ANNEX B
ANALYSES REQUIRED BY WRDA 2000 AND FLORIDA STATE LAW

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B.1 ANALYSES REQUIRED BY WRDA 2000 AND FLORIDA STATE LAW

B.1.1 Legal Basis–Background

Federal law and regulation implementing the Comprehensive Everglades Restoration Plan (CERP) requires Project Implementation Reports (PIR) to address certain assurances as part of the project being recommended for approval and implementation. This section addresses provisions of Section 601(h) of the Water Resources Development Act of 2000 (WRDA 2000), the Programmatic Regulations for the CERP (33 Code of Federal Regulations [CFR] Part 385) for Savings Clause requirements and Project-specific Assurances.

The following sections describe the specific requirements from WRDA 2000 and the CERP Programmatic Regulations and present the methods, results, and conclusions of the analyses necessary to meet those requirements.

B.1.1.1 Water Resources Development Act 2000

Congress enacted the WRDA 2000, Section 601, *Comprehensive Everglades Restoration Plan*, which approved CERP "as a framework for modifications and operational changes to the Central and Southern Florida (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." Section 601(h) of WRDA 2000, *Assurance of Project Benefits*, establishes project-specific assurances to be addressed as part of CERP implementation.

Section 601 (h)(1) of WRDA 2000 provides the following:

> *IN GENERAL—The overarching objective of the Plan 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. The Plan shall be implemented to ensure the protection of water quality in, the reduction of the loss of fresh water from, 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.*

This subsection of this annex discusses the Savings Clause and project assurances required by WRDA 2000 to be addressed in each PIR. **Subsection B.1.2.2** lists the Savings Clause and project assurances provisions of the CERP Programmatic Regulations, which provide supplemental information for implementing the WRDA 2000. **Subsection B.1.2.6** discusses the role of the Draft Guidance Memoranda in the analyses.

The Savings Clause analysis is listed in WRDA 2000 as a means to protect users of legal sources of water supply and to protect the levels of service for flood protection that were in place at the time of enactment. Specifically, Section 601(h)(5) of WRDA 2000, *Savings Clause,* requires an analysis of each project's effects on legal sources of water that were in existence on the date of enactment of WRDA 2000 (i.e., December 2000), effects on levels of service of flood protection in existence on the date of enactment of WRDA 2000, and effects on the Seminole Tribe of Florida Water Rights Compact with the State of Florida and South Florida Water Management District (SFWMD). Section 601(h)(5) of WRDA 2000 states the following:

(A) *NO ELIMINATION OR TRANSFER. – Until a new source of water supply of comparable quantity and quality as that available on the date of enactment of this Act is available to replace the water to be lost as a result of implementation of the Plan, the Secretary and the non-federal sponsor shall not eliminate or transfer existing legal sources of water, including those for–*

(i) *an agricultural or urban water supply;*

(ii) *allocation or entitlement to the Seminole Indian Tribe of Florida under section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 U.S.C. 1772e);*

(iii) *the Miccosukee Tribe of Indians of Florida;*

(iv) *water supply for Everglades National Park; or*

(v) *water supply for fish and wildlife.*

(B) *MAINTENANCE OF FLOOD PROTECTION. – Implementation of the Plan shall not reduce levels of service for flood protection that are–*

(i) *in existence on the date of enactment of this Act; and*

(ii) *in accordance with applicable law.*

(C) *NO EFFECT ON TRIBAL COMPACT. – Nothing in this section amends, alters, prevents, or otherwise abrogates rights of the Seminole Indian Tribe of Florida under the compact among the Seminole Tribe of Florida, the State, and the South Florida Water Management District, defining the scope and use of water rights of the Seminole Tribe of Florida, as codified in section 7 of the Seminole Indian Land Claims Act of 1987 (25 U.S.C. 1772e).*

The analysis of project-specific assurances is listed in WRDA 2000 as a means to assure that CERP project benefits are realized by establishing the appropriate quantity, timing, and distribution of water to be dedicated and managed for the natural system. Section 601(h)(4) of WRDA 2000, *Project-specific Assurances*, contains the following requirements for PIRs:

(A) *PROJECT IMPLEMENTATION REPORTS. –*

(i) *IN GENERAL. – The Secretary (of the Army) and the non-federal sponsor shall develop project implementation reports in accordance with Section 10.3.1 of the plan.*

(ii) *COORDINATION. – In developing a project implementation report, the Secretary and the non-Federal sponsor shall coordinate with appropriate Federal, State, tribal, and local governments.*

(iii) *REQUIREMENTS. – A project implementation report shall –*
…(IV) identify the appropriate quantity, timing, and distribution of water dedicated and managed for the natural system;

(V) identify the amount of water to be reserved or allocated for the natural system necessary to implement under State law; WRDA 2000 excerpts cited

above are intended to provide a concise summary of the Savings Clause and Project-specific Assurances analyses required under WRDA 2000. Refer to WRDA 2000 for complete text.

The Lake Okeechobee Storage Reservoir Section 203 Study (LOCAR, Project, or Section 203 Study) is not the mechanism to propose or conduct the required National Environmental Policy Act (NEPA) evaluation of modifications to the Lake Okeechobee Regulation Schedule (LORS) and system-wide operational modifications. These actions will be conducted under other authority consistent with the Integrated Delivery Schedule. The proposed modifications developed in LOCAR are meant as recommendations to inform this future LORS study. This analysis will identify storage north of Lake Okeechobee and implement Component A of CERP. The SFWMD will protect the water identified for the natural system as described in **Table B.1-7**. The legal mechanism, allocation or reservation, has not been determined. Water returned to Lake Okeechobee after storage will be available to meet all C&SF Project purposes and CERP's overarching objectives. Stored water, upon return to Lake Okeechobee, will be accessible to both the lake ecology and users in accordance with SFWMD's water supply program and the lake regulation schedule.

B.1.1.2 Programmatic Regulations (33 CFR Part 385)

Section 601(h)(3) of WRDA 2000 required the Secretary of the Army, with the concurrence of the Governor and the Secretary of the Interior, to promulgate Programmatic Regulations to ensure that the goals and objectives of the CERP are achieved. See **Section 6.8** of the main report for a summary of compliance with the provisions of the Programmatic Regulations. The Final Programmatic Regulations for the CERP, which were published in 33 CFR Part 385 in 2003, establish the processes and procedures to guide the U.S. Army Corps of Engineers (Corps) in the implementation of the CERP. In this document, **Section B.1.2** summarizes the requirements of the Programmatic Regulations that provide supplemental information to WRDA 2000.

B.1.1.2.1 Pre-CERP Baseline

Section 385.35(a) of the Programmatic Regulations requires the development of a pre-CERP baseline to aid the Corps and SFWMD when implementing the Savings Clause to determine if existing legal sources of water will be eliminated or transferred and to demonstrate that the levels of service of flood protection in existence on the date of enactment of WRDA 2000, and in accordance with applicable law, will not be reduced by implementation of a project. The 2008 LORS was developed as a temporary schedule during the Herbert Hoover Dike (HHD) repairs, and changes to the water supply delivery approach represent a "non-CERP intervening activity." According to the Draft Guidance Memoranda, the applicability of a "non-CERP intervening activity" shifts the baseline for savings clause analysis from use of the pre-CERP baseline (WRDA 2000) to use of the existing conditions baseline (ECB).

B.1.1.2.2 Savings Clause–Elimination or Transfer of Existing Legal Sources of Water

Section 385.36 of the Programmatic Regulations requires that PIRs include a determination of existing legal sources of water that are to be eliminated or transferred as a result of project implementation. If 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.

B.1.1.2.3 Savings Clause–Flood Protection

Section 385.37 of the Programmatic Regulations requires that PIRs include an analysis of the Project's impacts on levels of service for flood protection that existed on the date of enactment of WRDA 2000 (December 2000) and are in accordance with applicable law to demonstrate that the levels of service for flood protection will not be reduced by implementation of the Project. Where appropriate and consistent with restoration of the natural system, opportunities to provide additional flood protection shall be considered. The conditions that existed on the date of enactment of WRDA 2000 are included in the Pre-CERP Baseline.

B.1.1.2.4 Project Assurances–Identification of Water for the Natural System

Section 385.35(b) of the Programmatic Regulations requires that each PIR identify the quantity, timing, and distribution of water to be dedicated and managed for the natural system necessary to meet CERP restoration goals.

B.1.1.2.5 Project Assurances–Identification of Water for Other Water-related Needs

Section 385.35(b) of the Programmatic Regulations also requires that each PIR identify the quantity, timing, and distribution of water made available for other water-related needs of the region.

B.1.1.2.6 Draft Guidance Memoranda

The Programmatic Regulations require the development of six guidance memoranda jointly by the Corps and SFWMD, in consultation with others. The Draft Guidance Memoranda dated July 2007 provided additional information to complete the analyses initially described in WRDA 2000; however, since the guidance memoranda exist in draft form only, the PIRs completed prior to their approval can use appropriate methods deemed reasonable at the time. The July 2007 Draft Guidance Memoranda are available for review at the following link:
http://141.232.10.32/pm/progr_regs_guidance_memoranda.aspx.

Section 385.35(b)(3)(iii) of the Programmatic Regulations specifically states that "PIRs approved before... the development of the guidance memorandum may use whatever method the Corps and the non-federal sponsor deem is reasonable and consistent with the provisions of Section 601 of WRDA 2000." During the preliminary planning phases, based on consideration of the expedited schedule, the Corps and SFWMD advocated using efficiencies learned from the processes of developing prior PIRs, including prior CERP project methodologies for the technical analyses described in Draft Guidance Memoranda 3 (*Savings Clause Requirements*) and Draft Guidance Memoranda 4 (*Identifying Water Made Available for the Natural System and for Other Water-related Needs*). The two draft memoranda provide additional background information and describe the analyses and tools used to address the Savings Clause and project assurances requirements of the Programmatic Regulations. The analyses completed for LOCAR, which are documented in **Section B.2**, **Section B.3**, and **Section B.4** within this annex, meet the intent of the draft memoranda while fulfilling the requirements of Section 601 of WRDA 2000 and the Programmatic Regulations.

Subsection B.2.2.1 of this report contains the key assumptions common to Savings Clause and Project assurance analyses including an overview of the modeling tools available, the scenario assumptions, and the regional Project effects resulting from achieving the Feasibility Study (FS) objectives.

Subsection B.2.2.2 of this report contains a description of the assumptions, concepts, and methodologies applied for the FS evaluation of Savings Clause requirements.

Section B.2.3 contains a description of the assumptions, concepts, and methodologies applied for the FS evaluations to identify water made available by the Project for the natural system and for other water-related needs of the region.

Section B.2.4 describes the results of these analyses, while **Section B.3** provides conclusions and identifies the amount of water made available by the Project for the natural system to be reserved or allocated by the State of Florida and the amount of water made available for other water-related needs.

B.1.2 Methods

The same hydrologic models used for plan formulation are typically applied to the Savings Clause and Project assurance analyses. This ensures consistency when representing the project effects in the analyses subsequent to plan selection. The Regional Simulation Model for Basins (RSM-BN) hydrologic model was used to simulate and evaluate the environmental effects of the array of alternatives through comparison with pre-Project base conditions simulated with the same models. The RSM-BN model uses a 52-year period of hydrologic record (1965 through 2016), which includes sufficient climatological variability (including natural fluctuations of water) to represent the full range of hydrologic conditions experienced within the South Florida region over a long-term period. No one modeling tool or representation of model results can definitively predict with-Project hydrologic conditions across the Project Area given the large regional scope of the Project, model tools' limitations and assumptions, and future uncertainties regarding the effects of other projects. However, each snapshot of model results can form the basis for applying best professional judgment to determine whether the potential effects of the Recommended Plan would reduce the availability of an existing source of water or reduce the level of service for flood protection, and to quantify the water necessary to achieve the benefits of the plan.

The plan formulation process applied during the FS analyzed the environmental effects and benefits of the Project alternatives through qualitative and quantitative comparisons between the Future Without Project (FWO) condition and the Future With Project (FWP) condition. The FWO condition describes what is assumed to be in place if none of the study's alternative plans are implemented. The FWO condition assumes the construction and implementation of authorized CERP and non-CERP projects, and other federal, state, or local projects constructed or approved under existing governmental authorities that occur in the Study Area, as described in **Section 2.5** of the main report. The FWP condition describes what is expected to occur as a result of implementing each alternative plan that is being considered in the study.

B.1.2.1 Project Objectives and Associated Baseline Model Assumptions

Viewed from a programmatic perspective, the identification of water for the natural system associated with the CERP involves an analysis of four different aspects of ecological responses to hydrologic changes: 1) responses to the change in the quantity of water received by the natural system; 2) responses to the timing of those deliveries; 3) responses to the distribution of water delivered to the natural system; and 4) responses to the quality of the water received by the natural system. In a project-specific sense, however, the relative importance of each of these aspects (i.e., quantity, timing, distribution, and quality) will vary from project to project depending upon the specific objectives established for the project.

For example, some CERP projects may focus formulation efforts on simply changing the timing (i.e., seasonality) or distribution (i.e., inflow and outflow points or internal movement) of water delivered to the natural system. Other projects may focus primarily on increasing or decreasing the amount of water delivered to the natural system depending on its needs, while other projects may focus on improving the quality of the water delivered to the natural system to maintain desirable ecological community structure. These aspects, depending upon their applicability to specific CERP projects, are addressed during plan formulation through performance measures and evaluation criteria used to evaluate alternative plans and ultimately select a plan. Hydrologic targets for the natural system applied during plan formulation help to identify the quantity of water required to meet restoration objectives, in contrast to water that exceeds the targets and may not contribute to meeting the restoration targets.

The Recommended Plan achieves the Project objectives by changing the timing, distribution, and volume of water conveyed to the natural system. The large regional scale of the Recommended Plan causes large volumes of water to move between ecosystems and basins consistent with the Project's objectives (**Table B.1-1**). The water made available for the natural system is the water required for the protection of fish and wildlife within natural systems, including water that contributes to meeting hydrologic, water quality, and ecologic targets for natural system restoration. The Recommended Plan provides a further reduction in high volume flows from Lake Okeechobee to the Caloosahatchee and St. Lucie Estuaries (Northern Estuaries). The Savings Clause and Project assurances analyses for the Recommended Plan will focus on whether these regional-scale changes meet the requirements of WRDA 2000 and the Programmatic Regulations.

The analyses of the Savings Clause and Project Assurance requirements include considerations of three different sets of assumptions at two different points in time or conditions as depicted in **Table**) the ECB[1] and 2) the FWO baseline and 3) FWP Recommended Plan. The Initial Operating Regime (IOR) Baseline is represented by the FWO baseline. Comparison of the Recommended Plan to these baselines is discussed in the results section below. The model assumption tables for all base conditions are provided in the SFWMD Regional Simulation Model Documentation Report in **Annex A-2.4** to the *Engineering Appendix* (**Appendix A**). Please note that updates to the FWO were not needed to establish the IOR baseline. Therefore, the FWO is equal to the IOR baseline. This is also mentioned in the *Hydrologic Modeling* section in **Appendix A**.

The LOCAR documentation and complete sets of RSM-BN hydrologic model performance measure output are posted on the CERPZone Data Archival Storage and Recovery system at https://www.cerpzone.org. All data sets will be permanently archived and available in this system for the public (after requesting a login) and state and federal agencies. The following performance measure data sets are provided to facilitate additional review of the hydrologic modeling output for the baselines and Recommended Plan:

- ECB, FWO, Alternative 1 (Recommended Plan), Alternative 2, and Alternative 3 —Comparison used for NEPA evaluation in **Section 5**.
- ECB, FWO, Alternative 1 (Recommended Plan), —Comparison used for the Savings Clause and Project Assurances evaluation in this annex.

[1] Refer to Section 1.2.1 Pre-CERP Baseline for description of use of ECB as Savings Clause baseline.

Table B.1-1. Goals and Objectives of CERP and LOCAR.

CERP Objective	LOCAR Objectives
Improve habitat and functional quality	Improve the timing and volumes of freshwater flows from Lake Okeechobee to improve the salinity regime and the quality of habitats for oyster, SAV, and other estuarine communities in the Northern Estuaries
Improve native plant and animal species abundance and diversity	Improve quantity, timing, and distribution of flows into Lake Okeechobee to maintain ecologically desired lake stage ranges more often
CERP Goal: Enhance Economic Values and Social Wellbeing	-
Increase availability of fresh water (agricultural/municipal and industrial)	Increase availability of water supply for existing legal water users of Lake Okeechobee
Reduce flood damages (agricultural/urban)	No corresponding objective beyond Savings Clause
Provide recreational and navigation opportunities	Provide recreational opportunities and may include navigation within the reservoir
Protect cultural and archeological resources and values	Protect cultural and archeological resources and values

CERP = Comprehensive Everglades Restoration Plan; LOCAR = Lake Okeechobee Storage Reservoir Section 203 Study; Northern Estuaries = Caloosahatchee and St. Lucie Estuaries; SAV = submerged aquatic vegetation

Table B.1-2. Key Assumptions Based on Model Documentation Reports from *Engineering Appendix* (Appendix A, Annex A-3).

Condition	Intent	Equivalent for LOCAR	Model Scenario
Existing Conditions	Conditions at the time the Recommended Plan is selected, including land use, operations, and demands. Demand can be either permitted or projected, whichever is greater.	Conditions with only the projects and operations approved and in effect. Includes Lake Okeechobee System Operating Manual (LOSOM). Permitted demands are included.	ECB23L (ECB)
Initial Operating Regime Baseline	Future conditions, based on federally authorized projects only, at the time the Recommended Plan is operational, including land use, operations, and demands. Demands can be either permitted or projected, whichever is greater.	The future condition based on federally authorized projects; Lake Okeechobee Regulation Schedule per Central Everglades Planning Project/Everglades Agricultural Area Reservoir Operation. Permitted demands are included.	PA_FWOLL

LOCAR = Lake Okeechobee Storage Reservoir Section 203 Study

B.1.2.1.1 Volume Probability Curves and Stage Duration Curves

To identify the quantity, timing, and distribution of water for the natural system, a probabilistic approach was selected using volume probability curves to depict the distribution of volumes of water that provide natural system benefits as a result of project features or to determine whether water is eliminated or transferred from natural systems. These volumes of water may include water that is already available to meet natural system needs and water made available from the Recommended Plan. For purposes of identifying the increase in the volume of water for the natural system, volume probability curves were produced depicting the range of the quantities of water delivered for natural system areas and coastal

estuaries under all climatic conditions through the RSM-BN period of simulation used to perform Project evaluations.

The volume probability curve indicates the probability (i.e., percentage of time equaled or exceeded, on the x-axis) that a certain quantity of water (expressed as flow or volume on the y-axis) is made available as a function of historical rainfall distribution. The water quantities are aggregated for each water year within the RSM-BN period of simulation, defined as starting in May of year 1 and continuing through April of year 2 (40 total water years in the 1965 to 2016 RSM-BN period of simulation). Once computed, the values are ranked from highest to lowest. Volume probability curves quantify the water, along with its timing and distribution to the natural system.

B.1.2.2 Analyses for Savings Clause, Including Intervening Non-CERP and CERP Projects

The changes to quantity, timing, and distribution of water to be produced by the Project focus on meeting hydrologic restoration targets for Lake Okeechobee and the Northern Estuaries. The purpose of the Savings Clause analysis is to determine whether the effects of the Project would cause an elimination or transfer of existing legal sources of water or reduction to the level of service of flood protection. The potential effects of LOCAR can be assessed by comparing stage duration curves and other results from the model simulations for the FWO and proposed alternatives. If no reductions to existing legal sources or levels of service for flood protection are indicated during the comparison, then the Savings Clause requirements are determined to have been met. If there is an elimination or transfer of an existing legal source of water, then a new source of water supply to replace the water lost as a result of implementation of the Recommended Plan would need to be identified.

Consistent with the approach outlined in Draft Guidance Memoranda 3, which was developed to meet the intent of WRDA 2000 and the Programmatic Regulations, the following guidance would be applied by LOCAR to address the effects of intervening non-CERP activities:

- Savings Clause analysis only applies to changes from date of enactment of WRDA 2000 that result from “Implementation of the Plan”;
- Intervening non-CERP activities are changes wholly outside of CERP (e.g., LORS 2008, LOSOM, Modified Water Deliveries, C-111 South Dade, Everglades Restoration Transition Plan, etc.);
- Savings Clause does not require CERP to make up for reductions in quantity or quality of existing legal sources or levels of service for flood protection caused by intervening non-CERP activities, but CERP cannot cause further reductions; and
- Savings Clause does not prohibit CERP from reducing quantity or quality of existing legal sources or levels of service for flood protection increased by intervening non-CERP activities, but CERP cannot reduce those increases below those in place on the date of enactment of WRDA 2000.

To determine whether it is the Recommended Plan or other intervening CERP or non-CERP activities affecting the existing legal sources or levels of service for flood protection, the Recommended Plan can be compared to the ECB and IOR Baseline (**Table**). The simulations for the Recommended Plan and IOR Baseline both include the effects of intervening CERP activities that were assumed to be implemented in the IOR condition. In this analysis, the focus is to determine the potential effects of the Recommended Plan by comparing the LCR 1 (Alternative 1) to the IOR Baseline. This comparison isolates the effects of the intervening CERP and non-CERP projects.

If no reduction occurs at any step, then requirements of the Savings Clause have been met.

Table B.1-3. Summary of Comparisons for Savings Clause.

Step	Base Condition Model Run	With-Project Model Run
1	Existing Conditions Baseline (ECB23L)	LCR1(Recommended Plan)
2	Initial Operating Regime Baseline (PA_FWOLL)	Initial Operating Regime (Recommended Plan) LCR1

B.1.2.3 Pre-CERP Baseline

Section 385.35(a) of the Programmatic Regulations requires the development of a pre-CERP baseline to aid the USACE and SFWMD when implementing the Savings Clause to determine if existing legal sources of water will be eliminated or transferred and to demonstrate that the levels of service of flood protection in existence on the date of enactment of WRDA 2000, and in accordance with applicable law, will not be reduced by implementation of a project. The 2008 LORS was developed as a temporary schedule during the Herbert Hoover Dike (HHD) repairs and changes to the water supply delivery approach represent a "non-CERP intervening activity." According to the Draft Guidance Memoranda, the applicability of a "non-CERP intervening activity" shifts the baseline for savings clause analysis from use of the pre-CERP baseline (WRDA 2000) to use of the existing condition baseline (ECB).

B.1.2.3.1 Savings Clause–Elimination or Transfer of Existing Legal Sources of Water

To analyze the potential elimination or transfer of existing legal sources, affected basins or users are evaluated. The basins and users that may be affected by the Project are displayed in **Table**, classified according to the categories identified in WRDA 2000.

Table B.1-4. Existing Legal Sources Evaluated for Elimination and Transfer.

WRDA 2000, Section 601(h)(5)	User or Natural System Evaluated in LOCAR
An agricultural or urban water supply;	Lake Okeechobee Service Area, including the Everglades Agricultural Area
Allocation or entitlement to the Seminole Indian Tribe of Florida under Section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 U.S.C. 1772e);	Brighton Reservation Big Cypress Reservation
The Miccosukee Tribe of Indians of Florida;	N/A
Water supply for Everglades National Park; or	N/A
Water supply for fish and wildlife.	Lake Okeechobee, Caloosahatchee Estuary and St. Lucie Estuary

WRDA 2000 = Water Resources Development Act of 2000; U.S.C. = United States Code

The primary RSM-BN model results evaluated for effects to agricultural or urban water supply are the volume and/or frequency of cutbacks, which is applicable to the Lake Okeechobee Service Area (LOSA) and the Seminole Tribe of Florida's (STOF) Brighton and Big Cypress Reservations. Details of the modeling effort can be found in the *Model Documentation Report* in **Appendix A Annex A.2-4** of the LOCAR Feasibility Study. The selected metrics provide more direct and higher resolution measures of potential water supply effects for the LOCAR Savings Clause assessment than would be provided through assessment of inflow volume probability curves for these areas.

For the two Northern Estuaries, the Savings Clause analysis focuses on whether the Project eliminates or reduces deliveries to meet the low flow criteria targets for the Northern Estuaries. The high flows to the estuaries occur during times of excess water when water supply scarcity is not a concern.

B.1.2.3.2 Savings Clause–Flood Protection

Flood protection is evaluated by a combination of best professional judgment interpreting model results and engineering analyses. A summary of the screening level analysis can be found in **Section B.2.5**.

B.1.2.4 Analyses for Project Assurances–Identifying Water Made Available by the Project for the Natural System and Other Water-related Needs

Identification of water for the natural system is based on the concept of water needed to achieve the benefits of the Project and the overarching objective of restoration, preservation, and protection of the South Florida ecosystem. The water made available for the natural system is the water required for the protection of fish and wildlife, including water that contributes to meeting hydrologic, water quality, and ecologic targets for restoration of natural systems. Hydrologic targets for the natural system applied during plan formulation help to identify water required to meet restoration objectives, in contrast to water that exceeds the targets and may not contribute to meeting the restoration targets.

Water for Project Assurances is quantified where Project benefits accrue, consistent with the habitat unit benefits quantified during plan formulation resulting from water being made available by the Project. The ability of the Recommended Plan to provide water to meet other water-related needs in the LOSA was also analyzed. The basins where the Project may potentially supply water for the natural system or other water-related needs are listed below:

- Natural System
  - Lake Okeechobee
- Other Water-related Needs
  - LOSA, including Everglades Agricultural Area (EAA).

Identification of the water made available by the Project requires analysis of the RSM-BN results for the Recommended Plan. The identification of water involves both 1) existing water in the system that is available to the natural system and available for other water-related needs, and 2) water made available by the Project to the natural system and for other water-related needs, as depicted in **Figure**. The sum of these two categories is the total water that is expected to be available to the natural system and available for other water-related needs.

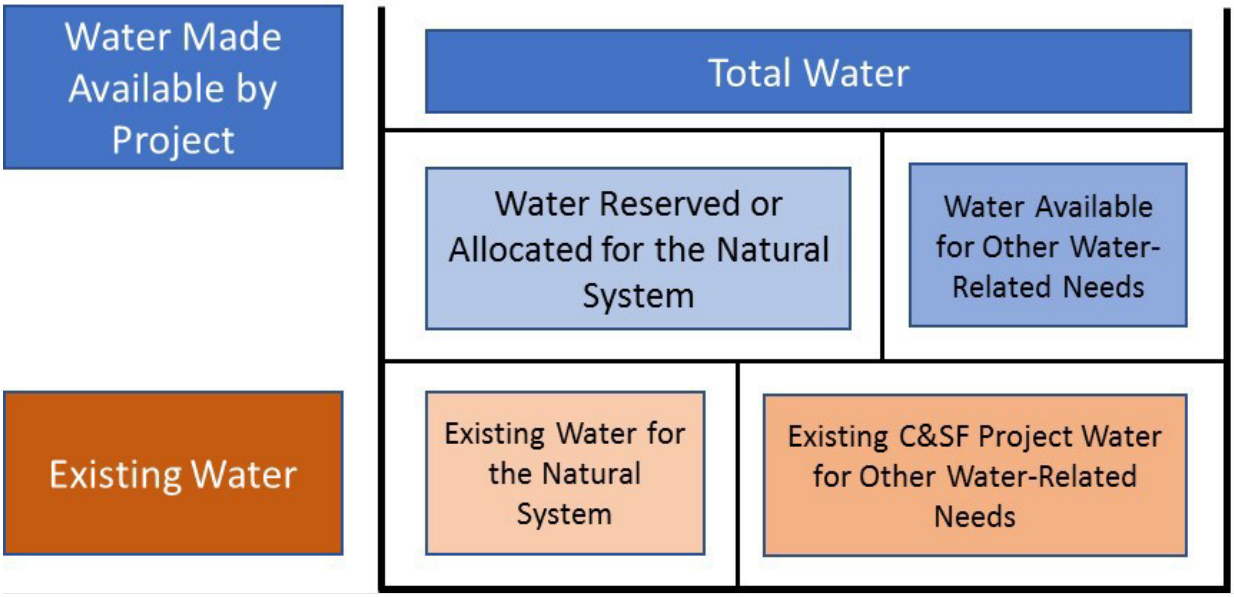


Figure B.1-1. Water needed to achieve the benefits of the plan.

Identification of water made available by the Project is represented by the FWP condition (Recommended Plan, Alternative 1) as depicted in **Table**. Given that LOCAR contains discrete storage, the water made available by the Project can be quantified as the volume released annually. From the reservoir. Water returned to Lake Okeechobee was also quantified. In addition, because the aboveground storage reservoir does not exist in the pre-Project condition, water is not quantified for the FWO condition.

Table B.1-5. Summary of Analyses for the Identification of Water Made Available by the Project.

Analysis	Water for the Natural System
Existing pre-Project water for the natural system	FWO
Total water for the natural system with the Project	Recommended Plan (Alternative 1) LCR1
Identification of water made available by the Project	Difference between Recommended Plan (Alternative 1) and FWO

FWO = Future Without Project; Project = Lake Okeechobee Storage Reservoir Section 203 Study

Quantification of water made available for the natural system is displayed using volume probability curves. The 10th, 50th, and 90th percentiles would be identified for the Recommended Plan representing water made available by the Project for the natural system. Benefits projected for the Northern Estuaries are the result of reduced high-volume flows from Lake Okeechobee and, therefore, water for the natural system is not identified. To evaluate whether additional water is made available by the Project to meet other water-related needs, specifically water supply for existing legal users in LOSA, the changes to the level of service were evaluated.

B.1.2.5 Elimination or Transfer of Existing Legal Sources of Water

The following information describes the analysis and resulting conclusions on whether the Recommended Plan would cause an elimination or transfer of existing legal sources of water.

B.1.2.5.1 Lake Okeechobee Service Area

Consistent with the WRDA 2000 and the Programmatic Regulations, the Savings Clause analysis removes the effects of the intervening non-CERP projects and compares the Recommended Plan to the FWO condition.

The table below (**Table B.1-6**) quantifies the frequency and severity of water restrictions over the period of simulation for water supply in LOSA. Cutbacks are reduced by the Recommended Plan compared to the ECB and FWO condition. A simulated cutback total of 1,335,000 acre-feet (ac-ft) in the ECB condition is reduced to 753,000 ac-ft by Alternative 1. Similarly, the severity score is decreased from 31 to 18. The water supply improvements for the Recommended Plan compared to the LOSOM water supply PM suite, satisfy Savings Clause requirements.

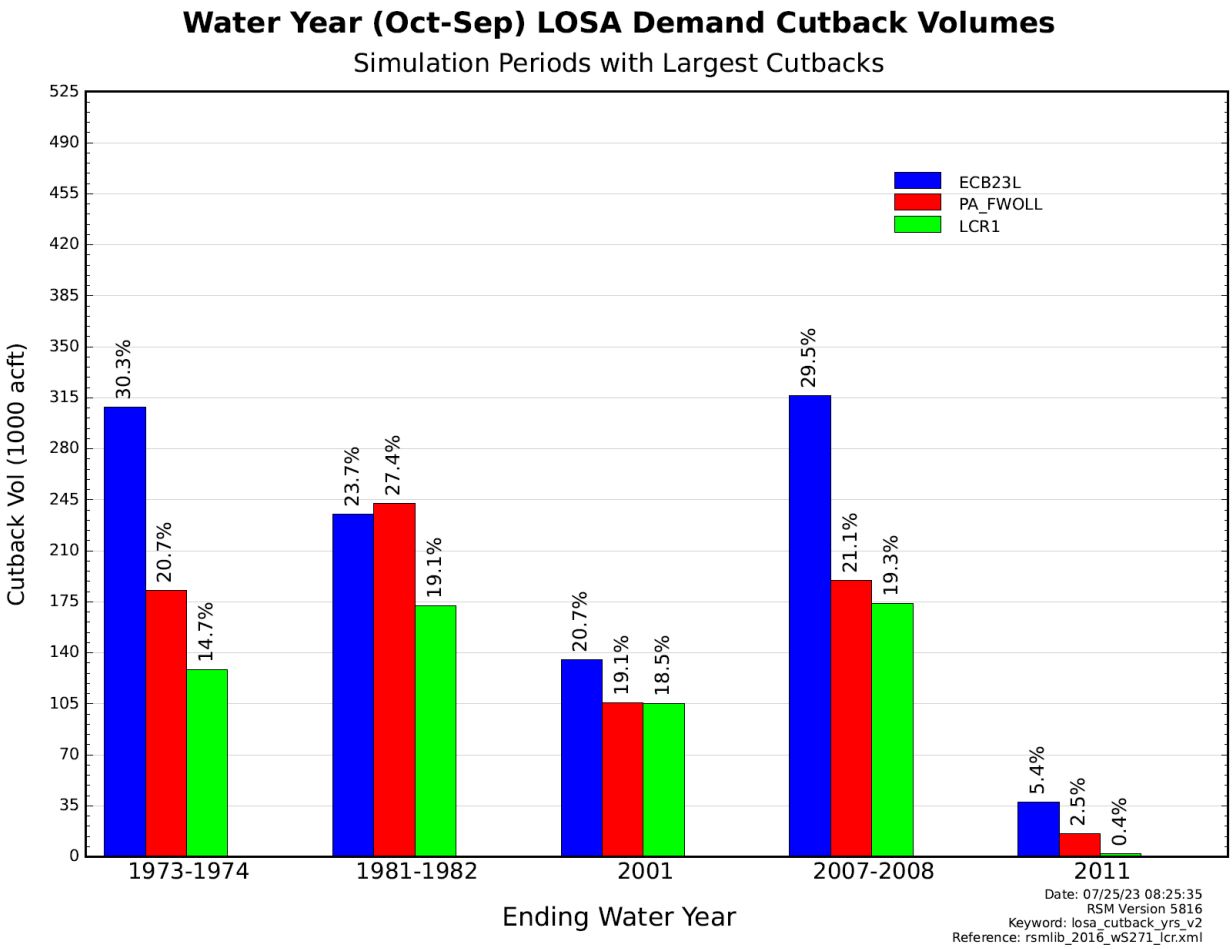
Table B.1-6. Frequency and Severity of Water Restrictions for LOSA.

Simulation	POR	Cutback Total (kaf)	Frequency	Severity Score	Number of Water Years with at Least 1 Cutback
ECB (ECB23L)	1965-2016	1,335	13	31	13
FWO (PA_FWOLL)	1965-2016	1,017	12	24	12
Alternative 1 (LCR1)	1965-2016	753	10	18	10

FWO = Future Without Project; LOSA = Lake Okeechobee Service Area; POR = period of record; RECOVER = Restoration Coordination and Verification

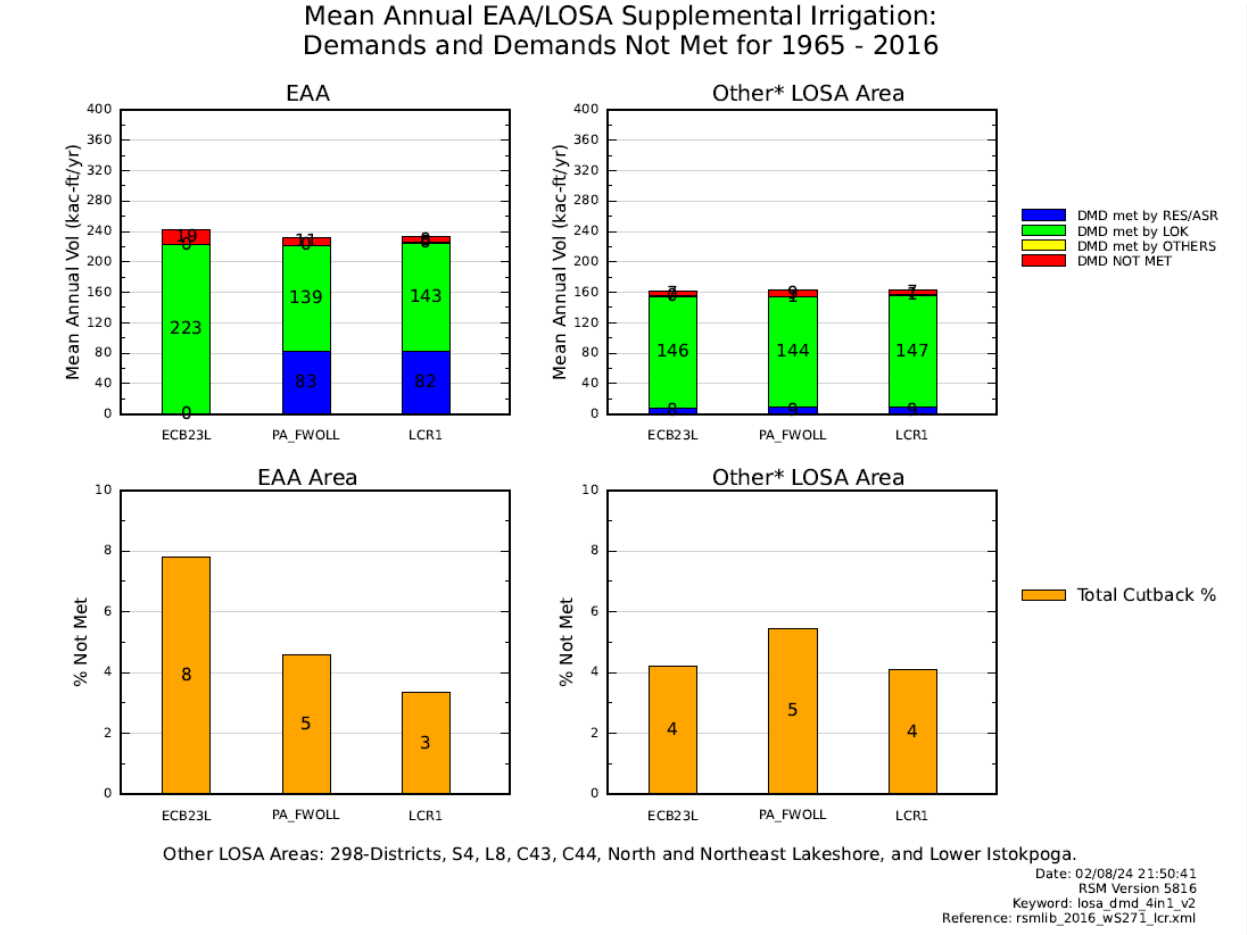
For each of the 8 years in the period of simulation with the largest water supply shortages in LOSA, cutback volumes are reduced, in aggregate, by the Recommended Plan compared to the ECB and FWO condition (**Figure B.1-2**). The volume of demand not met for the existing legal users in LOSA during the 8 years with the largest water shortage cutbacks is improved when comparing the Recommended Plan (Alternative 1) to the FWO condition, in each of the 8 water shortage years. The severity, duration, and magnitude of water supply shortages (i.e., cutbacks) for existing legal users decrease with the Project when comparing to the ECB, which includes LOSOM operations.

The Recommended Plan reduces the percentage of demands not met in the LOSA and the EAA (**Figure B.1-3**). Therefore, the Recommended Plan provides an enhancement of water supplies and would not cause an elimination or transfer of an existing legal use.



Note: ECB23L = Existing Condition Baseline (ECB); PA_FWOLL = Future Without Project (FWO); LCR1 = Alternative 1 (Recommended Plan)

Figure B.1-2. LOSA demand cutback volumes for the 5 years with the largest cutbacks.



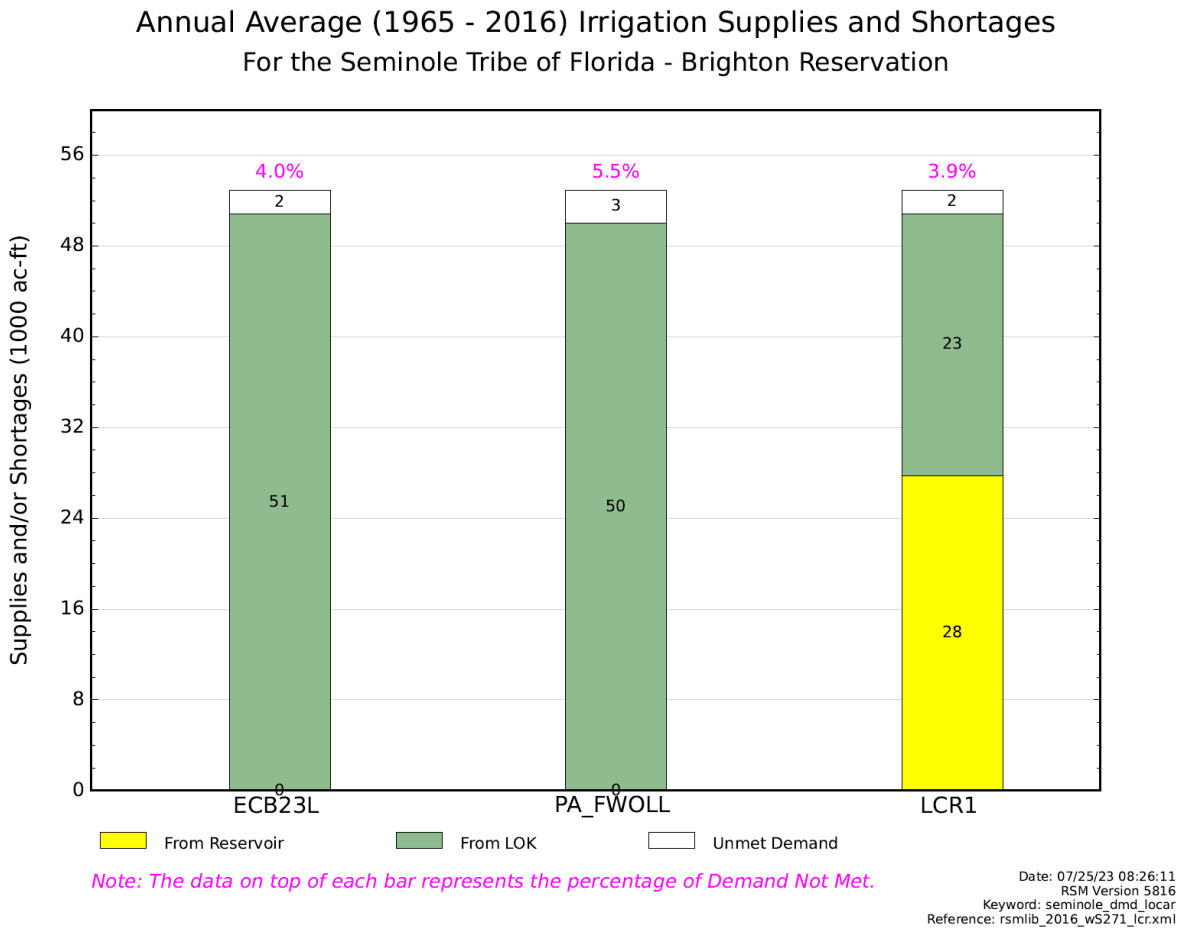
Note: ECB23L = Existing Condition Baseline (ECB); PA_FWOLL = Future Without Project (FWO); LCR1 = Alternative 1 (Recommended Plan)

Figure B.1-3. Mean annual EAA/LOSA supplemental irrigation: demands and demands not met for 1965–2016.

B.1.2.5.2 Seminole Tribe of Florida

Both the Brighton and Big Cypress Reservations depend partially on Lake Okeechobee for supplemental irrigation water supplies for agricultural and other needs. The volume and percentage of water demand not met can be compared to assess the ability of existing legal sources to continue to meet demands.

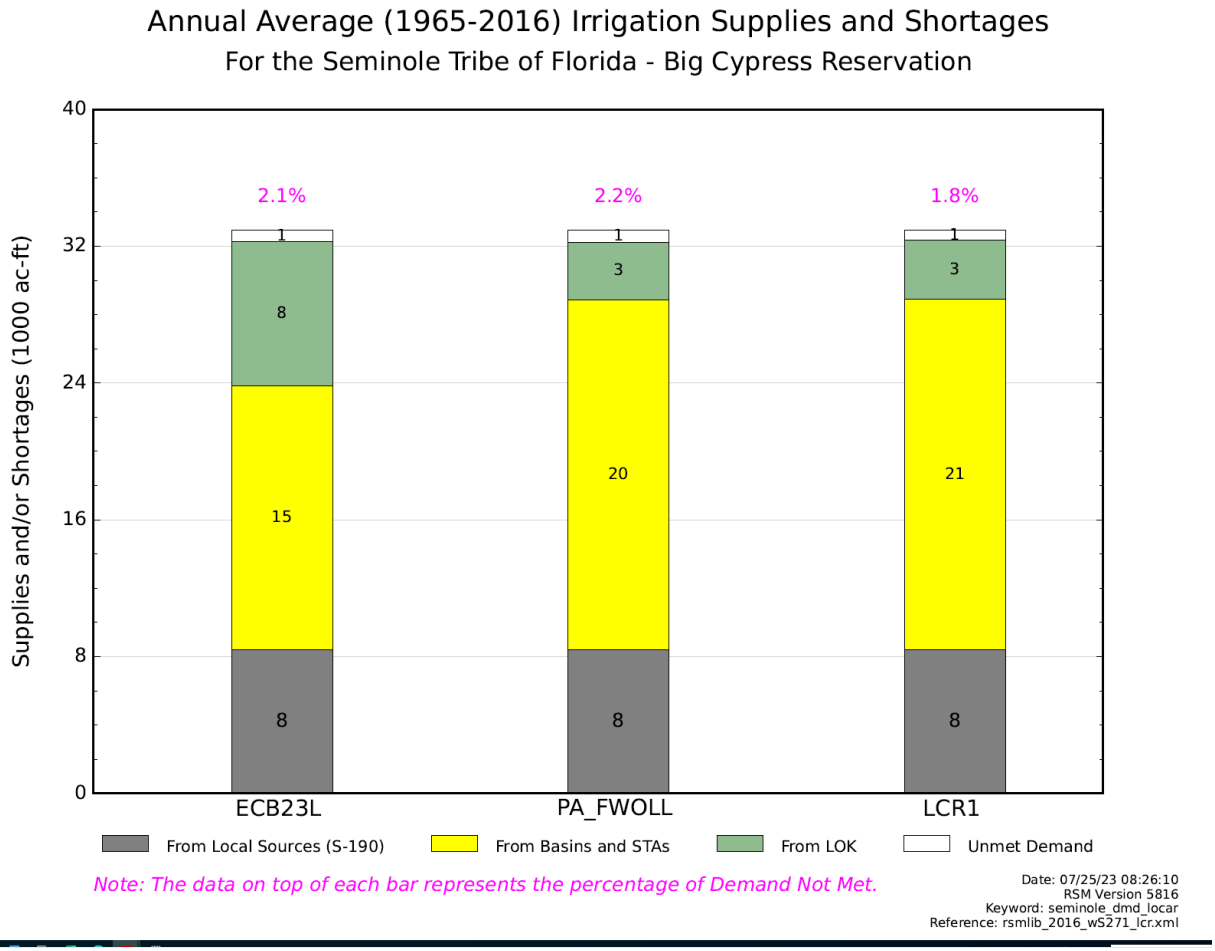
For the Brighton Reservation, water supply performance for Alternative 1 is improved slightly over the ECB and FWO condition, while most of the demand met shifts from Lake Okeechobee to the reservoir. The Recommended Plan reduces the volume of demand not able to be met from approximately 3,000 ac-ft in the FWO condition to 2,000 ac-ft. The percentage of demand not met is reduced from 5.5% in the FWO condition to 3.9% by the Recommended Plan. The volume and percentage of demand not met is also reduced by the Recommended Plan (LCR1) when compared to the ECB. (**Figure B.1-4**).



Note: ECB23L = Existing Condition Baseline (ECB); PA_FWOLL = Future Without Project (FWO); LCR1 = Alternative 1 (Recommended Plan)

Figure B.1-4. Annual average (1965–2016) irrigation supplies and shortages for the Seminole Tribe of Florida–Brighton Reservation.

For the Big Cypress Reservation, the volume and percentage of demand not met is also slightly reduced from the ECB and the FWO condition by the Recommended Plan The volume and percentage of demand not met are 1,000 ac-ft and 1.8 percent, respectively, for the Recommended Plan. For the FWO condition, the volume and percentage of demand not met are 1,000 ac-ft and 2.2 percent, respectively. The volume of water supplied by Lake Okeechobee is reduced from 8,000 ac-ft in the ECB to 3,000 ac-ft by the Recommended Plan. When comparing the Recommended Plan to the ECB, water supplied from basins and stormwater treatment areas [STAs] increases from 15,000 ac-ft to 21,000 ac-ft, and water supplied from Structure 190 (S-190)) remains unchanged. Based on this comparison, water supply performance for the STOF Brighton and Big Cypress Reservations is slightly improved with implementation (**Figure B.1-5**). The volume of water supplied by Lake Okeechobee is reduced and replaced with increased supplies from basins and STAs, while local supplies from S-190 remain unchanged. Based on this comparison, water supply performance for the STOF Brighton and Big Cypress Reservations is improved with the LOCAR implementation.



Note: ECB = Existing Condition, FWOL = Future Without, LCR1 = Alternative 1, LCR2 = Alternative 2, LCR3 = Alternative 3

Figure B.1-5. Annual average (1965–2016) irrigation supplies and shortages for the Seminole Tribe of Florida–Big Cypress Reservation.

B.1.2.5.3 Water Supply for Fish and Wildlife

The following sections describe the water supply for fish and wildlife.

Northern Estuaries

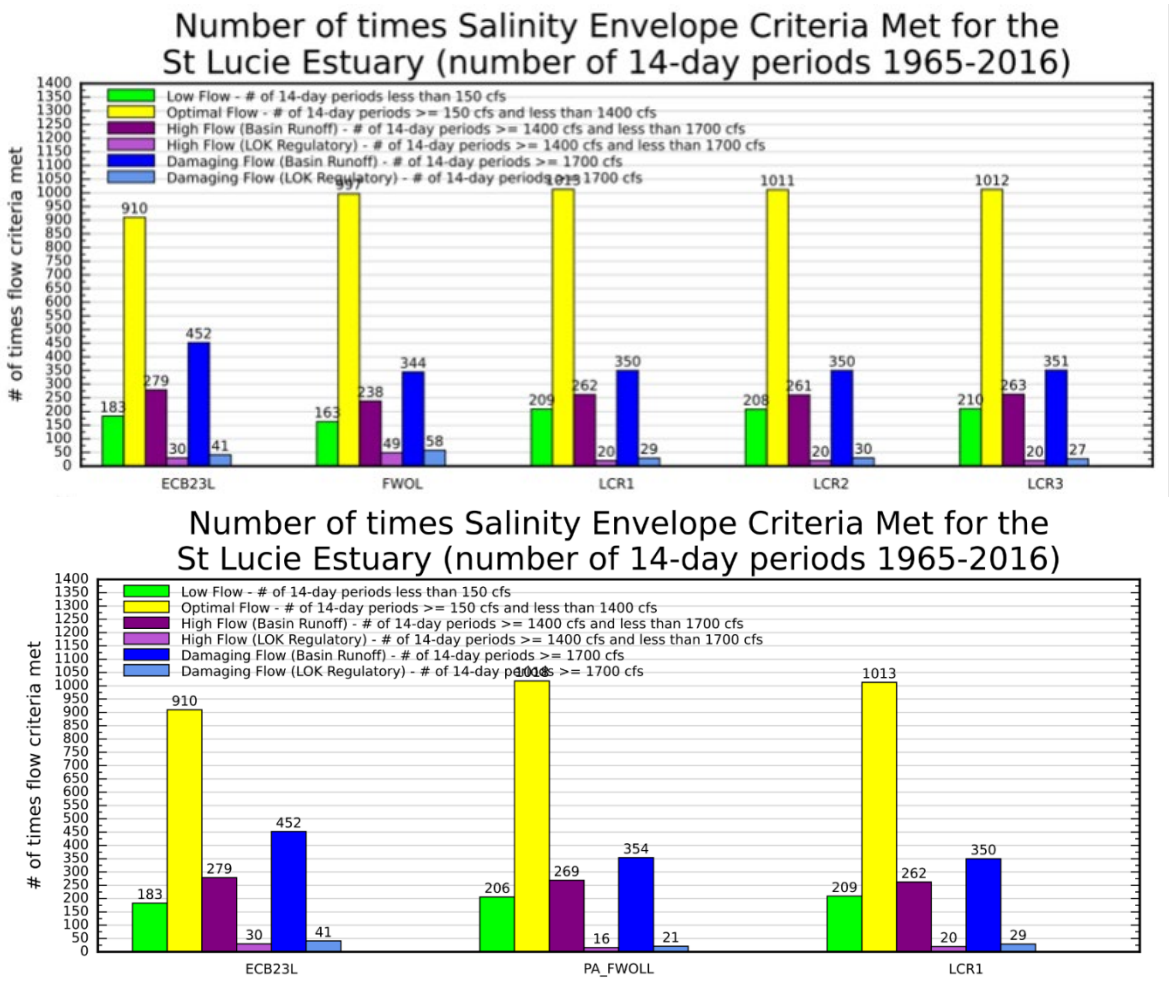
The RSM-BN outputs for the Northern Estuaries are based on the RECOVER Performance Measure for Northern Estuaries Salinity Envelope (RECOVER 2020). Each of the estuaries has biweekly flow criteria derived from the Curvilinear, Hydrodynamic Three-dimensional Model, which models estuary-wide salinities that are low, optimal, stressful (i.e., high), or damaging to key ecological indicator species. For the St. Lucie Estuary (SLE), this includes shoal grass (*Halodule wrightii*, a marine seagrass), and the Eastern oyster (*Crassostrea virginica*, a mesohaline bivalve); and for the Caloosahatchee Estuary (CRE), it includes these species in addition to tape grass (*Vallisneria americana*, a freshwater and oligohaline submerged aquatic vegetation).

The RSM-BN outputs for the Northern Estuaries include counts of biweekly flows in the following flow bins over the period of simulation, and distinguishes events triggered by the model resulting from either Lake Okeechobee regulatory releases, or basin runoff:

- St. Lucie Estuary:
  - Low Flow - # of 14-day periods less than 150 cubic feet per second (cfs)
  - Optimal Flow - # of 14-day periods greater than or equal to 150 cfs and less than 1,400 cfs
  - High Flow (Basin Runoff) - # of 14-day periods greater than or equal to 1,400 cfs and less than 1,700 cfs
  - High Flow (Lake Okeechobee regulatory releases) - # of 14-day periods greater than or equal to1,400 cfs and less than 1,700 cfs
  - Damaging Flow (Basin Runoff) - # of 14-day periods greater than or equal to 1,700 cfs
  - Damaging Flow (Lake Okeechobee regulatory releases) - # of 14-day periods greater than or equal to 1,700 cfs
  - Damaging Flow (Total Flows) - # of 14-day periods greater than or equal to 1700 and less than or equal to 4,000 cfs
  - Damaging Flow (Total Flows) - # of 14-day periods greater than or equal to 4,000 cfs
- Caloosahatchee River Estuary:
  - Low Flow - # of 14-day periods less than 750 cfs
  - Optimal Flow - # of 14-day periods greater than or equal to 750 cfs and less than 2,100 cfs
  - High Flow (Basin Runoff) - # of 14-day periods greater than or equal to 2,100 cfs and less than 2,600 cfs
  - High Flow (Lake Okeechobee regulatory releases) - # of 14-day periods greater than or equal to 2,100 cfs and less than 2,600 cfs
  - Damaging Flow (Basin Runoff) - # of 14-day periods greater than or equal to 2,600 cfs
  - Damaging Flow (Lake Okeechobee regulatory releases) - # of 14-day periods greater than or equal to 2,600 cfs
  - Damaging Flow (Total Flows) - # of 14-day periods greater than or equal to 2,600 and less than or equal to 4,500 cfs
  - Damaging Flow (Total Flows) - # of 14-day periods greater than or equal to 4,500 and less than or equal to 6,500 cfs
  - Damaging Flow (Total Flows) - # of 14-day periods greater than or equal to 6,500 cfs

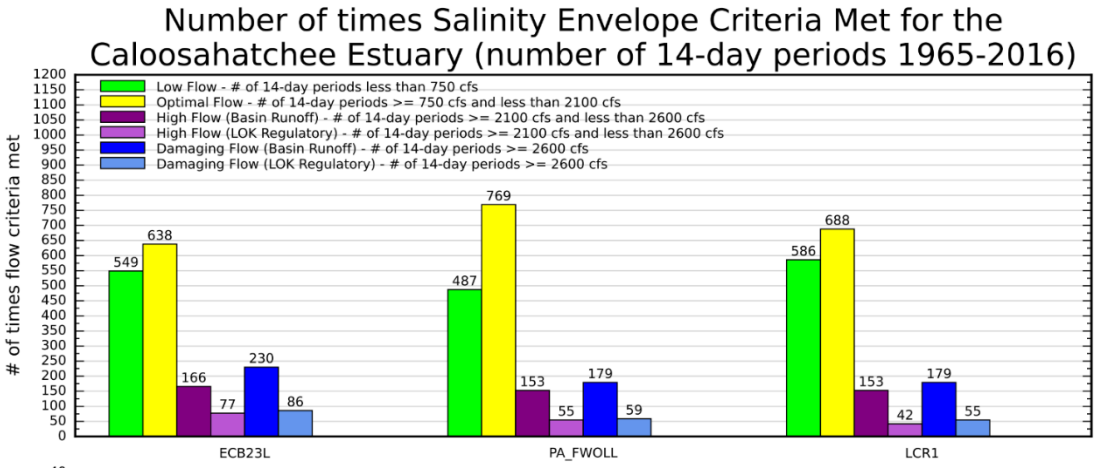
The restoration goal is to reestablish salinity regimes suitable for the maintenance of healthy, naturally diverse, and well-balanced estuarine ecosystems. Runoff from the watershed and freshwater flows from Lake Okeechobee both contribute to salinity fluctuations for the Northern Estuaries. Too much freshwater from watershed/basin runoff and freshwater flows from Lake Okeechobee can reduce salinity levels in the estuaries, and insufficient dry season flows can cause damaging high salinity extremes.

Overall, there is marked improvement in all high and damaging flow metrics triggered by Lake Okeechobee regulatory releases when compared to the ECB and the FWO (**Figure** and **Figure**). Across all alternatives, low flows (SLE biweekly flows less than 150 cfs; and CRE biweekly flows less than 750 cfs) perform worse than the ECB and the FWO, due to lake operations decisions. High and stressful flow events triggered by basin runoff, rather than Lake Okeechobee regulatory releases, improve across all alternatives compared to the ECB, but are worse than the FWO. Finally, across alternatives, extreme high flows in the estuaries (SLE biweekly flows between 1,700 and 4,000 cfs and greater than 4,000 cfs; and CRE biweekly flows between 2,600 and 4,500 cfs, 4,500 and 6,500 cfs, and greater than 6,500 cfs) show overall improvements, but degree of improvement depends on the estuary and on the flow category in question.



Note: ECB = Existing Condition; FWOL = Future Without Project; LCR1 = Alternative 1; LCR2 = Alternative 2; LCR3 = Alternative 3

Figure B.1-6. St. Lucie Estuary modeled results for the LOCAR alternatives, existing conditions baseline, and Future Without condition.



Note: ECB23L = Existing Condition; FWOL = Future Without Project; LCR1 = Alternative 1; LCR2 = Alternative 2; LCR3 = Alternative 3

Figure B.1-7. Caloosahatchee Estuary Modeled Results for the LOCAR alternatives, existing conditions baseline, and Future Without condition.

B.1.2.6 Savings Clause–Flood Protection

Flood protection is evaluated by a combination of best professional judgment interpreting model results and engineering analyses. Consistent with the Draft Guidance Memoranda, the same models and results used for plan formation were applied for the Savings Clause assessment. Two areas potentially affected by an increase in water stages from the Project and analyzed for related flood protection effects due to the high level of risk drivers in the area include Lake Okeechobee HHD and the service area surrounding the LOCAR reservoir.

B.1.2.6.1 Lake Okeechobee Herbert Hoover Dike

The LOCAR Project Team developed a set of plan formulation criteria that include limits to lake stages higher than the previously implemented regulation schedule (Water Supply and Environment [WSE]). Lake stages higher than those specified by the risk assessments conducted in support of the Dam Safety Modification Report (DSMR) on the HHD System would require a comprehensive dam safety reevaluation study, as the planned and approved remedial measures identified in the DSMR may not be sufficient to support higher stages. The following sections provide background information about the DMSR and results when compared with LOCAR alternatives including the Recommended Plan.

Background

Prior to the 2008 LORS, Lake Okeechobee was operated under the WSE regulation schedule. The WSE regulation schedule held lake stages approximately 1.0 to 1.5 feet (ft) higher than the 2008 LORS. Prior to the implementation of the WSE Regulation Schedule, Lake Okeechobee was operated under the Run 25 regulation schedule from May 1992 through July 2000. The Run 25 regulation schedule held lake stages approximately 0.1 to 0.3 ft higher than the WSE regulation schedule (refer to **Figure**), based on previous regional modeling analysis using a period-of-record from 1965 to 1995.

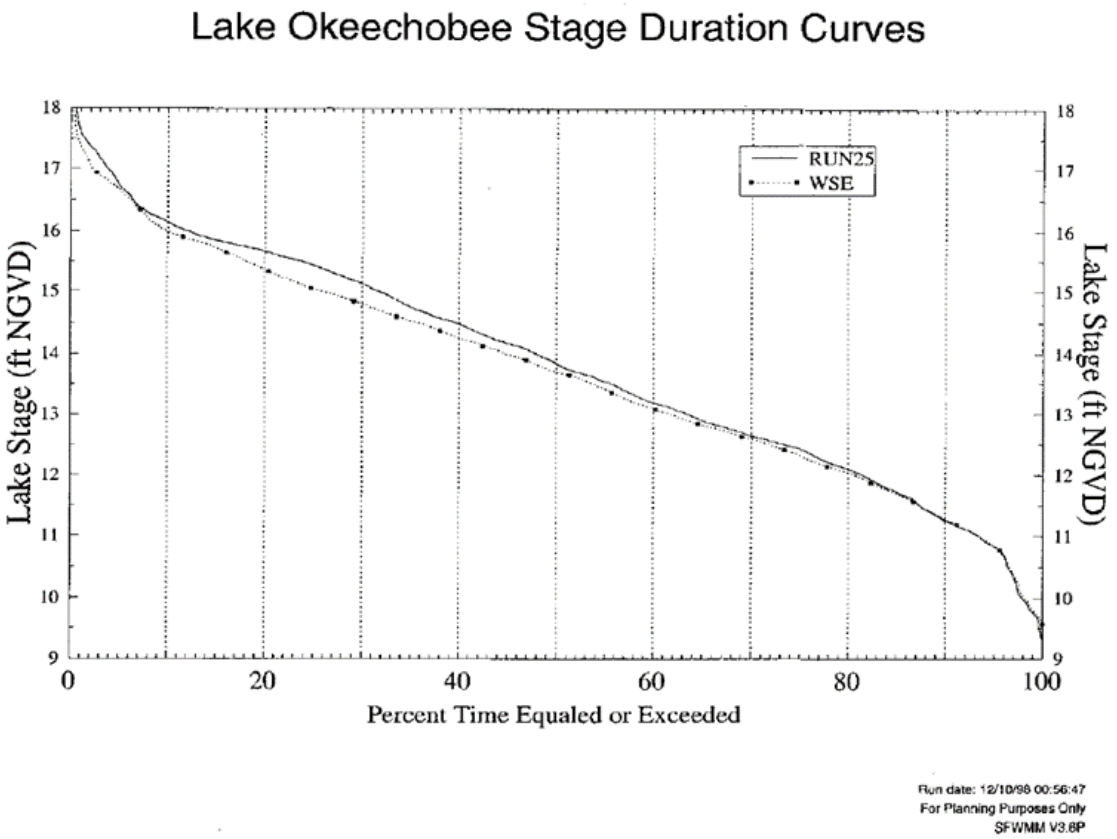


Figure B.1-8. Variation of Lake Okeechobee water stages with Run 25 and WSE regulation schedules (Corps 2016).

The LORS study, which led to the implementation of the 2008 LORS, was initiated because of the adverse environmental impacts the WSE Regulation Schedule had on lake ecology. Dam safety was later added as a performance criterion. Lowering a lake is one of the basic Interim Risk Reduction Measures implemented for deficient dams until appropriate rehabilitation is effectuated.

The DSMR and corresponding Environmental Impact Statement (EIS) used the 2008 LORS for the risk assessment and assumed that, in the absence of federal risk reduction measures being implemented, the current regulation schedule will continue into the future. The DSMR included a sensitivity analysis to evaluate the variation in Average Annual Life Loss (AALL) and Annual Probability of Failure (APF) that could result from possible future changes in the lake regulation schedule; for this analysis, the DSMR risk assessment evaluated the Run 25 regulation schedule. The DSMR did not conduct a risk assessment using the WSE Regulation Schedule.

The DSMR assumed that the Run 25 schedule represents the maximum reasonable change (or upper bound) that could be expected from future studies. Considering that the operation schedules are indistinguishable above 19.3 ft National Geodetic Vertical Datum of 1929 (NGVD29; 18.0 ft North American Vertical Datum of 1988 [NAVD88]) elevation, there was no discernible difference between AALL estimates from the two operation schedules modeled, Run 25, and the 2008 LORS.

The DSMR recommended remediation of the remaining areas of the HHD that exhibited intolerable risk. The existing condition risk assessment completed for the HHD in 2014 identifies significant potential failure modes that were determined to be intolerable for large portions of the dam. The DSMR addressed these failure modes and identified the mitigation needed to reduce the probability of catastrophic failure of the dam. The primary dam safety risk drivers are internal erosion and storm surge overtopping of isolated areas of embankment. The target for risk reduction related to the HHD is to reduce risk to within Corps tolerable risk guidelines for APF and to AALL, and to consider opportunities to reduce risk to As Low as Reasonably Practicable.

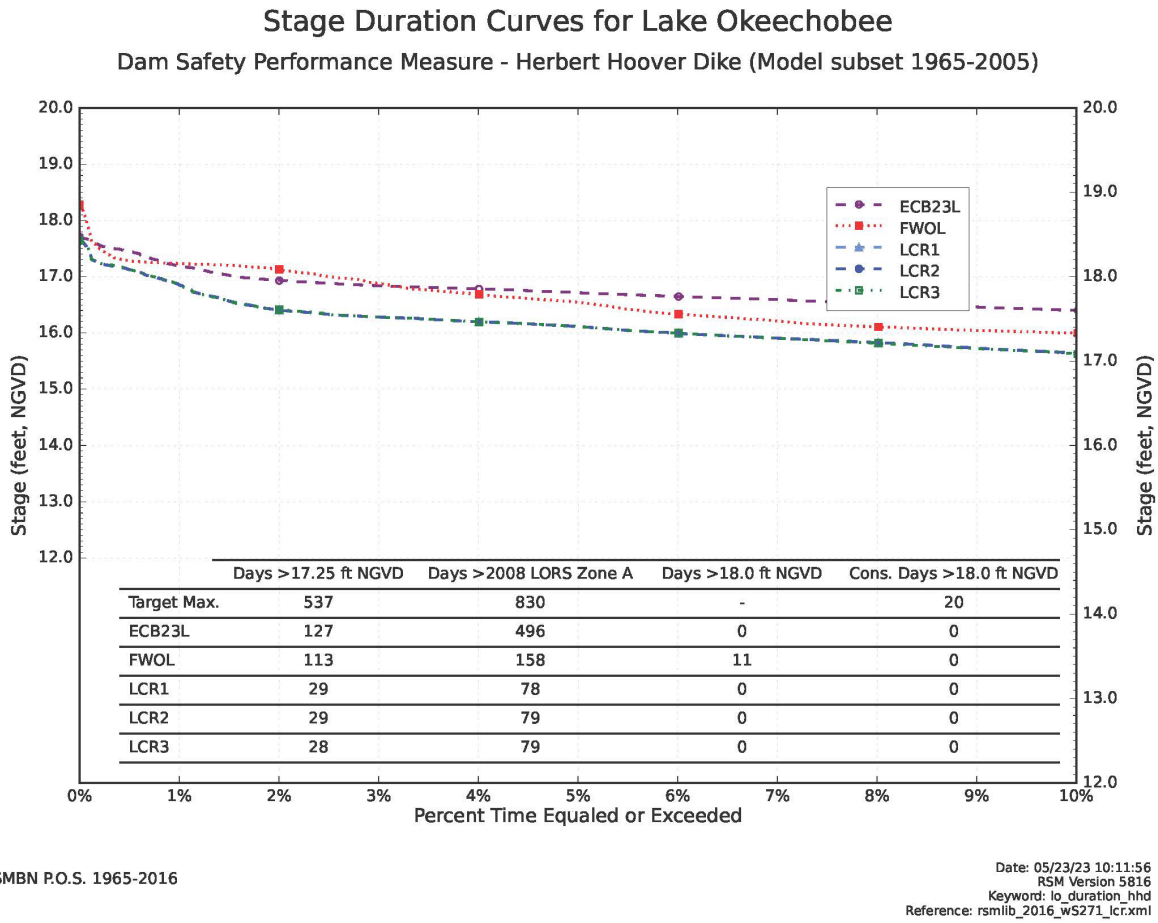
LOCAR RSM-BN Sensitivity Simulation WSE Regulation Schedule comparison

Figure illustrates the LOCAR RSM-BN modeled results used to characterize the performance difference between the LOCAR alternatives (using LOSOM-like operations with Central Everglades Planning Project (CEPP) EAA Phase optimized release guidance and proposed reservoirs), LORS 2008 with CEPP EAA Phase optimized release guidance (LOCAR WO), and LOSOM (LOCAR ECB) and the WSE Regulation Schedule (LOWRP Sensitivity Simulation with WSE Regulation Schedule replaced in the ECB):

- Total number of days in the LOCAR RSM-BN period-of-record with Lake Okeechobee mean daily stage above 18.0 ft NGVD29 would be zero days for all alternatives and 11 for the FWO. The targeted maximum would be 20 days.
- Total number of days in the LOCAR RSM-BN period-of-record (i.e., 1965 to 2016; 18,993 total days) with Lake Okeechobee mean daily stage above 17.25 ft NGVD29 was reduced from 113 in the FWO to 29 days for the Recommended Plan, Alternative 1.
- Total number of days in the LOCAR RSM-BN period-of-record with Lake Okeechobee mean daily stage above the 2008 LORS Zone A (seasonal range between 16.0 to 17.25 ft NGVD29) was reduced from 158 (FWO) to 78 days (Alternative 1).

The following include additional characteristics modeled.

- The percent of time in the LOCAR RSM-BN period-of-record with Lake Okeechobee mean daily stage above 16.0 ft NGVD29 was reduced from 16 (FWO) to 6 (Alternative 1) percent.
- The number of events in the LOCAR RSM-BN period-of-record with Lake Okeechobee mean daily stage above 16.0 ft NGVD29 for consecutive days was reduced from 15 (FWO) to 8 (Alternative 1) events.
- The number of years in the LOCAR RSM-BN period-of-record with Lake Okeechobee mean daily stage above 15.0 ft NGVD29 between May and September for longer than 120 cumulative years was reduced from 15 to 8 events. The number of cumulative years between October and April for longer than 120 cumulative years was reduced from 10 to 8 events.



	Days >17.25 ft NGVD	Days >2008 LORS Zone A	Days >18.0 ft NGVD	Cons. Days >18.0 ft NGVD
Target Max.	537	830	-	20
ECB23L	127	496	0	0
FWOL	113	158	11	0
LCR1	29	78	0	0
LCR2	29	79	0	0
LCR3	28	79	0	0

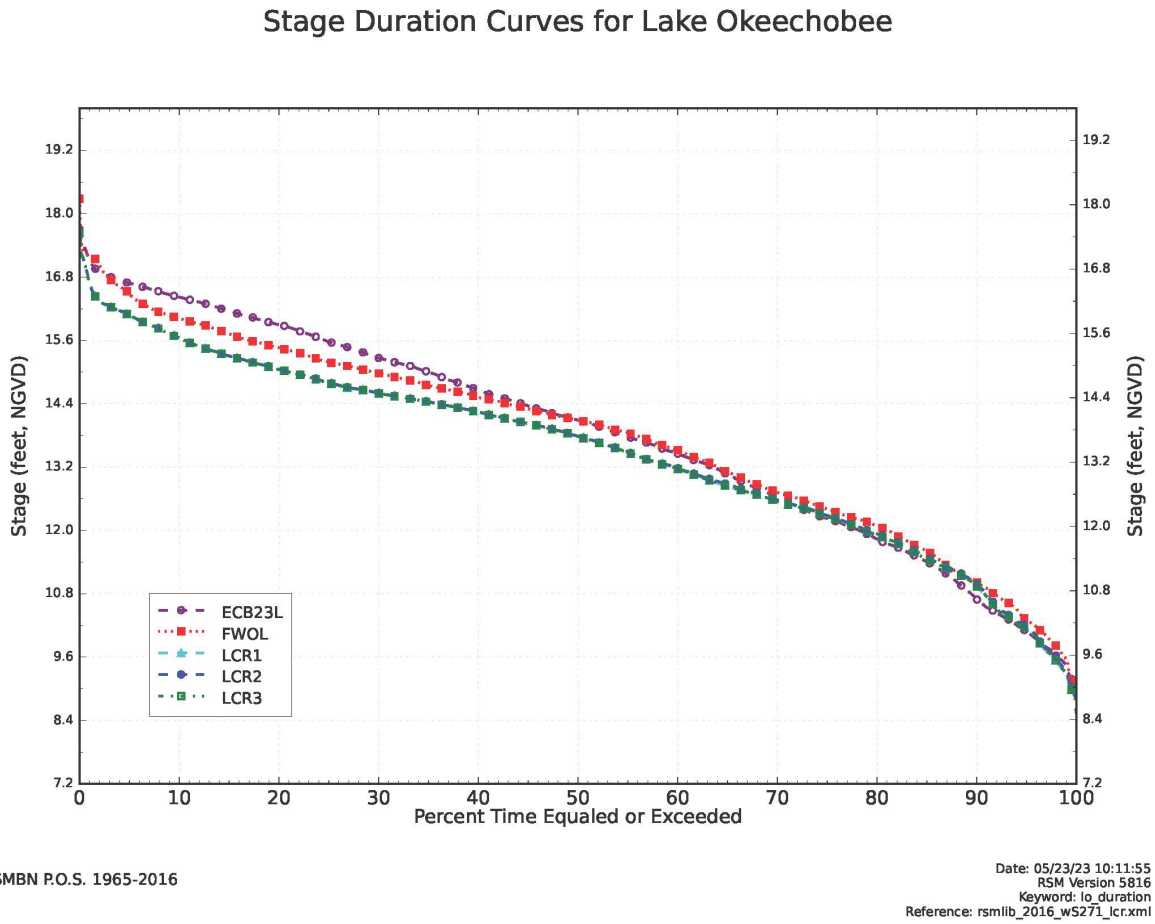
Note: ECB = Existing Condition; FWOL = Future Without Project; LCR1 = Alternative 1; LCR2 = Alternative 2; LCR3 = Alternative 3

Figure B.1-9. Variation of Lake Okeechobee water stages with LOCAR alternatives.

LOCAR Existing Conditions Baseline Compared to the Recommended Plan

Alternative 1 is the Recommended Plan. Documentation of the Recommended Plan modeling assumptions for Lake Okeechobee operations are found in **Appendix A, Annex A-3**. Independent of implementation of the Recommended Plan, there is an expectation that LOSOM will be implemented to incorporate recent CERP projects, HHD infrastructure remediation, and other factors. Lake Okeechobee stage duration curves for the RSM-BN model simulation of the ECB, FWO, Alternative 1 (the Recommended Plan), Alternative 2, and Alternative 3 are included as **Figure**. Peak stages for the LOCAR Savings Clause baselines and Recommended Plan are summarized as follows: 17.71 ft NGVD for the ECBLOW; 18.28 ft NGVD for the FWO; and 17.64 ft NGVD for the LOCAR Recommended Plan.

The Corps 2008 LORS EIS assessment recognized that minimizing the frequency of exceedances of the 17.25 ft elevation offers additional protection for public safety and the HHD, for the condition prior to completion of the approved and planned HHD remediation measures. The frequency of occurrence for lake stages within the ecologically preferred envelope is illustrated in **Table B.1-7**. Total number of days in the LOCAR RSM-BN period-of-record (i.e., 1965 to 2016; 18,993 total days) with Lake Okeechobee mean daily stage above 17.25 ft NGVD29 was reduced from 127 in the ECB and 113 in the FWO to 29 days for the Recommended Plan.



Note: ECB = Existing Condition; FWOL = Future Without Project; LCR1 = Alternative 1; LCR2 = Alternative 2; LCR3 = Alternative 3

Figure B.1-10.Lake Okeechobee stage duration curve.

Table B.1-7. Amount of Time Each Alternative is within the Lake Okeechobee Stage Envelope.

Category	Lake Okeechobee Stage Levels	Future Without Project	Alternative 1	Alternative 2	Alternative 3
% Time Inside Ecologically Preferred Stage Envelope	Varies between11.5 ft and 15.5 ft seasonally	22%	28%	28%	28%
%Time Above Stage Envelope	Varies between12.5 ft and 15.5 ft seasonally	48%	41%	41%	41%
%Time Below Stage Envelope	Varies between11.5 f. and 14.5 ft seasonally	30%	31%	31%	31%
% Time Below Navigational Min. Stage	% TIME < 12.5 ft	27.2%	30.1%	29.6%	30.2%
Extreme High Stage	% TIME > 17 ft	2.05%	0.59%	0.58%	0.58%
Extreme Low Stage	% TIME < 10 ft	3.05%	4.11%	3.98%	4.12%

ft = feet

B.1.2.6.2 LOCAR Project Service Area

The average water storage depth above ground within the storage cells of the LOCAR reservoir feature would be managed between zero and 18 ft. The reservoir inflow pump station would be designed to automatically cease pumping water into the reservoir when the reservoir water level reaches elevation 51.7 ft NAVD88, which is on average approximately 18 ft above the ground surface within the reservoir. Although structural inflows to LOCAR would be discontinued when the reservoir stage reaches 51.7 ft NAVD88, additional rainfall may further increase stages within the reservoir. The design of the reservoir perimeter dam system included consideration of the stage variability for operations.

Detailed assessments of the Recommended Plan were conducted. The MODFLOW groundwater seepage model results, presented in **Section A.9** of **Appendix A**, are undergoing risk review by the Corps and SFWMD engineering teams to ensure the service area surrounding the reservoir maintains its existing level of service of flood protection. Additional information and model results can be found in **Appendix A, *Engineering Appendix***. Additional assessments of potential effects from the Recommended Plan will be refined during the preconstruction engineering and design phase (PED). Information regarding the design considerations for flood protection is included in **Section B.3.4**.

B.1.2.7 Project Assurances–Identification of Water Made Available by the Project

The total water and the water made available for the natural system and other water-related needs are quantified when all Project features are constructed, and the Project is expected to be operational as identified in the FWP condition, the Recommended Plan. The pre-Project water expected to be available when the Project is operational is represented by the FWO.

B.1.2.7.1 Water Made Available for the Natural System

The habitat unit benefits were calculated during plan formulation at Lake Okeechobee and the Northern Estuaries. These locations represent where ecosystem benefits (habitat units) are expected as a result of implementation of the Recommended Plan.

B.1.2.7.2 Water for Other Water-related Needs

The ability of LOCAR to return water to Lake Okeechobee to meet other water-related needs was analyzed for the Recommended Plan. The LOCAR reservoir is designed to capture water from Lake Okeechobee during high stage events that would otherwise be lost to tide. Water stored in LOCAR is released during dry periods when lower stages in Lake Okeechobee may present water supply risks within LOSA. Water made available by LOCAR benefits water users within LOSA by increasing the reliability of its supply relative to the ECB or FWO. **Table** describes the number of cutbacks from the Recommended Plan compared to the ECB and FWO.

B.1.3 Conclusion

Water returned to Lake Okeechobee after the LOCAR storage would be available to meet all C&SF Project purposes and CERP's overarching objectives. The LOCAR's stored water, upon return to Lake Okeechobee, would be accessible to both benefit lake ecology and meet existing legal users' needs.

The following sections summarize the results of the Savings Clause Analysis.

B.1.3.1 Savings Clause–Elimination or Transfer of Existing Legal Sources of Water

LOCAR would provide storage capacity and attenuation of high flows, prior to delivery back to Lake Okeechobee. The cumulative water storage capacity of the Recommended Plan would decrease high-volume regulatory flows from Lake Okeechobee that are currently conveyed to the Northern Estuaries.

With implementation of the Recommended Plan, sources of water to meet agricultural and urban demand in LOSA would continue to be met by their current sources, primarily Lake Okeechobee. Sources of water for the STOF and Miccosukee Tribe of Indians of Florida are influenced by the regional water management system (C&SF Project, including Lake Okeechobee); these sources would not be negatively affected by the Project. Water sources for fish and wildlife located in Lake Okeechobee and the Northern Estuaries would not be diminished. Therefore, as a result of the Recommended Plan, there would be no elimination or transfer of existing legal sources of water supply for the following:

- Agricultural or urban water supply in LOSA;
- Allocation or entitlement to the STOF under Section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 United States Code 1772e); and
- Water supply for fish and wildlife in Lake Okeechobee or the Northern Estuaries.

B.1.3.2 Savings Clause–Flood Protection

The implementation of the Recommended Plan would not degrade the existing level of flood protection offered by various components of the C&SF Project for this area. Further, the Recommended Plan would ensure flood protection of the area through engineering design and construction following state of the practice methods for design and construction of pertinent features of the plan. Corps Engineering Regulations (ER) 1110-2-1150, *Engineering and Design for Civil Works Projects,* and ER 1110-2-1156, *Engineering and Design Safety of Dams–Policy and Procedures,* along with various other site/structure specific regulations, would be adhered to prior to and during the PED phase.

B.1.3.3 Project Assurances–Identifying Water for the Natural System

Identification of water for the natural system is quantified by releases to Lake Okeechobee. Water returned to Lake Okeechobee or delivered to the reservoir was quantified. The volumes of water at the 10th, 50th, and 90th percentiles are identified for the Recommended Plan (LCR1 condition only (**Table**). Because the LOCAR storage feature does not exist in the pre-Project condition, water is not quantified for the FWO condition. Benefits projected for the Northern Estuaries are the result of reduced high-volume flows from Lake Okeechobee and, therefore, water for the natural system is not identified.

Table B.1-8. Water Made Available for the Natural System by the LOCAR.

Location	Water Available Equaled or Exceeded 10% of Water Years (1,000 ac-ft)	Water Available Equaled or Exceeded 50% of Water Years (1,000 ac-ft)	Water Available Equaled or Exceeded 90% of Water Years (1,000 ac-ft)
Releases to Lake Okeechobee	175.8	31.5	0

ac-ft = acre-feet

B.1.3.3.1 Water to be Reserved or Allocated for the Natural System

As required by Section 601(h)(4)(A) of the WRDA 2000 and Section 385.35 of the Programmatic Regulations for the Implementation of CERP, the water made available by the Project would be protected using the State of Florida's reservation or allocation authority under state law as described in

Table. Water made available by the Recommended Plan must be protected before the SFWMD and Department of the Army enter into one or more Project Partnership Agreements to construct the Recommended Plan.

Lake Istokpoga/Indian Prairie Canal System

Currently, the footprint of LOCAR is contained within the Restricted Allocation Area (RAA) for the Lake Istokpoga/Indian Prairie Canal System. Within this RAA, no additional surface water would be allocated from SFWMD canals over and above existing allocations. The SFWMD will confirm protection of water made available by the project in the future.

Lake Okeechobee Service Area

Lake Okeechobee is a minimum flows and levels (MFL) waterbody. MFLs are the minimum flow or minimum water level at which further withdrawals would be significantly degrading to the water resources or ecology of the area. The 2008 LORS analysis revealed that the anticipated lower lake stages would turn Lake Okeechobee into an MFL waterbody in recovery. As part of the recovery strategy while 2008 LORS is in effect, the SFWMD adopted RAA criteria for LOSA. The criteria limit users' withdrawals to their base condition water use. Applicants are not authorized to use additional volumes from Lake Okeechobee waterbodies unless they identify one of the specified sources listed in the rule.

Currently, the LOSA RAA includes the waters of Lake Okeechobee, including integrated conveyance systems that are hydraulically connected to and receive water from Lake Okeechobee, such as Canal 43 (C-43), Canal 44 (C-44), and secondary canal systems that receive Lake Okeechobee water for water supply purposes via gravity flow or by pump. The SFWMD will confirm protection of water made available by the project in the future.

B.1.3.4 Project Assurances–Identifying Water Made Available for Other Water-related Needs

The ability of LOCAR to provide water to meet other water-related needs in LOSA was analyzed for the Recommended Plan (LCR1). Based on the analysis, the water supply level of service for existing legal users in LOSA is improved over the ECB. Increased water supply does not enable new or expanded allocations in LOSA.

B.1.3.5 Project Assurances Commitments for All CERP Projects

The overarching objective of the CERP (referred to as simply the "Plan" in WRDA 2000 and the Programmatic Regulations) 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. The federal government and the State of Florida are committed to the protection of the appropriate quantity, quality, timing, and distribution of water to achieve and maintain the benefits to the natural system described in CERP. As envisioned in WRDA 2000 and the Programmatic Regulations, each PIR will identify this appropriate quantity, quality, timing, and distribution of water for the natural system.

The overarching objective of the Plan 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. The federal government and the non-federal sponsor are committed to the protection of the appropriate quantity, quality, timing, and distribution of water to ensure the restoration, preservation, and protection of the natural system as defined in WRDA 2000, for so long as the project remains authorized. This quantity, quality, timing, and distribution of water shall meet applicable water quality standards and be consistent with the natural system restoration goals and purposes of CERP, as the Plan is defined in the programmatic regulations. The non-Federal sponsor will protect the water for the natural system by taking the following actions to achieve the overarching natural system objectives of the Plan:

1. Ensure, through appropriate and legally enforceable means under federal law, that the quantity, quality, timing, and distribution of existing water that the federal government and the non-federal sponsor have determined in this Project Implementation Report is available to the natural system, will be available at the time the Project Partnership Agreement (PPA) for the project is executed and will remain available for so long as the Project remains authorized.

2a. Prior to the execution of the PPA, reserve or allocate for the natural system the necessary amount of water that will be made available by the project that the federal government and the non-federal sponsor have determined in the PIR.

2b. After the PPA is signed and the project becomes operational, make such revisions under Florida law to this reservation or allocation of water that the federal government and the non-federal sponsor determines, as a result of changed circumstances or new information, is beneficial for the natural system.

3. For so long as the Project remains authorized, notify and consult with the Secretary of the Army should any revision in the reservation of water or other legally enforceable means of protecting water be proposed by the non-federal sponsor, so that the federal government can assure itself that the changed reservation or legally enforceable means of protecting water conform with the non-federal sponsor's commitments under paragraphs 1 and 2. Any change to a reservation or allocation of water made available by the project shall require an amendment to the Project Partnership Agreement.

B.1.4 State Compliance Report

The State Compliance Report, Section 373.1501, Florida Statutes, follows in **Section B.2**.

LAKE OKEECHOBEE WATERSHED RESTORATION PROJECT

COMPREHENSIVE EVERGLADES RESTORATION PLAN

Lake Okeechobee Storage Reservoir Section 203 Study

Final

State Compliance Report

Section 373.1501, Florida Statutes

January 2024

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Attachment B.2-1: Secretarial Order

List of Acronyms and Abbreviations

A	
AAC	Average Annual Cost
AALL	Average Annual Life Loss
ac	Acres
ac-ft	Acre-Feet
AAHU	Average Annual Habitat Unit
ALARP	As Low as Reasonably Practicable
AMMP	Adaptive Management and Monitoring Plan
APF	Annual Probability of Failure
APPZ	Avon Park Permeable Zone
ASR	Aquifer Storage and Recovery
B	
BA	Biological Assessment
BO	Biological Opinion
C	
CAR	Coordination Act Report
CBRS	Coastal Barrier Resources System
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
CE/ICA	Cost Evaluation and Incremental Cost Analysis
CEM	Conceptual Ecological Models
CEPP	Central Everglades Planning Project
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CERP	Comprehensive Everglades Restoration Plan
CERPRA	Comprehensive Everglades Restoration Plan Regulation Act
CESAJ	U.S. Army Corps of Engineers, Jacksonville District
CISRERP	Committee on Independent Scientific Review of Everglades Restoration Progress
CRE	Caloosahatchee River and Estuary
C&SF	Central and Southern Florida
D	
DSAC	Dam Safety Action Classification
DSMR	Dam Safety Modification Report
DO	Dissolved Oxygen
DOI	Department of Interior
DPOM	Draft Project Operating Manual
E	
EAA	Everglades Agricultural Area
ECB23L, ECB	Existing Conditions Baseline
ECBLOW	Existing Conditions Baseline for LOWRP

EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
E.O.	Executive Order
ER	Engineering Regulation
ERA	Ecological Risk Assessment
ERTP	Everglades Restoration Transition Plan
EV	Ecological Value
F	
F.A.C.	Florida Administrative Code
FEB	Flow Equalization Basin
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FLUCCS	Florida Land Use Cover and Forms Classification System
FR	Federal Register
FS	Feasibility Study
ft	feet
FWC	Florida Fish and Wildlife Conservation Commission
FWO	Future Without Project Condition (or the No Action Alternative under NEPA)
FWOLOW	Future Without Project Condition (or No Action Alternative under NEPA) LOWRP
FWP	Future With Project
FY	Fiscal Year
G	
GIS	Geographical Information System
H	
HHD	Herbert Hoover Dike
HSI	Habitat Suitability Index
HTRW	Hazardous, Toxic and Radioactive Waste
HU	Habitat Units
I	
IDC	Interest During Construction
INSMP	Invasive and Nuisance Species Management Plan
IOP	Interim Operations Plan
IOR	Initial Operating Regime
IORB	Initial Operating Regime Baseline
J	
K	
L	
LCR1	Lake Okeechobee Storage Reservoir Section 203 Study Recommended Plan
LOCAR	Lake Okeechobee Storage Reservoir Section 203 Study
LOK	Lake Okeechobee

LORS	Lake Okeechobee Regulation Schedule
LOSA	Lake Okeechobee Service Area
LOSOM	Lake Okeechobee System Operating Manual
LOW	Lake Okeechobee Watershed
LOWRP	Lake Okeechobee Watershed Restoration Project
M	
MFL	Minimum Flows and Levels
MGD	Million Gallons per Day
MS	Microsoft
MWD	Modified Water Deliveries
N	
NAPGPRA	Native American Graves Protection and Repatriation Act
NAVD/NAVD88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NER	National Ecosystem Restoration
NGVD/NGVD29	National Geodetic Vertical Datum of 1929
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
O	
OMRR&R	Operations, Maintenance, Repair, Rehabilitation, and Replacement
OPE	Other Program Element
OTMP	Operational Testing and Monitoring Phase
P	
PA FWOLL	Initial Operating Regime Baseline
PDT	Project Delivery Team
PED	Preconstruction Engineering and Design
PFM	Potential Failure Mode
PIR	Project Implementation Report
PM	Performance Measure
POM	Project Operating Manual
POR	Period of Record
PPA	Project Partnership Agreement
PS1 & PS2	LOCAR Pump Stations 1 and 2 (respectively)
psu	Practical Salinity Unit
PWS	Public Water Supply
Q	

R

RAA	Restricted Allocation Area
RECOVER	Restoration Coordination and Verification
RSM	Regional Simulation Model
RSM-BN	Regional Simulation Model for Basins

S

SAS	Surficial Aquifer System
SAV	Submerged Aquatic Vegetation
SFWMD	South Florida Water Management District
SHPO	State Historic Preservation Office(er)
SLE	St. Lucie River and Indian River Lagoon Estuary
SQAG	Sediment Quality Assessment Guidelines
SSC	Species of Special Concern
STA	Stormwater Treatment Area
STOF	Seminole Tribe of Florida
SWFWMD	Southwest Florida Water Management District

T

THPO	Tribal Historic Preservation Officer
TP	Total Phosphorus
TSP	Tentatively Selected Plan

U

UFA	Upper Floridan Aquifer
UIC	Underground Injection Control
U.S.	United States
Corps	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

V

W

WAF	Wetland Attenuation Feature
WG	Working Group
WQC	Water Quality Certification
WRDA	Water Resources Development Act
WSE	Water Supply and Environment
WY	Water Year

X

Y

Z

B.2 OVERVIEW OF SECTION 373.1501, FLORIDA STATUTES REQUIREMENTS

As the local sponsor for the Comprehensive Everglades Restoration Plan (CERP), South Florida Water Management District (SFWMD) is required by Florida Statue Section 373.1501 to consider all applicable water resource issues and analyze and evaluate all needs comprehensively to determine with reasonable certainty that Project components are feasible, cost-effective, consistent with applicable laws and regulations, and can be permitted and operated as proposed. Florida Statute Section 373.1501 also requires SFWMD to provide reasonable assurances that existing legal users will not experience adverse impacts or reduced quantities of water due to implementation of Project components. Moreover, SFWMD must provide assurance that existing levels of service for flood protection will not be diminished outside the geographic area of the Project components and that water management practices will continue to adapt to meet the needs of the restored natural environment. SFWMD must ensure that Project components are coordinated with existing utilities so that impacts to or relocations of public utilities and infrastructure are minimized, see Florida Statute Section 373.1501. This report, along with the additional detail provided in the Feasibility Study (FS), provides the information necessary for the Florida Department of Environmental Protection (FDEP) to determine that the SFWMD has conducted the necessary evaluations as set forth in Florida Statute Subsection 373.1501(5).

B.2.1 Introduction

An FS is being prepared to document the effects of an aboveground storage reservoir north of Lake Okeechobee, known as the Lake Okeechobee Storage Reservoir Section 203 Study (LOCAR or Project). The South Florida Water Management District (SFWMD) is preparing the FS pursuant to Section 203 of the Water Resources Development Act (WRDA) of 1986, as amended, for submission to the Assistant Secretary of the Army for Civil Works (ASA[CW]). The Jacksonville District U.S. Army Corps of Engineers (Corps) is the federal agency, acting on SFWMD's behalf, and intends to prepare a National Environmental Policy Act (NEPA) assessment to support the ASA(CW) review of the FS. The SFWMD initiated the LOCAR FS in 2023 as the non-federal interest in response to Florida Governor's Executive Order 23-06. The goal of LOCAR is to construct Component A of the Comprehensive Everglades Restoration Plan (CERP), a storage reservoir north of Lake Okeechobee, to address Everglades-related water resource issues identified in the Corps' 1999 *Central and Southern Florida Project Comprehensive Review Study: Final Integrated Feasibility Report and Programmatic Environmental Impact Statement* (also known as the Yellow Book) for the northern portion of the Lake Okeechobee Watershed, Lake Okeechobee, and Caloosahatchee and St. Lucie estuaries (Northern Estuaries) (Corps 1999). Similar aboveground storage reservoirs are being constructed to the east, south, and west of Lake Okeechobee.

The Kissimmee-Okeechobee-Northern Estuaries-Everglades ecosystem is an internationally recognized and valued aquatic ecosystem. Ecosystems within the Study Area have been altered from 120 years of highly effective public and private efforts to drain water off the land, in part by a massive federal project known as the Central and Southern Florida (C&SF) Project of the 1900s. The overall effect of the federal C&SF Project on the hydrology of this ecosystem has been a disruption of the natural timing, quantity, quality, and distribution of flows entering and leaving Lake Okeechobee; loss of overall water storage; increased stormwater runoff, values and rates, flows of water from Lake Okeechobee to the Northern Estuaries that significantly alter conditions in the estuaries; and a lower quantity of water available for the Everglades, all affecting nationally significant areas. Water that once flowed from Lake Okeechobee south

through the Everglades down Shark River Slough and to the southern estuaries has been impounded in Lake Okeechobee and now flows to the Northern Estuaries through the C-43 and C-44 canals. Changes in the quantity, timing, and distribution of freshwater entering the northern estuaries often leads to atypical salinity fluctuations, causing subaquatic vegetation stress, loss of benthic organisms and habitat, and redistribution of salinity-sensitive species including commercially and recreationally important fish. The spatial extent of wetlands throughout the system has been significantly reduced due to development and farming of natural areas after drainage from the C&SF Project made them viable.

The LOCAR, or Component A in the Yellow Book, is included in CERP, which was approved by Congress as a framework for the restoration of the natural system under Section 601 of WRDA 2000. CERP, consists of 68 components. The purpose of Component A is to detain water during wet periods for later use during dry periods to Lake Okeechobee. Increased storage capacity would reduce the duration and frequency of both high and low water levels in Lake Okeechobee that are stressful to the lake's littoral ecosystems and cause large discharges from the lake that are damaging to the downstream estuary ecosystems.

LOCAR expands upon previously authorized projects to continue progress towards achievement of the level of restoration envisioned for CERP. LOCAR is focused on aboveground water storage north of Lake Okeechobee. Since the original CERP planning was completed in 1999, new studies, policy guidance, data collection, pilot projects, and improvements in hydrologic systems modeling capabilities have allowed for refining the knowledge base and approach in ecosystem restoration. This refined approach is used to maximize Project benefits and reduce costs and risks to achieve the CERP goals. **Table B.2-1** compares how the LOCAR scope is in line with Component A of the Yellow Book for ecosystem restoration included in the FS.

Table B.2-1. Original Scope Envisioned in the CERP-Authorized Plan Compared to the Current LOCAR Planning Effort

CERP Component	CERP Facility and Description	CERP Facility Purpose	Management Measures Carried Forward for LOCAR Planning
North of Lake Okeechobee Storage Reservoir (CERP component A)	17,500-acre reservoir with total storage capacity of 200,000 acre-feet (average depth 11.5 feet) in Kissimmee River Region and 2,500-acre STA (with a maximum depth of 4 feet).	Detain water during wet periods for later use during dry periods, reduce nutrient loads flowing to the lower Kissimmee River and Lake Okeechobee, and reduce the duration and frequency of high and low water levels in Lake Okeechobee that are stressful to the lake's littoral ecosystems and can lead to large freshwater flows to the downstream St. Lucie and Caloosahatchee estuary ecosystems.	Various aboveground storage configurations. STAs are not a management measure in this effort.

B.2.2 Project and Study Area

The Project Area covers a portion of the Lake Okeechobee Watershed in Florida. LOCAR builds off previous studies and includes Glades and Highlands counties, along with the STOF Brighton Reservation. **Figure**

B.2-1. The Study Area includes the Project Area, along with Lake Okeechobee and the Caloosahatchee and St. Lucie Estuaries. A description of the LOCAR study area is provided in **Table B.2-2**.

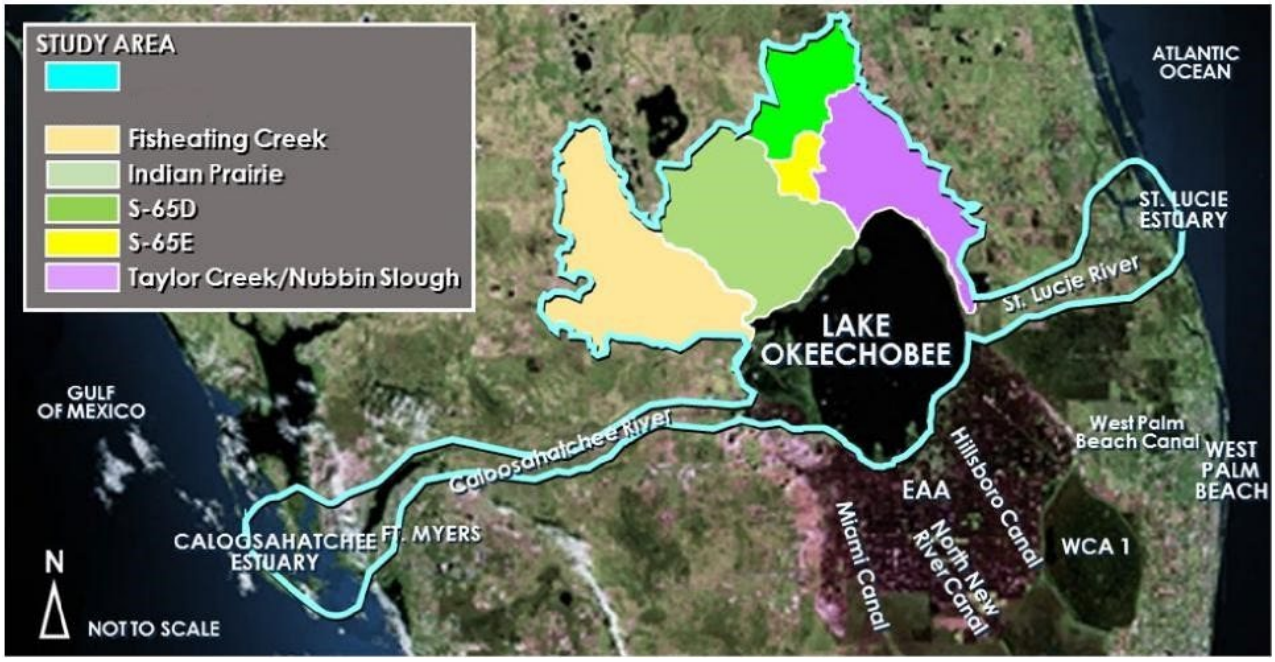


Figure B.2-1. LOCAR Study Area Map.

Table B.2-2. Description of the LOCAR Study Area

LOCAR Study Area Region	Description of the Study Area Region
Lake Okeechobee Watershed	The combined Lower Kissimmee, Indian Prairie, Fisheating Creek, Taylor Creek, and Nubbin Slough contribute 50 percent of the flow into Lake Okeechobee; 12 percent of that flow is from the Indian Prairie Basin. The Lake Istokpoga watershed contributes an additional 14 percent. Historically, approximately 40 percent of this area was comprised of wetland habitat consisting of cypress and bay tree forests, inland swamps, freshwater marsh, wet prairie, and sawgrass marsh. Today, only 15 percent of the area is wetlands. The current major land uses include agriculture, urban, and natural/open lands and wetlands.
Lake Okeechobee	Lake Okeechobee is a large, shallow lake (surface area approximately 730 square miles) located 30 miles west of the Atlantic coast and 60 miles east of the Gulf of Mexico. The lake is impounded by a system of levees, with six outlets: St. Lucie Canal eastward to the Atlantic Ocean, Caloosahatchee Canal/River westward to the Gulf of Mexico, and four agricultural canals (West Palm Beach, Hillsboro, North New River, and Miami). The lake is mostly surrounded by the 143-mile-long Herbert Hoover Dike (HHD). The lake has many functions including flood risk management, urban and agricultural water supply, navigation, recreation, fisheries, and wildlife habitat. It is critical for flood control during wet seasons and water supply during dry seasons. Agriculture in the Lake Okeechobee Service Area (LOSA), including the Everglades Agricultural Area immediately south of the lake, is the predominant lake water use. The lake is a significant economic driver for both the surrounding areas' and south Florida's economy.

LOCAR Study Area Region	Description of the Study Area Region
Northern Estuaries	In the current modified system, Lake Okeechobee flows into the two Northern Estuaries (Caloosahatchee and St. Lucie estuaries). The St. Lucie Canal flows eastward into the St. Lucie Estuary, which is part of the larger Indian River Lagoon Estuary. The Caloosahatchee Canal/River flows westward into the Caloosahatchee Estuary and San Carlos Bay, which are part of the larger Charlotte Harbor Estuary. The St. Lucie and Caloosahatchee estuaries are designated Estuaries of National Significance, and the larger Indian River Lagoon and Charlotte Harbor Estuaries are part of the National Estuary Program sponsored by the United States Environmental Protection Agency (USEPA). The landscape includes pine flatwoods, wetlands, mangrove forests, submerged aquatic vegetation (SAV), estuarine benthic areas (mud and sand), and nearshore reefs.

B.2.3 Objectives and Constraints

WRDA 2000, Section 601(h) states "the overarching objective of the Plan 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."

B.2.3.1 Goals and Objectives

In addition to Project purposes, the goals of LOCAR include:

1. Enhance ecological values in Lake Okeechobee and the St. Lucie and Caloosahatchee Estuaries ecosystems.
2. Enhance economic values and social well-being.
3. Maintain the rights of the STOF under the Compact among the Seminole Tribe of Florida (STOF), the State of Florida, and the SFWMD (Savings Clause [WRDA 2000, Section 601 (h)(5)(C)]).

The objectives of the LOCAR include:

1. Improve quantity, timing, and distribution of flows into Lake Okeechobee to maintain ecologically desired lake stage ranges more often.
2. Improve the timing and volumes of freshwater flows from Lake Okeechobee to improve the salinity regime and the quality of habitats for oyster, SAV, and other estuarine communities in the Northern Estuaries.
3. Increase availability of the water supply to existing legal water users of Lake Okeechobee commensurate with improving Lake Okeechobee ecology.

B.2.3.2 Constraints

Project constraints were recognized to ensure that the proposed Project would not reduce the level of service for flood protection and would protect existing legal water users. When a project is expected to result in an elimination or transfer of an existing legal source of water, the FS 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 would not reduce the levels of service for flood protection within the affected areas.

WRDA 2000 requires the inclusion of "Savings Clause" analyses for each CERP project. 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. The following are constraints for LOCAR implementation:

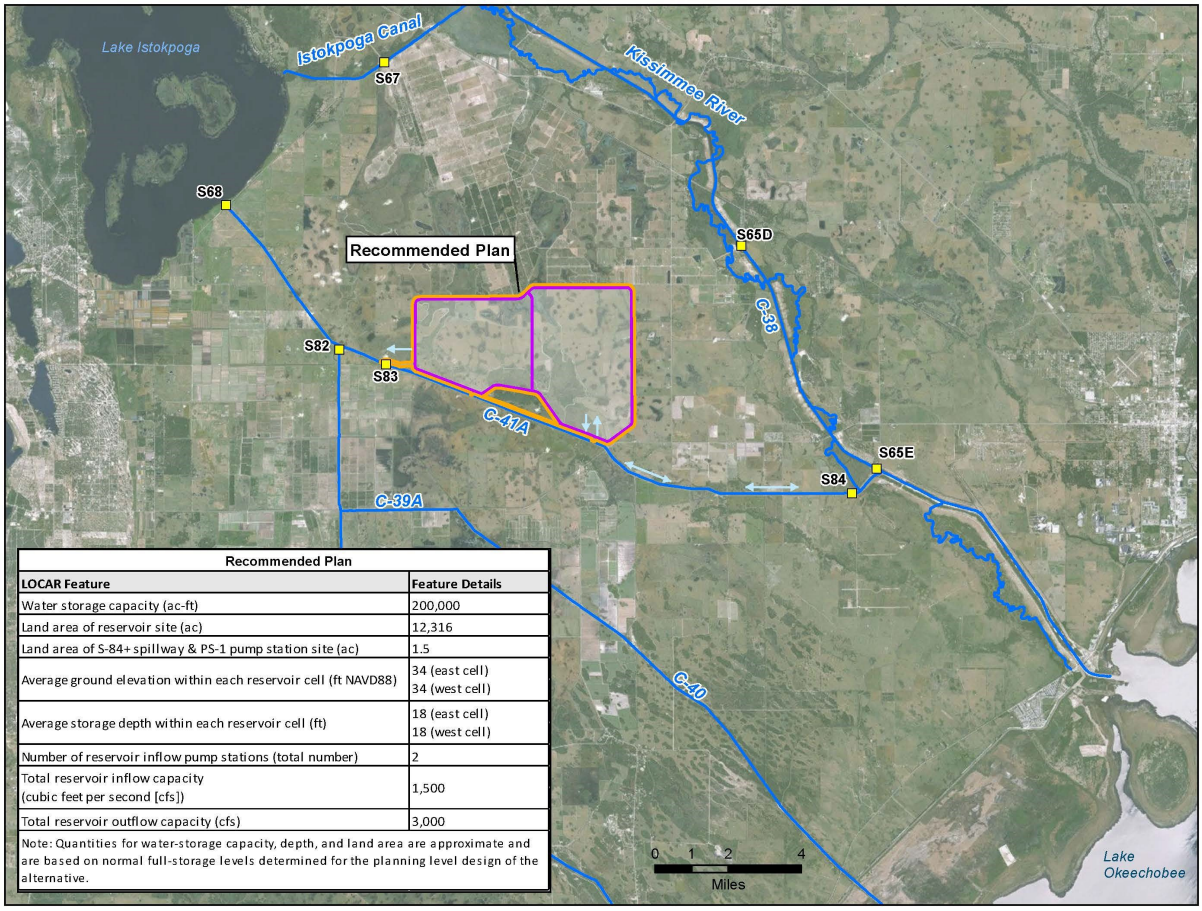
1. Comply with all applicable federal, state, and local laws, regulations, and policies.
2. Maintain levels of service for flood protection to agricultural and urban lands (Savings Clause [WRDA 2000, Section 601 (h)(5)(B)]).
3. Maintain levels of water supply service for existing legal users (Savings Clause [WRDA 2000, Section 601 (h)(5)(A)]).
4. Maintain the rights of the STOF a under the Compact among the STOF, the State of Florida, and the South Florida Water Management District (Savings Clause [WRDA 2000, Section 601 (h)(5)(C)]).
5. Maintain navigability to the lake, within the lake, and within the watershed.

B.2.4 Plan Features

The LOCAR Recommended Plan, Alternative 1, includes a 200,000-acre-foot aboveground storage reservoir north of the C-41A Canal and various recreation features (**Figure B.2-2**). The reservoir would cover an area of approximately 12,316 ac and be designed to have an average storage depth of 18.0 ft at its normal full-storage level. The reservoir would include two pump stations, two outflow culverts, an outflow canal, an interior divider dam with a gated control structure, and two overflow spillways. The perimeter and interior divider dams would have an average height of approximately 33 ft above ground. The perimeter dam would be approximately 18 miles around, allowing for recreational opportunities. The two pump stations would be used to fill the reservoir at 1,500 cubic feet per second (cfs). One pump station (PS1) would be located downstream of S-84 and move water from C-38 into the C-41A, upstream of S-84. The second pump station (PS2) would be located on the C-41A Canal upstream of State Highway 70 to pump water from the C-41A directly into the reservoir. A gated outflow culvert would be constructed on the west side of the reservoir to discharge water into the C-41A upstream of S-83, while another gated culvert would be constructed near the southeast side of the reservoir to discharge water into the C-41A downstream of S-83. The reservoir would be designed to have two storage cells (east and west) split by an interior divider dam to reduce wave runup. The interior divider dam would include a 1,500 cfs gated water control structure to allow for controlled conveyance of water between the two cells. Each cell would include an ungated overflow spillway designed to discharge into C-41A. Seepage from the reservoir would collect in a canal and be returned to the reservoir via seepage pump stations. If the seepage pump stations were not operational, the seepage collected in the canal would eventually overflow into the C-41A via overflow weir structures.

Reservoir operations would allow for a combination of methods to divert and return water to Lake Okeechobee from the reservoir. Water would be conveyed to the reservoir in one of two ways: (1) full or partial diversion of flow in C-41A downstream of S-83, into the reservoir by operating PS-2, or (2) back-pumping water from Lake Okeechobee by operating PS-1 and PS-2 concurrently. Water would be returned to Lake Okeechobee by discharging from the reservoir to C-41A upstream and/or downstream of S-83. The location of the two reservoir outflow culverts allows for water to be released from the reservoir into the C-41A upstream and/or downstream of S-83, to convey water to the Indian Prairie Sub-basin via C-

41A, C-41, C-39A, C-40, and/or C-38, as well as to Lake Okeechobee. The above described LOCAR plan features are also called the Recommended Plan in this report.



Recommended Plan	
LOCAR Feature	**Feature Details**
Water storage capacity (ac-ft)	200,000
Land area of reservoir site (ac)	12,316
Land area of S-84+ spillway & PS-1 pump station site (ac)	1.5
Average ground elevation within each reservoir cell (ft NAVD88)	34 (east cell) 34 (west cell)
Average storage depth within each reservoir cell (ft)	18 (east cell) 18 (west cell)
Number of reservoir inflow pump stations (total number)	2
Total reservoir inflow capacity (cubic feet per second [cfs])	1,500
Total reservoir outflow capacity (cfs)	3,000
Note: Quantities for water-storage capacity, depth, and land area are approximate and are based on normal full-storage levels determined for the planning level design of the alternative.	

Figure B.2-2. LOCAR Recommended Alternative.

B.2.4.1 Recreational Sites

The LOCAR provides recreation features compatible with the Recommended Plan. LOCAR provides the reservoir embankment with approximately 18 miles of trails and boat ramps constructed for maintenance that would also allow recreational users small boat access. Typical activities expected in the Project Area include nature study, wildlife viewing, hiking, boating, canoeing/kayaking, fishing, and hunting. These are all well suited to the environmental purposes of the Project. See **Figure B.2-3** for the recreation features, including proposed locations for public access sites.

Facilities in the LOCAR could include features such as gravel parking with a boat ramp, trailheads, shelters, and small boat portages. Other recreational amenities include signage, vehicle and pedestrian gates, picnic tables, and restroom facilities. These features and costs are described in detail in **Appendix F** of the FS.

The proposed features of the LOCAR recreation plan will not require additional real estate to be purchased. All features will be compatible with the environmental purposes of the Project. Program activities can be adjusted over time to better fit Project purposes.

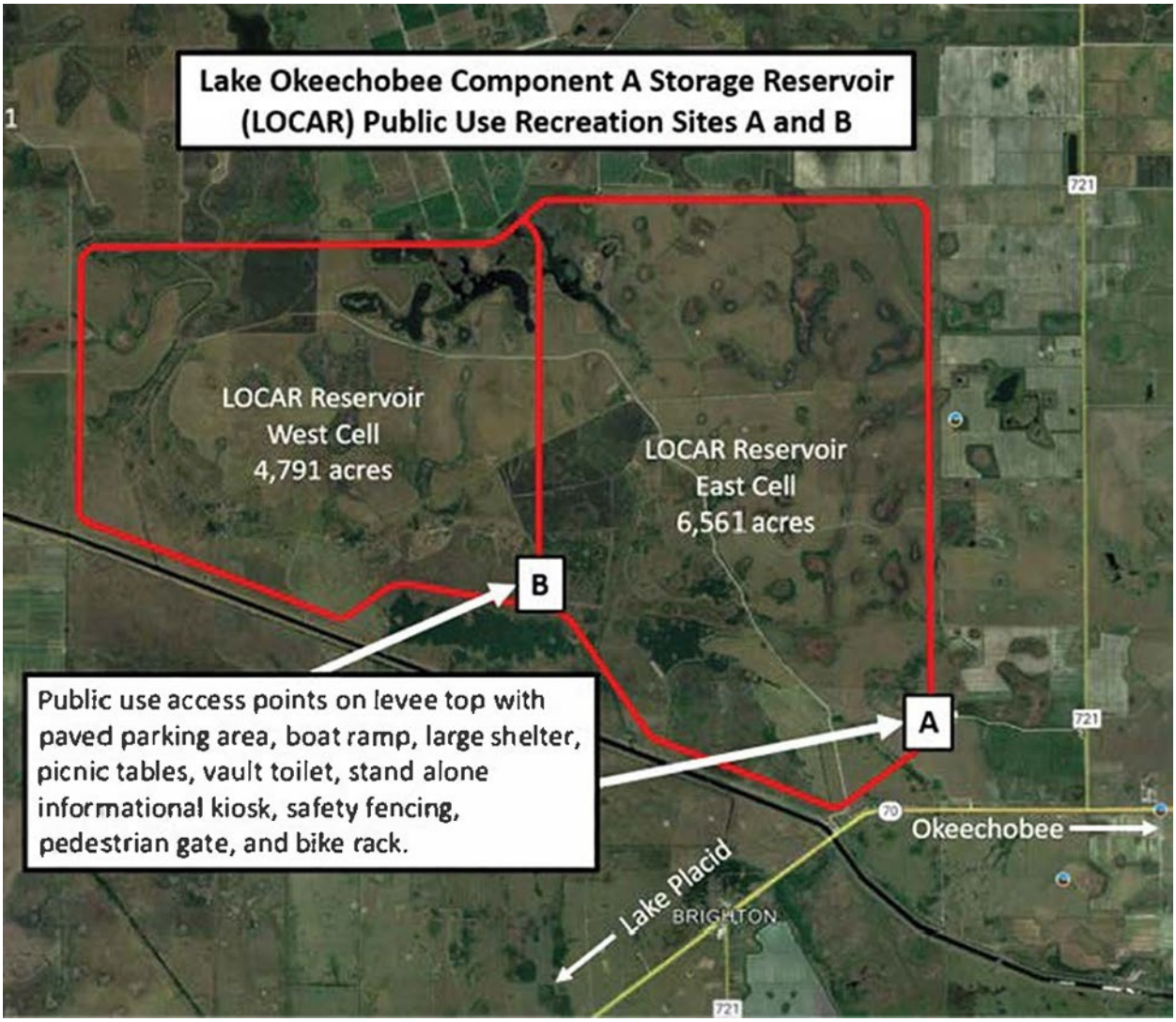


Figure B.2-3. Conceptual locations of recreational features in LOCAR.

B.2.4.2 Recommended Plan Operational Considerations

The Draft Project Operating Manual (DPOM) in **Annex C** of the FS includes operating criteria based on the LOCAR hydrologic modeling assumptions and generally discusses the transitions to operations during the construction phase, the operational testing and monitoring period (OTMP), and the long-term Operations, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R) phase. Hydrologic modeling was conducted for the Recommended Plan to optimize system-wide performance. The modeling incorporated the current regulation schedule management bands of the 2008 Lake Okeechobee Regulation Schedule (LORS) with the Central Everglades Planning Project (CEPP) modifications for water supply deliveries to the Northern Estuaries, plus additional optimizations to three parts of the decision tree:

- Class limits for Lake Okeechobee inflow and climate forecasts including tributary hydrologic conditions, seasonal climate outlook, and multi-seasonal climate outlook.
- Stage level, as delineated by the 2008 LORS management bands.
- Stage trends (whether water levels are receding or ascending).

Additional information and documentation of the Recommended Plan modeling assumptions for Lake Okeechobee operations, including water supply deliveries to the Northern Estuaries, is found in **Appendix G** of the FS. The LORS revisions and environmental water supply deliveries to the Northern Estuaries identified in LOCAR will inform future system-wide operational updates including the Lake Okeechobee System Operating Manual (LOSOM). The LOCAR FS is not the mechanism to propose or conduct the required National Environmental Policy Act (NEPA) evaluation of modifications to the LORS and system-wide operational modifications. These actions will be conducted under other authority consistent with the Integrated Delivery Schedule (IDS).

The specific feature locations of the Recommended Plan are shown in **Figure B.2-4**. Further details of features are available in **Appendix A** of the FS**.**

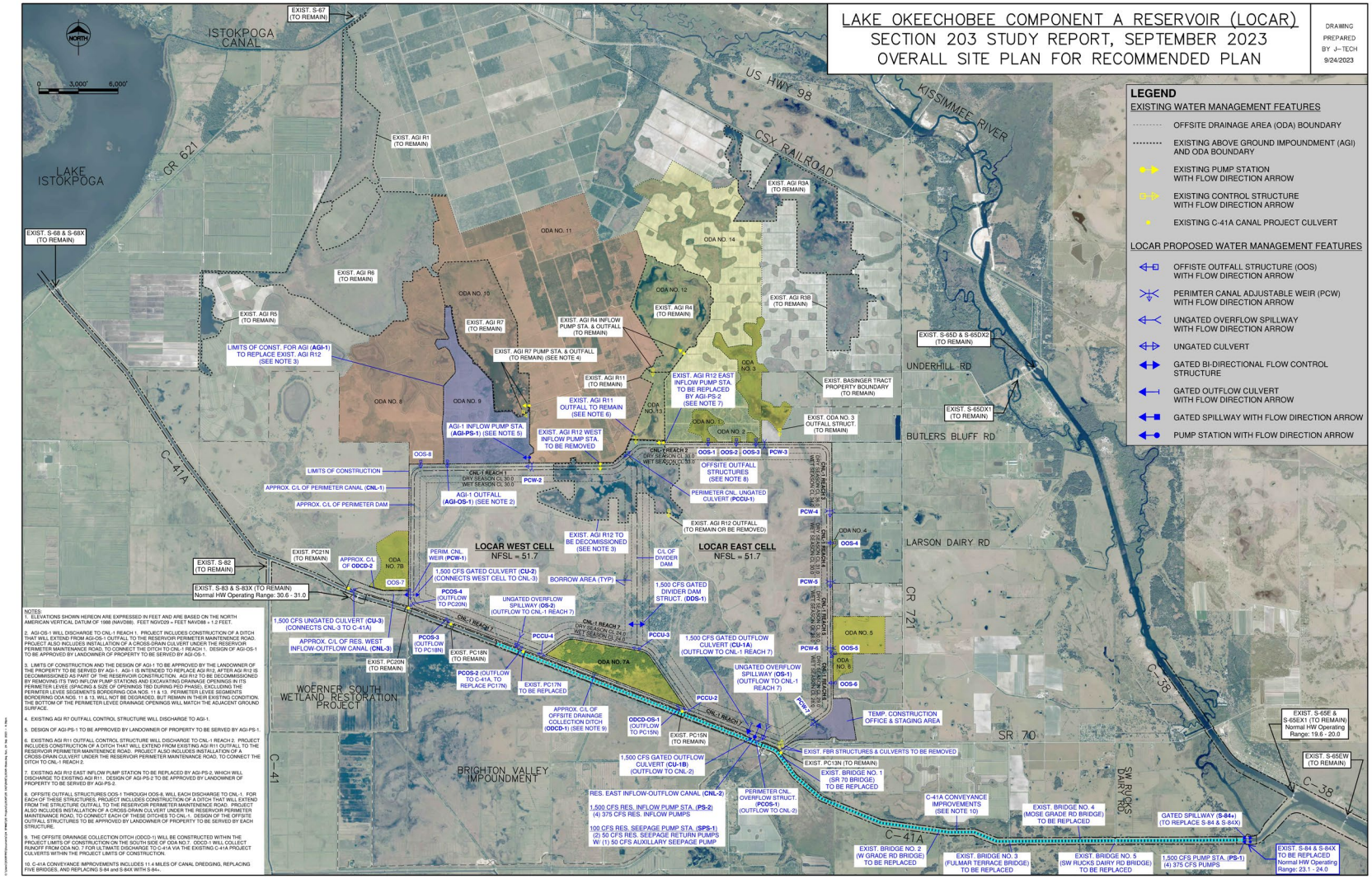


Figure B.2-4. LOCAR Recommended Plan features.

B.2.5 State Authority for CERP Projects

The Florida Legislature authorized the SFWMD to act as local sponsor for CERP projects. Florida Statute Section 373.1501 requires the SFWMD, for each CERP project, to analyze and evaluate whether all needs are being met in a comprehensive manner, to consider all applicable state water resource issues, and to determine if it is technologically feasible and cost effective. Specifically, SFWMD must evaluate the following:

1. Water Resource Issues - water supply, water quality, flood protection, threatened and endangered species and other natural system and habitat needs (Florida Statute Paragraph 373.1501(5)(a)).
2. Project Feasibility - determine, with reasonable certainty, project feasibility based upon standard engineering practices, cost effectiveness, consistency with CERP purposes and implementation of other CERP projects and operations (Florida Statute Paragraph 373.1501(5)(b)).
3. Consistency with state and federal laws - determine, with reasonable certainty, that each CERP project is consistent with applicable laws and can be permitted and operated as proposed (Florida Statute Paragraph 373.1501(5)(c)).
4. Project Assurances - Provide reasonable assurances that the quantity of water available to existing legal users shall not be diminished by a CERP project so as to adversely impact existing legal users; that existing levels of service for flood protection will not be diminished outside the geographic area of the project; and that water management practice will continue to adapt to meet the needs of the restored natural environment (Florida Statute Paragraph 373.1501(5)(d)).
5. Utility and Public Infrastructure Coordination - Coordinate with existing utilities and public infrastructure or minimize impacts to the relocation of existing public infrastructure and utilities (Florida Statute Paragraph 373.1501(5)(e)).

The FDEP oversees SFWMD to ensure it conducted these required evaluations (Subsection 373.1501(4), Florida Statute). FDEP needs these evaluations to approve each CERP project. Upon FDEP approval, the Project may receive state funds and be submitted to Congress for authorization, Paragraph 373.026(8)(b), Florida Statute.

In addition, Florida Statute Paragraph 373.470(3)(c) requires the SFWMD, in cooperation with the Corps, to complete a FS (functioning as a substitute for the Project Implementation Report) that identifies the increase in water supplies resulting from each CERP project, which shall be allocated or reserved by SFWMD. FDEP is also required to issue Comprehensive Everglades Restoration Plan Regulation Act permits for the construction and operation of each CERP project, Florida Statute Section 373.1502.

B.3 WATER RESOURCE ANALYSIS AND EVALUATION

Under Florida Statute Paragraph 373.1501(5)(a), the SFWMD shall "analyze and evaluate all needs to be met in a comprehensive manner and consider all applicable water resource issues, including water supply, water quality, flood protection, threatened and endangered species, and other natural system and habitat needs."

The Recommended Plan beneficially affects Lake Okeechobee, the Lake Okeechobee Watershed, and the St. Lucie and Caloosahatchee Estuaries. The effects of the alternative plans were evaluated based on a comparison of the most likely future conditions with and without those plans in place. To make this comparison, descriptions (or forecasts) must be developed for two different future conditions: the Future Without Project (FWO) condition and the Future With Project (FWP) condition. Note that the Project referred to in the FWP context is any one of the alternative plans that have been considered in the study. The FWP condition describes what is expected to occur from implementing each alternative plan that is being considered in the study. The FWO condition describes what is assumed to be in place if none of the study's alternative plans are implemented. The FWO condition is the same as the "no action" alternative required by NEPA and implementing regulations. For consistency of the report, the No Action Alternative is referred to as the FWO for the remainder of the report. The differences between the FWO condition and the FWP condition are the effects of the Project.

The period of analysis for water resources projects is 50 years, as set by Corps policy. Even if project structures last more than 100 years, there is too much inherent uncertainty to reliably forecast conditions and impacts beyond 50 years. The base year for the period of analysis for the LOCAR is 2033. The base year assumes an unconstrained implementation timeline in which LOCAR will be authorized, designed, and constructed. The period of analysis for the proposed Project will be 50 years, ending in the year 2083[1].

B.3.1 Project Objectives and Assumptions Associated with RSM Simulations

The analyses of the Savings Clause and Project Assurance requirements includes considerations of three different sets of assumptions at two different points in time or conditions as depicted in **Table B.3-1**): The (1) existing conditions baseline (ECB); (2) the Initial Operating Regime baseline (IOR Baseline); and (3) Initial Operating Regime ((IOR) Recommended Plan. Comparison of the Recommended Plan to these baselines is discussed in **Annex B** of the FS. The model assumption tables for all base conditions are provided in the Engineering Appendix (**Appendix A**) of the FS.

[1] CERP Revised Draft Final Guidance Memoranda (GM) dated July 2007 states that the end point for the period of analysis used in a FS will coincide with the period of analysis end-point in the most current version of the Plan (end point 2050). LOCAR is using 50 years after the period of analysis start date due to the construction schedule of Project features, which extends past the GM end point date.

Table B.3-1. Key Assumptions based on model documentation reports from Engineering Appendix (Appendix A, Annex A-3) of the FS

Condition	Intent	Equivalent for LOCAR	Model Scenario
Existing Conditions	Conditions at the time the Recommended Plan is selected, including land use, operations, and demands. Demand can be either permitted or projected, whichever is greater.	Conditions with only the projects and operations approved and in effect. Includes LOSOM. Permitted demands are included.	ECB23L
Initial Operating Regime Baseline	Future conditions, based on federally authorized projects only, at the time the Recommended Plan is operational including land use, operations, and demands. Demands can be either permitted or projected, whichever is greater.	The future condition based on federally authorized projects; Lake Okeechobee Regulation Schedule per Central Everglades Planning Project (CEPP)/Everglades Agricultural Area Reservoir Operation. Permitted demands are included.	PA_FWOLL

B.3.2 Water Supply

An existing legal use of water is defined as a water use authorized under a water management district-issued water use permit or existing and exempt from permit requirements. Existing legal users of water, including agricultural, urban, and Tribal in the Lake Okeechobee Service Area (LOSA) and Indian Prairie Basin will continue to be met by their current sources, primarily Lake Okeechobee, surface water in the regional canal network, and the surficial aquifer system. LOSA is more than 1.8 million acres in size. It includes Lake Okeechobee and the integrated conveyance systems that are hydraulically connected to, and receive water from, Lake Okeechobee. Water availability from Lake Okeechobee and its hydraulically connected water bodies is limited due to adoption of specific SFWMD water use permitting criteria developed in response to the 2008 LORS. All existing legal users will continue to have their needs met during construction and operation of the Project.

The period of simulation used for the LOCAR hydrologic modeling encompasses a wide range of historical climatologic and meteorologic conditions that are representative of south Florida hydrology and takes into account the different regulatory schedules for Lake Okeechobee during this time period. This analysis period includes several moderate wet and moderate dry periods, as well as less frequent and potentially more impactful periods of both extreme high rainfall and extreme drought conditions. Based on the period of simulation analysis, LOCAR maintains the pre-Project levels of service for water supply consistent with the requirements of WRDA 2000 and Florida Statute Chapter 373.1501.

The ability of the Project features to provide water to meet other water related needs in the LOSA, which includes the EAA, was analyzed for the Recommended Plan. The Recommended Plan meets the requirements of Florida Statute 373.1501(5)(a) by analyzing and evaluating water supply needs within the areas affected by the Project. Based on the analysis, the existing level of service for existing legal users is maintained or improved with the Recommended Plan (**Table B.3-2**). The Recommended Plan also reduces the frequency and/or severity of water shortage occurrences in LOSA when compared to the ECB project conditions which include LOSOM operations (**Figure B.3-1**). Additional detailed information on the Savings Clause analysis can be found in **Annex B** of the FS.

Table B.3-2. RECOVER Performance Measure WS-1: Frequency and Severity of Water Restrictions for LOSA.

Simulation	Period of Record	*Cutback Total (kaf)	Frequency	Severity Score	Number of WYs with at Least 1 Cutback
ECB (ECB23L)	1965-2016	1,335	13	31	13
IOR Baseline (PA_FWOLL)	1965-2016	1,017	12	47	12
Recommended Plan (LCR1)	1965-2016	753	10	18	10

FWO–Future Without Project; RECOVER–Restoration Coordination and Verification; LOSA–Lake Okeechobee Service Area

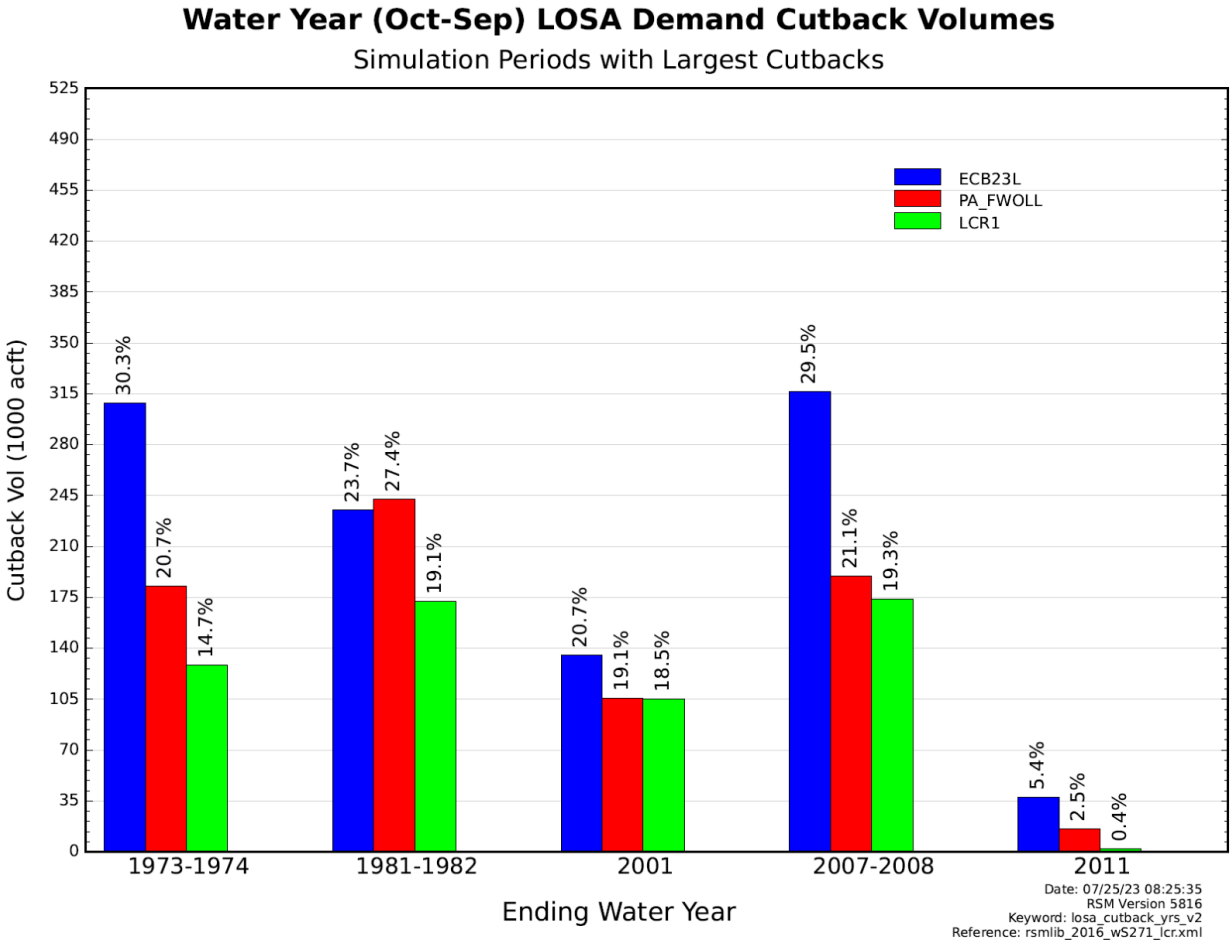


Figure B.3-1. LOSA demand cutback volumes for the 5years with the largest cutbacks.

B.3.2.1 Savings Clause Summary

The Savings Clause analysis is included in the Water Resources Development Act of 2000 (WRDA 2000) to protect legal users of the sources of water supply and to protect the level of service for flood protection that were in place at the time of WRDA's enactment. See Section 601(h)(5) of WRDA 2000. Specifically, the Savings Clause requires an analysis of each project's effects on legal sources of water that were in existence on the date of enactment of WRDA 2000 (December 2000), effects on levels of service of flood protection in existence on the date of enactment of WRDA 2000, and effects on the STOF Water Rights Compact with the State of Florida and SFWMD.

B.3.2.1.1 Savings Clause: Elimination or Transfer of Existing Legal Sources of Water

With Implementation of the Recommended Plan, sources of water used to meet agricultural and urban demand in the LOSA will continue to be met by their current sources, primarily Lake Okeechobee. Sources of water for the STOF and Miccosukee Tribe of Indians of Florida (MTI) are influenced by the regional water management system (C&SF Project, including Lake Okeechobee); these sources will not be negatively affected by the Project. Water sources for fish and wildlife located in Lake Okeechobee and the Northern Estuaries will not be diminished. Therefore, as a result of the Recommended Plan, there will be no elimination or transfer of existing legal sources of water supply for the following:

- Agricultural or urban water supply in the LOSA
- Allocation or entitlement to the STOF under Section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 U.S.C. 1772e)
- Water supply for fish and wildlife in Lake Okeechobee of the Northern Estuaries

B.3.2.2 Lake Okeechobee

Lake Okeechobee is the largest lake in the southeastern U.S. and is a central part of the south Florida watershed. Lake Okeechobee receives water from a 5,400-square-mile watershed that includes, but is not limited to, four sub-watersheds: Kissimmee River Valley, Lake Istokpoga-Indian Prairie/Harney Pond, Fisheating Creek, and Taylor Creek/Nubbin Slough. Lake Okeechobee provides water supply to urban areas, agriculture, and downstream estuarine ecosystems during the dry season (i.e., November to May) and is used for flood control during the wet season (i.e., June to October).

Lake Okeechobee differs from the historic lake in size, range of water depth, and connection with other parts of the regional ecosystem. Connecting Lake Okeechobee to the Caloosahatchee River and construction of the St. Lucie Canal in the early 1900s greatly reduced systemwide water storage and sheetflow to the south during drier periods. Construction of Herbert Hoover Dike (HHD) around the lake reduced the size of Lake Okeechobee's open-water zone by nearly 30 percent, resulting in considerable reductions in average water levels, and produced a new littoral zone within the dike that is only a fraction of the size of the natural one. Today, the lake has a surface area of 730 square miles and is extremely shallow. The lake has an average depth of 8.6 ft (average stage 14.11 ft National Geodetic Vertical Datum [NGVD]) based on the period of record from 1972 to 2012.

At the time of this report preparation, Lake Okeechobee stages are managed by the 2008 LORS, which determines the timing and quantity of water that is released from the lake when the stage exceeds defined seasonal regulatory levels. CEPP assumes that the lake stage will be held slightly higher for short durations to optimize flow equalization basin (FEB) use in the CEPP study area. In 2008, in response to the lower lake levels maintained by 2008 LORS, which changed Lake Okeechobee from a minimum flows and levels (MFL) prevention waterbody to an MFL recovery waterbody, the SFWMD adopted a restricted allocation area (RAA) rule limiting allocations to base condition water uses that occurred from April 1, 2001, to January 1, 2008, due to increased demand. The LOSA RAA serves as a part of the MFL recovery strategy for Lake Okeechobee. A new regulation schedule for Lake Okeechobee is expected to be finalized in 2023, known as the Lake Okeechobee System Operating Manual (LOSOM). The LOSOM manages water levels and releases based on four zones to limit high-volume releases and optimizes releases for flood control, water supply, navigation, recreation, and enhancement of fish and wildlife.

The ECB and FWO lake stage levels generated by the Regional Simulation Model for Basins (RSM-BN) hydrologic model using LOSOM for ECB and an FWO, including operation of the EAA Reservoir included in the lake regulation schedule is shown in **Table B.3-3**. The FWO Project conditions are expected to continue to impair downstream ecosystems, and the expansion of invasive and nuisance plant and animal species is expected to continue in the future.

Table B.3-3. Existing and FWO Condition for Lake Okeechobee Stage Levels as Modeled in RSM-BN.

Lake Okeechobee Stage Levels	Existing Conditions	FWO Conditions
% TIME > 17 feet NGVD	1.4	2.1
% TIME > 16 feet NGVD	17.9	10.3
% TIME < 11 feet NGVD	11.9	9.9
% TIME < 10 feet NGVD	4.4	3.1
% Time Inside Ecologically Preferred Stage Envelope	19	22
% Time Above Ecologically Preferred Stage Envelope	49	48
% Time Below Ecologically Preferred Stage Envelope	32	30

%-percentage; FWO–Future Without Project; NGVD–National Geodetic Vertical Datum; RSM-BN–Regional Simulation Model for Basins

The ecological condition is measured by the lake stage level, which measures the percentage of time that lake levels remain within a scientifically based, ecologically preferred range, or stage envelope, between seasonal elevations of 11.5 to 15.5 feet National Geodetic Vertical Datum of 1929 (NGVD29). The desired restoration condition avoids frequent or prolonged departures from this preferred envelope and extreme high (i.e., greater than 17 feet NGVD29) and extreme low (i.e., less than 10 feet NVGD29) lake stage events will be rare.[2]

Note: LOSA water restrictions primarily affect agricultural water users. Economic losses associated with water shortages depend not only on the number of water shortages, but also on the severity and duration of the water restrictions. The longer the restrictions are in place and the more severe the cutbacks, the more likely that crop yields will be reduced and the greater the expenses that are required by users to manage the water shortages.[3] The restoration target is to minimize the severity and duration of any water restrictions.

B.3.2.3 Groundwater Resources

The LOCAR Project Area is within the SFWMD Lower Kissimmee River Water Supply Planning Area. During the LOWRP planning effort, the Lower Kissimmee River Basin Groundwater Model was updated. The Upper Floridan Aquifer (UFA) is the main groundwater supply source in the Lower Kissimmee Basin, used primarily for irrigation and freeze protection. Pumping of the UFA for agricultural and public water supply is likely to occur in both SFWMD and SWFWMD areas. Negligible effects on groundwater resources would be expected from the Recommended Plan. **Table B.3-4** describes the impacts of the Recommended Plan on groundwater resources.

[2] RECOVER Lake Okeechobee Performance Measure: Lake Stage (March 2007)

[3] RECOVER Frequency and Severity of Water Restrictions for Lake Okeechobee Service Area (March 2005)

Table B.3-4. Effects of the Recommended Plan on Groundwater Resources

Aquifer	Future Without Project	Recommended Plan
Surficial Aquifer System (SAS)	Total water demand is expected to increase by 15% by 2035, mostly due to agricultural demands. Surficial aquifer will meet part of those demands. Extensive pumping of the SAS can potentially affect regional water levels in this unconfined aquifer.	Seepage from LOCAR would be managed by a seepage canal and discharge to C-41A. The Project would benefit the unconfined SAS by providing recharge to the aquifer.
Upper Floridan Aquifer (UFA)	Estimated future demands on UFA groundwater may be limited near the Lake Wales Ridge to maintain minimum flows and levels in adjacent lakes. However, sufficient confinement separates Lake Istokpoga and Lake Okeechobee from the UFA, so increased demands are unlikely to affect water levels in these lakes.	No effect on the UFA would be expected from LOCAR.
Avon Park Permeable Zone (APPZ)	The APPZ is not a water supply source due to greater salinity compared to the UFA, as well as greater depth. It is unlikely that the APPZ will provide drinking water or agricultural irrigation supplies in the future.	No effect on the APPZ would be expected from LOCAR.

B.3.2.3.1 Well Water Supply

Drinking water supply is obtained mostly from the surficial aquifer (land surface to 170 ft below land surface) and Lake Okeechobee in the Project Area. The period of simulation (1965 to 2016) used for the RSM-BN LOCAR hydrologic modeling encompasses a wide range of historical climatologic and meteorologic conditions that are representative of South Florida hydrology. Analysis indicates that the Recommended Plan maintains the pre-Project levels of service for water supply, consistent with the requirements of Section 601 (h)(5)(A) and Section 601 (h)(5)(C) of WRDA 2000 for existing legal users and to maintain the rights of the STOF under the Compact among the STOF, State of Florida, and SFWMD. Therefore, the Recommended Plan will not affect drinking water and existing uses. Please refer to **Chapter 5.13** of the **LOCAR FS** for additional effects information.

B.3.2.4 Elimination or Transfer of Existing Legal Sources of Water

Affected basins or users are evaluated to analyze the potential elimination or transfer of existing legal sources. The basins and users that may be affected by the Project are displayed in **Table B.3-5,** classified according to the categories identified in WRDA 2000.

Table B.3-5. Existing Legal Sources Evaluated for Elimination and Transfer.

WRDA 2000, Section 601(h)(5)	User or Natural System Evaluated in LOCAR
an agricultural or urban water supply;	LOSA, including the EAA
allocation or entitlement to the Seminole Tribe of Florida under section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 U.S.C. 1772e);	Brighton Reservation Big Cypress Reservation
the Miccosukee Tribe of Indians of Florida;	N/A
water supply for Everglades National Park; or	N/A
water supply for fish and wildlife.	Caloosahatchee Estuary St. Lucie Estuary

EAA–Everglades Agricultural Area; LOCAR–Lake Okeechobee Storage Reservoir Section 203 Study; LOSA–Lake Okeechobee service area; WRDA–Water Resources Development Act

The primary RSM-BN results evaluated for effects to agricultural or urban water supply are the volume and/or frequency of cutbacks, which is applicable to the LOSA and the STOF's Brighton and Big Cypress Reservations. The selected metrics provide more direct and higher resolution measures of potential water supply effects for the LOCAR Savings Clause assessment than would be provided through assessment of inflow volume probability curves for these areas.

For the two Northern Estuaries, the Savings Clause analysis focuses on whether the Project eliminates or reduces deliveries to meet the low flow criteria targets for the Northern Estuaries. The high flows to the estuaries occur during time of excess water when water supply scarcity is not a concern.

RECOVER's performance measure for water supply in LOSA (WS-1) quantifies the frequency and severity of water restrictions over the period of simulation. Cutbacks are reduced by the Recommended Plan compared to the ECB and the FWO condition. A simulated cutback total of 1,335,000 acre-feet (ac-ft) in the ECB conditions is reduced to 753,000 ac-ft by the Recommended Plan (LCR1). Similarly, the severity score is decreased from 31 to 18. The water supply improvements for the Recommended Plan compared to the ECB Project condition, as quantified in RECOVER WS-1, satisfy Savings Clause requirements.

The Recommended Plan reduce the percentage of demands not met in the LOSA and do not significantly change the percentage of demands not met in the EAA (**Figure B.3-2**).

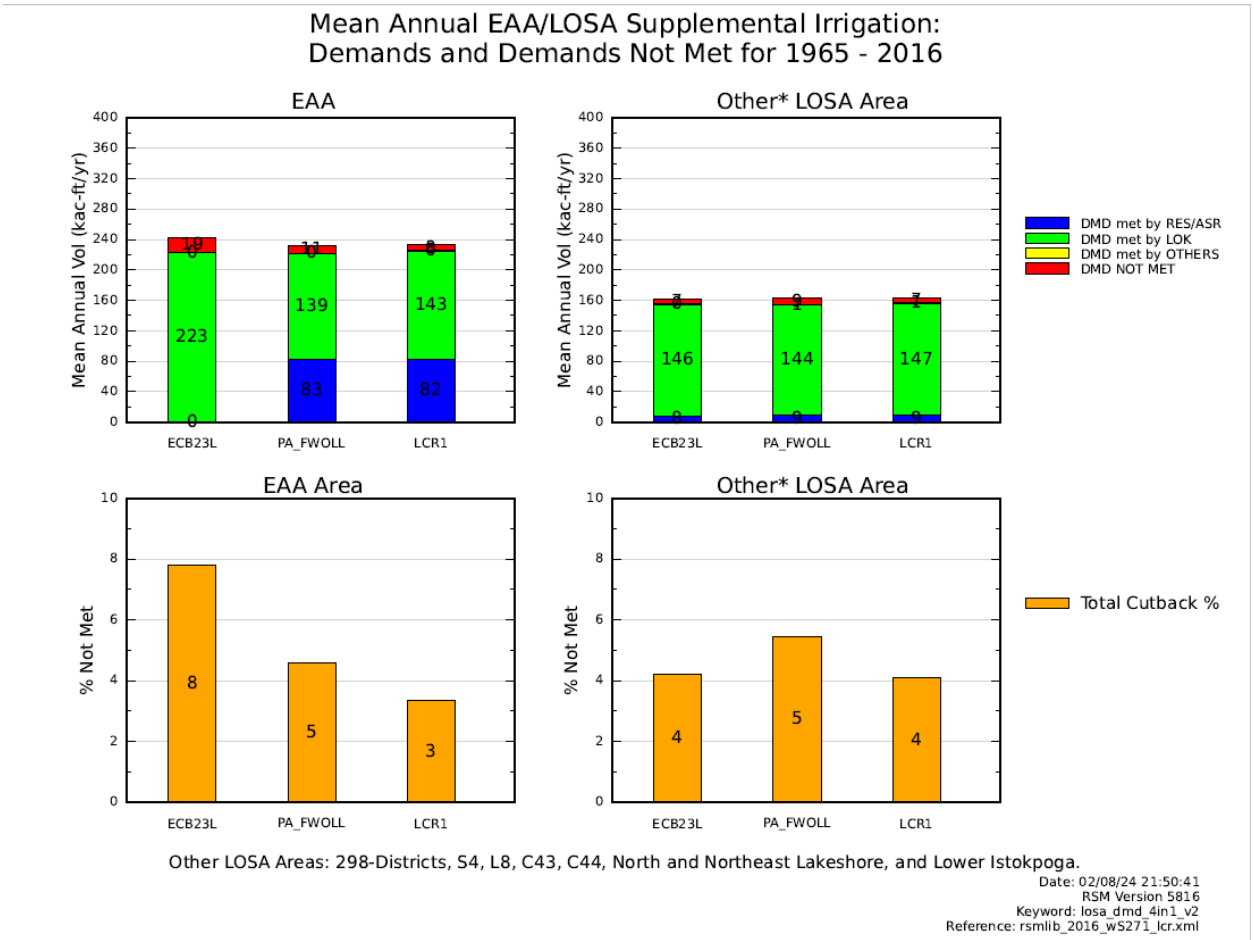


Figure B.3-2. Mean annual EAA/LOSA supplemental irrigation: demands and demands not met for 1965–2016.

B.3.2.5 Seminole Tribe of Florida

Both the Brighton and Big Cypress Reservations depend partially on Lake Okeechobee for supplemental irrigation water supplies for agricultural and other needs. The volume and percentage of water demand not met can be compared to assess the ability of existing legal sources to continue to meet demands. For the Brighton Reservation, water supply performance in the Recommended Plan is improved slightly over the ECB and FWO condition, while most of the demand met shifts from Lake Okeechobee to the reservoir. In the Recommended Plan, the volume and demand not able to be met is reduced from approximately 3,000 ac-ft in the FWO condition to 2,000 ac-ft by the Recommended Plan. The percentage of demand not met is reduced from 5.5% in the FWO condition to 3.9% by the Recommended Plan. The volume and percentage of demand not met is also reduced by the Recommended Plan when compared to the ECB (**Figure B.3-3**).

For the Big Cypress Reservation, the volume and percentage of demand not met is also slightly reduced from the ECB and the FWO condition by the Recommended Plan. The volume and percentage of demand not met are 1,000 ac-ft and 1.8 percent for the Recommended Plan. For the FWO condition, the volume and percentage of demand not met are slightly greater, 1,000 ac-ft and 2.2 percent, respectively (**Figure**

B.3-4). The volume of water supplied by Lake Okeechobee is reduced from 8,000 ac-ft in the ECB to 3,000 ac-ft by the Recommended Plan and replaced with increased supplies from basins and STAs, while local supplies from Structure S-190 remain unchanged. Based on this comparison, water supply performance for the STOF Brighton and Big Cypress Reservations is improved with LOCAR implementation.

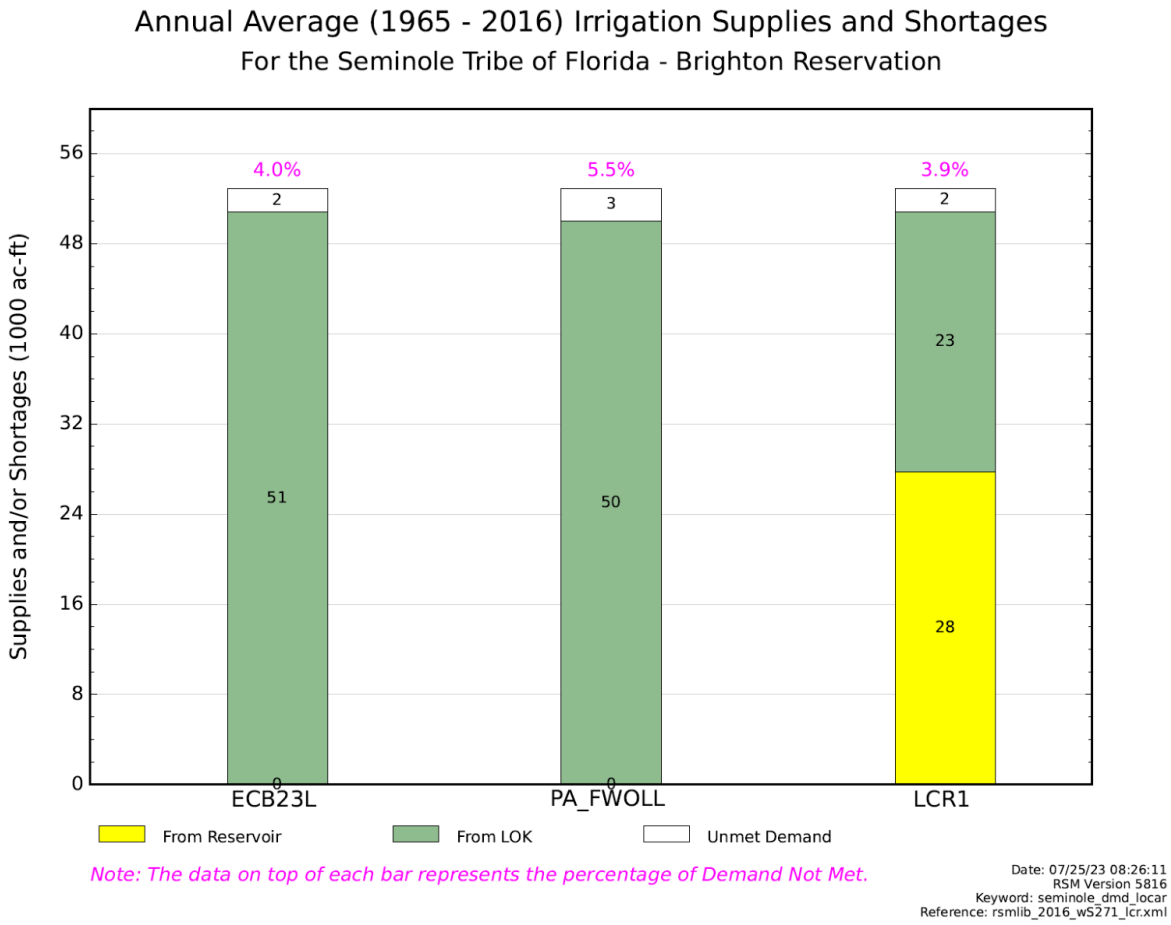


Figure B.3-3. Annual average (1965–2016) irrigation supplies and shortages for the Seminole Tribe of Florida Brighton Reservation.

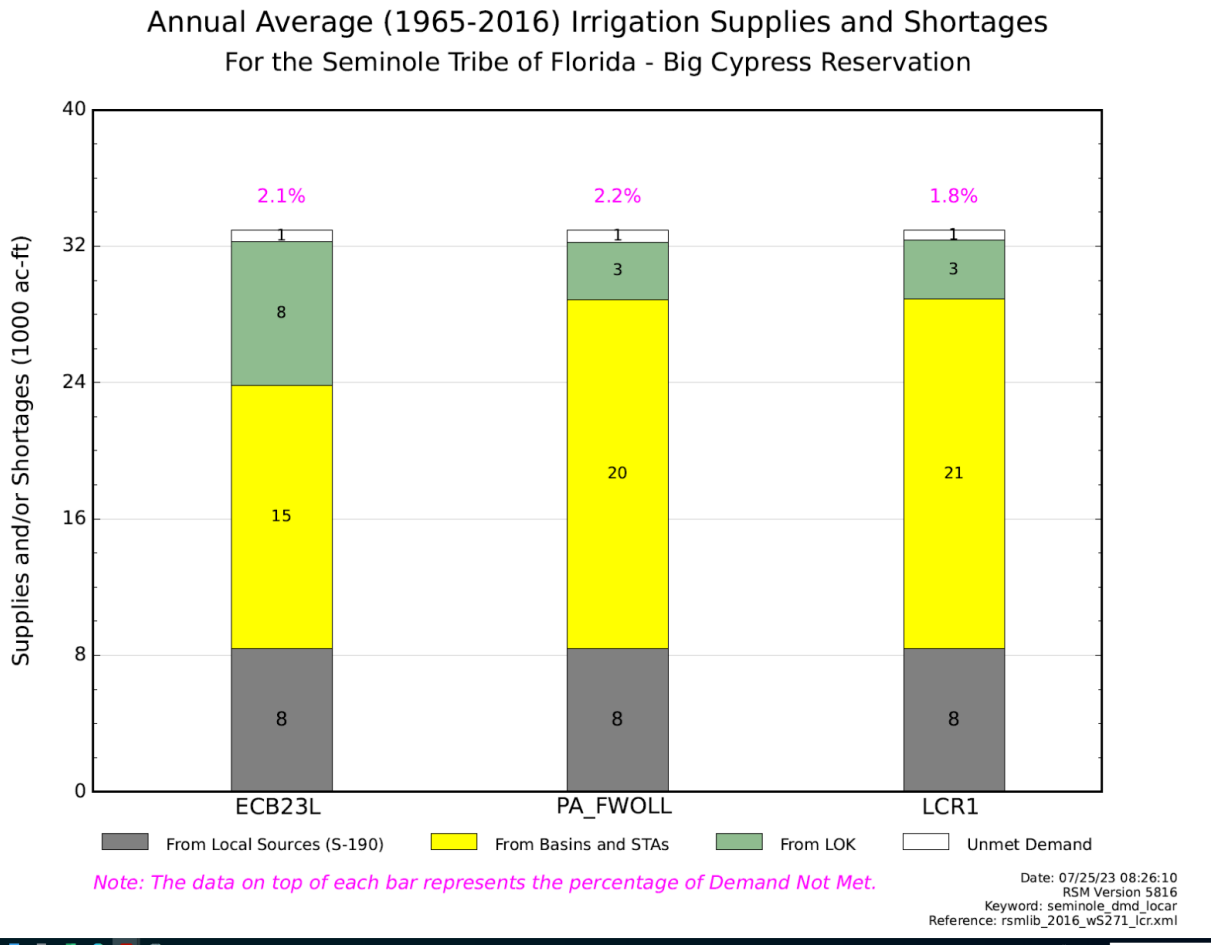


Figure B.3-4. Annual average (1965–2016) irrigation supplies and shortages for the Seminole Tribe of Florida Big Cypress Reservation.

B.3.2.6 Water Supply for Fish and Wildlife

The following sections describe the water supply for fish and wildlife.

B.3.2.6.1 Northern Estuaries

The RSM-BN outputs for the Northern Estuaries are based on the RECOVER Performance Measure for Northern Estuaries Salinity Envelope (RECOVER 2020). The RSM-BN outputs for the Northern Estuaries include counts of biweekly flows in the following flow bins over the period of simulation, and distinguishes events triggered by the model resulting from either Lake Okeechobee regulatory releases, or basin runoff:

- St. Lucie Estuary:
  - Low Flow – # of 14-day periods less than 150 cfs
  - Optimal Flow – # of 14-day periods greater than or equal to 150 cfs and less than 1,400 cfs

  - High Flow (Basin Runoff) – # of 14-day periods greater than or equal to 1,400 cfs and less than 1,700 cfs
  - High Flow (Lake Okeechobee regulatory releases) – # of 14-day periods greater than or equal to 1,400 cfs and less than 1,700 cfs
  - Damaging Flow (Basin Runoff) – # of 14-day periods greater than or equal to 1,700 cfs
  - Damaging Flow (Lake Okeechobee regulatory releases) – # of 14-day periods greater than or equal to 1,700 cfs
  - Damaging Flow (Total Flows) – # of 14-day periods greater than or equal to 1,700 and less than or equal to 4,000 cfs
  - Damaging Flow (Total Flows) – # of 14-day periods greater than or equal to 4,000 cfs
- Caloosahatchee River Estuary:
  - Low Flow – # of 14-day periods less than 750 cfs
  - Optimal Flow – # of 14-day periods greater than or equal to 750 cfs and less than 2,100 cfs
  - High Flow (Basin Runoff) – # of 14-day periods greater than or equal to 2,100 cfs and less than 2,600 cfs
  - High Flow (Lake Okeechobee regulatory releases) – # of 14-day periods greater than or equal to 2,100 cfs and less than 2,600 cfs
  - Damaging Flow (Basin Runoff) – # of 14-day periods greater than or equal to 2,600 cfs
  - Damaging Flow (Lake Okeechobee regulatory releases) – # of 14-day periods greater than or equal to 2,600 cfs
  - Damaging Flow (Total Flows) – # of 14-day periods greater than or equal to 2,600 and less than or equal to 4,500 cfs
  - Damaging Flow (Total Flows) – # of 14-day periods greater than or equal to 4,500 and less than or equal to 6,500 cfs
  - Damaging Flow (Total Flows) – # of 14-day periods greater than or equal to 6,500 cfs

The restoration goal is to reestablish salinity regimes suitable for the maintenance of healthy, naturally diverse, and well-balanced estuarine ecosystems. Overall, there is marked improvement in all high and damaging flow metrics triggered by Lake Okeechobee regulatory releases when compared to the ECB and the FWO. The Recommended Plan low flows (St. Lucie River and Indian River Lagoon Estuary (SLE) biweekly flows less 150 cfs; and Caloosahatchee River and Estuary (CRE) biweekly flows less than 750 cfs) perform worse than the ECB and the FWO, due to Lake Operations decisions. High and stressful flow events triggered by basin runoff, rather than Lake Okeechobee regulatory releases, improve across all alternatives compared to the ECB, but are worse than the FWO. Finally, extreme high flows in the estuaries (SLE biweekly flows ranging from 1,700 to 4,000 cfs and greater than 4,000 cfs; and CRE biweekly flows ranging from 2,600 to 4,500 cfs, 4,500 to 6,500 cfs, and greater than 6,500 cfs) show overall improvements, but degree of improvement depends on the estuary and on the flow category in question.

B.3.3 Water Quality

Although water quality improvement is not an objective of the Project, the water quality analysis conducted for the alternatives demonstrates that the Project may provide ancillary water quality improvements. Additional information on the water quality evaluations and analysis is included in **Section 5, Annex I** and **Appendix C** of the FS.

The Recommended Plan is expected to improve Lake Okeechobee water quality primarily through reduced discharge volume by retention of watershed runoff. Results from a simple phosphorus load analysis showed slightly reduced phosphorus loading of less than one percent (<1%) compared to the FWO condition. It is important to note that the P decrease identified by the model is predominantly attributed to particulate settling and is therefore strongly dependent on the residence time of lake water in the reservoir. The overall phosphorus loads to the lake should not be increased in compliance with the adopted Lake Okeechobee Total Maximum Daily Load. Additionally, the current and proposed state actions, including the Lake Okeechobee Basin Management Action Plan (BMAP), are anticipated to improve water quality to further meet hydrologic restoration objectives. The Recommended Plan is expected to reduce high-flow events, which may result in some improvement in Northern Estuaries water quality and in improved salinity conditions. Improved nutrient and dissolved oxygen conditions are expected to result from reduced high-flow events from Lake Okeechobee. Implementation of BMAP projects is anticipated to improve Lake Okeechobee nutrient levels, and improved estuary basin runoff quality. Water quality will be monitored as described in the Adaptive Management and Monitoring Plan (**Annex D** of the FS; hereon **Annex D**).

B.3.3.1 Compliance with State Water Quality Standards

LOCAR is projected to manage water on an annual basis to improve the quantity, timing, and distribution of water entering Lake Okeechobee. The water leaving the Project must meet the state water quality standards in F.A.C. Chapter 62-302. LOCAR Project features cannot proceed unless the Comprehensive Everglades Restoration Plan Regulation Act (CERPRA) permitting process finds that construction and/or operation of the feature[4]:

1. Will not cause or contribute to a violation of state water quality standards.
2. Will not cause or contribute to a violation of any applicable water quality permit discharge limits or specific permit conditions.
3. Reasonable assurances exist that demonstrate adverse impacts on flora and fauna in the area influenced by the Project features will not occur.

The results indicate that LOCAR will not cause or contribute to water quality degradation of the future conditions to downstream waters including Lake Okeechobee.

B.3.3.2 Hazardous, Toxic, and Radioactive Waste

The hazardous, toxic, and radioactive waste (HTRW) evaluation for LOCAR requires an analysis of the potential effects to human health and ecological risk. Human health risks are typically evaluated by

[4] Note there are permitting criteria contained in F.S. 373.1502 that need to be addressed in addition to water quality requirements.

comparing chemical concentrations in all media (e.g., soil, groundwater, surface water, sediment) to human health-based cleanup target levels (CTL) promulgated by FDEP in F.A.C. Chapter 62-777. Ecological risks are typically evaluated by comparing chemical concentrations to the Sediment Quality Assessment Guidelines (SQAG) developed by FDEP for inland waters and to ecological restoration targets established by the U.S. Fish and Wildlife Service (USFWS). Lands potentially used for this Project are very likely to have a past or present agricultural land use. Activities conducted over the past 100 years are likely to have resulted in the presence of some HTRW materials on some of this land. State and federal databases include information on the known HTRW contamination sites.

Phase I and II environmental site assessments will be used to identify unknown HTRW sites and to test cultivated areas for the presence of residual agricultural chemicals. The lands within the Project boundary will be investigated using the *Protocol for Assessment, Remediation, and Post-remediation Monitoring for Environmental Contaminants on Everglades Restoration Projects* jointly developed by FDEP, SFWMD, and USFWS. The protocol, commonly referred to as the Ecological Risk Assessment (ERA) Protocol, provides guidance on conducting environmental site assessments on agricultural lands proposed for use in projects to be inundated with water, such as for conversion to STAs, wetlands, reservoirs, and other aquatic features. **Annex G** of the FS contains additional information on the HTRW analysis completed at the time of the FS and EIS preparation. With the modern facilities proposed and best management practices, the potential risk for release of HTRW from the Project is minimal.

B.3.4 Flood Protection

The SFWMD shall "analyze and evaluate all needs to be met in a comprehensive manner and consider all applicable water resource issues, including … flood protection" (Florida Statute Section 373.1501(5)(a); 2018). Section 385.37 of the Programmatic Regulations also requires FSs include an analysis of the project's impacts on levels of service for flood protection that existed on the date of enactment of WRDA 2000 (December 2000). The analysis must demonstrate that the level of service for flood protection will not be reduced by implementation of the project. Where appropriate and consistent with restoration of the natural system, opportunities to provide additional flood protection shall be considered. Flood protection is evaluated by using best professional judgment to interpret model results and engineering analyses.

The implementation of the Recommended Plan will not degrade the existing level of flood protection offered by various components of the C&SF Project for this area and would be expected to have beneficial effects in the lower Kissimmee River Basin. This is accomplished by applying current industry standard design, engineering, and construction practices and techniques. Corps Engineering Regulation(s) 1110-2-1150 (*Engineering and Design for Civil Works Projects*) and 1110-2-1156 (*Engineering and Design Safety of Dams – Policy and Procedures*), along with various other site/structure specific regulations, will be adhered to prior to and during the PED phase by the agency leading the design. Please refer to **Annex B** Part 1 of the FS for additional information.

B.3.4.1 Lake Okeechobee Herbert Hoover Dike

Prior to the 2008 LORS, Lake Okeechobee operated under the Water Supply and Environment (WSE) regulation schedule. The WSE regulation schedule held lake stages approximately 1.0 to 1.5 ft higher than the 2008 LORS. Prior to WSE Regulation Schedule, Lake Okeechobee operated under the Run 25 regulation

schedule (May 1992 through July 2000). The Run 25 regulation schedule held lake stages approximately 0.1 to 0.3 ft higher than the WSE regulation schedule (**Figure B.3-5**), based on previous regional modeling analysis using a period-of-record from 1965 to 1995.

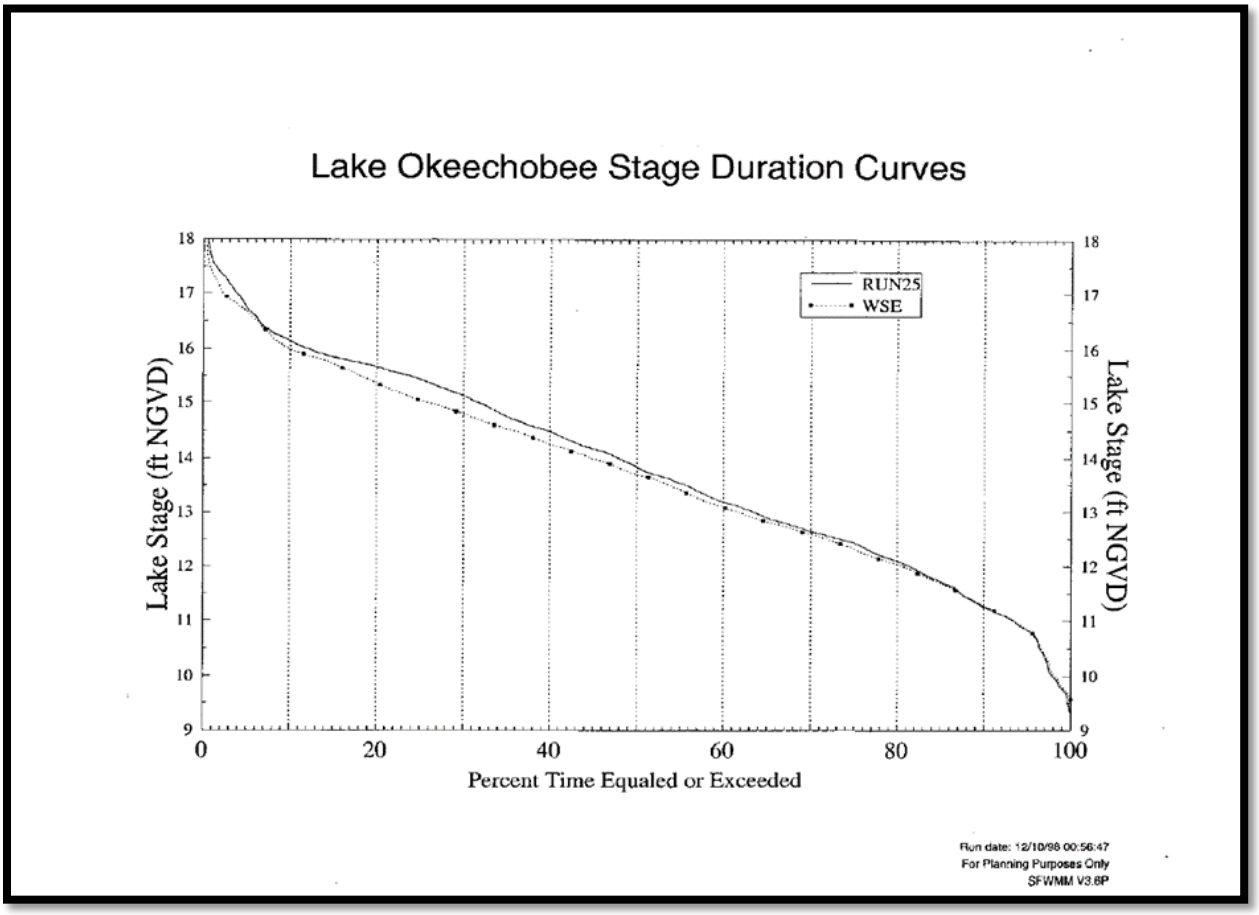


Figure B.3-5. Variation of Lake Okeechobee water stages with Run 25 and WSE Regulation Schedules (Corps 2016).

The LORS study, which led to the implementation of 2008 LORS, was initiated because of adverse environmental impacts that WSE Regulation Schedule had on the lake ecology. Dam safety was later added as a performance criterion. Lowering a lake is one of the basic Interim Risk Reduction Measures implemented for deficient dams until appropriate rehabilitation is effectuated.

The Dam Safety Modification Report (DSMR) and corresponding EIS utilized the 2008 LORS for the risk assessment and assumed that, in the absence of Federal risk reduction measures being implemented, the current regulation schedule will continue into the future. The DSMR included a sensitivity analysis to evaluate the variation in Average Annual Life Loss (AALL) and annual probability of failure (APF) that could result from possible future changes in the lake regulation schedule; for this analysis, the DSMR risk assessment evaluated the Run 25 regulation schedule.

The DSMR did not conduct a risk assessment using the WSE Regulation Schedule. Instead, the DSMR assumed that the Run 25 schedule represented the maximum reasonable change (or upper bound) that

could be expected from future studies. Considering that the operation schedules are indistinguishable above the 18.0 ft NAVD 88 (19.3 ft NGVD 29) elevation, there was no discernible difference between AALL estimates from the two operation schedules modeled: Run 25 and the 2008 LORS.

The DMSR recommended remediation of the remaining areas of HHD that exhibited intolerable risk. The existing condition risk assessment completed in 2014 identified significant potential failure modes (PFM) that were determined to be intolerable for large portions of the dam. The DSMR addressed those failure modes and identified the mitigation needed to reduce the probability of catastrophic failure of the dam. The primary dam safety risk drivers are internal erosion and storm surge overtopping of isolated areas of embankment. The target for risk reduction was to reduce risk to within Corps tolerable risk guidelines for APF and to AALL, and to consider opportunities to reduce risk to As Low as Reasonably Practicable (ALARP).

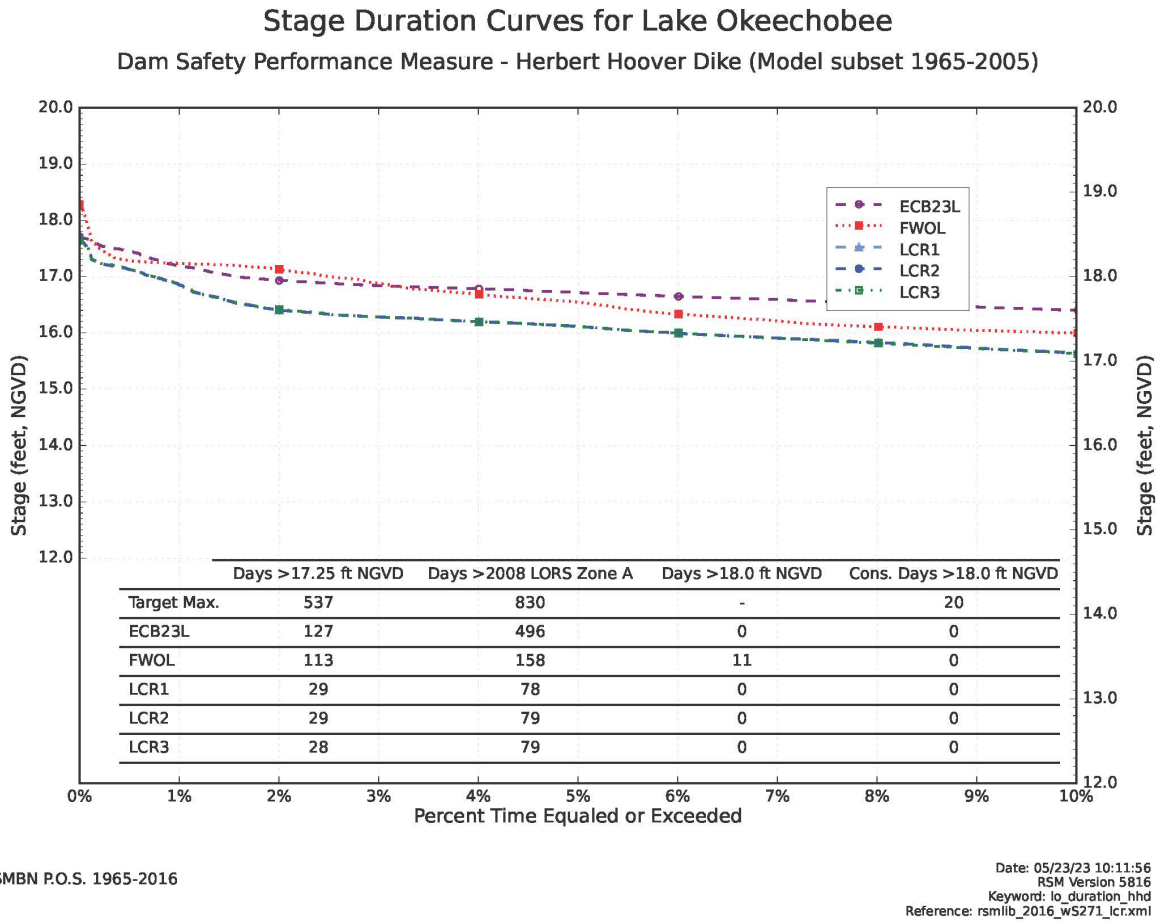
B.3.4.1.1 LOCAR RSM-BN Sensitivity Simulation Water Supply and Environment Regulation Schedule Comparison

Figure B.3-6 illustrates the LOCAR RSM-BN modeled results used to characterize the performance difference between the LOCAR alternatives (using LOSOM-like operations with CEPP EAA Phase optimized release guidance and proposed reservoirs), LORS 2008 with CEPP EAA Phase optimized release guidance (LOCAR FWO), and LOSOM (LOCAR ECB) and the WSE Regulation Schedule (LOWRP Sensitivity Simulation with WSE Regulation Schedule replaced in the ECB):

1. Total number of days in the LOCAR RSM-BN period-of-record with Lake Okeechobee mean daily stage above 18.0 ft NGVD 29 would be zero days for all alternatives and 11 for the FWO. The targeted maximum would be 20 days.
2. Total number of days in the LOCAR RSM-BN period-of-record (1965 to 2016; 18,993 total days) with Lake Okeechobee mean daily stage above 17.25 ft NGVD 29 was reduced from 113 in the FWO to 29 days for the Recommended Plan, Alternative 1.
3. Total number of days in the LOCAR RSM-BN period-of-record with Lake Okeechobee mean daily stage above the 2008 LORS Zone A (seasonal range between 16.0 to 17.25 ft NGVD 29) was reduced from 158 (FWO) to 78 days (Alternative 1).

The following include additional characteristics modeled.

1. The percent of time in the LOCAR RSM-BN period-of-record with Lake Okeechobee mean daily stage above 16.0 ft NGVD 29 was reduced from 16 (FWO) to 6 (Alternative 1) percent.
2. The number of events in the LOCAR RSM-BN period-of-record with Lake Okeechobee mean daily stage above 16.0 ft NGVD 29 for consecutive days was reduced from 15 (FWO) to 8 (Alternative 1) events.
3. The number of years in the LOCAR RSM-BN period-of-record with Lake Okeechobee mean daily stage above 15.0 ft NGVD 29 between May and September for longer than 120 cumulative years was reduced from 15 to 8 events. The number of cumulative years between October and April for longer than 120 cumulative years was reduced from 10 to 8 events.



	Days >17.25 ft NGVD	Days >2008 LORS Zone A	Days >18.0 ft NGVD	Cons. Days >18.0 ft NGVD
Target Max.	537	830	-	20
ECB23L	127	496	0	0
FWOL	113	158	11	0
LCR1	29	78	0	0
LCR2	29	79	0	0
LCR3	28	79	0	0

Figure B.3-6. Variation of Lake Okeechobee water stages with LOCAR.

B.3.4.1.2 LOCAR Existing Condition Baseline compared to the Recommended Plan

Alternative 1 is the Recommended Plan. Documentation of the Recommended Plan modeling assumptions for Lake Okeechobee operations are found in **Appendix A, Annex A-3**. Independent of implementation of the Recommended Plan, there is an expectation that LOSOM will be implemented to incorporate recent CERP projects, HHD infrastructure remediation, and other factors. Lake Okeechobee stage duration curves for the RSM-BN model simulation of the ECB, FWO, Alternative 1 (the Recommended Plan), Alternative 2, and Alternative 3 are included as **Figure B.3-7**. Peak stages for the LOCAR Savings Clause baselines and Recommended Plan are summarized as follows: 17.71 ft NGVD for the ECB; 18.28 ft NGVD for the FWO; and 17.64 ft NGVD for the Recommended Plan.

The Corps 2008 LORS EIS assessment recognized that minimizing the frequency of exceedances of the 17.25 ft elevation offers additional protection for public safety and the HHD, for the condition prior to completion of the approved and planned HHD remediation measures. The percent of time for Lake Okeechobee stages within the ecologically preferred envelope for the Recommended Plan is 28 percent, a 6 percent increase over the FWO (see **Table B.4-4**).Total number of days in the LOCAR RSM-BN period-

of-record (1965 to 2016; 18,993 total days) with Lake Okeechobee mean daily stage above 17.25 ft NGVD 29 was reduced from 127 in the ECBL and 113 in the FWO to 29 days for the Recommended Plan.

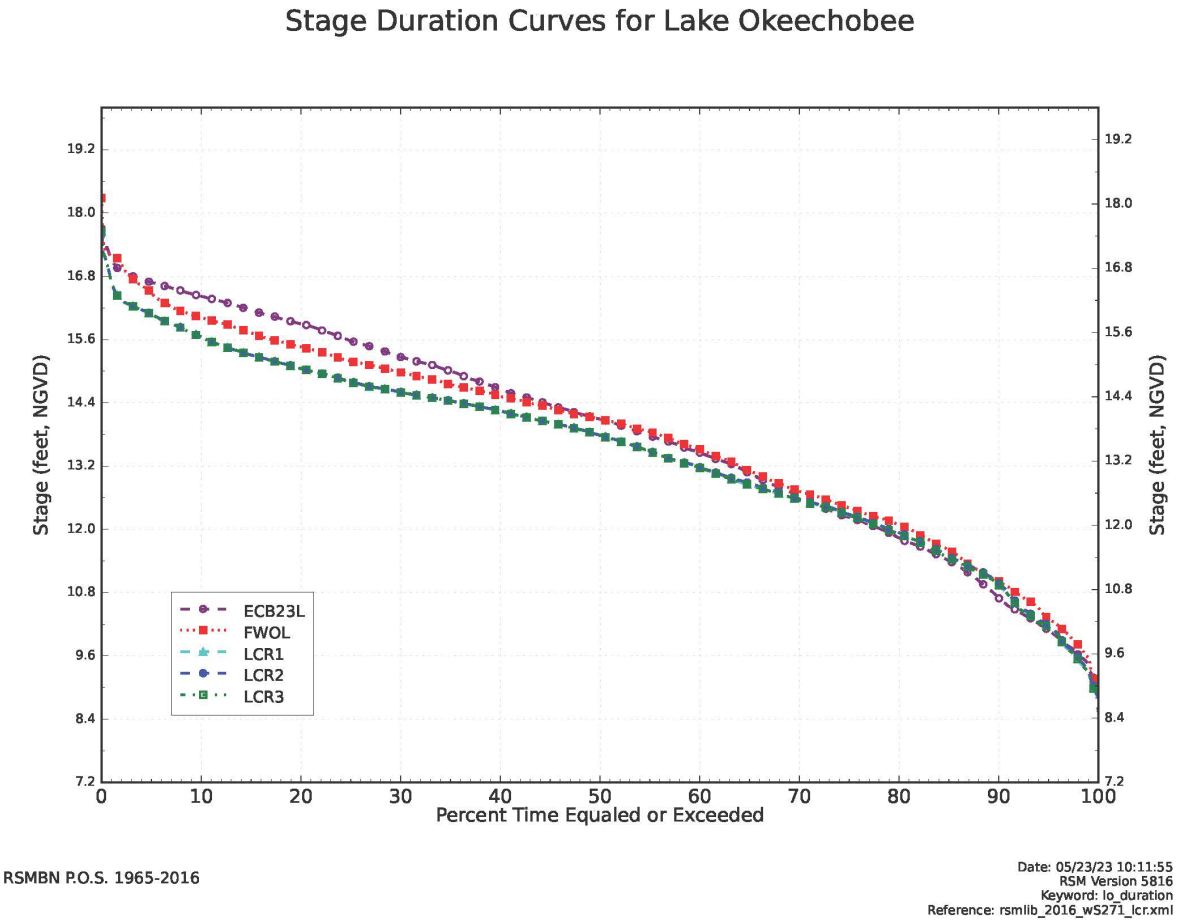


Figure B.3-7. Lake Okeechobee stage duration curve.

B.3.5 Threatened and Endangered Species

The Project Area of LOCAR is large and serves a great diversity of fish and wildlife species that occur throughout the Lake Okeechobee Watershed, the Northern Estuaries, and Lake Okeechobee. Important fish and wildlife resources in the Project Area include aquatic macroinvertebrates, small freshwater marsh fishes, larger sport fishes, amphibians and reptiles, birds, including raptors and wading birds, and mammals. Much of the native habitats in the Lake Okeechobee Watershed have been replaced by agricultural uses. The creation of ditches, canals, and the flooding of fallow agricultural fields provides some lower quality habitat for fish and wildlife, particularly during the rainy season. In the FWO condition, a further reduction in habitat function is possible, albeit to a lesser rate than in the past. In this event, it would likely result in a decrease in the abundance and diversity of fish and wildlife resources on non-protected lands. Without the Project, desired restoration of historic water fluctuations within Lake Okeechobee would not be accomplished. Lower water levels could provide foraging opportunities to aquatic-prey dependent species by concentrating prey and exposing additional shallow water habitat;

however, without the Project, drought conditions would be ecologically worse without additional water storage to offset low lake levels. Fish and wildlife resources inhabiting the Northern Estuaries would continue to be impacted by flood control regulatory releases from Lake Okeechobee. Annual variability in flow from Lake Okeechobee would lead to salinity extremes outside the tolerance ranges of many fish and wildlife resources resulting in decreased species diversity in the Northern Estuaries. Further declines in estuarine habitat (SAV and oysters) would continue to result in additional declines in the species that utilize these habitats.

Representatives from the USFWS and Florida Fish and Wildlife Conservation Commission (FWC) have been active Project team members and will provide guidance on LOCAR potential impacts on federally listed threatened and endangered species within the Project Area. The FWC completed an environmental resource analysis utilizing geographic information system (GIS) with multiple data sets to produce an initial list of potentially occurring state listed species. This list was evaluated and reviewed with published literature and survey data by a team of FWC's habitat, wildlife, and fisheries experts. These experts defined and provided a final determination of potential effects on state listed species. Additional protected species effects information can be found in **Section 5**, **Annex A,** and **Appendix C** of the FS.

B.3.5.1 Federally Listed Species

Federally listed threatened and endangered species may occur within the Project Area. Many of these species have been previously affected by habitat impacts resulting from wetland drainage, alteration of hydroperiod, wildfire, and water quality degradation. The potential of impact evaluation of federally listed species will be coordinated with the USFWS and National Marine Fisheries Service (NMFS), as appropriate. Specifically, coordination with the NMFS includes listed marine fish, whales, and sea turtles. Coordination with the USFWS includes freshwater plants and animals.

Federally threatened, endangered, and candidate species that may occur within the Study Area include the Florida panther (*Puma concolor coryi*), Florida manatee (*Trichechus manatus latirostris*) and its critical habitat, Florida bonneted bat (*Eumops floridanus*), eastern black bail (*Laterallus jamaicensis*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*) and its critical habitat, Audubon's crested caracara (*Polyborus plancus audubonii*), Florida grasshopper sparrow (*Ammodramus savannarum floridanus*), wood stork (*Mycteria americana*), Eastern indigo snake (*Drymarchon corais couperi*), Okeechobee gourd (*Cucurbita okeechobeensis* ssp. *okeechobeensis*), smalltooth sawfish (*Pristis pectinata*) and its critical habitat, green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricata*), leatherback sea turtle (*Dermochelys coriacea*), Kemp's ridley sea turtle (*Lepidochelys kempii*), and loggerhead sea turtle (*Caretta caretta*). For more detailed information please refer to **Section 5.4** of the FS.

B.3.5.2 State Listed Species

The LOCAR Project Area contains habitat suitable for the presence, nesting, and/or foraging of 12 state listed threatened and endangered species and 1 species of special concern. Threatened and endangered animal species include the American oystercatcher (*Haematopus palliatus*), black skimmer (*Rynchops niger*), least tern (*Sternula antillarum*), Florida burrowing owl (*Athene cunicularia*), Florida sandhill crane (*Grus canadensis pratensis*), little blue heron (*Egretta caerulea*), roseate spoonbill (*Platalea ajaja*), Southeastern American kestrel (*Falco sparverius paulus*), tricolored heron (*Egretta tricolor*), gopher tortoise (*Gopherus polyphemus*), and Florida pine snake (*Pituophis melanoleucus mugitus*).

The Recommended Plan shows a slight performance improvement within the Northern Estuaries as indicated by fewer high-volume flow months, providing minor beneficial effects to state listed beach-nesting birds. Implementation of the Recommended Plan is expected to improve conditions for state listed wading birds throughout much of the Project Area by helping retain watershed runoff that would assist Lake Okeechobee water levels and could also be used for restoration of wetlands along the Kissimmee River floodplain. Alternative 1 would convert uplands to a reservoir. Burrowing owls, southeastern American kestrels, Florida pine snakes, and southern fox squirrels have a high probability of occurrence and, as a result of construction, would likely to be displaced. Prior to construction, surveys of these species will be conducted, and the lead construction agency (i.e., the Corps or SFWMD) will coordinate with the FWC on appropriate impact avoidance, minimization, and/or mitigation measures. For more detailed analysis, please refer to **Appendix C** of the FS.

B.3.5.3 Threatened and Endangered Species Evaluation

The overall objective of LOCAR is to increase water storage capacity in the watershed, improve the quantity and timing of discharges to the Northern Estuaries, and restore wetlands. Federally and state listed threatened, endangered, and candidate species may occur within the Study Area (**Table B.3-6**). Species described in the following section were determined to potentially be affected by the Project. No effect species determinations will be described in **Annex A** of the FS, LOCAR Biological Assessment (BA), and the CERP Programmatic BA for the NMFS. Effects determinations on federally listed species in the BA submitted concurrently with the Draft FS and EIS remained the same. Direct and/or indirect impacts within the action area resulting from the Recommended Plan remained the same.

Table B.3-6. List of Threatened, Endangered, and Candidate Species Known to Occur in Okeechobee, Highlands, Charlotte, Glades, Martin, and St. Lucie Counties. State Listed Species of Special Concern are also listed.

Scientific Name	Common Name	Federal Status	State Status	Alternatives 1, 2, 3 Determinations
Reptiles				
Caretta	Loggerhead sea turtle	Threatened	Threatened	May Affect Not Likely to Adversely Affect
Chelonia mydas	Green sea turtle	Endangered	Endangered	May Affect Not Likely to Adversely Affect
Dermochelys coriacea	Leatherback sea turtle	Endangered	Endangered	May Affect Not Likely to Adversely Affect
Drymarchon couperi	Eastern indigo snake	Threatened	Threatened	May Affect
Eumeces egregius lividus	Bluetail mole skink	Threatened	Threatened	No Effect
Gopherus polyphemus	Gopher tortoise	Not listed	Threatened	May Affect
Lepidochelys kempii	Kemp's Ridley sea turtle	Endangered	Endangered	May Affect Not Likely to Adversely Affect
Neoseps reynoldsi	Sand skink	Threatened	Threatened	No Effect
Pituophis melanoleucus mugitus	Florida pine snake	Not listed	Threatened	May Affect
Birds				

Scientific Name	Common Name	Federal Status	State Status	Alternatives 1, 2, 3 Determinations
Ammodramus savannarum floridanus	Florida grasshopper sparrow	Endangered	Not Listed	May Affect Not Likely to Adversely Affect
Aphelocoma coerulescens	Florida scrub jay	Threatened	Not Listed	No Effect
Athene cunicularia	Burrowing owl	Not listed	Threatened	May Affect
Egretta caerulea	Little blue heron	Not listed	Threatened	May Affect
Egretta tricolor	Tricolored heron	Not listed	Threatened	May Affect
Falco sparverius paulus	Southeastern American kestrel	Not listed	Threatened	May Affect
Grus Americana	Whooping crane	Experimental Population non-essential	Not Listed	No Effect
Grus canadensis pratensis	Florida sandhill crane	Not listed	Threatened	May Affect
Haematopus palliates	American oystercatcher	Not listed	Threatened	No Effect
Mycteria americana	Wood stork	Endangered	Not Listed	May Affect Not Likely to Adversely Affect
Picoides borealis	Red-cockaded woodpecker	Endangered	Not Listed	No Effect
Platalea ajaja	Roseate spoonbill	Not listed	Threatened	No Effect
Polyborus plancus audubonii	Audubon's crested caracara	Threatened	Not listed	May Affect
Rostrhamus sociabilis plumbeus	Everglade snail kite	Endangered	Not Listed	May Affect Not Likely to Adversely Affect
Rychops niger	Black skimmer	Not listed	Threatened	No Effect
Sterna antillarum	Least tern	Not Listed	Threatened	No Effect
Mammals				
Eumops floridanus	Florida bonneted bat	Endangered	Not Listed	May Affect Not Likely to Adversely Affect
Puma concolor coryi	Florida panther	Endangered	Not Listed	May Affect
Sciurus niger avicennia	Big Cypress Fox Squirrel	Not Listed	Threatened	May Affect
Sciurus niger shermani	Sherman's Fox Squirrel	Not Listed	Not Listed	May Affect
Trichechus manatus	Florida manatee	Endangered	Not Listed	May Affect Not Likely to Adversely Affect
Plants and Lichens				
Asimina tetramera	Four-petal pawpaw	Endangered	Endangered	No Effect
Cladonia perforata	Florida perforate cladonia	Endangered	Endangered	No Effect
Chionanthus pygmaeus	Pygmy fringe-tree	Endangered	Endangered	No Effect
Clitoria fragrans	Pigeon wings	Threatened	Endangered	No Effect
Conradina brevifolia	Short-leaved rosemary	Endangered	Endangered	No Effect

Scientific Name	Common Name	Federal Status	State Status	Alternatives 1, 2, 3 Determinations
Cucurbita okeechobeensis	Okeechobee gourd	Endangered	Endangered	May Affect Not Likely to Adversely Affect
Crotalaria avonensis	Avon Park harebells	Endangered	Endangered	No Effect
Dicerandra immaculate	Lakela's mint	Endangered	Endangered	No Effect
Dicerandra christmanii	Garret's mint	Endangered	Endangered	No Effect
Dicerandra frutescens	Scrub mint	Endangered	Endangered	No Effect
Eryngium cuneifolium	Snakeroot	Endangered	Endangered	No Effect
Halophila johnsonii	Johnson's seagrass	Threatened	Threatened	No Effect
Hypericum cumulicola	Highlands scrub hypericum	Endangered	Endangered	No Effect
Jacquemontia reclinata	Beach jacquemontia	Endangered	Endangered	No Effect
Liatrus ohlingerae	Scrub blazing star	Endangered	Endangered	No Effect
Panicum abscissum	Cutthroat grass	Not Listed	Endangered	No Effect
Paronchia chartacea	Papery whitlow-wort	Threatened	Endangered	No Effect
Polygala lewtonii	Lewton's polygala	Endangered	Endangered	No Effect
Polygala smallii	Tiny polygala	Endangered	Endangered	No Effect
Polygonella basiramia	Wireweed	Endangered	Endangered	No Effect
Polygonella myriophylla	Sandlace	Endangered	Endangered	No Effect
Warea carteri	Carter's mustard	Endangered	Endangered	No Effect
Ziziphus celata	Florida ziziphus	Endangered	Endangered	No Effect
Critical Habitat				
Rostrahamus sociabilis plumbeus	Everglade snail kite	Endangered	Endangered	May Affect Not Likely to Adversely Affect
Trichechus manatus	West Indian Manatee	Endangered	Endangered	May Affect Not Likely to Adversely Affect
Chelonia mydas	Green sea turtle	Endangered	Endangered	May Affect Not Likely to Adversely Affect

Information regarding the species evaluation processes can be found in **Sections 2.1.4, Section 5,** and **Appendix C** of the FS.

B.3.6 Other Natural System Habitat Needs

Historically, the LOCAR watershed was approximately 40 percent wetlands, consisting of cypress and bay tree forests, inland swamps and lake floodplains, freshwater marsh, wet prairie, and sawgrass marsh (Davis 1943). Wetlands in the watershed have been drastically reduced by land use changes and drainage projects. This substantial reduction in the spatial extent of wetlands is exacerbated by a reduction in the functionality of remaining wetlands, as many of them have lost vital hydrologic and ecological connections

to each other and to the greater aquatic system of the lake and the Everglades. This loss of wetland habitat has resulted in reduced water storage on the landscape, increased stormwater runoff, and flashier hydroperiods in the Lake Okeechobee Watershed. The conversion of natural areas for urban and agricultural uses and the network of C&SF Project canals has caused complete shifts in vegetative communities, habitat loss for fish and wildlife resources, and smaller and less diverse wildlife populations.

The Northern Estuaries have been subject to watershed runoff and increased freshwater releases from Lake Okeechobee for decades, resulting in successive years of environmental and economic impacts to these regions. Current operations of the C&SF Project and drainage for urban and agricultural development increased the volume and altered the timing of local basin discharges to the rivers and estuaries. Both stormwater runoff and regulatory releases from Lake Okeechobee have changed the quantity, timing, and distribution of freshwater entering the estuaries, which can cause atypical salinity fluctuations. Low flows to the estuaries also affect the balance and stability of downstream communities. Flows less than 450 cfs at S-79 in the Caloosahatchee River Estuary are considered undesirable because low flows allow saltwater to intrude, raising salinity above the tolerance limits for communities of submerged aquatic plants in the upper estuary. In the St. Lucie Estuary, flows less than 350 cfs at S-80 have this effect, as they result in higher salinities at which oysters are susceptible to increased predation and disease. Both SAV and oyster reefs are important habitats for fish and other organisms and contribute to ecological values.

Implementation of the Recommended Plan benefits existing legal water users within the LOSA by storage water that can be sent to Lake Okeechobee during dry periods. Though modeled results do not illustrate significant decreases in water supply cutback volumes over the FWO condition, it would be expected that water would be released from the LOCAR reservoir to meet LOSA demands. This and other future CERP increments that provide additional storage would increase water made available in the regional system for other water-related needs. The Recommended Plan reduces the return frequency, volume, and duration of freshwater releases from Lake Okeechobee that are discharged into the Northern Estuaries, thus reducing the turbidity, sedimentation, and moderate unnatural changes in salinity that are detrimental to estuarine communities. Reductions in turbidity and sedimentation would allow greater light penetration, promoting the growth of seagrass beds. These reductions would also help lessen the flushing of oyster spat into outer areas of the estuaries that currently experience high salinity levels during the dry season, resulting in increased predation and disease in the oyster population.

The restoration goal is to reestablish salinity regimes suitable for the maintenance of healthy, naturally diverse, and well-balanced estuarine ecosystems. Overall, there is marked improvement as a result of the Recommended Plan in all high and damaging flow metrics triggered by Lake Okeechobee regulatory releases when compared to the ECB and the FWO. Reducing the duration and return frequency of freshwater releases allows more time for the estuaries to recover and establish resiliency. The implementation of LOCAR would increase the habitat acres of SAV, oyster, and healthy benthic communities. The improvement of estuarine conditions will ultimately have a significant beneficial effect to essential fish habitat resources. SAV and algal communities are also common foraging areas for the green sea turtle. Reductions in freshwater releases within the Northern Estuaries reduce stress on SAV and promote increases in seagrass shoots that have the potential to increase foraging opportunities for green sea turtles in this region.

B.4 DETERMINATION OF PROJECT COMPONENT FEASIBILITY

Florida Statute Paragraph 373.1501(5)(b) requires the SFWMD to:

determine with reasonable certainty that all project components are feasible based upon standard engineering practices and technologies and are the most efficient and cost-effective of feasible alternative or combination of alternatives, consistent with Yellow Book purposes, implementation of project components, and operation of the project.

The goal of the Planning Level cost estimates for LOCAR are to present a Total Project Cost (i.e., construction and non-construction costs) for the Recommended Plan, in today's dollars, for Project justification and authorization. In addition, the costing efforts are intended to produce a final product (i.e., cost estimate) that is reliable and accurate. The cost estimate was prepared in Micro-computer Aided Cost Estimating System (MCACES) second-generation (MII) tool. This estimate is supported by the preferred labor, equipment, materials, and crew/production breakdown. The Project team performed a preliminary risk analysis to addresses Project uncertainties and set contingencies for the final alternative array cost items. Guidance for estimating costs, the fully funded (escalated for inflation through Project completion) cost estimate and the Total Project Cost Summary, including the risk register, is provided in **Appendix B** of the FS. **Section 6.4** of the FS contains additional cost estimate information.

B.4.1 Standard Engineering Practices and Technologies

LOCAR is proposed to be implemented in accordance with the Recommended Plan (Alternative 1). The Project components are described in **Section 1.3** of this State Compliance Report. More information about the Project components can be found in **Section 6** of the FS.

B.4.1.1 Engineering and Design

Appendix A of the FS represents a limited level of design but includes documentation of all engineering assumptions and conceptual designs. PED for Recommended Plan features could begin after congressional authorization and upon the SFWMD's concurrence consistent with the implementation phases. The SFWMD will prepare an Engineering Design Report, updating the conceptual design, and prepare initial, intermediate, and final plans and specifications for each phase of construction. All work will be coordinated and reviewed between the Corps and the SFWMD, and approved by the Corps and SFWMD prior to construction, to ensure that the work meets Corps standards and regulations and incorporates SFWMD design guidance, as applicable. PED will include site-specific surveys and geotechnical investigations. During the design phase, detailed analyses and subsurface and site investigations will be conducted to prepare construction documents. During PED, Project assurances, Savings Clause analysis, and operating manuals will be reviewed for consistency with the implementation phases, as necessary. After completion of 60 percent plans and specifications for a given Project feature, the lead construction agency (i.e., the Corps or SFWMD) will prepare and submit a CERPRA permit application (Florida Statute Section 373.1502) to the FDEP. The FDEP will review the application material to determine if the agency provided reasonable assurances that the feature will be consistent with 373.1502 Florida Statute criteria, which includes:

1. The project component will achieve the design objectives set forth in the detailed design documents submitted as part of the application.

2. State water quality standards, including water quality criteria and moderating provisions, will be met. Under no circumstances shall the project component cause or contribute to violation of state water quality standards.
3. Discharges from the project component will not pose a serious danger to public health, safety, or welfare.
4. Any impacts to wetlands or threatened or endangered species resulting from implementation of the project component will be avoided, minimized, and mitigated, as appropriate.

The Corps uses the NGVD 29 system for elevation comparisons with monitoring data, hydrologic modeling, and design in Florida. This allows the continuity of years of valuable data to be transitioned during PED to the more accurate NAVD 88. This report and the FS continue of the usage of NGVD and NAVD where appropriate in hydrologic modeling and preliminary design of LOWRP features. In PED, the NGVD 29 elevations will be converted to NAVD88 for design analyses and completion of construction documents (e.g., plans and specifications). In some prior instances, the local sponsor has requested both vertical datums to be referenced during PED. There are appropriate conversions based on spatial relevance to maintain design intent changing from the NGVD29 datum to the NAVD88 datum.

B.4.2 Efficiency and Cost Effectiveness

The Recommended Plan is justified by the environmental benefits derived by the South Florida ecosystem; however, a comparison of the benefits and costs of alternative plans was conducted to ensure that the selected alternative would efficiently produce the desired environmental benefits, as documented in **Section 4** of the FS. The measurement of efficiency is the extent to which an alternative plan is the most cost-effective means of alleviating the specified problems and realizing the specified opportunities, consistent with protecting the nation's environment.

The Cost Evaluation and Incremental Cost Analysis (CE/ICA) tool is used to evaluate and compare the production efficiency of alternatives. This identifies the plans that reasonably maximize ecosystem restoration, a key criterion to select the National Ecosystem Restoration (NER) plan. Cost-effectiveness analysis begins with a comparison of the costs and outputs of alternative plans to identify the least cost plan for every level of output considered. Alternative plans are compared to identify those that would produce greater levels of output at the same cost or lesser cost than other alternative plans. Alternative plans identified through this comparison are the cost-effective alternative plans. Cost effective plans are 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. The results of these calculations and comparisons of costs and outputs between alternative plans provide a basis for addressing the decision question, "Are the additional outputs worth the costs incurred to achieve them?"

The CE/ICA analysis follows guidance from the Corps ER 1105-2-100, Appendix E, Paragraph E-36. Costs are based initially on a planning-level estimate and benefits are based on the habitat unit (HU) evaluation. The CE/ICA analysis compares the alternative plans' average annual costs (AAC) against the appropriate average annual HU estimates. The average annual outputs are calculated as the difference between with-plan and without-plan conditions over the period of analysis. Additional detailed information on efficiency and cost effectiveness is included in the Evaluation and Comparison of Alternative Plans (**Section 4**) of the FS.

B.4.2.1 Cost-effectiveness and Incremental Cost Analysis

Costs and benefits for water storage and wetland restoration components were analyzed both independently and combined. However, a combined Average Annual Habitat Unit (AAHU) 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 AAHU was used to ensure a cost-effective alternative was identified. The Lake Okeechobee and Northern Estuary benefits were calculated as the difference in AAHU between the with-Project and FWO over the period of analysis (through year 2083). For sake of comparison, the FWO benefits have been set to "zero" to show each action alternative's lift over the FWO, even though the FWO includes ecological improvements associated with the completed projects described in **Section 2.5** of the FS.

For the incremental cost analysis, only the cost-effective plans are arrayed by increasing output to show changes in cost (i.e., marginal cost) and changes in output (i.e., marginal output) of each cost-effective alternative plan compared to the FWO condition cost. The plan with the lowest incremental costs per unit of output of all plans is the first best buy plan. The LOCAR CE/ICA (FY23 Price Planning-level) is summarized in **Table B.4-1**.

Table B.4-1. CE/ICA Summary

Project Region	ECB	FWO	Alternative 1	Alternative 2	Alternative 3
Annual Average Habitat Units	6,149	7,314	8,424	8,453	8,396
Difference from FWO	-	-	1,109 (+13%)	1,138 (+14%)	1,082 (+13%)
Annual Average Cost*	-	-	$122,392,400	$181,284,600	$148,501,400
Cost Per Habitat Unit	-	-	$110,363	$159,301	$137,247
Outputs	-	-	Best Buy	Best Buy	Not Cost Effective

* These costs are planning-level for the purposes of comparison of alternatives.
CE/ICA— Cost Evaluation and Incremental Cost Analysis; ECB—existing condition baseline; FWO—Future Without Project

Two best buy plans were identified by the CE/ICA because of the higher benefits produced by Alternative 2. However, the difference between Alternative 1 and Alternative 2 Hus was not significant enough to justify the cost increase between Alternatives 1 and 2. Alternative 1 was considered the NER plan because of the benefits to Lake Okeechobee.

B.4.2.2 Costs of Final Array of Alternative Plans

Costs represent the difference between conditions without any plan (i.e., the "base condition" or FWO condition) and with a plan or alternative. For purposes of this report and analysis, NED costs (as defined by federal and Corps policy) are expressed in FY2020 price levels. Costs of a plan represent the value of goods and services required to implement and operate/maintain the plan. The cost estimate for the alternatives includes construction; lands; easements; rights-of-way; relocation; PED; construction management; and operation and maintenance, repair, replacement, and rehabilitation (OMRR&R). The cost estimate was developed through engineering design and cost estimation and real estate appraisal efforts. The 4.75 percent federal discount rate and a 50-year economic period of analysis were used to amortize costs and determine the Project investment costs. Guidance for estimating costs, the fully funded (escalated for inflation through Project completion) cost estimate and the Total Project Cost Summary, including the risk register, is provided in **Appendix B** of the FS, and additional cost estimate information for the Recommended Plan is included in **Section 6.4** of the FS.

B.4.2.2.1 Overview of Real Estate Costs

An analysis of the real estate requirements of the final array was completed. Each parcel required for the Project was identified and a planning-level fee simple estimate was calculated for each alternative. The total real estate cost is $219,243,000, (at the time of this report preparation) which includes non-federal and federal administrative costs and a 40 percent contingency. More detail on real estate analysis is available in **Appendix D** of the FS.

B.4.2.2.2 Average Annual Costs

The timing of a plan's costs is important. Construction and other initial implementation costs cannot simply be added to periodically recurring costs for Project operation, maintenance, and monitoring if meaningful and direct comparisons of the costs of the different alternatives are to be made. ER 1105-2-100 requires that interest during construction (IDC) be computed, which represents the opportunity cost of capital incurred during the construction period. IDC was computed for real estate, construction costs, and PED. IDC for construction and construction management assumed a 70-month, unconstrained construction timeline. IDC was computed for the total real estate cost starting from the month prior to construction commencing, amounting to a 121-month period. IDC for PED costs was calculated to reflect a 48-month period. These estimates are based on generalized construction schedules and assume that funding is readily available and land acquisition is completed before construction starts. The total first cost is the sum of construction and other capital costs, such as real estate and preconstruction. Based on preliminary engineering and design of the Recommended Plan, the average annual cost is $122,392,400.

B.4.2.3 Ecological Evaluation (Habitat Units) and Environmental Benefits

The PDT developed performance measures and a benefit model to evaluate alternatives. The primary areas evaluated included Lake Okeechobee and the Northern Estuaries. The Lake Okeechobee Stage Envelope and Extreme Stages performance measures and the Northern Estuaries Salinity Envelope performance measures used for the LOCAR planning effort were derived from those approved for use in CERP by RECOVER. A description of the performance measures used to quantify plan benefits is provided in **Appendix G** of the FS.

Performance measure scores are displayed as a function of restoration potential or achievement of the target, with the minimum value of "zero" representing a fully degraded ecosystem and a maximum value of "100" representing the restoration target. Habitat suitability indices associated with each RECOVER performance measure were applied to the total spatial extent (acres) for each of the regions and summed to produce HUs. HU results are displayed in **Table B.4-2**.

Table B.4-2. Total HU

Project Region	ECB[1/]	FWO[2/]	Alternative 1[2/]
Total Lake Okeechobee	250,073	274,335	328,902
Caloosahatchee Estuary	35,817	53,884	57,217
St. Lucie Estuary	21,561	37,503	35,057
Total Northern Estuaries	57,378	91,387	92,274
Total HUs	307,451	365,722	421,176

[1/] HU values for the ECB represent those calculated in the year 2033.
[2/] HU values for the FWO and all alternatives are calculated for the full ecological response time.
ECB—existing condition baseline; FWO—Future Without Project; HU—habitat unit

B.4.2.3.1 Average Annual Habitat Units

The AAHU outputs were calculated as the difference between the FWP and FWO conditions over the period of analysis (through year 2083). The base year for the period of economic analysis for LOCAR is the year 2033. The average annual HU lift is calculated by subtracting the FWO HUs from the FWP HUs for each year and averaging over the 50-year period of analysis. The anticipated time it will take to realize the benefits is necessary to calculate the average annual lift associated with each alternative. Since ecosystem restoration outputs are not monetary, they were not discounted. The ECB, FWO, and the Recommended Plan have 6,149, 7,314, and 8,424 annual average HUs, respectively. For additional information please refer to **Appendix G** of the FS.

B.4.2.3.2 Lake Okeechobee Ecological Benefit

Lake Okeechobee benefits are calculated using RECOVER-approved Lake Stage and Extreme Stage Performance Measures (PM). The Lake Stage PM looks at maintaining stages within a seasonally variable, ecologically preferred envelope of 11.5 to 15.5 ft NGVD29, and durations above and below the envelope are evaluated. The Extreme Stage PM considers durations of lake stages at extreme high (i.e., above 17 ft NGVD29) and extreme low stages (i.e., below 10 ft NGVD29).

Lake Okeechobee Habitat Unit Calculation

The Lake Okeechobee AAHU lifts were calculated as the difference between the FWP and FWO conditions over the period of analysis (through year 2083). For the FWO condition, a straight trajectory between existing and FWO HUs was assumed to establish HU totals for each site and year.

The FWP HU trajectory was modeled to reflect the timeline of expected restoration effects. Lake Okeechobee HUs for each alternative are assumed to reach 25 percent potential 2 years following construction completion, 50 percent potential at 5 years, 60 percent potential at 10 years, and 100 percent potential 25 years following construction completion. At that point, the full potential of HUs will be realized for the remainder of the period of analysis. For the FWO, a straight HU trajectory was assumed between base year HUs and that at the end of the period of analysis. **Table B.4-3** shows the Lake Okeechobee HUs for the Recommended Plan.

Table B.4-3. Combined Lake Okeechobee HUs for the Recommended Plan.

Condition	HUs	Potential Lift (HUs)	% Increase from FWO
FWO	274,335	N/A	
Alternative 1	328,902	54,568	19.9

ECB—existing condition baseline; FWO—Future Without Project; HU—habitat unit

Lake Okeechobee Recommended Plan Performance

The Recommended Plan would increase the amount of time Lake Okeechobee is within the ecologically preferred stage envelope, primarily through reductions in the frequency and duration of moderate and extreme high stages (i.e., greater than 16.0 ft NGVD29 and greater than 17.0 ft NGVD29, respectively) (**Table B.4-4)**. Extreme high stages lead to a loss of woody species (nesting substrate for wading birds) and expansions of invasive or nuisance vegetation at high elevations, loss of submerged plant beds at low elevations, and reduction in littoral extent. Stages above the preferred envelope, which would be reduced by 7 percent with the Recommended Plan, cause greater mixing of nutrients and sediment from the deep,

open-water (limnetic) portion of the lake; reduce light penetration at the edge of the marsh; increase nutrient transport to the inner marsh; reduce the overall marsh size through loss of plants in deeper areas; and alter the plant community to one dominated by invasive or nuisance species. The Recommended Plan would improve conditions for fish in Lake Okeechobee by creating better conditions for the emergent and SAV habitat that fish use in the nearshore and littoral zones. Reductions in high stage would also improve nesting substrate for wading birds by restoring and maintaining historic colony locations in woody vegetation and will improve foraging by increasing prey density and availability of shallow marsh habitat during the breeding season.

The effectiveness of the Recommended Plan for Lake Okeechobee was assessed with an index score composed of two lake PMs. The scores were weighted as follows: 67 percent high stage criteria (above ecological envelope and duration at greater than 17 ft NGVD29) and 33 percent low stage criteria (below the ecological envelope and duration at less than 10 ft NGVD29; methodology further documented in **Appendix G-4**). The Lake Weighted Index Score indicates a 26.9 percent improvement over the pre-CERP Baseline (PCB1), or 74.6 percent achievement of the lake index score CERP goal when including authorized projects in the FWO condition.

Table B.4-4. Lake Okeechobee Stage Envelope Improvements with the Recommended Plan.

Lake Okeechobee Stage Levels	FWO	Recommended Plan
Percent Time Inside Ecologically Preferred Stage Envelope (Seasonally Variable 11.5 – 15.5 ft)	22%	28%
Percent Time Above Stage Envelope (Seasonally Variable >12.5 – 15.5 ft)	48%	41%
Percent Time Below Stage Envelope (Seasonally Variable <11.5 – 15.5 ft)	30%	31%
Percent Time Below Navigational Min. Stage (< 12.56 ft)	27.2%	30.1%
Percent Time Above Extreme High Stage (> 17 ft)	2.05%	0.59%
Percent Time Below Extreme Low Stage (< 10 ft)	3.05%	4.11%
Percent Time Above Moderate High Stage (> 16 ft)	10.3%	5.8%
Percent Time Below Moderate Low Stage (< 11 ft)	9.9%	10.3%

ft—foot; FWO—Future Without Project

B.4.2.3.3 Northern Estuaries

The primary areas evaluated in the Northern Estuaries are the Caloosahatchee Estuary (**Figure B.4-1**) and the St. Lucie Estuary (**Figure B.4-2**). These two estuaries connect directly to Lake Okeechobee. Please refer to **Appendix G, Section G.5** of the FS for the complete Northern Estuaries evaluation.

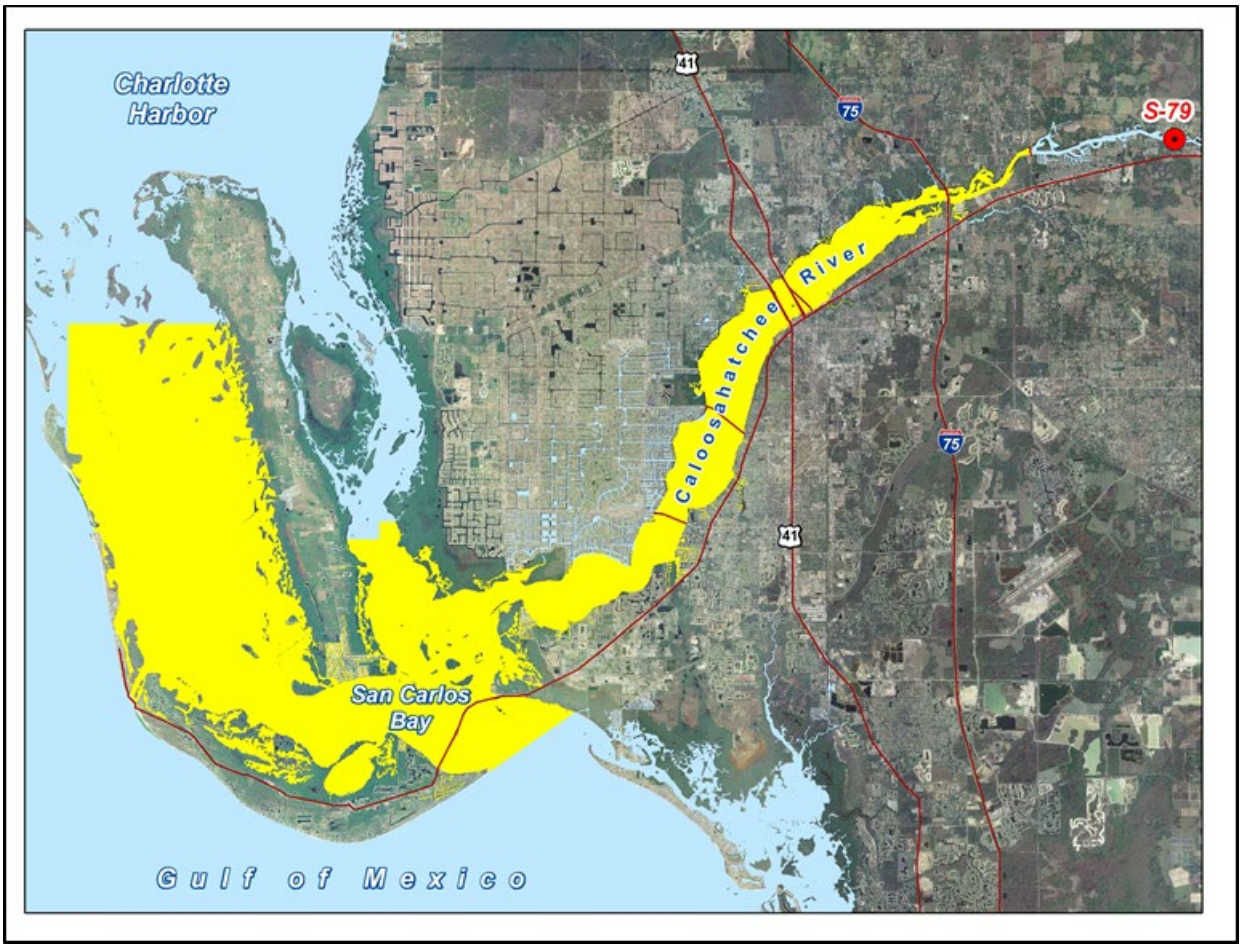


Figure B.4-1. Estimate of the maximum area of potential ecological benefit for the Caloosahatchee Estuary (70,979 acres).

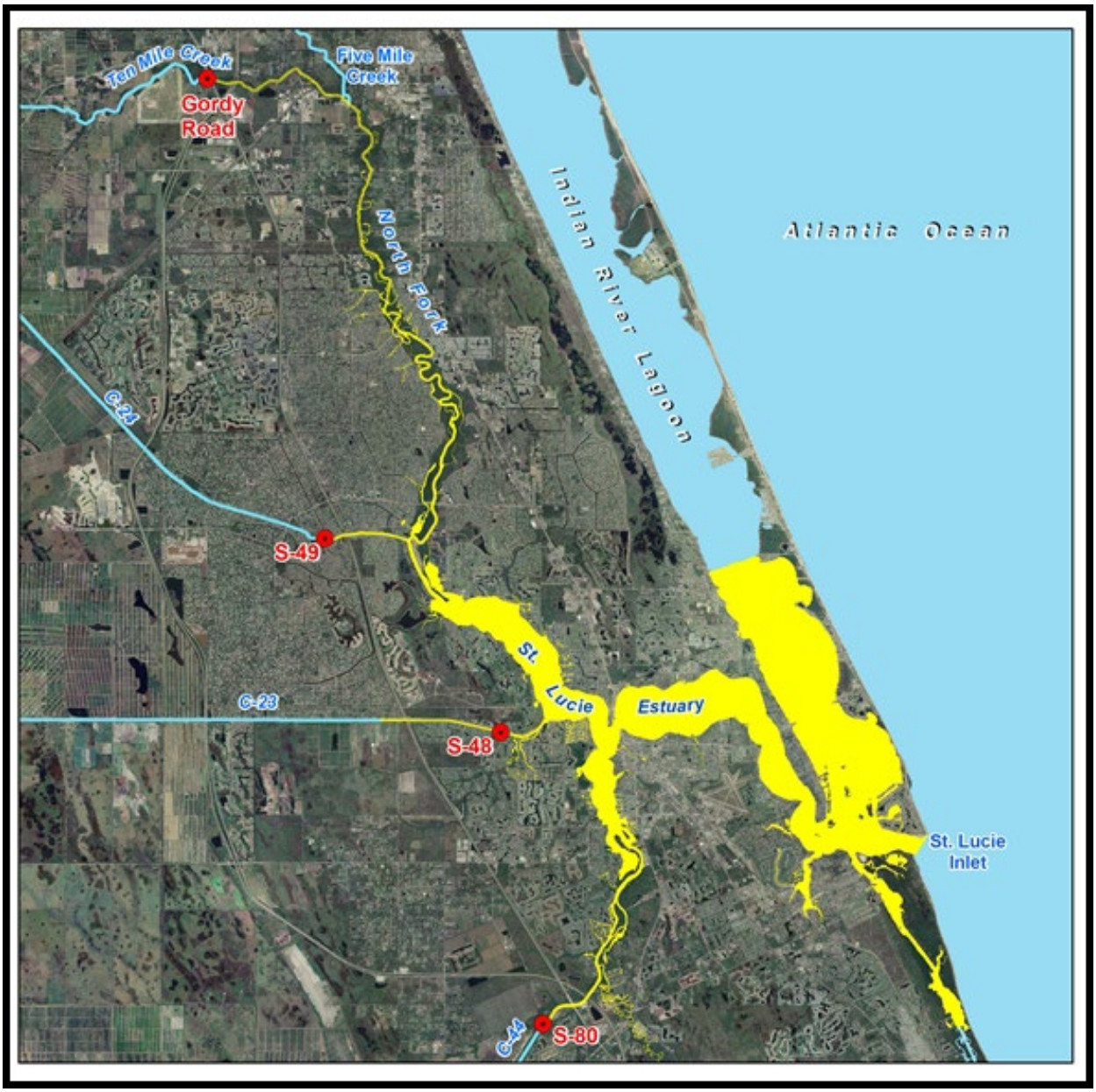


Figure B.4-2. Estimate of the maximum area of potential ecological benefit for the St. Lucie Estuary (14,994 acres).

Northern Estuaries Habitat Unit Calculation

RECOVER's Salinity Envelope Performance Measure (RECOVER 2020) provides Optimal Flow targets (in cfs) for each of the estuaries: biweekly flows of 150 to 1,400 cfs for the SLE, and biweekly flows of 750 to 2,100 cfs for the CRE. It also includes flow bin(s) below the Optimal Flows (i.e., low flows), and above the Optimal. Those above Optimal are categorized as either stressful flows (in some figures referred to as "high flows"), or damaging flows. Performance measures within the Northern Estuaries were used to evaluate salinity improvements over available Eastern oyster habitat from resulting flow volumes over water control structures (**Figure B.4-3**). Within the Caloosahatchee Estuary, targets were based on

freshwater discharges at the S-79 structure. Within the St. Lucie Estuary, targets were based on freshwater discharges at the S-80, S-48, S-49, and Gordy Road structures.

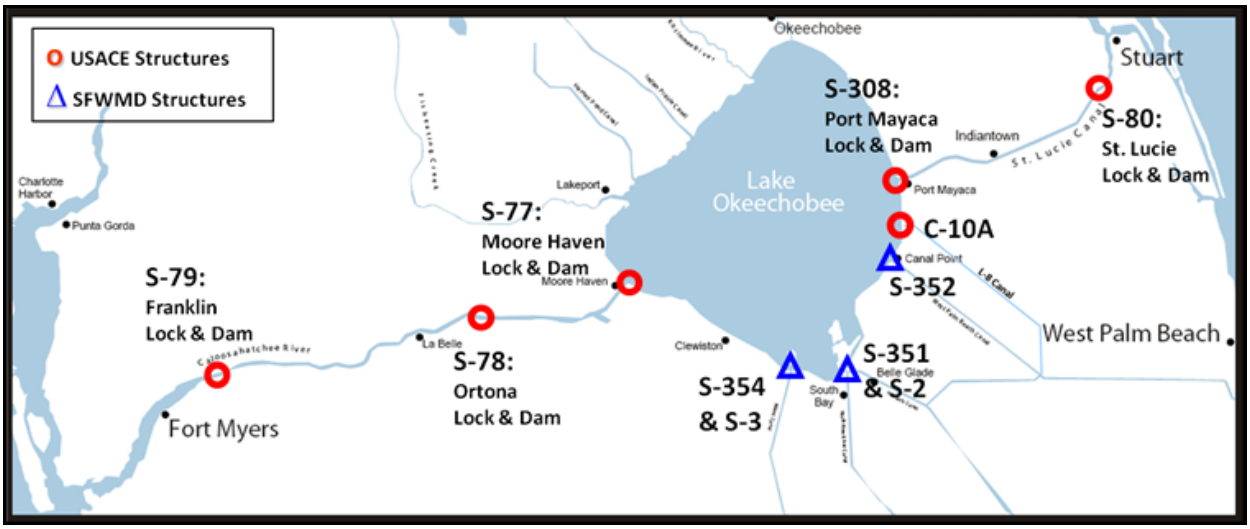


Figure B.4-3. Key structures of Lake Okeechobee and the Northern Estuaries.

Raw scores from the RSM-BN, which includes counts of 14-day moving average flow events in Low, Optimal, Stress, and Damaging Flows (RECOVER 2020) modeled over the period of simulation, were normalized to scores from zero percent (worst performance) to 100 percent (best performance). The performance measures for each estuary were assumed of equal value and averaged, then multiplied by the extant oyster reef habitat (434 ac for SLE and 980 ac for CRE) to calculate HUs. See **Appendix G** of the FS for a detailed description of how the HUs are derived.

Northern Estuaries Recommended Plan Performance

LOCAR is expected to improve conditions for estuarine and marine resources throughout the Northern Estuaries by restoring more natural timing, volume, and duration of freshwater flows to the Northern Estuaries. Marginal differences in performance exist between alternatives for high and damaging flows from lake releases. As a result of this reduction in Lake Okeechobee regulatory releases, the tabulation of events by the RSM-BN model shows increases in the number of high and damaging flow events triggered by basin runoff. This is indicative of storage capacity because of the reservoir, but that during certain high precipitation or tropical storm events, basin runoff will still result in high and damaging freshwater inflow. **Table B.4-5** shows the combined Northern Estuaries HUs.

Table B.4-5. Combined Northern Estuaries HUs for the Recommended Alternative.

Region	ECB	FWO	Alternative 1
Caloosahatchee HUs	35,817	53,884	57,217
St. Lucie Estuary HUs	21,561	37,503	35,057
Overall Northern Estuaries HUs	57,378	91,387	92,274
Potential Lift from FWO	N/A	N/A	887
Potential Lift from ECB	N/A	34,009	34,896

FWO—Future Without Project; HU—habitat unit

The best performing LOCAR alternative is Alternative 1. Compared to the ECB, Alternative 1 has a potential lift of 34,896 HUs, and 887 HU lift compared to the FWO. The implementation of LOCAR may increase the acres of SAV, oyster, and healthy benthic habitat. The improvement of estuarine conditions will ultimately have a beneficial effect to essential fish habitat resources. SAV and algal communities are also common foraging areas for the green sea turtle and manatee. Reductions in freshwater flows within the Northern Estuaries reduce stress on SAV and promote increases in seagrass shoots, potentially increasing foraging opportunities for green sea turtles in this region.

B.4.2.3.4 Recommended Plan Performance

Lake and estuary HUs were assumed of equal value and summed. Alternative 2 provides the most total HUs (including Lake Okeechobee and Northern Estuaries), followed by Alternative 1, which were both best buy alternatives. Alternative 3 was found to be not cost effective. All alternatives provide a lift in HUs over the FWO. Please refer to **Appendix G.5** and **Chapter 4.1.4.5** of the FS for a detailed alternative performance summary.

B.4.3 Consistency with Yellow Book Purpose

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 CERP will work together to benefit the ecological structure and function of more than 2.4 million ac 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 30-year period. Recommendations for interim goals and interim targets were developed by RECOVER in 2005. An intergovernmental agreement signed in 2007 among the Corps, U.S. Department of Interior (USDOI), and SFWMD established interim goals for CERP. The progress towards the interim goals was evaluated using quantitative and qualitative predictions derived from RECOVER-approved PMs, information from additional ecological planning tools, and professional judgement. CERP is designed to achieve more natural flows by redirecting regulatory flows that are currently discharged to the Atlantic Ocean and Gulf of Mexico (via the C-44 and the C-43 Canals to the Northern Estuaries) to a more restored flow of water that is distributed throughout the system similar to pre-drainage conditions.

The Project planning for LOCAR is consistent with the sequencing of projects in the Integrated Delivery Schedule and included in the next generation of CERP project features to provide restoration benefits. LOCAR, or Component A in the Yellow Book, is included in CERP and contains (1 of the 68 CERP components. Each of the PMs for the LOCAR planning effort were derived from those approved for use in CERP by RECOVER. Detailed information about the performance measures and the methodology that was used to quantify ecosystem benefits and support plan evaluation and selection of the Recommended Plan can be found in **Appendix G** of the FS.

B.4.4 Implementation of Project Components and Operation of the Project

Implementation of LOCAR will occur over many years and include many actions by the Corps and SFWMD. Phasing of the construction incorporates the adaptive management process, per the guidance of the

Programmatic Regulations for the CERP (2003) and the WRDA of 2007. Phasing of the construction into logical groupings will allow earlier restoration benefits by initially building Project components that can be implemented within a shorter timeframe to begin accruing benefits, while providing assurances of sound financial investments. Other factors may influence implementation, including funding availability, maintaining cost-share balance between the federal and non-federal sponsor, as well as the integration of projects that may be constructed by other agencies. Additional Project implementation information can be found in **Section 6.6** of the FS.

B.4.4.1 Implementation and Construction Sequencing

Development of sequencing for LOCAR features considers that not all previously authorized large capital investment CERP projects have been implemented. Several other basic principles were considered in development of an implementation plan for LOCAR features:

1. Construction of the Project 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.
    b. Will not cause or contribute to a violation of any applicable water quality permit discharge limits or specific permit conditions.
    c. Reasonable assurances exist that demonstrate adverse impacts on flora and fauna in the area influenced by the Project features will not occur.
2. Recreation features will be constructed in conjunction with corresponding Project features.

The implementing agencies are committed to engaging in a public process to integrate LOCAR into the IDS, which defines the order in which CERP projects will be planned, designed, and constructed.

B.4.4.2 Project Operations

The draft Project Operating Manual (POM) in **Annex C** of the FS includes operating criteria assumptions and generally discusses the transitions to operations during the construction phase, the Operation, Testing & Monitoring Phase (OTMP), and the long-term Operations and Maintenance (O&M) phase. The POM assumes completion of all LOCAR components. Modifications and/or revisions to the POM will occur during subsequent implementation phases. Development of the POM is an iterative process that will continue throughout the life of the Project. The POM will be updated at periodic intervals during the detailed design, construction, and operational testing and monitoring phases of the Project.

Refinements to the operating criteria in the POM will be made as more Project design details, data, operational experience, and general information are gained during these Project phases. It is also anticipated that once the POM is completed and the long-term O&M phase is underway, it may be necessary to revise the POM from time to time based on additional scientific information and implementation of CERP or non-CERP activities. The POM will develop over time as the details of the design of LOCAR components are developed. The first draft is presented in the FS with the recognition that multiple revisions and operational fine-tuning would occur over the life of the Project. The operations discussed represent the start-up operational strategy, recognizing that constraints in the system may be removed over time due to the completion of CERP and non-CERP Projects. The Corps and SFWMD will share in the responsibilities for conducting water management operations during the OTMP.

B.5 DETERMINATION OF PROJECT CONSISTENCY WITH APPLICABLE LAWS AND REGULATIONS

B.5.1 Pre-application Conferences

In accordance with Florida Statute Section 373.1501(5)(c), a pre-application conference was held on June 2, 2023, at the SFWMD in West Palm Beach, Florida, and via webinar. The following were represented at the conference:

- SFWMD;
- FDEP;
- USFWS; and
- EPA.

The meeting summary can be found at the end of this report. Information gained at the pre-application conference was considered by the SFWMD in preparing the FS.

B.5.2 Compliance with Federal Environmental Laws, Regulations, and Executive Orders

Table B.5-1 summarizes required compliance with specific federal Acts, Executive Orders (EO), and other applicable environmental laws, and provides a summary of the compliance status associated with each Act, EO, or applicable law. **Appendix C.4** and **Section 7** of the FS contain detailed descriptions of completed and ongoing coordination efforts.

Table B.5-1. Compliance with Federal Environmental Laws, Regulations, and Executive Orders: Recommended Plan

Law, Policy, and Regulations	Status	Comments
Anadromous Fish Conservation Act	Complies with this Act.	Recommended Plan would not adversely affect anadromous fish species.
Archaeological and Historic Preservation Act (ACHP)	This Act is not applicable.	This Act applies to federally owned lands. The Recommended Plan does not occur on federally owned lands.
Archaeological Resources Protection Act of 1979	Complies with this Act and will continue to comply throughout construction and operation.	This statute was enacted to protect archaeological resources and sites on federal and Native American lands. The Recommended Plan does not occur on federally owned lands or reservation lands.
American Indian Religious Freedom Act	Complies with this Act.	The policy of the U.S. is to protect and preserve the inherent rights of freedom to believe, express, and exercise traditional religions of Native Americans, Alaska Native Groups, and Native Hawaiians. These rights include, but are not limited to, access to sites, use and possession of sacred objects, and the freedom to worship through ceremony and traditional rites.
Bald and Golden Eagle Protection Act	Complies with this Act.	Potentially suitable nesting and foraging habitat for bald eagles occur within the Project Area; however, the closest nest is

Law, Policy, and Regulations	Status	Comments
		located approximately 2.13 miles to the east. The Recommended Plan would not adversely affect the bald eagle. No take permits are required.
Clean Air Act of 1963	The Project would comply with this Act as applicable based on detailed design; would obtain any required permits.	Potential for permanent sources of air emissions would not be expected from the use of electric pump stations. However, operations staff would determine if stations would be exempt from air permitting or if an air general permit would be required.
Clean Water Act of 1972	The Project would be implemented in compliance with this act. Water Quality Certification (WQC) would be obtained from the State of Florida as would any required National Pollutant Discharge Elimination System (NPDES) permits needed for construction. The 404(b)1 analysis would be updated as needed with submission of the WQC application.	All required permits will be obtained prior to construction activities. **Appendix C, Part 3** of the FS includes the 404(b)1 analysis.
Coastal Barrier Resources Act and Coastal Barrier Improvement Act of 1990	These Acts are not applicable to this Project.	No designated coastal barrier resources are in the Project Area that would be affected.
Coastal Zone Management Act of 1972	This Project would be implemented in compliance with this Act and obtaining concurrence by the State of Florida.	A Florida Coastal Zone Consistency Determination was prepared in accordance with the provisions of 15 CFR Part 930 and is located in **Appendix C, Part 3** of the FS.
Endangered Species Act of 1973	The Project would be implemented in compliance with this Act. Consultation with the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) was conducted as appropriate.	Formal consultation was initiated with USFWS in July 2023, with completion of Biological Assessment (BA). The Final BA was delivered to the USFWS on August 16, 2023, and is included in **Annex A** of the FS. The USFWS Biological Opinion (BO) was received from the USFWS on November 30, 2023, and is located in **Annex A** of the FS. The Corps determined there would be no effect on species under NMFS purview, therefore no further NMFS consultation is required.
Estuary Protection Act of 1968	Complies with this Act.	The objectives of the Recommended Plan are focused on environmental protection, providing opportunities to redirect large freshwater flows from Lake Okeechobee and increasing the number of days optimal flow reaches the Caloosahatchee

Law, Policy, and Regulations	Status	Comments
		and St. Lucie Estuaries (Northern Estuaries).
Farmland Protection Policy Act of 1981	Complies with this Act.	Coordination with U.S. Department of Agriculture/Natural Resources Conservation Service to meet the requirements of the Farmland Policy Protection Act was completed.
Federal Water Project Recreation Act of 1965/Land and Water Conservation Fund Act	Complies with this Act.	The Recommended Plan would create new recreational opportunities described in **Appendix F** of the FS.
Fish and Wildlife Coordination Act of 1958, as Amended	Complies with this Act.	The Final Fish and Wildlife Coordination Act Report was received on November 17, 2023.
Magnuson-Stevens Fishery Conservation and Management Act	Complies with this Act.	An essential fish habitat assessment was prepared and coordination with NMFS was initiated.
Marine Mammal Protection Act of 1972	Complies with this act and will continue to comply with the Act at the time of construction.	The Study Area is accessible to the Florida manatee, a subspecies of the West Indian manatee. Applicable listed species guidelines and conservation measures will be followed and coordinated with the USFWS and NMFS.
Marine Protection, Research, and Sanctuaries Act	This Act is not applicable.	Ocean disposal is not a component of this Project; therefore, this Act is not applicable.
Memorandum on Government-to-Government Regulations with Native American Tribal Governments	Complies with this memorandum.	The Corps consulted with the Miccosukee Tribe of Indians of Florida (MTI), Seminole Tribe of Florida (STOF), Seminole Nation of Oklahoma, and Thlopthlocco Tribal Town. Consultation is ongoing and would continue throughout final design.
Migratory Bird Treaty Act of 1918	Complies with this Act and will continue to comply with the Act at the time of construction.	Migratory bird surveys would be conducted prior to and during construction and buffers will be implemented as necessary
National Environmental Policy Act (NEPA) of 1969	Public and agency review of this document are compliant with this Act. Compliance is expected during preparation of Final Environmental Impact Statement (EIS) and signing of Record of Decision.	Compliance with NEPA is documented in a separate EIS prepared by the Corps.
National Historic Preservation Act	Compliance Pending.	Consultation has been initiated. Section 106 of the NHPA allows compliance with this act using a phased approach. Consultation is ongoing and would be completed prior to the signing of the ROD.
Native American Graves Protection and Repatriation Act, as Amended	This Act is not applicable.	This Act applies to federally owned lands, including reservation lands. The Project

Law, Policy, and Regulations	Status	Comments
		Area does not occur on federally owned lands or reservation lands.
Noise Control Act	Would comply with this act.	The effects of noise from the operation of pump stations would be localized and measures would be put in place to reduce the effects of noise from pump stations operating at Lake Okeechobee Component A Storage Reservoir (LOCAR).
Resource Conservation and Recovery Act, as amended by the Hazardous and Solid Waste Amendments of 1984; Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act of 1986; Toxic Substances Control Act of 1976	Complies with this Act.	The SFWMD completed a desktop survey of available information. Historical environmental assessments indicate that other properties in the area have been identified cattle dip vat sites that required further investigation. Compliance with this Act would be achieved prior to construction. If any items regulated under these laws are discovered, the SFWMD would comply with applicable requirements. to ensure removal of materials of concern.
Rivers and Harbors Act of 1899 and 1953	Complies with this Act.	The Recommended Plan would not obstruct navigable waters of the United States.
Seminole Indian Claims Settlement Act of 1987	Complies with this Act.	This Act also involves an agreement known as the Water Rights Compact, which specifically defines Tribal water rights. The analysis contained in the Feasibility Study demonstrates that the number and severity of water shortages and water shortage cutbacks increase when compared with the Future Without Project. The modeled sensitivity run indicates that cutbacks would be reduced based on proposed operational changes to Lake Okeechobee. The STOF's Big Cypress and Brighton Reservations lie within the SFWMD Section 203 Feasibility Study Area. Water supply deliveries to these reservations are not affected by the proposed Project and may actually improve.
Submerged Lands Act of 1953	This Act is not applicable.	The Recommended Plan improves optimal flows to the Northern Estuaries that would ultimately benefit the ecological habitats that occur on submerged estuarine lands of the State of Florida. The Project does not occur on submerged lands, and no construction is expected on submerged lands.
Wild and Scenic River Act of 1968, As Amended	This Act is not applicable.	No designated wild and scenic rivers are located within Project Area.

Law, Policy, and Regulations	Status	Comments
Executive Order (EO) 11514, Protection and Enhancement of Environmental Quality	Complies with this EO.	The objectives of the Recommended Plan are focused on environmental protection by providing storage for water that would otherwise increase water levels in Lake Okeechobee and increase the number of optimal flows to the Northern Estuaries. The Recommended Plan changes the timing and distribution of flows into Lake Okeechobee per the Comprehensive Everglades Restoration Plan (CERP) goals.
EO 11593, Protection and Enhancement of the Cultural Environment	Complies with this EO.	The proposed Project takes into consideration the preservation of non-federally owned cultural resources of significance.
EO 11988, Floodplain Management	Complies with this EO.	The purpose of this EO is to discourage federally induced development of floodplains. Commitment of lands to restoration precludes such development.
EO 11990, Protection of Wetlands	Complies with this EO.	Portions of the Project Area are existing wetlands, which would be mitigated if impacts are unavoidable.
EO 12962, Recreational Fisheries	Complies with this EO.	The Recommended Plan is expected to improve recreational fisheries in Lake Okeechobee by expanding and improving habitat through reductions in the duration and frequency of high water level events.
EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations	Complies with this EO.	A full environmental justice analysis was completed (**Appendix C, Part 2** of the FS). The analysis demonstrates that the alternatives would not disproportionately adversely affect minority or low-income populations.
EO 13007, Indian Sacred Sites	This EO is not applicable	This EO directs federal land managing agencies to accommodate and facilitate the accessibility and ceremonial utilization of Indian sacred sites by Indian religious practitioners while ensuring that sites are not adversely physically impacted. The Recommended Plan would have no adverse effect to historic properties and cultural resources. This EO is not applicable.
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	Complies with this EO.	The alternatives would not be expected to have environmental or safety risks that may disproportionately affect children. Children would not be in the vicinity of any of the construction activities or reservoir operational areas.
EO 13089, Coral Reef Protection	This EO is not applicable	Coral reefs are not affected.

Law, Policy, and Regulations	Status	Comments
EO 13122, Invasive Species	Complies with this EO.	A nuisance and exotic vegetation control plan was prepared to prevent or reduce establishment of invasive and non-native species within the Project Area. The vegetation control plan is located in **Annex G** of the FS**.** The Invasive & Nuisance Species Management Plan (INSMP) is in **Annex F** of the FS.
EO 13175, Consultation and Coordination with Indian Tribal Governments	Complies with this EO.	The Corps would continue to consult with members and representatives of the STOF, MTI, Seminole Nation of Oklahoma, and Thlopthlocco Tribal Town.
EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds	Complies with this EO.	The Recommended Plan would not adversely affect migratory bird species.
EO 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis	Complies with this EO.	Greenhouse gas emissions from construction and operation of the Recommended Plan are discussed in **Appendix C, Part 2** of the FS.
EO 14008, Tackling the Climate Crisis at Home and Abroad	Complies with this EO and will continue to comply with the EO at the time of construction.	Construction and operation of the Recommended Plan would be consistent with the DOD's Climate Action Plan. A full environmental justice analysis was completed (**Appendix C, Part 2** of the FS). The analysis demonstrates that the alternatives would not have disproportionately adverse climate-related effects on disadvantaged communities.
EO 14096, Revitalizing Our Nation's Commitment to Environmental Justice for All	Complies with this EO and will continue to comply with the EO at the time of construction.	A full environmental justice analysis was completed (**Appendix C, Part 2** of the FS). The analysis demonstrates that the Alternatives would not disproportionately adversely affect communities with environmental justice concerns.

B.5.3 Compliance with the Corps' CERP Agricultural Chemical Policy

The Corps' HTRW policy (ER 1165-2-132) directs that Construction of Civil Works projects in HTRW-contaminated areas should be avoided where practicable. In September 2011, the Army for Civil Works provided clarification to this HTRW policy for CERP Projects (*Memorandum for Deputy Commanding General for Civil and Emergency Operations, Subject: CERP – Residual Agricultural Chemicals,* dated September 14, 2011). A copy of this policy is included in **Appendix C** of the FS. If specific criteria are met, this policy memorandum allows residual agrichemicals to remain on Project lands and allows the Corps to integrate response actions directly into the construction plan.

B.5.4 Compliance with Florida Statutes

As described in **Section 1** of this FS, the State of Florida enacted several laws pertaining to implementation of CERP projects. The SFWMD must submit a State Compliance report pursuant to Florida Statute Section

373.1501 for the FDEP's review and approval before formally requesting congressional authorization and receiving an appropriation of State funds for construction and other implementation activities (except the purchase of lands from willing seller) (Florida Statute Section 373.026(8),2018). Florida Statute Section 373.1501 establishes the procedures the SFWMD and FDEP must follow for submitting and reviewing requests for approval, permitting requirements, and process for CERP projects. Florida Statute Sections 373.470 and 373.472 establish the "Save Our Everglades Trust Fund" funding and reporting requirements and procedures for distributions from the trust fund.

In addition to the above-described statutory requirements, Florida Statute Chapters 373 (*Water Resources*) and 403 (*Environmental Control*), may apply to various aspects of CERP project planning and implementation. Florida Statute Chapter 403 and its implementing rules govern "facilities that discharge, or potentially discharge, pollutants to surface and groundwaters, and the discharge of air pollutants." These facilities may also be regulated under the federal Clean Water and Safe Drinking Water Acts and the federal Clean Air Act.

Based on the information contained in this document and the FS, the Recommended Plan complies with the applicable statutory provisions. Detailed explanation of how the Project complies with the applicable state requirements for CERP projects is found throughout this document, and documents referenced herein. **Appendix C (Section C.3.3)** of the FS contains a detailed explanation of how the Project complies with the applicable requirements for CERP projects contained in the Florida Statutes.

B.5.5 Permits, Entitlements, and Certifications

The SFWMD must obtain a Section 404 Clean Water Act Permit to perform work in jurisdictional wetlands and other waters of the United States. The permit application will be reviewed and coordinated with other federal agencies, including the USFWS, NMFS, State Historic Preservation Office (SHPO), and the Tribes. Although areas of the Project will likely be determined to be jurisdictional, most of the area has been affected by past activities, and existing wetland areas currently provide limited wetland functions and values. The Project will have to demonstrate that wetland losses will be mitigated to the extent practicable. Based on the Project benefits described herein and in the FS, the SFWMD anticipates LOCAR will result in net increases in aquatic resource functions and services.

The SFWMD, as the local sponsor, must also obtain a State Water Quality Certification and Coastal Zone Consistency Determination. Both authorizations are prerequisites to issuance of the Section 404 Permit and will be included within applicable state permits. A CERPRA permit (see Florida Statute Section 373.1502, Florida Statute) will be procured for LOCAR facilities which would include the State Water Quality Certification and Coastal Zone Consistency Determination.

Prior to construction, the Project contractor must obtain a Generic Permit for Stormwater Discharge from Large and Small Construction activities, pursuant to F.A.C. Subsection 62-621.300(4), from the FDEP, and consumptive use permits for construction dewatering or consumptive use activities. All required federal and state permits and/or modifications to existing permits would be acquired prior to commencement of construction activities.

B.5.6 Compliance with Applicable Water Quality Standards and Permitting Requirements

LOCAR is not expected to significantly affect Lake Okeechobee's and the Northern Estuaries' compliance with applicable water quality criteria. In general, any short-term impacts to water quality associated with construction of the Recommended Plan would be ameliorated by construction sequencing, best management practices for erosion and sedimentation control, and monitoring during construction. If potentially adverse effects are observed or predicted, longer-term impacts to water quality associated with the operation of Project features would be addressed through operational monitoring and adaptive management actions.

B.6 REASONABLE ASSURANCES

The SFWMD shall:

provide reasonable assurances that the quantity of water available to existing legal users shall not be diminished by implementation of project components so as to adversely impact existing legal users, that existing levels of service for flood protection will not be diminished outside the geographic area of the project component, and that water management practices will continue to adapt to meet the needs of the restored natural environment (Florida Statute Section 373.1501(5)(d) [2018]).

LOCAR will improve the quantity, timing and distribution of water entering Lake Okeechobee, provide for better management of lake water levels, reduce freshwater releases to the Northern Estuaries, and improve systemwide operational flexibility.

Maintaining Lake Okeechobee stage levels within the ecologically preferred stage envelope benefits plant and animal communities by providing appropriate depths and seasonality of flooding, concentrating prey resources in the marsh for wading birds, improving nesting and foraging habitat for endangered Everglade snail kites, increasing spawning habitat for sport fish, increasing light penetration for submerged and emergent plants at the edge of the marsh, and creating a diverse littoral vegetation community. Additionally, maintaining lake stage levels within the preferred stage envelope reduces the frequency and severity of water shortage cutbacks to LOSA. Reducing the return frequency, volume, and duration of regulatory discharges to the Northern Estuaries will improve salinity and turbidity conditions and benefit seagrass beds and the animals that inhabit them. Recreational features will enhance the existing opportunities for resource-based recreation found in the Study Area.

Better managing Lake Okeechobee stage levels within ecologically preferred stage envelope benefits plant and animal communities of Lake Okeechobee by concentrating prey resources in the littoral zone where wading birds forage, providing optimal light levels for photosynthesis in the summer months to benefit submerged plants and bulrush by and favoring development of a diverse emergent plant community, along with providing water supply benefits to LOSA users. Reducing the volume, duration, and magnitude of discharges to the Northern Estuaries will improve salinity and turbidity conditions and benefit seagrass beds and the animals that inhabit them.

The same hydrologic models used for plan formulation are applied to the Savings Clause and Project assurance analyses. This ensures consistency when representing the Project effects in the analyses subsequent to plan selection. The RSM-BN hydrologic model was used to simulate and evaluate the environmental effects of the LOCAR array of alternatives through comparison with pre-Project base conditions simulated with the same models. The RSM model uses a 52-year period of hydrologic record (1965 through 2016), which includes sufficient climatological variability (including natural fluctuations of water) to represent the full range of hydrologic conditions experienced within the South Florida region over a long-term period. No one modeling tool or representation of model results can definitively predict FWP hydrologic conditions across the Project Area, given the large regional scope of the Project, model tools limitations and assumptions, and future uncertainties regarding the effects of other projects. However, each snapshot of model results can form the basis for applying best professional judgment to determine whether the potential effects of Recommended Plan would reduce the availability of an

existing source of water or reduce the level of service for flood protection, and to quantify the water necessary to achieve the benefits of the plan.

The plan formulation process applied during the LOCAR FS analyzed the environmental effects and benefits of the Project alternative through qualitative and quantitative comparisons between the FWO condition and the FWP condition. The FWO condition describes what is assumed to be in place if none of the study's alternative plans are implemented. The FWO condition assumes the construction and implementation of authorized CERP and non-CERP projects, and other federal, state, or local projects constructed or approved under existing governmental authorities that occur in the Study Area, as described in **Section 2.5** of the FS (**Figure B.2-1**). The FWP condition describes what is expected to occur as a result of implementing each alternative plan that is being considered in the study.

B.6.1 Analyses for Savings Clause, including Intervening non-CERP and CERP Projects

The changes to quantity, timing, and distribution of water to be produced by the Project focus on meeting hydrologic restoration targets for Lake Okeechobee and the Northern Estuaries. The purpose of the Savings Clause analyses is to determine whether the effects of the Project would cause an elimination or transfer of existing legal sources of water or reduction to the level of service of flood protection. The potential effects of LOCAR can be assessed by comparing stage duration curves and other results from the model simulations for the FWO and proposed activities. If no reductions to existing legal sources or levels of service for flood protection are indicated at any sequential step during the comparison, then the Savings Clause requirements are determined to have been met. If there is an elimination or transfer of an existing legal source of water, then a new source of water supply to replace the water lost from implementation of the Recommended Plan would need to be identified.

Consistent with the approach outlined in Draft Guidance Memoranda 3, which was developed to meet the intent of WRDA 2000 and the Programmatic Regulation, the following guidance would be applied by LOCAR to address the effects of intervening non-CERP activities:

- Savings Clause analysis only applies to changes from date of enactment of WRDA 2000 that result from "Implementation of the Plan";
- Intervening non-CERP activities are changes wholly outside of CERP – for example, LORS 2008, LOSOM, Modified Waters Deliveries to Everglades National Park (MWD), C-111 South Dade, Interim Operations Plan (IOP), Everglades Restoration Transition Plan (ERTP), etc.;
- Savings Clause does not require CERP to make up for reductions in quantity or quality of existing legal sources or levels of service for flood protection caused by intervening non-CERP activities, but CERP cannot cause further reductions;
- Savings Clause does not prohibit CERP from reducing quantity or quality of existing legal sources or levels of service for flood protection increased by intervening non-CERP activities, but CERP cannot reduce those increases below those in place on the date of enactment of WRDA 2000.

To determine whether it is the Recommended Plan or other intervening CERP or non-CERP activities are affecting the existing legal sources or levels of service for flood protection, the Recommended Plan can be compared to the ECB and IOR Baseline (**Table B.6-1**). The simulations for Recommended Plan and the IOR Baseline include the effects of intervening CERP activities that were assumed to be implemented in the IOR condition. In this analysis, the focus is to determine the potential effects of the Recommended

Plan by comparing the LCR1 (Alternative 1) to the IOR Baseline. This comparison isolates the effects of the intervening CERP and non-CERP projects.

If no reduction at any step, then requirements of Savings Clause have been met.

Table B.6-1. Summary of Comparisons for Savings Clause

Step	Base Condition Model Run	With-Project Model Run
1	Existing Conditions Baseline – ECB23L	LCR1 (Recommended Plan)
2	Initial Operating Regime Baseline – PA_FWOLL	LCR1 IOR (Recommended Plan)

B.6.2 Water Supply Assurance – Identifying Water Made Available by the Project for the Natural System and Other Water-related Needs

The total water and the water made available for the natural system and other-water-related needs are quantified when all Recommended Plan Project features are constructed and the Project is expected to be operational as identified in the FWP condition. The pre-Project water expected to be available when the Project is operational is represented by FWO.

Water for Project assurances is quantified where Project benefits accrue, consistent with the HU benefits quantified during the Recommended Plan formulation resulting from water being made available by the Project. The ability of the Recommended Plan to provide water to meet other water-related needs in the LOSA was also analyzed. The basins where the Project may potentially supply water for the natural system or other water-related needs are listed below:

- Natural System
  - Lake Okeechobee
- Other Water-related Needs
  - LOSA, including the EAA

Identification of the water made available by the Project requires analysis of the RSM-BN results for the Recommended Plan. The identification of water involves both 1) existing water in the system that is available to the natural system and available for other water-related needs, and 2) water made available by the Project to the natural system and for other water-related needs, as depicted in **Figure B.6-1**. The sum of these two categories is the total water that is expected to be available to the natural system and available for other water-related needs.

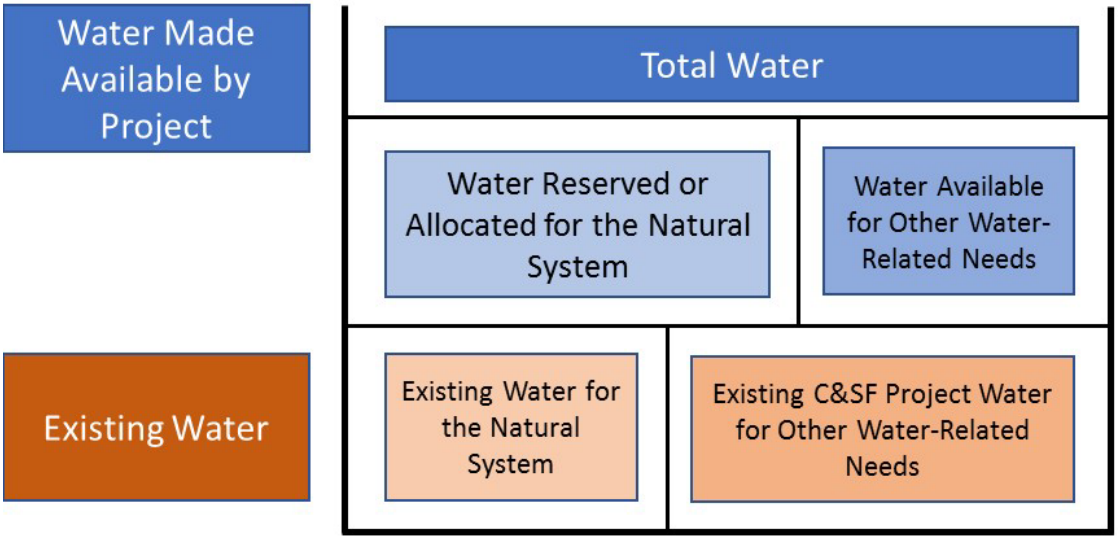


Figure B.6-1. Water needed to achieve the benefits of the plan.

Identification of water made available by the Project is represented by the FWP condition (Recommended Plan, Alternative 1 model run), as depicted in **Table B.6-2.** Given that LOCAR contains storage, the water made available by the Project can be quantified as the volume discharged from the Project annually. Water returned to Lake Okeechobee was also quantified. In addition, because the aboveground storage reservoir does not exist in the pre-Project condition, water is not quantified for the FWO condition.

Table B.6-2. Summary of Analyses for the Identification of Water Made Available by the Project

Analysis	Water for the Natural System
Existing pre-Project water for the natural system	Future Without Project (FWO)
Total water for the natural system with the Project	Recommended Plan (Alternative 1)
Identification of water made available by the Project	Difference between Recommended Plan (Alternative 1) and FWO

Quantification of water made available for the natural system is displayed using volume probability curves. The tenth, fiftieth, and ninetieth percentiles will be identified for the Recommended Plan, representing water made available by the Project for the natural system. Benefits projected for the Northern Estuaries are the result of reduced high-volume flows from Lake Okeechobee and, therefore, water for the natural system is not identified. To evaluate whether additional water is made available by the Project to meet other water-related needs, specifically water supply for existing legal users in LOSA, the changes to the level of service were evaluated.

B.6.2.1 Water for Other Water-related Needs

The ability of LOCAR to return water to Lake Okeechobee to meet other water-related needs in LOSA was analyzed for the Recommended Plan. The reservoir is designed to capture water from Lake Okeechobee during high stage events that would otherwise be lost to tide. Water stored in LOCAR is released during dry periods when lower stages in Lake Okeechobee may present water supply risks within LOSA. Water made available by LOCAR benefits water users within LOSA by increasing the reliability of its supply relative to the ECB or FWO. Based on the analysis, the water supply level of service for existing legal users

in LOSA is improved over the ECB (refer to **Chapter 4** and **Annex B** of the FS). Increased water supply does not enable new or expanded allocations in LOSA.

B.6.3 Flood Protection Assurance

The implementation of the Recommended Plan will not degrade the existing level of flood protection offered by various components of the C&SF Project for this area. Further, the Recommended Plan will ensure flood protection of the area through engineering design and construction following industry standards for design and construction of pertinent features of the plan. The Corps ERs 1110-2-1150 (*Engineering and Design for Civil Works Projects*) and 1110-2-1156 (*Engineering and Design Safety of Dams–Policy and Procedures*), along with various other site/structure specific regulations, will be adhered to prior to and during the PED phase.

B.6.4 Adaptive Management to Meet the Needs of the Natural Environment

The LOCAR Adaptive Management and Monitoring Plan (AMMP) (**Annex D** of the FS/EIS; hereon **Annex D**) identifies the monitoring information needed to inform implementation and to document restoration progress to agencies, the public, and Congress. The AMMP contains descriptions of monitoring that should address specific uncertainties identified during planning, required parameters such as water quality and hydrology, and ecological features that track progress toward achieving the LOCAR objectives. The monitoring data will also be used to ensure conformance to applicable legal requirements. The monitoring descriptions are found in detail in **Annex D**.

For each objective, the monitoring parameters, their value to the Project, timeframe needed to see changes, measurement frequencies, decision criteria for triggering adaptive management options, and suggested adaptive management options are provided in the AMMP text. The information is also summarized per Project objective. Monitoring durations, which are specified in **Annex D**, are dependent on the intended use of the monitoring. Regulatory monitoring will be continued as long as required by applicable regulations. Consistent with WRDA 2016 implementation guidance for Section 1161, and Section 2039 as amended, monitoring will continue until the success criteria identified in the monitoring plans are determined to have been met, even though federal cost-sharing is limited to 10 years. See **Annex D, Part 1, Section D.1.6** for a description of the rolling implementation of the monitoring and the feedback that the data will provide to inform management decisions.

B.6.4.1 Invasive and Nuisance Species Management Plan

The purpose of the Invasive and Nuisance Species Management Plan (INSMP) is to outline measures for preventing, controlling, reducing, and monitoring invasive species within the LOCAR footprint to achieve restoration benefits. The plan proposes to complete both initial and long-term invasive species management within the reservoir. The INSMP is a living document and will be updated throughout design, construction, and OMRR&R. **Annex F** of the FS contains the INSMP.

B.6.4.2 Other Project Monitoring Plans

In addition to the AMMP, **Annex D** contains the Water Quality Monitoring Plan, Hydrometeorological Monitoring Plan, and regulatory monitoring requirements. The LOCAR AMMP has been designed to support achievement of CERP and LOCAR goals and objectives and remain within constraints by providing the data necessary to detect changes expected due to LOCAR.

B.7 COORDINATION WITH EXISTING UTILITIES AND PUBLIC INFRASTRUCTURE

Florida Statute Paragraph 373.1501(5)(e) requires the SFWMD to "ensure that implementation of project components is coordinated with existing utilities and public infrastructure and that impacts to and relocation of existing utility and public infrastructure are minimized." Agency coordination and public involvement has taken place throughout the LOCAR feasibility planning process. PDT and public involvement have been a critical component of the development of the FS.

B.7.1 Summary of Utilities and Coordination with Utilities and Public Infrastructure

Preliminary aerial and ground inspections have revealed no major transmission lines within Project Areas. There are expected to be service lines for occupied structures in those Project Areas. Since these areas are to be acquired, no facility or utility relocations are expected. PDT membership consists of those individuals designated by the Corps and the SFWMD, the implementing agencies, and representatives designated by other governmental agencies or Tribes. Interagency participation is encouraged to take advantage of technical skills and knowledge of other agencies. Several federal, Tribal, and state agencies are active members of the PDT. Participants include the EPA, USFWS, U.S. Geological Survey (USGS), National Park Service (NPS), MTI, STOF, FWC, Florida Department of Agriculture and Consumer Services (FDACS), and FDEP. Representatives from Highlands, Okeechobee, Glades, Martin, Palm Beach, Lee, and St. Lucie Counties are also active participants. Designated public comment periods provided opportunities for public participation during PDT meetings. The Corps mailed letters to 18 federal, state, local, and Tribal government representatives and agencies and issued press releases. Scoping comments were accepted through May 24, 2023. A Notice of Intent (NOI) to prepare an EIS for LOCAR was published in the *Federal Register* (Volume 88, Number 78; 88 FR 24777) on April 24, 2023. A public scoping meeting was held on April 27, 2023, in Okeechobee, Florida.

Public outreach efforts for LOCAR 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 FS. Workshops were held at key phases of LOCAR planning process during the formulation of Project objectives, management measures, and evaluation of alternatives. **Appendix C, Part 3** of the FS contains all the pertinent correspondence information regarding the agencies and public meetings.

Specific outreach efforts will be undertaken to coordinate implementation of the Project components with existing utilities and public infrastructure, as well as minimize impacts to and relocation of existing utilities and public infrastructure. The purpose of this coordination is to (1) review the network of existing and proposed utility facilities and roads in the area; (2) identify which utility facilities can be removed (or relocated) and the process and timeframes for implementing their removal (or relocation) consistent with the project schedule; (3) identify those facilities that need to remain that may be impacted by the proposed Project; (4) discuss options for minimizing and/or avoiding impacts to the facilities that need to remain and, if necessary, relocation options; and (5) identify any other potential utility and public infrastructure issues that need to be addressed during the planning, design, and/or construction process.

This effort will help strengthen working partnerships with local agencies and utility companies affected by the Project, and to identify new local issues to consider as detailed design progresses. Most importantly, the process allows the Corps and SFWMD to conclude that no insurmountable obstacles exist that would

prevent or significantly alter the design and construction of the Project. Through these coordination efforts, the agencies will ensure that the implementation of the Project components minimizes impacts to and relocation of existing utilities or public infrastructure.

B.8 INCREASED WATER SUPPLY AVAILABLE FROM PROJECT

Florida Statute Paragraph 373.470(3)(c) requires the SFWMD, in cooperation with the Corps, to identify the increase in water supplies resulting from each CERP project, which shall be allocated or reserved by the SFWMD. From a programmatic perspective, the identification of water for the natural system associated with the CERP involves an analysis of four different aspects of ecological responses to hydrologic changes: (1) responses to the change in the quantity of water received by the natural system; (2) responses to the timing of those deliveries; (3) responses to the distribution of water delivered to the natural system; and (4) responses to the quality of the water received by the natural system. However, the relative importance of each of these aspects (i.e., quantity, timing, distribution, and quality) will vary from project to project depending upon the specific objectives established for the Project.

The Recommended Plan achieves the Project objectives by changing the timing, distribution, and volume of water conveyed to the natural system. The large regional scale of the Recommended Plan causes large volumes of water to move between ecosystems and basins, consistent with the Project's objectives (**Table B.8-1**). The water made available for the natural system is the water required for the protection of fish and wildlife within natural systems, including water that contributes to meeting hydrologic and ecologic targets for natural system restoration. The Recommended Plan provides a further reduction to regulatory releases from Lake Okeechobee to the Northern Estuaries. The Savings Clause and Project assurances analyses for the Recommended Plan focus on whether these regional-scale changes meet the requirements of WRDA 2000, the Programmatic Regulations, and Florida Statute Chapter 373.1501.

Table B.8-1. Goals and Objectives of CERP and LOCAR

CERP Objective	LOCAR Objectives
Improve habitat and functional quality.	Improve the timing and volumes of freshwater flows from Lake Okeechobee to improve the salinity regime and the quality of habitats for oyster, SAV, and other estuarine communities in the Northern Estuaries.
Improve native plant and animal species abundance and diversity.	Improve quantity, timing, and distribution of flows into Lake Okeechobee to maintain ecologically desired lake stage ranges more often.
CERP Goal: Enhance Economic Values and Social Wellbeing	
Increase availability of fresh water (agricultural/municipal and industrial).	Increase availability of the water supply to existing legal water users of Lake Okeechobee commensurate with improving Lake Okeechobee ecology.
Reduce flood damages (agricultural/urban).	No corresponding objective beyond Savings Clause.
Provide recreational and navigation opportunities.	Provide recreational and navigation opportunities.
Protect cultural and archeological resources and values.	Protect cultural and archeological resources and values.

CERP–Comprehensive Everglades Restoration Plan; LOCAR–Lake Okeechobee Storage Reservoir Section 203 Study; Northern Estuaries–Caloosahatchee and St. Lucie Estuaries; SAV–submerged aquatic vegetation

Identification of water for the natural system is quantified from releases from the reservoir to Lake Okeechobee in the Recommended Plan. This location represents inflows to the basins where ecosystem benefits (HUs) are expected from implementation of the Recommended Plan. Water returned to Lake

Okeechobee or delivered to the reservoir was quantified. Benefits projected for the Northern Estuaries are the result of reduced discharges from Lake Okeechobee and, therefore, water for the natural system is not identified. In addition, because the LOCAR storage features do not exist in the pre-Project condition, water is not quantified for the FWO condition.

B.8.1 Water to be Reserved or Allocated for the Natural System

As required by Section 601(h)(4)(A) of the WRDA 2000 and Section 385.35 of the Programmatic Regulations for the Implementation of CERP, the water made available by the Project must be protected using the State of Florida's reservation or allocation authority under state law. Water made available by the Recommended Plan must be protected before the SFWMD and U.S. Department of the Army enter into one or more Project Partnership Agreements to construct the Recommended Plan.

B.8.1.1 Lake Istokpoga/Indian Prairie Canal System—Restricted Allocation Area

The footprint of LOCAR is contained within the Restricted Allocation Area (RAA) for the Lake Istokpoga/Indian Prairie Canal System. Within this RAA, no additional surface water will be allocated from SFWMD canals over and above existing allocations.

B.8.1.2 Lake Okeechobee Service Area—Restricted Allocation Area

Lake Okeechobee is an MFL waterbody. MFLs are the minimum flow or minimum water level at which further withdrawals would be significantly degrading to the water resources or ecology of the area. The 2008 LORS analysis revealed that the anticipated lower lake stages would turn Lake Okeechobee into an MFL waterbody in recovery. As part of the recovery strategy while 2008 LORS is in effect, the SFWMD adopted RAA criteria for LOSA. The criteria limit users' withdrawals to their base condition water use. Applicants are not authorized to use additional volumes from Lake Okeechobee waterbodies unless they identify one of the specified sources listed in the rule.

The LOSA RAA includes the waters of Lake Okeechobee, including integrated conveyance systems that are hydraulically connected to and receive water from Lake Okeechobee, such as the C-43 Canal, the C-44 Canal, and secondary canal systems that receive Lake Okeechobee water for water supply purposes via gravity flow or by pump.

LOCAR was evaluated for effects to water supply and water supply performance and the Recommended Plan improves slightly over the ECB and FWO conditions.

B.8.1.3 Water for Other Water-related Needs

The ability of LOCAR to provide water to meet other water-related needs in LOSA was analyzed for the Recommended Plan. Based on the analysis, the water supply level of service for existing legal users in LOSA is improved over the ECB (refer to **Section B.3.2** and **Annex B Part 1** of the FS). Increased water supply, however, does not enable new or expanded allocations in LOSA.

B.8.1.4 Commitments for All CERP Projects

The overarching objective of the CERP (referred to as simply the "Plan" in WRDA 2000 and the Programmatic Regulations) 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. The federal government and the State of Florida are committed to the protection of the appropriate

quantity, quality, timing, and distribution of water to achieve and maintain the benefits to the natural system described in CERP. As envisioned in WRDA 2000 and the Programmatic Regulations, each FS will identify this appropriate quantity, quality, timing, and distribution of water for the natural system.

The following language sets forth these commitments:

The overarching objective of the Plan 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. The Federal Government and the non-Federal sponsor are committed to the protection of the appropriate quantity, quality, timing, and distribution of water to ensure the restoration, preservation, and protection of the natural system as defined in WRDA 2000, for so long as the project remains authorized. This quantity, quality, timing, and distribution of water shall meet applicable water quality standards and be consistent with the natural system restoration goals and purposes of CERP, as the Plan is defined in the programmatic regulations. The non-Federal sponsor will protect the water for the natural system by taking the following actions to achieve the overarching natural system objectives of the Plan:

1. Ensure, through appropriate and legally enforceable means under Federal law, that the quantity, quality, timing, and distribution of existing water that the Federal Government and the non-Federal sponsor have determined in this Project Implementation Report is available to the natural system, will be available at the time the Project Partnership Agreement for the project is executed and will remain available for so long as the Project remains authorized.

2a. Prior to the execution of the Project Partnership Agreement, reserve or allocate for the natural system the necessary amount of water that will be made available by the project that the Federal Government and the non-Federal sponsor have determined in this Project Implementation Report.

2b. After the Project Partnership Agreement is signed and the project becomes operational, make such revisions under Florida law to this reservation or allocation of water that the Federal Government and the non-Federal sponsor determines, as a result of changed circumstances or new information, is beneficial for the natural system.

3. For so long as the Project remains authorized, notify and consult with the Secretary of the Army should any revision in the reservation of water or other legally enforceable means of protecting water be proposed by the non-Federal sponsor, so that the Federal Government can assure itself that the changed reservation or legally enforceable means of protecting water conform with the non-Federal sponsor's commitments under paragraphs 1 and 2. Any change to a reservation or allocation of water made available by the project shall require an amendment to the Project Partnership Agreement

Lake Okeechobee Storage Reservoir Section 203 Study (LOCAR)

1501 Pre-Application Meeting Minutes

June 2, 2023 – 3:00pm to 4:00pm

1. Welcome & Introductions

   Luis Colón, South Florida Water Management District (SFWMD), opened the meeting at 3:01 PM, welcomed everyone, competed the roll call (attached), and reviewed the agenda.

2. Requirements of 373,1501 Florida Statute

   Mr. Colón explained 373.1501 Florida Statute, which codifies the District's roles, responsibilities as the Local Sponsor for the Lake Okeechobee Storage Reservoir Section 203 Study, and reviewed the specific requirements of 373.1501(5) Florida Statute, which states the District's is required to:

   - Analyze and evaluate needs in a comprehensive matter and to consider all applicable water resource issues,
   - Determine that components are feasible, efficient, and cost effective,
   - Determine that project components are consistent with laws and regulations, and can be permitted and operated as proposed,
   - Provide reasonable assurances to existing legal users that the quantity of water available and existing levels of flood protection shall not be diminished, and
   - Ensure that components are coordinated with utilities and public infrastructure and that impacts to, and relocation of existing utility or public infrastructure are minimized.

3. Project Study, Scope, and Schedule

   Mr. Colón reviewed the Lake Okeechobee Storage Reservoir Section 203 Study Project Study Area. Which is the same geographical area as the Lake Okeechobee Watershed Restoration Project.

   Mr. Colón presented the LOCAR Goals and Objectives, which are to:

   - Construct a storage reservoir north of Lake Okeechobee with approximately 200,000 ac-ft of storage,
   - Detain water during wet period for later use during dry periods to benefit Lake Okeechobee,
   - Increased storage would reduce duration and frequency of how and low waters levels in Lake Okeechobee, and
   - Reduce large discharges from the lake that are damaging to downstream estuary ecosystems.

   Mr. Colón reviewed some of the constraints of the project. In addition to being 1501 compliant the project must meet applicable water quality standards, maintain Lake Okeechobee navigability within the watershed, and maintain rights of the STOF under the compact.

   Mr. Colón went on to outline the many project opportunities including:

- Improve the lake ecology by reducing dramatic fluctuations in water levels,
- Minimize invasive species by improving marsh inundation patterns, and improving herbaceous vegetation,
- Create better conditions for emergent and submerged aquatic vegetation habitat,
- Increase fish, invertebrates, and plankton populations,
- Improve timing and distribution to estuaries,
- Improve water supply reliability, and
- Provide recreation and economic opportunities.

4. Array of Alternatives

Liz Caneja, SFWMD, clarified that we are conducting a feasibility study and environmental impact statement for the Lake Okeechobee Storage Reservoir Section 203 Study, under Section 203 of the Federal Water Resources Development Act of 1986. The District is taking the lead on the study including all the coordination, modeling, and the report preparation. The report has to be technical and policy compliant with the federal planning process, in order to be submitted to the Assistant Secretary of the Army and to Congress for authorization.

Ms. Caneja provided a review of the three reservoir locations being considered. She went on to explain that all locations provide approximately 200,000 acre feet of storage, however the acreage in size ranges from 12,000 to 19,000 acres, and the depth varies from 10 to 18 feet.

Ms. Caneja identified the 3 Alternatives being considered:

- Alternative 1 (Potential Reservoir) – 12,000 acres, 18’ depth,
- Alternative 2 (Dual Reservoir) – 19,000 acres, 10.2’ max depth,
- Alternative 3 (North/South Reservoir) – 13,700 acres, 14’ max dept

Ms. Caneja reviewed the proposed Tentatively Selected Plan (TSP): Alternative 1 (Potential Reservoir). The TSP provides 200,000 acre-feet of storage, has a maximum reservoir depth of 18 feet, has 2 reservoir inflow pump stations, total inflow capacity of 1,500 ft^3/second, total outflow capacity of 3,000 ft^3/second; is situated on approximately 12,000 acres and is bordered by the C-41A canal to the south.

Ms. Caneja reviewed the preliminary modeling results and said they show improved environmental performance measures for Lake Okeechobee, a decrease to the high and damaging flows to the estuary, and no impacts to water supply.

Mr. Colón advised that we met with the STOF prior to the April 27, 2023, NEPA Scoping Meeting and that coordination with the Miccosukee Tribe is ongoing. There was an open house for the LOCAR project was held May 4, 2023, and there will be a public meeting to present the TSP in July 2023.

Ms. Caneja reviewed the project schedule. The draft FS and PIS for public review by September. The goal is to have the FS and the PIS finalized by December 2023 for submittal to Congress in January 2024.

5. Discussion

Tim Breen, U.S. Fish and Wildlife Service, given that all of the alternatives store 200,000 acre-feet of water, it seems that most of the modeling results would be similar. He asked what types of factors were you looking at with the placement of the reservoir? As proposed to performance. Liz Caneja, SFWMD, advised that when we were evaluating LOWRP we were also looking at one of the reservoirs with a very similar footprint. The K42 Reservoir has a great location, access for water along the C41A canal. Land is currently being used for cattle crazing and is a good potential source for a reservoir. We are in the preliminary stages of looking at cultural resources, geotechnical surveys and other environmental concerns. Alternative 2 and 3 have some long-term leases that need to be considered and would be difficult to break.

Stan Ganthier, Florida Department of Environmental Protection, asked if the modeling is being done interagency of by SFWMD. Ms. Caneja advised that it is being done by SFWMD.

Mr. Ganthier asked if, in the TSP, it would be pumping water from the C38 Canal and pumping it west to the proposed reservoir and then pumping it with the second pump. Jennifer Leeds, SFWMD, responded that where we are pumping the water from is technically the Lake. That gives us the ability to pump water off the Lake when it is high.

Mr. Ganthier, asked when pumps are not working if the normal flow would resume? Ms. Caneja responded that we would defer to one or our engineers to clarify.

Mr. Ganthier asked if any canal improvements are needed. Project Team indicated that we are not aware of any at this time, but modeling is ongoing.

Mr. Ganthier inquired about the elevation of the overflow of the spillway. Ms. Caneja advised that she would double-check with the engineers regarding the overflow and elevations.

Andrew Eastwick, U.S. Fish and Wildlife Service, asked when would SFWMD want to begin construction if included in WRDA 2024 and how long would it take? Jennifer Leeds responded that if it is passed then we would look to start detailed design right away and that would take 18 - 24 months. Then construction would take 5 to 8 years to complete.

Tracy Woods, Florida Department of Environmental Protection, asked if geotechnical evaluations have been done for the Alternative 1 area?

Georgia Vince, J Tech, advised that the geotechnical work is going on right now in the field.

Ms. Woods inquired about the reason for the 10’ vs. 18’ depth? Liz Caneja stated that we were looking at different configurations. Trying to submit the target of 200,000 acre-feet.

Ms. Woods asked about high hazard potential should the dam fail. Ms. Caneja responded that a full dam breach analysis will be conducted.

Ms. Woods asked if the water quality is similar at different depths? Ms. Caneja stated that water quality is not an objective of the project.

Ms. Ganthier stated that is seems that most reservoirs are in close proximities to STA’s,

Is there an effort to continue to look for an STA that is close to this site? Ms. Leeds advised not under CERP, maybe under other programs. Once this is approved under WRDA it will be under CERP.

Meeting adjourned at 3:42 pm

Attendees:

SFWMD

Luis Colon-Pineiro

Liz Caneja

Marissa Hodapp

Jennifer Leeds

Elizabeth Pigman

Nimmy Jeyakumar

Jennifer Aiton

Armando Ramirez

FDEP

Ed Smith – Director for Water Policy and Ecosystem Restoration

Jordan Tedio – Environmental Administrator, Office of Water Policy and Ecosystem Restoration

Kelli Edson -Environmental Manager, Office of Water Policy and Ecosystem Restoration

Tracy Woods – State Dam Safety Officer, Division of Water Resource Management

Saba Shariat-Pearce – Everglades Funding and Grant Management, Office of Water Policy and Ecosystems Restoration

Mailin Sotolongo-Lopez – Everglades Water Quality Manager

Ed Cambeiro – Permit Lead

Connor Davis – Permit Lead

Samantha Dawson – Permitting and Compliance

Maxwell Ihns – Compliance Coordinator

Marlene Severino - Biologist

Stanley Ganthier – Engineering Lead, WPB Office of Water Policy and Ecosystem Restoration

Luke Hudson – Water Quality

James Albright – Water Policy

Pamela Flores – Water Policy

U.S. Fish & Wildlife Service

Andrew M. Eastwick – Fish & Wildlife Biologist – Everglades Restoration

Timothy Breen – Supervisory Biologist for the North Team for Everglades Restoration Program

Bonnie Irving – Program Supervisor

Misc.

Carlie Klapper

Georgia Vince

Corps – no

FWC – no

FDACS – no

Tribal Nations – no

Local muni – no

Any others – no

Non-governmental org – no

Attachment B.2-1: Secretarial Order

FLORIDA DEPARTMENT OF Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, FL 32399

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

December 13, 2023

Mr. Drew Bartlett
Executive Director
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33406

Dear Mr. Bartlett:

The South Florida Water Management District (District) submitted the State Compliance Report for the Comprehensive Everglades Restoration Plan (CERP) Lake Okeechobee Storage Reservoir Section 203 Study (LOCAR) on September 27, 2023, to the Florida Department of Environmental Protection (Department) for review pursuant to §373.026(8)(b), Florida Statutes (F.S.). The Department reviewed the report and has determined that sufficient information was provided to demonstrate that the project, as proposed, is consistent with the requirements of §373.026, F.S., and that the District has complied with its responsibilities under §373.1501(5), F.S. The attached Final Order constitutes Department approval of LOCAR, which is required before the project is submitted to Congress for authorization or receives an appropriation of state funds.

The Department is pleased to support this measure in achieving progress toward meeting the state's objectives for the restoration of the greater south Florida ecosystems. We look forward to continued coordination with both the District and the United States Army Corps of Engineers as we move forward together with the implementation of the CERP program. If you have any questions regarding this letter, please feel free to contact me at (850) 245--3169.

Sincerely,

Edward C. Smith

Digitally signed by Edward C. Smith
Date: 2023.12.13 09:27:14 -05'00'

Edward C. Smith
Director
Office of Water Policy and Ecosystems Restoration

Enclosure:
Final Order — LOCAR State Compliance Report

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

RE: Lake Okeechobee Component A Storage Reservoir Project OGC No. 20-0215

FINAL ORDER APPROVING THE COMPREHENSIVE EVERGLADES RESTORATION PLAN LAKE OKEECHOBEE COMPONENT A STORAGE RESERVOIR PROJECT

Pursuant to Sections 373.026(8)(b), 373.470(3)(c), 373.1501(5) of the Florida Statutes (F.S.), the State of Florida Department of Environmental Protection (Department) enters this final agency action in response to the formal submittal of the Final State Compliance Report for the Lake Okeechobee Component A Storage Reservoir Section 203 Feasibility Study (LOCAR) by the South Florida Water Management District (District). The District's submittal was followed by the Section 203 Feasibility Study and Draft Environmental Impact Statement proposing the recommended plan for the Comprehensive Everglades Restoration Plan of the Lake Okeechobee Component A Storage Reservoir Project in Glades and Highlands counties, Florida. The submittal and associated materials have been reviewed for compliance with the criteria in Section 373.1501(5), F.S., as outlined below.

The Kissimmee-Okeechobee-Northern Estuaries-Everglades ecosystem is an internationally recognized and valued aquatic ecosystem. Ecosystems within the Study Area have been altered from 120 years of highly effective public and private efforts to drain water off the land, in part by a massive federal project known as the Central and Southern Florida (C&SF) Project of the 1900s. The overall effect of the federal C&SF Project on the hydrology of this ecosystem has been a disruption of the natural timing, quantity, quality, and distribution of flows entering and leaving Lake Okeechobee; loss of

overall water storage; increased stormwater runoff, values and rates, flows of water from Lake Okeechobee to the Northern Estuaries that significantly alter conditions in the estuaries; and a lower quantity of water available for the Everglades, all affecting nationally significant areas. Water that once flowed from Lake Okeechobee south through the Everglades down Shark River Slough and to the southern estuaries has been impounded in Lake Okeechobee and now flows to the Northern Estuaries through the C-43 and C-44 canals. Changes in the quantity, timing, and distribution of freshwater entering the northern estuaries often leads to atypical salinity fluctuations, causing subaquatic vegetation stress, loss of benthic organisms and habitat, and redistribution of salinity-sensitive species including commercially and recreationally important fish. The spatial extent of wetlands throughout the system has been significantly reduced due to development and farming of natural areas after drainage from the C&SF Project made them viable.

LOCAR, or Component A in the Yellow Book, is included in CERP, which was approved by Congress as a framework for the restoration of the natural system under Section 601 of WRDA 2000. CERP, as documented in the 1999 C&SF Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement (1999 Restudy) consists of 68 components. The purpose of Component A is to detain water during wet periods for later use during dry periods to Lake Okeechobee. Increased storage capacity would reduce the duration and frequency of both high and low water levels in Lake Okeechobee that are stressful to the lake's littoral ecosystems and cause large discharges from the lake that are damaging to the downstream estuary ecosystems.

LOCAR expands upon previously authorized projects to continue progress towards achievement of the level of restoration envisioned for CERP. LOCAR is focused on aboveground water storage north of Lake Okeechobee. Since the original CERP planning was completed in 1999, new studies, policy guidance, data collection, pilot projects, and improvements in hydrologic systems modeling capabilities have allowed for refining the knowledge base and approach in ecosystem restoration. This refined approach is used to maximize Project benefits and reduce costs and risks to achieve the CERP goals.

In issuing this order, the Department finds that the District has provided sufficient information to demonstrate compliance with the criteria outlined in Section 373.1501(5), F.S. The Department bases this finding on the following documents:

a) South Florida Water Management District, Lake Okeechobee Storage Reservoir Section 203 Study Final State Compliance Report (September 2023);

b) South Florida Water Management District, Lake Okeechobee Storage Reservoir Draft Section 203 Feasibility Study and Report (October 2023);

c) United States Army Corps of Engineers, Jacksonville District, Draft Environmental Impact Statement, North of Lake Okeechobee Storage Reservoir Section 203 Study (October 2023).

The Department has reviewed the documents referenced in the paragraph above and bases this order on the information and conditions in those documents by the District, the United States Army Corps of Engineers (Corps), and other federal partners.

CONCLUSIONS OF LAW

Section 373.026(8)(b), F.S., directs the Department to approve or approve with amendments, any project component before it is submitted to Congress for authorization or receives an appropriation of state funds. Such approval is based on a determination of the District's compliance with Section 373.1501(5), F.S., in its role as local sponsor for the Project.

1) Section 373.1501(5)(a), F.S.: Comprehensive Needs Analysis and Evaluation: Based upon the information provided, the Department concludes that the District has met the requirements set forth in Section 373.1501(5)(a), F.S. The District has analyzed and evaluated the Project such that all needs will be met in a comprehensive manner and that all applicable water resource issues have been adequately considered, including water supply, water quality, flood protection, threatened and endangered species, and other natural system and habitat needs.

2) Section 373.1501(5)(b), F.S.: Determination of Project Feasibility: Based upon the information provided, the Department concludes that the District has met the requirements set forth in Section 373.1501(5)(b), F.S. The District has determined with reasonable certainty that the Project is feasible based upon standard engineering practices and technologies and are the most efficient and cost-effective of feasible alternatives or combination of alternatives, consistent with Restudy purposes, implementation of project components, and operation of the Project.

3) Section 373.1501(5)(c), F.S.: Consistency with Applicable Law and Regulations: Based upon the information provided, the Department concludes that the District has met the requirements set forth in Section 373.1501(5)(c), F.S. The District

has determined with reasonable certainty that the Project is consistent with applicable laws and regulations, and can be permitted and operated as proposed. A pre-application meeting for LOCAR was held on June 2, 2023, between agencies with applicable regulatory jurisdiction, as required by Section 373.1501(5)(c), F.S.

4) Section 373.1501(5)(d), F.S.: Reasonable Assurances: Based upon the information provided, the Department concludes that the District has met the requirements set forth in Section 373.1501(5)(d), F.S. The District has provided reasonable assurances that the quantity of water available to existing legal users shall not be diminished by implementation of the Project so as to adversely impact existing legal users, that existing levels of service for flood protection will not be diminished outside the geographic area of the Project, and that water management practices will continue to adapt to meet the needs of the restored natural environment. During the design phase of the project, project assurances, Savings Clause analysis, and operating manuals will be reviewed for consistency with the implementation phases, as necessary.

5) Section 373.1501(5)(e), F.S.: Coordination with Existing Utilities and Public Infrastructure: Based upon the information provided, the Department concludes that the District has met the requirements set forth in Section 373.1501(5)(e), F.S. The District provided information to ensure that implementation of the Project has been coordinated with existing utilities and public infrastructure, and that impacts to and relocation of existing utilities or public infrastructure are minimized.

The Department finds that the LOCAR component of the CERP, which is proposed by the District, meets the criteria of Section 373.1501, F.S. Such finding is predicated upon acceptance of the conditions in the referenced documents by the District and Corps without substantive changes. If the Department finds that the District or Corps has made substantive changes to the referenced documents, or the conditions are not addressed, the Department may vacate this Order.

THEREFORE, IT IS ORDERED that the LOCAR component of the Comprehensive Everglades Restoration Plan is APPROVED under Section 373.026(8)(b), F.S.

NOTICE OF RIGHTS

This agency action is final and effective unless a timely petition for an administrative hearing is filed under §§ 120.569 and 120.57, F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

A person whose substantial interests are affected by the Department's proposed agency action may petition for an administrative proceeding (hearing) under§§ 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000. Petitions by the applicant or any of the parties listed below must be filed within 21 days of receipt of the written notice. Petitions filed by other persons must be filed within 21 days of publication of the notice or receipt of the written notice, whichever occurs first. The petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within

the appropriate time period shall constitute a waiver of the person's right to request an administrative determination (hearing) under §§120.569 and 120.57, F.S. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Department's action is based must contain the following information:

a) The name and address of each agency affected and each agency's file or identification number, if known;

b) The name, address, any e-mail address, any facsimile number, and telephone number of the petitioner, if the petitioner is not represented by an attorney or a qualified representative; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding ; and an explanation of how the petitioner's substantial interests will be affected by the agency determination;

c) A statement of when and how the petitioner received notice of the agency decision;

d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action;

f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and

g) A statement of the relief sought by the petitioner, precisely stating the action petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts on which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

Mediation is not available in this proceeding.

Any party to this order has the right to seek judicial review of it under § 120.68, F.S., by filing a notice of appeal under rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department in the Office of General Counsel, Mail Station 35, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within 30 days after this order is filed with the clerk of the Department.

DONE AND ORDERED on this 13th day of December 2023, in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Digitally signed by Shawn Hamilton
Date: 2023.12.13 09:03:18 -05'00'

Shawn Hamilton
Secretary

FILED on this date pursuant to Section 120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Lea Crandall

Digitally signed by Lea Crandall
Date: 2023.12.13 09:10:16 -05'00'

Clerk Date