

REPORT SUMMARY
Comprehensive Everglades Restoration Plan
Central Everglades Planning Project
Final Integrated Project Implementation Report and Environmental Impact Statement – Dated
April 2014

Decision Point 1 (DP1)	27 January 2012
Decision Point 2 (DP2)	13 August 2013
Draft Report Guidance Memorandum	27 February 2014
Division Engineer Transmittal:	1 April 2014
Received at SAD and HQUSACE	2 April 2014
CWRB Briefing:	22 April 2014
FEIS filed with EPA:	23 May 2014
30 Day S&A Review Start:	27 May 2014
30 Day S&A Review End:	24 June 2014

STUDY INFORMATION

Study Authority: The Water Resources Development Act (WRDA) of 2000 approved the Comprehensive Everglades Restoration Plan (CERP) as a framework for modifications to the Central and Southern (C&SF) Project in Section 601(b)(1)(A).

Section 601, Water Resources Development Act of 2000

PUBLIC LAW 106-541—DEC. 11, 2000

(b) COMPREHENSIVE EVERGLADES RESTORATION PLAN.—

(1) APPROVAL

(A) IN GENERAL. —Except as modified by this section, the Plan is approved as a framework for modifications and operational changes to the Central and Southern Florida Project that are needed to restore, preserve, and protect the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection. The Plan shall be implemented to ensure the protection of water quality in, the reduction of the loss of fresh water from, and the improvement of the environment of the South Florida ecosystem and to achieve and maintain the benefits to the natural system and human environment described in the Plan, and required pursuant to this section, for as long as the project is authorized.

The Central Everglades Planning Project (CEPP), project implementation report (PIR) will be submitted in compliance with Section 601(d) WRDA 2000, titled 'Authorization of Future Projects'.

(d) AUTHORIZATION OF FUTURE PROJECTS-

(1) IN GENERAL- Except for a project authorized by subsection (b) or (c), any project included in the Plan shall require a specific authorization by Congress.

(2) SUBMISSION OF REPORT- Before seeking congressional authorization for a project under paragraph (1), the Secretary shall submit to Congress--

(A) a description of the project; and

(B) a project implementation report for the project prepared in accordance with subsections (f) and (h).

Study Sponsor: The South Florida Water Management District (SFWMD) is the non-Federal Sponsor for the implementation of this project.

Study Purpose and Scope: The CEPP is encompassed in the CERP, which was approved by Congress as a framework for the restoration of the natural system under Section 601 of the WRDA 2000. The CERP, as documented in the 1999 C&SF Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement (the Restudy) consists of 68 different components. The purpose of the CERP is to modify structural and operational components of the C&SF Project to achieve restoration of the Everglades and the south Florida ecosystem, while providing for other water-related needs such as urban and agricultural water supply and flood protection. The 68 components identified in the Restudy will work together to benefit the ecological structure and function of more than 2.4 million acres of the south Florida ecosystem by improving and/or restoring the proper quantity, quality, timing and distribution of water in the natural system. CERP will also address other concerns such as urban and agricultural water supply and maintain existing levels of service for flood protection in those areas served by the project. The CERP components were originally planned for implementation over an approximate 40 year period. The CERP is designed to achieve more natural flows by re-directing flows that are currently discharged to the Atlantic Ocean and Gulf of Mexico, to a more restored flow of water that is distributed throughout the system similar to pre-drainage conditions.

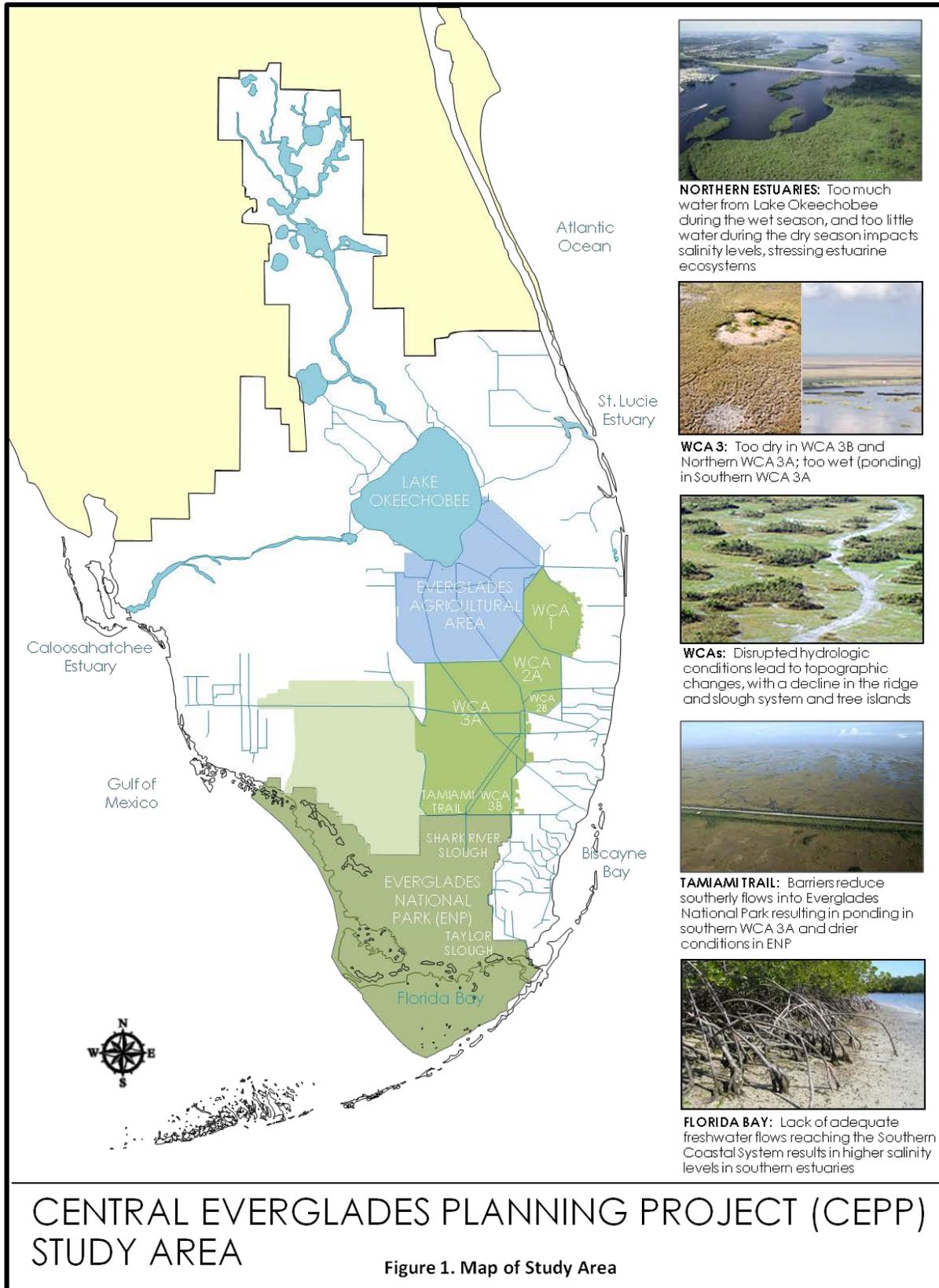
Since the CERP was approved, three projects were authorized in the 2007 WRDA and proceeded into construction (Indian River Lagoon-South, Picayune Strand, and Site 1 Impoundment) and a fourth project, Melaleuca and Other Exotic Plants Biological Controls, was implemented under the programmatic authority in WRDA 2000. Despite this progress, ecological conditions and functions within the central portion of the Everglades, consisting mostly of unique 'ridge and slough' topography and associated biodiversity, continue to decline due to lack of sufficient quantities of freshwater flow into the central Everglades and timing and distribution problems, while much of the fresh water that is needed is instead discharged via canals to coastal estuaries where it disrupts estuarine habitats and fish nurseries. To respond to these concerns, the U.S. Army Corps of Engineers (USACE) and the SFWMD initiated the CEPP in November 2011 to evaluate alternatives for restoring ecosystem conditions in the central portion of the Everglades and opportunities for providing for other water-related needs in the region.

The purpose of the CEPP is to improve the quantity, quality, timing and distribution of water flows to the Northern Estuaries, central Everglades (Water Conservation Area 3 (WCA 3) and Everglades National Park (ENP)), and Florida Bay while increasing water supply for municipal, industrial and agricultural users.

The CEPP recommends increments of six components of the CERP:

- Everglades Agricultural Storage Reservoirs (Component G)
- WCA 3 Decompartmentalization and Sheetflow Enhancement (Components AA and QQ)
- S-356 Pump Station Modifications (Component FF)
- L-31 N Improvements for Seepage Management (Component V)
- System-wide Operational Changes – Everglades Rain-Driven Operations (Component H)
- Flow to Northwest and Central WCA 3A (Component II)

Project Location/Congressional District: The study area for the CEPP encompasses the Northern Estuaries (St. Lucie River and Indian River Lagoon and the Caloosahatchee River and Estuary), Lake Okeechobee, the Everglades Agricultural Area (EAA), the WCAs (specifically WCAs 2 and 3); ENP, the Southern Estuaries (specifically focused on Florida Bay), and portions of the Lower East Coast (LEC). The project features are located in Palm Beach, Broward, Miami-Dade, Monroe, Martin and Lee Counties in Congressional District numbers 18, 19, 20, 25, and 26. The project study area is shown in **Figure 1**.



Prior Reports and Existing Water Projects: Prior projects in the study area include the 1948 C&SF Project, the 1999 C&SF Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic EIS (the Restudy), and other first generation and second generation CERP projects as discussed below.

CERP contains 68 components that include approximately 217,000 acres of new reservoirs and wetlands-based water treatment areas. A number of operational components have also been identified in CERP and will, in most cases, occur in conjunction with related construction features. The operational features in CERP include: a modified Lake Okeechobee regulation schedule; environmental water supply deliveries to the Caloosahatchee and St. Lucie Estuaries; modifications to the regulation schedules for WCAs 2A, 2B, 3A, 3B, and the current rainfall delivery formula for ENP to implement rain-driven operations; modified Holey Land Wildlife Management Area Operation Plan; Modified Rotenberger Wildlife Management Area Operations Plan; a modification for coastal well field operations in the LEC; LEC utility water conservation; and operational modifications to the southern portion of L-31 and C-111.

CERP projects would increase the supply of freshwater for the Everglades and south Florida ecosystem. Large areas within the study area would be used to increase water storage resulting from CERP Projects for the overall gain and long term benefit of the regional system. These project features would provide important storage functions and are essential to the overall restoration of the freshwater marshes and the estuaries of the greater Everglades ecosystem. CERP project components in the area, especially storage, seepage control, and redirection of point source canal flows to overland flow, will act to restore more natural freshwater flows to the northern and southern estuaries, reduce seepage losses from the Everglades, and improve recharge of the Biscayne aquifer.

Construction has begun on the first generation of CERP project modifications already authorized by Congress. These include the Indian River Lagoon-South Project, the Picayune Strand Restoration Project, and the Site 1 Impoundment Project. The second generation of CERP projects for Congressional authorization includes the Biscayne Bay Coastal Wetlands Project, Broward County Water Preserve Areas Project, the Caloosahatchee River (C-43) West Basin Storage Reservoir, and the C-111 Spreader Canal Western Project. These projects will result in significant environmental benefits to the CEPP project area, improving the quantity, quality, timing and delivery of water to the natural system.

Non-CERP projects which incorporate similar restoration goals of improving flow and water quality to the Everglades include the Modified Water Deliveries (MWD) Project, the Department of Interior (DOI) Tamiami Trail Modifications Next Steps Project and the State of Florida's Restoration Strategies Project.

Federal Interest: The Final integrated PIR and EIS evaluates the Federal interest in implementing the CEPP. The CEPP, as presented in this PIR, is aimed at achieving restoration goals in the study area. With the passage of WRDA 2000, the CERP – a national priority – was approved as a “framework for modifications and operational changes to the C&SF Project that are needed to restore, preserve, and protect the south Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection.” The CEPP, as part of the CERP, will provide substantial environmental restoration in the study area, beneficially affecting more than 1.5 million acres in the St. Lucie and Caloosahatchee Estuaries,

WCA 3, ENP, and Florida Bay. The Everglades has been designated an International Biosphere Reserve (1976) and a World Heritage Site (1979) by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and a Wetland of International Importance (1987) in accordance with the Ramsar Convention. The project also increases the amount of water available for agricultural, municipal and industrial use in Lower East Coast Service Area (LECSA) 2 (Broward County) and LECSA 3 (Miami-Dade County), while maintaining existing water supply performance for agricultural users in the Lake Okeechobee Service Area (LOSA) and the Seminole Tribe of Florida. Work completed for the PIR has confirmed the Federal interest in the project by demonstrating project benefits, completeness, cost effectiveness, and acceptability.

STUDY OBJECTIVES

Problems and Opportunities: Current operations of the C&SF Project involve water supply and flood releases to manage stage levels in Lake Okeechobee, the WCAs, and the Everglades. Prolonged high volume discharges of water from Lake Okeechobee to the Northern Estuaries coupled with excessive nutrient concentrations in Lake Okeechobee water and downstream basin water have resulted in damaging effects on the plants and animals inhabiting these areas. System changes have resulted in point source peak flows that are higher just prior to and/or following major rain events, and flow rates that decline more abruptly during the end of the wet season. Due to limited storage capacity and water quality treatment requirements, flows to the Everglades from Lake Okeechobee have shifted from primarily wet season flows in response to rainfall to controlled dry season deliveries in response to urban and agricultural water demands. The impoundment of the natural system, construction of drainage canals and conveyance features, and current C&SF operations within the Everglades have disrupted the annual pattern of rising and falling water depths in the remaining wetlands. These hydrologic changes have caused complete shifts in vegetative communities and loss of fish and wildlife resources. The result is reduced water storage capacity in the remaining natural system and an unnatural mosaic of impounded, fragmented, over-inundated and over-drained marshes.

The already degraded state of the Everglades will continue to worsen in the absence of increased water deliveries, improved water timing and restored spatial distribution. Redirecting a portion of the approximately 1.7 billion gallons of water per day on average that is discharged to the Atlantic Ocean and the Gulf of Mexico is essential to meeting the quantity, quality, timing and distribution of water required to realize a portion of the benefits envisioned in CERP.

Planning Objectives: Section 601(h) of WRDA 2000 states “[t]he overarching objective of the Plan (CERP) is the restoration, preservation, and protection of the South Florida Ecosystem while providing for other water-related needs of the region, including water supply and flood protection”. These same objectives apply to the CEPP study efforts and are listed in **Table 1**.

Table 1. Goals and Objectives of CERP and CEPP

CERP Goal: Enhance Ecological Values	
CERP Objective	CEPP Objective
Increase the total spatial extent of natural areas	No corresponding CEPP objective; consider this objective in future increments
Improve habitat and functional quality	Restore seasonal hydroperiods and freshwater distribution to support a natural mosaic of wetland and upland habitat in the Everglades System
	Improve sheetflow patterns and surface water depths and durations in the Everglades system in order to reduce soil subsidence, the frequency of damaging peat fires, the decline of tree islands, and salt water intrusion
	Reduce high volume discharges from Lake Okeechobee to improve the quality of oyster and SAV habitat in the northern estuaries
Improve native plant and animal species abundance and diversity	Reduce water loss out of the natural system to promote appropriate dry season recession rates for wildlife utilization
	Restore more natural water level responses to rainfall to promote plant and animal diversity and habitat function
CERP Goal: Enhance Economic Values and Social Well Being	
Increase availability of fresh water (agricultural/municipal & industrial)	Increase availability of water supply
Reduce flood damages (agricultural/urban)	No corresponding CEPP objective; consider this objective in future increments
Provide recreational and navigation opportunities	Provide recreational opportunities
Protect cultural and archeological resources and values	Protect cultural and archeological resources and values

Planning Constraints: Project constraints were recognized to ensure that the project would not reduce the level of service for flood protection, protect existing legal users, and meet applicable water quality standards for the natural system. When a project is expected to result in an elimination or transfer of an existing legal source of water, the PIR shall include an implementation plan that ensures a new source of water of comparable quantity and quality is available to replace the source that is being transferred or eliminated. Implementation of the project will not reduce the levels of service for flood protection within the areas affected by the project.

WRDA 2000 requires the inclusion of “Savings Clause” analyses within each CERP PIR. The “Savings Clause” protects existing legal sources of water supply, such as water for municipal and agricultural uses, and ensures that CERP implementation does not reduce the level of service for flood protection. In accordance with Section 601(h)(4) and (5)) of WRDA 2000 the following are constraints for CEPP implementation:

- Avoid reduction in the existing level of service for flood protection caused by Plan implementation
- Provide replacement sources of water of comparable quantity and quality for existing legal sources that could experience water supply reductions caused by Plan implementation

- Meet applicable Water Quality Standards

ALTERNATIVES

Plan Formulation Rationale: The Everglades is a complex ecosystem comprising multiple physical and biological elements whose functions and responses are highly interdependent. The Everglades lie at the center of the complex south Florida regional water management system in which water distributed to any part of the system affects many others. In order to achieve incremental restoration of the central Everglades ecosystem, management measures and components cannot be evaluated in isolation, but must be combined and evaluated. The CEPP formulation and modeling strategies acknowledge that the storage and conveyance of water, distribution of water, and seepage management are interacting, interdependent elements that must work together to move restoration forward.

The plan formulation process used data and findings developed in previous plan formulation efforts, including CERP planning and restoration initiatives such as the EAA Reservoir project, WCA 3 Decompartmentalization and Sheetflow Enhancement project (Decomp), and the ENP Seepage Management project.

Plan formulation was conducted from a spatial perspective (**Figure 2**). The study area was divided into four sub-regions recognizing that physical and environmental boundaries create distinctive water management issues. This allowed for the development and screening of alternatives, by sub-region, to proceed from upstream to downstream.

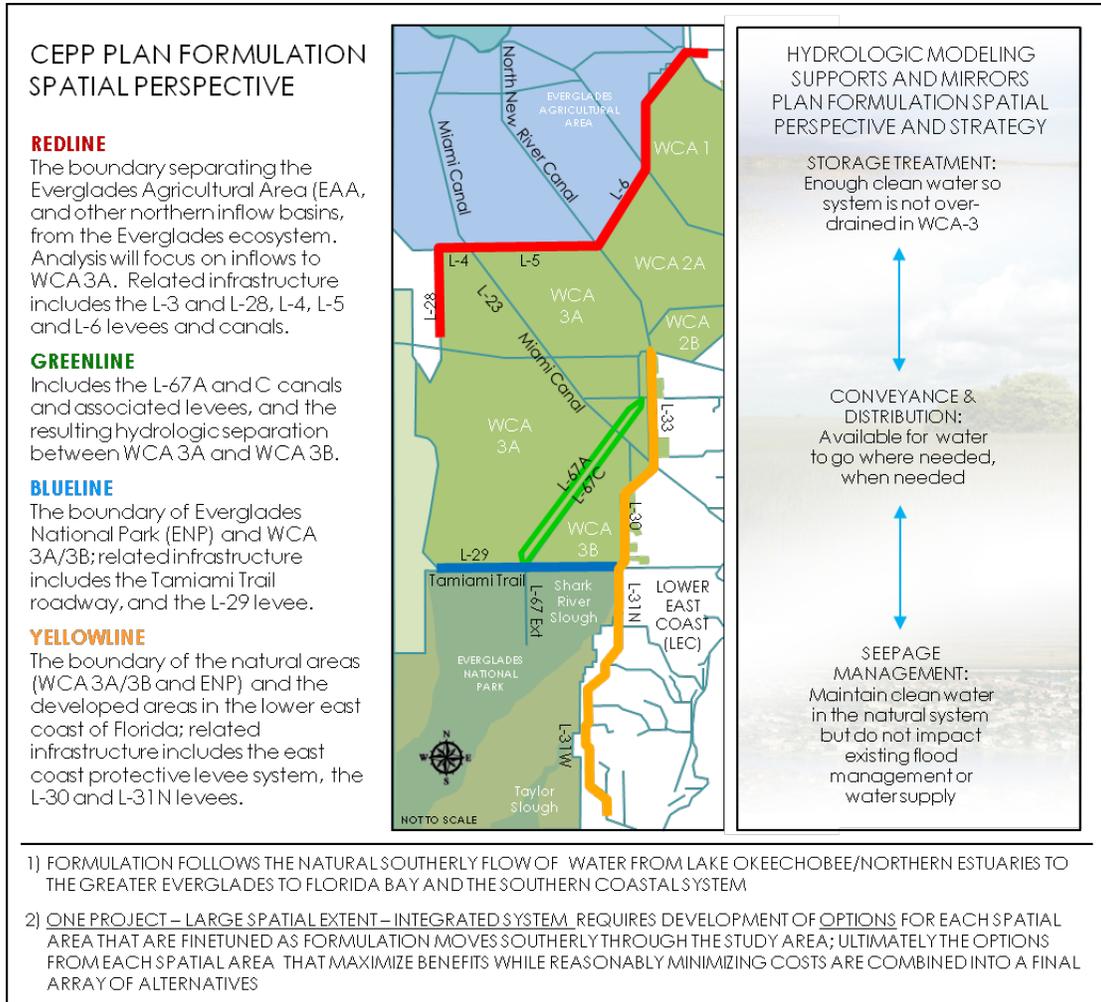


Figure 2. Spatial Perspective of Plan Formulation

Management Measures and Alternative Plans: Following this spatial perspective, CEPP alternative development began with an initial screening to identify feasible management measures (structural and non-structural features or activities that address one or more planning objectives). Management measures considered for each sub-region identified in **Figure 2** above are listed below.

Storage and Treatment Management Measures: EAA North of the Redline	
• Higher Lake Levels	• Stormwater Treatment Areas
• Operational Changes in Lake Okeechobee	• Chemical Precipitation
• Partition Lake Okeechobee	• Localized Aquifer Storage and Recovery
• Dredging of Lake Okeechobee for Storage	• Hybrid Wetland Treatment Technology
• Above-Ground Storage Reservoir	
• Ecoreservoir	
• Flowage Equalization Basin	
• Dry/Wet Flow Way within the EAA	
• Dredging of Lake Okeechobee near Primary Canal intakes	

Northern Distribution and Conveyance Management Measures: Northern WCA 3A South of the Redline	
• Spreader Canal	• Backfill Miami Canal to Marsh Grade
• Levee Removal	• Above or In-ground Pipeline
• Levee Gaps	• Shallowing of Miami Canal
• Pump Stations	• Cap over Miami Canal
• Flow Through Wetlands within the EAA (Restored Wetlands)	• Spoil Mound or Berm Removal along Miami Canal
• Plug Miami Canal to Marsh Grade	• Conveyance Canal Modifications (L-5 and L-6)

Southern Distribution and Conveyance Management Measures: Southern WCA 3A, WCA 3B. ENP Greenline/Blueline	
• Levee Removal	• Weirs
• Levee Gaps	• Operational Changes
• Levee/Berm Construction	• Pump Stations
• Flow Through Wetlands (Restored Wetlands)	• Bridging along Tamiami Trail
• Culverts within Existing Levees	• Elevating Tamiami Trail Roadway
• Gated Water Control Structures	• Collection Canals within WCA 3B

Seepage Management Measures: Yellowline	
• Recharge Basin	• Above-Ground Storage for Seepage Gradient (Detention Areas)
• New Pump Stations to Return Seepage Water to the Natural System	• Groundwater Wells to Return Seepage Water to the Natural System
• Operate or Relocate Existing Pump Stations to Return Seepage Water to the Natural System	• Line/Pipe Canals to Reduce Seepage
• In-Ground Seepage Barrier	• New Canals/Relocate Existing Canals
• Raise Canal Stages along L-30/L-31N	• Changes in Operations
• Flood Attenuation Reservoir	• Step -down Levees

Retained management measures underwent a rigorous screening analysis to evaluate, optimize, refine, and finally group into components (i.e. one or more management measures that can be implemented at a specific geographic site) and options (i.e. a grouping of one or more components that function together to provide a sub-regional restoration approach to address objectives and avoid constraints). **Figures 3** through **6** present an overview of the steps used during plan formulation for the screening and grouping of management measures into components and options for each sub-region. Combining options from the screening of treatment and storage, distribution and conveyance, and the resulting seepage management analysis ultimately led to a limited number of discrete alternative plans that were considered in the final array and underwent a comprehensive system-wide evaluation.

Multi-Criteria Decision Analysis (MCDA) was used to organize the formulation and selection of options which were included in the final array of alternatives. The MCDA was used to support

an inclusive and transparent evaluation process for selecting options. The criteria utilized for MCDA were specific to the phase and location of plan formulation. The analysis provided a normalized and aggregated evaluation score for project options, which prioritized achievement of project objectives, simultaneously considering costs, constraints, and other important considerations.

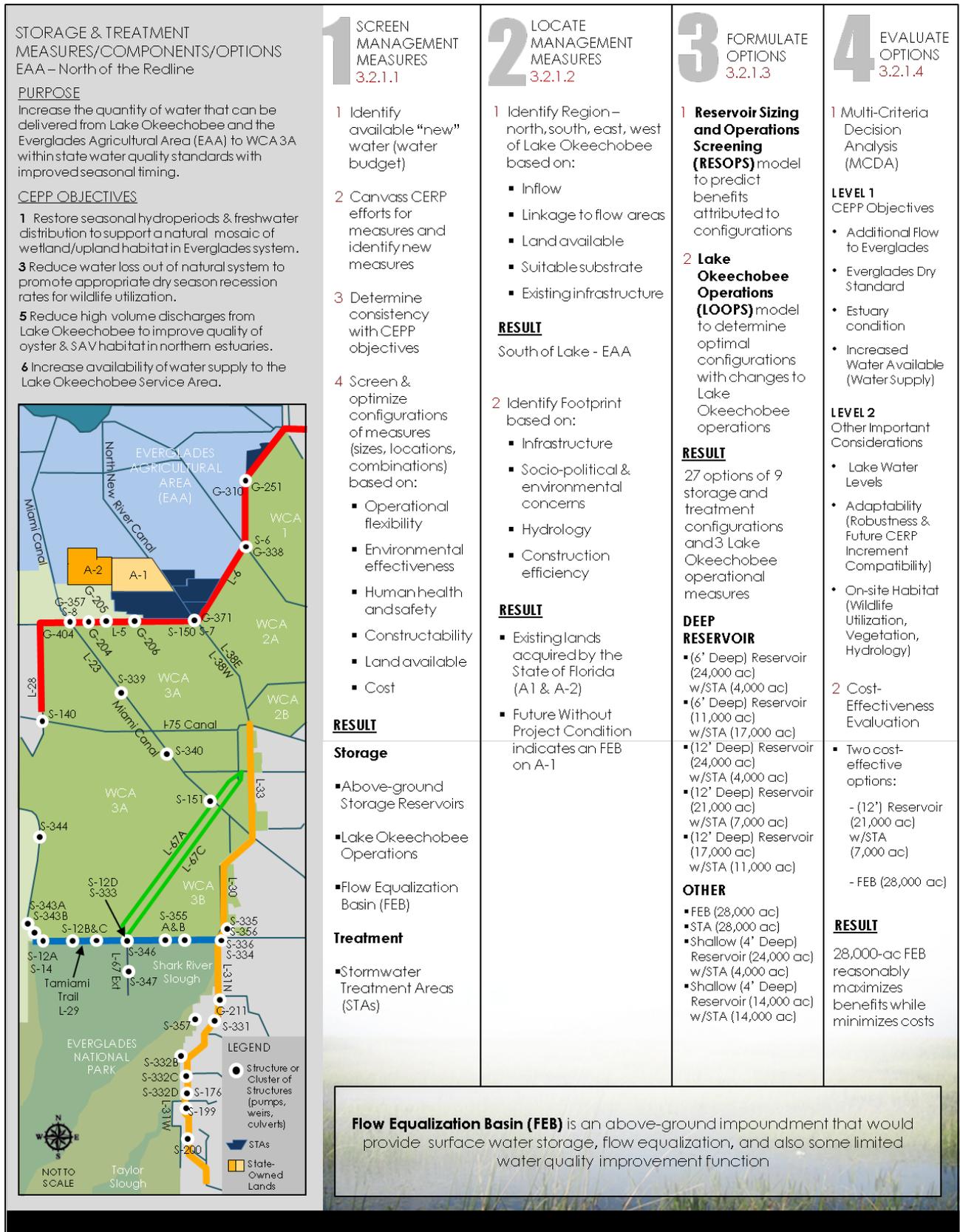


Figure 3. Storage and Treatment North of the Redline

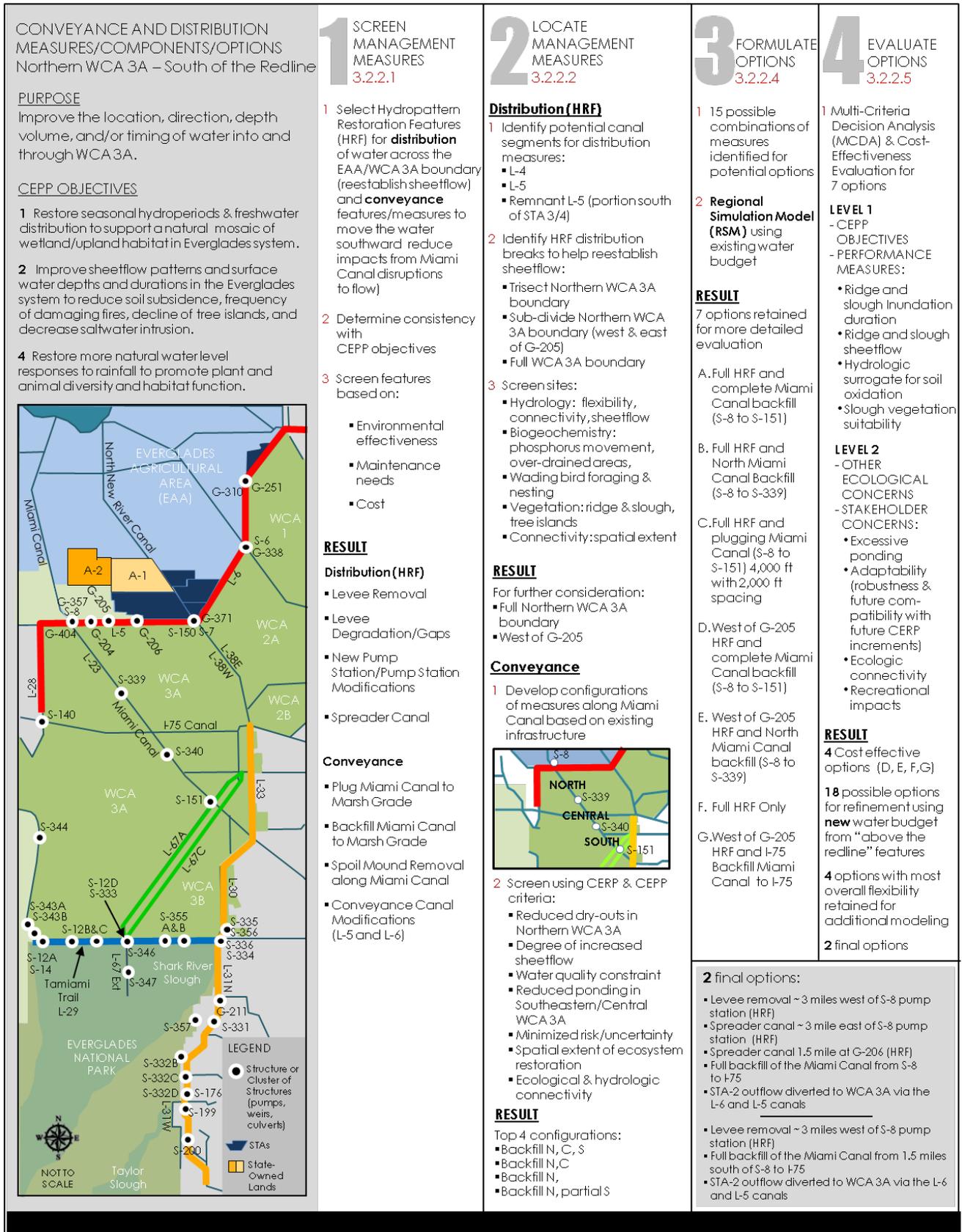


Figure 4. Conveyance and Distribution South of the Redline

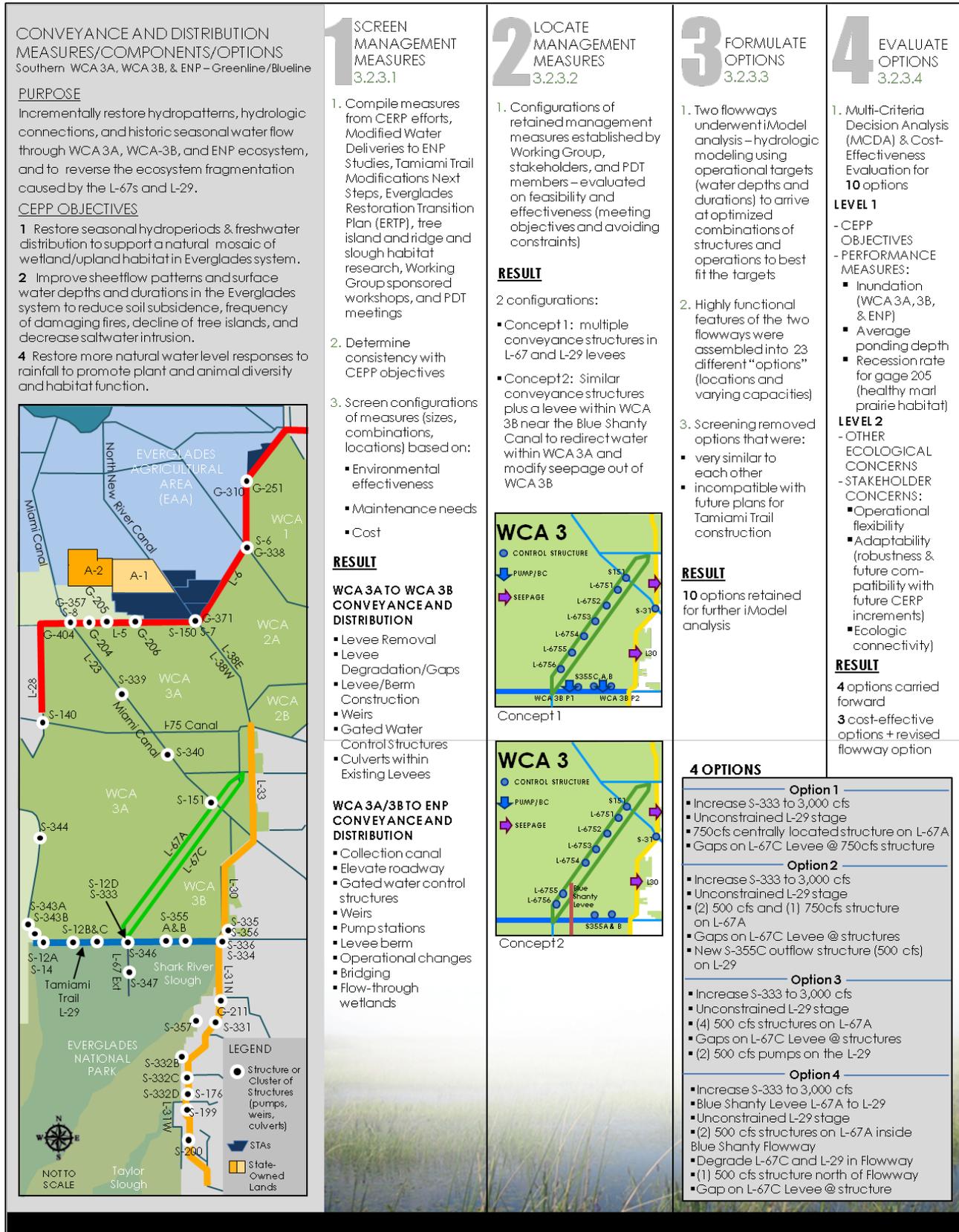


Figure 5. Conveyance and Distribution Southern WCA 3A, WCA 3B, and ENP (Blueline and Greenline)

SEEPAGE MANAGEMENT MEASURES/COMPONENTS/OPTIONS

PURPOSE

Seepage management measures reduce water loss out of the natural system and reduce the flood risk to agricultural and urban areas

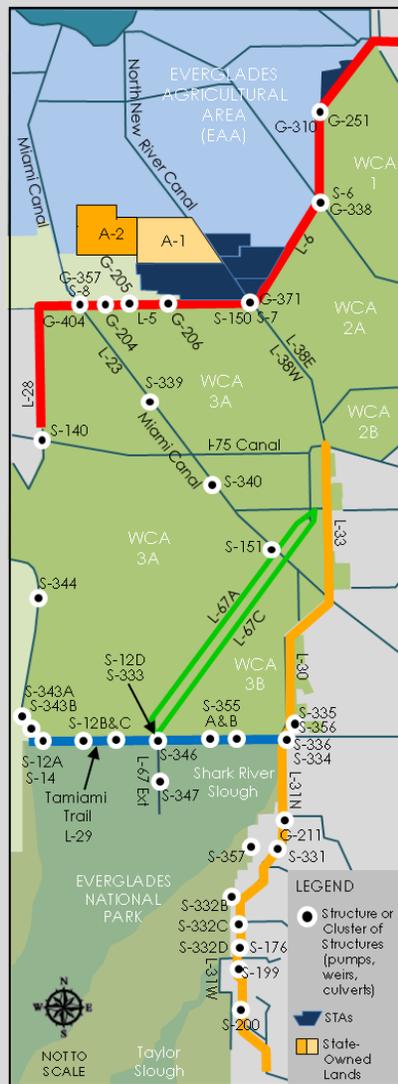
CEPP OBJECTIVES

- 3 Reduce water loss out of natural system to promote appropriate dry season recession rates for wildlife utilization.
- 6 Increase availability of water supply

CEPP CONSTRAINTS

Avoid any reduction in level of service for flood protection.

Provide replacement sources of water of comparable quantity and quality for existing legal users for reductions caused by the project



1 SCREEN MANAGEMENT MEASURES 3.2.4.1

1. Canvass CERP efforts for measures and identify new measures
2. Determine consistency with CEPP objectives and constraints
3. Screen & optimize configurations of measures (sizes, locations, combinations) based on:
 - Flooding impacts
 - Effectiveness
 - Land available
 - Cost

RESULT

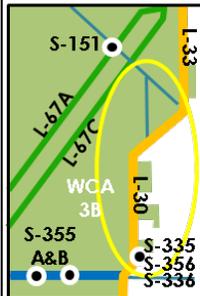
- New Pump Stations
- Raised Canal Stages
- New Canals
- Divide Structure
- Operational Changes
- Relocate /Operate Existing Pumps
- In-Ground Seepage Barrier
- Step-Down Levee

2 LOCATE MANAGEMENT MEASURES 3.2.4.2

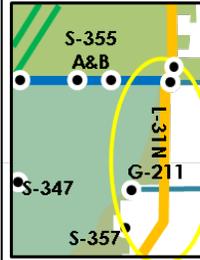
1. Seepage management location is directly related to the spatial distribution and quantity of water delivered across the L-67 levees and Tamiami Trail

RESULT

- North of Tamiami Trail



- South of Tamiami Trail



3 FORMULATE OPTIONS 3.2.4.3

1. **Sensitivity modeling** using several quantities of new water and existing facilities to predict locations and volumes of seepage
2. **Sensitivity modeling** of five sets of management measures to assess performance trends and effectiveness
 - Seepage Barrier | S-335 to S-334
 - Seepage Barrier Pennsuco to G-211
 - Convey Discharges to Coastal Canals + Utilize North and South Detention areas
 - Distributed pump scenario
 - Hydraulic Ridge + Pennsuco Pump

Criteria

Quantity of water seepage into the LEC Canal Stage
Groundwater Stage
Structure Flow through Coastal Structures

RESULT

Each set of measures had some level of success in reducing seepage and retaining water within the natural areas

4 EVALUATE OPTIONS 3.2.4.4

1. Further evaluation of modeling results

Criteria:

- Adaptability
- Fuel consumption
- Land requirements and costs
- O&M costs

RESULT

Four seepage Management measures to be included in final alternatives:

- Increase S-356 to 1,000cfs
- Full depth seepage barrier between S-335 and S-334
- Partial depth seepage barrier
- 250 cfs seepage return pumps on L-31 N



Figure 6. Seepage Management Along the Lower East Coast Protection Levee

Final Array of Alternative Plans: A key tenet of CEPP formulation is the interdependency of project components; therefore, the storage and treatment (i.e. water budget), distribution and conveyance, and seepage management components are not standalone features and, while formulated from a spatial perspective, do not function separately from the remaining portions of CEPP. Benefits are realized south of the storage and treatment facilities through redistribution and conveyance of the existing and “new” water made available. Likewise, the design of the seepage management features is highly dependent on the spatial distribution, directionality, and quantity of water that is moving into and through WCA 3A, WCA 3B, and ENP for restoration of natural habitat within these specific areas. Combining the options (See **Figures 3** through **6**) identified through the plan formulation screening resulted in four alternatives to be considered in the final array (**Figure 7**).

The final array was evaluated by utilizing a cost effectiveness/incremental cost analysis (CE/ICA) that was based on average annual habitat unit (HU) values compared to costs. Further evaluation of the final array was conducted by comparing alternative consistency with objectives and constraints, the four Principles and Guidelines criteria (Completeness, Acceptability, Efficiency and Effectiveness), the system of accounts (National Economic Development, Environmental Quality, Regional Economic Development and Other Social Effects), and effects on the environment. The evaluation and comparison resulted in the identification of the National Ecosystem Restoration (NER) plan and the recommended plan.

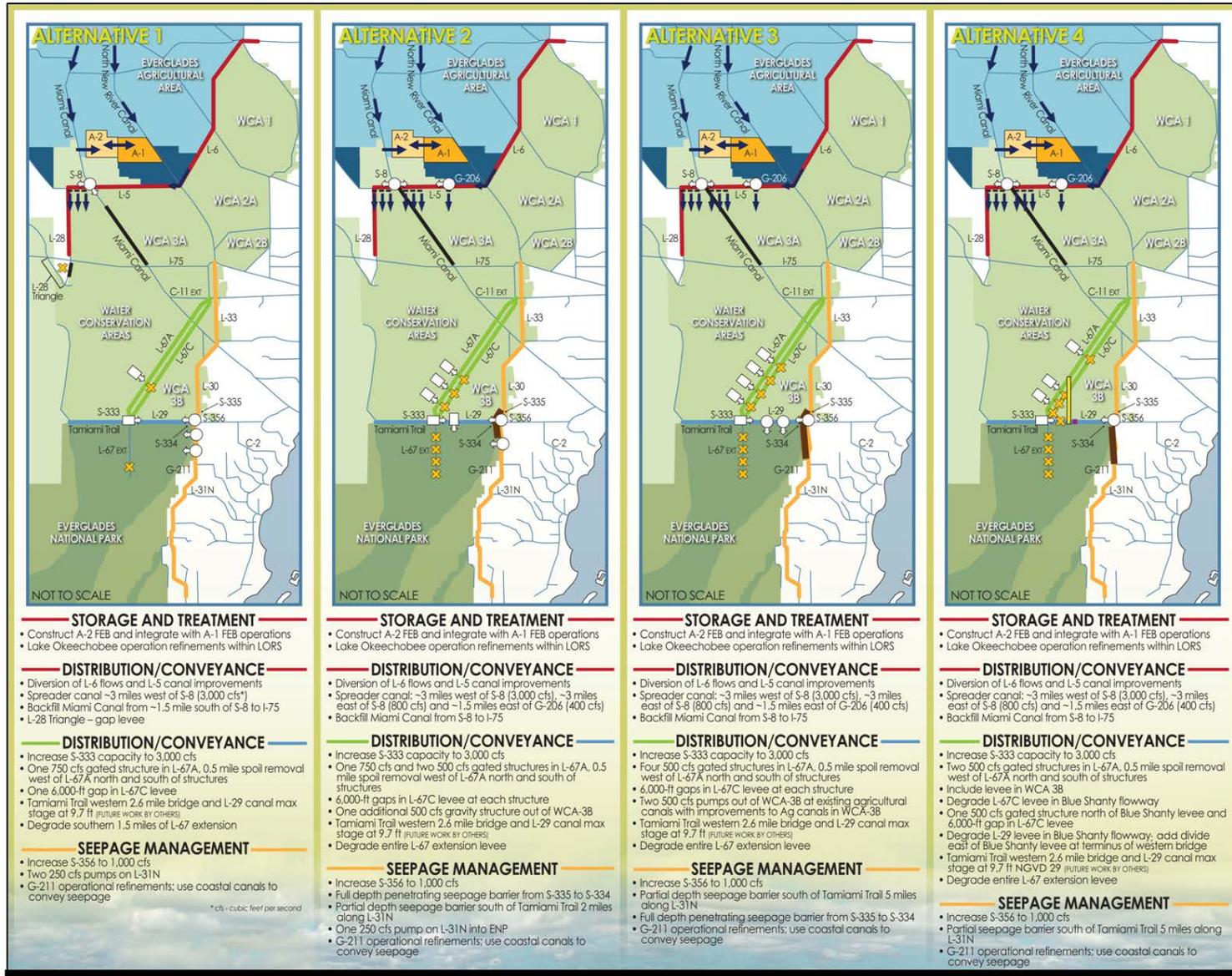


Figure 7. Final Array of Alternatives

Comparison of Alternatives: The final array of alternatives was evaluated using ecological output measured in HUs and alternative costs. The cost effectiveness analysis compared the costs and outputs of alternative plans to identify the least cost plan for every level of output considered. Alternative plans were compared to identify those that would produce greater levels of output at the same cost, or at a lesser cost, as other alternative plans. Alternative plans identified through this comparison were the cost effective alternative plans. Cost effective plans were then compared by examining the additional (incremental) costs for the additional (incremental) amounts of output produced by successively larger cost effective plans. The plans with the lowest incremental costs per unit of output for successively larger levels of output are the best buy plans.

Sometimes it is difficult to summarize the results of CE/ICA when the analyses are performed separately on HUs for distinct species, communities or geographic areas. This phenomenon often occurs simply because different management measures or alternative plans have different functions, provide different types of output, and provide benefits to different biological communities. This is the case for the CEPP plans, in which certain features or alternatives provide greater benefits to Florida Bay and ENP, while other alternatives provide greater benefits for northern WCA 3A and WCA 3B.

Costs and benefits for each geographic area (Northern Estuaries, Greater Everglades (WCA 3A and ENP) and Florida Bay) were examined both independently and combined. However, a combined HU score summing all geographic areas of the study area, while not appropriately representing the significance of each geographic area, provides a valuable cumulative analysis for determining the plan that best meets the needs of the entire watershed; for this reason, the combined HU were used to ensure a cost effective solution was identified.

For the incremental cost analysis, only the cost effective plans are arranged by increasing output to show changes in cost (marginal cost) and changes in output (marginal output) of each cost effective alternative plan compared to the without plan condition. The CE/ICA was performed using the following four spatial metrics to represent various ecosystem outputs of the CEPP alternatives:

1. System-Wide HU Score
2. Northern Estuaries alone
3. Greater Everglades (WCA 3A and ENP) alone
4. Florida Bay alone

Both Alternatives 1 and 4 were identified as being cost effective (**Table 2**). Alternative 1 has the lowest cost per unit of output of any alternative (\$376 per combined HU produced). The next best alternative in terms of average cost per combined HU is Alternative 4 (\$381).

Table 2. Results of cost effectiveness analysis for total system-wide performance

	Alt 1	Alt 2	Alt 3	Alt 4
Average Annual Cost	\$92,500,000	\$108,000,000	\$113,400,000	\$106,800,000
Northern Estuaries	6,859	6,859	6,859	6,859
Greater Everglades (WCA 3 and ENP)	180,426	177,096	182,512	190,875
Florida Bay	58,463	56,830	72,171	82,359
Average Annual System Wide Habitat Units	245,748	240,785	261,542	280,094
Average Annual Cost/Average Annual Habitat Unit	\$376	\$449	\$434	\$381
Cost Effective	YES			YES

Notes: Values for alternatives are differences between “Without” plan and “With” plan on an average annual basis. Alternatives are arranged by increasing costs.

Alternative 4 provides an increment of 34,345 additional average annual HUs produced over Alternative 1 at an incremental cost of over \$14,300,000, which corresponds to an incremental cost of \$416 per HU (**Table 3**). Alternative 4 provides approximately 14% greater benefits for a cost increase of 15%.

Table 3. Results of Incremental Cost Analysis

	Average Annual Cost	Average Annual Habitat Units	Cost Per Average Annual Habitat Unit	Incremental Average Annual Cost Increase	Incremental Average Annual Habitat Unit Increase	Incremental Average Annual Cost/Average Annual Habitat Unit
Alt 1	\$92,500,000	245,748	\$376	\$92,500,000	245,748	\$376
Alt 4	\$106,800,000	280,093	\$381	\$14,300,000	34,345	\$416

Following the results of the system-wide CE/ICA analysis, a more detailed efficiency analysis examination of alternative components following the spatial perspective was completed to:

- Provide insight into the efficiency of specific components
- Provide logic and opportunity to modify alternatives to maximize benefits while minimizing costs
- Identify information that would support selection of a more expensive cost effective plan to determine if the additional benefit is worth the additional cost

Resulting from the efficiency analysis, Hydropattern Restoration Feature (HRF) and Miami Canal infrastructure modifications were recommended to Alternatives 2, 3 and 4, to match the infrastructure proposed in Alternative 1, and the descriptor “M” was added to the title of these alternatives to represent the modification. The HRF and Miami Canal infrastructure included in Alternative 1 are the features that most efficiently minimize costs while providing greater benefits than the other alternatives.

Modifications to the HRF and Miami Canal infrastructure for Alternatives 2M, 3M, and 4M, resulted in cost reductions of \$176,000,000 (when accounting for additional preconstruction engineering and design (PED) and S/A (Supervision and Administration) savings) for these alternatives (**Table 4**). Since there was no significant difference between alternatives for the area influenced by the HRF and Miami Canal backfill, benefits were not recalculated and consequently, these alternatives were not re-modeled. Alternative 1 and Alternative 4M are cost effective for the revised system-wide evaluation. The original Alternatives 2, 3 and 4 would no longer be cost effective since the costs of the modified alternatives decreased while the benefits were unchanged. Alternative 4M is the lowest cost per HU alternative at producing system-wide benefits, and is therefore the only best buy alternative.

Table 4. Modified Alternative Construction, Real Estate and Operations, Maintenance, Repair, Replacement and Rehabilitation Cost

	Alt 1	Alt 2M	Alt 3M	Alt 4M
Construction Costs	\$1,854,000,000	\$1,998,000,000	\$2,106,000,000	\$1,971,000,000
Real Estate	\$41,000,000	\$39,000,000	\$39,000,000	\$39,000,000
Total First Cost	\$1,895,000,000	\$2,037,000,000	\$2,145,000,000	\$2,010,000,000
Total Project Investment*	\$2,041,000,000	\$2,193,000,000	\$2,309,000,000	\$2,164,000,000
OMRR&R	\$5,500,000	\$6,400,000	\$6,900,000	\$6,500,000
Average Annual Cost	\$92,500,000	\$99,900,000	\$105,300,000	\$98,800,000
System-Wide Average Annual Habitat Unit Lift	245,748	240,785	261,542	280,094
Average Annual Cost/ Average Annual Habitat Units	\$376	\$415	\$403	\$353
Cost Effective	YES			YES
Best Buy				YES

*Total project investment includes interest during construction

An alternative plan that reasonably maximizes ecosystem restoration benefits compared to costs, consistent with the Federal objective, was identified as the National Ecosystem Restoration (NER) plan. Selecting the NER plan requires careful consideration that the plan meets planning objectives and constraints and reasonably maximizes environmental benefits, while passing tests of cost effectiveness and incremental cost analyses, significance of outputs, acceptability, completeness, efficiency, and effectiveness.

The results of the NER analysis identified Alternative 4M infrastructure as providing the greatest overall benefits with the least cost per HU and as the NER plan; however, the evaluation also identified the need to revise the operations of Alternative 4M to ensure the project savings clause constraints were met, localized adverse ecological effects were minimized, and additional opportunities to provide for other water related needs were identified. Three modeling scenarios were conducted to identify project effects resulting from operational changes: Alternative 4R, Alternative 4R1, and Alternative 4R2.

- Alternative 4R did not fully address localized adverse ecological effects nor did it identify additional opportunities for other water related needs. A 6% decrease in ecosystem

benefits compared to Alternative 4M was observed for Alternative 4R due to competing demands for the allocation of water in the regional system.

- Alternative 4R1 was successful in delivering additional 71 MGD of available water supply to LECSA 2 and LECSA 3 while maintaining ecosystem benefits identified by Alternative 4R. However, Alternative 4R1 caused potential adverse impacts to Biscayne Bay by reducing freshwater flows to the Bay. Additionally, groundwater drawdowns in the vicinity of regional canals were observed which could lead to increased saltwater intrusion and potential impacts to local wetlands.
- Alternative 4R2 was successful in delivering an additional 12 MGD of available water supply to LECSA 2 and 5 MGD to LECSA 3 while improving benefits relative to Alternative 4R, and the alternative maintained freshwater flows to Biscayne Bay. Alternative 4R2 also provided approximately 210,000 acre-feet average annual flow to the Everglades System, which is more than Alternative 4R.

While the costs of Alternatives 4R and 4R2 are equal, Alternative 4R2 provides slightly improved environmental benefits, better meets the project objective of increasing public water supply opportunities, and alleviates concerns over meeting constraints of the project. After a thorough comparison, Alternative 4R2 was selected as the recommended plan.

Recommended Plan: The components of the recommended plan are organized into four geographic areas: North of the Redline, South of the Redline, the Green/Blue lines and along the Yellowline.

- I. **Everglades Agricultural Area (EAA)** (North of the Redline) includes construction and operations to divert, store and treat Lake Okeechobee regulatory releases.

Storage and treatment of new water will be possible with the construction of a 14,000 acre Flowage Equalization Basin (FEB) and associated distribution features on the A-2 footprint that is operationally integrated with the State-owned and State-constructed A-1 FEB and existing stormwater treatment areas (STAs). The A-2 FEB will accept EAA runoff and a portion of the Lake Okeechobee water currently discharged to the estuaries. This Lake Okeechobee water is diverted to the FEB when FEB/STAs and canals have capacity. The C-44 Reservoir also collects water that would go to the St. Lucie Estuary, and CEPP modifies operations of the reservoir to return a portion of this water back to Lake Okeechobee, from which water can be delivered to the FEB or used to provide water supply deliveries.

CEPP benefits gained from sending new water south from Lake Okeechobee are derived in part from operational refinements that can take place within the existing, inherent flexibility of the 2008 Lake Okeechobee Regulation Schedule (LORS), and in part with refinements that are beyond the schedule's current flexibility. Modifications to 2008 LORS will be required to optimally utilize the added storage capacity of the A-2 FEB to send the full 210,000 acre-feet per year of new water available in CEPP south to the Everglades, while maintaining compliance with Savings Clause requirements for water supply and flood control performance levels.

The recommended plan operations also expand on the 2008 LORS backflow operations to Lake Okeechobee through the following operational changes: (1) backflow to Lake Okeechobee from the C-44 Canal is allowed when S-308 is not open for regulatory discharge and the stage in Lake Okeechobee is below 14.5 feet (ft) National Geodetic Vertical Datum (NGVD) (no seasonal

variability); and (2) discharges from the Indian River Lagoon-South project C-44 Reservoir to the C-44 Canal are made when the stage in Lake Okeechobee is below the baseflow zone of the 2008 LORS schedule to provide an additional source of backflow water to Lake Okeechobee.

Independent of CEPP implementation, there is an expectation that revisions to the 2008 LORS will be needed following the implementation of other CERP projects and Herbert Hoover Dike infrastructure remediation. It is anticipated that the need for modifications to the 2008 LORS will be initially triggered by non-CEPP actions and that these actions will occur earlier than implementation of CEPP. Therefore, the CEPP PIR is not used as the mechanism to propose or conduct the required National Environmental Policy Act (NEPA) evaluation of modifications to the LORS. However, depending on the ultimate outcome of these future LORS revisions, including the level of inherent operational flexibility provided with these revisions, CEPP implementation may still require further LORS revisions to optimize system-wide performance and ensure compliance with Savings Clause requirements.

- II. **WCA 2A and Northern WCA 3A** (South of the Redline) includes conveyance features to deliver and distribute existing flows and the redirected Lake Okeechobee water through WCA 3A.

Backfilling 13.5 miles of the Miami Canal between I-75 and 1.5 miles south of the S-8 pump station, and converting the L-4 Canal into a spreader canal by removing 2.9 miles of the southern L-4 Levee are the key features needed to ensure spatial distribution and flow directionality of the water entering WCA 3A.

Conveyance features to move water into and through the northwest portion of WCA 3A include: a gated culvert to deliver water from the L-6 Canal to the remnant L-5 Canal, a new gated spillway to deliver water from the remnant L-5 Canal to the western L-5 Canal (during L-6 diversion operations); a new gated spillway to deliver water from STA 3/4 to the S-7 pump station during peak discharge events (eastern flow route is not typically used during normal operations), including L-6 diversion operations; approximately 13.6 miles of conveyance improvements to the L-5 Canal; a new 360 cubic feet per second (cfs) pump station to move water within the L-4 Canal to maintain water supply deliveries to retain the existing functionality of STA-5 and STA-6 and maintain water supply to existing legal users, including the Seminole Tribe of Florida; and new gated culverts and an associated new canal to deliver water from the Miami Canal (downstream of S-8, which pulls water from the L-5 Canal) to the L-4 Canal, along with potential design modifications to the existing S-8 and G-404 pump stations.

The Miami Canal will be backfilled to approximately 1.5 ft below the peat surface of the adjacent marsh. Spoil mounds on the east and west side of the Miami Canal from S-8 to I-75 will be used as a source for Miami Canal backfill material. Refuge for mammals and other upland species will continue to be provided by the retention of 22 of the highest priority Florida Fish and Wildlife Conservation Commission (FWC) enhanced spoil mounds between S-339 (located approximately 10 miles south of S-339) to I-75 and the creation of additional upland landscape (constructed tree islands) approximately every mile along the entire reach of the backfilled Miami canal section (S-8 to I-75) where historic ridges and tree islands once existed. The constructed tree islands will block flow down the backfilled canal in addition to the canal backfilling. A preliminary Miami Canal constructed tree island design was determined during CEPP's planning

in order to incorporate the best available science; additional construction and contracting details will be determined during CEPP PED phase.

III. **Southern WCA 3A, WCA 3B, and ENP** (Green/Blue Lines) includes conveyance features to deliver and distribute water from WCA 3A to WCA 3B and ENP.

A new Blue Shanty Levee extending from Tamiami Trail northward to the L-67A Levee will be constructed. This approximately north-south Blue Shanty Levee will divide WCA 3B into two subunits, a large eastern unit (3B-E) and a smaller western unit, the Blue Shanty Flowway (3B-W). A new levee is the most efficient means to restore continuous southerly sheetflow through a practicable section of WCA 3B and alleviates concerns over effects on tree islands by maintaining lower water depths and stages in WCA 3B-E. The width of the 3B-W flowway is aligned to the width of the downstream 2.6-Mile Tamiami Trail Next Steps Bridge, optimizing the effectiveness of both the flowway and bridge.

In the western unit, construction of two new gated control structures on the L-67A, removal of the L-67C and L-29 Levees within the flowway, and construction of a gated spillway in the L-29 Canal will enable continuous sheetflow of water to be delivered from WCA 3A through WCA 3B-W to ENP. A third gated control structure in the L-67A Levee and associated gap in the L-67C Levee, both outside the flowway, will improve the hydroperiod of the eastern unit of WCA 3B. Spoil mounds along the northwestern side of the L-67A Canal, in the proximity to the three new L-67A structures will also be removed to facilitate sheetflow connectivity with the WCA 3A marsh.

Increased outlet capability at the S-333 structure at the southern terminus of the L-67A Canal, removal of approximately 5.5 miles of the L-67 Extension Levee, and removal of approximately 6 miles of Old Tamiami Trail between the ENP Tram Road and the L-67 Extension Levee will facilitate additional deliveries of water from WCA 3A directly to ENP. Detailed design and construction of these features will minimize project footprints due to the nature of these environmentally sensitive areas.

IV. **Lower East Coast Protective Levee** (Yellowline) includes features primarily for seepage management, which are required to mitigate for increased seepage resulting from the additional flows into WCA 3B and ENP.

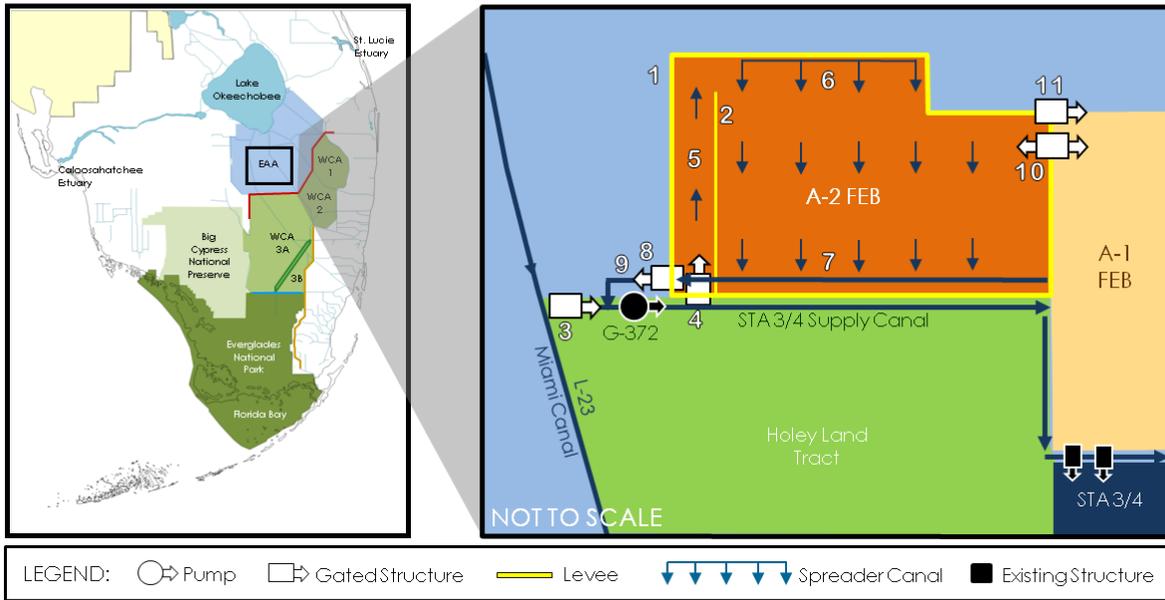
A newly constructed pump station with a combined capacity of 1,000 cfs will replace the existing temporary S-356 pump station, and a 4.2-mile partial depth seepage barrier will be built along the L-31N Levee south of Tamiami Trail.

There is an existing 2-mile seepage cutoff wall in the same vicinity that was constructed by a permittee as mitigation to offset authorized impacts under a Clean Water Act (CWA) Section 404 permit. There is a possibility that the same permittee may construct an additional 5 miles of seepage wall south of the 2-mile seepage wall, if permitted. Since the capability and effectiveness of the existing seepage wall to mitigate seepage losses from ENP remains under investigation, the recommended plan conservatively includes an approximately 4.2 mile long, 35 ft deep tapering seepage barrier in the event construction is necessary. There are remaining uncertainties about the effectiveness of the recommended plan seepage cutoff wall in maintaining desired stages in marshes of ENP while maintaining flood protection and canal

stages to the east without limiting water availability to water users and Biscayne Bay. Therefore, additional analysis of the CEPP seepage cutoff wall will be conducted as an early phase in PED.

The specific feature locations of the recommended plan are shown in **Figure 8** through **Figure 11**.

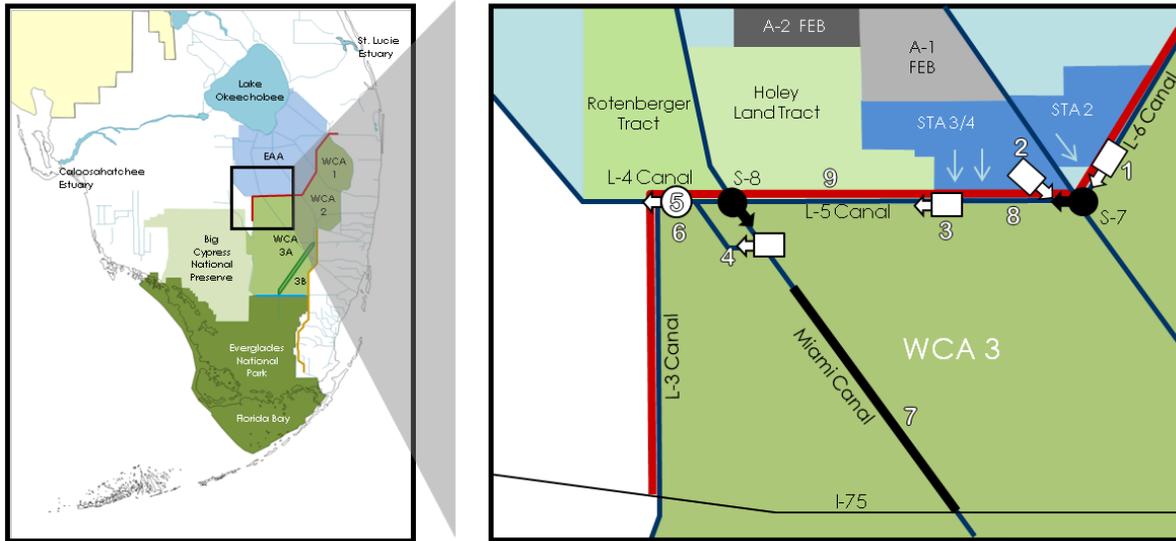
NORTH OF THE REDLINE STORAGE AND TREATMENT EQUALIZATION BASIN (FEB) – A2



#	STRUCTURE	STRUCTURE/FEATURE TYPE	CFS	TECHNICAL NOTES
1	L-624	Levee		Perimeter Levee (~ 20 miles, 11.3 feet high, 14 feet wide, 3:1 side slope)
2	L-625	Levee		Interior levee (~ 4 miles, 11.3 feet high, 12 feet wide, 3:1 side slope)
3	S-623	Gated Spillway	3700	Delivers water from Miami Canal to existing G-372 pump station
4	S-624	Gated Sag Culvert (FEB inflow structure)	1 550	Receives water from existing pump station G-372 via STA 3/4 Supply Canal and delivers it to C-624 FEB inflow canal
5	C-624	FEB Inflow Canal	1 550	Conveys water from FEB inflow structure S-624 to FEB C-624 E spreader canal (length: ~ 4 miles)
6	C-624E	FEB Spreader Canal		Distributes FEB inflows across northern FEB; sheetflow within FEB is generally north to south (length: ~ 4 miles)
7	C-625E	FEB Collection Canal	400	Existing seepage canal for STA 3/4 Supply Canal, used to supplement FEB sheetflow during normal operating conditions
8	S-625	Gated Culverts (FEB discharge structure)	1 550	Delivers water to FEB outflow canal (C-625W)
9	C-625W	FEB Outflow Canal	1 550	FEB Outflow Canal is the extended seepage canal for the STA 3/4 Supply Canal; delivers water via existing G-372 pump station to STA 3/4 for water quality treatment
10	S-628	Gated Culvert (FEB intake/discharge structure)	930	Delivers water in both directions between A-2 FEB and A-1 FEB for operational flexibility
11	S-627	Emergency Overflow weir	445	Location to be determined
A-2 FEB design also includes an exterior seepage collection system (not illustrated):				
	C-626	Seepage Canal	400	~ 11 miles
	S-626	Seepage Pump Station	500	Delivers seepage back into the FEB outflow canal C-625W

Figure 8. Recommended Plan Treatment and Storage Feature Locations

SOUTH OF THE REDLINE DISTRIBUTION AND CONVEYANCE

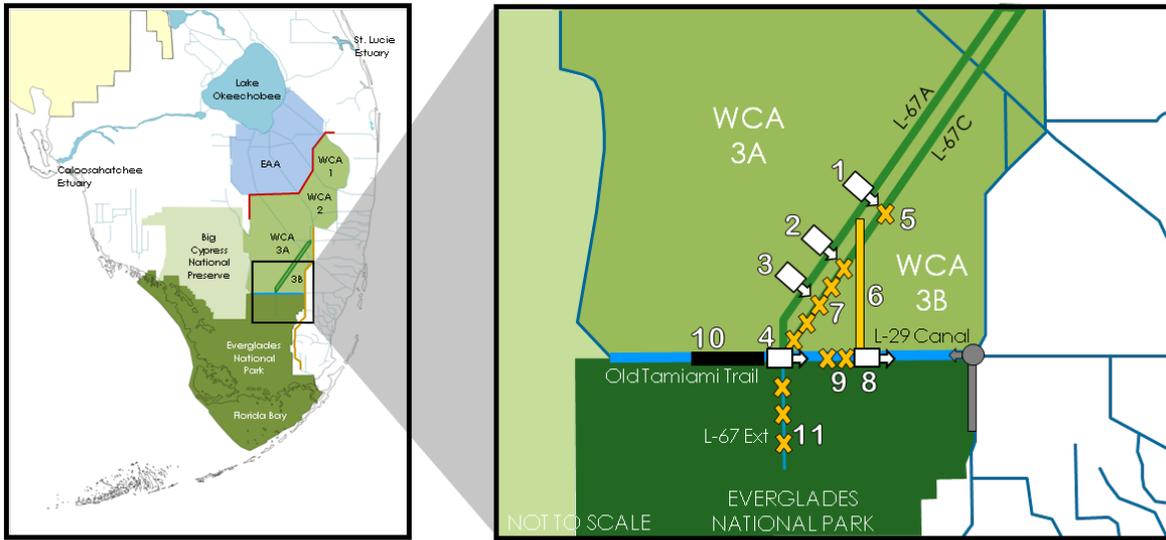


LEGEND: Pump Gated Structure Levee Removal Existing Structure

#	STRUCTURE	STRUCTURE/FEATURE TYPE	CFS	TECHNICAL NOTES
1	S-620	Gated Culvert	500	Delivers water from L-6 Canal to L-5 Canal
2	S-621	Gated Spillway	2500	Closed to direct STA 3/4 discharges to western L-5 Canal during normal operations; controls water from STA 3 /4 to the existing S-7 pump station during peak events
3	S-622	Gated Spillway	500	Delivers water from east to west in L-5 Canal (replaces existing L-5 canal plug)
4	S-8A	Gated Culverts with Canal	3080 & 1020	Existing S-8 pump station delivers water from L-5 Canal to Miami Canal; S-8A delivers water from Miami Canal to L-4 Canal (3120 cfs) and remaining Miami Canal segment (1040 cfs); potential design modifications to the existing S-8/G-404 complex will be assessed during PED
5	S-630	Pump Station	360	Delivers water from L-4 Canal west to maintain existing water supply deliveries
6		L-4 Levee Removal		Removes ~2.9 miles of south L-4 Levee
7		Miami Canal Backfill with Tree Islands Mounds		Remove ~ 13.5 miles of Miami Canal , from 1.5 miles south of S-8 to I-75; tree island mounds create habitat and promote sheetflow in WCA-3A within the footprint of the former Miami Canal
8		L-5 Remnant Canal	500	Enlarging canal to expand capacity of L-5 Canal (between S-621 & S-622)
9		L-5 Canal	3000	Enlarging canal to expand capacity of L-5 Canal (between S-622 & S-8)

Figure 9. Recommended Plan Northern Conveyance and Distribution Features and Locations

BLUE AND GREEN LINES DISTRIBUTION AND CONVEYANCE



LEGEND: Pump Gated Structure Levee Levee Removal Road Removal Yellow Line Features

#	STRUCTURE	STRUCTURE/FEATURE TYPE	CFS	TECHNICAL NOTES
1	S-631	Gated Culvert	500	Delivers water from WCA 3A to 3B, east of L-67D Levee
2	S-632	Gated Culvert	500	Delivers water from WCA 3A to 3B, west of L-67D Levee
3	S-633	Gated Culvert	500	Delivers water from WCA 3A to 3B, west of L-67D Levee
4	S-333 (N)	Gated Spillway w/new canal	1150	Delivers water from L-67A Canal to L-29 Canal; supplements existing S-333 gated spillway
5		L-67C Levee Removal Gap		Gap, ~ 6000 feet (corresponding to S-631)
6	L-67D	Blue Shanty Levee		Levee, ~ 8.5 miles, connecting from L-67A to L-29 (6 feet high, 14-foot crest width, 3:1 side slopes)
7		L-67C Levee Removal		Complete removal of ~ 8 miles from New Blue Shanty Levee (L-67D) south to intersection of L-67A/L-67C; L-67C canal is not backfilled
8	S-355W	Gated Spillway	1230	Maintains water deliveries to eastern L-29 Canal
9		Levee Removal (L-29)		Removal of ~ 4.3 miles between L-67A and Blue Shanty Levee intersection with L-29 Levee
10		Removal of remnants of Old Tamiami Trail roadway		Removal of ~ 6 miles of roadway west of L-67 Extension
11		L-67 Extension Levee Removal and Canal Backfill)		Complete removal of ~ 5.5 miles of remaining L-67 Extension, including S-346 culvert

Figure 10. Recommended Plan Southern Distribution and Conveyance Features and Location

YELLOW LINES SEEPAGE MANAGEMENT

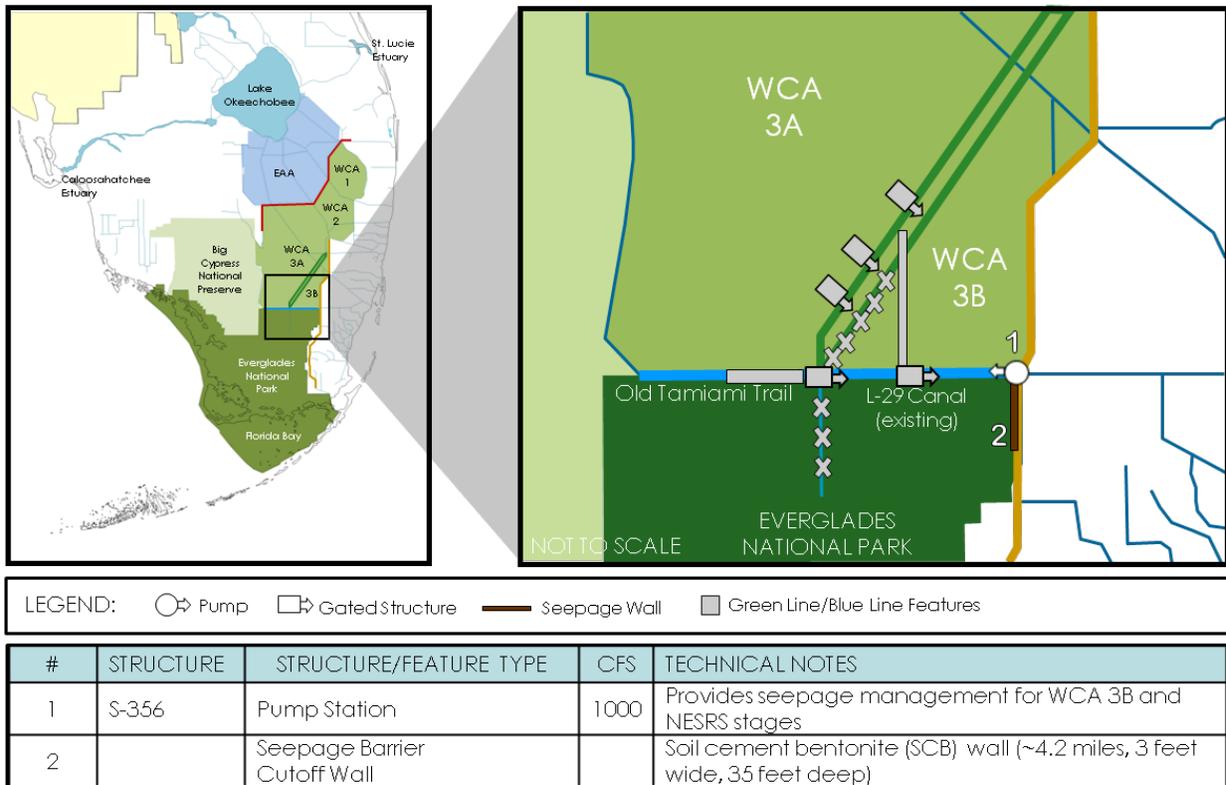


Figure 11. Recommended Plan Seepage Management Features and Location

Systems/Watershed Context: The recommended plan was formulated to maximize system-wide benefits and is consistent with the goals and objectives of the CERP. The evaluation of project effects demonstrates that the proposed project will benefit the Northern Estuaries and the Everglades ecosystem, including WCA 3, ENP, and Florida Bay.

The lead agency is the USACE, Jacksonville District. Regulations for implementing the National Environmental Policy Act (NEPA) state that, when requested by the lead agency, any other Federal agency having special expertise with respect to any environmental issue that should be addressed in the study, may be a cooperating agency upon request of the lead agency. Several agencies were requested to be cooperating agencies because of their special expertise in the subject area including the SFWMD and the Department of Interior (DOI) including U.S. Fish and Wildlife Service (USFWS) and ENP. None of the agencies accepted to be an official cooperating agency under the NEPA. The selection of these agencies to be invited as cooperating agencies did not exclude any other agencies from full participation in the project.

Environmental Operating Principles: The proposed project is consistent with the USACE Environmental Operating Principles (EOP) particularly with respect to the south Florida ecosystem-wide approach for plan formulation, evaluation, and selection, and a holistic

consideration of water resources needs and solutions to water resources problems in the study area.

USACE EOP are addressed for this project as follows: 1) Each element of human health, welfare, and viability of natural systems was thoroughly assessed throughout this report in a responsible manner; 2) Impacts to the environment were thoroughly assessed in this report and any impacts have been thoroughly evaluated and minimized to the extent practicable; 3) The USACE developed an Adaptive Management (AM) and Monitoring Plan for CEPP to identify the monitoring information needed to inform implementation and to ensure the proposed project is achieving the intended purposes within its constraints; 4) The USACE collected a great deal of information throughout the preparation of this study which has been thoughtfully prepared and organized in a manner so as to facilitate a greater knowledge base about the area, its challenges, and the opportunities which can be achieved; 5) The USACE worked with many agencies, individuals, and groups throughout this study, sharing scientific information and exchanging ideas for the betterment of a design that will find solutions to the problem while maintaining the level of quality within the surrounding environment.

Peer Review: An external Agency Technical Review (ATR) was performed by a multi-disciplinary team consisting of technical staff from the USACE Districts. The ATR team membership and the scope of ATR work were coordinated with the USACE National Ecosystem Restoration Planning Center of Expertise (ECO-PCX). The ATR team consisted of nine individuals with the technical expertise in the following categories: civil works planning/economics, environmental and ecological evaluation, hydraulic engineering, geotechnical engineering, cost engineering, and real estate. ATR was performed on all products subjected to formal review outside of the Jacksonville District, in this case, including the Draft PIR and Final PIR. Leading up to the ATR of the Draft PIR, where practicable, technical products that supported subsequent analyses were reviewed prior to being used in the study, including interim review of the following products: study area description, purpose and scope, study authority, Federal interest and USACE Interest, future without project conditions, problems and opportunities, plan formulation including modeling strategy and formulation strategy, economic, environmental, cultural, and social inventories, cost estimates, etc. The following documents the purpose and completion date of each ATR.

ATR 1 Plan Formulation Framework Completed April 9, 2012: Products reviewed included planning framework, management measure screening strategy, modeling/design strategy, and ecological evaluation techniques.

ATR 2 Management Measure Formulation and Screening: Completed March 11, 2013. Products reviewed included identification of the final array, including ecological evaluation screening results of the management measures, parametric cost results, and optimization results.

ATR 3 Final Array Evaluation Completed March 15, 2013: Products reviewed included the application of habitat units for the final array, costs of final array (construction, real estate and O&M), value engineering analysis, and cost effectiveness and incremental cost analysis.

ATR 4 Draft Report Completed January 28, 2014: Products reviewed included review of draft report.

ATR 5 Final Report Completed February 26, 2014: Products reviewed included review of final report.

Engineering models directed for ATR review were reviewed as a separate effort between ATR 1 and ATR2.

The ATRs have been completed to the satisfaction of the ATR team. Comments requiring significant discussion and/or noted as critical by the ATR team related to the appropriateness of the water supply objective, the ability of the CEPP Planning Model to represent change, the lack of information about the planning-level cost estimating tool, the display of the Principles and Guideline evaluation criteria and the NER analysis, and the inclusion of camp sites as recreation features. All concerns resulting from ATR of the report have been resolved, and all necessary changes were made in the report.

The Independent External Peer Review (IEPR) was performed by the Battelle Memorial Institute (Battelle) through a contract with the U.S. Army Engineer Institute for Water Resources. The IEPR panel consisted of four individuals selected by Battelle with the technical expertise in the following categories: civil works planning/economics, environmental and ecological evaluation, hydraulic engineering, and geotechnical engineering. IEPR was performed on the Draft PIR dated August 13, 2013. The Final Report from the IEPR panel was issued October, 10 2013. Overall, eight final comments were identified and documented. Of the eight comments, 2 were identified as having high significance, 4 were identified as having medium significance, and 2 were identified as having low significance. Comments of high significance in the Final Report included requests to add additional information to the report addressing the impacts to navigation on the Okeechobee Intercoastal Waterway and cultural resources (including human remains/burial sites). The Jacksonville District has prepared the Draft Agency Response detailing actions undertaken in response to the Final Report. All concerns resulting from IEPR of the report have been resolved, and all necessary changes were made in the report.

EXPECTED PROJECT PERFORMANCE

Project Costs: Table 5 includes a breakdown of the estimated costs of CEPP by construction and non-construction costs for ecosystem restoration activities. Lands and Damages generally include LERR (lands, easements, rights-of-way and relocations), Engineering During Construction (EDC), PED and Supervision and Administration (S&A) costs. Costs were estimated at Fiscal Year 2014 price levels and rounded to the nearest \$1,000,000. The Federal discount rate of 3.5% and a 50-year economic period of analysis were used to amortize costs and determine the project investment costs.

Table 5. Ecosystem Restoration Cost Estimates (2014 Prive Level)^{1, 2}

Construction Phase Items	Cost
06 Fish and Wildlife (monitoring and adaptive management)	\$106,000,000
09 Channels & Canals	\$370,000,000
11 Levees	\$399,000,000
13 Pumping Plant	\$133,000,000
15 Floodway Control and Diversion	\$342,000,000
18 Cultural Resources Preservation	\$26,000,000
32 HTRW Investigations	\$1,000,000
Construction Features Sub-Total	\$1,377,000,000
Preconstruction Engineering and Design (PED), Engineering During Construction (EDC) and Planning	\$345,000,000
Construction Management (S&A)	\$135,000,000
Lands & Damages	\$37,000,000
Total First Cost	\$1,894,000,000

¹ Construction costs in this table include contingencies

² Recreation costs are not included in the ecosystem recreation cost estimates

Equivalent Annual Costs and Benefits: Based on preliminary engineering and design of the recommended plan, the average annual cost is \$100,000,000 (Table 6).

Table 6. Ecosystem Restoration Investment and Average Annual Costs

Investment Costs	
Total First Cost	\$1,894,000,000
Interest During Construction: Construction	\$96,000,000
Interest During Construction: Real Estate	\$4,000,000
Total Investment Cost	\$1,994,000,000
Average Annual Costs¹	
Interest and Amortization of Initial Investment	\$85,000,000
OMRR&R Sub Total	\$11,250,000
New Project Features	\$4,150,000
State Facilities	\$4,000,000
Invasive Species	\$3,100,000
Monitoring Sub-Total	\$3,880,000
Water Quality	\$710,000
Hydrometeorological	\$195,000
Ecological Sub-Total	\$2,145,000
<i>Biological Opinion</i>	<i>\$1,885,000</i>
<i>General Ecological Monitoring¹</i>	<i>\$260,000</i>
Adaptive Management ¹	\$690,000
Invasive Species ¹	\$140,000
Total Average Annual Costs²	\$100,000,000

¹ Costs reflect 10-year annual monitoring costs amortized over the period of analysis

² Total rounded to the nearest \$1,000,000

The expenditures attributed to recreation features are justified using a benefit to cost ratio. The tangible economic justification of the proposed project can be determined by comparing the equivalent average annual costs with the estimate of the equivalent average annual benefits realized over the period of analysis. The average annual recreation benefits and costs are summarized in **Table 7**. The Federally mandated project evaluation interest rate of 3.5 percent, an economic period of analysis of 50 years and 2014 price levels were used to evaluate economic feasibility. The benefit to cost ratio for the recreation features is 1.6 to 1, with net annual benefits of \$215,000.

Table 7. Summary of Recreation Costs and Benefits (Fiscal Year 2014)

Total Recreation Costs	\$6,400,000
Interest During Construction	\$330,000
Total Investment	\$6,730,000
Amortized	\$287,000
OMRR&R	\$65,000
Average Annual Cost	\$355,000
Unit Day Value ¹	\$7.79
Daily Use	200 users
Annual Use (200 users x 365 days)	73,000
Average Annual Benefit	\$570,000
Benefit to Cost	1.6 to 1
Net Annual Benefits	\$215,000

Cost Sharing: The total first cost of the restoration features of CEPP, including the value of LERR and PED costs, will be shared between the Federal Government and the non-Federal sponsor under the CERP program as a whole (**Table 8**). The non-Federal sponsor will provide cash, perform work-in-kind during planning, engineering and design or manage a portion of construction as necessary to meet its 50 percent share of the total first cost of the project to be balanced according to Section 601 of WRDA 2000.

Table 8: Cost Share for the CEPP Recommended Plan

Item	Federal Cost	Non-Federal Cost	Total ¹
<u>Ecosystem Restoration (ER)</u>			
Restoration Construction	\$676,875,000	\$700,125,000	\$1,377,000,000
PED ¹	\$172,500,000	\$172,500,000	\$345,000,000
Construction Management	\$67,500,000	\$67,500,000	\$135,000,000
LER&R	\$31,000,000	\$6,000,000	\$37,000,000
ER Subtotal	\$947,875,000	\$946,125,000	\$1,894,000,000
<u>Recreation (NED)</u>			
Recreation Subtotal	\$3,000,000	\$3,000,000	\$6,000,000
Total Project First Cost ²	\$950,875,000	\$949,125,000	\$1,900,000,000
<u>Average Annual Costs</u>			
OMRR&R - CEPP Features	\$2,075,000	\$2,075,000	\$4,150,000
OMRR&R - State Facilities	\$2,000,000	\$2,000,000	\$4,000,000
OMRR&R - Invasive Species	\$1,550,000	\$1,550,000	\$3,100,000
OMRR&R - Monitoring (cost per year over 10- year cycle) ³	\$1,345,000	\$1,345,000	\$2,690,000
OMRR&R - Monitoring (annual perpetual cost)	\$1,395,000	\$1,395,000	\$2,790,000
OMRR&R - Recreation		\$65,000	\$65,000

¹Construction costs totals are FY '14 First Costs Rounded to the nearest \$1,000,000 and include a 44% contingency

²Federal costs include cultural resources data recovery of \$1,750,000 represented at 100% federal responsibility

³10-year monitoring costs include are amortized over the period of analysis in **Table 6**

Section 601(e)(4) of the WRDA 2000 specifies that the OMRR&R of authorized projects of the CERP would be cost shared equally by the Federal Government and the non-Federal sponsor. Consistent with the provisions of Section 601(e)(4) of the WRDA of 2000 and given the multi-objective nature of the features in this plan, it is appropriate for the OMRR&R associated with the features of this plan to be shared equally between the Federal Government and the non-Federal sponsor. The Federal and non-Federal sponsor's obligations to provide OMRR&R will continue indefinitely unless the project is de-authorized by Congress. OMRR&R costs associated with recreation features of the plan will be funded 100 percent by the non-Federal sponsor.

The plan recommended by this PIR requires the use of several State facilities constructed and operated pursuant to State permits. The facilities are necessary for the State to meet Clean Water Act requirements as approved by the USEPA, and as litigated by the U.S. Department of Justice. Some of these requirements are currently subjected to a Settlement Agreement filed with and overseen by the Federal District Court (*United States v. South Florida Water Management District, et. al.*, Case No. 88-1886-CIV-Moreno (U.S.D.C., S.D. Fla.)).

The Non-Federal Sponsor is responsible for the operation, maintenance, repair, replacement, and rehabilitation of State Restoration Strategies and Everglades Construction Project facilities.

Certain of those facilities, as named below and herein after referred to as “State facilities”, are to be used by CEPP until such time as CEPP is deauthorized or it is determined used of the State facilities are no longer necessary for the purpose of achieving CEPP project purposes. However, the State’s A-1 FEB operations will be integrated with the A-2 FEB project feature and operated pursuant to a mutually agreed upon water control manual. The joint water control plan for the FEBs will integrate the operation of CEPP and the operation of the State facilities used by CEPP. The State facilities will use excess capacity to process “new water” provided by CEPP in addition to the water processed for purposes of achieving the State’s water quality requirements.

The State has requested cost sharing OMRR&R of the State facilities to be used by the CEPP project. Given the State features in question are Everglades Construction Project features, already constructed, or under construction pursuant to State compliance requirements and under permit for that purpose, and/or United State v. So. Fla. Water Management Dist. Settlement Agreement requirements, and cost sharing is prohibited by Section 528 of WRDA 1996, they may not be included as Federal project features and no cost sharing for construction would be allowed. There is currently no applicable authority which would allow for cost sharing any expenses associated with such features, including the OMRR&R costs. Thus, because of the current statutory and policy prohibitions against such cost sharing, as the 30 November 2007, *CERP, Water Quality Improvements, Policy Determination* Memorandum indicates, new statutory language affording such authority must be adopted as part of the CEPP project authorization in order for the State’s request to be effected.

The PIR recommends use of the following State facilities not previously cost shared for construction under the C&SF Project or other Federal authority and the listed C&SF features that are currently cost shared pursuant to executed resolutions: (1) STA 2, (2) STA 3/4, (3) A-1 FEB, (4) G-370 Pump Station, (5) G-371 Gated Spillway, (6) G-372 Pump Station, (7) G-357 Gated Culvert, (8) G-404 Pump Station, (9) G-434 Pump Station, (10) G-435 Pump Station, (11) S-6 Pump Station, (12) S-7 Pump Station, (13) S-8 Pump Station, and (14) S-150 Gated Culverts and their corresponding remote-control facilities.

The aforementioned State facilities will use excess capacity to process “new water” provided by CEPP, which has been estimated to comprise approximately 19% of the total water volume that would flow through these facilities. For the purposes of this report, OMRR&R costs are assumed to be linear with flow volumes and will therefore increase the OMRR&R costs for the State facilities that are to be used by CEPP by 19%. Therefore, consistent with the general CERP authorization for cost sharing OMRR&R (WRDA 2000 Section 601(e)(4)), the Corps recommends congressional authorization of CEPP to contribute up to 19% of the OMRR&R costs of the aforementioned facilities to the extent that OMRR&R activities are directly related to their use for treating “new water.” The Corps’ pro-rated share for OMRR&R for the aforementioned State facilities used by CEPP is therefore 50% of the 19%, or 9.5% of the total OMRR&R costs. The 19% CEPP cost share will apply to the State facilities and the C&SF features listed above to the extent that OMRR&R activities are directly related to their use for treating “new water.”

After CEPP has operated for an appropriate period of time, an analysis based on monitoring data shall be undertaken to evaluate project performance and verify that CEPP successfully delivers and annual average of approximately 210,000 acre-feet of new water for the natural system, as described in this PIR. If the monitoring data and analyses show CEPP actually produces less than

the anticipated 210,000 acre-feet of “new water” on average, then the Federal project is not fully realizing the projected benefits and the State facilities are not being burdened as projected. In such a case, the analysis will be used to inform changes in operations in order to achieve the quantity, timing, or distribution of water as described in this PIR, or recommended changes to the amount of water reserved or allocated to the natural system. Additionally, if the monitoring data and analyses show CEPP actually processes significantly more or less than the anticipated 210,000 acre-feet of “new water” on average, then the analysis may be used to adjust the calculation of OMRR&R cost share upward or downward to reflect the actual average annual use of excess capacity by the Federal project. Any recommended adjustments to the OMRR&R cost share calculation may require additional Congressional approval and legislation. This will be accomplished through consultation with the State and USACE Headquarters and is necessary after operations have begun to capture the true Federal interest and cost share responsibility. Additionally, it must be recognized and the adjustment made given these State facilities are subject to legal requirements outside of the Federal project and will not be operated in such a manner that the Federal project will cause exceedances of the State’s water quality requirements and which may limit the anticipated Federal project benefits.

No cost share of the aforementioned State facilities shall commence before the date the CEPP project produces “new water” and the associated Federal project feature is declared construction complete and the state assumes its OMRR&R responsibilities as established in the appropriate PPAs. Similarly, no cost share for State facilities is allowed until the State facilities are shown to be construction complete and the State begins regular operation of such facility.

The proposed Federal cost-share for OMRR&R is intended to include only the State facilities listed above. Modifications to this list of State facilities used by CEPP, including new flow control structures that may be constructed within STA 2, STA 3/4, and the A-1 FEB, must be coordinated with, and approved for cost-sharing purposes by, the USACE Headquarters and the Office of the Assistant Secretary of the Army for Civil Works (ASA (CW)). For proposed modifications to this list, the State will coordinate any additional State water quality facilities upon which CEPP is dependent and which the State has determined are needed to meet water quality standards and achieve CEPP project purposes, with the Corps’ Jacksonville District. Upon receipt of the State’s request to modify the list of cost shared facilities, the Corps’ Jacksonville District will prepare a recommendation for USACE Headquarters approval. USACE Headquarters will coordinate the Corps’ recommendation with the Office of the Assistant Secretary of the Army for Civil Works. Preparation and approval of a Modifications to Completed Projects report, in accordance with ER 1165-2-119 may be required as a prerequisite to Federal cost share.

Similarly, as a condition of the Corps' cost share for replacement and rehabilitation actions for the State facilities listed above, prior to commencing such actions early coordination with, and approval by, the USACE Headquarters and the Office of the ASA (CW) will be required, using the procedures outlined above. Preparation and approval of a Modifications to Completed Projects report, in accordance with ER 1165-2-119, may be required as a prerequisite to Federal cost share. Costs associated with major rehabilitation of the wetland treatment areas (STA 2, STA 3/4, and the A-1 FEB) due to peat soil accretion are excluded from cost sharing. A pro-rata determination of appropriate repair, replacement, and rehabilitation cost share at the time of turnover of the CEPP A-2 FEB project feature, will be conducted based on the remaining life expectancy of the State facilities. USACE Headquarters will approve the established Corps obligation. The State may request, through coordination with Corps’ Jacksonville District, that

USACE Headquarters approve exemptions for certain replacement and rehabilitation activities that they deem to be minor actions. Additionally, during PED the State and the Corps will coordinate on more specific definitions of activities that are considered as either repair, replacement or rehabilitation. The Corps' Jacksonville District will subsequently coordinate these determinations with USACE Headquarters for approval.

Project Implementation: Implementation of CEPP will occur over many years and include many actions by USACE and the SFWMD. Development of sequencing for CEPP features takes into consideration that a number of CERP and non-CERP projects must be in place before implementing many CEPP features to avoid unintended consequences, including the A-1 FEB State Restoration Strategies, 8.5 Square Mile Area and Existing S-356, C-111 South Dade, Modified Water Deliveries 1-Mile Bridge and Road Raisings, Broward County Water Preserve Area C-11 Impoundment, C-44 Reservoir (Indian River Lagoon -South) and connection to C-23 Canal, and modification of the Lake Okeechobee Regulation Schedule. Multiple project partnership agreements (PPAs) composed of separable project elements that provide hydrologic and ecologic benefits in a cost effective manner will be executed prior to construction. These PPAs include the construction of logical groupings of plan elements that maximize benefits to the extent practicable consistent with project dependencies.

Following identification of the recommended plan for CEPP, the next step was to consider how CEPP features will be implemented (sequencing scenarios) when considering internal and external project dependencies. The development of the sequencing for CEPP features considered that a number of CERP and non-CERP projects (**Table 9**) must be in place before implementing most CEPP features to avoid unintended consequences. Additionally, several basic principles considered in development of an implementation plan for CEPP features include the following:

1. All features of the State's Restoration Strategies must be completed and meet State water quality standards prior to initiating construction of most CEPP project features;
2. Construction of CEPP Project features cannot proceed until it is determined that construction and operation of the feature:
 - a. Will not cause or contribute to a violation of State water quality standards; and
 - b. Will not cause or contribute to a violation of any applicable water quality permit discharge limits or specific permit conditions ; and
 - c. Reasonable assurances exist that demonstrate adverse impacts on flora and fauna in the area influenced by the Project features will not occur.
3. Appendix A water quality compliance must be addressed for new project water entering ENP
4. The operation of State facilities is required to ensure that new water made available by CEPP meets water quality standards and to ensure achievement of CEPP project benefits. If after construction and operation of CEPP project features State water quality standards are not being met, the Federal and State partners agree **per paragraph 8.3 of Section 8** of this PIR/EIS to meet to determine the most appropriate course of action in accordance with existing law and policy. In such an event, an evaluation of CEPP benefits, including the possibility of reduced benefits, will be included in the assessment of any suggested resolution. It is recognized that the

- operation of the State facilities has a primary permitted purpose of achieving water quality compliance for existing flows.
5. Sequencing takes into account the earliest opportunity to realize benefits, including the features that can provide benefits that utilize existing water meeting State water quality standards.
 6. Additional outlet capacity from the south end of WCA 3A must be provided before new project water from Lake Okeechobee is released into WCA 2A and WCA 3A.
 7. The sources of material needed for Miami Canal backfilling and the Blue Shanty Levee were considered to minimize costs associated with double handling and stockpiling of materials.
 8. Where possible sequencing should include steps and timing to test concepts, as described in the CEPP AM Plan (**Annex D**).
 9. Recreation features will be constructed in conjunction with corresponding CEPP project plan features.

Table 9. Project Dependencies

Project	CEPP Feature Dependencies
A-1 FEB State Restoration Strategies	Required prior to implementation of northern WCA 3A distribution features (L-4 degrade, new pump station, S-8 Modifications, L-5 and L-6 improvements, Miami Canal Backfilling) to ensure adequate water quality treatment of inflows
8.5 Square Mile Area and Existing S-356	Construction of the C-358 seepage collector canal and structure S-357N within the 8.5 SMA must be completed to allow full utilization of the 8.5 SMA features to provide seepage mitigation for increasing flows into Northeast Shark River Slough; operation of the existing S-356 pump station (500 cfs) is required prior to significantly increasing flows to NESRS, to provide seepage management
C-111 South Dade	Extension of the detention area levees to connect with 8.5 Square Mile Area (SMA) required prior to significantly increasing flows to NESRS to enable operation of S-357 pump station to provide seepage management to 8.5 SMA
MWD 1-Mile Bridge & Road Raising	The MWD project will be complete and operational prior to implementation of WCA 3B inflow structures along the L-67A&C levees or increasing flows through existing S-333 to NESRS to ensure adequate road protection to allow for increased stages in L-29 canal
Broward County Water Preserve Aarea C-11 Impoundment	Required prior to increasing flow through S-333 or implementation of WCA 3B inflow structures along the L-67A&C levees to ensure adequate water quality of inflows to WCA 3B and NESRS
Tamiami Trail Next Steps Bridging and Road Raising	Required prior to increasing capacities of S-333 and S-356 and implementation of WCA 3B inflow structures along the L-67A levee, gaps in L-67C levee and Blue Shanty flowway (L-67C removal, L-29 levee removal)
C-44 Reservoir (Indian River Lagoon-South) and connection to C-23 Canal	Required prior to re-directing the maximum amount of water from Lake Okeechobee south to the FEB to meet environmental performance, to avoid reduction in low flows to the St. Lucie Estuary and low Lake Okeechobee water levels that effect the LOSA.
Modification of the Lake Okeechobee Regulation Schedule	Anticipated prior to full utilization of the A-2 FEB in order to achieve the complete ecological benefits envisioned through re-directing the full 210,000 acre-feet per year south and to avoid low Lake levels that would affect the LOSA

Other factors that influence implementation include funding availability, cost-share balance between the Federal and non-Federal sponsor, as well as the integration of projects that are to be constructed by other agencies.

Project features were grouped into three separate project partnership agreements (PPA) for implementation, based on the spatial distribution of features and the locations where separable hydrologic and environmental benefits would accrue. These groupings include a PPA of project features in northern WCA 3A (PPA North), a PPA of project features in southern WCA 3A, 3B and ENP (PPA South), and a final PPA which provides the new water and required seepage management that benefits the entirety of the study area (PPA New Water). A description of CEPP features by PPA is provided in **Table 10**.

Table 10. Project Features by PPA

PPA North	
<ul style="list-style-type: none"> • L-6 Diversion • S-8 Pump Modifications • L-4 Levee Degrade and Pump Station • L-5 Canal Improvements • Miami Canal Backfill 	
PPA South	
<ul style="list-style-type: none"> • L-67 A Structure North • L-67 C Levee Gap (6,000 ft) • Increase S-356 capacity to 1,000 cfs • Increase S-333 capacity • L-29 Gated Spillway • L-67 A Structures 2 and 3 South • L-67 A Spoil Mound Removal 	<ul style="list-style-type: none"> • L-67 C Levee Degrade (approx 8 miles) • Remove L-67 Extension Levee (No Backfill) • 8.5 Mile Blue Shanty Levee • Remove L-29 Levee Segment • Backfill L-67 Canal Extension • Remove Old Tamiami Trail*
PPA New Water	
<ul style="list-style-type: none"> • Seepage Barrier L-31 N • A-2 FEB 	

*Removal of Old Tamiami Trail can be completed at any time during implementation, but must precede backfilling of L-67 Extension Canal. Refer to Figures 6 through 9 for detail on specific project features.

PPA North and PPA South are expected to achieve only regional benefits by utilizing existing limited inflow volumes to WCA 2A and WCA 3A to improve deliveries to WCA 3, ENP, and Florida Bay. The ability to increase flows to the south as envisioned with the recommended plan depends on the construction of the A-2 FEB and seepage wall in PPA New Water, as well as the distribution and conveyance features in PPA North and PPA South. Implementation of all three PPAs are needed to see all of the CEPP's improvements associated with the reduction of undesirable high volume discharges to the Northern Estuaries and the restoration of hydroperiods and sheetflow from WCA 3 and ENP to the coastal mangroves of Florida Bay. The total benefits predicted with implementation of the recommended plan cannot be achieved without the combination of storage and treatment, distribution and conveyance, and seepage management.

Other viable options for the implementation of groupings into PPAs may be considered in the future. This flexibility is essential to successful CEPP implementation given the uncertainties associated with the lengthy implementation period and the inevitable improvement in scientific knowledge about the functioning of the greater Everglades that will occur as planned CERP and

non-CERP projects are completed. The Corps and the SFWMD will undertake integration of the CEPP recommended plan and the other CERP projects awaiting authorization into the CERP programs' integrated delivery schedule through a robust public process.

Federal laws and regulations applicable to implementing the CERP require PIRs to address certain assurances as part of the project recommendation for approval and subsequent implementation. For the CEPP PIR, the analyses for CEPP associated with Section 601(h)(4) and 601 (h)(5) of WRDA 2000 and the Programmatic Regulations for the CERP (33 CFR Part 385) for Project-Specific Assurances and Savings Clause were conducted for the recommended plan. The USACE and the SFWMD will undertake updated project assurances and Savings Clause analyses, if necessary, for the implementation phases that are selected to be included in a PPA or amendment thereto prior to entering into the PPA or PPA amendment. NEPA documentation will be updated, if applicable, as revisions are made to Water Control Plans and/or Project Operating Manuals associated with each PPA. Compliance with the requirements of the Savings Clause will be maintained throughout the entirety of the CEPP implementation period.

Operation, Maintenance, Repair, Rehabilitation, and Replacement: OMRR&R begins after physical project construction and Operational Testing and Monitoring (OTMP) is complete, and generally includes all operation activities and maintenance needed to keep the project features functioning as intended. OMRR&R for the CEPP project will occur for all new facilities constructed as a result of the project, and as an increase to the OMRR&R for State Facilities that CEPP will use to provide new water to the WCAs and ENP.

The Operations and Maintenance Costs Methodology Report Database developed by SFWMD was used to calculate OMRR&R costs. Rehabilitation and replacement costs include those costs required to keep the pump station operable for the period of analysis, and in perpetuity. Repair and rehabilitation costs on items such as pumps, drivers, and switchgear are assumed to be rehabilitated or replaced once during the 50-year life cycle. While rehabilitation costs are typically only 35-45 % of replacement costs, in order to provide a conservative estimate for CEPP features, major equipment replacement is considered in the estimate. Replacement is estimated to occur 30 years after placing the station into operation. The replacement cost includes engineering and structural modification costs as well as the equipment costs. **Table 11** lists the average annual OMRR&R costs for new CEPP facilities.

Table 11 Average Annual OMRR&R for New CEPP Facilities

Structure	OMRR&R Costs
A-2 FEB	\$2,090,000
S-620 (CS-1) 500 cfs gated culvert, S-621 (CS-2) 2500 gated spillway, S-622 (CS-3) 500 cfs gated culvert	\$330,000
Modified S-8 (2 gated culverts)	\$230,000
S-630 (360 cfs PS)	\$240,000
New S-333N - 1150 cfs	\$160,000
New (S-356) PS at 1000 cfs	\$600,000
500 cfs gated structures (S-631, S-632, and S-633)	\$340,000
8.5 mile levee in WCA 3B	\$50,000
S-355W-1230 cfs gated structure	\$110,000
Total Average Annual OMRR&R Costs New Facilities	\$4,150,000

The future OMRR&R costs of operating the State facilities, without CEPP, are based on the Operations and Maintenance Costs Methodology Report Database developed by SFWMD, as described above. The future OMRR&R costs of operating the system once CEPP is constructed and operational is based on the volume of new water flows through the State facilities as a portion of the overall water flows through the State facilities. **Table 12** lists the average annual OMRR&R costs of State facilities used by CEPP.

Table 12. Average Annual OMRR&R Costs of State Facilities used by CEPP

Structure	Without CEPP Per Year Costs	Costs with CEPP in Place
Current G-404 PS costs	\$ 340,000	\$410,000
STA 2 and Associated Infrastructure ¹	\$ 3,010,000	\$3,720,000
STA 3/4 and Associated Infrastructure ¹	\$3,680,000	\$4,550,000
FEB A-1 and Associated Infrastructure	\$1,850,000	\$2,290,000
G-357 Gated Culvert	\$ 110,000	\$140,000
G-370 PS	\$1,480,000	\$1,820,000
G-371 Gated Spillway	\$110,000	\$140,000
G-372 PS	\$1,850,000	\$2,280,000
G-434 PS	\$610,000	\$760,000
G-435 PS	\$300,000	\$ 370,000
S-6 PS	\$1,480,000	\$1,820,000
S-7 PS	\$1,270,000	\$1,570,000
S-8 PS	\$810,000	\$1,000,000
S-150 Gated Culverts	\$100,000	\$130,000
Total Average Annual OMRR&R Costs State Facilities	\$17,000,000	\$21,000,000

Key Social and Environmental Factors: National Economic Development benefits will occur as a result of the recommended plan. The recommended plan is expected to improve conditions in the Northern Estuaries, central Everglades and Florida Bay, which will lead to both direct and indirect economic benefits to commercial fisheries, property value, tax revenue, tourism and other significant economic sectors. Regional Economic Development benefits will also occur. In particular, the construction of recommended plan features would have a beneficial effect on employment and demand for local goods and services during the construction period. In addition, the inclusion of recreational features in the recommended plan are anticipated to provide lasting benefits that would accrue to the area as a result of additional recreational use and the associated economic activity. There will be no adverse impacts on minorities or disadvantaged populations as a result of the proposed project.

All practicable means to avoid or minimize adverse environmental effects have been incorporated into the recommended plan. An Adaptive Management and Monitoring Plan has been included in the Final PIR to ensure that the project benefits progress as expected, and that adjustments are made to project operations and/or implementation to adjust performance if needed to achieve project objectives while avoiding or minimizing adverse affects. Adverse effects associated with implementing the recommended plan are expected to be minimal to moderate. Temporary short term impacts to air quality, the noise environment, aesthetic resources, vegetation, and disturbances to and displacement of fish and wildlife resources to other nearby habitat are expected from operation of construction equipment through lands designated for staging, access, and construction. Major adverse effects on alligators that utilize

the Miami Canal within northern WCA 3A would occur due to backfilling of the Miami Canal. However, these effects are expected to be short-term as alligators will expand into other areas of suitable habitat created as a result of CEPP implementation. Due to increased water flow and changes in water distribution, it is anticipated that overdrained areas in northern WCA 3A will be rehydrated, triggering a vegetation transition from upland to wetland habitat. Although mammals occurring within the project area are adapted to the naturally fluctuating water levels in the Everglades, there is an increased potential that mammals currently utilizing upland habitat may be negatively affected. Refuge for mammals will continue to be provided by the retention of a portion of existing spoil mounds located adjacent to the Miami Canal in northern WCA 3A and the creation of additional upland landscape (constructed tree islands). Changes in water quality also have the potential to affect prey forage base through altering of vegetation composition or structure. Water quality will continue to be monitored under CEPP. Non-native and invasive plant infestations in the project area may be exacerbated by soil disturbance during construction and hydrological modification and may require active management. Introduction or expansion of non-native fish species due to changes in water distribution and increased connectivity between WCA 3A, WCA 3B and ENP is likely to occur; however, the extent of the impact is uncertain at this time.

Publicly owned lands are being utilized for the recommended plan. Portions of the A-2 footprint are currently leased for purposes of agricultural production, including sugar cane. Potential adverse impacts on prime and unique farmland will be assessed during detailed design. Adverse impacts on wetland acreage would occur within WCA 3B with implementation of the recommended plan as a result of the construction of the Blue Shanty Levee (L-67D). This loss would be offset by improved conditions in wetland acreage elsewhere within the region.

Formal consultation was initiated with USFWS on August 5, 2013 with completion of Biological Assessment. USACE received a Request for Additional Information (RAI) from USFWS on September 4, 2013. USACE provided a Supplemental Technical Analysis in Response to USFWS' RAI for CEPP on October 24, 2013. On December 13, 2013, USACE changed its request from formal to early consultation. A Preliminary Biological Opinion (BO) was received on December 17, 2013 that does not provide incidental take of potentially affected species, but does provide preliminary terms and conditions to support species management and recovery in anticipation of incidental take associated with future project implementation and subsequent consultations under the Endangered Species Act. A Programmatic BO was prepared March 28, 2014, by USFWS. USACE entered formal consultation with USFWS on the Everglade snail kite (*Rostrhamus sociabilis plumbeus*), and its designated critical habitat, Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*), and its designated critical habitat, wood stork (*Mycteria americana*) and eastern indigo snake (*Drymarchon corais couperi*). The preliminary conclusion is that the proposed project is not likely to jeopardize the continued existence of the species listed above and are not likely to adversely modify critical habitat, where designated. The Preliminary BO concurred on the Corps' determination of may affect, but is not likely to adversely affect the Florida panther (*Puma concolor coryi*), West Indian manatee (*Trichechus manatus*), and its critical habitat, American crocodile (*Crocodylus acutus*) and its critical habitat, deltoid spurge (*Chamaesyce deltoidea* ssp. *deltoidea*), Garber's spurge (*Chamaesyce garberii*), Small's milkpea (*Galactia smallii*), and tiny polygala (*Polygala smallii*). Furthermore, the Service concurred with all the "No Effect" determinations made by USACE in regard to the applicable threatened or endangered species that are found in the action area.

Incidental take was not provided for the Everglade snail kite, the CSSS and the wood stork; however take is anticipated on these three species. Take will be enumerated when a final biological opinion is required for each phase of CEPP implementation. Incidental take of eastern indigo snake is likely during construction and operation, particularly construction of the A-2 FEB and the backfill of the Miami Canal. The amount of take includes 14,000 acres of the FEB currently in sugar cane and row crops that will become inundated and mostly unusable to indigo snakes. Up to 268 snakes could be harassed through being displaced as a result of the CEPP and up to two indigo snakes may be injured or killed (harmed).

The recommended plan will potentially have adverse effects to cultural resources, some of which are unavoidable and long term, and/or cannot be assessed until the detailed design phase of the project. Avoidance of adverse effects to cultural resources is the Corps preference. Therefore, throughout the planning process for CEPP, the project archaeologist, engineers, and plan formulators have worked closely to determine alternatives and features of alternatives that reduce or eliminate impacts to cultural resources. Pursuant to 36 CFR 800.1, where possible, the project design will be modified to avoid affecting significant historic properties and culturally significant sites. Where avoidance is not possible, other mitigation measures will be considered. As consulted on throughout CEPP, mitigation measures will be developed during the preconstruction, engineering, and design phase in consultation with the State Historic Preservation Office, tribal groups and other interested parties as established in implementing regulations for Section 106 of the National Historic Preservation Act.

CEPP is expected to contribute to a net beneficial cumulative impact on the regional ecosystem. The recommended plan would benefit fish and wildlife resources, vegetation, water supply, water quality, and regional hydrology within the project area. Beneficial environmental effects are expected to result from the recommended plan and other similar ecosystem restoration activities (which are existing or being considered in the area).

Stakeholder Perspectives and Differences: Public outreach efforts for CEPP began early in the planning process. Due to intense public, political, and media interest in restoration of the south Florida ecosystem, public participation was a critical component of the development of the Final PIR. Participants invited to attend project delivery team meetings included those individuals designated by USACE and the SFWMD and representatives designated by other governmental agencies or Tribes. Members included the United States Environmental Protection Agency (USEPA), USFWS, United States Geological Survey (USGS), National Park Service (NPS), Miccosukee Tribe of Indians of Florida, Seminole Tribe of Florida, Florida Fish and Wildlife Conservation Commission (FWC), Florida Department of Agriculture and Consumer Services (FDACS) and Florida Department of Environmental Protection (FDEP). Representatives from Okeechobee, Glades, Martin, Palm Beach, Broward, Miami-Dade, and Monroe Counties were also active participants.

Comments received on the tentatively selected plan presented in the Draft PIR were positive and supportive. The following summarizes areas of controversy and unresolved issues identified from public and agency review of the Draft PIR.

Providing Additional Regional Ecosystem Restoration Needs: Although CEPP provides a significant increase in freshwater needed for the restoration of the Northern Estuaries, central Everglades and Florida Bay, additional actions are needed to further reduce

undesirable discharges of freshwater from Lake Okeechobee to the Northern Estuaries. Additionally, the Seminole Tribe of Florida and the Miccosukee Tribe of Indians of Florida have voiced concerns about conditions on Tribal lands in the western Everglades and the lack of progress on CERP components or other initiatives that would benefit those areas.

Providing Additional Water for Other Water Related Needs: During the CEPP, agricultural and municipal/industrial water supply stakeholders expressed concerns about the lack of progress on CERP projects intended to increase supplies of water for these users. To address this concern, the modeled operations of the recommended plan were optimized to improve water supply performance, including increasing the amount of water made available by the project for consumptive use allocation in LECSA 2 (Broward County) and LECSA Area 3 (Miami-Dade County) without reducing the beneficial effects on the natural system. In addition, the recommended plan maintains water supply for agricultural users in the LOSA and the Seminole Tribe of Florida.

System Wide Operations and the WRDA 2000 Savings Clause: CEPP study planners modeled and evaluated system-wide operations changes envisioned in the CERP to evaluate hydrologic conditions in, discharges to, and deliveries from the St. Lucie and Caloosahatchee Estuaries, Lake Okeechobee, WCA 3A, WCA 3B, WCA 2A, WCA 2B, ENP, Biscayne Bay, and Florida Bay. Some stakeholders expressed concerns that system-wide operations modeled and evaluated involve changes to current approved operating plans and that the quantity of water available for irrigation and water supply had been reduced by intervening changes, including the LORS (adopted in 2008) and the Everglades Restoration Transition Plan (ERTP, 2012). Furthermore, modeling results for the recommended plan indicate that some of the water utilized by water users in the LOSA will be transferred to WCA 3 and further south as a result of CEPP implementation. To address the requirements of the WRDA 2000 Savings Clause, the recommended plan identifies an additional source of water of comparable quantity and quality available to replace the water that will be transferred to WCA 3. However, this replacement source is dependent on implementation of another CERP project (Indian River Lagoon-South - C-44 Reservoir/STA). This transfer, if actualized, would therefore not occur until the C-44 Reservoir, the canal connecting it to the C-23 Canal, and the A-2 FEB are built and operating. Since recommended plan implementation involves other system-wide operations changes, water managers for USACE and the SFWMD will continue to evaluate system-wide operations as conditions change, such as Herbert Hoover Dike rehabilitation and implementation of other CERP projects including the Indian River Lagoon - South project to determine if changing conditions warrant changes to system-wide operations. Under USACE regulations, such operations changes require notifying the public, evaluating the effects of proposed alternatives, and preparation and coordination of proposed revisions to water control manuals.

Water Quality and Effects on State Facilities: The recommended plan depends on water quality treatment facilities owned and operated by the SFWMD (STAs 2 and 3/4) and is integrated with the yet-to-be constructed A-1 FEB. To achieve restoration objectives for WCA 3A, the recommended plan involves discharges from these STAs to WCA 3A. Concerns were expressed about the effects of the new discharges on water quality and native flora and fauna in WCA 3A. To ensure that the recommended plan meets State water quality standards, discharge permits with associated effluent limits will govern

discharges from the state facilities. The recommended plan also increases flows into Shark River Slough in ENP subject to the limits for total phosphorus contained in Appendix A of the 1991 Settlement Agreement for U.S. vs. SFWMD (Case No. 88-1886-Civ-Moreno) and in accordance with State water quality standards. State and Federal water managers expressed concerns that the recommended plan may increase the probability of exceeding the compliance limit and agreed to consider re-evaluating the Shark River Slough compliance calculation. Agency managers agree that current and proposed State and Federal actions are sufficient and anticipated to achieve water quality requirements for existing flows to the Everglades and hydrologic restoration objectives.

Effects on Endangered Species: To achieve restoration objectives, the recommended plan increases the amount of water delivered into areas inhabited by endangered species, including the critically-endangered Cape Sable seaside sparrow. A Programmatic BO was prepared by USFWS. USACE entered formal consultation with USFWS on the Everglade snail kite, and its designated critical habitat, Cape Sable seaside sparrow, and its designated critical habitat, wood stork and eastern indigo snake as mentioned previously. The preliminary conclusion is that the proposed project is not likely to jeopardize the continued existence of these species and are not likely to adversely modify critical habitat, where designated. Take will be enumerated when a Final BO is obtained for each phase of CEPP implementation.

Effects on Invasive Species on the South Florida Ecosystem: South Florida contains numerous harmful invasive plant and animal species that have the potential to significantly alter ecological communities throughout the region. Concerns have been expressed that hydrologic restoration efforts to improve the Greater Everglades, including the CEPP, may be ineffectual if invasive plant and animal species continue to spread and overtake natural communities of plants and animals. Scientists generally agree that restoring natural system processes and managing those areas provide greater resilience to threats posed by invasive species.

Climate Change: Although the magnitude of the effects of climate change, including rising sea levels, temperature changes, and changing rainfall patterns is uncertain, it is generally acknowledged that climate change will affect both natural system and human environmental conditions in south Florida during the next century. As the mean tide level increases, the additional water from CEPP will provide a buffer of freshwater that will limit salinity related impacts to freshwater wetland vegetation, reduce peat soil degradation, and impede saltwater intrusion into the groundwater aquifer.

Environmental Compliance: A Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for the CEPP was published in the Federal Register (FR Volume 76, Number 232) December 2, 2011. In accordance with the NEPA, a scoping letter dated November 23, 2011 was used to invite comments from Federal, State, and local agencies, affected Indian Tribes, and other interested private organizations and individuals. Public scoping meetings were held December 14, 2011 in Plantation, Florida and December 15, 2011 in Clewiston, Florida. Five NEPA public meetings were also held to present the preliminary final array of alternatives. These workshops were held on December 10, 2012 in Estero, Florida, December 11, 2012 in Homestead, Florida, December 12, 2012 in Clewiston, Florida, December 13, 2012 in Stuart, Florida and December 18, 2012 in Coconut Creek, Florida.

The Notice of Availability (NOA) of the Draft PIR was published in the Federal Register (FR Volume 78, Number 169) August 30, 2013 and mailed to interested stakeholders. The Draft PIR was circulated for a 64 day review period. Five NEPA public meetings were held on the tentatively selected plan. These workshops were held on September 16, 2013 in Plantation, Florida, September 17, 2013 in Fort Myers, Florida, September 18, 2013 in West Palm Beach, Florida, September 19, 2013 in Stuart, Florida and September 25, 2013 in Homestead, Florida. Comments received during the review period were taken into consideration in determination of the recommended plan presented in the Final PIR.

The NOA of the Final PIR will be published in the Federal Register and mailed to interested stakeholders. The Final PIR will be circulated for a 30 day review period upon which a Chief's Report and Record of Decision will be prepared based on the Final PIR and additional opportunities for public comment. The Jacksonville District has prepared a Draft Record of Decision and Chief's Report. Submittal to the Assistant Secretary of the Army for Civil Works and the Office of Management and Budget for administrative review will occur upon completion of the state and agency review of the Final PIR.

Per ER 1105-2-100 Appendix H, Amendment # 1 20 November 2007 – the Jacksonville District has included a draft statement initially. A final version for HQUSACE to insert will be provided after the public/agency review of the Final PIR is completed.

State and Agency Review: Per ER 1105-2-100 Appendix H, Amendment # 1 20 November 2007 – text for this section is to be provided and inserted by USACEHQ after public/agency review of the Final PIR is completed.

Certification of Peer and Legal Review: The recommended plan estimate, as well as the cost and schedule risk analysis and total project cost summary included in the Final PIR, has undergone cost review and certification by the Cost Engineering Directory of Expertise located in the Walla Walla District. Cost certification was received on March, 14, 2014.

The Final PIR, including associated documents required by the NEPA, has been fully reviewed by the Office of Counsel, Jacksonville, and is approved to be legally sufficient with the following caveats.

1. The recommendation to cost share in operation and maintenance of components of the Everglades Construction Project is inconsistent with existing law. Section 528(e)(2) of WRDA 1996 authorizes the Corps to cost share 50 percent in water quality improvement features that are essential to Everglades restoration except for the Everglades Construction Project. The components of STA 3/4 and associated infrastructure, STA 2 and associated infrastructure, G-370 Pump Station, G-371 Gated Spillway, and the G-372 Pump Station are components of the Everglades Construction Project. As reflected in the PIR, such cost sharing will require a change in law.
2. Endangered Species Act (ESA) consultation resulted in receipt of a Programmatic Biological Opinion that does not fully address Corps legal and policy concerns. One concern is that the Programmatic Biological Opinion anticipates take but does not

quantify take to be authorized for three avian species. Without quantification of take and finalization of terms and conditions, the Corps cannot confirm the project can be implemented in compliance with the ESA and still achieve benefits justifying the recommended plan. The Corps continues to work with USFWS to resolve consultation issues.

Legal certification of the Final PIR was received on March 31, 2014.

Policy Compliance Review: Per ER 1105-2-100 Appendix H, Amendment # 1 20 November 2007 - to be inserted by HQUSACE when the Documentation of Review Findings are completed.