

ANNEX A
404(b)(1) EVALUATION

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SECTION 404 (b)(1) EVALUATION REPORT

CENTRAL AND SOUTHERN FLORIDA STUDY MODIFIED WATERS DELIVERY TO THE EVERGLADES NATIONAL PARK

PROPOSED IMPROVEMENTS TO THE TAMIAAMI TRAIL DADE COUNTY, FLORIDA

1.0 PROJECT DESCRIPTION

1.1 LOCATION

The proposed work will be performed in the western-central portion of Miami-Dade County, Florida (*Figure 1*). The potentially impacted local areas are located on the south side of U.S. Highway 41, which is commonly called the Tamiami (Tampa to Miami) Trail. The Tamiami Trail, the L-29 Canal, and particularly the L-29 levee on the north side of the canal, form the southern boundary of the South Florida Water Management District's (SFWMD) Water Conservation Area 3B (WCA-3B). The south side of the Tamiami Trail is bounded by the Everglades National Park (ENP).

The limits of the proposed project begin slightly more than one mile west of the intersection of Krome Avenue and Tamiami Trail and extend approximately 10.7 miles to the west. The L-29 Canal, also known as the Tamiami Canal, runs along the north side of the Tamiami Trail through this area. The project limits are more definitively marked at each end by two water-control structures across the canal, S-334 on the east and S-333 on the west.

1.2 DESCRIPTION

1.2.1 Existing Conditions

Under the current authorized and approved Modified Waters Delivery (MWD) Plan, water would be transferred from WCA-3A to WCA-3B by constructing three new water control structures at Levee L-67A and three new water control structures at L-67C. Water would be passed from WCA-3B through S-355A and S-355B to the L-29 Canal and through the existing culvert system under the Tamiami Trail into Northeast Shark River Slough (NESS) of ENP. When the General Design Memorandum (GDM) was completed in 1992, it was believed that existing culverts under the roadway would be adequate to convey the flow of water. However, Subsequent hydrological analyses revealed that the head height in the L-29 Canal required for the culverts to convey the increased water could adversely affect the structure of Tamiami Trail and overtop the highway under certain conditions.

A final general Re-evaluation Report and Second Supplemental Environmental Impact Assessment (RGRR/SEIS) was prepared to analyze alternatives for re-designing Tamiami Trail so that increased MWD water flows could be conveyed south into the park without encroaching upon the sub-grade or overtopping the road. The RGRR/SEIS recommended a raised road profile with three miles of bridges. An ROD selecting this alternative was signed on January 25, 2006.

Under the conference language of the Water Resources Development Act of 2007, the intent of Congressional managers directs the Chief of Engineers to implement measures to improve water deliveries and adopt an adaptive management approach toward restoring flows to ENP. To achieve this improvement, the Chief of Engineers was directed to re-examine prior reports and to evaluate practicable alternatives for increasing the flow of water under the highway and into the Park. The Limited Reevaluation Report (LRR) documents previous and recent studies conducted and steps taken to restore the natural hydrologic conditions of Northeast Shark River Slough (NESS) to the extent practicable to improve water deliveries to the ENP. It provides a summary of the following information:

1. Updated cost estimates of previous plans proposed in the 2005 RGRR/SEIS for an improved water delivery system for ENP, including incorporation of cost saving measures and value engineering proposals.
2. Limited reevaluation of alternatives, including incremental cost analysis, for all proposed structural alternatives.
3. Potential environmental benefits to be obtained as a result of hydrologic changes produced by the different alternatives.

The LRR includes a general description of all viable alternatives, cost estimates, and environmental benefits analysis. Recommendations were developed considering environmental benefits produced, cost, related CERP flow needs and other relevant factors.

1.2.2 Tentatively Selected Plan

The tentatively selected plan (TSP) would include construction to enable greater flows of water from WCA-3B through the L-29 Canal, under the Tamiami Trail, and into ENP. The increased flows would be necessary to complete the MWD plan and allow the Comprehensive Everglades Restoration Plan (CERP) to proceed.

The tentatively selected plan includes construction of a one-mile-long bridge in the eastern portion of the project area. This would create a hydraulic conveyance opening through Tamiami Trail by removing one mile of the existing highway, embankment, and associated culverts. A bridge would be constructed over the opening to replace the removed section of highway. The bridge would

start approximately one mile west of S-334 and proceed west approximately one mile, ending approximately 3,000 ft east of Radio One.

The bridge span would result in the removal of the S-16 and S-17 culvert sets (six culverts). Construction of the bridge and bridge approaches would reduce the number of culverts sets from 19 (55 individual culverts) to 17 (49 individual culverts).

The crown elevation of the unbridged portions of the roadway would be raised to approximately 11.55 ft NGVD by adding asphalt to areas of the highway that fall below that elevation.

The TSP also includes a 50-foot-wide construction easement along the southern side of the bridge. Vegetation would be removed from the easement to facilitate mobility and operation of cranes and other heavy equipment required to construct the bridge.

1.2.3 Affected Wetlands

To determine the number of acres and types of vegetated wetlands affected by the project, Geographic Information Systems (GIS) technology was used by ENP to compare the construction footprint of the TSP to a land use database. **Table A2-1** shows the land uses and number of acres impacted by each of the alternatives.

The additional conveyance and water distribution associated with this project would enable the restoration of many thousands of acres of wetlands of NESRS within ENP, thereby offsetting wetland losses. Wetland habitats would be improved through the partial restoration of deep sloughs in NESRS and the promotion of sheetflow downstream of the bridges and culverts. Wetland area would be reestablished upstream of the bridge where the highway embankment would be removed.

Table A2-1. Land Use Impacts

| Land Use | Permanent Construction Easement | Temporary Construction Easement |
|-----------------------------------|--|--|
| Graminoid Wetlands | 0.61 | 3.57 |
| Forested Wetlands | 1.38 | 2.72 |
| Mixed Forest & Graminoid Wetlands | -- | 0.31 |
| Uplands | 6.67 | -- |
| Upland Forest | -- | 0.13 |
| Open Water | 0.3 | -- |
| Total Acres | 8.96 | 6.73 |
| Total Wetland Acres | 2.29 | 6.60 |

Implementing the TSP would result in both permanent and temporary losses in vegetated wetlands. The proposed bridge would be located 40 feet south of the existing highway alignment. Access to the bridge would require constructing transitions from the existing highway alignment to intersect the bridge. A permanent loss of wetlands would occur from constructing the transitions. Wetlands under the bridge would be permanently lost by conversion to open water. The area would be cleared of soil and vegetation to promote the flow of water. Shading by the bridge would prevent the reestablishment of wetlands. A total of 2.29 acres of wetlands would be lost (**Table A2-1**).

A 50-foot-wide construction easement needed for the operation of cranes and other heavy equipment to construct the bridge would create a temporary loss of wetland function. Vegetation within this area would be removed to facilitate access by equipment. After bridge construction has been completed, the sites would be returned to wetlands. Approximately 6.6 acres of wetlands would be temporarily impacted (**Table A2-1**).

The existing highway embankment would be removed from the flow-way created by the bridge. The area would be cleared of soil and returned to the elevation of the surrounding wetlands. It is expected that approximately 8.5 acres of wetlands would be restored by this action.

The TSP is would result in the long-term improvement in the quality of over 63,000 acres of wetlands in ENP.

1.2.4 Summary of Mitigation Features Incorporated into the Proposed Project

A “mitigation feature” is a management procedure, activity, or technique to reduce the severity of environmental impacts and/or offset impacts associated with a project.

In the development of the TSP, features that were incorporated to avoid, minimize, and compensate for potential adverse environmental effects include the removal of embankment where the bridge would be constructed. This allows for the restoration of wetland habitat in that section of the roadway to be degraded. Additionally, the removal of embankment would facilitate the restoration of sheet flow from the L-29 Canal southward into ENP. Therefore, the TSP offers far greater benefits to wetland habitat than it will adversely impact.

The TSP is part of a larger effort intended to improve the ecological quality of many thousands of wetland acres through the hydrologic restoration of ENP, to the extent practicable. Therefore, the TSP can be considered self-mitigating. The loss of wetland habitat associated with project construction would be fully compensated by the benefits.

Best Management Practices (BMPs) would be employed during construction activities in order to minimize erosion and control sediment transport off-site, including the retaining of grassed side-slopes along the sides of the highway and the incorporating of a stormwater collection and treatment system with the bridge. Final BMPs for controlling turbidity will be fully coordinated with DOI and FDEP prior to implementation.

Two wood stork (*Mycteria americana*) rookeries and snail kite management areas (**Figure A2-1**) exist near the project area, and restrictions would be in place during construction to minimize impacts.

1.3 AUTHORITY AND PURPOSE

The Everglades National Park Protection and Expansion Act (Public Law [PL] 101-229, Section 104, 16 U.S.C. Part 410r-5 *et seq.*), December 1989, authorized the Secretary of the Army to undertake certain actions to improve water deliveries to the ENP and to take steps to restore natural hydrologic conditions. This Act provides the underlying authority for this project. Section 104 of the Act stated:

The Everglades National Park is a nationally and internationally significant resource and the park has been adversely affected and continues to be adversely affected by external factors which have altered the ecosystem including the natural hydrologic conditions within the park. Wildlife resources and their associated habitats have been adversely impacted by the alteration of natural hydrologic conditions within the park, which has contributed to an overall decline in fishery resources and a 90 percent population loss of wading birds.

The Act also provided direction for the U.S. Army Corps of Engineers (USACE) to initiate corrective actions to alleviate deterioration in natural resources of ENP attributed to changes in water conditions associated with construction of the Central and Southern Florida (C&SF) water management system. The Act stated:

Upon completion of a final report by the Chief of the Army Corps of Engineers, the Secretary of the Army, in consultation with the Secretary, is authorized and directed to construct modifications to the Central and Southern Florida Project to improve water deliveries into the park and shall, to the extent practicable, take steps to restore the natural hydrological conditions within the park.

Such modifications shall be based upon the findings of the Secretary's experimental program authorized in Section 1302 of the 1984 Supplemental Appropriations Act (97 Stat. 1292) and generally as set forth in a General Design Memorandum to be prepared by the Jacksonville District entitled Modified Water Deliveries to Everglades National Park. The Draft of such Memorandum and the Final Memorandum, as prepared by the Jacksonville District, shall be submitted as promptly as practicable to the Committee on Energy and Natural Resources and the Committee on Environment and Public Works of the United States Senate and the Committee on Natural Resources and the Committee on Public Works and Transportation of the United States House of Representatives

The GDM called for in the Act was completed in June 1992. This GDM and its associated Environmental Impact Statement (EIS) for Modified Water Deliveries (MWD) to ENP is the authorizing document for structural modifications and additions to the existing C&SF Project required for the modification of water deliveries for ecosystem restoration in the ENP. The 1992 GDM stated,

The future without project condition will lead to the further deterioration of unique and outstanding ecological resources of the Everglades that are recognized and valued throughout the world. Therefore, based on the direction provided in the Everglades National Park Protection and

Expansion Act of 1989, the goal is to restore natural hydrologic conditions in the Park to the extent practicable. Meeting this goal will lead to improvements in the abundance, diversity and ecological integrity of native plants and animals in the Park.

Section 528 of the Water Resources Development Act enacted October 1996 (Public Law [PL] 102-580) was entitled “Everglades and South Florida Ecosystem Restoration.” This authorized a number of ecosystem restoration studies, now collectively known as the Comprehensive Everglades Restoration Plan (CERP). As a result of this Act, the USACE submitted a report to Congress on July 1, 1999, containing a comprehensive blueprint for Everglades restoration. Implementation of CERP will further increase the flow of water entering NESRS. The plan has subsequently been approved as the Water Resources and Development Act of 2000.

1.4 GENERAL DESCRIPTION OF DREDGED AND FILL MATERIAL

1.4.1 General Characteristics

Where the transition to the new bridge would be constructed, the existing embankment and muck would be removed to bedrock, and a new soil embankment would be built. Fill material will be consistent with the requirements of FDOT Design Standard Index 505, which places restrictions on the characteristics of soils that may be used for highway embankments based on their plasticity and organic content. Consistency with FDOT standards would provide stability to the highway embankment. Testing will be performed as necessary to ensure that fill material meets the FDOT requirements. The embankment would also include a four-inch drainage layer of sieve material composed of crushed limestone. Concrete pilings placed in bedrock would provide support for the bridge.

1.4.2 Quantity of Material

Approximately 29,000 cubic yards of fill material would be used for the project.

1.5 DESCRIPTION OF PROPOSED DISCHARGE SITES

1.5.1 Location and Size

Because the bridge is offset to the south of the existing highway alignment by approximately 40 feet, approaches to the bridge must transition from the existing highway. Construction of Bridge approaches would require an area of up to 80 feet south of the existing highway over a distance of approximately 1700 feet.

1.5.2 Type of Site/Habitat

The type of habitat adjacent to the existing Tamiami Trail includes long and short hydroperiod wetlands as well as an abundance of interspersed willowheads, bayheads, and hardwood hammocks. Sawgrass (*Cladium jamaicense*) communities dominate the long hydroperiod wetlands while muhly grass (*Muhlenbergia capillaris*) and black sedge (*Schoenus nigricans*) dominate the short period wetlands mostly influenced by NESS and local rainfall.

Four herbaceous wetland cover types are present in the Everglades: (1) sloughs with deep, permanent water levels, (2) sawgrass marshes with semi-permanent water levels and long hydroperiods, (3) wet peat prairies, and (4) wet marl prairies with shorter hydroperiods. The wetland cover types are differentiated by the average flooding depth and duration and by their predominant plant cover.

The dominant species of vegetation along the south side of Tamiami Trail is the invasive exotic species, the Brazilian pepper (*Schinus terebenthifolius*). The Brazilian pepper forms a corridor of 10-30 feet wide.

1.5.3 Timing and Duration of Discharge

Construction of the project is anticipated to begin in late 2008 and is expected to require 36 months to complete.

The FWS, using the Habitat Management Guidelines for the Wood Stork in the Southeast Region (Guidelines) (Ogden 1990) based on recent photography during nesting season, identified primary and secondary restriction zones. The primary zone is the most critical area and must be managed according to the guidelines to insure the colony survives. For the West Colony, a core area that contains nesting habitat has been designated by FWS to have a radius of 385 feet from the center of the colony. The primary zone for the West Colony extends an additional 1,300 feet in all directions from the core area for a radius of 1,585 feet. The FWS has designated the primary zone for the East Colony as a 1,300-foot radius from the colony center. The pond apple forest creates a visual barrier between the rookery and Tamiami Trail. The storks appear to have become somewhat acclimated to highway traffic noise.

The secondary zone may be used by wood storks for collecting nesting material and for roosting, loafing, and feeding (especially important for newly fledged young). The secondary zone of the West Colony extends an additional 1,000 feet beyond the primary zone for a total radius of 2,885 feet from the center of the colony. For the Tamiami East Colony, the secondary zone extends 1,200 feet beyond the primary zone for a total radius of 2,500 feet.

Approximately 3,700 linear feet of the Tamiami Trail are located within the primary zone of the Tamiami West Colony; none lies within the primary zone of the East Colony. In addition, approximately 5,000 linear feet of the highway lies within the secondary zones of the colonies.

FWS guidelines restrict such activities as "the construction of any building, roadway, tower, power line, canal, etc.", within the Primary Zone when active wood stork nesting is occurring. Therefore, between February (or the onset of nesting activity) and through the onset of the rainy season (or when the young have fledged, highway construction should not be permitted in the reach of the highway affected. In addition, any activity that reduces the area, depth, or length of flooding in wetlands under and surrounding the colony should also be restricted during the nesting season. For the Secondary Zone (1,885 to 2,885 feet from the colony), it is **recommended** that no unauthorized human activity (on foot, airboat, or off-road vehicle [ORV]) occur at any time of the year within the reach of highway affected by that alternative on the south side of the highway and particularly during the nesting season.

While these are published guidelines, final decisions on restrictions to protect wood storks will occur after completion of ongoing consultations with FWS.

Because wading bird and snail kite nesting patterns, as well as Everglades mink territories, may vary with the prevailing hydrological conditions, surveys will be performed by a qualified biologist to determine whether any nesting efforts of state and federal protected species would potentially be affected prior to the commencement of construction activities.

1.6 DESCRIPTION OF DISPOSAL METHODS

The TSP involves the placement of fill on the south side of the Tamiami Trail. The encroachment into ENP on the south side of the roadway extends up to 80 feet where transitions from the roadway to the bridge will be constructed.

The TSP also involves the removal of approximately one mile of existing highway and embankment where traffic would be served by the bridge. The fill material would be disposed approximately 10 miles south of the project area in the C-111 Basin (Rocky Glades), which is owned by SFWMD. The material would be stockpiled south of the 8.5 Square Mile Area (8.5 SMA) and west of the Flow Way (**Figure A2-1**). Selected quantities of soils and organic peat may be evaluated for placement in the nearby Broward Water Preserve Area. Excavated fill may also be evaluated for backfill for the L-67 Extension project, where up to 50,000 cubic yards of material could be needed.



2.0 FACTUAL DETERMINATIONS

2.1 PHYSICAL SUBSTRATE DETERMINATIONS

2.1.1 Substrate Elevation and Slope

The elevation ranges from 9.8 feet, National Geodetic Vertical Datum (NGVD) 1929 to 10.1 feet NGVD, with very little slope.

2.1.2 Sediment Type

Sediment is nearly level and poorly drained, consisting of organic material eight to more than 51 inches deep. The black to dark brown muck is underlain by soft, porous limestone.

2.1.3 Dredged and Fill Material Movement

No movement of the fill material is expected.

Where the transition to the new bridge would be constructed, the existing embankment and muck would be removed to bedrock, and a new embankment of would be built. Fill material will be consistent with the requirements of FDOT Design Standard Index 505, which places restrictions on the use of plastic and organic soils used for highway embankments. Soils that fail to meet the standards may have a tendency to move or shift under a traffic load. Testing will be performed as necessary to ensure that fill material meets the FDOT requirements.

2.1.4 Physical Effects on Substrate

On the transitions to the bridge, the existing substrate would be removed to bedrock and replaced by soil capable of providing an embankment that would support a major highway.

The TSP would affect substrates outside the construction footprint. Through project implementation, the distribution of flows would occur more evenly through the conveyance channel created by the bridge and through the remaining culverts under the improved roadway. The improvement of water deliveries would contribute to the restoration in ENP of a substrate more suitable for vegetative communities by enabling a shift to open water, spikerush marsh, and slough communities, and by reducing the risk of ridge and tree island peat burning.

2.1.5 Other Effects

No change in the general type of substrate is expected in WCA-3B to the north of the project. The quality of the substrate in ENP to the south will be improved through project implementation.

2.1.6 Actions Taken to Minimize Impacts

The TSP incorporates actions to avoid and minimize impacts to aquatic communities. See Section 1.3.2, *Summary of Mitigation Features Incorporated into the Tentatively Selected Plan*.

2.2 WATER CIRCULATION, FLUCTUATION, AND SALINITY DETERMINATION

2.2.1 Water Quality

Existing water quality in the Everglades is greatly influenced by both urban and agricultural development-related activities of south Florida. The primary constituents of concern in ENP include nutrients, dissolved oxygen (DO), mercury, biochemical oxygen demand (BOD), and coliforms. In WCA-3B the constituents of concern are total phosphorus, DO, conductivity, mercury, and nitrite/nitrate nitrogen. Canals bordering the WCAs generally have very low DO levels typical of marsh waters.

Highway runoff potentially introduces contaminants such as metals, fuels, lubricants, combustion products, and toxic chemicals. Based on the low traffic volume along Tamiami Trail (5,200 vehicles per day), it can be inferred that the introduction of pollutants due to highway runoff is minimal. The bridge will be constructed with a pollution abatement system that will collect and treat stormwater runoff from the bridge.

2.2.1.1 Salinity

Not applicable.

2.2.1.2 Water Chemistry

The potential increase in sediment transport during construction would be minimized through the implementation of BMPs. Nutrient levels in the project area may increase slightly from sediment disturbing activities. No significant long-term increases in these conditions are expected as a result of the project.

The long-term water quality in ENP would not be affected by the proposed project.

2.2.1.3 Clarity

Turbidity may increase during construction, but would revert to pre-construction conditions once implementation of the project is complete.

2.2.1.4 Color

No expected change.

2.2.1.5 Odor

The soils in the project area contain thick layers of organic material from eight to 51 inches thick. The exposure of the muck may release odors; however, these fumes are not noxious.

2.2.1.6 Taste

Not applicable.

2.2.1.7 Dissolved Gas Levels

The release of organic materials from sediments may slightly increase BOD, and the release of reduced materials may slightly increase chemical oxygen demand (COD), both of which would have the effect of lowering dissolved oxygen concentrations in the ecosystem. These impacts would be temporary, limited only to the time of construction and soil-disturbing activities.

2.2.1.8 Nutrients

Nutrient levels in the project area may increase slightly from sediment disturbing activities. This impact would be temporary, during construction activities only. No long-term change in nutrient concentrations would occur from implementation of the project.

2.2.1.9 Eutrophication

Not applicable.

2.2.2 Current Patterns and Circulation

2.2.2.1 Current Patterns and Flow

Implementation of the TSP would have beneficial effects on the current pattern and flow of waters in the project area. Modifications to Tamiami Trail will provide the capacity for a design stage of 8.5 feet in the L-29 Canal. The

distribution of flows would occur through a one-mile-wide conveyance channel and the remaining existing culverts.

2.2.2.2 Velocity

The existing culvert system concentrates flows from L-29 Canal under Tamiami Trail through localized points. Flow velocity has been a concern.

The TSP would reduce high flow velocity discharges beyond that of the No-Action Alternative. Rather than concentrating flows under Tamiami Trail at the existing 55 culverts, flows would be more evenly distributed through the conveyance channel. Additionally, the TSP would minimize the difference between the average velocity of flows at the road and those in the ENP marsh.

2.2.2.3 Stratification

The project would not affect stratification.

2.2.2.4 Hydrologic Regime

The hydrologic regime in south Florida has been drastically altered in the last hundred years through development of urban areas, agricultural practices, and the construction of systems of canals and levees. South Florida has become compartmentalized, and much of the former sheet flow over a vast expanse of Everglades has been concentrated in canals.

The implementation of the project would assist in the restoration of water deliveries to ENP. In turn, the natural ridge and slough processes would be restored.

2.2.3 Normal Water Level Fluctuations

Water levels fluctuate during the year. The wet season in south Florida extends from May to September when there exists a higher than average incident of rainfall. The dry season lasts from October through April.

Currently, WCA-3B helps to maintain water levels in ENP, serving as storage for runoff during the wet season for use during the dry season. Water releases into ENP are only allowed when the minimum water level is achieved.

The TSP will provide for a design stage in the L-29 Canal of 8.5 feet. By allowing for a higher design stage, the deep sloughs of ENP would be better capable of maintaining water storage potentially year-round, except during extremely dry years.

2.2.4 Salinity Gradients

Not applicable.

2.2.5 Actions That Will be Taken to Minimize Impacts

The TSP incorporates actions to restore water circulation and fluctuations in NESS. See Section 1.3.2, Summary of Mitigation Features Incorporated into the Tentatively Selected Plan.

2.3 SUSPENDED PARTICULATE/TURBIDITY DETERMINATIONS

2.3.1 Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Sites

No changes in suspended particulates and turbidity levels are expected in the vicinity of the disposal site.

2.3.2 Effects on Chemical and Physical Properties of the Water Column

2.3.2.1 Light Penetration

Sediments released during construction operations may periodically reduce light penetration. Photosynthesis and primary productivity in portions of the affected areas is not expected to decrease because light attenuation from very briefly suspended particulates would be negligible.

2.3.2.2 Dissolved Oxygen

Effects on BOD and COD levels are expected to be minimal.

2.3.2.3 Toxic Metals and Organics

No anticipated increase in toxic metals and organics exists.

2.3.2.4 Pathogens

This project would have no effect on pathogens.

2.3.2.5 Aesthetics

Implementation of the TSP would beneficially impact the aesthetics of the area, as exotic vegetation would be removed along the highway and, depending on the design, the bridge could offer an expansive view of the Everglades.

2.3.3 Effects on Biota

2.3.3.1 Primary Production

Photosynthesis and primary productivity in portions of the affected areas is not expected to decrease because light attenuation from very briefly suspended particulates would be negligible. As these particulates settle, primary production would return to pre-project levels.

2.3.3.2 Suspension/Filter Feeders

No impact to suspension/filter feeders is anticipated.

2.3.3.3 Sight Feeders

No impact to sight feeders is anticipated.

2.3.4 Actions Taken to Minimize Impacts

The TSP incorporates actions to avoid and minimize impacts to aquatic communities. See Section 1.2.4, *Summary of Mitigation Features Incorporated into the Tentatively Selected Plan*. Aquatic communities are expected to benefit from the project.

2.4 CONTAMINANT DETERMINATIONS

Fill material will be inspected and tested as necessary to ensure that no contaminants are present.

2.5 AQUATIC ECOSYSTEM AND ORGANISM DETERMINATION

2.5.1 Plankton

No major changes in the plankton communities are anticipated as a direct result of the TSP.

2.5.2 Benthos

No impacts to the benthic community are anticipated.

2.5.3 Nekton

Impacts to nekton from implementation of the project are anticipated to be beneficial. During construction, elevated sediment levels during fill removal may occur; however, these impacts would be related to construction. Once

construction is complete, improved water flow and distribution from WCA-3B and the L-29 Canal through Tamiami Trail to ENP would improve conditions and increase the total abundance of fishes in ENP.

2.5.4 Aquatic Food Web

The aquatic food web would not be adversely impacted.

2.5.5 Special Aquatic Sites Effects

2.5.5.1 Sanctuaries and Refuges

WCA-3B managed by the Florida Fish and Wildlife Conservation Commission (FWC) as the Francis S. Taylor Wildlife Management Area is located north of the project area, and ENP and NESS are located south of the project area. No excavated material would be placed within WCA-3B; however, encroachment of the highway to the south will be necessary to meet current FDOT highway construction standards.

ENP is designated in F.A.C. 62-302.700(9)(a) as an Outstanding Florida Water (OFW), which Florida Department of Environmental Protection (FDEP) defines as a water worthy of special protection because of its natural attributes. The OFW designation requires that existing ambient water quality be maintained. Therefore, turbidity and other water quality impacts would be restricted to a mixing zone approved by FDEP and would occur temporarily during construction activities only. Approximately 8.5 acres of parkland would be incorporated into permanent construction easement, and 6.6 acres of parkland would be in temporary construction easement.

2.5.5.2 Wetlands

Implementing the TSP would involve a permanent loss of 2.29 acres of wetlands that would be incorporated into permanent construction easement. In addition, 6.6 acres of wetlands would be temporarily affected by its use as a area to facilitate bridge construction; this area would be restored following construction. Removal of the existing highway embankment would allow the restoration of about 8.5 acres.

Exotic vegetation present along the south side of Tamiami Trail has diminished the quality of wetland habitat in the project area. The dominant exotic species of vegetation, Brazilian pepper (*Schinus terebenthifolius*), exists in a 10 to 30-foot-wide corridor along the highway. The construction of modifications to Tamiami Trail presents the opportunity to remove existing exotic vegetation, thereby improving the quality of wetlands in the project area.

As discussed in the 2005 RGRR/SEIS, additional wetland benefits would be realized through restoration of water deliveries to ENP, ridge and slough processes and vegetative communities.

2.5.5.4 Vegetated Shallows

Historically, the area was predominantly ridge and slough habitat, a complex mosaic of marsh assemblages with distinct tree islands. Currently, WCA-3B and ENP are dominated by long and short hydroperiod wetlands with an abundance of interspersed willowheads, bayheads, and hardwood hammocks. Sawgrass (*Cladium jamaicense*) communities dominate the long hydroperiod wetlands while muhly grass (*Muhlenbergia capillaris*) and black sedge (*Schoenus nigricans*) dominate the short hydroperiod wetlands. Four herbaceous wetland cover types are found in the project area: (1) sloughs with deep, permanent water levels, (2) sawgrass marshes with semi-permanent water levels and long hydroperiods, (3) wet peat prairies, and (4) wet marl prairies with shorter hydroperiods.

The TSP would help restore water deliveries to ENP and thus restore the quality of vegetative communities south of Tamiami Trail.

2.5.5.5 Coral Reefs

Not applicable.

2.5.5.6 Riffle Pool Complexes

Not applicable.

2.5.6 Threatened and Endangered Species

Six Federally protected species are known or are potentially encountered in the project area in the 2003 and 2005 Fish and Wildlife Coordination Act Report (FWCAR). These include the Cape Sable seaside sparrow (CSSS) (*Ammodramus maritimus mirabilis*), eastern indigo snake (*Drymarchon corais couperi*), Florida panther (*Puma [=Felis] concolor coryi*), snail kite (*Rostrhamus sociabilis*), West Indian manatee (*Trichechus manatus*), and wood stork (*Mycteria americana*). FWC also identified a wading bird rookery just north of the project area across L-29 Canal.

USFWS and FWC did not **recommend** protective measures or restrictions during construction for the Florida panther, snail kite, West Indian manatee, or the Frog City wading bird rookery. The project was also determined to not preclude compliance with the reasonable and prudent alternatives (RPA) established for conservation of the CSSS through the 1999 USFWS Biological Opinion.

Protective measures will be put in place during construction to avoid and minimize impacts to the eastern indigo snake and the wood stork.

2.5.7 Other Wildlife

The American alligator (*Alligator mississippiensis*) and the Everglades mink (*Mustela vison evergladensis*) were reported in the FWCAR to be present in the area. These species are protected by the State of Florida.

After implementation of the project, wildlife mortality in the area is expected to decrease as a result of the one-mile elevated section.

2.5.8 Actions to Minimize Impacts

The TSP incorporates actions to avoid and minimize impacts to aquatic communities. See Section 1.2.4, Summary of Mitigation Features Incorporated into the TSP. Although not a part of the project purpose, wildlife crossings could be incorporated into the project as a betterment or enhancement if funded from another source, or the betterment can be included in another project.

2.6 PROPOSED DISPOSAL SITE DETERMINATIONS

2.6.1 Mixing Zone Determination

ENP is designated in F.A.C. 62-302.700(9)(a) as an Outstanding Florida Water (OFW), which the Florida Department of Environmental Protection (FDEP) defines as a water worthy of special protection because of its natural attributes. The OFW designation requires that existing ambient water quality be maintained. ENP requires that turbidity not exceed ambient NTU levels outside the mixing zone. The mixing zone for this project will extend a length of 50 meters.

2.6.2 Potential Effects on Human Use Characteristics

2.6.2.1 Municipal and Private Water Supply

No adverse effects would occur to municipal or private water supply.

2.6.2.2 Recreational and Commercial Fisheries

Indirect effects of the project on habitat of fishes are discussed in Section 2.5.3, *Nekton*. This TSP would have no adverse impacts on recreational and commercial fisheries.

2.6.2.3 Water Related Recreation

The project area is used for both consumptive (fishing, hunting, and frogging) and non-consumptive (wildlife viewing, camping, boating, airboating, etc.) recreational use. Access to businesses and other existing facilities would be maintained during and after construction. Bank fishing from the highway would be eliminated in the vicinity of the bridge, but access to the L-29 Canal would be maintained using the L-29 Levee road.

2.6.2.4 Aesthetics

During construction, the aesthetics of the area would be impacted by heavy equipment and construction related activities. However, after construction is completed, a net long-term gain would be realized. Exotic vegetation would be removed from the edge of the highway, and, depending on the design, the bridge could offer expansive views of ENP.

2.6.2.5 Parks, National Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves

The TSP is part of a larger effort to restore ecological values to the Everglades. The implementation of this project would benefit both WCA-3B (Francis Taylor Wildlife Management Area) and ENP.

2.7 DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM

The project would restore hydrologic patterns and ecological connectivity in a portion of the Everglades ecosystem to the extent practicable. It is compatible with future actions to be taken throughout the area of south Florida and minimizes retrofit that would be necessary should future modifications of Tamiami Trail be undertaken.

2.8 DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM

All benefits to flora and fauna would be secondary in that the direct effects of the project would be hydrological, but the secondary effects of the project would benefit the ecological components of the region. Both the vegetation and the fish and wildlife resources would be improved upon implementation of the TSP.

2.9 ACTIONS TAKEN TO MINIMIZE IMPACTS

The TSP incorporates actions to avoid and minimize impacts to aquatic communities. See Section 1.2.4, *Summary of Mitigation Features Incorporated*

into the Proposed Project. The project is designed to benefit aquatic communities.

3.0 FINDINGS OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

3.1 ADAPTATION OF THE SECTION 404(b)(1) GUIDELINES TO THIS EVALUATION

No significant adaptations of the guidelines were made relative to this evaluation.

3.2 EVALUATION OF AVAILABILITY OF PRACTICABLE ALTERNATIVES TO THE PROPOSED DISCHARGE SITE THAT WOULD HAVE LESS ADVERSE IMPACT ON THE AQUATIC ECOSYSTEM

The selection and screening of alternative actions were discussed in Section 4.0 of the LRR, Formulation and Evaluation of Alternatives. Section 5.0 of the LRR, Environmental Effects, discusses the environmental impacts of the No-Action Alternative and four action alternatives. No practicable alternative exists that meets the study objectives and does not involve discharge of fill into waters of the United States.

3.3 COMPLIANCE WITH APPLICABLE STATE WATER QUALITY STANDARDS

The TSP would not violate any applicable state water quality standards with the possible exception of temporary and negligible increases in turbidity, which might occur during construction. All other standards would be maintained during and following the placement of excavated and fill material.

3.4 COMPLIANCE WITH APPLICABLE TOXIC EFFLUENT STANDARD OR PROHIBITION UNDER SECTION 307 OF THE CLEAN WATER ACT

This TSP would be in full compliance of Section 307 of the Clean Water Act and would not violate the Toxic Effluent Standards.

3.5 COMPLIANCE WITH THE ENDANGERED SPECIES ACT OF 1973

The TSP would not harm any threatened or endangered species or their critical habitats. Coordination with USFWS has been maintained throughout the planning process for this project. USFWS comments concerning protected species were addressed in the 2005 RGRR/SEIS.

3.6 COMPLIANCE WITH SPECIFIED PROTECTION MEASURES FOR MARINE SANCTUARIES DESIGNATED BY THE MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT OF 1972

Not Applicable.

3.7 EVALUATION OF EXTENT OF DEGRADATION OF THE WATERS OF THE UNITED STATES

3.7.1 Significant Adverse Effects on Human Health and Welfare

The TSP would not result in adverse effects on human health and welfare.

3.7.1.1 Municipal and Private Water Supplies

This project would not be located near municipal water supply intakes or private water supplies.

3.7.1.2 Recreational and Commercial Fishing

Recreational bank fishing would be eliminated along the bridge where the highway embankment would be removed; however access to the L-29 Canal would remain from the L-29 Levee which can be accessed from the S-333 or S-334 water control structure.

3.7.1.3 Plankton

This project would not adversely affect plankton.

3.7.1.4 Fish

This project would not adversely affect fisheries resources. The project would on the contrary improve the total abundance of fishes in ENP based upon the improvement of water distribution and flow through the one-mile-wide conveyance channel in the eastern side of the project area.

3.7.1.5 Shellfish

This project would not adversely affect shellfish.

3.7.1.6 Wildlife

No adverse effect on wildlife is expected, rather the project would increase flows to ENP, thereby improving wildlife habitat. Construction of the bridge is would

decrease wildlife mortality in the project area; in the area of the bridge, small animals could pass from ENP to the L-29 Canal without exposure to traffic.

3.7.1. Special Aquatic Sites

WCA-3B (Francis Taylor Wildlife Management Area) and ENP would not be adversely impacted by the TSP.

3.7.2 Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems

Significant adverse effects of life stages of aquatic life are not anticipated.

3.7.3 Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity, and Stability

Significant adverse effects on aquatic ecosystem diversity, productivity, and stability are not anticipated.

3.7.4 Significant Adverse Effects on Recreational, Aesthetic, and Economic Values

The TSP would have no adverse impacts on recreational, aesthetic, and economic values.

3.7.5 Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem

The TSP incorporates actions to avoid and minimize impacts to aquatic communities. The project is intended to benefit the aquatic ecosystem. See Section 1.2.4, Summary of Mitigation Features Incorporated into Proposed Project. Among features applicable to the substrate are the removal of highway embankment where the new bridge would be located, the incorporation of best management practices into construction activities, and the implementation of protective measures for the Tamiami East and West Wood Stork colonies.

3.8 COMPLIANCE

Based on the guidelines, the proposed project is specified as complying with the requirements of these guidelines with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the affected aquatic ecosystem.

4.0 REFERENCES

- U.S. Army Corps of Engineers. 1992. General Design Memorandum and Environmental Impact Statement, Modified Water Deliveries to Everglades National Park. Jacksonville District, U.S. Army Corps of Engineers.
- U.S. Army Corps of Engineers. 2003. General Reevaluation Report and Supplemental Environmental Impact Statement for the Tamiami Trail Modifications. Jacksonville District, U.S. Army Corps of Engineers.
- U.S. Army Corps of Engineers. 2005. Final General Reevaluation Report/Second Supplemental Environmental Statement (RGRR/SEIS) for the Tamiami Trail Modifications, Jacksonville District, U.S. Army Corps of Engineers.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 1996. Soil Survey of Dade County Area, Florida.