural levee feature located along an old meander loop of the river.

While the Donna–Brownsville levee extends for 65 miles along the Rio Grande, only certain areas are recommended as needing structural improvements. Therefore, these sections are the areas of concern for the purposes of this cultural resources study (See Appendix C, Figures 3.1a-3.11). The land area reviewed in this section consists of 160 feet either side of the center line of the proposed improvement sections of levee sections and is referred to as the project study area. These areas extend slightly beyond the current ROW to include areas of potential cultural resources immediately adjacent to the project but beyond the current ROW. A 3,000-foot buffer has also been placed around the project areas for the purposes of discussing previous archaeological resources studies.

3.2.1 Previous Cultural Resources Studies

Three previous archaeological resources surveys were conducted, and one archaeological site was recorded within 3,000 feet of the project area. In 1987 a survey by USACE was conducted along an elevated ditch east of the town of Ranchito (See Appendix C, Figure 3.1h) (Texas Archeological Sites Atlas [TASA] 2007). No archaeological sites were recorded during this survey. The USIBWC also conducted a survey in 1987 within a large section between the Rio Grande and the levee. The survey extended eastward from the Los Fresnos Canal to well beyond the current project terminus (See Appendix C, Figures 3.1j – 3.1l). Several archaeological sites were recorded during this effort; however, none are near the current project areas (TASA 2007). Finally, a series of linear surveys was conducted by SWCA Environmental Consultants for the Texas Department of Transportation (TxDOT) in 2005 in anticipation of road widening in the Austin, Laredo, Pharr, and Yoakum Districts (See Appendix C, Figure 3.1k). No sites were recorded in Cameron or Willacy Counties during the series of surveys (TASA 2007). Site 41CF182 was recorded by Prewitt and Associates in 2002 as an early 20th century irrigation canal and pump station (See Appendix C, Figure 3.1i). The site contains a series of engineering structures constructed on the floodplain and first terrace of the Rio Grande. Prewitt and Associates recommended no additional archaeological testing; however, archival research was advised for the site (TASA 2007).

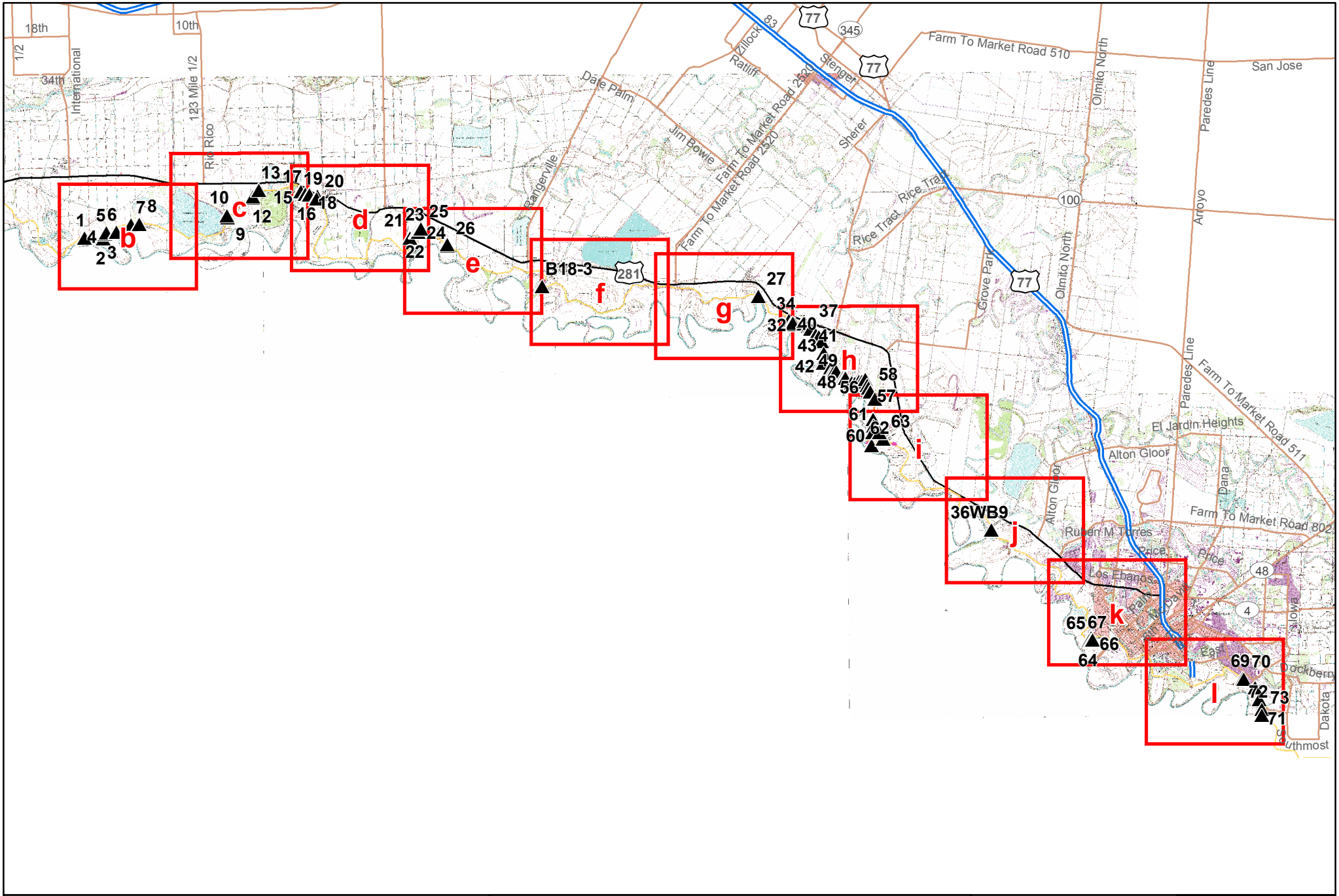


Figure 3.1a. Donna-Brownsville Levee System
Cultural Resources Study Corridor

USGS 7.5 minute series topographic maps: San Juan Southeast, Progresso, Santa Maria, La Paloma, Olmito, West Brownsville, East Brownsville, Southmost, Palmito Hill, and Mouth of the Rio Grande.

- HPA / Historic-Age Resources
- Archaeological Site
- 160 Foot Wide Survey Corridor
- Potential Levee Expansion Area
- Current Levee Footprint
- Map Index

0 2.5 5
Miles

In 2002, the USIBWC commissioned an archival research and a cultural resources assessment to determine the potential for archaeological sites along the 180-mile length of the LRGFCP, where the Donna-Brownsville Levee System is located (Cooper, *et al.* 2002). Cooper, *et al.* (2002) identified six areas as having a high potential to contain cultural resources within the Donna-Brownsville project areas, as defined at that time. The six areas were designated as High Probability Areas (HPA) (Cooper, *et al*. 2002) and are contained within the footprint of proposed expansion areas or are immediately adjacent to these areas.

A cultural resources evaluation of the specific Donna-Brownsville levee improvement sections was recently conducted by cultural resources specialists from the Lopez-Garcia Group in support of the EA preparation (Sundermeyer, *et al.* 2007) [*a copy of this document is provided with the EA in the attached CD-ROM*]. The evaluation included research from online and archival sources, as well as published reports to supplement previous research by Cooper, *et al.* (2002). In addition, photographic documentation of landforms and resources adjacent to the project areas was collected. No systematic intensive archaeological or historic resources surveys have been undertaken for the Donna-Brownsville Levee System.

3.2.2 Historical and Prehistoric Archaeological Resources

Historical Resources

An archival research and a cultural resources assessment were commissioned by the USIBWC to determine the potential for archaeological sites along the 180-mile length of the LRGFCP (Cooper, *et al*. 2002). One known historic archaeological site and six other areas were identified at that time as having high potential for historic archaeological resources within or adjacent to the proposed improvement areas for the Donna-Brownsville levee system (Cooper, *et al.* 2002: See Appendix C, Figures 3.1g – 3.11). These HPAs and historic archaeological resources retain the potential to be affected by the proposed project. Additional areas of potential historic archaeological resources were identified during the archival research conducted in support of the Donna-Brownsville EA (Sundermeyer, *et al.* 2007). These resources are the locations of former buildings, abandoned canals, and areas where residential structures have been removed. These historic archaeological resources and HPAs are listed in Table 3.3 and depicted on Figures 3.1a through 3.11 in Appendix C. The areas identified as HPAs are locations of structures as depicted on quadrangle and banco maps. The archaeological site location data are derived from TASA.

Prehistoric Cultural Resources

No prehistoric archaeological sites have been identified on or within 1000 meters of the proposed Donna–Brownsville levee improvement areas, and no HPAs were identified for prehistoric archaeological resources during the previous study by Cooper, *et al.* (2002). A second review of the TASA and the recent reconnaissance field study conducted in March 2007 in support of the EA documentation confirms these data (Sundermeyer, *et al*. 2007). No systematic intensive archaeological surveys for prehistoric sites have been undertaken for the Donna-Brownsville improvement areas.

Table 3.3 Known Archaeological Resources and HPAs Identified Within the Survey Corridor

Resource Type	Previous Designation (reference)	Primary Source (year)	Description*	Location Relative to Levee	Within Survey Corridor** (estimate)	Resource Number/ Map Key	Project Mile Marker
HPA	N/A (this report)	IBC (1934)	Previous structure location	Riverside	yes	2	9.8
HPA	N/A (this report)	DOS (1910)	Kiln location	Riverside	yes	3	10.3
HPA	N/A (this report)	IBC (1934)	Previous structure location	Riverside	yes	4	13.8
HPA	N/A (this report)	IBC (1934)	Previous structure location	Riverside	yes	6	14.8
HPA	N/A (this report)	Beck et al. (1923)	Previous structure location	Riverside	yes	9	16.2
HPA	N/A (this report)	USGS (1929)	Previous structure location	Riverside	yes	10	16.4
HPA	N/A (this report)	USGS (1929)	Previous structure location	Riverside	yes	11	16.5
HPA	N/A (this report)	IBC (1934)	Previous structure location	Riverside	yes	14	16.9
HPA	36SM3 (Cooper et al. 2002:17)	N/A	Florida Ranch location	Landside	yes	36SM3	23.1
HPA	36LP3 (Cooper et al. 2002:19)	USGS (1936)	Site of Encantada Community; not verified	Landside	yes	36LP3	34.7
HPA	36LP9 (Cooper et al. 2002:19)	USGS (1934)	Previous structure location, not verified	Landside	yes	36LP9	36.8
HPA	36WB14 (Cooper et al. 2002:19)	USGS (1936)	Previous structure locations, not verified	Both sides	yes	36WB14	38.2
Archaeological site 41CF182	41CF182 (TASA 2007)	TASA (2007)	Early 20th century irrigation canal and pump station	Both sides	yes	41CF182	39.4
HPA	36EB1 (Cooper et al. 2002:23)	USGS (1936)	Previous structure locations, not verified	Riverside	yes	36EB1	55.5
HPA	N/A (this report)	IBC (1927)***	Site of Indiana Pump Plant	Both sides	yes	20	56.0

** Description is based on field inspection of the resource during reconnaissance conducted in support of the EA preparation.*

*** The survey corridor is a 160-foot-wide area centered on the current levee.*

**** As discussed in Cooper, et al. 2002.*

3.2.3 Historic-age Resources

Previous research was conducted to determine if historic-age buildings and structures are known to be present along the LRGFCP (Cooper, *et al*. 2002). Two structures or groups of structures were identified as occurring within the current project area. These potential sites are B18-3 (Cooper, *et al*. 2002), the extant San Benito Pumping Station, 36WB9 (Cooper, *et al*. 2002), and the extant Los Fresnos Pump Station. Additionally, one known archaeological site consisting of historic-age structures was identified in the TASA. Designated 41CF182 (TASA 2007), the structure complex consists of an early 20th century irrigation canal and pump station.

More recent investigations conducted in preparation of this EA revealed that numerous other historic-age resources exist within the project ROW and immediately adjacent to the ROW (Sundermeyer, *et al*. 2007). These historic-age resources are engineering elements of the levee system and residential and agricultural structures located along the levee. The engineering structures are the Donna-Brownsville Levee itself, the canal at the Mercedes District Settling Basin, the canal gate at the Mercedes District Settling Basin, the canal at Gloria Ranch, the San Benito Pumping Station (identified by Cooper, *et al*. [2002] as B18-3), the canal at El Calaboz, an elevated ditch, an early 20th century irrigation canal and pump station (designated at 41CF182 [TASA 2007]), the Los Fresnos Pump Station (identified by Cooper, *et al*. [2002] as 36WB9), and approximately 53 weir gates and standpipe structures (Sundermeyer, *et al*. 2007).

Additional historic-age structures were identified on 1934 aerial photographs (IBC 1934) located in the Special Collections of The University of Texas Pan American, and in the John Hunter Room at The University of Texas at Brownsville. These are residential and agricultural structures or complexes located immediately outside the ROW. A limited field reconnaissance indicates that approximately three of these structures or structure complexes are extant. The locations of these historic-age resources are depicted on Figures 3.1a through 3.11 in Appendix C and listed in Table 3.4. No reconnaissance level field survey of historic-age resources within the project area has been completed, but during a windshield survey of the project area, their existence was verified.

3.2.4 Cemeteries

Two cemeteries were identified as occurring immediately adjacent to the ROW. These cemeteries are an unnamed cemetery with an unknown association, and another unnamed cemetery, possibly associated with El Calaboz. The locations of these cemeteries are depicted on Figures 3.1c and 3.1h in Appendix C and listed in Table 3.5.

Table 3.4 Historic-age Resources Identified Within or Near the Survey Corridor

Resource Type	Previous Designation (reference)	Primary Source (year)	Description*	Location Relative to the Levee	Within Survey Corridor** (estimate)	Resource Number/ Map Key	Project Mile Marker
Historic-age structures	N/A (this report)	USIBWC (2004)	Donna-Brownsville Levee weir gates and standpipes, in use and plugged	Riverside	yes	1	various (see Fig 3.1 a-l)
Historic-age structure	N/A (this report)	N/A	Canal at Mercedes District Settling Basin	Landside	yes	5	13.8
Historic-age structure	N/A (this report)	USIBWC (2004)	Canal gate at Mercedes District Settling Basin	Landside	yes	7	14.8
Historic-age structure	N/A (this report)	N/A	House	Landside	yes	12	16.6
Historic-age structures	N/A (this report)	N/A	Houses in Santa Maria	Landside	yes	13	16.8
Historic-age structure	N/A (this report)	N/A	Canal at Gloria Ranch	Landside	yes	15	22.3
Historic-age structures	B18-3 (Cooper et al. 2002:17)	USGS (1929); IBC (1927)	San Benito Pumping Station	Both sides	yes	B18-3	26.5
Historic-age structure	N/A (this report)	N/A	Canal at El Calaboz	Both sides	yes	16	35.2
Historic-age structure	N/A (this report)	N/A	Elevated ditch	Both sides	yes	18	37.7
Archaeological site 41CF182	41CF182 (TASA 2007)	TASA (2007)	Early 20th century irrigation canal and pump station	Both sides	yes	41CF182	39.4
Historic-age structures	36WB9 (Cooper et al. 2002:22)	USGS (1936)	Los Fresnos Pump Station (extant)	Riverside	yes	36WB9	44.5
Historic-age structures	N/A (this report)	N/A	Barn complex	Landside	no	19	49.6
Historic-age structure	N/A (this report)	N/A	Donna-Brownsville Levee	Both sides	yes	21	all

** Description is based on field inspection of the resource during reconnaissance conducted in support of the EA preparation.*

*** Location elative to the levee: riverside (R). Landside (L), or both sides (B).*

**** The survey corridor is a 160-foot-wide area centered on the current levee.*

Table 3.5 Cemeteries Identified Within or Near the Survey Corridor

Resource Type	Previous Designation (reference)	Primary Source (year)	Description*	Location Relative to the Levee	Within Survey Corridor** (estimate)	Resource Number/ Map Key	Project Mile Marker
Cemetery	N/A (this report)	N/A	Fenced cemetery, in use	Landside	no	8	15.0
Cemetery	N/A (this report)	N/A	Fenced cemetery, in use; possibly associated with El Calaboz	Landside	no	17	35.5

** Description is based on field inspection of the resource during reconnaissance conducted in support of the EA preparation.*

*** The survey corridor is a 160-foot-wide area centered on the current levee.*

3.3 WATER RESOURCES

3.3.1 Regional Flood Control

Lower Rio Grande Flood Control Project

In 1932 an agreement was reached between the United States and Mexico to develop a coordinated plan for an international project to protect the Lower Rio Grande Valley against flooding from the Rio Grande in both countries. This agreement, which later resulted in the Lower Rio Grande Flood Control Project, was developed by the IBWC. The USIBWC and MxIBWC are each responsible for meeting treaty obligations within their national boundaries.

The LRGFCP is designed for flood protection of urban, suburban, and highly developed irrigated farm lands in the Rio Grande delta in both countries. The LRGFCP flood levees are grass-covered earthen structures, with a distance between the United States and Mexico levees ranging from approximately 400 feet to 3 miles (USIBWC 1992). The LRGFCP is jointly operated by the USIBWC and MxIBWC to convey excess floodwaters of the Rio Grande to the Gulf of Mexico through the river and United States and Mexico interior floodways.

The LRGFCP facilities on the United States side are located in Hidalgo, Cameron, and Willacy Counties, Texas, with the river levee beginning near the Town of Peñitas at the head of the delta, about 180 RMs from the Gulf of Mexico. The United States interior floodway system is flanked by 168 miles of levees including the natural channel of the Arroyo Colorado, and 102 miles of levees along the Rio Grande (USIBWC 1980).

The LRGFCP includes the Anzalduas Diversion Dam, completed in 1960, and the Retamal Diversion Dam, completed in 1973. Joint ownership of Anzalduas and Retamal Dams is a responsibility of the United States and Mexico, via the USIBWC and MxIBWC, respectively. Operation and maintenance is shared equally between both countries.

The design flood for the LRGFCP is based on a peak flow of 250,000 cubic feet per second (cfs) at Rio Grande City, which attenuates to 235,000 cfs at Peñitas. During the design flood, Anzalduas Diversion Dam and Retamal Diversion Dam would each divert 105,000 cfs into the U.S. and Mexico, respectively. Flow diversion during the design flood would limit flood flows through the Brownsville-Matamoros area to 20,000 cfs. The USIBWC and MxIBWC coordinate operation of these dams to ensure both dams divert equal flows into the respective countries during significant flood events.

Donna-Brownsville Levee System

The Donna-Brownsville Levee System extends 65 miles south of the Donna Pumping Station (RM 135.5) to an area east of Brownsville (RM 26). The levee ROW runs primarily through agricultural areas, except in the lower reaches where the levee runs through the City of Brownsville. Numerous irrigation canals intersect the levee on the landside at the following irrigation district locations: Donna (Project Miles 0); Progreso (Project Mile 9.5); Mercedes (Project Mile 15); Santa Maria (Project Mile 18.5); La Feria (Project Mile 21); Harlingen (Project Mile 30); San Benito (Project Mile 30.5); Cameron County (Project Mile 48.5); Los Fresnos (Project Mile 62.5); and Brownsville (Project Mile 75).

Flood Containment Capacity

The current Donna-Brownsville Levee System does not meet design criteria for the design flood event. The need for improvements to the 65-mile levee system and current levee elevation data was determined by hydraulic modeling completed by the USIBWC. A 3-foot freeboard value is the design criterion for the levee system. The current levee elevation would not meet this freeboard requirement (USIBWC 2003a).

Structural Condition

As previously noted in Subsection 2.2, along with the increase in levee height, structural improvements may be required for levee segments. Structural improvements would consist of either a slurry cutoff barrier or a riverside impermeable liner. The slurry barrier would be installed at the riverside toe of the expanded levee, or along the levee centerline. The impermeable liner would be buried to a specified depth (18-30 inches) along the levee slope, and from some distance from the riverside toe to above the riverside shoulder of the levee.

According to the USACE assessment, structural improvements would be required along a 5-mile area upstream and downstream of the Progreso International Bridge (USACE 2003).

3.3.2 Water Flow

Flow of the Rio Grande is highly variable and tightly managed. Along the LRGFCP, including the Donna-Brownsville Levee System, the flow is dictated by the needs of agriculture and crop watering schedules. Low water flow conditions characterize the river, with minimum values from September to February. Severely reduced flows occur, frequently due to increased water demands from a growing urban and industrial population, reduced riparian habitat and ground cover, proliferation of exotic aquatic vegetation, and recent drought conditions. Rio Grande water is currently fully allocated, with agricultural use constituting 82 to 90 percent of the water in the LRGV (USIBWC 2003b).

Two other factors that impact flow in the Rio Grande are water storage and storms. There are two large international reservoirs on the lower Rio Grande: International Amistad Reservoir, near Del Rio, Texas, and International Falcon Reservoir, near Zapata, Texas. These reservoirs store water for agricultural use, public water supply, and recreational activities, and provide storage capacity for control of floods. Storm water is managed by 270 miles of levees that channel flow into and out of diversions and floodways. During non-flood conditions, irrigation/municipal water and local drainage flow into the floodways through multiple irrigation and drainage structures.

3.4 LAND USE

Current land use along the Donna-Brownsville Levee System was evaluated along the potential expansion corridor associated with the levee improvement project using three main categories: natural resources management areas, agricultural lands, and urban areas.

3.4.1 Natural Resources Management Areas

Land set aside specifically for natural resource management activities are maintained by the USFWS, TPWD, and National Audubon Society. Twenty four tracts of the LRGV National Wildlife Refuge are located in the levee vicinity, 10 of them located adjacent to the Rio Grande. Of those tracts, only 3 are adjacent to the potential levee expansion area (at mile markers 22.0, 37.5, and 38.5).

3.4.2 Agricultural Land

Agricultural land mostly flanks the landside of the levee. On the riverside, agricultural parcels intermixed with natural resources management areas account for approximately one half of the land adjacent to the levee.

3.4.3 Urban Areas

In the northern reaches of the Donna-Brownsville Levee System, there is limited urban development on the United States side of the river, to the landside of the levee. This limited urban development includes the town of Progreso, just to the north of the Progreso International Bridge. Further downstream at approximately RM 35, immediately north of the levee, is the town of El Calaboz. At the lower reaches of the Donna-Brownsville Levee System are the Cites of Brownsville (United States side) and Matamoros (Mexico side). On both sides of the river, the cities are immediately adjacent to the levees. No residential developments are located, nor allowed, within the levee system ROW.

3.5 COMMUNITY RESOURCES

3.5.1 Socioeconomics

The Donna-Brownsville Levee System is located in the southern portion of Hidalgo and Cameron Counties. The nearest populated areas to the proposed levee improvement area are the Cities of Progreso north of the Progreso International Bridge and Brownsville at the lower reaches of the levee system.

Population

Hidalgo County's total population in 2005 was approximately 671,967, an 18 percent increase from 569,463 in 2000 (Texas Water Development Board 2006). The largest populated cities within the county are McAllen with a population of 123,622; Mission, population 60,146; and Pharr, population 58,986. The City of Hidalgo had a 2005 population of 10,889. The largest racial category for the county is "Hispanic or Latino" (Table 3.6). The median age for Hidalgo County is 27 years, with a 49 percent male and 51 percent female population. According to the U.S. Census Bureau, Hidalgo County has 231,571 total housing units (U.S. Census Bureau 2005).

Table 3.6 Racial Composition of Hidalgo County

Race	Number	Percent
Hispanic or Latino (any race)	600,738	89.4
White	53,757	8.0
Black or African American	6,048	0.9
American Indian and Alaska Native	4,032	0.6
Asian	5,376	0.8
Other	2,016	0.3
Total Population	671,967	100

Cameron County's total population in 2005 was approximately 378,311, a 12.9 percent increase from 335,227 since 2000. Brownsville is the largest populated city in Cameron County, located along the Rio Grande, with a population of 156,178. Other towns located along the river are small, dispersed communities. The largest racial category for the county is Hispanic or Latino (Table 3.7). The median age for Cameron County is 29 years, with a 48 percent male and 52 percent female population. According to the 2005 U.S. Census Quickfacts, Cameron County has 137,240 total housing units (U.S. Census Bureau 2005).

Table 3.7 Racial Composition of Cameron County

Race	Number	Percent
Hispanic or Latino (any race)	325,347	86.0
White	44,641	11.8
Black or African American	3,026	0.8
American Indian and Alaska Native	2,270	0.6
Asian	2,270	0.6
Other	757	0.2
Total Population	378,311	100

Employment

Hidalgo County's total full-time and part-time employment in 2005 was 242,525 (Texas Workforce Commission 2007). The largest employment sectors in terms of jobs were federal, state, and local government; trade, transportation and utilities; and education and health services with 43,699, 35,337, and 25,335 jobs, respectively. The unemployment rate in 2005 was 7.7 percent (Texas Economic Development 2005). Farm employment makes up approximately 2 percent of the county's total employment (Bureau of Economic Analysis 2003). In 1997 there were approximately 1,373 farms totaling 635,884 acres in the county. The surrounding area near the proposed levee improvement area is primarily agricultural (USIBWC 2003b).

Cameron County's total full-time and part-time employment in 2005 was 130,864 (Texas Workforce Commission 2007). The economy of the county is based primarily on the service,

retail trade, and government sectors. Each of these industries comprised approximately 22 to 23 percent of the total employment in the region. In Cameron County, the unemployment rate in 2005 was 7.5 percent (Texas Economic Development 2005). In 1997 there were approximately 902 farms totaling 368,528 acres in the county. The surrounding area near the proposed levee improvement area is primarily agricultural (USIBWC 2003b).

Income

Medium household incomes for Cameron and Hidalgo Counties (reported in 1999 dollars) was $26,155 and $24,863, respectively. The median family income was $27,853 and $26,009 for the respective counties. Per average capita income was $10,980 for Cameron County and $9,899 for Hidalgo County (U.S. Census Bureau 2000). Approximately 28 percent of all families in Cameron County and 29 percent in Hidalgo County were reported to be below the poverty level in the 2000 Census (U.S. Census Bureau 2005).

3.5.2 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued by the president on February 11, 1994. The Executive Order requires a federal agency to make "…achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." As such, a proposed action must be evaluated in terms of an adverse effect that would be:

- Predominantly borne by a minority population and/or low-income population; or
- Suffered by the minority population and/or low-income population in an appreciably more severe or greater magnitude than the adverse effect that would be suffered by the non-minority population and/or non-low income population.

Information from Tables 3.6 and 3.7 indicate that Hidalgo and Cameron Counties have disproportionately high minority (approximately 89 and 86 percent, respectively) and low-income populations (families – 29 and 28 percent, respectively) in relation to the State of Texas.

3.5.3 Transportation

The levee system for the proposed project extends from the Donna Canal Pumping Station, which is just upstream of the Retamal Dam, downstream approximately 65 levee miles to the City of Brownsville. The levee system transgresses the southern portions of Hidalgo and Cameron Counties. Cities within these counties that are adjacent to the levee system include Hidalgo, Progreso, Relampago, Santa Maria, Los Indios, Carricitos, La Paloma, El Calaboz, Ranchito, San Pedro, Brownsville, and Palm Grove. The levee system ends on the east side of Brownsville.

Hidalgo and Cameron Counties are an important throughway for agricultural products. The major artery for highway traffic is U.S. Highway 281, which connects Hidalgo County with cities to the north. Also important is U.S. Highway 83, which traverses the county from

east to northwest and U.S. Highway 77 in Cameron County from Brownsville northwest to Raymondville. Hidalgo and Cameron Counties have an extensive network of state and farm-to-market roads. In Hidalgo County, the two spans of the Hidalgo-Reynosa International Bridge, the Pharr-Reynosa Bridge and the Progreso Bridge over the Rio Grande, serve as crossing points between Mexico and the United States. Cameron County has four bridges that serve as crossing points between the two countries: the B&M Bridge at Brownsville; the Veterans International Bridge at Los Tomates; the Gateway International Bridge, and the Free Trade Bridge in Los Indios. A new bridge, the Anzalduas International Bridge, is in the design phase. Two major rail systems serve Hidalgo County.

The Donna-Brownsville levee crown is an unpaved service road with restricted public access throughout most of the system. The service road is utilized by the USIBWC as a service road for levee maintenance and vegetation management. The service road is also used extensively by the U.S. Border Patrol for immigration control and by the USFWS for access to the LRGV National Wildlife Refuge and Santa Ana National Wildlife Refuge.

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 U.S. Environmental Protection Agency (USEPA) classifies air quality within an AQCR according to whether the concentrations of criteria air pollutants in the atmosphere exceed 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.

NAAQS are currently established for six air pollutants (known as “criteria air pollutants”) including carbon monoxide, nitrogen dioxide (NO_2), ozone (O_3), sulfur oxides (measured as sulfur dioxide, SO_2), lead, and particulate matter. Particulate matter standards incorporate two particulate classes: 1) particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM_{10}), and 2) particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$). Only PM_{10} is regulated by the rule.

An attainment designation indicates that air quality within an area is as good as or better than the NAAQS. The proposed levee improvement area is located within AQCR 213, or the Brownsville-Laredo AQCR. This AQCR is located completely within the State of Texas, covering Cameron County, Hidalgo County, Jim Hogg County, Starr County, Webb County, Willacy County, and Zapata County (CFR 2001). As of December 2006, the USEPA designated air quality within all counties of AQCR 213 to be under attainment status for all criteria pollutants (USEPA 2007a). The emissions data for Cameron and Hidalgo Counties are used for analysis purposes because the activity associated with the alternatives would be localized in the narrow area along the river, and emissions from the activities would not likely affect the more distant counties within the AQCR.

The Texas Commission on Environmental Quality (TCEQ) has identified 13 companies in Cameron and Hidalgo Counties as contributors of point source emissions. Potential stationary sources of criteria pollutant and hazardous air pollutant emissions within Cameron and Hidalgo Counties include the Rio Grande Valley Sugar growers, Inc., Wil Ron Manufacturing Corporation, and several oil mills and refineries, and utilities and gasoline facilities (TCEQ 2006). Area emission sources for Cameron and Hidalgo Counties, as designated generally by USEPA, include waste disposal and recycling, highway and off-highway vehicles, and other miscellaneous emission sources.

The area and stationary point source emission inventory for Cameron and Hidalgo Counties for calendar year 2001, the latest available data from USEPA as of March 2007 (USEPA 2007b) is as follows:

- Carbon monoxide, 234,494 tons per year;
- Volatile organic compounds, 44,333 tons per year;
- Nitrogen dioxide, 31,566 tons per year;
- Sulfur oxides, measured as SO_2, 2,187 tons per year; and
- PM_{10}, 97,863 tons per year.

3.6.2 Noise

Guidelines

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. Noise levels often change with time. To compare sound levels over different time periods, several descriptors have been developed that take into account this time-varying nature. These descriptors are used to assess and correlate the various effects of noise on humans.

The day-night average sound level (DNL) is a measure of the total community noise environment. DNL is the average A-weighted sound level in decibels, or 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. DNL is an accepted unit for quantifying annoyance to humans by general environmental noise, including aircraft noise. The Federal Interagency Committee on Urban Noise developed land use compatibility guidelines for noise (U.S. Department of Transportation 1980). Potential adverse effects of noise include annoyance, speech interference, and hearing loss.

Annoyance. 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 (National Academy of Sciences 1977).

Speech Interference. 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. 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).

Baseline Noise Levels

Land use and zoning classifications in the area surrounding the proposed levee improvement area provide an indication for potential noise impact. Land surrounding the Donna-Brownsville Levee System is predominantly managed as urban or built-up (Brownsville), wildlife refuge areas, and agricultural land. No sensitive noise receptors such as schools, churches, and medical facilities are located in or surrounding the Donna-Brownsville Levee System.

Typical outdoor noise sources near the levee system include vehicles, pickup trucks, diesel tractor mowers, and other farm machinery. Noise sources such as mowers at 100 feet, a diesel truck, or scrapers used to grade levee roads at 50 feet are approximately 70 dBA, 88 dBA, and 89 dBA, respectively (CERL 1978).

3.6.3 Hazardous and Toxic Waste

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 waste is defined under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA). In general, both hazardous substances and waste 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 proposed levee improvement area were reviewed to identify areas where industrial processes occurred, solid and hazardous waste 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 along the Donna-Brownsville Levee System was conducted by Banks Information Systems (Banks 2007). The search extended along several portions of the levee system along Military Highway near Ranchito and areas near Brownsville, up to 0.5 miles from the levee centerline. Detailed data are reported in the

document *Technical Support Studies for the Environmental Assessment of Flood Control Improvements to the Donna-Brownsville Levee System* (Parsons 2007).

The identification of hazardous and toxic waste disposal and the storage site near the project area included the following databases:

- The National Priority List (NPL);
- RCRA Corrective Actions and associated Transport, Storage, and Disposal (TSD) list;
- State equivalent priority list;
- State equivalent Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list;
- Sites currently or formerly under review by the USEPA;
- RCRA-permitted transport, storage, and disposal facilities;
- RCRA-registered generator of hazardous waste (GENS);
- Registered underground storage tanks (UST), including leaking underground storage tanks (LUST);
- Registered aboveground storage tanks;
- Sites permitted as solid waste landfills, incinerators, or transfer stations;
- Emergency Response Notification System of Spills (ERNS) list; and
- State spills list.

Results of the data search along the Donna-Brownsville Levee System, including the search radius (up to one-half mile) by individual database, are shown in Table 3.8. A total of 60 sites were identified by Banks Information System (Banks 2007) as being located within the radius search; all within Brownsville. One site designated as "no further remedial action planned" (NFRAP) was listed for possible chemical contamination from a Cotton Insects Research Laboratory. A preliminary assessment was completed and USEPA issued an NFRAP for this site. Six RCRA generator sites were listed as being small quantity generators (SQG) and all the sites reportedly had no instances of spills. One ERNS site was listed as having an unknown quantity of a spill of hydrochloric acid in June 1991. The spill was contained within the dike area and was cleaned up. There were 25 LUST sites for underground storage tanks containing either gasoline or diesel fuels reported in the search radius. All the USTs have since been removed and are no longer in service. The 21 USTs listed in the database search are USTs that have been registered with the state, six of which some are still in service and the remaining 15 USTs have been removed because they were also listed as LUSTs. Lastly, six sites were identified as State Other Sites are reported as SQGs or conditionally exempt SQGs. All six sites have no reported instances of a spill. None of these sites would affect, or be affected by, the levee construction project.

Table 3.8 Summary Search Report for the Donna-Brownsville Levee System

Database	Database Updated	Search Radius	Survey Corridor	1/8 Mile	1/4 Mile	1/2 Mile	Total
NPL	12-08-06	1.00	0	0	0	0	0
CERCLIS	12-08-06	0.50	0	0	0	0	0
NFRAP	12-08-06	0.50	0	0	1	-	1
RCRA TSD	06-06-06	0.50	0	0	0	0	0
RCRA COR	06-06-06	1.00	0	0	0	0	0
RCRA GENS	06-06-06	0.25	0	2	4	-	6
ERNS	12-31-05	0.25	0	1	0	-	1
State Sites	05-14-06	1.00	1	2	3	0	6
SWL	05-14-06	0.50	0	0	0	0	0
Other	03-14-06	0.25	0	0	0	-	0
Regular UST/AST	06-28-06	0.25	0	10	11	-	21
Leaking UST	06-28-06	0.50	0	6	10	9	25
Total Sites			**1**	**21**	**29**	**9**	**60**

SECTION 4
ENVIRONMENTAL CONSEQUENCES

Section 4 presents an analysis of the environmental consequences of the No Action Alternative and proposed improvements for the Donna-Brownsville Levee System. Resource areas are presented in the same sequence used in Section 3 for the description of the affected environment: biological resources; cultural resources; water resources; land use; community resources; and environmental health issues.

4.1 BIOLOGICAL RESOURCES

4.1.1 Vegetation

No Action Alternative

No changes would be made to improve the levees. The levee slopes would continue to be mowed on an as-needed basis, which would maintain the vegetation as non-native grasses.

Proposed Action

Improvements to the Donna-Brownsville Levee System would affect plant communities through excavation and fill activities. Impacts would occur on the levee sidewalls where fill would be added, and within the expanded levee footprint area. The vegetation communities identified during field surveys fall into one of the following classes: a) Mesquite-Acacia woodland; b) Herbaceous, represented primarily by Bufflegrass-dominant grassland; c) Wetlands/Riparian communities, represented primarily by phragmites – arundo emergent and semi-emergent plants; and d) Agricultural. Table 4.1 shows potential acreage removed and impacts to each vegetation community for the Donna-Brownsville levee. Within the proposed project area, several tracts of land are owned and/or managed by federal, state, or non-governmental agencies. Table 4.2 shows the location of the conservation lands along the levee, the length of the tracts of conservation land adjacent to the levees, and if the conservation land is adjacent to the potential levee expansion area.

4.1.2 Wildlife

No Action Alternative

No changes would be made to improve the levees. The ongoing mowing operations would maintain the non-native grasses on the levee slopes, which provides little suitable wildlife habitat, except as transit corridors.

Table 4.1 Impacts to Vegetation within the Donna-Brownsville Levee System

Vegetation Community	Acreage Within 160-Ft Wide Survey Corridor	Acreage Within Potential Levee Expansion Area	Impact Characterization
Woodland / Thornscrub Communities			
Mesquite - Acacia Woodland	313.1	0.5	Woodlands along the levee systems are in varying stages of succession. The removal of thorn woodland along the Donna-Brownsville Levee is approximately 0.1% of the total thorn woodland within the 160-foot wide survey corridor.
Acacia – Remnant Sabal Woodland	38.8	-	
Total Woodland / Thornscrub	*351.9*	0.5	
Herbaceous Community			
Bufflegrass Dominant Grassland	681.6	50.5	Short-term impact on grassland communities in the areas of levee expansion would occur. An invasive species, Bufflegrass, is predominant throughout the herbaceous areas. Herbaceous vegetation will be rapidly re-established when construction activities are complete.
Wetlands / Riparian Communities			
Texas Ebony – Anauco Forest	19.4	-	Along the Donna-Brownsville Levee system, none of the potential jurisdictional wetlands fall within the potential expansion corridor.
Typha / Phragmites Emergent	38.3	-	
Drainage Ditches	8.5	-	
Open Water	14.6	-	
Total Wetlands / Riparian	*80.8*	0	
Agricultural			
Active Agricultural	120.5	-	No agricultural areas are located within the Donna-Brownsville potential expansion corridor.
Fallow Agricultural	52.3	-	
Total Agriculture	*172.8*	0	
Developed / Impervious Cover			
Lined Canal	7.4	0.1	
Road	8.0	4.8	
Residential	6.3	-	
Commercial / Industrial	4.7	-	
Total Developed / Impervious Cover	*26.4*	*4.9*	
TOTAL	***1,313***	***55.9***	

Table 4.2 Location of Federal, State, and Non-governmental Conservation Tracts Relative to the Donna-Brownsville Levee System

Tract Size	Location	Approximate Length Adjacent to Levee	Adjacent to Potential Levee Expansion Area
USFWS Lower Rio Grande Valley National Wildlife Refuge			
258 Acre Tract	Mile Marker 4.0 Riverside	750 Feet	No
186 Acre Tract	Mile Marker 8.0 Riverside	1,700 Feet	No
32 Acre Tract	Mile Marker 11.0 Riverside and Landside	1,800 Feet	No
556 Acre Tract	Mile Marker 15.0 Riverside	5,200 Feet	No
47 Acre Tract	Mile Marker 21.0 Riverside	1,800 Feet	No
269 Acre Tract	Mile Marker 22.0 Riverside and Landside	4,000 Feet	Yes, expansion inside ROW
38 Acre Tract	Mile Marker 27.5 Riverside and Landside	1,200 Feet	No
1 Acre Tract	Mile Marker 34.5 Riverside	470 Feet	No
1 Acre Tract	Mile Marker 34.5 Riverside	450 Feet	No
175 Acre Tract	Mile Marker 37.5 Riverside and Landside	1,000 Feet	Yes, expansion inside ROW
297 Acre Tract	Mile Marker 38.5 Riverside and Landside	5,700 Feet	Yes, expansion inside ROW
30 Acre Tract	Mile Marker 46.0 Riverside	1,500 Feet	No
339 Acre Tract	Mile Marker 48.0 Landside	7,800 Feet	No
297 Acre Tract	Mile Marker 55.0 Riverside	1,500 Feet	No
423 Acre Tract	Mile Marker 58.0 Riverside and Landside	4,500 Feet	No
184 Acre Tract	Mile Marker 62.0 Landside	6,100 Feet	No
336 Acre Tract	Mile Marker 62.0 Riverside	2,500 Feet	No
TPWD Wildlife Management Areas			
Las Palomas WMA (3 Acre Champion Tract)	Mile Marker 2.5 Landside	200 Feet	No
Las Palomas WMA (21-Acre Gonzales Tract)	Mile Marker 17.0 Landside	600 Feet	No
Las Palomas WMA (62 Anacua Tract)	Mile Marker 17.5 Landside	2,700 Feet	No
Las Palomas WMA (139-Acre Anacua Tract)	Mile Marker 18.5 Riverside and Landside	5,200 Feet	No
National Audubon Society, Texas Chapter[3]			
Sabal Palms Center (557-Acre Tract)	Mile Marker 59.0, Riverside	2,500 Feet	No

Proposed Action

The value of vegetation to wildlife along the Donna-Brownsville Levee depends on the quantity of habitat and the relative successional stage of the vegetation (quality of habitat). The thorn woodlands and wetlands areas along the Donna-Brownsville Levee system may provide the best quality wildlife habitat. The herbaceous and agricultural areas are dominated by invasive or cultivated species, and provide little suitable habitat for most wildlife species. Some wildlife species may utilize these areas as transit corridors, but the usage is likely limited. There are natural resource conservation areas along the length of the project area, in discreet units. Although some tracts are very large, the length of the conservation areas adjacent to the levee that might be affected by levee improvements total 11.21 miles, or 17.25 percent of the 65 miles total levee length.

The Donna-Brownsville Levee expansion would remove approximately 0.5 acre of Mesquite-Acacia thorn woodland, which is approximately 0.1 percent of the thorn woodland that occurs within the 160-foot wide survey corridor. Potential removal of thorn woodland would require a recovery period of over 25 years to achieve a community structure similar to current conditions. Although not considered unique, the limited extent of thorn woodland accentuates its value as wildlife habitat.

A total of 681.6 acres of herbaceous vegetation, and approximately 50.5 acres would be removed during levee expansion. This herbaceous vegetation is considered relatively low-quality wildlife habitat and the non-native grasses are expected to rapidly re-establish after construction. No herbaceous wildlife habitat would be lost.

4.1.3 Threatened and Endangered Species

Preferred habitat types for each T&E species potentially occurring in Hidalgo, Cameron, and Willacy Counties were compared to the habitat types identified during field surveys to evaluate their likelihood of occurrence. The habitat determination was categorized according to USFWS guidelines as follows:

- *Not Likely Present*: no suitable habitat identified;
- *Potentially Present*: habitat present but there are no records of species occurrence in the vicinity;
- *Likely Present*: habitat present and species are known to occur in the vicinity; and
- *Present*: observed.

For those species considered potentially or likely present in the area, a determination of the effect of each action on those species was made. The determination of effect includes vegetation that may be altered or removed, water resources used by the species (if appropriate), and the effects of construction activities such as noise and disturbance during breeding activities. Table 4.3 lists potential impacts of the Donna-Brownsville Levee System improvements to T&E species habitat.

No Action Alternative

No changes would be made to improve the levees. The ongoing mowing operations would maintain the non-native grasses on the levee slopes, which provides little suitable T&E habitat, except as transit corridors.

Proposed Action

Levee expansion activities within the survey corridor would remove some habitat for T&E species. There are 15 species considered potentially present in the vicinity of the levee system. Due to the relatively small amount of habitat subject to removal, no adverse effects would be expected from the levee expansion.

In all likelihood, adverse effects may be mitigated by timing construction activities to avoid breeding and nesting seasons of T&E species. Consultation with TPWD and USFWS would be needed to schedule construction activities to minimize potential impacts on species and species habitat (see Table 4.3).

4.1.4 Jurisdictional Wetlands and Aquatic Habitat

No Action Alternative

Sediment removal and nuisance aquatic vegetation removal would continue on an as needed basis. There would be no impacts to wetlands or aquatic habitat due to ongoing operations.

Proposed Action

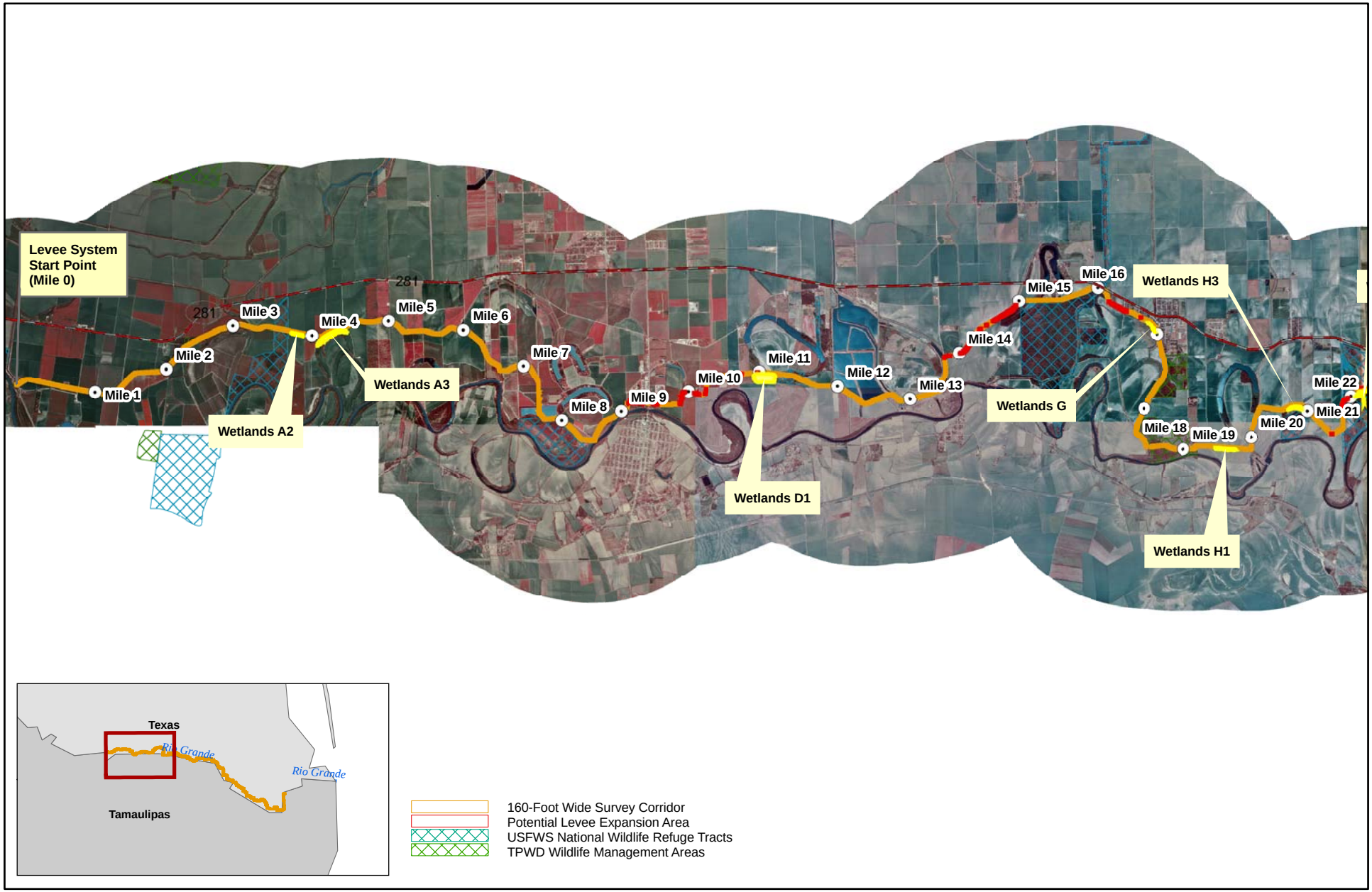
Within this survey corridor, there were a total of 80.8 acres of potentially jurisdictional wetlands; no wetlands are located within the potential levee expansion area (Figures 4.1, 4.2 and 4.3).

Table 4.3 Potential Impacts of Donna-Brownsville Levee Improvements on Federally Listed Threatened and Endangered Species

Common Name	Scientific Name	Federal Status	State Status	Likelihood of Occurrence	Potential Effect
AMPHIBIANS					
Black-spotted newt	*Notophthalmus meridionalis*		T	Potentially present	Not likely to affect – Avoidance of potential habitat during construction
Mexican treefrog	*Smilisca baudinii*		T	Potentially present	Not likely to affect – Avoidance of potential habitat during construction
Sheep frog	*Hypopachus variolosus*		T	Not likely present	Not likely to affect – Avoidance of potential habitat during construction
South Texas siren (large form)	*Siren sp 1*		T	Potentially present	Not likely to affect – Avoidance of potential habitat during construction

Common Name	Scientific Name	Federal Status	State Status	Likelihood of Occurrence	Potential Effect
White-lipped frog	*Leptodactylus labialis*		T	Not likely present	Not likely to affect – Avoidance of potential habitat during construction
BIRDS					
American Peregrine Falcon	*Falco peregrinus anatum*	DL	E	Potentially present	Not likely to affect – Timing of construction activities to limit impacts
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	DL	T	Potentially present	Not likely to affect – Timing of construction activities to limit impacts
Brown Pelican	*Pelecanus occidentalis*	LE	E	Not likely present	Not likely to affect
Cactus Ferruginous Pygmy-owl	*Glaucidium brasilianum cactorum*		T	Potentially present	Not likely to affect – Timing of construction activities to limit impacts
Common Black-Hawk	*Buteogallus anthracinus*		T	Not likely present	Not likely to affect
Eskimo Curlew	*Numenius borealis*	LE	E	Not likely present	Not likely to affect
Gray Hawk	*Asturina nitida*		T	Potentially present	Not likely to affect – Timing of construction activities to limit impacts
Interior Least Tern	*Sterna antillarum athalassos*	LE	E	Potentially present	Not likely to affect – Timing of construction activities to limit impacts
Northern Aplomado Falcon	*Falco femoralis septentrionalis*	LE	E	Not likely present	Not likely to affect
Northern Beardless-tyrannulet	*Camptostoma imberbe*		T	Potentially present	Not likely to affect – Timing of construction activities to limit impacts
Peregrine Falcon	*Falco peregrinus*	DL	E T	Potentially present	Not likely to affect – Timing of construction activities to limit impacts
Piping Plover	*Charadrius melodus*	LT	T	Not likely present	Not likely to affect
Reddish Egret	*Egretta rufescens*		T	Not present	Not likely to affect
Rose-throated Becard	*Pachyramphus aglaiae*		T	Potentially present	Not likely to affect – Timing of construction activities to limit impacts
Sooty Tern	*Sterna fuscata*		T	Not likely present	Not likely to affect
Texas Botteri's Sparrow	*Aimophila botterii texana*		T	Potentially present	Not likely to affect – Timing of construction activities to limit impacts
Tropical Parula	*Parula pitiayumi*		T	Potentially present	Not likely to affect – Timing of construction activities to limit impacts
White-Faced Ibis	*Plegadis chihi*		T	Not likely present	Not likely to affect
White-Tailed Hawk	*Buteo albicaudatus*		T	Not likely present	Not likely to affect
Wood Stork	*Mycteria americana*		T	Not present	Not likely to affect
Zone-Tailed Hawk	*Buteo albonotatus*		T	Not likely present	Not likely to affect
MAMMALS					
Black bear	*Ursus americanus*	T/SA;NL	T	Not present	Not likely to affect
Black-footed ferret	*Mustela nigripes*	LE	E	Not present	Not likely to affect

Common Name	Scientific Name	Federal Status	State Status	Likelihood of Occurrence	Potential Effect
Coues' rice rat	*Oryzomys couesi*		T	Potentially present	Not likely to affect – Timing of construction activities to limit impacts
Gray wolf	*Canis lupus*	LE	E	Not present	Not likely to affect
Greater long-nosed bat	*Leptonycteris nivalis*	LE	E	Not likely present	Not likely to affect
Jaguar	*Panthera onca*	LE	E	Not present	Not likely to affect
Jaguarundi	*Herpailurus yaguarondi*	LE	E	Potentially present	Not likely to affect
Ocelot	*Leopardus pardalis*	LE	E	Potentially present	Not likely to affect
Southern yellow bat	*Lasiurus ega*		T	Potentially present	Not likely to affect
West Indian manatee	*Trichechus manatus*	LE	E	Not present	Not likely to affect
White-nosed coati	*Nasua narica*		T	Not likely present	Not likely to affect
REPTILES					
Atlantic hawksbill sea turtle	*Eretmochelys imbricata*	LE	E	Not present	Not likely to affect
Black-striped snake	*Coniophanes imperialis*		T	Potentially present	Not likely to affect – Timing of construction activities to limit impacts
Green sea turtle	*Chelonia mydas*	LT	T	Not present	Not likely to affect
Indigo snake	*Drymarchon corais*		T	Potentially present	Not likely to affect
Kemp's Ridley sea turtle	*Lepidochelys kempii*	LE	E	Not present	Not likely to affect
Leatherback sea turtle	*Dermochelys coriacea*	LE	E	Not present	Not likely to affect
Loggerhead sea turtle	*Caretta caretta*	LT	T	Not present	Not likely to affect
Northern cat-eyed snake	*Leptodeira septentrionalis septentrionalis*		T	Potentially present	Not likely to affect
Reticulate collared lizard	*Crotaphytus reticulatus*		T	Potentially present	Not likely to affect
Speckled racer	*Drymobius margaritiferus*		T	Not likely present	Not likely to affect
Texas horned lizard	*Phrynosoma cornutum*		T	Potentially present	Not likely to affect
Texas scarlet snake	*Cemophora coccinea lineri*		T	Potentially present	Not likely to affect
Texas tortoise	*Gopherus berlandieri*		T	Potentially present	Not likely to affect
FISHES					
Blackfin goby	*Gobionellus atripinnis*		T	Potentially present	Not likely to affect
Opossum pipefish	*Microphis brachyurus*		T	Not likely present	Not likely to affect
Rio Grande silvery minnow	*Hybognathus amarus*	LE	E	Not present	Not likely to affect
River goby	*Awaous banana*		T	Not present	Not likely to affect
MOLLUSKS					
Texas hornshell	*Popenaias popeii*	C		Not present	Not likely to affect
PLANTS					
South Texas ambrosia	*Ambrosia cheiranthifolia*	LE	E	Potentially present	Not likely to affect
Star cactus	*Astrophytum asterias*	LE	E	Not likely present	Not likely to affect
Texas ayenia	*Ayenia limitaris*	LE	E	Potentially present	Not likely to affect
Walker's manioc	*Manihot walkerae*	LE	E	Not likely present	Not likely to affect



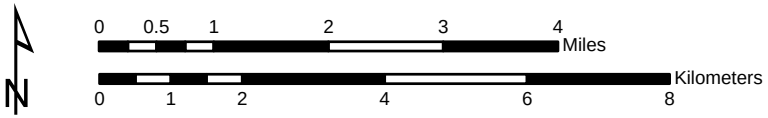
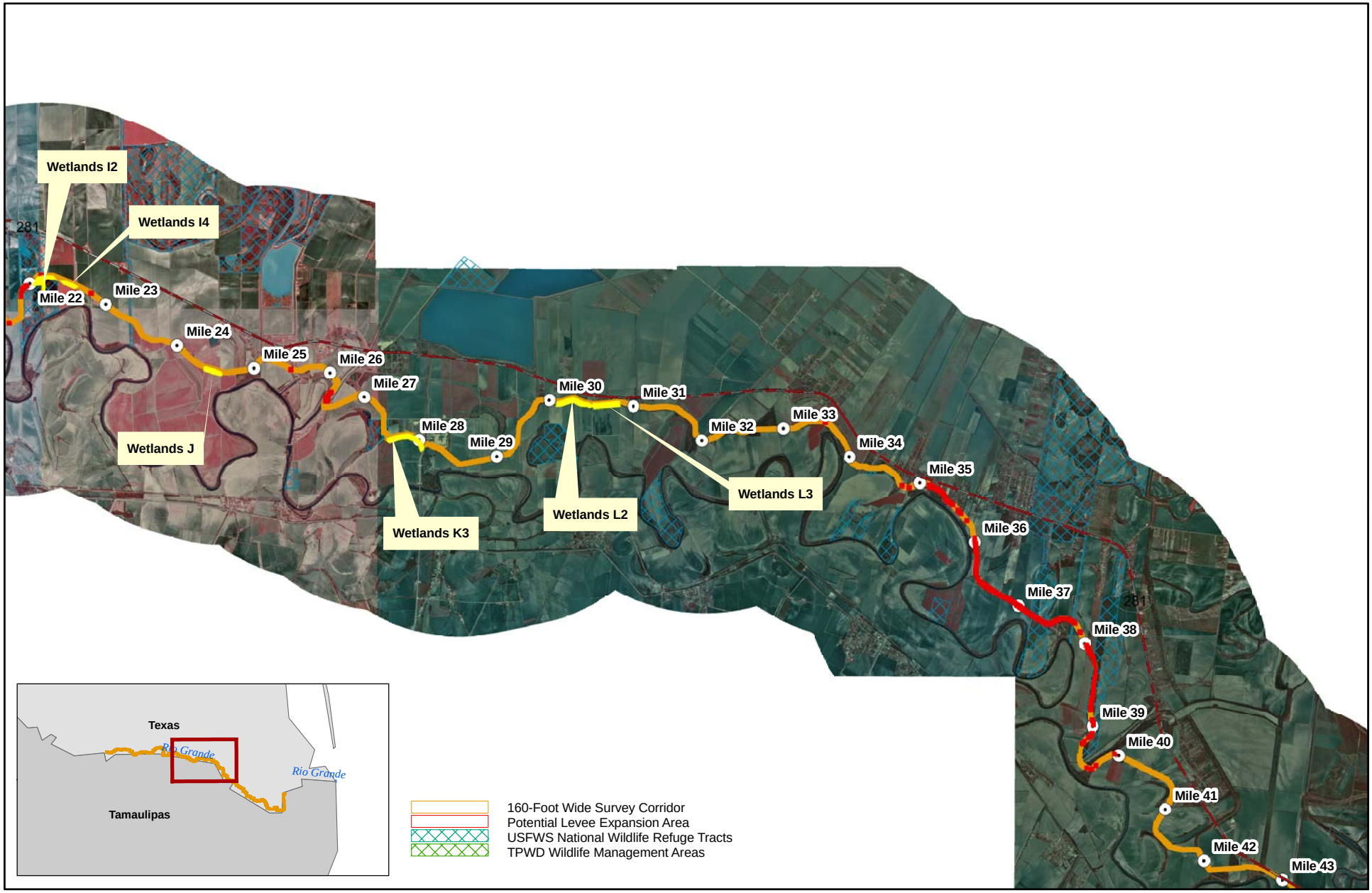


Figure 4.1
Location of Wetlands Within 160-Foot Wide Survey Corridor, Levee Miles 0 - 22

Donna - Brownsville Levee System EA
International Boundary and Water Commission, United States Section



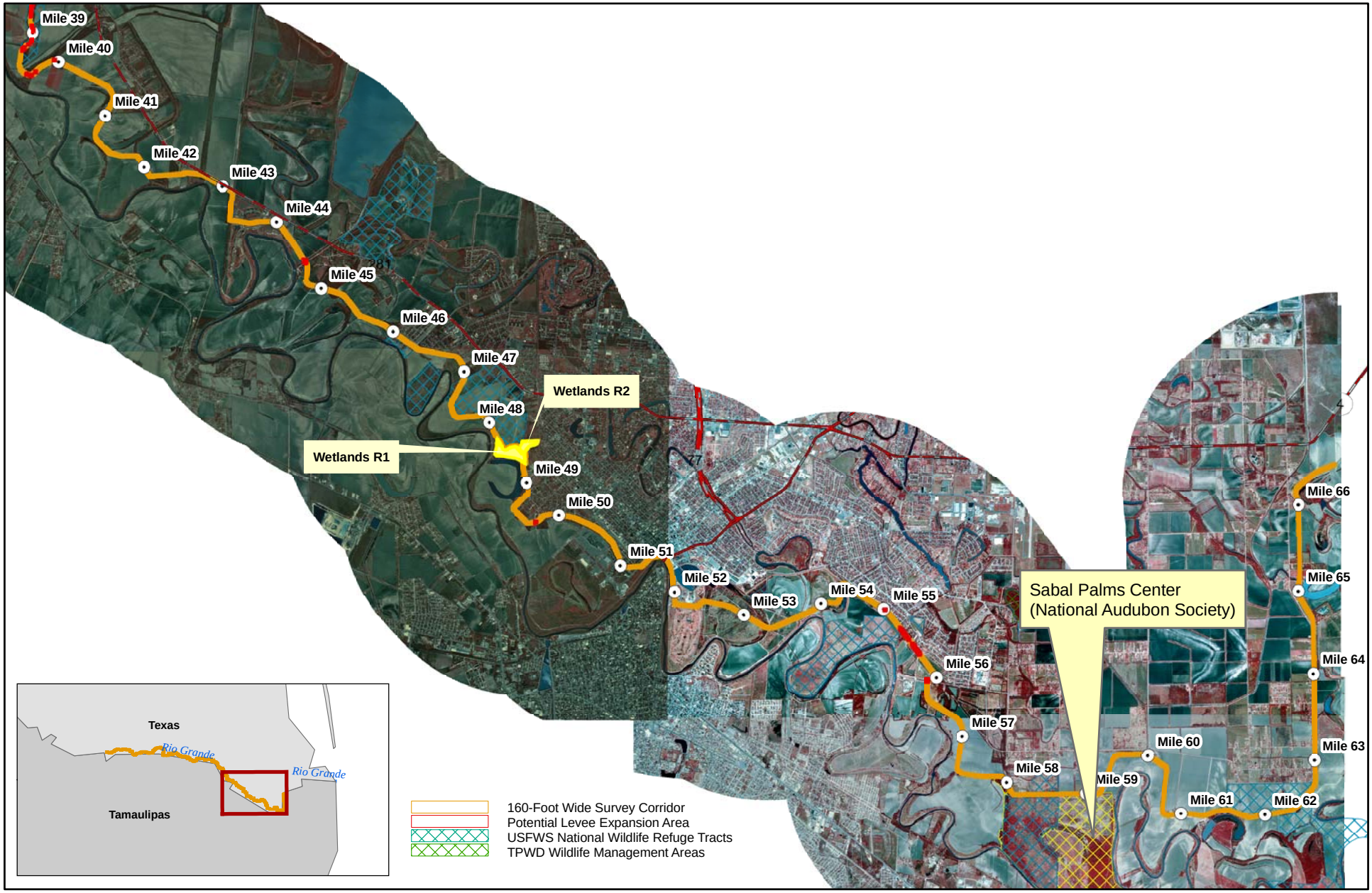
N

0 0.5 1 2 3 4 Miles

0 1 2 4 6 8 Kilometers

Figure 4.2
Location of Wetlands Within 160-Foot Wide Survey Corridor, Levee Miles 22 - 40

Donna - Brownsville Levee System EA
International Boundary and Water Commission,
United States Section



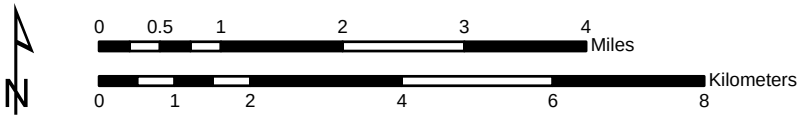


Figure 4.3
Location of Wetlands Within 160-Foot Wide Survey Corridor, Levee Miles 40 - 65

Donna - Brownsville Levee System EA
International Boundary and Water Commission,
United States Section

4.2 CULTURAL RESOURCES

4.2.1 Historic and Prehistoric Archaeological Resources

No Action Alternative

Under the No Action Alternative, operation and maintenance would continue and the current levee configuration would be retained. No adverse effects to historic or prehistoric archaeological resources are anticipated.

Proposed Action

Proposed improvements to the Donna-Brownsville levee system may adversely affect unrecorded archaeological sites and HPAs that may contain historic or prehistoric archaeological materials. The locations of the known resources are listed in Table 4.4 and depicted in detail in Figures 3.1a to 3.1k of Appendix C. Proposed improvements to the Donna-Brownsville levee system segment may adversely affect one known archaeological site (41CF182) and eight HPAs that may contain historic archaeological materials. Archaeological resources may be adversely affected by mechanical excavation or by burial under the expanded levee footprint. An intensive archaeological resources survey has not been completed within the project area.

Table 4.4 Potentially Impacted Archaeological Resources and HPAs Identified Within the 160-Foot Survey Corridor

Resource Number	Description	Potential Impact	Comment
Recorded Sites			
41CF182	Early 20th century irrigation canal and pump station	yes	Within survey corridor
Structures			
2	HPA, Previous structure location	yes	Within survey corridor
3	HPA, Kiln location	yes	Within survey corridor
4	HPA, Previous structure location	yes	Within survey corridor
6	HPA, Previous structure location	yes	Within survey corridor
9	HPA, Previous structure location	yes	Within survey corridor
10	HPA, Previous structure location	yes	Within survey corridor
11	HPA, Previous structure location	yes	Within survey corridor
14	HPA, Previous structure location	yes	Within survey corridor
36SM3	HPA, Florida Ranch location	yes	Within survey corridor
36LP3	HPA, Site of Encantada Community	yes	Within survey corridor
36LP9	HPA, Previous structure location	yes	Within survey corridor
36WB14	HPA, Previous structure locations	yes	Within survey corridor
36EB1	HPA, Previous structure locations	yes	Within survey corridor
20	HPA, Site of Indiana Pump Plant	yes	Within survey corridor

4.2.2 Historic-age Resources

No Action Alternative

Under the No Action Alternative, operation and maintenance would continue. No adverse effects to historic-age resources are anticipated.

Proposed Action

Sundermeyer, *et al.* (2007) identified 65 potential historic-age resources along the Donna-Brownsville Levee. These resources are the levee, canals and ditches, weir gates, standpipes, residential and agricultural structures, and cemeteries. Due to the fact that the preferred alternative indicates that modifications are likely to occur on the landside of the levee the resources located on the riverside along the Donna-Brownsville Levee are not likely to be adversely affected or would be minimally affected by levee modifications; however, where structures such as canals are located on the landside, improvements are intended to take place on the riverside. The locations of these resources are depicted on Figures 3.1a-k in Appendix C and listed in Table 4.5. No reconnaissance-level historic-age resources survey has been completed within the project area for determination of effects of the project.

Table 4.5 Potentially Impacted Historic-age Resources Identified Within or Near the Survey Corridor

Resource Number	Description	Potential Impact
Irrigation System Structures		
1	Donna-Brownsville Levee weir gates and standpipes, in use and plugged	yes
5	Canal at Mercedes District Settling Basin	yes
7	Canal gate at Mercedes District Settling Basin	yes
15	Canal at Gloria Ranch	yes
B18-3	San Benito Pumping Station	yes
16	Canal at El Calaboz	yes
18	Elevated ditch	yes
41CF182	Early 20th century irrigation canal and pump station	yes
36WB9	Los Fresnos Pump Station (extant)	yes
21	Donna-Brownsville Levee	yes
Other Structures		
12	House	yes
13	Houses in Santa Maria	yes

4.3 WATER RESOURCES

4.3.1 Flood Control

No Action Alternative

The No Action Alternative would retain the current configuration of the Donna-Brownsville Levee System, as designed over 30 years ago, and maintain the current level of protection currently associated with this system. Under severe storm events, current containment capacity may be insufficient to fully control Rio Grande flooding with risks to personal safety and property.

Proposed Action

Improvements to the levee system would increase flood containment capacity to control the design flood event as evaluated by hydraulic modeling. A minimum change in water elevation, less than 1 inch, would be anticipated as a result of the levee height increase for the Donna-Brownsville Levee System. In areas where there are structural deficiencies in the Donna-Brownsville Levee System, the proposed levee expansion would address those deficiencies during construction to improve the overall performance of the Donna-Brownsville Levee along this reach of the LRGFCP.

4.3.2 Water Flow

No Action Alternative

No impacts are anticipated under the No Action Alternative, as the current levee configuration would be retained.

Proposed Action

For the Proposed Action, improvements to the Donna-Brownsville Levee System would not affect water flow or downstream water bodies.

4.4 LAND USE

No Action Alternative

No impacts are anticipated, as the current levee configuration would be retained.

Proposed Action

Expansion of the Donna-Brownsville Levee System would occur entirely within the ROW. The expansion would primarily occur on the riverside of the levee due to the presence of irrigation canals along large levee segments. Landside expansion is only considered in the upper reaches of the Donna-Brownsville Levee where ROW is available and irrigation canals are absent. Potential impacts were evaluated in terms of natural resources management areas, agricultural lands, and urban areas.

Natural Resources Management Areas. The levee expansion project of the Donna-Brownsville Levee System would impact mostly herbaceous vegetation dominated by invasive species (approximately 50.5 acres). Approximately 0.5 acre of thorn woodland, a higher quality wildlife habitat, would also be removed.

Agricultural Land. No agricultural areas are located within the Donna-Brownsville Levee System.

Urban Areas. Urban development in the vicinity of the Donna-Brownsville Levee System is limited to Hidalgo and Brownsville and unincorporated towns located on the levee landside. The Proposed Action would not affect urban development in these areas.

4.5 COMMUNITY RESOURCES

4.5.1 Socioeconomics

No Action Alternative

No impacts to community resources are anticipated, as the current levee configuration would be retained.

Proposed Action

The analyses of impacts of the footprint expansion on socioeconomic resources and environmental justice were based on changes in employment, income, and business volume as indicator criteria, as well as the disproportionate number of minority or low-income populations potentially affected by the proposed levee improvements.

The direct influx of federal funds would be $7,750,000 on the basis of construction costs, assuming half of the levee system expansion project would be constructed in Hidalgo County. This influx of funds would have a small but positive local economic impact, representing an increase of $26,264,851 in direct and indirect sales. Job creation is estimated at 241 in direct and indirect employment. The positive impact would be limited to the duration of the construction period. Table 4.6 illustrates the magnitude of the economic influx relative to reference values for Hidalgo County.

The direct influx of federal funds would be $7,750,000 on the basis of construction costs, assuming half of the levee expansion project would be constructed in Cameron County. This influx of funds would have a small but positive local economic impact, representing an increase of $26,264,851 in direct and indirect sales. Job creation is estimated at 241 in direct and indirect employment. The positive impact would be limited to the duration of the construction period. Table 4.7 illustrates the magnitude of the economic influx relative to reference values for Cameron County.

Table 4.6 Potential Economic Impacts of Improvements to the Donna-Brownsville Levee System for Hidalgo County

Evaluation Criteria	Unit Value for Rio Grande Levees [a]	Raising of Donna-Brownsville Levee	Annual Value for Hidalgo County	Increase Relative to County
Local Expenditures	$1,000,000	$7,750,000	Not applicable	
Direct Employment	10	148		
Indirect Employment	6	93		
Total Employment	16	241	242,525 [b]	0.01%
Direct Sales Volume	$1,274,065	$9,874,004		
Indirect Sales Volume	$2,114,948	$16,390,847		
Total Sales Volume	$3,389,013	$26,264,851	$ 10,375 million [c]	0.25%
Direct Income	$554,814	$4,299,809		
Indirect Income	$452,466	$3,506,612		
Total Income	$1,007,280	$7,806,421	$6,652 million [d]	0.12%

a Unit data for levee construction from the USIBWC Rio Grande Canalization Project (Parsons 2004).
b Total of the labor force (16 years and older) employed in 2005 (Texas Workforce Commission 2007).
c Estimated Gross sales for Hidalgo County in 2005 (Texas Comptroller 2005).
d Based on a 2000 per capita income of $9,899 and an Hidalgo County population of 671,967.

Table 4.7 Potential Economic Impacts of Improvements to the Donna-Brownsville Levee System for Cameron County

Evaluation Criteria	Unit Value for Rio Grande Levees [a]	Raising of Donna-Brownsville Levee	Annual Value for Cameron County	Increase Relative to County
Local Expenditures	$1,000,000	$7,750,000	Not applicable	
Direct Employment	10	148		
Indirect Employment	6	93		
Total Employment	16	241	130,864 [b]	0.18%
Direct Sales Volume	$1,274,065	$9,874,004		
Indirect Sales Volume	$2,114,948	$16,390,847		
Total Sales Volume	$3,389,013	$26,264,851	$ 5,064 million [c]	0.52%
Direct Income	$554,814	$4,299,809		
Indirect Income	$452,466	$3,506,612		
Total Income	$1,007,280	$7,806,421	$4,154 million [d]	0.19%

a Unit data for levee construction from the USIBWC Rio Grande Canalization Project (Parsons 2004).
b Total of the labor force (16 years and older) employed in 2005 (Texas Workforce Commission 2007).
c Estimated Gross sales for Cameron County in 2005 (Texas Comptroller 2005).
d Based on a 2000 per capita income of $10,980 and an Cameron County population of 378,311.

4.5.2 Environmental Justice

No Action Alternative

Under the No Action Alternative, current condition of minority and low-income populations would remain unchanged, as improvements to the levee system would not occur.

Proposed Action

Data indicate that Hidalgo and Cameron Counties have disproportionately high minority (approximately 89 and 86 percent, respectively) and low-income populations (families–29 and 28 percent, respectively); however, construction activities would not occur in residential or workplace areas associated with these populations. A small but positive economic input to the local community would occur as a result of the levee improvements. As a result, no adverse impacts to disproportionately high minority and low-income populations are expected from construction of the Donna-Brownsville Levee improvements.

4.5.3 Transportation

No Action Alternative

No impacts are anticipated, as the current levee system configuration would be retained.

Proposed Action

Proposed improvements to the Donna-Brownsville Levee would have moderate impacts on local transportation. Heavy construction equipment (dump trucks, front-end loaders, graders) in the upper reach would likely be driven to the construction site from local areas near McAllen using state highways (SH) 83 and 281. Along lower reaches of the Rio Grande, access to construction areas would be from the City of Brownsville using SH 77.

During levee construction, a temporary increase in use of the access road would take place during placement of equipment in the staging areas. Subsequent construction activities would also temporarily increase local transportation, as fill material would be imported from sources outside the levee system. Most of these construction activities, however, would not require public road use as, material borrow sites would be located in the vicinity of the construction sites. All construction activities would occur within the existing ROW. Transportation of construction equipment and the use of personnel vehicles would mainly occur within the levee ROW and along the levee road system within the floodway. New easements would have to be obtained by USIBWC if levee footprints are increased from existing conditions. Following completion of the levee improvement project, the levee road would continue providing service for USFWS and Border Patrol activities, and limited public access.

4.6 ENVIRONMENTAL HEALTH

4.6.1 Air Quality

No Action Alternative

No impacts are anticipated, as the current configuration of the levee system would be retained.

Proposed Action

Improvements to the Donna-Brownsville Levee System would impact air quality through excavation and fill activities. Potential impacts would be a slight increase in criteria air pollutants within Cameron and Hidalgo Counties. Table 4.8 summarizes the additional estimated criteria pollutants associated with the Proposed Action, as well as the percent increase above the existing Cameron and Hidalgo Counties emissions inventory. Estimates were calculated for 65 miles of levee construction for the levee height increase. Unit air emissions estimates for these activities followed common construction practices and methods (Means 2005) and emission factors reported by USEPA (1996) as applied to a similar levee expansion project in an upper reach of the Rio Grande (Parsons 2003).

The USEPA designated air quality within all counties of AQCR 213 to be under attainment status for all criteria pollutants (USEPA 2007a). Impacts to air quality in attainment areas would be considered significant if pollutant emissions associated with the Proposed Action caused or contributed to the exceedance of any national, state, or local ambient air quality standard; or represented an increase of 10 percent or more in the affected counties emissions inventory. Estimated emissions for all five criteria pollutants ranges from 0.06 percent to 1.64 percent of the Cameron and Hidalgo Counties annual emissions inventory.

Table 4.8 Air Emissions for Improvements to the Donna-Brownsville Levee System

Parameter	Emissions (tons per year)				
	Sulfur Oxides	Nitrogen Dioxides	Carbon Monoxide	Volatile Organic Compounds	Particulate Matter (PM_{10})
Unit emissions per mile of levee height increase*	0.55	5.05	2.11	0.4	5.61
Cameron and Hidalgo Counties emissions inventory**	2,187	31,566	234,494	44,333	97,863
Donna-Brownsville Levee System *(65 miles)*					
Estimated emissions (tons/year)	35.8	328.3	137.2	26.0	364.7
Donna - Brownsville Levee System Emissions as a Percent of Hidalgo and Cameron Counties Emissions	1.64%	1.04%	0.06%	0.06%	0.37%

** Unit data for construction from the USIBWC Rio Grande Canalization Project EIS (Parsons 2003).*

*** USEPA 2007b, the most recent available data as of March 2007.*

Criteria pollutant increases in Cameron and Hidalgo Counties by levee construction under the Proposed Action would not be considered regionally significant. Fugitive dust emissions and combustion emissions from construction equipment would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in long-term impacts.

4.6.2 Noise

No Action Alternative

No impacts from noise are anticipated, as the current levee configuration would be retained.

Proposed Action

Improvements to the Donna-Brownsville Levee System would increase ambient noise levels through the use of trucks to bring additional fill material to the site and fill activities associated with the levee improvement project. For the purposes of this EA, it is estimated that the shortest distance between an equipment noise source and a receptor in a rural area would be a person(s) 100 feet off-site. Given the rural nature of the area, it is also unlikely a person other than a worker would be within 100 feet of the site boundary during activities. However, if a person were within this distance, the person could be exposed to noise as high as 74 to 83 dBA.

It is anticipated that construction activities would occur between 7:30 a.m. and 5:00 p.m., 5 days per week for the duration of the project. However, individuals would not be exposed during entire noise-producing period. Under these conditions, persons would not be exposed to long-term and regular noise above 75 BA. As stated in Subsection 3.6.2, DNL 75 dBA during the noise event indicates a good probability for frequent speech disruption, producing ratings of "barely acceptable" for intelligibility of spoken material. Therefore, nearby persons should not experience loss of hearing, but may experience frequent speech disruption.

4.6.3 Hazardous and Toxic Waste

No Action Alternative

No impacts from waste storage and disposal sites are anticipated, as the current levee configuration would be retained.

Proposed Action

Waste storage and disposal sites identified in Subsection 3.6.3 that were within the proposed Donna-Brownsville Levee project area would not affect, or be affected by, the levee construction project.

4.7 INDIRECT AND CUMULATIVE EFFECTS

Following completion of the proposed levee improvement project, the levee road would continue providing service for agencies, farmers and adjacent landowners.

SECTION 5
BEST MANAGEMENT PRACTICES AND MITIGATION ACTIONS

Section 5 describes best management practices (BMP) and mitigation measures addressing potential impacts of the Proposed Action for improved flood control of the Donna-Brownsville Levee System. Best management practices represent specific actions for minimizing impacts to natural and cultural resources. Mitigation measures compensate for potential adverse effects of the Proposed Action that cannot be prevented through BMPs. These BMPs and mitigation measures are organized within the engineering, natural resources, and cultural resources categories.

5.1 ENGINEERING MEASURES

5.1.1 Best Management Practices

The following BMPs would be utilized:

- A storm water pollution prevention plan (SWP3) would be developed during project design to minimize impacts to receiving water, as specified by USEPA regulations for construction projects. The SWP3 would include construction areas along the levee system, as well as equipment staging areas. To prevent sedimentation, sediment fences and/or sediment barriers around wetlands would be installed while construction occurs in affected areas.
- During the project construction, methods such as wetting the soil would be employed to prevent erosion from unvegetated slopes and/or corridors.
- During the project construction, existing access points to the levee road will remain in service; because no modifications will be made to the levee 3:1 slope ratio, lateral access to the levee road will continue as currently available.
- After construction is complete, the expanded levee would be re-vegetated with herbaceous vegetation.

5.1.2 Engineering Design Measures

Levee expansion alignment would be optimized to avoid impacts to wooded vegetation, wetlands, and other natural resources. Landside expansion alignment would be used over more than half of the Donna-Brownsville Levee System, avoiding potential impacts to various natural resources management areas in upstream reaches of the Donna-Brownsville Levee (Project Miles 0 to 5.3).

5.2 NATURAL RESOURCES

5.2.1 Best Management Practices

To protect vegetation, the following BMPs would be utilized:

- ROW easement utilization along tracts of the LRGV National Wildlife Refuge will be coordinated with the USFWS.
- After construction is complete, it is likely that in most areas the construction service area, typically 20 feet wide, would be abandoned. The construction service area may be re-vegetated with herbaceous or woody vegetation at the discretion of the potentially affected natural resources management agency.
- If required, a survey prior to the start of the project will determine the types (herbaceous or woody) and amounts of vegetation to be removed. Herbaceous vegetation is expected to rapidly reestablish upon project completion. Woody vegetation may be re-vegetated elsewhere on the site (see mitigation actions below), depending on quantity and quality of vegetation removed.

To protect wildlife, the following BMPs would be utilized:

- Construction activities along natural resources management areas would be scheduled to occur outside the March through August migratory bird nesting season alternatively, wildlife habitat areas proposed for disturbance will be surveyed first for nesting birds to avoid disruption or inadvertent destruction of nests.
- The topographic survey to be conducted for engineering design of levee improvements will define the extent of wooded habitats that would be removed. If thorn woodland is removed, then re-vegetation may occur in adjacent or other locations, at the discretion of the natural resources management agencies (see mitigation below).

5.2.2 Mitigation Measures

If natural resources cannot be fully protected from adverse impacts through BMPs, then mitigation measures would be adopted. Mitigation is the action that would compensate for unavoidable losses of sensitive vegetation, wetlands, or wildlife during project construction.

Natural resources mitigation may include at least the following:

- Revegetation would be used as mitigation for unavoidable impacts to vegetation. Revegetation would be performed with native species that occur in habitats that would be impacted, or with native plants indigenous to Cameron and Hidalgo Counties.
- If thorn woodland is removed during construction, woody plant revegetation would occur in areas where such revegetation will provide the most benefit. That is, replanting may take place elsewhere on the property where previous disturbance occurred, or in areas where woody vegetation is desired for continuity of habitat. A 2:1 replacement ratio is recommended by the TPWD for high quality woodlands, and a 1:1 ratio for herbaceous vegetation. Target plant density revegetation would be at the discretion of the natural resources management organization where the removal occurred.

5.3 CULTURAL RESOURCES

5.3.1 Best Management Practices

Following implementation of mitigation measures, as described below, there remains the possibility that an accidental discovery of archaeological resources may be encountered during construction. If buried cultural materials are encountered during construction, the contractor would cease work in the immediate area and notify the State Historic Preservation Officer.

5.3.2 Mitigation Measures

Because potential impacts to archaeological sites and historical structures were identified in the EA, a Phase I archeological survey and an Historic resources reconnaissance survey with National Register recommendations will be conducted during the engineering design phase. The extent of those investigations will be coordinated through the official Section 106 review process as agreed in a Memorandum of Agreement with the Archeology and Architecture Divisions of the Texas Historical Commission (THC).

Any mitigation actions recommended by the THC for potential impacts to historical or archaeological resources will be specified in a Memorandum of Agreement between THC and the USIBWC.

SECTION 6
ENVIRONMENTAL COMPLIANCE AND COORDINATION

6.1 COOPERATING AGENCY

In response to a December 22, 2006 request by the USIBWC, the Texas Ecological Services Office of the USFWS, LRGV Suboffice, agreed to serve as cooperating agency for preparation of the Donna-Brownsville Levee System EA (January 10, 2007 letter from Mr. Ken Merritt to Mr. Gilbert Anaya).

6.2 CONSULTATION

Consultation on biological, cultural, and water resources, and land issues was conducted with representatives of agencies and organizations listed below. The Draft EA was distributed for a 30-day review period, from June 29 to July 31, 2007. Review comments received from the U.S. Fish and Wildlife Service, Natural Resources Conservation Service, Texas Commission on Environmental Quality, and Texas Historical Commission, addressed in the Final EA, are provided in Appendix D.

Biological Resources

Ken Merritt
Lower Rio Grande Valley National Wildlife Refuge
U.S. Fish and Wildlife Service

Ernesto Reyes
Ecological Services
U.S. Fish and Wildlife Service

Russell Hooten, Habitat Assessment Biologist
Texas Parks and Wildlife Department
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Cultural Resources

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Water Resources

Lloyd Mullins, Unit Leader
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Lori Hamilton

Land Use

James Greenwade, Soil Scientist
Natural Resources Conservation Service
Soil Survey Section USDA-NRCS

Cruz J. Rodriguez
Assistant Chief Patrol Agent, McAllen Sector
U.S. Customs and Border Protection

Irrigation Districts

- Progreso Irrigation District
- Adams Garden Irrigation District
- Brownsville Irrigation District
- Cameron County Irrigation District #16
- Harlingen Irrigation District
- La Feria Irrigation District
- Los Fresnos Irrigation District
- San Benito Irrigation District
- Santa Maria Irrigation District

Texas Commission on Environmental Quality
Water Quality Division

6.3 LIST OF CONTRIBUTORS

Tables 6.1 and 6.2 list contributors to the preparation of this EA for improvements to the Donna-Brownsville Levee System, and development of technical support studies.

Table 6.1 Preparers of the Environmental Assessment and Technical Studies

Name	Organization	Degree	Years Experience	Project Role
R. C. Wooten	Parsons	Ph.D. Biology/Ecology	34	Technical director; NEPA compliance
Carlos Victoria-Rueda.	Parsons	Ph.D., Environmental Engineering	22	Project manager; water and soil analyses
James Hinson	Parsons	M.S. Wildlife Science	20	Vegetation and wildlife analyses; field studies supervision
Anthony Davis	Parsons	B.S. Civil Engineering	30	Air quality, noise, environmental health
Taylor Houston	Parsons	M.S, Geography-Environmental Resources	6	Wetlands and land use
Jill Noel	Parsons	M.S. Botany	8	Vegetation and community resources
Sherrie Keenan	Parsons	B.A., Journalism	28	Technical editor
Scott Sundermeyer	LopezGarcia Group	M.S, Archaeology	16	Cultural resources evaluation

Table 6.2 Technical Review of the Environmental Assessment

Name	Agency	Degree	Years Experience	Project Role
Daniel Borunda	USIBWC Environmental Protection	M.S. Fisheries and Wildlife Science	10	Project manager; NEPA compliance; document review
Raymundo Aguirre	USIBWC Engineering Division	Ph.D. Civil Engineering	49	Engineering, hydraulics and hydrology; document review
Gilbert Anaya	USIBWC Environmental Protection	M.S. Environmental Science	17	NEPA compliance; document review
Enrique Reyes	USIBWC O&M Division	B.S., P.E., Civil Engineering	32	LRGFCP Project Manager; document review
Ernesto Reyes, Jr.	USFWS Ecological Services	M.S. Biology	20	Cooperating Agency review

SECTION 7
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