

Draft

Okeechobee Waterway Master Plan Update

and

Integrated Environmental Assessment

23 July 2018



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Okeechobee Waterway Project
Master Plan

DRAFT 23 July 2018

The attached Master Plan for the Okeechobee Waterway Project is in compliance with ER 1130-2-550 Project Operations RECREATION OPERATIONS AND MAINTENANCE GUIDANCE AND PROCEDURES and EP 1130-2-550 Project Operations RECREATION OPERATIONS AND MAINTENANCE POLICIES and no further action is required.

Master Plan is approved.

Jason A. Kirk, P.E.
Colonel, U.S. Army
District Commander

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Okeechobee Waterway Master Plan Update

**PROPOSED FINDING OF NO SIGNIFICANT IMPACT FOR
OKEECHOBEE WATERWAY MASTER PLAN UPDATE
GLADES, HENDRY, MARTIN, LEE, OKEECHOBEE, AND PALM BEACH COUNTIES**

1. **PROPOSED ACTION:** The proposed Master Plan Update documents current improvements and stewardship of natural resources in the project area. The proposed Master Plan Update includes current recreational features and land use within the project area, while also including the following additions to the Okeechobee Waterway (OWW) Project:
 - a. Conversion of the abandoned campground at Moore Haven West to a Wildlife Management Area (WMA) with access to the Lake Okeechobee Scenic Trail (LOST) and day use area.
 - b. Closure of the W.P. Franklin swim beach, while maintaining the picnic and fishing recreational areas with potential addition of canoe/kayak access. This would entail removing buoys and swimming signs and discontinuing sand renourishment. The area could be planted with selected native vegetation, leaving access paths for shore fishermen. A floating platform for canoe/kayak access is being considered within the current beach area.
2. **NEED FOR PROPOSED ACTION:** A Master Plan is required for each civil works project. It serves as a planning document for Federal land use features, including recreational opportunities. The primary goals of this OWW Master Plan Update are to prescribe an overall land and water management plan, resource objectives, and associated design and management concepts, which (1) provide the best possible combination of responses to regional needs; (2) contribute toward providing a high degree of recreation diversity within the region; (3) emphasize the particular qualities, characteristics, and potentials of the project; and (4) exhibit consistency and compatibility with national objectives and other State and regional goals and programs.
3. **ALTERNATIVE TO THE PROPOSED ACTION CONSIDERED:** The Master Plan Update considered reasonable alternatives, including No Action. With the No Action Alternative, the abandoned campground would likely stay abandoned, and the W.P. Franklin swim beach would remain open. The Proposed Action is intended as an update that would improve the overall land use and safety within the OWW. All other features included within the Master Plan would be no different than the description of the existing

conditions and No Action.

4. **FACTORS CONSIDERED IN DETERMINING THAT NO ENVIRONMENTAL IMPACT STATEMENT IS NEEDED:** Based on the Environmental Assessment, the OWW Master Plan will not significantly affect human health and the environment. The OWW Master Plan is in compliance with all applicable laws and regulations.
5. **CONCLUSIONS:** The environmental analysis supports the conclusion that the OWW Master Plan will not significantly impact health and the human environment; consequently, an Environmental Impact Statement is not required.

Jason A. Kirk, P.E.
Colonel, U.S. Army
District Commander

Date

Table of Contents

PROPOSED FINDING OF NO SIGNIFICANT IMPACT.. iii
EXECUTIVE SUMMARYE-1
1. Introduction..... 1-1
 1.1. Project Authorization 1-1
 1.2. Project Purpose and Need 1-3
 1.3. Purpose and Scope of Master Plan..... 1-4
 1.4. Brief Watershed and Project Description..... 1-5
 1.5. Listing of Prior C&SF Project Design Documents related to Recreation, Public Use, and Operation/Related Environmental and Design Documents 1-7
 1.6. Listing of Pertinent Project Information 1-7
2. Project Setting (Exiting Conditions) and Factors Influencing Management and Development..... 2-1
 2.1. The Master Plan Study Area. 2-1
 2.2. Existing Conditions and Description of Lake Okeechobee, the St. Lucie River, and the Caloosahatchee River 2-2
 2.3. Hydrology..... 2-3
 2.4. Shoreline Plan, Sedimentation and Erosion 2-4
 2.5. Water Quality 2-5
 2.6. Climate 2-6
 2.7. Topography, Geology, Soils..... 2-6
 2.8. Fish and Wildlife Resources 2-7
 2.9. Threatened and Endangered Species 2-10
 2.10. Invasive Species 2-16
 2.11. Wetlands 2-16
 2.12. Cultural Resources..... 2-17
 2.13. Okeechobee Waterway Project Components 2-18
 2.13.1. St. Lucie Lock and Dam Reservation 2-20
 2.13.2. St. Lucie Canal..... 2-21
 2.13.3. Port Mayaca 2-23
 2.13.4. Herbert Hoover Dike..... 2-23
 2.13.5. Lake Okeechobee..... 2-24
 2.13.6. Clewiston Operations Office..... 2-24
 2.13.7. Moore Haven Lock Reservation 2-24
 2.13.8. The Caloosahatchee Canal 2-25
 2.13.9. Ortona Lock and Dam..... 2-26
 2.13.10. W.P. Franklin Lock and Dam 2-27
 2.13.11. Easement Properties..... 2-27
 2.13.12. Lake Okeechobee Park 2-28
 2.13.13. Clewiston Park Recreation Area..... 2-28
 2.13.14. South Hicpochee Access Area 2-28
 2.13.15. Nubbin Slough Recreation Area 2-28
 2.13.16. Lake Okeechobee Scenic Trail (LOST)..... 2-28
 2.13.17. Easement Properties 2-28
 2.14. Aesthetics..... 2-31
 2.15. Baseline Socioeconomics 2-31
 2.16. Demographic Analysis 2-32
 2.16.1. Methodology 2-32
 2.16.2. Age Segmentation 2-33
 2.16.3. Racial/Ethnic Population Distribution 2-33

2.16.4. Households, Income, and Poverty Level	2-37	3.3.1. Alternative 1:	3-4
2.17. Recreation Facilities, Activities, and Needs	2-37	3.3.2. Alternative 2:	3-5
2.18. Zones of Influence	2-38	3.3.3. Alternative 3:	3-5
2.19. Visitation Profile.....	2-38	3.4. Issues and Basis for Choice.....	3-5
2.20. Recreational Analysis	2-38	3.5. Preferred Alternatives	3-5
2.21. Recreational Carrying Capacity.....	2-41	4. Land Allocation, Land Classification, and Project Lands	4-1
2.22. Conceptual Relationship/Linkage between recreation use and Management of Lake Okeechobee	2-41	4.1. Land Allocation.....	4-1
2.23. Recreational Value to the Nation, Florida	2-43	4.2. Land Classification.....	4-1
2.24. Related Recreational, Historical, and Cultural Areas	2-43	4.2.1. Project Operations.....	4-1
2.25. Real Estate* (Real Estate/Acquisition Policy)*	2-43	4.2.2. Recreation	4-1
2.26. Applicable Federal Laws and Directives.....	2-45	4.2.3. Fish and Wildlife.....	4-2
2.26.1. Public Laws.....	2-45	4.2.4. Waterway Corridor	4-2
2.26.2. Cooperative Agreements.....	2-47	4.2.5. Project Lands	4-2
2.26.3. Executive Orders.....	2-48	4.3. Environmentally Sensitive Areas	4-3
2.26.4. Corps of Engineers Regulations, Pamphlets, and Manuals.....	2-48	4.4. Multiple Resource Management Lands.....	4-4
2.26.5. Management Plans	2-50	4.5. Water Surface.....	4-4
3. Resource Objectives and Description of Alternatives	3-1	5. Resource Plan.....	5-1
3.1. Description of Alternatives – Changes from the 1986 Master Plan	3-1	5.1. Caloosahatchee River.....	5-4
3.2. Moore Haven Recreation Area West Site	3-4	5.1.1. Ortona Lock (Recreation Area & Campground)	5-4
3.2.1. Alternative 1:	3-4	5.1.2. W.P. Franklin (Recreation Area, Campground, and Visitor Center).....	5-4
3.2.2. Alternative 2:	3-4	Multiple Resource Management Lands	5-5
3.2.3. Alternative 3:	3-4	5.2. Lake Okeechobee / HHD / Lake Okeechobee Scenic Trail 5	
3.3. W.P. Franklin Beach	3-4	5.2.1. Alvin Ward Park (Moore Haven East).....	5-5
		Multiple Resource Management Lands	5-6

5.2.2.	Jolly Roger Marina, Clewiston Marina.....	5-6	6.11.1.	Moore Haven Recreation Area West site.....	6-3
5.2.3.	The Lake Okeechobee Scenic Trail Partnership...	5-6	6.11.2.	W.P. Franklin Beach	6-3
5.2.4.	Moore Haven Recreation Area, West	5-7	6.12.	Real Estate	6-4
5.2.5.	Port Mayaca Lock Recreation Area	5-8	6.13.	Aesthetic Resources.....	6-4
5.2.6.	South Florida Operations Office	5-9	6.13.1.	Moore Haven Recreation Area West site.....	6-4
5.3.	St Lucie River.....	5-10	6.13.2.	W.P. Franklin Beach	6-4
5.3.1.	St Lucie Lock (Recreation Area, Campground, and Visitors Center).	5-10	6.14.	Cultural Resources.....	6-4
6.	Special topics/issues/considerations – NEPA analysis	6-1	6.14.1.	Moore Haven Recreation Area West site.....	6-4
6.1.	Evaluation of Alternatives/Environmental Effects .	6-1	6.14.2.	W.P. Franklin Beach	6-4
6.2.	Soils.....	6-1	6.15.	Tribal Resources	6-5
6.2.1.	Moore Haven Recreation Area West site.....	6-1	6.15.1.	Moore Haven Recreation Area West site.....	6-5
6.2.2.	W.P. Franklin	6-1	6.15.2.	W.P. Franklin	6-5
6.3.	Land Use/recreation	6-1	6.16.	Irreversible and Irrecoverable Commitment of Resources	6-5
6.3.1.	Moore Haven Recreation Area West site.....	6-1	6.17.	Unavoidable Adverse Environmental Effects	6-5
6.3.2.	W.P. Franklin Beach	6-2	6.18.	Conflicts and Controversy	6-6
6.4.	Hydrology and Hydraulics	6-2	6.19.	Environmental Commitments.....	6-6
6.5.	Water Quality	6-2	6.20.	Cumulative Effects	6-7
6.6.	Wetlands.....	6-2	7.	Environmental Compliance	7-1
6.7.	Threatened and Endangered Species.....	6-2	7.2.	List of Agencies	7-5
6.8.	Noise.....	6-3	8.	References.....	8-1
6.9.	Air Quality.....	6-3			
6.10.	Socioeconomics	6-3			
6.10.1.	Moore Haven Recreation Area West Site.....	6-3			
6.10.2.	W.P. Franklin Beach	6-3			
6.11.	Public Safety.....	6-3			

List of Figures

Figure 1-1: The Okeechobee Waterway 1-6
 Figure 2-1: Population by Age Segment for the Market Area
 2-33
 Figure 2-2: Population Projections of Six Counties within the
 Project Region..... 2-34
 Figure 2-3: 2013 Florida SCORP Regions 2-40
 Figure 2-4: Interrelationships of Relocation of Water and
 Resulting Biological and Economic Effects 2-42
 Figure 3-1: Moore Haven Recreation Area West 3-2
 Figure 3-2: W.P. Franklin Beach 3-3

List of Tables

Table 2-1: Federal and State Listed Plant and Animal Species
 Occurring in Glades, Hendry, Lee, Martin, Okeechobee, and
 Palm Beach Counties, Florida..... 2-12
 Table 2-2: Cultural resources identified on Corps-owned or
 easement properties by county..... 2-30
 Table 2-3: Cultural resources not affiliated with lock and dam
 reservations, major canals, or HHD 2-30
 Table 2-4: 2016 Population and Per Capita Income 2-32
 Table 2-5: Racial/Ethnic Population Distribution..... 2-35
 Table 2-6: Labor Force, Employment, and Unemployment Rate
 2-35
 Table 2-7: Households and Household Size 2-36
 Table 2-8: Study Area per Capita Personal Income: 2010, 2016
 2-36
 Table 2-9: Percentage of People in Poverty..... 2-37
 Table 2-10: Acreages by Estate Type 2..... 2-44

Table 4-1: Acreages by Estate Type 4..... 4-2
 Table 5-1: OWW Recreational Facilities Managed by Others ...
 5-11
 Table 6-1: Past, Present, and Reasonably Foreseeable Future
 Projects..... 6-8
 Table 7-1:List of Preparers 7-4

List of Appendices

Appendix A: Coastal Zone Management Act Consistency
 Statement
 Appendix B: Public Involvement and Pertinent
 Correspondence
 Appendix C: Standard Protection Measures
 Appendix D: Recreational Carrying Capacity Study at the Lake
 Okeechobee and the Okeechobee Waterway
 Appendix E: Okeechobee Waterway Master Plan Update Map
 Book

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EXECUTIVE SUMMARY

A Master Plan with accompanying National Environmental Policy Act (NEPA) is required for each civil works project and for all fee-owned lands for which the U.S. Army Corps of Engineers has administrative responsibility. It serves as a planning document that anticipates what could and should happen at a U.S. Army Corps of Engineers project, but is flexible enough to address changing conditions. The requirements specified in ER 1130-2-550 Project Operations RECREATION OPERATIONS AND MAINTENANCE GUIDANCE AND PROCEDURES 30 January 2013 and EP 1130-2-550 Project Operations RECREATION OPERATIONS AND MAINTENANCE POLICIES 30 January 2013 have been applied to the development of this Master Plan.

The primary goals of this Okeechobee Waterway Master Plan Update are to prescribe an overall land and water management plan, resource objectives, and associated design and management concepts, which (1) provide the best possible combination of responses to regional needs; (2) contribute toward providing a high degree of recreation diversity within the region where practicable; (3) emphasize the particular qualities, characteristics, and potentials of the project; and (4) exhibit consistency and compatibility with national objectives and other State and regional goals and programs.

This master plan document is an inventory of the Okeechobee Waterway resources and is intended to provide direction for the long term management of the associated properties under USACE control. This master plan is a living document and is developed for overall guidance for the management of lands and as such is not intended to be a specific day to day operating plan for these lands. The associated properties provide access to the Okeechobee Waterway for operations and maintenance of the waterway. At the same time the properties provide recreational access areas for the public as well as habitat areas for various types of wildlife and plants where possible and practicable. Recreational opportunities along the waterway include:

- 154 miles of waterway for recreational uses
- 5 boating launching facilities
- 3 campgrounds with 93 campsites and 16 boat in sites
- 110 miles of trail and 14 primitive camp sites associated with the Lake Okeechobee Scenic Trail
- 1 mile of hiking/walking trails
- 163 acres of upland passive recreation usage
- 4 fishing piers
- 5 pavilions for group events
- 2 staffed visitor centers with interactive interpretive displays

This document also provides the necessary NEPA considerations for the land management opportunities, as well as any foreseeable changes from the current plan. The NEPA document is integrated within the Master Plan, with the Alternatives in Chapter 3 and Environmental Effects in Chapter 6. The NEPA does not follow a typical/traditional format; the following table indicates where portions of the document coincide with NEPA requirements. All features included within the Master Plan Update would be no different than the

description of the existing conditions and No Action, with the exception of the alternatives described at the Moore Haven Recreation Area West and the W.P. Franklin Lock Beach Area (see Chapter 2 for Alternatives descriptions and Chapter 6 for environmental effects of alternatives). The land use changes within these two areas are proposed in order to improve public safety within the W.P. Franklin Lock Beach Area and to enhance areas for wildlife use and improve recreation within the Moore Haven Recreation Area West.

A NEPA scoping letter was sent the public on August 31, 2017 to announce the intent of updating the master plan, including the recreational land use changes. Public comments that were received during the 30 day scoping period were responded to in a comment-response matrix, which is included in Appendix B – Public Coordination & Pertinent Correspondence. Letters with the scoping comment response matrix were sent to commenters on January 10, 2018.

A Notice of Availability was sent by letter and noticed in a Press release to all interested parties on 23 July 2018 to announce release of the Master Plan Update and Integrated NEPA for a 60 day public review period. A hard copy of the document was made available to the public in several libraries within the project area for public review. A public presentation meeting will be held in LaBelle Florida in early August 2018 during the public review window for additional public involvement on the master plan process. This meeting will be announced in a Press Release and posted on the Jacksonville District’s internet web pages.

The following table provides the general location of the standard NEPA requirement topics within this document.

NEPA Requirement	Location within this document
Executive Summary	Executive Summary
Table of Contents	Table of Contents
Purpose and Need for Action	Chapter 1 – Introduction
Affected Environment	Chapter 2 – Existing Conditions
Alternatives	Chapter 3 – Resource Objectives – Description of Alternatives
Environmental Consequences	Chapter 6 – Environmental Effects, Analysis of Alternatives
List of Preparers	Chapter 6
List of Agencies, organizations, and persons to whom copies of the statement are sent	Chapter 6
Index	As listed in Table of Contents
Appendices	As listed in Table of Contents

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Introduction

Mission Statement

The U.S. Army Corps of Engineers (Corps) is the steward of the lands and waters at Corps water resource projects. Its Natural Resources Management Mission is to manage and conserve those natural resources, consistent with ecosystem management principles, while providing quality public recreation experiences to serve the needs of present and future generations.

In all aspects of natural and cultural resources management, the Corps promotes awareness of environmental values and adheres to sound environmental stewardship, protection, compliance, and restoration practices.

The Corps manages for long-term public access to, and use of, the natural resources in cooperation with other Federal, State, and local agencies as well as the private sector.

The Corps integrates the management of diverse natural resource components such as fish, wildlife, forests, wetlands, grasslands, soil, air, and water with the provision of public recreation opportunities. The Corps conserves natural resources and provides public recreation opportunities that contribute to the quality of American life.

1.1. Project Authorization

The OWW and Lake Okeechobee are components of the Central and Southern Florida (C&SF) Flood Control Project which provides for flood risk management and water conservation (Figure 1-1). The C&SF Project is a multipurpose project providing regional flood damage reduction, water conservation, municipal and agricultural water storage and supply, fish and

wildlife conservation, regional groundwater control, salinity control, navigation, and recreational benefits.

The River and Harbor Act of 1930, Public Law 71-520, provided for improvements to the Caloosahatchee River and Lake Okeechobee drainage areas in accordance with Senate Document Number 115, Seventy-first Congress, 2nd Session and authorized the construction of levees and other features for protection from storm surge-induced flooding along the north and south shores of Lake Okeechobee. Components authorized included:

- (a) Improving the Caloosahatchee River and Canal from Lake Okeechobee to the Gulf of Mexico by straightening and dredging a channel which will provide a discharge outlet capacity of 2,500 cubic feet per second from Lake Okeechobee and a navigation channel at least 6 feet deep and 80 feet wide, including the necessary control works.
- (b) Improving Taylors Creek by providing a channel 6 feet deep and 60 feet wide from Okeechobee City into Lake Okeechobee.
- (c) Construction of a levee and navigation channel 6 feet deep and 80 feet wide following, in general, the south shore of the lake.
- (d) Construction of a levee on the north shore of the lake.
- (e) Improving the St Lucie River to provide a channel 6 feet deep and 80 feet wide.
- (f) Construction of protection works in St Lucie Canal.

The River and Harbor Act of 1935, Public Law 74-409, modified the plan authorized in the 1930 River and Harbor Act and authorized the Corps' construction of multiple drainage structures in the levees and provided that the United States would be responsible for operation and maintenance of the

levees and channels authorized in the 1930 act and drainage structures authorized in the 1935 act.

Pursuant to the 1930 and 1935 Rivers and Harbors Acts, the Corps constructed levees on the south shore totaling approximately 67.8 miles and levees on the north shore totaling approximately 15.7 miles, 5 hurricane gates in the levees surrounding Lake Okeechobee, and 16 drainage culverts in the levees surrounding Lake Okeechobee. By virtue of the Rivers and Harbors Act of 1935, the Corps became responsible for operation and maintenance of the culverts, the hurricane gate structures, the 67.8 miles of the southern levee, the 15.7 miles of the northern levee, and the St. Lucie Canal and the Caloosahatchee River Canal, as well as the OWW through Lake Okeechobee.

The Flood Control Act of 1948, Public Law 80-585, modified the plans authorized under the 1930 and 1935 River and Harbor Acts and created the C&SF Project, including authorization for the first phase of the C&SF Project that involved raising the existing levees and construction of additional levees along the northeast and northwest shores. Additional provisions included agricultural and municipal water supply, additional flood control, the preservation of fish and wildlife, regional groundwater control, salinity control, and navigation. Components included:

- Raising the existing levees around Lake Okeechobee
- Construction of new levees, channels, and control works for Lake Okeechobee
- Construction of major drainage of the Everglades Agricultural Area
- Conservation of water for control of regional groundwater supplies

- Protection of east coast urban areas from overflow from the Everglades
- Flood and water control for salinity control in the existing east coast urban areas
- Construction of main outlets for the water conservation areas

The Flood Control Act of 1948 also required the United States to operate and maintain the levees, channels, locks, and control works of the St. Lucie Canal, Lake Okeechobee, and Caloosahatchee River, and the main spillways of the conservation areas.

The Flood Control Act of 1954, Public Law 83-780, authorized the remainder of the C&SF Project.

These elements included:

- Additional flood control, water conservation, and navigation projects in the upper St. Johns and Kissimmee River Watershed basins
- An increase in the outlet capacity of the Caloosahatchee River from Lake Okeechobee
- Construction of the remaining levees for the Everglades Agricultural and Water Conservation Areas (WCAs)
- Construction of the remaining salinity barrier in south Miami-Dade County

The Flood Control Act of 1958, Public Law 85-500, provided additional authorization and modified the Comprehensive Plan to provide that in the second phase of the project authorized by the Flood Control Act of 1954, non-Federal interests be required to contribute 20 percent toward the cost of contracts for construction, plus supervision and administration thereof, to provide the necessary lands and relocations, to bear the cost of

maintenance and operation of all works except those the levees, channels, locks, and control works of the St. Lucie Canal, Lake Okeechobee, Caloosahatchee River, and the main spillways of the conservation areas having to do with the regulation of Lake Okeechobee, and to hold and save the Federal government free from damages resulting from project construction and operation.

The Flood Control Act of 1960, Public Law 86-645, authorized the name of all levees around the shore of Lake Okeechobee to be “Herbert Hoover Dike”, in honor of the former President and his role in implementing levee construction.

The Flood Control Act of 1962, Section 207, authorized the Chief of Engineers to construct, maintain, and operate public park and recreation facilities at water resource projects under the control of the Department of the Army.

The Flood Control Act of 1968 expanded the C&SF Project to provide for increased storage, conservation, and improved distribution of water throughout much of the project area. It also included recreation as a full project purpose. The 1968 modification would also facilitate increased delivery of water to Everglades National Park (ENP) and further authorized construction projects around the lake. Some of the components included:

- Construction of an interrelated system of canals, levees, pump stations, and other structures necessary to supply irrigation water, provide flood protection to St. Lucie and Martin Counties, and to maintain optimum water control levels.
- Provisions to meet the long-term needs of urban and agricultural water users.

- Conservation and conveyance of additional water supply for ENP (recreation and allied purposes) to include:

1. Facilities for pumping excess water from the east coast areas into storage in Lake Okeechobee and the water conservation areas;
2. A system of interrelated canals, levees, pumping stations, and control structures for conveyance of water to demand areas;
3. Deepening the navigation channel across Lake Okeechobee;
4. Construction of recreation facilities;
5. Raising the Lake Okeechobee levees to provide for an increase of about 4 feet of authorized regulation stages;
6. Deletion of the deepening of the St. Lucie Canal from the authorized project;
7. The construction of the small craft lock in Buttonwood Canal.

The Flood Control Act of 1968 authorized the raising of the Herbert Hoover Dike (HHD) regulation schedule to increase the water levels 4 feet in regulation stage as described in House Document 369, Ninetieth Congress, 1968. House Document 369 used the criteria set forth in the prior Design Memoranda and the 1959 General Design Memorandum to determine the revised design levee heights for the HHD. The levees were never raised pursuant to this authorization.

1.2. Project Purpose and Need

As authorized, the OWW and Lake Okeechobee components of the C&SF Project are a multipurpose project providing regional flood damage reduction, water conservation, storage and supply,

fish and wildlife conservation, navigation, and recreational benefits. Pursuant to EP 1130-2-550 (30 Jan 2013) Appendix V, a NEPA analysis is integrated within this Master Plan Update. (See the Executive Summary for specific NEPA topics and where they are located within this report).

This plan is intended to provide a programmatic approach to management of project resources by classifying project lands, developing general and site-specific objectives, and identifying appropriate development needs. Sound stewardship requires the development and management of project resources for the public benefit, consistent with resource capabilities.

1.3. Purpose and Scope of Master Plan Update

The OWW Master Plan Update (MP) updates the 1986 Okeechobee Waterway Master Plan for the C&SF Project.

The MP is the strategic land use management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of the water resource project. It will cover all resources, including, but not limited to water, fish and wildlife, vegetation, cultural, aesthetic, interpretive, and recreational. The plan will also consider the land (fee, easement, or other interest) acquired for project operations and outgranted lands.

The MP guides and articulates Corps responsibilities pursuant to Federal laws to preserve, conserve, restore, maintain, manage, and develop the project lands, waters, and associated resources. The MP is a dynamic operational document projecting what could and should happen over the life of the project and is flexible based upon changing conditions. The MP deals in concepts, not in details of design or administration.

The MP will focus on four primary components:

1. Regional and ecosystem needs
2. Project resource capabilities and suitability
3. Expressed public interests that are compatible with authorized purposes
4. Environmental sustainability elements

The MP will ensure that natural and cultural resource mandates and considerations are incorporated. The MP also will ensure that economy, quality, need, and appropriate scale be given equal attention in the management of resources and facilities.

The primary goals of the MP are to prescribe an overall land use management plan, resource objectives, and associated design and management concepts. Surface water recreational use may be addressed. MP goals include the following:

- Provide the best management practices to respond to regional needs, resource capabilities and sustainability, and expressed public interests consistent with authorized project purposes;
- Protect and manage project natural and cultural resources through sustainable environmental stewardship programs;
- Provide public outdoor recreation opportunities that support project purposes and public demands created by the project itself while sustaining project natural resources;
- Recognize the particular qualities, characteristics, and potentials of the project;

- Provide consistency and compatibility with national objectives and other State and regional goals and programs.

1.4. Brief Watershed and Project Description

Located in central and southern Florida, the 451,000 acre lake and 154 mile long waterway extends from the Atlantic Ocean at Stuart to the Gulf of Mexico at Fort Meyers. The waterway runs through Lake Okeechobee and consists of the Caloosahatchee River to the west of the lake and the St. Lucie Canal east of the lake. Lake Okeechobee and the OWW Project are part of the complex water management system known as the C&SF Project. The C&SF Project covers 16,000 square miles starting just south of Orlando and extending southward through the Kissimmee River Basin to the ENP to Florida Bay.

The OWW, operated and maintained by the Corps, is a contiguous navigation system across the Florida peninsula as shown in Figure 1-1: The Okeechobee Waterway. It is comprised of three distinct segments: the St. Lucie Canal, Lake Okeechobee, and the Caloosahatchee River. The easterly limit of the system lies on the Intracoastal Waterway near Stuart, Florida. It passes westerly through the St. Lucie River, the South Fork of the St. Lucie River, and into the St. Lucie Canal system. The OWW enters the St. Lucie Lock at statute mile 15.1, passes Indiantown at mile 28.1, and reaches Port Mayaca Lock at mile 39. From Port Mayaca Lock, the OWW takes two distinct routes across Lake Okeechobee to the town of Clewiston, mile 65. Route 1 travels across open water while Route 2, known as the Rim Canal, follows the southern shore, passing the towns of Canal Point, Pahokee, Belle Glade, and Lake Harbor. From Clewiston, the OWW continues 13 miles along the shoreline,

reaching the Moore Haven Lock at mile 78. The OWW continues on a three mile run of canal from Moore Haven to Lake Hicpochee, then along the Caloosahatchee River to Ortona Lock at mile 93.5. Proceeding westerly past the towns of LaBelle, Denaud, Alva, through the W.P. Franklin Lock at mile 121.4, and past Olga, Tice, and the City of Fort Myers, it reaches the Caloosahatchee River estuary and terminates approximately one mile offshore of Estero Island.

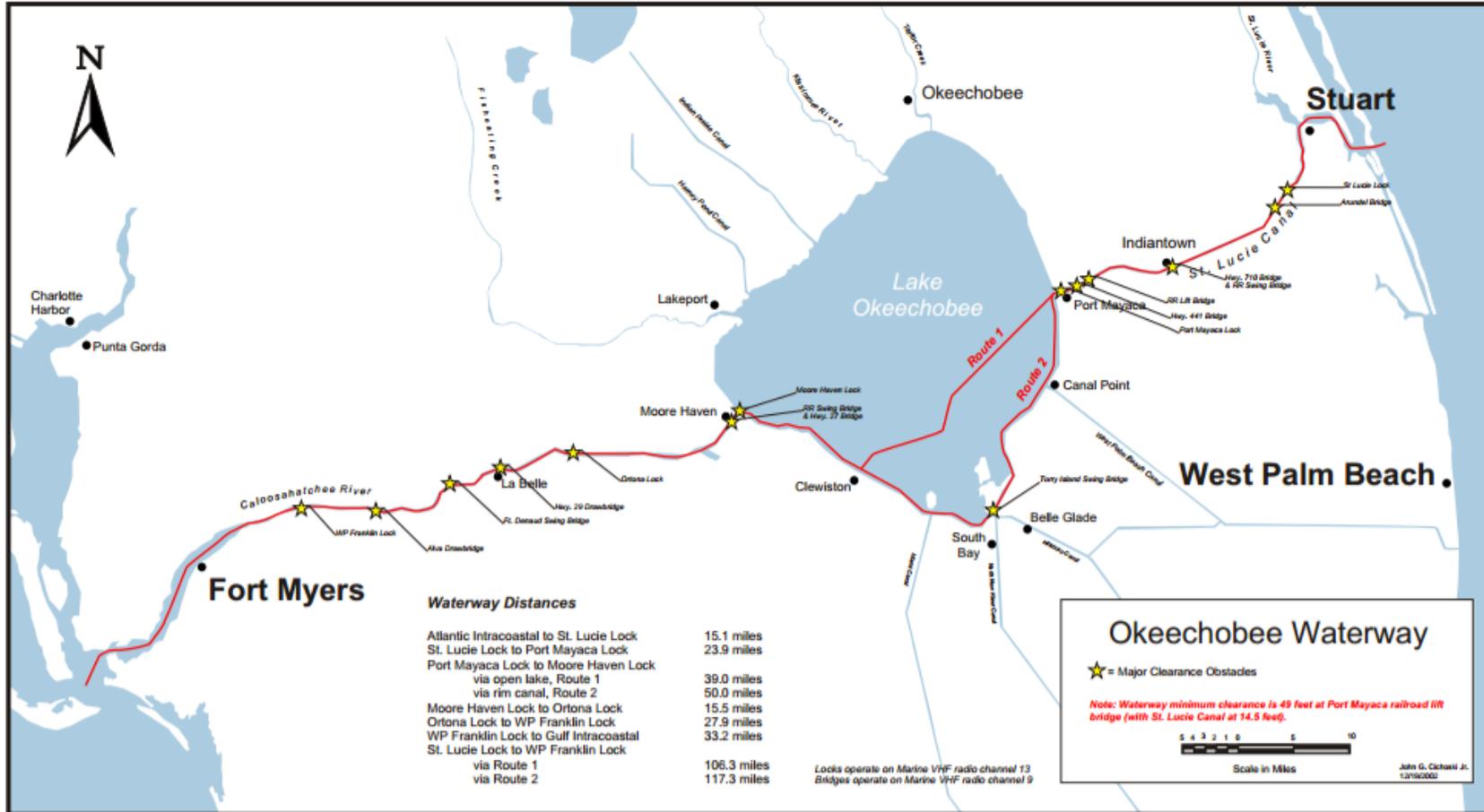


Figure 1-1: The Okeechobee Waterway

1.5. Listing of Prior C&SF Project Design Documents related to Recreation, Public Use, and Operation/Related Environmental and Design Documents

Various Corps' studies and reports preceding this Master Plan have recognized public use opportunities. These reports, as listed below, have laid the framework for existing facility development:

Central and Southern Florida Project for Flood Control and Other Purposes, Part IV, Lake Okeechobee and Outlets, Supplement 8, Design Memorandum: General Development Plan, Recreation, Public Use and Operation, 06 May 1958

Central and Southern Florida Project for Flood Control and Other Purposes, Part IV, Lake Okeechobee and Outlets, Supplement 9, Detail Design Memorandum, Detail Development Plan, Recreation, Facilities on Canals 43 and 44, 14 May 1959

Central and Southern Florida Project for Flood Control and Other Purposes, Part IV, Lake Okeechobee and Outlets, Supplement 19, Preliminary Master Plan, Caloosahatchee River, 31 May 1963

Water Resources for Central and Southern Florida, Letter Report, Appendix H, Preliminary · Recreation Plan, 3 June 1968

Lake Okeechobee and Okeechobee Waterway Shoreline Management Plan, August 2004: The Shoreline Management Plan (SMP) provides guidance and information to the public specific to the effective management of Lake Okeechobee and the OWW shoreline, describing the types of private use and activities that may be permitted on the shoreline, and addresses

shoreline allocations, rules, regulations, and other information relevant to Lake Okeechobee and the OWW. The SMP complements the Lake Okeechobee and OWW Master Plan.

[\[http://www.saj.usace.army.mil/Portals/44/docs/Shorelinemgmt/2004%20LOOWWSLMP.pdf\]](http://www.saj.usace.army.mil/Portals/44/docs/Shorelinemgmt/2004%20LOOWWSLMP.pdf)

1.6. Listing of Pertinent Project Information

Lake Okeechobee is the largest Florida lake (730 square miles) and the second largest freshwater lake by surface area wholly within the contiguous continental United States.

A major hurricane in 1947 prompted the need for additional flood and storm damage reduction work. As a result, Congress passed the Flood Control Act of 1948 authorizing the first phase of the C&SF Project, a comprehensive plan to provide flood and storm damage reduction and other water control benefits in central and South Florida. The new dike system around Lake Okeechobee was completed in the late 1960's and named the Herbert Hoover Dike (HHD).

Lake Okeechobee Scenic Trail: Designated as part of the Florida National Scenic Trail in 1993, the Lake Okeechobee Scenic Trail (LOST) is an approximately 110 mile trail encircling the lake. More than half of the trail is paved and the remainder consists of a two-track gravel roadway on top of HHD.

2. Project Setting (Exiting Conditions) and Factors Influencing Management and Development

2.1. The Master Plan Study Area.

2.2. Existing Conditions and Description of Lake Okeechobee, the St. Lucie River, and the Caloosahatchee River

Lake Okeechobee

Lake Okeechobee is the second largest freshwater lake by surface area wholly within the contiguous continental United States. Lake Okeechobee is a natural lake that serves as a multipurpose reservoir providing drinking water for urban areas, irrigation water for agricultural lands, recharge for aquifers, freshwater for the Everglades, habitat for fish and waterfowl, flood control, navigation, and many recreational opportunities. Lake Okeechobee has been designated by the Florida Department of Environmental Protection (FDEP) as a Class I water body (drinking water supply). The surface water in the HHD toe ditch and nearby canals meets most Class III water quality standards; i.e. recreation and maintenance of healthy fish and wildlife populations.

The vegetation within the Lake Okeechobee region has been greatly altered during the last century. Historically, the natural vegetation was a mix of freshwater marshes, hardwood swamps, cypress swamps, and pine flatwoods. Although some of these natural areas still exist, the introduction of controlled drainage for agriculture and land development has resulted in a significantly different set of cover types.

Landward of the HHD, sugarcane plantations, improved pasture, row crops, and urban lands now prevail. The HHD itself is

covered with mixed grasses that are mowed on a regular basis and a few shrubs and trees. The exotic invasive plants melaleuca (*Melaleuca quinquenervia*), Australian pine (*Casuarina sp.*), and Brazilian pepper (*Schinus terebinthifolius*) are found throughout the area. Wetland vegetation can be found in the toe ditch of the HHD, though this vegetation is mowed during regular maintenance activities to allow inspection of the toe of the HHD embankment. In the toe ditch and network of canals, exotic and nuisance vegetation exists, including species such as water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), hydrilla (*Hydrilla verticillata*), cattails (*Typha sp.*), and bamboo (*Arundinaria sp.*).

The major cover types lakeward of the HHD include open water and freshwater marshes. A 98,000 acre (154 square-mile) littoral zone is found along Lake Okeechobee's western edge and on the islands of its southern shore (Kraemer Island, Torry Island, and Ritta Island, which together encompass 4,000 acres). The littoral zone supports more than 50 species of emergent, submerged, and floating-leaf plants. Emergent vegetation within the littoral zone is dominated by cattail, spike rush (*Eleocharis sp.*), and the nuisance exotic torpedo grass (*Panicum repens*). The dominant land cover types east and west of the Lake along the HHD are pine flatwoods or improved pasture.

Caloosahatchee River (C-43)

Lake Hicpochee, once the headwaters of the Caloosahatchee, was contiguous with the sawgrass marshes of the Everglades and the surrounding area was wet prairie. A series of shallow lakes and marshes with abundant submerged and floating wetland vegetation extended from Lake Hicpochee to a reach of rapids just upstream from the town of LaBelle. This stretch of lake was bordered by hammocks, cypress, and hardwood swamps. Below

LaBelle, the river flowed through pine flatwoods where the terrain was flat and poorly drained, yet dry enough to retain pines and prevent the dominance of freshwater marsh vegetation.

Today, the organic land east and west of Lake Hicpochee is ditched and used for agriculture and housing. Lake Hicpochee has approximately 300 acres of open water backed by cattails, willows, and elderberry. The Coffee Mill Hammock complex east of the Ortona Lock consists mostly of oak-cabbage palm stands with some cypress, maple, and hickory. In most cases, these forests are grazed and have limited understory invaded by Brazilian pepper. The remaining pine flatwoods along the river are open canopied and in a secondary stage of succession with several ages of pines present. West of Franklin Lock, the river becomes an estuarine system where the shoreline vegetation is predominantly red and black mangrove forest with a remnant pond apple component, invaded by Brazilian pepper. These forests border open water and saltwater marsh areas.

Submerged vegetation in the Caloosahatchee River is prominent both in the estuary and freshwater portions. In the estuary, submerged aquatic vegetation (SAV) is comprised of algae and seagrass assemblages common to the coastal waters of southwest Florida. It is dominated by turtle grass, Cuban shoal grass, and manatee grass. Further upstream, where the interaction between freshwater flow and tidal influence begins to change the salinity, brackish and freshwater submerged plants appear. The vegetation in the freshwater section of the river is comprised of numerous species, the submerged aquatic vegetation, tape grass, and emergent or floating species such as alligator weed, floating maiden cane, water lettuce, primrose willow, and duckweed. Most of these floating plants are highly

susceptible to movement by wind, and consequently, tend to concentrate on the edges of the river and in the oxbows for sheltered habitat. Another aquatic species, the water hyacinths, have presented a weed control problem on the river.

St. Lucie River (C-44)

The St. Lucie Canal alignment extends through eastern pineland flatwoods dominated by slash pine and saw palmetto understory. A narrow band of pine flatwoods dominated by South Florida slash pine still lines the canal west of St. Lucie Lock. Vegetation changes are extensive in the St. Lucie corridor that range from total removal of the native vegetation to small areas of surviving functional pineland within an agricultural setting. The agricultural land use has transitioned from lumbering and clearing for cattle pasture and citrus groves to row crops, such as tomatoes, corn, and peppers, landscaping nurseries, sod farms, and sugar cane. The result has the appearance of open fields with occasional cabbage palms, scattered settlements, and limited pineland with several age classes. Drainage has had considerable effect in the pineland and is difficult to evaluate. There is a shortened hydroperiod, and for some of the pineland, it is likely that the water nears or covers the surface only in extremely wet years. The resulting effect primarily limits the variety of the small woody and herbaceous understory plants. Most of the pineland has naturalized guava as an understory plant among the natives such as saw palmetto. The guava is considered to be the result of recent invasion.

In some forested areas along the canal, oak hammocks have succeeded the original pineland. Near Indiantown, oak hammocks appear intact with a number of mature trees. Mature oaks and large pines have been left for shade around buildings and along roads. Mangrove forests and the associated

buttonwood are limited to areas downstream of the St. Lucie Lock and Dam. The white mangrove is the most common and dominant inland and the red mangrove dominated the open water fringe of the estuary. Low sand ridges along the Southfork and the St. Lucie Rivers have cabbage palm, oak, and occasional hardwoods.

Wetlands

Wetlands in the Lake Okeechobee area, though greatly reduced in area and quality through human impact, still exist as valuable ecosystems lakeward of the HHD. Lake Okeechobee hydraulically feeds wetlands beyond the dike, providing freshwater for the Florida Everglades to the south and for the WCAs in Palm Beach and Broward Counties. Low quality wetlands also occur in the toe ditches around the HHD. Typical vegetation in the toe ditch wetlands includes baby bluestem (*Andropogon* spp.), rush fuirena (*Fuirena scirpoidea*), bald cypress (*Taxodium distichum*), begger's tick (*Torilis arvensis*), matchhead (*Phyla* sp.), alligator weed (*Alternanthera philoxeroides*), Brazilian pepper, common reed (*Phragmites australis*), common hackberry (*Celtis occidentalis*), elderberry (*Sambucus nigra subsp. canadensis*), smartweed (*Polygonum* sp.), southern willow (*Salix caroliniana*), cabbage palm (*Sabal palmetto*), sweetscent (*Pluchea odorata*), day flower (*Commelina* sp.), pennywort (*Hydrocotyle* sp.), Australian pine, water hyacinth, cattails, and water lettuce. Although wetlands present on the landward side of the HHD (toe ditch) may not be considered high quality ecosystems, they host small fishes and invertebrates and provide usable foraging habitat for wading birds, alligators, and turtles. High quality wetland habitat can be found in the extensive littoral zone covering the western side of Lake Okeechobee. The dominant land cover types east and west

of the lake along the HHD are pine flatwoods, sugar cane agriculture, or improved pasture.

2.3. Hydrology

The OWW is located in a hydrologic basin which covers an area of approximately 18,000 square miles, encompassing parts of central and all of South Florida. The topography of the area is generally flat and the lack of topographic relief makes clear delineation of drainage basins difficult. In some areas as little as 4 to 6 inches of rain can typically use up all available ground water storage space, resulting in no separation of ground water and surface water.

Lake Okeechobee plays an important role in the center of this hydrologic system. It has been modified by a full century of construction to alleviate flooding problems. Prior to any attempt by the State or Federal Government to control the water level and drain the Everglades, Lake Okeechobee had a normal elevation of about 20.5 feet above sea level and a normal fluctuation of 2.5 feet. Originally, when the lake's water surface was at 20.5 feet, most of the vast Everglades area to the southeast of the lake was under water. The lake is now diked to allow considerable storage, with a series of culvert structures that allows water to flow either in or out through numerous outlets. Maintaining lake and OWW optimum pool levels are important for navigation and water supply for agriculture and drinking. Lake levels have been controlled under water regulation schedules since the lake was diked. Lake levels are controlled under a schedule placed into effect during March 2008, called the Lake Okeechobee Regulation Schedule (LORS). This Master Plan does not address operations of the lake and the operating schedule does not impact this Master Plan.

The Caloosahatchee River watershed, Hydrologic Unit Code (HUC) 03090205, drains about 1,429 square miles. It receives water from Lake Okeechobee and is a natural drainage outlet for stormwater runoff. Water levels and water quality are further influenced by receiving drainage or draw down of 52 culverted agricultural canals between Moore Haven spillway S-77 and W. P. Franklin spillway S-79. The river drains an area of about 390 square miles upstream of the Ortona Lock. The drainage basin for the area downstream of the Ortona Lock is about 500 square miles. The total area is less than the original pre-project drainage area. This is due to man-made canals that have diverted some of the surface runoff originally flowing into the river.

The St. Lucie Canal also receives water from Lake Okeechobee. Unlike the Caloosahatchee River, the canal does not have additional, extensive drainage basins. However, stormwater discharges from 16 man-made drainage canals can greatly influence water levels. In 1935, to reduce sedimentation of the OWW, the Corps built spillway structures at each confluence with the OWW. Today, the St. Lucie Canal flows are highly regulated by means of gated control structures adjacent to the Port Mayaca Lock and St. Lucie Lock. Records of flows at the St. Lucie Lock over a 30 year period show a range from 11,500 cubic feet per second to periods of zero flow lasting two to three months.

2.4. Shoreline Plan, Sedimentation and Erosion

Since the Corps' initial efforts to construct spillway structures at existing canals in 1935 to reduce sedimentation within the St. Lucie River section of the OWW, the Corps continues to consider water quality and sedimentation during decision making and operational processes.

Shoreline Management Plan Lake Okeechobee and the Okeechobee Waterway, 2004. The Lake Okeechobee and Okeechobee Waterway Shoreline Management Plan was developed to provide long-term protection of the authorized project purposes including recreational and natural resource benefits to the public. The Shoreline Management Plan describes the types of public or private use and activities, such as boat docks or shoreline stabilization, that may be authorized by the Jacksonville District Operations Division. These uses are authorized through the programmatic general permit SAJ-67, pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404 of the Clean Water Act. Other public or private uses such as walkways within Corps' easements may require real estate authorizations, such as permits, licenses, or Consent to Easements. The plan addresses shoreline allocations, rules, regulations, and other information relevant to the OWW. The Shoreline Plan complements the Master Plan for the OWW. It is Corps' policy to manage and protect the OWW Shoreline in a manner that promotes the safe and healthful use of the shoreline by the public while maintaining environmental safeguards to ensure a quality resource for future generations.

Numerous studies have been conducted in the Atlantic Intracoastal Waterway to assess the negative effects of recreation boat wake on sedimentation, hydrology, organisms, and habitat substrate (Campbell, D.E., 2009.). The effects of boat wake are measured considering wave height and energy in various environments. Less effort has been made to study the wake-driven erosion caused by recreational vessels within the OWW. However, the damage is evident on the high banks with exposed roots and collapses observed along the sandy slopes of

the St. Lucie Canal. The marshes and islands in Lake Okeechobee adjacent to the OWW show signs of erosion and loss of vegetation. Similar erosion is observed in the Caloosahatchee River where wakes up to 4 feet pound the shoreline. In the lower elevated landscape surrounding the Caloosahatchee River, many shorelines are vegetated, while others are armored; both mitigate the eroding effects of the waves. Unfortunately, shoreline armoring serves less as a sediment filter and does not provide habitat for the diverse wildlife using the OWW.

2.5. Water Quality

The State of Florida surface water standards for Class 1A, drinking water supply are met in Lake Okeechobee and the portion of the Caloosahatchee River from the W.P. Franklin Lock eastward to the Lee County line. The remainder of the Waterway is Class III, designated for recreation and propagation of fish and wildlife. A small area at the western terminus of the waterway in San Carlos Bay is identified as Class II, which is designated for shellfish harvesting.

Florida takes part in a water quality monitoring program implemented by states with EPA oversight. The two parts of the program are the Clean Water Act Section 303(d) listing of impaired waters and the development of Total Maximum Daily Loads, (TMDL) related to restoring those impaired waters.

The St. Lucie River South Fork, east of the Florida Turnpike and downstream of the St. Lucie Lock and dam, (S-80), is classified as impaired waters with the EPA 303d impaired waterbody history reports indicating causes including copper levels, turbidity, chlorophyll-A, mercury in fish tissue and dissolved oxygen. The Caloosahatchee River assessment unit above

Ortona Lock and dam, S-78, are classified as impaired waters with causes of impairment listed as biochemical oxygen demand, dissolved oxygen. In 2014, causes for impairment in the assessment unit between Ortona, S-78, and W.P. Franklin lock and dam, S-79, are listed as un-ionized ammonia, nutrients and dissolved oxygen. In 2010 Benthic macroinvertebrates, bioassessments, dissolved oxygen and Chlorophyll-A were listed. Regular bacteriological testing at the W.P. Franklin Recreation area, by Florida Department of Health, Lee County is generally under the County determined maximum contaminant level for swimming beaches. However, there have been 29 closures which accounted for multiple days of noticed “No Swimming” at this location since 2015.

Harmful algal blooms (HAB) have become a greater concern nationwide in both fresh and salt water systems (EPA <https://www.epa.gov/nutrient-policy-data/monitoring-and-responding-cyanobacteria-and-cyanotoxins-recreational-waters>). Cyanobacteria (blue-green algae), are photosynthetic bacteria that can accumulate into a harmful algal bloom (HAB) containing *microcystins* and *cylindrospermopsin* containing toxins. If ingested or inhaled, these toxins pose health risks to humans and animals. Elevated nitrogen and phosphorus levels from human activities can increase the likelihood of HAB events. Lake Okeechobee and the OWW have experienced HAB events following heavy rainfall events and flood water discharges. Florida has taken a shared Multi-Agency Approach with online information sharing through their Algal Bloom Monitoring and Response web site (<https://floridadep.gov/DEAR/Algal-Bloom>). The Corps has initiated a notification protocol for HAB, fish kills or oil spills detected in the region. SFOO has an SOP for response at lock

and dam operations to spills or HAB in waterways to assist with containment while the State investigates.

Groundwater. The project area has two separate types of aquifers, the deeper Floridan aquifer and shallow aquifers, most of them contiguous with surface waters. Shallow aquifers are variable over the region and contain numerous, often localized subdivisions. Between the Floridan aquifer and the shallow aquifers is an aquiclude that confines the artesian Floridan aquifer. Water of the Floridan aquifer is neither potable nor even useful for irrigation over most of the region. Abandoned, flowing wells from the Floridan aquifer are a widely recognized source of local mineral contamination of the shallow aquifers and surface waters. The aquiclude overlying the Floridan aquifer lies too deep to be penetrated by canal construction and maintenance. The shallow aquifers yield potable water throughout most of the region except around Lake Okeechobee where it is highly mineralized.

2.6. Climate

The OWW project is located in the southern portion of the temperate zone and is greatly influenced by the proximity to the Atlantic Ocean and Gulf of Mexico. The climate is often described as subtropical. Summers are long, warm, and wet while winters are relatively dry and mild with short intermittent cool periods.

2.7. Topography, Geology, Soils

Topography

The topography in the project area around Lake Okeechobee is very flat and surrounding elevations are lowest in Belle Glade,

in the southeastern region near the lake. Belle Glade is where historically organic soils of the marsh transitioned to Everglades habitat. The terrain in the area does not exceed 2 percent in slope. The lake and its associated canals and levees are the most visible portions of the vast area. Surrounding elevations along the St. Lucie Canal are somewhat higher as the canal flows east.

Geology

The entire project area is underlain by at least 14,000 feet of sedimentary strata. Sediments in the upper few hundred feet consist mostly of non-competent beds of elastic materials such as sands, silts, clays, and shell beds. These are underlain by competent stratas of carbonate limestone or dolomites bearing artesian water. Sediments exposed on the surface range from Miocene to Holocene. Geologic, soil, and physiographic features are directly or indirectly the result of climatic fluctuations during the Pleistocene, when glaciers waxed and waned over vast land areas, causing periodic inundation of this region by rising and falling ocean levels. Surficial drainage patterns are a result of sandy terraces deposited when the sea level was higher than at present. In general, the entire study area region is so flat that, historically, much surface water drainage was by overland sheet flow and poorly defined sloughs.

Soils

Soils surrounding Lake Okeechobee are organic peats and mucks. Historically, periodic lake overflow, plus the water from annual rainfall, moved slowly southward over the almost level Everglades plain through the thick vegetation. Silts, clay, and organic colloids were carried in suspension during major overflows and deposited near the shore of the lake where they intermixed with plant remnants to form mucks. Most of the rest

of the Everglades soils were derived from sawgrass and related marsh plants which decomposed to form a light, felty, brown fibrous peat with low mineral content. The formation of this organic soil was possibly due to the flooded conditions existing in the Everglades prior to massive drainage of the region. These organic soils generally existed south of Lake Okeechobee, with arms reaching northward along both the eastern and western shores of the lake. The peat, when drained, properly fertilized, and augmented by minor elements, becomes an excellent field soil. Today these soils, together with the more highly prized muck soils, make up one of the richest agricultural regions on earth. These soils were originally 7 to 15 feet thick over the northern Everglades region. Farther east and west of the lake are sandy soils that range from deep, white, draughty, very permeable sands on the east coast, to wet, gray or grayish-brown soils underlain by sandy clay or marl located mostly in the western reaches of the waterway.

In Martin County, leaving Lake Okeechobee farther east along the OWW, soils transition from Everglades' organic soils to the Coastal Lowlands unit of the Atlantic Coastal Plain, consisting of a waveland-lawnwood Bassinger complex, classified as sandy flatlands soils. They form deep, steep, white eroded slopes on the canal banks of very permeable sands to the east coast. A larger wetland marsh known as the Allapattah Flats marsh extends southeast of Indiantown.

Flowing west from the southwest edge of Lake Okeechobee, the Caloosahatchee River segment of the OWW eventually forms an estuary at the Gulf of Mexico. A band of Arents soils measuring 50 to 400 foot wide lines the OWW canal west of Lake Hicpochee to near Port LaBelle and again at W. P. Franklin Lock and Dam. These soils are classified as altered marine

deposits and are remnant dredge deposits. Mucky soils are present in areas where sloughs, wetlands, or canals meet the waterway. The soils inland from the river consist of fine permeable sands such as Immokalee fine sand or Malabar sand near Ortona. These sandy soils support South Florida flatwoods, hydric or mesic lowlands, or scrub. The Ortona area north of the Caloosahatchee River is an important commercial source of beach quality sand.

Further west as the Caloosahatchee River flows through LaBelle, Hendry County and Alva, Lee County toward the estuary, there are natural oxbows and no dredge spoil lining the waterway. The soils transition to predominantly sandy soils such as Immokalee sand and Wabasso, interspersed with poorly drained mucky or loamy soils supporting hydric flatwoods or hardwood sloughs.

2.8. Fish and Wildlife Resources

Fish

Fish and wildlife resources are more extensively discussed in the RECOVER System Status Reports under Lake Okeechobee and the Northern Estuaries. This resource can be found at http://141.232.10.32/pm/ssr_2014/mod_lo_2014.aspx.

The commercial fishery on Lake Okeechobee is important to the local economy and as a local food source. Commercial fishermen launch at some of the Corps' managed or OWW access points. Commercial fishing is regulated by the Florida Fish and Wildlife Conservation Commission (FWC) issuing licenses for salt or fresh water species. Commercial harvest or sale of freshwater mussels is prohibited. A limited number of permits may be issued by the FWC to authorize operation of haul

seines in Lake Okeechobee and in the southwest region. See the FWC website link for information on permits, application procedures, and gear specifications and use (<http://myfwc.com/fishing/freshwater/commercial/>). Fishing gear must be clearly and legibly marked to enable better enforcement and removal of abandoned gear that would create a navigation hazard.

In most years, the catfish harvest is the largest on the lake. A 1993 report by J. Rudd's Packing Company reported processing 1.36 million pounds of catfish (*Ictalurus punctatus*) and bluegills (*Lepomis macrochirus*). The five counties surrounding Okeechobee reported an estimated \$117 million in retail sales of freshwater fish in 2000. Recent harvest quota data is not available since it is no longer collected for most freshwater fish. Other important commercial fisheries in the region and OWW include black crappie (*Pomoxis nigromaculatus*), threadfin shad (*Dorosoma petenense*), mullet species (*Mugil spp.*), and several species of bait minnows. The surrounding region is known for aquaculture and fish farms, however catfish are not generally farmed in Florida. Trotlines, funnel-shaped wire traps, and limited seine nets are used to catch catfish or crappie. Mullet species are collected primarily with cast nets in the OWW, Caloosahatchee, and St. Lucie Rivers sections.

The FWC classifies fish species as either game or non-game freshwater fish. Specific game fish are listed: <http://myfwc.com/fishing/freshwater/regulations/taking-fish/>. All freshwater fish are defined as non-game fish, unless otherwise defined as freshwater game fish.

The first study specifically aimed at documenting the fish fauna of Lake Okeechobee was conducted from 1967 to 1969. Forty-

three species were identified, of which 36 were true freshwater fishes and seven were marine species that also utilize freshwater. Lake Okeechobee and the St. Lucie and Caloosahatchee rivers have an abundance of fishery resources. Although managed for water supply, marsh habitat covers large areas of Lake Okeechobee. Studies of the food chain using isotopes demonstrated a wider array of foods in marsh versus open water habitats (Fry, Brian et. al. 1999.) Limnetic areas of Lake Okeechobee in sampling from 1987-1991 showed numerically that threadfin shad were the most abundant species, ~ 49%, while black crappie comprised the largest portion of the catch in terms of biomass (1,052.5 kg.) (A. Bull, et al. 1995).

Lake Okeechobee is known for its bass fishing. Bass tournaments are scheduled almost every weekend from January to April, sponsored by at least 7 major organizations. See the FWC website for more information on bass management in Florida; Florida Black Bass Management Plan, <http://myfwc.com/fishing/freshwater/black-bass/>

Reptiles and Amphibians

Habitats around the lake and OWW are important for amphibian and reptile populations that are essential to natural community dynamics. A variety of amphibian and reptile species may be found within the area, including salamanders, frogs, toads, turtles, and snakes. Some species of reptiles have possession limits; some also have designated seasons.

Representatives of all four North American groups of reptiles; namely, crocodylians, turtles, lizards, and snakes, can be found currently using habitats along the project. Likewise, both anurans (frogs and toads) and salamanders; the two groups of amphibians, are represented.

Perhaps the most notable among the reptiles which occur in the project area is the American alligator, one of Florida's largest reptiles and North America's only freshwater crocodilian. The alligator prefers areas where dense littoral stands of grasses and sedges or dense hardwood swamps provide breeding habitat.

The gopher tortoise, a state listed threatened species, occupies many areas on the Caloosahatchee River, west of central Glades County. The tortoise may burrow in the high berms along the banks of the waterway. Large numbers of yellow and Everglades' rat snakes inhabit the rows of Australian pines bordering the levee along the southern end of Lake Okeechobee and a large population of brown snakes inhabit the riprap along the levee banks. Soft-shelled turtles are of concern as a commercial commodity to the fisheries in Lake Okeechobee. A six-year study, commencing in 1966, indicated a severe decline both in quantities caught and the relative value of the catch during that period. Although atypical habitat for gopher tortoises, the HHD and Clewiston area have established populations of tortoises.

East of Lake Okeechobee along the St. Lucie Canal, there is little uniqueness in the herpetofaunal community, except where the canal cuts through the eastern coastal ridge in northern Martin County. This ridge, along with Corps' easements and recreation lands, supports a dense population of gopher tortoises which display some demographic characteristics which differ from the rest of the State's population.

Birds

The South Florida ecosystem provides important habitat to a suite of migratory bird species including: warbler species,

killdeer (*Charadrius vociferous*), Eastern grasshopper sparrow (*Ammodramus savannarum*), American kestrel (*Falco sparverius*), grackle species (*Quiscalus spp.*), and black and turkey vultures (*Cathartes altratus*) and (*Cathartes aura*). Resident breeding birds include those that inhabit open grasslands, such as mourning doves (*Zenaida macroura*), zanaida (*white-winged*) doves (*Zenaida asiatica*), common ground doves (*Columbina passerine*), eastern meadowlark (*Sturnella magna*), loggerhead shrike (*Lanius ludovicianus*), burrowing owl (*Athene cunicularia. Guadeloupensis*), and the Crested caracara (*Polyborus plancus*). The Everglades Watershed and Lake Okeechobee marshes provide a significant resource for the feeding and nesting activities of several wading and wetland dependent bird species, such as snail kite (*Rostrhamus socialbillis*), red-winged blackbirds (*Agelaius phoeniceus*), and rail species. Many species of birds are considered to be of special concern by the State because of their rapidly declining populations resulting from wetland drainage and altered hydroperiods. The wading bird population on Lake Okeechobee has been observed and inventoried, with special emphasis placed on the populations of American white ibis (*Eudocimus albus*), glossy ibis (*Plegadis falcinellus*), great egrets (*Ardea alba*), snowy egrets (*Egretta thula*), reddish egrets, and wood storks (*Mycteria americana Linnaeus*). Little blue, great blue, and Louisiana herons, black-necked stilt (*Himantopus mexicanus*), and roseate spoonbills are also frequently found using the marsh for feeding and the islands and floating vegetation for nesting. The lake marshes provide an essential habitat that may be crucial for long-term maintenance of these species. The marshes of the lake also provide year round habitat for several species of waterfowl, including wood ducks, coots, and gallinules. Lake Okeechobee's shallow marshes and abundant emergent and floating plants harbor

several species of migratory waterfowl that attract duck hunters: the Florida mottled duck (*Anas fulvigula*), ring-necked duck (*Aythya collaris*), blue-winged teal (*Anas discors*), and ruddy duck (*Oxyura jamaicensis*).

Mammals

There are 34 native species of mammals occurring in southern Florida, plus ten introduced species which are known to be established. The raccoon is considered to be the most abundant carnivore in southern Florida. It is extremely versatile, both in its habitat preference and its tolerance for man. Although less abundant than raccoons, bobcat (*Lynx Rufus*) and grey fox (*Urocyon cinereoargenteus*) are predatory mammals frequently observed throughout the Corps' recreation and operations projects. Grey foxes have been observed foraging for apple snails (*Pomacea spp*) from the LOST trail on the HHD. The Ortona area is within documented Florida Panther (*Puma concolor coryi*) territory and another cat species, the jaguarundi (*Herpailurus yagouaroundi*), has been seen on Corps managed sites. Signs of black bear activity are documented at Ortona.

Deer inhabit the dike extensions, but are rarely seen at the recreation areas. Other smaller mammals that inhabit parts of the OWW span across South Florida are the marsh rabbit, grey squirrel, Big Cypress fox squirrel, and opossum (*Dedeliphis virginiana*). The Florida water rat, or round-tailed muskrat, is found primarily in wet habitats, but is also known to live in burrows in seasonally wet areas with peat soils. It has been recorded in Martin, Palm Beach, and Hendry Counties, but populations are localized

A marine mammal, the West Indian manatee, (*Trichechus manatus*), especially *T. m. latirostris*, the Florida subspecies, has

been the focus of conservation efforts and research since its listing under the Endangered Species Act of 1973. Due to conservation efforts, the West Indian manatee was reclassified by Fish and Wildlife Service as a threatened species in 2017. The highly migratory Florida manatees' summer range extends north up the Atlantic Coast and to Texas in the Gulf of Mexico. In winter, it migrates to South Florida or warm springs due to its limited ability to adapt to low temperature extremes. Manatees are found in all waters accessible to them throughout Lake Okeechobee, the Caloosahatchee River, and the St. Lucie Canal. Increased numbers are being reported, particularly near the northeastern areas of Lake Okeechobee. Opportunistic manatee observations are recorded at Corps operated lock structures. Data shows that larger numbers of manatees are observed at W.P. Franklin and Ortona Lock in winter due to the Fort Myers power plant warm water aggregation site. In the St. Lucie River, manatees are seen more frequently in summer months. The Corps, Jacksonville District committed as a manatee recovery partner in 1996. Retrofitting water control structures with barriers and detection devices began in 1995 and Manatee Protection System (MPS) acoustic detection systems were installed on navigation locks from 2000-2010. The American otter is a marine mammal that also frequently uses the OWW.

2.9. Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and the State of Florida have designated certain species of reptiles, birds, mammals, gastropods, and plants and lichens in Glades, Hendry, Lee, Martin, Okeechobee, and Palm Beach counties as threatened or endangered (Table 2-1). Activities, in-water work, or construction not identified within this plan will require preconstruction surveys and, based upon results, consultation.

This Master Plan Update includes some areas on the dike, but also includes the St. Lucie and Caloosahatchee rivers and recreational land adjacent to the OWW. Refer to the FWC, Florida Imperiled Species Management Plan, 2016 for a list of species status (<http://myfwc.com/media/4133167/Floridas-Imperiled-Species-Management-Plan-2016-2026.pdf>).

Table 2-1: Federal and State Listed Plant and Animal Species Occurring in Glades, Hendry, Lee, Martin, Okeechobee, and Palm Beach Counties, Florida

Scientific Name	Common Name	Federal Status	State Status
Amphibians			
<i>Rana capito</i>	Gopher frog	Not listed	Species of Special Concern
Reptiles			
<i>Crocodylus acutus</i>	American crocodile	Threatened	Endangered
<i>Drymarchon couperi</i>	Eastern indigo snake	Threatened	Threatened
<i>Eumeces egregius lividus</i>	Bluetail mole skink	Threatened	Threatened
<i>Gopherus polyphemus</i>	Gopher tortoise	Candidate	Threatened
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	Not listed	Species of Special Concern
Birds			
<i>Ammodramus savannarum floridanus</i>	Florida grasshopper sparrow	Endangered	Endangered
<i>Aphelocoma coerulescens</i>	Florida scrub jay	Threatened	Threatened
<i>Aramus guarauna</i>	Limpkin	Not listed	Species of Special Concern
<i>Athene cunicularia</i>	Burrowing owl	Not listed	Species of Special Concern
<i>Calidris canutus rufus</i>	Red knot-migrant	Candidate	Candidate
<i>Charadrius melodus</i>	Piping plover	Threatened	Threatened
<i>Egretta caerulea</i>	Little blue heron	Not listed	Species of Special Concern
<i>Egretta thula</i>	Snowy egret	Not listed	Species of Special Concern
<i>Egretta tricolor</i>	Tricolored heron	Not listed	Species of Special Concern

Scientific Name	Common Name	Federal Status	State Status
<i>Eudocimus albus</i>	White ibis	Not listed	Species of Special Concern
<i>Falco sparverius paulus</i>	Southeastern American kestrel	Not listed	Threatened
<i>Grus Americana</i>	Whooping crane	Endangered	Species of Special Concern
<i>Grus canadensis pratensis</i>	Florida sandhill crane	Not listed	Threatened
<i>Haematopus palliates</i>	American oystercatcher	Not listed	Species of Special Concern
<i>Mycteria americana</i>	Wood stork	Endangered	Endangered
<i>Pandion haliaetus</i>	Osprey	Not listed	Species of Special Concern
<i>Pelecanus occidentalis</i>	Brown pelican	Not listed	Species of Special Concern
<i>Picoides borealis</i>	Red-cockaded woodpecker	Endangered	Species of Special Concern
<i>Platalea ajaja</i>	Roseate spoonbill	Not listed	Species of Special Concern
<i>Polyborus plancus audubonii</i>	Audubon's crested caracara	Threatened	Not listed
<i>Rostrhamus sociabilis plumbeus</i>	Snail kite	Endangered	Endangered
<i>Rychops niger</i>	Black skimmer	Not listed	Species of Special Concern
<i>Sterna antillarum</i>	Least tern	Threatened	Threatened
Invertebrates			
<i>Bolbocerosoma hamastum</i>	Bicolor burrowing scarab beetle	Not listed	Species of Special Concern
Mammals			
<i>Eumops floridanus</i>	Florida bonneted bat	Endangered	Endangered

Scientific Name	Common Name	Federal Status	State Status
<i>Podomys floridanus</i>	Florida mouse	Not listed	Species of Special Concern
<i>Puma concolor coryi</i>	Florida panther	Endangered	Endangered
<i>Sciurus niger shermani</i>	Sherman's fox squirrel	Not Listed	Species of Special Concern
<i>Trichechus manatus</i>	Manatee	Endangered	Endangered
<i>Ursus americanus floridanus</i>	Florida black bear	Not Listed	Threatened
Gastropods (Snails and Allies)			
<i>Orthalicus reses reses</i>	Stock Island tree snail	Threatened	Endangered
Plants and Lichens			
<i>Acrostichum aureum</i>	Golden leather fern	Not Listed	Threatened
<i>Argusia gnaphalodes</i>	Sea lavender	Not Listed	Endangered
<i>Asimina tetramera</i>	Four-petal pawpaw	Endangered	Endangered
<i>Calopogon multiflorus</i>	Many-flowered grasspink	Not Listed	Endangered
<i>Chamaesyce cumulicola</i>	Sand-dune spurge	Not Listed	Endangered
<i>Coccothrinax argentata</i>	Silver palm	Not Listed	Threatened
<i>Cucurbita okeechobeensis</i>	Okeechobee gourd	Endangered	Endangered
<i>Dalea carthagenensis floridana</i>	Florida prairie cover	Candidate (1918)	Endangered
<i>Dicerandra immaculate</i>	Lakela's mint	Endangered	Endangered
<i>Glandularia maritima</i>	Coastal vervain	Not Listed	Endangered
<i>Halophila johnsonii</i>	Johnson's seagrass	Threatened	Threatened
<i>Hypericum edisonianum</i>	Edison's ascyrum	Not Listed	Endangered
<i>Jacquemontia reclinata</i>	Beach jacquemontia	Endangered	Endangered
<i>Lantana depressa</i> var. <i>floridana</i>	Atlantic Coast Florida lantana	Not Listed	Endangered
<i>Lantana depressa</i> var. <i>sanibelensis</i>	Gulf Coast Florida lantana	Not Listed	Endangered
<i>Lechea cernua</i>	Nodding pinweed	Not Listed	Threatened
<i>Lechea divaricata</i>	Pine pinweed	Not Listed	Endangered

Scientific Name	Common Name	Federal Status	State Status
<i>Liatrus ohlingerae</i>	Scrub blazing star	Endangered	Endangered
<i>Linum carteri</i> var. <i>smallii</i>	Carter's large-flowered flax	Not Listed	Endangered
<i>Nemastylis floridana</i>	Celestial lily	Not Listed	Endangered
<i>Nolina atopocarpa</i>	Florida beargrass	Not Listed	Threatened
<i>Okenia hypogaea</i>	Burrowing four-o'clock	Not Listed	Endangered
<i>Ophioglossum palmatum</i>	Hand fern	Not Listed	Endangered
<i>Panicum abscissum</i>	Cutthroat grass	Not Listed	Endangered
<i>Paronchia chartacea</i>	Papery whitlow-wort	Threatened	Endangered
<i>Plantanthera integra</i>	Yellow fringeless orchid	Not listed	Endangered
<i>Polygala lewtonii</i>	Lewton's polygala	Endangered	Endangered
<i>Polygala smallii</i>	Tiny polygala	Endangered	Endangered
<i>Pteris bahamensis</i>	Bahama brake	Not Listed	Threatened
<i>Pteroglossaspis ecristata</i>	Giant orchid	Not Listed	Threatened
<i>Sacoila lanceolata</i> var. <i>paludicola</i>	Fahkahatchee ladies' tresses	Not Listed	Threatened
<i>Schizaea pennula</i>	Ray fern	Not Listed	Endangered
<i>Tephrosia angustissima</i> var. <i>cutissii</i>	Coastal hoary-pea	Not Listed	Endangered
<i>Thelypteris serrata</i>	Toothed maiden fern	Not Listed	Endangered
<i>Tillandsia flexuosa</i>	Banded wild-pine	Not Listed	Threatened
<i>Tolumnia bahamensis</i>	Dancing-lady orchid	Not Listed	Endangered
<i>Warea carteri</i>	Carter's mustard	Endangered	Endangered
Critical Habitat			
<i>Rostrahamus sociabilis plumbeus</i>	Everglade snail kite	Endangered	Endangered
<i>Trichechus manatus</i>	West Indian manatee	Endangered	Endangered
<i>Chelonia mydas</i>	Green sea turtle	Endangered	Endangered
<i>Halophila johnsonii</i>	Johnson's seagrass	Threatened	Threatened

Species that are likely to occur or known to occur within the recreational lands adjacent to the OWW include caracara, Everglade snail kite, wood stork, West Indian manatee, Eastern indigo snake, fox squirrel, and gopher tortoise. Recreational and maintenance activities that would be expected to affect these species are discussed in Chapter 6, NEPA analysis.

2.10. Invasive Species

Invasive species of plants, fish, animals, and organisms are introduced from distant places and can cause harm to native ecosystems, the economy, or potentially, human health. Often displacing native species, these species can alter the delicate natural balance between animals and plants, and important processes such as water flow. These species may grow unchecked by natural predators or weather conditions causing significant damage (United States Geological Survey 2013). The climate and environment of South Florida is conducive to the spread of tropical and other fast growing or reproducing species. In Florida alone, more than 500 non-native fish and wildlife species have been observed and over 1,180 non-native plant species have become established outside of human cultivation (Florida Fish and Wildlife Conservation Commission 2014; Schmitz 2002). Fortunately, not all of these have become invasive, yet Florida still ranks as one of the top four areas in the U.S. facing serious problems with invasive species (University of Georgia 2014; USFWS 2012b).

The recreation facilities, navigation structures, and easements managed by the South Florida Operations Office (SFOO) experience management challenges due to invasive aquatic or terrestrial plant and animals. The SFOO, Environmental Stewardship program plans and executes a limited number of contracts annually to control terrestrial invasive or nuisance plant or animal species on Corps owned recreation lands.

The Jacksonville District's Invasive Species Management (ISM) Branch is responsible for managing aquatic invasive plants on Lake Okeechobee, the OWW, and associated tributaries. Other invasive species responsibilities include managing invasive animals and terrestrial plants for the OWW and Central and Southern Flood Control Projects. Lake Okeechobee and the OWW are located in central and southern Florida. The 451,000-acre lake and 154 mile long waterway extend from the Atlantic Ocean at Stuart to the Gulf of Mexico at Fort Myers. Under the Removal of Aquatic Growth (RAG) program, the Corps predominantly controls water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), and tussocks (floating clumps of assorted aquatic species). However, the Corps has the authority to control any species that poses a threat to navigation, including native vegetation. The ISM Branch utilizes Integrated Pest Management (IPM) to manage invasive species. IPM is the coordinated use of the most appropriate strategy, chemical, mechanical, or biological control, to prevent or reduce levels of invasive species by the most economical means and with the least possible hazard to people, property, and the environment.

2.11. Wetlands

Wetlands associated with the OWW were described previously in section 2.2 of this plan. Few wetlands meeting the Federal definition are associated with the fee lands managed by SFOO, with the exception of littoral areas on the OWW, basins, ditches, canals, or stormwater collections depressions. An exception to this is a wetland restoration area on the government owned

parcel known as Moore Haven East, managed by the Corps and consisting of 25.42 acres of uplands and 42.68 acres of enhanced wetlands contiguous with Alvin Ward Park. The area is classified as a wildlife and vegetation management area.

2.12. Cultural Resources

The OWW is a 155-mile-long waterway connecting the St. Lucie River, Lake Okeechobee, and the Caloosahatchee River. Just as the waterway crosses a wide range of ecotones and habitats, the waterway and its adjacent lands contain a variety of cultural resources which are representative of the types of resources that are present throughout South Florida. The number and diversity of cultural resources that are known within and adjacent to the waterway and on the related easement properties reflects the steady growth and importance in the protection and stewardship of cultural resources. In the 1981 Master Plan, 14 previously recorded archaeological sites were noted along the Caloosahatchee River from Moore Haven to the W.P. Franklin Lock (USACE 1981). As of 2018, 136 cultural resources are documented within Corps properties and Corps-held easements for the OWW. These resources range from Archaic Period prehistoric Native American Indian sites to twentieth century lock and dam complexes. The following archaeological sites should be noted as environmentally sensitive and require additional review for disposal, permitting, or O&M:

Sites

8GL33, 8GL41, 8GL55, 8HN17, 8HN 18, 8LL73, 8LL772, 8OB23, and 8PB16178

The following paragraphs generally summarize the prehistoric and historic periods along the OWW.

Prehistoric

The earliest widely accepted date of occupation by aboriginal inhabitants of Florida is around 12,000 years ago. New evidence suggests that people were present even earlier. This earliest cultural period, called the Paleo-Indian period, lasted until about 7500 BC. Few Paleo-Indian archeological sites are recorded in South Florida. Two of the few Paleo-Indian sites in South Florida are located at the Warm Mineral and Little Salt Springs in Sarasota County. A review of the Florida Master Site Files (FMSF) did not identify any Paleo-Indian sites within the vicinity of the OWW. The lack of Paleo-Indian archaeological sites in South Florida may be due to the scarcity of raw materials in the region as well as a lack of fresh water during this period. Lakes such as Lake Okeechobee did not exist during this period due to the drier climate during the Younger Dryas event. While sea levels were significantly higher than they were during the Late Glacial Maximum (LGM), sea levels were still 40 to 80 meters lower than their present levels during this period.

During the Archaic Period (ca. 7500-500 BC), prehistoric people exploited a wider range of resources and may have led a more sedentary existence than in earlier periods. Few Archaic Period archeological sites are recorded in South Florida. Known sites are clustered along the Atlantic and Gulf coasts, near the Caloosahatchee River and along old remnant lake shorelines, as recorded in the FMSF. In South Florida, evidence for a substantial Early Archaic Period population is limited. Early Archaic Period sites have been identified in Miami and along the southeastern coast of Florida. During the Middle Archaic Period, formation of peat deposits in the Everglades indicate that precipitation and surface runoff in South Florida dramatically increased. With the presence of more water sources, Archaic Period populations expanded into formerly inhospitable interior

locations. During this period, sea levels continued to rise until reaching modern levels. The stabilization of sea levels resulted in the formation of estuaries where Archaic Period populations began to exploit coastal resources. By the late-Archaic, inland locations were more widely and intensively exploited. Prehistoric Archaic Period middens have been identified on tree-islands in South Florida which have been dated to around 2500 BCE (Schwadron 2005).

Two late-Archaic cultures are generally archaeologically recognized in South Florida; the Orange culture and the Glades Archaic cultures. The Orange culture is recognized for using a distinctive type of pottery manufactured using fiber temper. While Orange culture sites are most widely known from northeast Florida, these site types are also recognized along the southeast coast. Site types generally consist of oyster and coquina shell middens located along the coast, freshwater ponds, and inland rivers and streams. The Glades Archaic culture is characterized by its lack of ceramics, and the exploitation of freshwater and marsh species such as turtle, fish, and apple snail, which were plentiful in the surrounding marshes.

The next cultural sequence within the Okeechobee Basin is generally termed the Glades Period (ca. 500 BC-AD 1700). In the Okeechobee Basin, the Belle Glades culture sequence (ca. 500 BC-AD 1500) follows the Archaic. Black earth middens, low sand mounds, and circular and linear earthworks are typical Belle Glade site types located in the Lake Okeechobee Basin, as recorded in the FMSF.

The early historic period began with the first Spanish colonial period (1513-1763 AD). At this time, the Calusa inhabited southwest Florida. Their population was decimated by

European-introduced diseases, warfare, enslavement, and migration out of Florida. The Miccosukee and the Seminole migrated into Florida in the eighteenth and nineteenth centuries from Georgia and Alabama. Throughout the mid-nineteenth century, the U.S. relentlessly pursued a policy of Indian removal in Florida, and the Seminole, resisting removal, eventually established themselves in the Everglades, Big Cypress Swamp, and the Ten Thousand Islands. Several important battles of the Seminole Wars occurred around Lake Okeechobee, including the largest and bloodiest battle of the Second Seminole War, the Battle of Okeechobee on Christmas Day in 1837. The Okeechobee Battlefield site is located at the north end of Lake Okeechobee and is a National Historic Landmark. Other Seminole battle and habitation sites, predominantly on tree islands, are located throughout the study area.

American settlement around Lake Okeechobee began in earnest in the late-nineteenth century when efforts to drain and reclaim the Everglades began. Agriculture began in the Everglades south of Lake Okeechobee after drainage projects between 1906 and 1927. By 1921, there were 16 settlements on or near Lake Okeechobee, with a total estimated population of 2,000. By the 1940s, a number of homes had been built in this area forming historic districts that are potentially eligible for listing in the National Register of Historic Places (NRHP).

2.13. Okeechobee Waterway Project Components

As a Federal navigation project, the OWW was first authorized under the River and Harbor Act of 1930, (Public Law 71-520) and completed in 1937 (HPMP 1997). The Federal involvement in the construction of the OWW began after a series of piecemeal private and public ventures to drain wetlands, control floods, aid navigation, and manage water supplies proved unsuccessful.

The earliest efforts to modify water flows in the Lake Okeechobee Basin began in 1881. That year, Hamilton Disston purchased four million acres of land from the State of Florida in the largest land sale ever made to a private individual (Kimes and Crocker 1998). Disston organized the Atlantic and Gulf Coastal Canal & Okeechobee Land Company to drain his lands within the Okeechobee Basin by cutting canals and channelizing the existing waterways to remove surface water in the Everglades. His projects included attempts to drain the Kissimmee River floodplain and develop canals to capture overflow and channel it from Lake Okeechobee into the St. Lucie River in the east and the Caloosahatchee River in the west. While Disston intended to drain large areas of interior Florida, his dredging operations on the Caloosahatchee and the Kissimmee Rivers also opened an interior waterway over 300 miles in length from the Gulf of Mexico to Kissimmee through Lake Okeechobee.

While partially successful at removing surface water from some areas and lowering water levels in Lake Okeechobee, the drainage of the wetlands and the channelization of the Kissimmee and Caloosahatchee Rivers exacerbated flood and drought conditions in both drainage basins. By 1913, the water level in Lake Okeechobee was lowered to such an extent that navigation in the upper Caloosahatchee became difficult and some settlements were abandoned. Shortly thereafter, Florida Governor Trammel began advocating for the Federal government to develop a navigable Cross Florida Waterway (Antonini et al 2002). In 1915, the State of Florida dredged a 40 foot wide by 5 foot deep channel from Lake Okeechobee to LaBelle. Efforts to connect the St. Lucie River to Lake Okeechobee began in 1915, when the Everglades Drainage

District began construction on the St. Lucie Canal (C-44). The canal and the associated locks were completed in 1924. The canal connects Lake Okeechobee to the South Fork of the St. Lucie River and was primarily designed to provide flood relief.

Between 1922 and 1928, hurricanes and floods resulted in the loss of many lives and great property damage throughout the Lake Okeechobee region. On September 18, 1926, the Great Miami Hurricane hit the Lake Okeechobee region. The storm's winds drove water southwest from the lake, creating a swell of water seven feet above normal lake levels which surged against the levees along the shoreline. The sudden failure of these levees killed an estimated 150 to 250 people and caused significant damage to Moore Haven and Lakeport (Reed et al. 2011). Two years later, the Okeechobee Hurricane, an even more catastrophic storm, hit the region. This time, the strong winds pushed water towards the levees on the southeast side of the lake near the towns of Belle Glade, Canal Point, and Pahokee. As the hurricane passed and the wind direction shifted, water was pushed against the northern side of the lake, flooding Okeechobee City. Water levels during the storm were 29.5 feet above normal lake level and caused the failure of over 21 miles of levees. The storm killed over 2,000 people, many of whom were black cane workers from the Bahamas (Reed et al. 2011).

The River and Harbor Act of 1930 (Public Law 71-520) was enacted in response to the Miami and Okeechobee hurricanes. The Act not only authorized the construction of 67.8 miles of levees and other water control structures along the south shore of Lake Okeechobee and 15.7 miles along the north for protection from storm surge-induced flooding, but also included substantial improvements to navigation. The act provided for the Federal government to take over the Florida cross-state

waterway, straightening some sections by dredging a 6 foot-deep and 80 foot-wide channel on the Caloosahatchee River and a channel 6 feet deep and 60 feet wide on Taylor Creek between the lake and Okeechobee City.

The River and Harbor Act of 1935, Public Law 74-409, modified the plan authorized in the 1930 River and Harbor Act and authorized the Corps' construction of multiple drainage structures in the levees. The Act provided that the United States would be responsible for operation and maintenance of the levees and channels authorized in the 1930 Act, as well as the drainage structures heretofore or hereafter constructed in connection with the Caloosahatchee River and Lake Okeechobee drainage areas.

In March 1937, the Cross Florida Waterway was opened and the Corps took over maintenance of the canals within the Lake Okeechobee drainage basin, including an enlarged St. Lucie Canal with rebuilt locks. Additional flood protection and water control was authorized in the Flood Control Act of 1948. Over 80 years of management by the Corps has left a distinct historic legacy on the landscape.

The HHD, five locks and dams, the St. Lucie Canal, the Caloosahatchee River and Canal, and the dredged navigation channels across Lake Okeechobee comprise the historically built features of the OWW. Today, the Corps manages buildings and structures within the lock and dam reservations that are historic in nature. Several of these date to the early periods of Corps' involvement in the development of flood protection and navigation features in the region. At Ortona Lock, for example, the lock is still operated with machinery that was manufactured in Germany prior to World War II. Many of these facilities have been inventoried and evaluated against the National Register of

Historic Places (NRHP) and have been determined eligible for inclusion either individually or as contributing resources to the NRHP. Significant historic properties are located at four of the five lock and dam reservations and at the SFOO in Clewiston. The Clewiston main office retains its distinctive Art Deco architectural style popular in Florida when it was built in the 1930s and it is eligible for listing in the NRHP. Both the St. Lucie Canal and the Caloosahatchee Canal are historic and are eligible for listing in the NRHP. Many of the historic structures located within the OWW are also associated with HHD. Although the OWW has not been systematically surveyed for the presence of significant archeological resources, archaeological surveys have been conducted in some locations adjacent to the waterway.

The following narrative provides summaries of the historic properties managed by the Corps within the OWW boundaries.

2.13.1. St. Lucie Lock and Dam Reservation

The St. Lucie Lock and Dam Recreation Area is comprised of 155 acres located along the canalized St. Lucie River in Martin County, Florida. Construction on the lock began in 1915. The original St. Lucie lock and dam structure included an eight gate spillway, dredge pass, and the lock, which was completed by 1926. The original lock was converted to an auxiliary lock in 1941 and a larger, electric-operated lock built into the south bank of the canal. The original lock was filled with soil in 1978, though it retains much of its integrity and visitors to the St. Lucie Lock and Dam Reservation can still see this historic feature. With the completion of the OWW and the HHD in 1937, the Corps assumed control and maintenance of the St. Lucie Canal and other canals throughout South Florida as a part of the Federal assumption of flood risk management responsibilities.

In 1941, the St. Lucie Lock, Dam, and spillway were deepened and extended, and a new powerhouse and lock and control facility were constructed. During this period, residences for the lockmaster and facility personnel were completed, creating a nearly self-contained compact operational unit.

The St. Lucie Lock and Dam was determined eligible for listing on the NRHP in 1997 and 11 historic structures associated with the facility are inventoried. The historic structures include the concrete and steel water control structure anchoring the original 1926 lock and dredge pass, dam, and spillway (8MT349A), powerhouse (8MT349B), hydroelectric plant (8MT349C), 1941 lock (8MT349D), and control station office (8MT349E), which were determined to possess integrity of materials, design, workmanship, and association, and determined eligible for listing on the NRHP as a district. The 1977 lock attendant's quarters (8MT349F), and five ca. 1946 masonry residential structures (8MT349 G, H, I, J, and K) constructed on the property were potentially individually eligible for the NRHP, but did not contribute to the NRHP District.

The St. Lucie Lock and Dam was recorded as part of a Historic American Engineering Record (HAER) project. In 2000, in anticipation of unavoidable adverse effects by maintenance activities at the St. Lucie lock and dam structures, the Corps executed a Memorandum of Agreement (MOA) with the Florida State Historic Preservation Office (SHPO). As part of this MOA, Corps' contractors prepared HAER, National Park Service Level II documentation for each of the facilities (HAER No. FL-20). This report documented the history and the general description of the lock and provides a detailed account of the history and structural details of each facility.

The north portions of the St. Lucie Lock Recreation Area are reported as the only parcels of Corps property within the Okeechobee Waterway Project that have been surveyed for archeological resources (Ellis 1992). Ellis (1992) primarily surveyed selected areas that would have been directly impacted by development. The survey found that portions of the property had been damaged by periodic construction and maintenance of the dam and lock facility. No archaeological sites were identified during the survey; however, it was the archaeologists' opinion that significant properties may be located on undeveloped portions of the recreation area (LOOW HPMP 1997). Today, one of the three Corps visitor centers operates at the St. Lucie Lock and Dam. The visitor center features exhibits highlighting the history and the environment of the OWW. The St. Lucie Lock operates between 7 AM and 5 PM with last lockage beginning at 4:30 PM.

2.13.2 St. Lucie Canal

The St. Lucie Canal/C44 (8MT1316) extends approximately 38 miles from Lake Okeechobee to the south fork of the St. Lucie River in Martin County, Florida. It is one of the six early-twentieth-century drainage canals that were constructed by the Everglades Drainage Project. Construction on the canal began in 1916 and was not completed until 1924. The primary function of the canal was for drainage and water control of Lake Okeechobee. The canal included two locks, one located at the present location of the St. Lucie lock and dam, and the other near Stuart, Florida. The completion of the St. Lucie Canal and locks represented the first complete cross Florida navigation channel; however, it was only accessible to shallow draft vessels. In 1928, the St. Lucie Canal was reportedly 150 feet wide and 8 feet deep (USACE 1928:7-8).

The St. Lucie Canal was surveyed by Janus Research in 1999 and determined eligible for listing in the NRHP as a linear resource in 2001 (Port 2014). The canal is significant for its engineering importance and its role in the development of Florida. In addition to the canal, 16 spillways were constructed on the St. Lucie Canal by the Corps between 1935 and 1937 (8MT1647 through 8MT1660). These spillways were constructed along inflow points on the canal to prevent sedimentation, which has been a major problem since 1924. These structures were constructed using similar standardized designs with variations in size and orientation. The spillways consist of reinforced concrete sedimentation basins on one end within an inclined spillway which empties into the canal with concrete wing walls supporting the spillways and canal banks (Price 2014). Two of the spillways were not relocated due to overgrown vegetation along the banks (Price 2014). These canal spillways are eligible as a Resource Group for listing in the NRHP as contributing resources to the St. Lucie Canal.

2.13.3. Port Mayaca

The Port Mayaca Recreation Area is located at the western end of the St. Lucie Canal west of U.S. 441, where the canal enters Lake Okeechobee in Martin County, Florida. The recreational area is divided into two parcels by the canal and includes 41 acres of property owned by the Corps. The Corps has easement rights on an additional 214 acres. The recreation area contains the Port Mayaca Lock (S-308B/8MT1529) and the Port Mayaca spillway (S-308B/8MT1528). In addition to the lock itself, there is a main control shelter (SF90) immediately south of the hurricane gates. Adjoining the control shelter to the south is a work building/garage (SF94), and further away is a generator building and storage facility (SF95). Adjacent to the lower gates, on either side of the lock chamber, are two small motor houses. A series of tanks dedicated to various ecological studies are located south of the lock area (Swanson and Joseph 2011).

The Port Mayaca Lock and spillway were constructed between 1974 and 1977 to help raise the water level in Lake Okeechobee for agriculture water supply, navigation, and flood risk management during hurricane season. The lock chamber is a large concrete structure measuring 56 feet wide by 400 feet long and 14 feet deep. The lock contains a relatively large pair of gates at the lake end (west) and another, smaller pair of steel sector gates at the east of the lock. The sill elevation is minus 3.5 feet NGVD. The tops of the lock gates are 32 feet NGVD (USACE 1996:2.42). The spillway, also known as S-308B, is located on tieback levees that were provided for flood risk management and vehicular access from U.S. Route 441. The site is located west of U.S. 441, and is divided into two parcels by the St. Lucie Canal.

Because the spillway and lock were constructed around 1977 and are not 50 years in age, they have not yet been assessed for National Register eligibility. During the construction and dredging of the Port Mayaca Lock and slipway/boat ramp, the dredges encountered site 8MT39. This site contained a historic canoe and military artifacts associated with the Second Seminole War (1835-1842). While the site was not evaluated for NRHP eligibility, it is likely that dredging and lock construction probably destroyed most of the site.

Approximately 9,500 vessels use the Port Mayaca Lock annually. Of these, approximately 96 percent are recreational vessels. The Port Mayaca Lock is also responsible for facilitating the transport of 18,000 tons of manufactured goods, machinery, raw materials, food, and produce annually.

Located just to the east of the Port Mayaca reservation, the Florida East Coast Railway Lift Bridge (8MT925) spans the St. Lucie Canal (8MT1316) and the Port Mayaca Cemetery (8PB1293). The railroad bridge was constructed and the cemetery was established ca. 1930, around the same time period that construction on HHD began. The cemetery contains burials representing the multi-ethnic history of the Lake Okeechobee region including Caribbean, African American, Native American, and Hispanic interments.

2.13.4. Herbert Hoover Dike

The HHD (8MT1325) is a system of approximately 143 miles of levees and 32 associated culverts, hurricane gates, and other water control structures, and is the largest man-made engineering project in South Florida. The dike was constructed by the Corps following two catastrophic hurricanes in 1926 and 1928 that swamped smaller scale flood protection measures. In

1930, Congress authorized the construction of 15.7 miles of levees on the north shore and 67.8 miles on the south shore of Lake Okeechobee. Initially, the levees were built to a height of 34 feet and were constructed from material excavated from the lakeside which incorporated as much of the previously constructed levee as possible. Additional levees, raising of existing levees, and water control structures were added to HHD after 1948, pursuant to the Flood Control Act of 1948. Today, the dike encircles most of Lake Okeechobee and is eligible for listing on the NRHP as a linear resource group. Other site numbers associated with the HHD resource group include 8OB244A, 8HN179A, 8GL421A, 8PB2028A, and 8MT1325A. The HHD period of significance is the initial period of construction of the system and the early period of modifications from 1930 to 1952. Many of the water control structures that are located within the OWW easements are also associated with the HHD and contribute, or are potentially contributing elements, of the resource group/district.

2.13.5. Lake Okeechobee

During construction of the OWW, two separate navigation routes were dredged across the lake. Route 1 is a 39 mile-long channel that runs directly across the open lake from Port Mayaca to Clewiston, Florida. Route 2 is also known as the rim canal, which is a 50 mile-long route that was dredged along the southern perimeter of Lake Okeechobee from Port Mayaca to Moore Haven. Most of the HHD adjacent to the rim canal was constructed from material that was removed from the canal. Both routes usually remain navigable even during drought and low water conditions. The navigation channel is 10 feet in depth and varies in width. The channel is 80 feet wide from Moore Haven to Clewiston; however, the majority of the channel is 90 feet wide or wider.

2.13.6. Clewiston Operations Office

The U.S. Army Corps of Engineers, SFOO is located in Clewiston, Florida on approximately 20 acres of Corps property adjacent to Structure 310 (S310)/Clewiston Lock. The SFOO complex currently contains 17 buildings and one object that were constructed between 1938 and 1989. In addition to these buildings, four others were removed from the property in 2007. Three of the buildings still located on the property (8HN296, 8HN304, 8HN305) were determined individually eligible for listing in the NRHP (Reed et al. 2011). The main office building (1938), equipment storage building (1939), and the machinery shop and heavy equipment storage and repair building (1935) are associated with the original construction and operation of the HHD.

The SFOO was evaluated as a potential district but was found ineligible for listing as a historic district. The three NRHP eligible structures (8HN296, 8HN304, 8HN305) were significant for the period between 1935 and 1939 and important in the construction and maintenance of HHD and local and regional development. The Clewiston Operations Office currently manages the operations of the five navigation locks and dams along the OWW and the Canaveral Lock at Canaveral Harbor, Florida. The complex also serves as a command center during major storm events.

2.13.7. Moore Haven Lock Reservation

The Moore Haven Lock is located at the junction of the Caloosahatchee Canal and Lake Okeechobee. The Lock Reservation is comprised of eight acres within the larger Moore

Haven Recreation Area. The Recreation Area consists of 150 acres of Corps owned land and 39 acres of easement land located approximately a ½-mile north of the town of Moore Haven. The Moore Haven Lock was the second lock constructed in Moore Haven in November 1935 and was one of the first major structures completed as part of the original HHD system. The upper set of sector gates were completed prior to the rest of the facility and served as electrically powered hurricane gates. The lower set of gates formed the navigational lock. The lock chamber was 250 feet long by 50 feet wide and 10 feet deep (Port and Hodes 2001:23).

The historic reservation, which has survived intact since its original development, includes 16 structures (8GL432). These structures include the lock, a small control house for the lock tender, two lock tender residential houses, a warehouse and generator house constructed in the 1930s, and the existing garage and pump house constructed in 1948. By the 1940s, the lock contained a large warehouse, power plant, machine shop, office space, houses for the staff with landscaping, radio telephone sets, and a modern weather station with gauges to record barometric pressure, temperatures, wind characteristics, rainfall, and lake levels. Some of these instruments were even designed specifically for the site (OFCD 1943:23). A second tender's house, garage, boathouse, and landing dock were completed between December 1936 and September 1937 (Annual Report 1937:607; 1938:649). The spillway was constructed in 1965.

The original Moore Haven Lock was built in 1918, was relatively small, and was located close to the center of the town on the original section of the Three-Mile Canal. While adequate for navigation, the original lock was insufficient for flood risk

management during major events such as the 1926 hurricane (Port and Hodes 2001:15-16, 26). After the Corps constructed the new lock and hurricane gate north of town, the 1918 lock was dismantled in 1936. Warehouse Building # 33 was removed from the property in 2010.

The Moore Haven Lock and Dam (8GL432) complex was determined eligible for listing in the NRHP. It was recorded as a resource group containing 16 structures. Ten of these structures were recorded in as part of a HAER project. In 2000, in anticipation of unavoidable adverse effects by maintenance activities at the Moore Haven lock and dam structures, the Corps executed a MOA with the Florida SHPO. As part of this MOA, Corps contractors prepared HAER, National Park Service Level II documentation for each of the facilities (HAER No. FL-18-B). This report documented the history and the general description of the lock and provides a detailed account of the history and structural details of each facility.

2.13.8. The Caloosahatchee Canal

The Caloosahatchee Canal/C-43 (8GL442) flows 65 miles from Lake Okeechobee to the Gulf of Mexico through Glades and Lee counties, Florida. It was begun in the 1880s as part of Hamilton Disston's plan to drain thousands of acres of inundated lakes in South Florida. Between 1881 and 1887, dredges widened, deepened, and straightened the Caloosahatchee River to improve drainage and navigation. At the eastern end of the river, a 3 mile long and 25 foot wide canal was excavated from Lake Okeechobee to Lake Hicpochee (located south of Moore Haven) and the headwaters of the Caloosahatchee River to assist in the drainage of the lake (Grunwald 2006). By the 1890s, the Caloosahatchee River had been transformed into a man-made canal suitable for navigation. By 1913, the Caloosahatchee

River alternated between extreme high and low water conditions. To assist in water control and navigation, the State constructed three locks (Caloosahatchee Lock Nos. 1, 2, and 3) located at Lake Flirt, Citrus Center, and Moore Haven (Port and Hodes 2001: 11).

Beginning in the 1920s, after a series of damaging floods, the Corps began surveying the Caloosahatchee River drainage to improve flood protection and navigation on the river. In the 1930s, the Corps constructed locks at Moore Haven and Ortona. In the 1940s and 1950s, the canal was dredged and additional locks and pumping stations constructed. A 1950s dredging project deepened the channel to 8 feet in depth and widened it to 250 feet (Antonini 2002). In the 1960s, the W.P. Franklin Locks were constructed at Olga. Today, the canal is bordered by an earthwork or berm of compacted soils. The slopes of the berm are covered with vegetation and portions of the crest berm carry unimproved roads (Gillard and Rabbysmith 2011). The Caloosahatchee River Canal and its associated earthwork were recorded in 2009 with the Florida Master Site Files and determined eligible for listing in the NRHP as a linear cultural resource. The canal is eligible under Criterion A for early community planning and development, Criterion B for its association with Hamilton Disston, and Criterion C for engineering.

2.13.9. Ortona Lock and Dam

The Ortona Lock and Dam (8GL433) is an approximately 58 acre reservation located on the north and south banks of the Caloosahatchee River east of LaBelle, approximately 15.5 miles west of Moore Haven Lock and 28 miles east of the W.P. Franklin Lock. The Ortona Lock (Lock No. 2) was constructed between 1935 and 1937 by the Corps to facilitate navigation on

the Caloosahatchee River and the Cross-State Canal. The connecting spillway, located south of the lock, is operated for flood control, irrigation, and maintenance of water. The concrete spillway is separated from the lock by a manmade island that is developed as a natural park and resting stop for visitors along the waterway. The machinery and control houses (Building No. SF60, SF61, SF62, SF63, and SF64) are located adjacent to the lock and spillway while the lock tender's house (Main Office, No. SF51 and SF96), power house (Warehouse, Building No. SF52 and Bld. 26), water treatment plant (Building No. SF54), fire pump house (Building No. 103 and SF55) and other buildings are all located on the north side of the river. The lock chamber is 250 feet long by 50 feet wide and constructed of concrete with steel sector gates. (Port and Hodes 2001:23). Originally, the spillway had five bays, however, in 1963, one was removed and the floodway channel was enlarged. Two residences and two garages were removed from the property sometime after 1996.

The Ortona Lock and Dam is eligible for listing in the NRHP. It was recorded as a resource group building complex containing 16 structures. Ten of these structures were recorded as part of a HAER project. In 2000, in anticipation unavoidable adverse effects by maintenance activities at the Ortona Lock and Dam structures, the Corps executed a MOA with the Florida SHPO. As part of this MOA, Corps contractors prepared HAER, National Park Service Level II documentation for each of the facilities (HAER No. FL-19). This report documented the history and general description of the lock and provides a detailed account of structural details of each facility.

The Ortona Lock and Dam Recreation Area is a picnic and recreational vehicle camping area located on both the north and

the south sides of the canal. The north side of the complex is a smaller day use area and can be accessed from State Road 78. The facility includes two covered picnic pavilions, six tables, a restroom building, and a recreation vehicle parking area. The south side of the complex is larger and can be accessed via State Road 90. It includes RV camping spaces, picnic shelters, wildlife viewing platforms, fishing piers, restrooms with showers, and walking and bicycle paths. The Ortona South Campground offers 51 sites with electric and water hook ups. The area was inventoried as part of a 2014 investigation of the recreational area. The Lock and Dam Recreation Area was assigned a site number 8GL488 (Price 2014). The site is ineligible for listing in the NRHP.

2.13.10. W.P. Franklin Lock and Dam

The W.P. Franklin Lock and Dam (8GL2633) (also called Structure 79) is the westernmost water control structure on the Caloosahatchee River. It is located in Lee County, just east of the town of Olga, approximately 33 miles upstream of the Gulf Intracoastal Waterway. The W.P. Franklin Lock and Dam was named after Walter P. Franklin who was president of the Gulf, Okeechobee, and Atlantic Waterway Association and was constructed in 1965 for flood control, water control, prevention of salt-water intrusion, and navigation. The lock and dam separate the tidal estuary to the west from the fresh water canal to the east. They operate in conjunction with companion structures located at Ortona and Moore Haven to control the release of water from Lake Okeechobee (Price 2014).

The W.P. Franklin Lock and Dam complex is located on 57 acres of Corps-owned property located on the north and south banks of the Caloosahatchee River. The lock chamber is a reinforced concrete structure approximately 400 feet long, 56 feet wide,

and 14 feet deep with steel sector gates. The lock gates are operated by machinery and control houses that are located adjacent to the lock chamber. The spillway is reinforced concrete with eight gates that have a discharge capacity of 28,900 cubic feet per second (cfs) used to control water flow from the lake.

The property includes administrative buildings, a recreation area, and a campground. The administration buildings and the recreation area are located on the south side of the property, while the RV campground restroom buildings, dump station, a courtesy dock, and a boat ramp are located on an island between the old river channel and the lock spillway (Price 2014). Buildings on the south side include the lock tender's residence (Inland Residence) which has been renovated into a Visitors and Environmental Education Center. A one-story, concrete block building with two garage bays serves as the main office building (Price 2014). The recreation area includes a beach, landscaped picnic areas, playground, boat ramp, restrooms, and parking areas.

The W.P. Franklin Lock and Dam was evaluated both individually and as part of a potential historic district that includes the structure's adjacent administrative buildings (Price 2014). The lock and dam and the main office building at the south end of the dam were recommended eligible for listing in the NRHP. The complex was not recommended eligible as a historic district due to the demolition and alteration of several original buildings; however, the SHPO determined that the W.P. Franklin Lock and Dam Complex is eligible for listing in the NRHP.

2.13.11. Easement Properties

In addition to the Real Property owned and operated by the Corps at the lock and dam complexes and the SFOO, the Corps also holds a significant number of easements on properties that are located on and adjacent to the OWW and the HHD. Some of these properties are used for recreational purposes and include the Clewiston Park Recreation Area, South Hicpochee Access Area, and the Nubbin Slough Recreation Area.

2.13.12. Lake Okeechobee Park

This area consists of 10 acres of easement lands located near the town of Okeechobee and operated by Okeechobee County. It is accessible from State Road 441 and via an unpaved road over the HHD. The site has picnicking facilities, a gravel parking area, a fishing pier, beach, and a boat launching area.

2.13.13. Clewiston Park Recreation Area

Known as Levee Park, this site consists of about 2,000 feet of shoreline berm adjacent to the Lake Okeechobee levee and west of S310)/Clewiston Lock. The berm is very narrow with about 30 to 40 feet of level ground between the paved access road and the shoreline. Historically, the site has been a city-maintained park used for picnicking, shoreline and pier fishing, and viewing the lake. The park contains paved and curbed parking spaces and public rest rooms. Access to the shoreline park is gained through a public ramp area maintained by the City of Clewiston on the inland side of the levee berm and across a canal.

2.13.14. South Hicpochee Access Area

Lake Hicpochee is a small lake located southwest of Moore Haven and was the original headwater for the Caloosahatchee River before it was drained by the C-43 Canal. The access area is owned by the Corps, but leased to Glades County. The 4 acre site has minimal development. The facilities include one launching ramp and a gravel parking area

2.13.15. Nubbin Slough Recreation Area

This 40 acre public use area is on Corps easement land and is located on the northeast shore of Lake Okeechobee. The area is located between the dike and the lake shore and is bisected by Nubbin Slough. A boat ramp and 40 space gravel parking area are located on the site. Although the overall site is large, no additional facilities are available.

2.13.16. Lake Okeechobee Scenic Trail (LOST)

The Lake Okeechobee Scenic Trail is a 109 mile-long scenic trail located on the HHD around Lake Okeechobee. The mostly paved trail was developed in the 1980s and is part of the Florida National Scenic Trail, used for cycling and walking. The trail provides access to many of the historic structures related to the HHD as well as views of the marshes, open waters, sunrises and sunsets over Lake Okeechobee.

2.13.17. Easement Properties

A total of 137 cultural sites have been recorded on Corps-owned real property, maintained waterways (the St. Lucie and Caloosahatchee canals), and on properties with Corps easements¹ (Table 2-2). Twenty-two of these resources are

¹ Multiple site numbers assigned to the HHD for each county segment were counted as a single site

already listed in, or are individually eligible for listing, in the NRHP. An additional 24 cultural resources are NRHP eligible as contributing resources to existing listed or eligible complexes, districts, or resource groups. The majority of these eligible resources are associated with four of the five historic lock and dam reservations, canals, associated spillway structures, and the HHD. Fifty-nine of the cultural resources identified in this study were not associated with the lock and dam reservations, canals, spillway structures, and the HHD (Table 2-3).

A total of 35 cultural resources located within the OWW are associated with the HHD. These include culverts, water control structures, hurricane gates, pump buildings, and the HHD levees. Many of these structures are individually eligible for listing in the NRHP or are contributors to HHD resource groups. Together, the HHD structures account for approximately 25 percent of the cultural resources present within or just adjacent to the OWW.

Table 2-2: Cultural Resources identified on Corps-owned or Easement Properties by County

	Total Sites	Unevaluated for NRHP eligibility	Individually NRHP Listed/Eligible	Contributing Resources
Glades	20	15	3	
Hendry	22	12	6	3
Lee	14	12	1	1
Martin	40	8	5	15
Okeechobee	12	8	4	
Palm Beach	28	7	2	5
Multi County	1	0	1	
	137	62	22	24

Table 2-3: Cultural resources not affiliated with lock and dam reservations, major canals, or HHD

	Total Sites	Unevaluated for NRHP eligibility	Individually NRHP Listed/Eligible
Glades	8	6	2
Hendry	17	10	3
Lee	8	6	0
Martin	11	6	2
Okeechobee	5	2	3
Palm Beach	10	4	2

In addition to the parks, and public access areas, the Corps also holds easements on a significant number of properties that are located directly adjacent to the waterway and in areas that are adjacent to the HHD. These easements were primarily acquired for the construction and maintenance of the OWW and HHD. While few archaeological surveys have been completed on most of these easement lands, nevertheless, a number of archaeological sites, historic structures, resource groups, cemeteries, and historic landscapes have been recorded within or adjacent to the OWW on properties which still retain Corps easements. A total of 59 documented cultural resources are located on or adjacent to Corps properties with easements that are not associated with the lock and dam reservations, the associated canals and canal features, and the HHD.

In addition to the historic resources that are present throughout the OWW, there are 12 prehistoric cultural resources associated with properties with easements along the waterway. These sites are fairly evenly distributed along the length of the OWW and only one of them is eligible for listing in the NRHP. The remaining sites have not been formally evaluated for NRHP eligibility. Five of these unevaluated sites include prehistoric canals, mounds, and earthwork sites. The remainder include habitation sites, middens, campsites, and artifact scatters. While relatively few prehistoric cultural resources are present within the OWW and adjacent properties, it is likely that there are substantially more prehistoric sites located along the length of the waterway and even under the waters of Lake Okeechobee.

2.14. Aesthetics

No changes to the human built or natural aesthetics are expected from the implementation of this plan. The built environment has been in place for many years at each Corps-managed recreation

area. The Moore Haven West property is upland grassland conditions and should remain unchanged. At W.P. Franklin Beach, the shoreline will continue to resemble surrounding river waterfront.

2.15. Baseline Socioeconomics

The 2016 estimates for the six counties composing Lake Okeechobee and the OWW was 2,324,535 persons. Table 2-4 presents the 2016 population and per capita personal income for each county. Palm Beach County, Florida is the most populated county located within the project boundaries and Florida's third most populous county overall. According to the Office of Economic and Demographic Research, the per capita personal income in Palm Beach County in 2016 was \$71,946, compared to \$45,953 for the State of Florida as a whole. With the exception of Palm Beach, Martin, and Lee counties, the other three counties in the study area had per capita personal income lower than that of the State of Florida.

Agriculture, recreation, and tourism all play an important role in the local economy. An estimated 742,668 acres of irrigated agricultural lands are located in the Lake Okeechobee Service Area and 447,000 acres in the Everglades Agricultural Area (EAA). These agricultural lands and associated activities employ hundreds of people and account for hundreds of millions of dollars in revenue annually.

Table 2-4: 2016 Population and Per Capita Income

County	2016 Population	2016 Per Capita Personal Income
Glades	13,420	\$23,041
Hendry	38,376	\$29,556
Lee	680,970	\$45,768
Martin	153,592	\$73,296
Okeechobee	39,420	\$29,106
Palm Beach	1,398,757	\$71,946

Source: Florida Legislature Office of Economic and Demographic Research

The lake and its associated waterways, shoreline, and the LOST on top of the HHD, provide a wide variety of water-based recreation activities for local residents and tourists, including: fishing, boating, picnicking, sightseeing, camping, swimming, birding, hunting, biking, horse-back-riding, rollerblading, air boating, and hiking. Additionally, the lake supports an active commercial fishing industry. This includes several different types of commercial fishing operations and landside support activities, such as marinas and wholesale and retail distribution facilities.

In 2016, the leading industry sectors that provide non-farm employment are trade, transportation and utilities, professional and business services, education and health services, leisure and hospitality, government, and construction. The remaining non-farm employment is provided by manufacturing, other services, natural resources and mining, information, and financial services.

The six counties in the project area had an average annual employment (all industries) of 925,374, compared to 8,309,088 for the State of Florida. The highest average annual wage (all industries in 2016) for Palm Beach County was \$51,868 compared to \$47,060 for the State of Florida. All other counties within the project area reported average annual wage below State level.

2.16. Demographic Analysis

The Demographic Analysis provides an understanding of the population within and surrounding Lake Okeechobee, especially the six counties: Glades, Henry, Lee, Martin, Okeechobee, and Palm Beach, Florida. This analysis is reflective of the total population and its key characteristics such as age segments, income levels, race, ethnicity, people with disabilities, veteran status, and immigration.

2.16.1 Methodology

Demographic data used for the analysis was obtained from the U.S. Census Bureau, Bureau of Economic and Business Research (BEBR), University of Florida, and Environmental Systems Research Institute, Inc. (ESRI). Data acquired in 2016 reflects actual numbers as reported in the 2010 Census and estimates for 2015 as obtained by the BEBR. The BEBR population projections used in this analysis represent BEBR’s medium range projection; low and high estimates are also developed in BEBR’s population studies. Figure 2-2 presents census data and population projections for the study area.

The six Central and South Florida counties which combine to make up the study area had a population of 2.2 million, accounting for about 11.6% of Florida’s total in 2010. This

share has changed very little over the past ten years, and projections show this proportion to remain the same for the next 30 years.

The population is increasing and is projected to experience a 2.6% average growth rate over the next 30 years. The number of households is projected to experience a 9.1% growth rate over the same timeframe. What this means is that the population will grow and recreation services must grow commensurate to the population. Additionally, development will continue over the next 30 years and the recreation facilities and activities within the project region will need to be developed and maintained in relation to housing development areas.

2.16.2. Age Segmentation

The market area’s (i.e. Glades, Hendry, Lee, Martin, Okeechobee, and Palm Beach counties) aging trend is significant because programs and facilities focused on an active adult (55+ population) will assume greater importance as the population changes in the years to come. Age segments have different tendencies towards activities. For example, older adults may enjoy passive recreation more than active. However, multigenerational facilities and services will be crucial to Lake Okeechobee and OWW because younger age segments will still represent 60% of the total population by 2045. Additionally, there are different recreation activities that are popular among different older adult segments. Understanding the growing trend of individual older adult age segments will help better position Okeechobee management priorities.

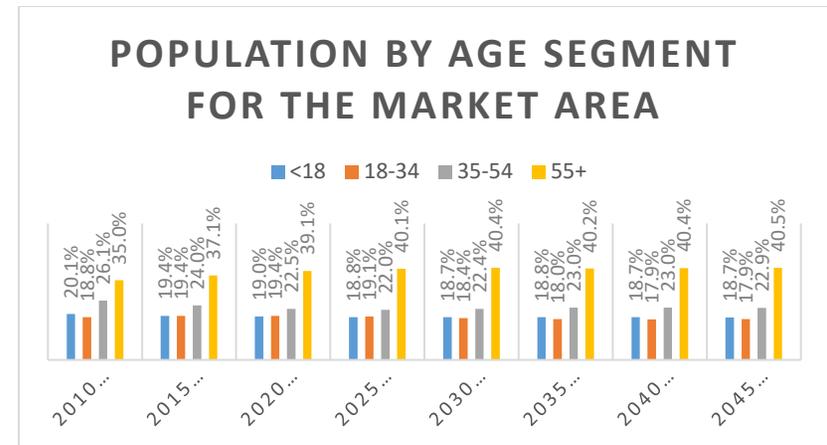


Figure 2-1: Population by Age Segment for the Market Area

2.16.3. Racial/Ethnic Population Distribution

The overall study area’s racial/ethnic population distribution is similar to that of the State of Florida as a whole except that the Hispanic population is significantly higher for Hendry County (51.1%) and lesser in Martin County (12.9%). There is more variability in white-black distribution from county to county; however, the area’s average (11.0%) is close to the proportion of blacks in the US (12.6%). There are relatively high concentrations of Native American and Alaskan Native populations in Glades and Hendry Counties. Table 2-5 presents the racial-ethnic population distribution.

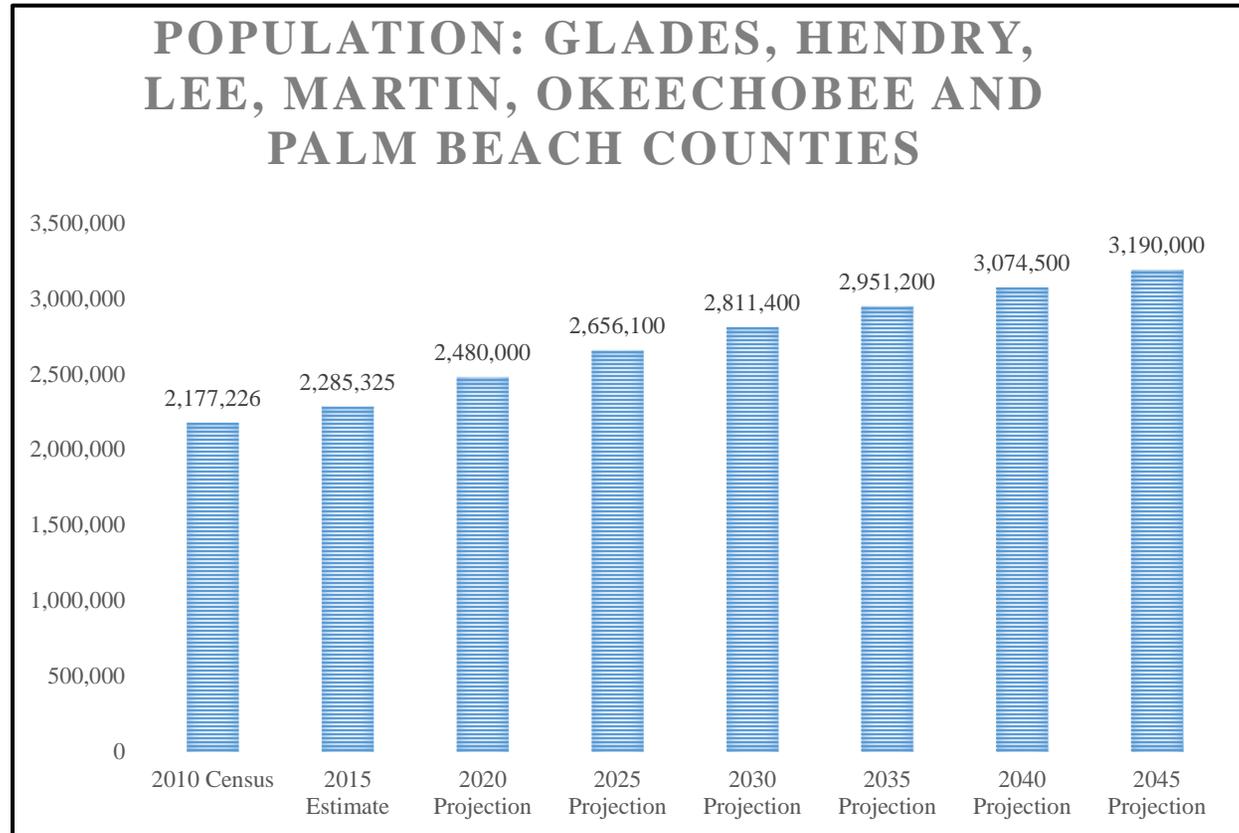


Figure 2-2: Population Projections of Six Counties within the Project Region

Table 2-5: Racial/Ethnic Population Distribution²

Racial Ethnic Population Distribution 2016 Census							
Area	White	Black	American Indian and Alaskan Native	Asian or Pacific Islander	Native Hawaiian and Other Pacific Islander	Some Other Race	Hispanic of any Race
United States	73.3%	12.6%	0.8%	5.2%	0.2%	4.8%	17.3%
Florida	75.9%	16.1%	0.3%	2.6%	0.1%	2.5%	24.1%
Glades County	80.0%	12.6%	4.0%	0.6%	0.0%	1.3%	21.0%
Hendry County	76.2%	11.9%	2.2%	0.9%	0.1%	7.1%	51.1%
Lee County	84.9%	8.6%	0.2%	1.6%	0.0%	2.9%	19.6%
Martin County	87.1%	5.6%	0.4%	1.2%	0.0%	4.2%	12.9%
Okeechobee County	86.9%	8.8%	0.9%	1.0%	0.1%	1.3%	25.1%
Palm Beach County	74.5%	18.3%	0.1%	2.5%	0.0%	2.3%	20.7%

Table 2-6: Labor Force, Employment and Unemployment Rate³

Area	Civilian Labor Force	Number Employed	Number Unemployed	Unemployment Rate
Glades County	4,181	3,627	554	13.3%
Hendry County	17,040	15,312	1,728	10.1%
Lee County	299,588	274,224	25,364	8.5%
Martin County	68,328	62,343	5,742	8.4%
Okeechobee County	15,178	13,475	1,703	11.2%
Palm Beach County	693,752	636,646	57,106	8.2%
State of Florida	9,557,443	8,755,427	802,016	8.4%

² U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

³ U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Table 2-7: Households and Household Size⁴

Area	Number of Households	Average Household Size
Glades County	4,019	2.99
Hendry County	11,817	3.07
Lee County	258,084	2.60
Martin County	62,980	2.38
Okeechobee County	12,850	2.82
Palm Beach County	538,549	2.56
State of Florida	7,393,262	2.64

Table 2-8: Study Area per Capita Personal Income: 2010, 2016⁵

Area	Per Capita Personal Income		Relative to State of Florida	
	2010	2016	2010	2016
Florida	\$38,624	\$45,953	100%	100%
Glades County	\$19,716	\$23,041	51%	50%
Hendry County	\$26,195	\$29,556	68%	64%
Lee County	\$39,117	\$45,768	101%	100%
Martin County	\$55,051	\$73,296	143%	160%
Okeechobee County	\$24,229	\$29,106	63%	63%
Palm Beach County	\$55,555	\$71,946	144%	157%

⁴ U.S. Census Bureau, 2012-2016 American Community Survey 5-Year

⁵ State of Florida Office of Economic and Demographic Research, March 2018

Table 2-9: Percentage of People in Poverty⁶

Individuals Below Poverty Level		
	2010	2016
United States	13.80%	15.10%
Florida	13.80%	16.10%
Glades County	19.60%	20.70%
Hendry County	26.40%	26.30%
Lee County	12.00%	15.50%
Martin County	10.40%	12.10%
Okeechobee County	19.70%	25.30%
Palm Beach County	12.20%	13.90%

2.16.4. Households, Income, and Poverty Level

There are approximately 888,299 households in the zone of interest with an average size of 2.74 persons per household. For the State of Florida, there are 7.4 million households, with an average size of 2.64 persons per household as shown in Table 2-7.

With the exception of Lee, Martin, and Palm Beach counties, the other three counties in the study area had per capita personal income lower than that of the State of Florida as reported in the 2000 and 2010 census. Table 2-8: Study Area per Capita Personal Income: 2010, 2016 presents per capita personal income for six counties and the State of Florida.

As with many of the other socio-economic statistics, the percent of persons by county below the poverty threshold varies considerably throughout the study area. With the exception of Palm Beach County, Lee County, and Martin County, the other three counties have a higher percent of people below the poverty threshold. Martin County, Lee County, and Palm Beach County rank better than both the State of Florida and the nation in this category. Table 2-9 presents the percent of people in poverty (2010 and 2016) for the six counties, the State of Florida, and the United States.

2.17. Recreation Facilities, Activities, and Needs

The Corps manages eight recreation areas: W. P. Franklin Lock and Dam North and South Recreation Areas, Ortona Lock and Dam North and South Recreation Areas, Port Mayaca Lock and

⁶ U.S. Census Bureau, American Community Survey

Dam Recreation Areas North and South, and St. Lucie Lock and Dam North and South Recreation Areas. There are three Corps-managed campgrounds with 109 campsites (including 16 boat-in sites) at W. P. Franklin North, Ortona South, and St. Lucie South. Project-wide, there are 22 recreation areas managed by other agencies: Pahokee City Park (on OWW), Jaycee Park in Okeechobee (on HHD), Okee-Tantie near Buckhead Ridge (on HHD), Clewiston City Park (on OWW), Clewiston Marina (on OWW), Torry Island in Belle Glade (on OWW), Nubbin Slough (on HHD), Harney Pond Canal (on HHD), Henry Creek (on HHD), Bare Beach (Dyess Ditch Canal) near Lakeport (on HHD), Fisheating Creek (on HHD), Rardin Park near Belle Glade (on OWW), South Bay (on OWW), LaBelle (on OWW), Phipps County Park near St. Lucie Lock and Dam (on OWW), Barron Park in LaBelle (on OWW), Alva (on OWW), Liberty Point (on HHD), Indiantown Marina (on OWW), Buckhead Ridge (on HHD), Chancy Bay and Moore Haven (on OWW). There are five Corps-managed boat ramps at W. P. Franklin North and South recreation areas, Port Mayaca, and the Ortona North and St. Lucie South recreation areas. The Corps has two visitor centers: W. P. Franklin, Lock and Dam recreation area and St. Lucie Lock and Dam Recreation Area. The current inventory confirms 11 recreational activities at Lake Okeechobee, including boating, camping, fishing, environmental education, hiking, picnicking, water sports, wildlife viewing, swimming, the Playground Park Specialized Sport site, and other recreation and concession sites. There is also LOST which many people use year round for running, biking, and walking, etc.

2.18. Zones of Influence

The primary area of economic influence encompasses portions of Glades, Hendry, Lee, Martin, Okeechobee, and Palm Beach

counties. This six-county region is used as the basis when summarizing the population characteristics of Lake Okeechobee and OWW.

2.19. Visitation Profile

Thousands of visitors come to the OWW region each year for recreational activities such as birding, cycling, fishing, and wildlife viewing. The majority of visitors are locals and come from all over the State of Florida. The visitors are a diverse group ranging from campers, to full and part time residents of the private housing developments that border the lake, State and federally operated parks, mariner customers, and many other user groups. LOST circumnavigates Lake Okeechobee atop the HHD. It is a popular place for viewing wildlife, particularly birds in the fall and winter, and the long ride and lake views attract bicyclists. Every Thanksgiving week is the “Big O Hike”, a nine-day hike around the lake. The OWW is a favorite for both recreational and commercial vessel operators to save on time and fuel by cutting across the state instead of going all the way around the tip of Florida. On average, annual visitation is estimated at over 6.6 million. The OWW is primarily used for recreation, but it is also used for commercial navigation, including tug/barge combinations, and commercial fishing vessels. Peak visitation months on Lake Okeechobee are December through April. Typically, tourist visits increase during this season because most tourists, especially from the northeast and north central U.S. visit the lake to enjoy the year-round warm weather.

2.20. Recreational Analysis

The OWW/Lake Okeechobee recreation areas, trails, and water add to the attractiveness, vitality, and appreciation of outdoors. These areas provide a sense of place and allow a growing population to enjoy outdoor recreation opportunities in the

recreation areas. While visitation in recreation areas remains strong, there are indications that there is a new demand for more recreational opportunities.

Based on a review of unmet demand information derived from the 2013 Florida State Comprehensive Outdoor Recreation Plan (SCORP); regions with dense populations such as the northeast, central west, central, and southeast regions tend to have the greatest needs. According to the 2013 Florida SCORP, comparing regional levels of service to the statewide median, the central east region has a level of service above the statewide median in all but three activities: non-boat freshwater fishing, tent camping, and hunting, implying that the region is meeting the demand for recreation. Similarly, in the southwest region, all but three activities: freshwater beach activities, freshwater boat ramps, and nature studies have a level of service above the statewide median. In the southeast region, however, only four activities: freshwater beach activities, picnicking, hunting, and non-boat saltwater fishing have a level of service above the statewide median. The vast majority of the 13 activities (saltwater beach activities, non-boat freshwater fishing, saltwater boat ramps, freshwater boat ramps, paved and unpaved bicycling, hiking, horseback riding, off-highway vehicle driving, nature studies, visiting historical or archeological sites, tent camping, RV or trailer camping) are below the median level of service, implying that the region can benefit from additional recreation resources. The steady rise of Florida's population will lead to an increasing demand in all regions, calling for a continuing need for the provision of outdoor recreation facilities and the conservation of natural and cultural resources. Figure 2-2 depicts the 2013 Florida SCORP, which divides the State of Florida into eight planning regions.

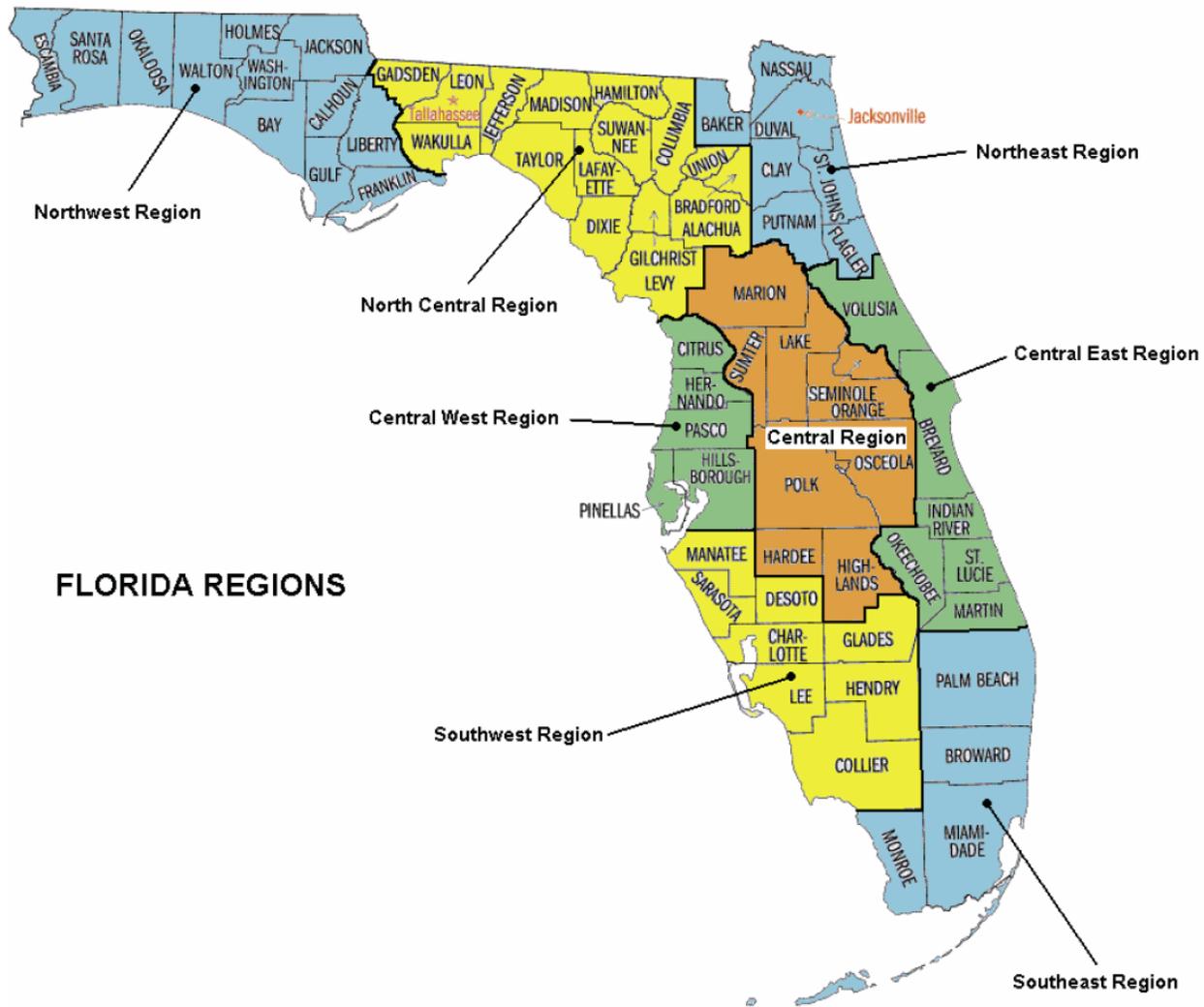


Figure 2-3: 2013 Florida SCORP Regions

2.21. Recreational Carrying Capacity

Recreation Carrying Capacity evaluates the ability of Lake Okeechobee and the OWW to accommodate existing and future recreational uses and assess whether these uses are suitable given the potential effects on recreational, environmental, and social resources. (See Appendix D). It is important to establish the carrying capacity of a project to ensure that there are appropriate facilities that will maintain the quality of the recreational experience. Recreation carrying capacity can be analyzed in many ways. For this analysis, the parking spaces and general visitation data were used to establish general recreation carrying capacity at the project. Other analyses, such as peak season weekend day visitation, design load, parking demand, boating density, and boating density classification assisted in the existing and future conditions for recreation carrying capacity at the Lake Okeechobee and the OWW. Currently Lake Okeechobee is classified as a rural developed setting by water recreation experience. There are three marinas which have 247 wet slips and six boat ramps located in five Corps-operated recreation areas.

The analysis of parking demand and supply shows that by 2020 there is likely to be adequate parking for the foreseeable future. This outcome assumes that visitation will grow at 2.59% annually.

2.22. Conceptual Relationship/Linkage between recreation use and Management of Lake Okeechobee

The recreation experience at Lake Okeechobee is directly related to management decisions or actions. Activities such as controlling water releases at dams, managing fish and wildlife habitat programs, providing ranger patrols, and mowing of road shoulders impacts the facilities, services, and/or natural resource

base that contribute to the recreational experience. There exists a causal relationship between management decisions and recreational experience.

An illustration of the generalized linkages between the potential reallocation of water and the resulting impacts on water quality, fish habitat and recreation is presented in Figure 2-4. A change in the allocation of water, or storage space, between project outputs (uses) could affect the reservoir operating criteria, leading to a change in the flow regime. Changes in water release schedules could result in changes in water quality and in the aquatic habitat. Over a period of time, biological changes in the fishery resources (e.g., in the size or number of fish) may occur. For many recreation users, the fishery resource, water quality, and water level are important attributes that affect their experience. The impact on these attributes would, therefore, ultimately be reflected in a change in recreation user behavior and in economic value.

The economic evaluation of such actions as depicted in Figure 2-4 requires not only being able to identify the general cause and effect relationships, but also the marginal changes in user behavior and value that ultimately occur.

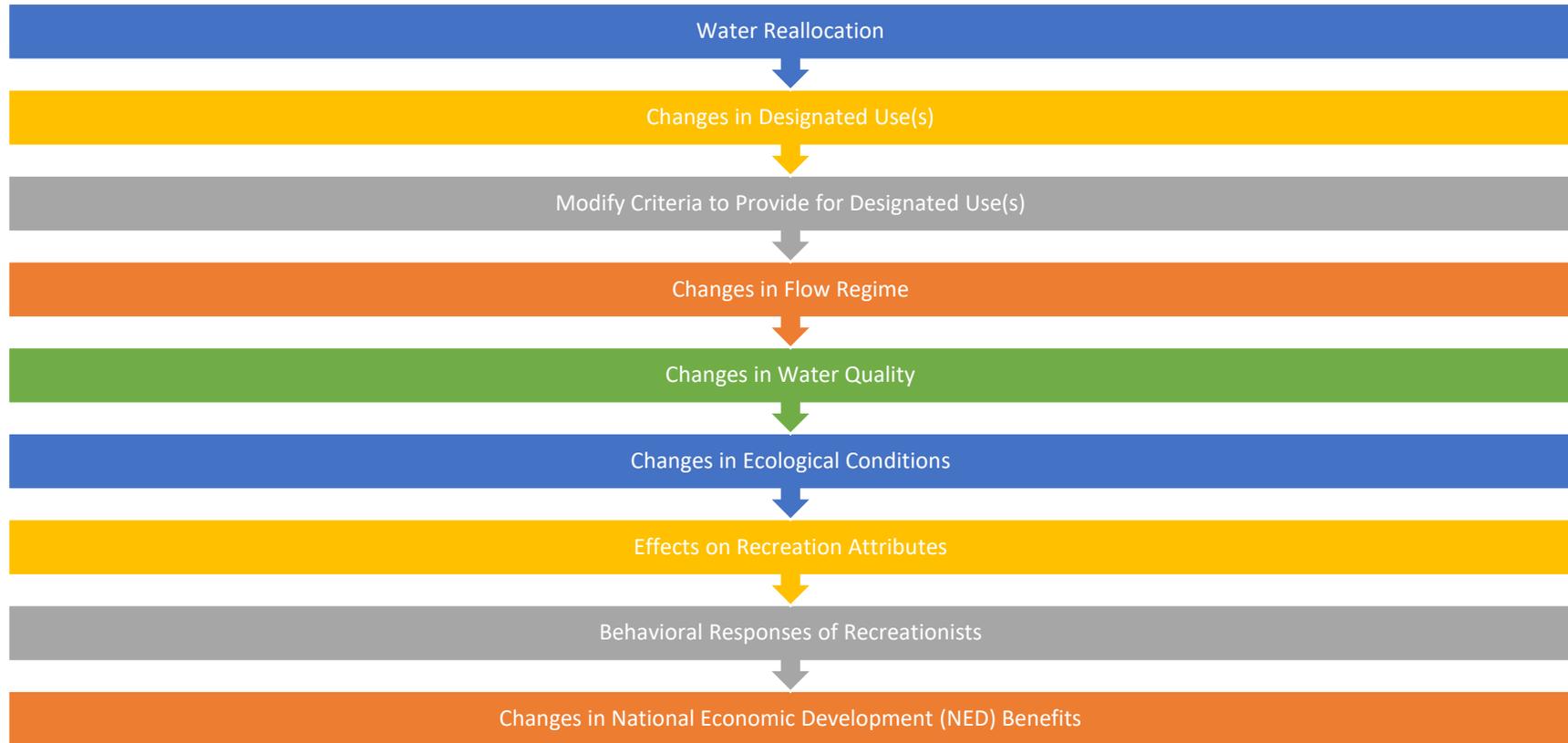


Figure 2-4: Interrelationships of Relocation of Water and Resulting Biological and Economic Effects

2.23. Recreational Value to the Nation, Florida

Economic data in FY2016 reveals that there were 267 million visits to Corps' lakes, resulting in \$8.5 billion in visitor spending within 30 miles of Corps lakes, \$5.1 billion in sales, 76,256 jobs, \$2 billion in labor income, \$2.7 billion in value added within 30 miles of Corps' lakes and \$2.3 billion in National Economic Development (NED) benefits. With multiplier effects, visitor trip spending resulted in \$10.6 billion in total spending, 96,895 jobs, about \$3 billion in labor income, \$4.4 billion in value added (wages and salaries, payroll benefits, profits, rents, and indirect business taxes).

For FY2016, a total of 772,749 tourists visited Lake Okeechobee and the OWW, generating \$27 million in visitor spending within 30 miles of the lake, \$14.7 million in sales, 220 jobs, \$6.6 million in labor income, and \$8.6 million in value added within 30 miles of the OWW Project and \$5.8 million in NED benefits. With multiplier effects, visitor trip spending resulted in \$24.3 million in total sales, 291 jobs, \$9.8 million in labor income, and \$14.2 million in value added (wages and salaries, payroll benefits, profits, rents, and indirect business taxes).

2.24. Related Recreational, Historical, and Cultural Areas

Please see Section 2.12 for Cultural Resources and Sections 2.17 and 2.20 for Recreation.

2.25. Real Estate* (Real Estate/Acquisition Policy)*

Land Management

Lands were acquired in accordance with Congressional authorizations for the construction, operation, and maintenance of the project. The appropriate land uses will consider the needs of the public interest, resource capability and suitability of the project, and applicable laws and regulations.

Land management plans identify the best public use of project lands. The intent is to enhance public awareness and provide a framework for future cooperative efforts in resource management. Land management is influenced by the following factors:

- Federal laws and regulations that place priority on flood risk management and water supply above other project uses.
- Federal land management practices coordinated with the non-Federal sponsor and other governmental agencies to prevent conflicts that may arise from land zoning and building codes of private developments.
- Protection and enhancement of fish and wildlife management areas to include threatened and endangered species.
- Protection of project lands and waters from unauthorized public use activities where regulatory permits and real estate instruments are required.
- Maintenance and retention of dredged material disposal areas where appropriate.
- Preservation and retention of unique oxbows and islands that are remnants of the pre-channelized Caloosahatchee River.
- Protection and preservation of the natural vegetation along the shoreline to prevent erosion, retard run-off, and maintain the natural scenic values.
- Protection of the water quality of the lake where appropriate.
- Assuring that future development intended uses are in line with the capability and suitability of the land and water resources as authorized for the project.

- Benefits the public interest or national defense.

Project Lands

The Okeechobee Waterway is a congressionally authorized project where lands were acquired either by the Federal government directly or by the non-Federal sponsor (South Florida Water Management District) and provided to the Federal government for the purpose of constructing drainage, flood control, water supply, and navigation. The lands include areas where the Federal government has fee title, perpetual easement rights, and other interests originally acquired for the operation and maintenance of the project and any subsequent land acquired to support the operations and authorized missions of the project. It also includes the operational structures and facilities such as the locks and dams, offices, pump stations, and other structures along the waterway. Project acreage is provided in Table 2-10: Acreages by Estate Type.

Table 2-10: Acreages by Estate Type

ESTATE	ACQUIRED ACRES	DISPOSED ACRES	CURRENT ACRES
FEE	1,040.48	88.37	952.11
EASEMENTS	26,116.81	9,216.28	16,909.99
LICENSES	0.19	0.05	0.14

The Corps will grant use of real estate, water, or natural resources when the use of the property does not conflict with the authorized purposes of the project and the goals and intent of Federal policy and legislation on the overall environmental quality. The issuance of real estate instruments are generally outgrants or consents to easement, which authorize Federal agencies, State, or local governments, private organizations, or

individuals to use Army-owned and controlled real property and administer those interests in real property. The real estate instruments specifically require compliance with applicable Federal, State, and local laws and regulations. The availability of lands and improvements for outgrant and/or consent will be determined according to AR 405-80 (Army Regulations for Management of Real Property) and ER 405-1-12 (Engineer Regulations for Real Property Management). The Determination of Availability will be made by the approving official at the delegated level of authority to preserve, conserve, restore, maintain, manage, and develop the project lands, waters, facilities, and associated resources consistent with the authorized project purposes. Any proposed non-Federal use shall be in conformance with the management plan and shall not interfere with project operations.

The Corps has the authority to regulate and manage structures within the Federal channels to maintain the navigable capacity of the waterway in accordance with Section 10 of the Rivers and Harbors Act of 1899 (33 USC §403) and Section 404 of the Clean Water Act (33 US §1344). Department of the Army Regulatory permits are required for projects located within the waters of the United States. Real Estate instruments are required for activities that occur within Federal real property interests.

The project is comprised of three (3) distinct segments: the St. Lucie Canal (C-44), Lake Okeechobee, and the Caloosahatchee River (C-43). Lake Okeechobee is a multi-purpose reservoir that is integral to the OWW and is jointly managed by the Corps and the non-Federal Sponsor, South Florida Water Management District, for flood risk management and water supply purposes. The lake is surrounded by a 34 foot high dike designed to control flooding and to increase the storage capacity for water supply to

the agricultural areas, the Everglades National Park, and the lower east coast. The lake measures approximately 35 miles from north to south and 30 miles from east to west. The St. Lucie Canal, which runs to the east from Lake Okeechobee to Stuart, Florida, and the Caloosahatchee River, which runs west from the Lake to Fort Myers, Florida, are navigable flood risk management channels. The Corps operates and maintains these waterway corridors.

Private exclusive use of project lands and waters shall continue to be prohibited, especially where sensitive resources require restrictions on public access. Recreation activities on project lands include, but are not limited to, public use parks, campgrounds, marinas, picnicking, hiking, biking trails, primitive camping, fishing, boating, wildlife observation, and interpretive activities. The Corps owns, operates, and maintains five areas for recreation. One parcel is leased to a concessionaire at Clewiston and a portion of the Moore Haven parcel is leased to Glades County as a recreation area with graded access roads and boat ramps to project waters.

2.26. Applicable Federal Laws and Directives

The following Federal statutes, other applicable laws, Executive Orders, interagency agreements, and Corps regulations affecting resource development and management have been considered during this study.

2.26.1. Public Laws

Public Law 78-534 – The Flood Control Act of 1944, as amended, authorizes the Chief of Engineers to construct, operate, and maintain public park and recreational facilities at water resource projects. It also requires that the water areas of

all such projects be open to public use for boating, fishing, and other recreation, and that ready access to and exits from such areas be maintained for general use when in the public interest.

Public Law 85-624 – The Fish and Wildlife Coordination Act of 1958, as amended, requires that wildlife conservation receive equal consideration with other features of water-resource development programs; that proposals for work affecting any body of water be coordinated with the USFWS and the State Wildlife Agency (SWA); that recommendations by the USFWS and the SWA be given full consideration; and that justifiable means and measures for wildlife purposes, including mitigation measures, be adopted. The Act requires that adequate provisions be given for the use of project lands and waters for the conservation, maintenance, and management of wildlife resources, including their development and improvement. It provides that the use of project lands for wildlife management be in accordance with the general plans approved jointly by the Department of Army, Department of the Interior, and the SWA.

Public Law 88-578 – The Land and Water Conservation Fund Act of 1965, as amended, authorizes Federal assistance to the states for planning, acquisition, and development of land and water areas for public recreation. Regulations are established for entrance and user fees.

Public Law 89-72 – The Federal Water Project Recreation Act of 1965, requires that full consideration be given to opportunities for recreation and fish and wildlife enhancement; that recreation planning be based on coordination of use with existing and planned Federal, State, and local recreation; and that non-Federal administration of recreation and enhancement areas be encouraged. It further states that, without a cost-sharing

sponsor, facilities may not be provided for recreation and fish and wildlife enhancement except those justified to serve other project purposes or as needed for public health and safety.

Public Law 90-483 – The Flood Control Act of 1968, authorizes the water resources project for Central and South Florida.

Public Law 91-190 – The National Environmental Policy Act of 1969, as amended, declares a national environmental policy and requires that all Federal agencies shall, to the fullest extent possible, use a systematic, interdisciplinary approach which integrates natural and social sciences and environmental design arts in planning and decision making. The agencies shall study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources. Ecological information shall be utilized in the planning and development of projects. An environmental impact statement shall be included in every recommendation or report on proposals for major Federal actions significantly affecting the quality of the human environment.

Public Law 92-512 – The State and Local Fiscal Assistance Act of 1972, as amended by P.L. 94-488 of 1976, provides that Revenue Sharing Funds can be made available to states and local communities. The amendment (P.L. 94-488) provides that these funds can be used as matching funds by the locals on Corps' cost sharing projects.

Public Law 89-669 – Endangered Species Act of 1973, states the congressional policy that the Secretaries of the Interior, Agriculture, and Defense shall seek to protect species of native fish and wildlife, including migratory birds, that are threatened

with extinction and, insofar as it is practicable and consistent with the primary purposes of these agencies, shall preserve the habitats of such threatened species on lands under their jurisdiction.

Public Law 93-291 – Preservation of Historic and Archaeological Data Act of 1974, permits the expenditure of up to one percent of the amount appropriated for the construction of a civil works project for the surveying, recovering, analyzing, and reporting of important data which may be lost as a result of project development under the Corps jurisdiction. This data may be of scientific, historical, archaeological, or paleontological significance.

Public Law 93-303 of 1974, on Recreational User Fees, by amending Section 4 of PL 88-578, the Land and Water Conservation Fund Act of 1965, this act allows collection of “fair and equitable” user fees for campgrounds operated on Federal lands by Federal agencies. It does not grant the Corps the authority to assess an entrance fee for general use of project resources except where specialized facilities, equipment, or services are provided.

Public Law 96-95 – the Archeological Resources Protection Act of 1979, protects archeological resources and sites which are on public lands and Indian land and fosters increased cooperation and exchange of information between government authorities, the professional community, and private individuals. It establishes requirements for issuance of permits by Federal land managers to excavate or remove any archeological resource located on public or Indian lands.

Public Law 101-336 – Americans with Disabilities Act of 1990, addresses universal accessibility guidelines and sets accessibility standards for disabled individuals which must be applied during the design, construction, or alteration of public buildings and places of business. The law also covers employment provisions, public services, public transportation, and telecommunications.

Additional authorization for development of public recreation, flood control, and navigation projects is included in Section 209 of the Flood Control Act of 1954, Section 207 of the Flood Control Act of 1962, and the Land and Water Conservation Fund Act of 1965, as amended.

Archaeological and Historic Preservation Act (“Archaeological Recovery Act”), as amended, provides for the preservation of historical and archaeological data which might otherwise be lost or destroyed as the result of flooding or any alteration of the terrain caused as a result of any Federal construction projects; for coordination with the Secretary of the Interior whenever activities may cause loss of scientific, pre-historical, historical, or archaeological data; and for expenditure of funds for recovery, protection, and data preservation.

National Historic Preservation Act, as amended, states a policy of preserving, restoring, and maintaining cultural resources and requires that Federal agencies take into account the effect of any undertaking on any site on or eligible for the National Register of Historic Places; afford the Advisory Council on Historic Preservation opportunity to comment on such undertaking; nominate eligible properties to the National Register; exercise caution in disposal and care of Federal property which might

qualify for the National Register, and provide for the maintenance of federally-owned and registered sites.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) (54 U.S.C. §306101 et. seq.), obligations regarding Corps trust responsibilities to federally-recognized Native American Tribes, and in consideration of the Burial Resources Agreement between the Corps and the Seminole Tribe of Florida, consultation is ongoing with Native American tribes having ancestral ties to this region, including the Seminole Tribe of Florida, the Seminole Nation of Oklahoma, Thlopthlocco Tribal Town, and the Miccosukee Tribe of Indians of Florida.

Archaeological Resources Protection Act of 1979, protects archaeological resources and sites which are on public lands; fosters increased cooperation and exchange of information between governmental authorities, the professional community, and private individuals; and established requirements for the issuance of permits by Federal land managers to excavate or remove any archaeological resource located on public lands.

2.26.2. Cooperative Agreements

Resolution #880 dated October 17, 1969 of the Central and Southern Flood Control District (now the South Florida Water Management District, SFWMD) acknowledges their responsibility for requirements of local cooperation as set forth in House Document No. 369, 90th Congress, 2nd Session in connection with the improvement by the Federal Government of water resources for Central and South Florida, authorized by Public Law 90-483, approved 13 August 1968.

Memorandum of Agreement dated April 18, 1973 between the Corps of Engineers and the U.S. Coast Guard clarifies areas of

jurisdiction and the responsibilities under Federal statutes to regulate certain activities in navigable waters of the United States. The agreement covers alteration of bridges; construction, operation, and maintenance of bridges and causeways; closure of waterways and restriction of passage under bridges; and design of flood flows. The agreement also requires mutual coordination and consultation on projects and activities in or affecting navigable waters.

Resolution #74-46, dated August 16, 1974 of the Central and South Florida Flood Control District (now SFWMD) indicates their intent to participate with the Corps of Engineers in the recreational development of various public use areas on the OWW and around Lake Okeechobee.

2.26.3. Executive Orders

EO-11593 provides for the protection and enhancement of the cultural environment.

EO-11990 provides for the protection of wetlands during project construction.

EO-12512 provides for a review of public lands for excessing and retention.

EO-12898 provides for environmental justice to ensure that no adverse impacts to human health or the environment occur as a result of recreation projects.

2.26.4. Corps of Engineers Regulations, Pamphlets, and Manuals

ER 200-2-300, Environmental Quality, Environmental Compliance Policies, 30 October 1996, provides a policy for the management of environmental compliance related operations and maintenance activities at Corps civil works and military projects and facilities. The environmental compliance mission is to assure that all Corps facilities and associated lands (including outgrants) meet the environmental standards contained in relevant Federal, State, and local laws and regulations. The environmental compliance mission is also related to environmental stewardship.

ER 1105-2-20, 15 May 1985, (Change 1, 18 April 1986) Project Purpose Planning Guidance (Chapter 6-Recreation), provides requirements for the inclusion of recreation as a project purpose and guidance on the types of projects and facilities allowed with appropriate Federal and non-Federal participation.

ER 1105-2-50, 29 January 1982, Environmental Resources, provides requirements for environmental resources planning, consistent with national policies both to create and maintain conditions under which the human and natural environments can exist in productive harmony, and to preserve important historic and archaeological resources.

ER 1105-2-167, 12 April 1978, Planning Resource Use: Establishment of Objectives, provides policy and guidance on establishing resource use objectives.

ER 1105-2-100, 2 April 2000, Planning Guidance Notebook, provides the overall direction by which Corps civil works projects are formulated, evaluated, and selected for implementation. It contains a description of the Corps planning process, Corps missions and programs, specific policies

applicable to each mission and program, and analytical requirements.

ER 1120-2-400, 14 August 1970, Investigation, Planning and Development of Water Resources: Federal Participation in Recreational Development, provides policies, guidelines, and procedures for insuring that protection and enhancement of recreation resources are given equal treatment with other objectives in the planning and development of water resources projects under the jurisdiction of the Corps.

ER 1130-2-400, 1 October 1983, Management of Natural Resources and Outdoor Recreation at Civil Works Water Resource Projects, provides policy and procedural guidance for the administration and management of civil works water resource projects to (a.) manage natural resources on Corps-administered land and water to insure their continued availability, (b.) provide outdoor recreation opportunities on a sustained basis and (c.) provide a safe and healthful environment for project visitors.

ER 1130-2-406, Lakeshore Management at Civil Works Projects, 31 October 1990, provides policy and guidance on the protection of desirable environmental characteristics of civil works lake projects and restoration of shorelines where degradation has occurred through private exclusive use.

ER 1130-2-500, Project Operations, Partners and Support, Work Management Policies, 27 December 1996, establishes policy for the management of operation and maintenance activities of Corps personnel performing civil works functions related to flood control, navigation, dredging, hydroelectric power

generation, environmental stewardship, and recreation services at water resource, waterway, and other Corps projects.

EP 1130-2-500, Project Operations. Partners and Support, Work Management Guidance and Procedures, 27 December 1996, establishes guidance and procedures for the management of activities at Corps water resource and development projects and supplements ER 1130-2-500.

ER 1130-2-520, Project Operations, Navigation and Dredging Operations and Maintenance Policies, 29 November 1996, establishes policy for the operation and maintenance of Corps navigation and dredging projects, as well as their related structures and equipment.

EP 1130-2-520, Project Operations, Navigation and Dredging Operations and Maintenance Guidance and Procedures, 29 Nov 1996, establishes guidance for navigation and dredging operation and maintenance regulation activities of the Corps and supplements ER 1130-2-520.

ER 1130-2-530, Project Operations, Flood Control Operations and Maintenance Policies, 30 October 1996, in addition to ER 1130-2-500, establishes policy for the operation and maintenance of Corps flood protection and related structures at civil works water resource projects and of Corps constructed flood protection projects operated and maintained by non-Federal sponsors.

ER 1130-2-540, Project Operations, Environmental Stewardship Operations and Maintenance Policies, 15 November 1996, establishes land management policy for Corps-administered

project lands and water, based on various authorizing legislation and the principles of good environmental stewardship.

EP 1130-2-540, Project Operations, Environmental Stewardship Operations and Maintenance Guidance and Procedures, 15 November 1996, establishes guidance for the management of environmental stewardship related operations and maintenance activities at Corps civil works water resources projects and supplements ER 1130-2-540.

ER 1130-2-550, Project Operations, Recreation Operations and Management Policies, 15 November 1996, as updated, establishes policy for the management of recreation programs and activities, and for the operation and maintenance of Corps recreation facilities and related structures at civil works water resource projects.

EP 1130-2-550, Project Operations, Recreation Operations and Maintenance Guidance and Procedures, 15 November 1996, establishes guidance for the management of recreation programs and activities and for the operation and maintenance of Corps recreation facilities and related structures at civil works water resource projects and supplements ER 1130-2-550.

ER 1165-2-400, Water Resources Policies and Authorities, 9 August 1985, defines the objectives, philosophies, and basic policies for the planning, development, and management of outdoor recreation and enhancement of fish and wildlife resources.

SADvR 1110-2-10, 17 April 1979, Engineering and Design: Recreation Resources Planning, Design and Management, provides consolidation of recreation resources planning, design, and management guidance.

EM 1110-2-410, Design of Recreation Areas and Facilities – Access and Circulation, 31 December 1982, presents data compiled from experience useful in the design of access and circulation to recreation sites, areas, and facilities.

2.26.5. Management Plans

Dredged Material Management Plan

Long-Range Dredged Material Management Plan for the OWW, St. Lucie Lock to Palm Beach/Hendry County Line, August 2007

Lake Okeechobee Regulation Schedule

The Central and Southern Florida Project, Water Control Plan for Lake Okeechobee and Everglades Agricultural Area, March 2008 – provides an operational plan for Lake Okeechobee and OWW projects and the Everglades Agricultural Area. LORS is regulated under a separate authority than this Master Plan, therefore, this Master Plan will not address any information regarding operations.

Shoreline Management Plan

The OWW Shoreline Management Plan (2004) is applicable to all project lands owned in fee and easement by the Corps at Lake Okeechobee and the OWW:

- The St. Lucie canal pool and shoreline from the St. Lucie Lock and Dam west to Lake Okeechobee (Port Mayaca Lock and Dam)

- Lake Okeechobee and the portion of HHD right-of-way from Port Mayaca to Moore Haven
- The Caloosahatchee River shoreline and W.P. Franklin and Ortona pools, including oxbows, from the W.P. Franklin Lock and Dam east to Lake Okeechobee (Moore Haven Lock and Dam)

Manatee Protection Plan

The Manatee Protection Plan for Water Control Structures (2013) for the development and implementation of operational protocols to ensure that structure operations do not harm or kill manatees.

Gopher Tortoise Habitat Management Plan

Gopher Tortoise Habitat Management Plan, St. Lucie Lock Recreation Area, (Draft 2017)

Invasive Plant and Habitat Management Plans

Invasive Plant and Habitat Management Plans, St. Lucie Lock Recreation Area North (2015-2020, and Moore Haven West (draft 2017)

3. Resource Objectives and Description of Alternatives

An important component of a programmatic approach to managing resources is establishing viable resource objectives; realistically attainable goals to develop, implement, use, and manage resources. These objectives serve as guidelines for attaining maximum public benefit within Corps safety guidelines and security levels (while minimizing the potential for adverse impacts) and enhancing environmental sustainability. They are developed with full consideration of authorized project purposes, applicable Federal laws and directives, resource capabilities, regional needs, plans and goals of regional and local governments, and expressed public desires. The project-wide resource objectives for the OWW project are:

- Develop and manage project lands in full cooperation and coordination with other public management agencies and appropriate private sectors
- Develop and manage project lands to support various types and levels of recreation activities consistent with carrying capacities, aesthetics, and cultural and ecological values
- Educate the public about the history of the area, project resources, and the Corps' role in developing and managing these resources
- Develop and manage project lands to support a diversity of wildlife species
- Preserve and enhance threatened and endangered species and unique, representative and important ecological and aesthetic resources

- Control encroachment on project lands and waters
- Protect and reestablish indigenous shoreline vegetation
- Maintain and manage project lands to support regional management programs
- Preserve, monitor, and protect significant cultural resource sites
- Manage resources in response to changing conditions in a developing region

Specific resource objectives for each land classification are identified in Section 4.2. Site-specific resource objectives for the individual management areas are listed in Section 5.

3.1. Description of Alternatives – Changes from the 1986 Master Plan

This Master Plan Update is addressing two potential changes from the current plan; the Moore Haven Recreation Area West Site (former campground) and the W.P. Franklin Beach. The rest of the master plan remains as it was in 1986 with regular routine maintenance type activities, as listed in Chapter 5 of this Master Plan Update. If a maintenance activity would be expected to affect any natural resources, it will be discussed within this section of the report. These potential foreseeable changes are analyzed in Chapter 6 for their effect on the natural and human environment.



Figure 3-1: Moore Haven Recreation Area West



Figure 3-2: W.P. Franklin Beach

3.2. Moore Haven Recreation Area West Site

This area was once a recreation vehicle campground maintained by lessees; since 1986 there have been 3 lessees. The recreational vehicle campground at this location is in competition with numerous parks and campgrounds which abound in the area. Competing recreation facilities in the market area are typically located near the coast where population is concentrated. On both east and west coasts, saltwater-oriented and urban facilities provide recreation opportunities for both residents and tourist, and visitation to these far exceeds visitation to other regional facilities. See appendix D for additional discussion of recreational carrying capacity. All of the previous campground infrastructure was removed from this area in 2015 through 2016 due to abandonment of the site by the lessee at a cost to the Jacksonville District of \$140 K. The structures, pool, and fuel tanks were removed by the Corps due to the dilapidated nature and potential hazard and liability these structures presented to the public. The site has been closed to the public since 2012 and is currently vegetated ground with an access road and a boat ramp.

3.2.1. Alternative 1: No Action

The No Action Alternative would leave the campground site unmaintained and abandoned as it is in its current state as vegetated open space. In the past, there have been lessees for the property, however, the economy and flood threat has not supported the means needed to maintain the campground facilities and the area has therefore been left as vegetated ground with a single lane boat ramp.

3.2.2. Alternative 2: find a lessee to construct and operate the site

Alternative 2 would entail finding a commercial entity to lease the property, reconstruct all necessary campground facilities, and operate it as a seasonal commercial campground.

3.2.3. Alternative 3: Convert the abandoned campground site to a wildlife management area with a canoe/kayak and boat launch

Alternative 3 would entail conversion of the abandoned campground at Moore Haven West to a 32 acre Wildlife Management Area and small Low Density Recreation Area with existing parking and access to the Lake Okeechobee Scenic Trail. This area could potentially include a canoe/kayak launching pier (no additional soil disturbance necessary if placed at the locations of the previous floating docks) and repair of the existing boat ramp.

3.3. W.P. Franklin Beach

Currently, W.P. Franklin Beach provides a swimming area marked by buoys. The location of the beach is between a boat ramp and the lock guide wall, which puts swimmers at risk of boat traffic. Wildlife, including alligators, are present within the area, and the liability and danger due to human/alligator interaction is a growing concern for swimmers. Degraded water quality in the general area due to coliform bacteria and harmful algae blooms resulting in beach closings and the potential for swimmers health risk is also a growing concern at this location. There is an annual cost to the Jacksonville District to maintain the sand beach area at W.P. Franklin Lock. This annual cost is approximately \$20-\$25K to maintain the sand beach area and remove trash that is drawn from the OWW recreation budget.

3.3.1. Alternative 1: No Action

The No Action Alternative would entail keeping the beach activities ongoing, including replenishing the beach with sand and maintaining the buoys and swimming area.

3.3.2. Alternative 2: Closure of swim beach

Alternative 2 would entail closing the swim beach and restoring the shoreline with native plantings. Closure of the swim beach allows for more effective allocation of limited resources to improve public safety and shoreline management. It is also a potential danger as there are no lifeguards and the swim beach is in between a boat ramp and the W.P. Franklin Lock, the water quality is often above coliform levels recommended for swimming, and wildlife, such as alligators, may be present.

3.3.3. Alternative 3: Closure of beach with additional trail access for fishing

Alternative 3 would entail removing buoys and swimming signs and the discontinuance of sand renourishment. The area would be planted with selected native vegetation providing additional access paths for shore fishermen and expanding the fishing shoreline. There is consideration on the feasibility of a canoe/kayak pier, which would be a prefabricated floating platform located within the current beach area. No additional area or soils would need to be disturbed.

3.4. Issues and Basis for Choice

The proposed changes to the Master Plan are expected to increase the recreational value of the land and better align resources with the authorized purpose of the projects.

Converting the abandoned campground at Moore Haven (Alternative 3.2.3) will save money, improve safety, and provide land and resources for the many species throughout the area. The swim beach closure at W.P. Franklin (Alternative 3.3.3) will reduce risk of harm and injury to people while maintaining access for fishing. Adding the ability to facilitate paddle craft usage at both sites will add recreational value to both facilities, which is why the Preferred Alternatives were chosen over Alternatives 3.2.2 and 3.3.2.

3.5. Preferred Alternatives

The Preferred Alternative for Moore Haven (Alternative 3) is to convert the abandoned campground site to a wildlife management area with a canoe/kayak and boat launch (Alternative 3.2.3). The preferred Alternative for W.P. Franklin (Alternative 3) is closure of the swim beach with the addition of canoe/kayak launching (Alternative 3.3.3) and additional trail access for fishing. The No Action Alternatives do not meet the objective of the Master Plan to contribute toward providing a high degree of recreation diversity and safety within the region.

4. Land Allocation, Land Classification, and Project Lands

4.1. Land Allocation

Lands were acquired in accordance with congressional authorizations for the construction, operation, and maintenance use of the project. The appropriate land uses are designated with consideration of the needs of the public interest, resource capability and suitability of the project, and applicable laws and regulations.

Lands are allocated to identify the best use of project lands. The intent is to enhance public awareness and provide a framework for future land management that is influenced by the following factors:

- Federal laws and regulations that place priority on flood risk management and water supply above other project uses.
- Federal land management practices coordinated with the non-Federal sponsor and other governmental agencies to prevent conflicts that may arise from land zoning and building codes of private developments.
- Protection and enhancement of fish and wildlife management areas to include threatened and endangered species.
- Protection of project lands and waters from unauthorized public use activities where regulatory permits and real estate instruments are required.
- Maintenance and retention of dredged material disposal areas where appropriate.

- Preservation and retention of unique oxbows and islands that are remnants of the pre-channelized Caloosahatchee River.
- Protection and preservation of the natural vegetation along the shoreline to prevent erosion, retard run-off, and improve the natural scenic values.
- Protection of the water quality of the lake where appropriate.
- Assurance that future development's intended uses are in line with the capability and suitability of the land and water resources as authorized for the project.
- Benefits the public interest or national defense.

4.2. Land Classification

Project lands are classified in four land management classifications as described below.

4.2.1. Project Operations

This classification includes those lands required for the project's safe and efficient operational structures and facilities such as locks and dams, spillways, levees, dikes, offices, storage yards, pump stations, and other areas that are used solely for operation of the project (i.e. flood control, water supply, and navigation). Limited public use and access may be permitted.

4.2.2. Recreation

This classification is for the lands that support the limited implementation of public recreational opportunities. The lands are developed for both intensive recreational activities and low density recreation. Intensive recreation areas include quasi-public development parks, day use areas, campgrounds, and/or

marinas. Low density recreation areas include hiking, biking, nature/scenic trails, boardwalks, bird watching, canoeing, primitive camping, and/or fishing access sites.

4.2.3. Fish and Wildlife

This classification is for the conservation and enhancement of fish and wildlife habitat and other aquatic life that has proven to be compatible with the land management plan. Fishing is the most popular recreation activity on the project. Lands are managed to protect threatened and endangered plant and wildlife species and to control the invasion of exotic plant species. Potential enhancement programs such as controlled burning should be considered to assist in marsh protection. Project shoreline provides vegetation important to wildlife. The emergent marsh in Lake Okeechobee has become a productive ecosystem supporting fish and wildlife populations that draw thousands of fisherman, hunters, and nature observers each year.

4.2.4. Waterway Corridor

This classification is the project’s authorized purpose for the operation and maintenance of the OWW that is not otherwise allocated for a specific public use. The lands are managed to preserve the natural vegetation along the shoreline and to prevent erosion. Protecting the aesthetic quality of shoreline vegetation along the natural corridor is essential for the navigation of the project.

4.2.5. Project Lands

The OWW is a congressionally authorized project where lands were acquired either by the Federal government directly or by the non-Federal sponsor (South Florida Water Management District) and provided to the Federal government for purposes

of constructing drainage, flood control, water supply, and navigation. The lands include areas where the Federal government has fee title, perpetual easement rights, and other interests originally acquired for the operation and maintenance of the project and any subsequent land acquired to support the operations and authorized missions of the project as depicted in Table 4-1: Acreages by Estate Type. It also includes the operational structures and facilities such as the locks and dams, offices, pump stations, and other structures along the waterway.

Table 4-1: Acreages by Estate Type

ESTATE	ACQUIRED ACRES	DISPOSED ACRES	CURRENT ACRES
FEE	1,040.48	88.37	952.11
EASEMENTS	26,116.81	9,216.28	16,909.99
LICENSES	0.19	0.05	0.14

The Corps will grant use of real estate, water, or natural resources when the use of the property does not conflict with the authorized purposes of the project and the goals and intent of Federal policy and legislation on the overall environmental quality. The issuance of real estate instruments are generally outgrants or consents to easement, which authorize Federal agencies, state, or local governments, private organizations, or individuals to use Army owned and controlled real property and administer those interests in real property. The real estate instruments specifically require compliance with applicable Federal, State, and local laws and regulations. The availability of lands and improvements for outgrant and/or consent will be determined according to AR 405-80 (Army Regulations for Management of Real Property) and ER 405-1-12 (Engineer Regulations for Real Property Management). The Determination of Availability will be made by the approving official at the

delegated level of authority to preserve, conserve, restore, maintain, manage, and develop the project lands, waters, facilities, and associated resources consistent with the authorized project purposes. Any proposed non-Federal use shall be in conformance with the management plan and shall not interfere with project operations.

The Corps has the authority to regulate and manage structures within the Federal channels to maintain the navigable capacity of the waterway in accordance with Section 10 of the Rivers and Harbors Act of 1899 (33 USC §403) and Section 404 of the Clean Water Act (33 US §1344). Department of the Army Regulatory permits are required for projects located within the waters of the United States. Real Estate instruments are required for activities that occur within Federal real property interests.

The project is comprised of three (3) distinct segments: the St. Lucie Canal (C-44), Lake Okeechobee, and the Caloosahatchee River (C-43). Lake Okeechobee is a multi-purpose reservoir that is integral to the waterway and is jointly managed by the Corps and the non-Federal Sponsor, South Florida Water Management District, for flood risk management and water supply, and navigation purposes. The lake is surrounded by a 34 foot high dike designed to control flooding and to increase storage capacity for water supply to the agricultural areas, the Everglades National Park, and the lower east coast. The lake measures approximately 35 miles from north to south and 30 miles from east to west. The St. Lucie Canal, which runs to the east from Lake Okeechobee to Stuart, Florida, and the Caloosahatchee River, which runs west from the Lake to Fort Myers, Florida, are navigable and flood risk management channels. The Corps operates and maintains these waterway corridors.

Private exclusive use of project lands and waters shall continue to be prohibited especially where sensitive resources require restrictions on public access. Recreation activities on project lands include, but are not limited to, public use parks, campgrounds, marinas, picnicking, hiking, biking trails, primitive camping, fishing, boating, wildlife observation, and interpretive activities. The Corps owns, operates, and maintains 5 areas for recreation. One (1) parcel is leased to a concessionaire at Clewiston and a portion of the Moore Haven parcel is leased to Glades County as a recreation area with graded access roads and boat ramps to project waters.

4.3. Environmentally Sensitive Areas

Environmentally sensitive areas are areas where scientific, ecological, cultural, or aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the Endangered Species Act, the National Historic Preservation Act, or applicable state statutes. These areas must be considered by management to ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands. No agricultural or grazing uses are permitted on these lands unless necessary for a specific resource management benefit, such as prairie restoration. These areas are typically distinct parcels located within another, and perhaps larger, land classification, area. A brief narrative should be provided describing the associated resource analysis and/or inventory used in making the classification. The project area does not include any lands designated as environmentally sensitive, apart from designated critical habitat for the Everglade snail kite and cultural resources sites.

4.4. Multiple Resource Management Lands

This classification allows for the designation of a predominate use as described below, with the understanding that other compatible uses may also occur on these lands (e.g. a trail through an area designated as wildlife management.). Land classification maps must reflect the predominant sub-classification, rather than just multiple resource management.

- (a) Low Density Recreation. Lands with minimal development or infrastructure that support passive public recreational use (e.g. primitive camping, fishing, hunting, trails, wildlife viewing, etc.).
- (b) Wildlife Management. Lands designated for stewardship of fish and wildlife resources.
- (c) Vegetative Management. Lands designated for stewardship of forest, prairie, and other native vegetative cover.
- (d) Future or Inactive Recreation Areas. Areas with site characteristics compatible with potential future recreational development or recreation areas that are closed. Until there is an opportunity to develop or reopen these areas, they will be managed for multiple resources.

4.5. Water Surface

If the project administers a surface water zoning program, then it should be included in the Master Plan.

- (a) Restricted Waters are areas restricted for project operations, safety, and security purposes. The only restricted waters are the ones upstream and downstream

of the dams at St Lucie, Mayaca, Ortona, and WP Franklin. These areas are marked with buoys.

(b) Designated No Wake zones are to protect environmentally sensitive shoreline areas, recreational water access areas from disturbance, and for public safety. There are slow and idle speed zones upstream and downstream of each lock. In addition, there are several bridges, boat ramps, and marinas that have similarly posted restrictions.

(c) Fish and Wildlife Sanctuary. Annual or seasonal restrictions on areas to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. None of these exist within the project area.

(d) Open Recreation. All waters are available for year round or seasonal water-based recreational use, except those designated otherwise, which are marked by buoys.

5. Resource Plan

A wide variety of factors were and continue to be considered for the continued operation or the development of the OWW/LO project lands and resources, including physical characteristics; land, lake, and waterway access, compatibility with adjacent land uses, existing and projected visitation levels and visitor-use patterns, visitor safety and project security, economics of operation and maintenance, and Federal, state, and local initiatives. The original plans for development considered the public access for fishing as the most important recreational demand in the region. Demand for access is highest near water control structures and campgrounds. The overall objective of this Resource Plan is to maximize the recreational benefits while preserving and enhancing the project area's natural resources and scenic qualities.

This Master Plan and Environmental Assessment provides a programmatic approach through the land classifications and resource objectives to allow these plans to move forward. This document also identifies any additional development needs to improve or maintain existing recreation areas within the project boundary.

Since the purpose of this Master Plan is to provide a programmatic approach to the use of project lands, it is important to examine (1) the condition and use of existing facilities and structures and (2) each Corps-managed area in order to determine how each area should be maintained, changed, or further developed to fit within the overall goals of the OWW/LO project.

The existing properties were developed to maintain quality, multiple use recreational experiences while maintaining the

environmental quality. In accordance with policy, Corps-managed projects strive to meet the demand for recreational uses that are natural resource dependent. Within the OWW/LO and C&SF project boundaries, there are seven primary project operations facilities with recreation areas, ranging from three navigation locks and dams with fully developed campgrounds to navigation and flood risk management projects providing only primitive waterway access points. Each is described in detail in this section. All are government owned lands managed by the Corps or by agreement with a partner agency. These government owned properties are also referred to as fee lands.

The remainder of this section provides a detailed description of each Corps-managed area arranged by "reach" then by primary land classification. The descriptions are organized in the following categories:

- **Management Agency** - The agency responsible for the day-to-day operation of the management area as of the date of this Master Plan.
- **Land Classification** - The designated land use classification (as defined in Section 4.2) for the management area.
- **Recommended Future Use** - The recommended future use of the management area. This may include the existing land classification, a change to a different classification, or a specific activity allowed within the land classification.
- **Rationale** - A discussion of the needs and intent of the management areas identified resource objectives.

- **Location** - A brief description of the management area's location, including visitor access points.
- **Description** - A brief description of the management area, focusing on its natural, cultural, or recreational resources.
- **Site-Specific Resource Objectives** - Identification of site-specific resource objectives that build on the project-wide resource objectives identified in Section 3 and the land classification resource objectives identified in Section 4.2 of this report. Resource objectives are attainable goals for the development, conservation, and management of natural, cultural, and manmade resources at the Corps facilities on the OWW. They establish guidelines for attaining maximum public benefit within Corps safety guidelines and security levels while minimizing the potential for adverse impacts to the local environment. Each recreation area has multiple resource objectives, but they are not prioritized. In some of the areas, the resource objectives may not be implemented for some time.
- **Development Needs** - Summary descriptions of the proposed actions to implement the resource objectives for each area. These needs, which include a range of potential construction projects and management strategies, are based on input from the public, as well as from State and Federal agencies. They will be further refined and detailed in subsequent planning and design documents, including the Operational Master Plan (OMP) and future design memorandums. Final decisions regarding the specific actions to be implemented will be made following coordination between Corps, Federal, State, and local agencies, and other interested parties, where appropriate and as opportunities arise. Prior to site-specific development, additional environmental studies will be conducted, as required.

Lands Classified as High Density Recreation Areas

There are three existing Corps properties classified as high density recreation areas along the OWW that are co-located with lock and dam operation projects. The Corps resource objectives are uniform for all high density recreation areas. From east to west, they are the South St. Lucie Recreation Area, Ortona Recreation Area, and W.P. Franklin Recreations Area. A project site such as St. Lucie Recreation Area, for example, may have multiple resource management land classifications consisting of acreage primarily classified as high density recreation south of the OWW and lands classified as low density recreation and/or wildlife management of habitat for sensitive species north of the OWW. A fourth high density recreation fee property is operated by Glades County under a Corps real estate outgrant agreement and is known as Alvin Ward Park. This outgrant is located on a larger government owned parcel adjacent to Moore Haven Dam.

Management Agency: Corps

Resource Objectives, where applicable:

- Develop Recreation Management OMP
- Maintain or update appropriate facilities for day-use and/ or camping activities.
- Maintain existing boating access levels.
- Continue to manage a volunteer workforce to be campground hosts, man visitor centers, and perform light maintenance to supplement the rangers.
- Develop and maintain native wildlife understory and habitat in more secluded areas of the parks.
- Convert some sodded areas to lower maintenance native cover with understory

- Promote non-consumptive resource use, such as nature walks and photography.
- Support consumptive resource use, such as fishing.

Rationale: The Corps will act as stewards of the land while managing recreation lands consistent with the mission statement in ER and EP 1130-2-550, 2002, Corps recreation management policy, and ER and EP 1130-2-540, Environmental Stewardship Operations and Maintenance Policies, Environmental Policy ER 200-2-3.

Lands Classified under Multiple Resource Management Lands

This classification includes specific sub-classifications. The majority of the properties managed by the Corps or with partners along the OWW or LOST fall under a one of the sub-classifications below. Land classification maps reflect the predominant sub-classification,

- (a) Low Density Recreation - minimal infrastructure, passive, or consumptive recreation.
- (b) Wildlife Management
- (c) Vegetative Management

Management Agency: The Corps

Resource Objectives, where applicable:

- Maintain trails and visitor parking areas (preferably previous parking areas).
- Maintain current waterfront access levels.
- Develop partnerships for management of environmentally sensitive habitats.

- Develop Operation Management Plan (OMP) for wildlife or vegetation management areas, continue regular inventory, adaptive management objectives, and implement site specific prescriptions and resources management in conjunction with agency partners.
- Sensitive species habitat shall be identified and accommodated with active management.
- Promote or maintain native grasslands or wildlife understory and habitat.
- Develop and effectively implement plans for control of upland invasive plant species while considering effects to sensitive species.
- Maintain or enhance wetlands habitat integrating the needs of fish and wildlife and supporting national programs.

Rationale: The Corps will prioritize the management of ecosystems, communities, and habitats identified as having special status species, consistent with the mission statement in ER and EP 1130-2-550, 2002, Corps recreation management policy, and ER and EP 1130-2-540, Environmental Stewardship Operations and Maintenance Policies, ER 200-2-3 ERGO Policy.

5.1. Caloosahatchee River

5.1.1. Ortona Lock (Recreation Area & Campground)

Location: The site is in Glades County, located between Moore Haven and LaBelle on both banks of the Caloosahatchee River. The north bank site is accessible via SR 78, while the larger south bank is accessible via SR 80.

Description: The entire site consists of 66 acres of Corps land, long, narrow and divided by the Caloosahatchee River. On the north bank of the Caloosahatchee River, there is a day use recreation area west of the lock entrance road. Amenities consist of picnic tables, a boat ramp, a comfort station, two picnic shelters, a volunteer RV site, and parking. To the east is the Ortona Lock office located on lands designated for operations. The north area presents an attractive setting with mature trees in both the recreation and lock operations areas.

On the south bank, the riverfront campground offers 51 developed camp sites, 2 comfort stations with showers, and a picnic shelter.

Constructed in 1937, the Ortona Lock's chamber is 50' by 250' and provides a lift of approximately eight feet. The dam consists of 4 bays. A drainage canal with a foot traffic bridge divides the south area. The project structures, turbulence, and steep river shoreline prohibit swimming activities.

Fishing piers on each bank are located downstream of the spillway. A central island between the lock and the spillway is usually accessible to the public.

Site Specific Resource Objectives: Maintain the diverse natural resource components of the site, such as fish, wildlife, and water resource habitat including submerged aquatic vegetation (SAV). Ensure environmental review, avoidance of wildlife impacts, and traffic management plans for any onsite construction or maintenance projects. Consideration of the large river otter population and dens, Big Cypress fox squirrel, gopher tortoise, eagle, wood stork, and other species.

Development Needs: Shoreline stabilization adjacent to the campground and replacement of marginal fishing access piers will be needed in the future, as well as the placement of a marginal pier at the day use area boat ramp. Additionally, there should be consideration on the construction of a ranger's office at the Ortona Recreation Area.

5.1.2. W.P. Franklin (Recreation Area, Campground, and Visitor Center)

Location: The site is west of Alva in Lee County, located on both banks of the Caloosahatchee River. The north bank is accessible via highway SR 78, while access to the south bank is from highway SR 80.

Description: The site includes 57 acres of Corps land and six acres of easement land in Olga. The Caloosahatchee River divides it into two areas.

Operations Lands - W.P. Franklin Lock, constructed in 1965, with a chamber of 56' by 400', provides a lift of up to approximately three feet between sea level and the western Caloosahatchee River.

The south area provides for day use with a swimming beach, picnic shelters, a boat ramp, washhouse, playground, and parking. The visitor center here also serves as an area office for resource management. There is a volunteer village with nine RV campsites with full hookups. A campsite at the day use entrance is provided for a volunteer day host.

The north area is an island between the old river channel and the spillway and has an unobstructed view up and down the river. The north side offers boat launching facilities, a 38 site campground with a washhouse, boat-in camping, a picnic shelter, and a fishing pier/viewing platform. Fishing is reported to be good downstream of the spillway and fisherman also use the spillway abutment as a fishing pier.

Multiple Resource Management Lands

The approximately 10-acre parcel of land on the south side acquired from the SFWMD remains undeveloped in sod with some overstory of trees. The acreage is classified as multiple resource management lands with a vegetation management sub-classification and could be restored as habitat, a created stream project to filter stormwater runoff from nearby ditches, or left for passive recreational purposes.

Refer to Chapter 6 for an alternative analysis of existing amenities.

Site Specific Objectives: The general resource objections listed for lands classified as high density recreation areas and multiple resource management areas. Additionally, exploration of the feasibility of an engineering with nature initiative project may be considered.

Development Needs: Re-slope and vegetate the southwest shoreline with mangrove and saltmarsh plants to stabilize the area of the swimming beach. Consideration of altering boat ramp access.

5.2. Lake Okeechobee/HHD/Lake Okeechobee Scenic Trail

5.2.1. Alvin Ward Park (Moore Haven East) (defined boundaries within a larger parcel)

Management Agency: Outgrant agreement with Glades County

Land Classification: High Density Recreation

Resource Objectives: Ensure property and water access recreation facilities are maintained by Glades County in accordance with agreement requirements, regulation, and Corps policy.

Rationale: The Corps will act as stewards of the land while managing recreation lands consistent with the mission statement in ER and EP 1130-2-550, 2002 and Corps recreation management policy.

Location: The recreation area with boat launching facilities is in Glades County, on the Rim Canal portion of the OWW, just east of Moore Haven Dam and accessible from Highway US-27.

Multiple Resource Management Lands

Moore Haven East - A government owned parcel managed by the Corps that consists of 25.42 acres of uplands and 42.68 acres of enhanced uplands and wetlands contiguous with Alvin Ward Park. The area is classified as a wildlife and vegetation management area. There was a HHD related mitigation commitment over the wetlands restoration area within this acreage. Management of invasive plants is required.

Development Needs: This "East" mitigation site needs to be recorded with real estate and the county.

Description: The site features utilities, a picnic shelter, restrooms, boat and airboat launches and courtesy piers, multi-purpose play fields, security building, fishing pier, parking, and LOST access.

Site Specific Objectives: Improve environmental practices and maintenance and coordination with the real estate division, SFOO, and the grantee.

Development Needs: Alvin Ward Park has many user groups and may develop conflicts if further development occurs.

5.2.2. Jolly Roger Marina, Clewiston Marina

Management Agency: Corps lease agreement with commercial enterprise.

Land Classification: High Density Recreation

Resource Objectives: Ensure property and recreation facilities are maintained by Jolly Rover Marina in accordance with Corps real estate agreement requirements, regulation, and policy.

Rationale: The Corps will act as stewards of the land while managing recreation lands consistent with the mission statement in ER and EP 1130-2-550, 2002 and Corps recreation management policy.

Location: The commercially operated marina is located in Hendry County accessible from Highway 27 and the OWW through the Clewiston Lock. The marina is located contiguous to the Clewiston, SFOO and Maintenance compound property.

Description: A small commercial marina operation featuring covered boat slips, boat rentals, a store, and repair facilities.

Development Needs: Consider disposing of surplus property.

5.2.3. The Lake Okeechobee Scenic Trail Partnership

Management Agency: Corps, Department of Transportation

Land Classification: Multiple Resource Management Lands, Low Density Recreation

Recommended Future Use: Recreation

Rationale: In accordance with recreational uses and partnership agreement.

Description: The Lake Okeechobee Scenic Trail (LOST) is part of the Florida National Scenic Trail. It encircles Lake Okeechobee utilizing the crown road on the HHD. The length

of the trail is approximately 110 miles. Marginal fishing piers are maintained by the Corps on the downstream bank of S-351 Belle Glade and S-77.

Site Specific Objectives: Continue to have Corps' contractors support recreation by mowing and removing solid waste at major access points along the LOST trail including: C-10, S-351, S-252, S-354, Port Mayaca Recreation Area, Belle Glade, and Canal Point.

Develop partnerships or use volunteers to manage kiosks and shelters along the LOST.

Development Needs: HHD contractors will replace segments of pavement that were removed for construction where cost effective.

5.2.4. Moore Haven Recreation Area, West

Management Agency: Corps

Land Classification: Future or Inactive Recreation

Recommended Future Use: Multiple resource management lands, subdivided into, primarily, a wildlife management area with the easternmost area immediately surrounding the canal basin classified as low density recreation. For this region, this is rare upland native grass habitat utilized by a suite of ground or palm nesting bird species including the bobwhite quail and crested caracara.

Rationale: The Corps will prioritize the management of ecosystems, communities, and habitats identified as having special status species consistent with the mission statement in

ER and EP 1130-2-550, 2002, Corps recreation management policy, and ER and EP 1130-2-540, Environmental Stewardship Operations and Maintenance Policies, ER 200-2-3 ERGO Policy and Partners in Flight Initiatives.

Location: Located in Glades County, in the City of Moore Haven, access to the site is from US 27, off 1st Street or from Hwy 78 North, then to the end of Canal Road.

Multiple Resource Management Lands

Description: Moore Haven West Multiple Resource Management Area is located immediately adjacent to the Moore Haven Lock compound. It currently consists primarily of native grasses and successional vegetation where campground infrastructure was removed. Invasive species treatment took place in 2016 and few exotic plants remain.

A major portion of the west bank of the site was previously under a concession lease as a small marina with waterfront fuel sales and a campground with 139 RV sites primarily with full hookups using septic. A boat ramp constructed by the Corps was previously maintained by the concessionaire. The site was abandoned by the concessionaire and required extensive cleanup and remediation due to public safety and environmental concerns.

Operations Lands - Moore Haven Lock and Spillway (S-77), includes a wide portion of the dike berm on the Rim Canal where the lock operations office and other facilities are located. A historic structure constructed in 1935, the Moore Haven Lock provides a chamber of 50' by 250' with a range of lift of two to seven feet depending on lake level. It controls flow between

Lake Okeechobee and the Caloosahatchee River. There is a central island between the lock and the spillway. The entire government owned property consists of 150 acres of Corps land and 39 acres of easement land. The Caloosahatchee River divides the property into west and east areas. Both banks of the property offer access to LOST. The eastern site has a fishing pier downstream of the spillway. Both banks of the property will be impacted by the current Herbert Hoover Dike safety enhancement project that is underway. The possibility of the west site being used for construction staging has been discussed. The impacted areas will be returned to preconstruction conditions upon project work completion. The impacted areas will need to be assessed and evaluated for any needed efforts to return the lands to designated uses.

Site Specific Objectives:

- Develop partnerships for management of environmentally sensitive habitats.
- Develop OMP for wildlife or vegetation management areas, continue regular inventory, adaptive management objectives, and implement site specific prescriptions and resources management in conjunction with agency partners.
- Sensitive species habitat shall be identified and accommodated with active management.
- Promote or maintain native grasslands or wildlife understory and habitat.
- Develop and effectively implement plans for control of upland invasive plant species while considering the effects to sensitive species.

Resource Needs: Native ground cover could be enhanced with some disturbed substrate smoothing and seeding of native

grasses. The majority of the Moore Haven West acreage supports about a dozen breeding upland grassland bird species. Planting trees and tall shrubs surrounding the grasslands should be avoided since they provide perches for predators. Herbicide treatment should be funded annually or provided in-house, to avoid establishment of invasive grass cover. The site specific prescription should be completed.

Development Needs: Consideration should be made for the future replacement of the boat ramp for public or project operations purposes. Consideration of a composting toilet or a requirement for group primitive camping to provide portables. Only low impact or passive recreation activities should be allowed so native grassland and other bird species will not be impacted.

5.2.5. Port Mayaca Lock Recreation Area

Management Agency: Corps

Land Classification: Low Density Recreation

Recommended Future Use: No Change

Rationale: Same as those for Multiple Resource Management Lands.

Location: The site is west of Indiantown in Martin County on US 441 and is divided into two parcels by the St. Lucie Canal. Access is via US 441/98 to the north bank and from SR 76 to the south bank.

Description: The site consists of 41 acres of Corps land.

Operations Lands - Constructed in 1977, the Port Mayaca Lock Chamber is 56' by 400' and provided an average two foot lift between the St. Lucie Canal and Lake Okeechobee, unless lake or river levels are high.

There are no developed recreational facilities with the exception of one hardened surface boat ramp on the north side of the canal. There is ample parking on the levee berms and the public regularly fish inside the basin near the spillway. There are three benches available for visitors. The lake's shoreline is protected by the shoreline revetment. The site is without trees as it is part of the levee system thus affords unobstructed views of the lake. The site serves as a recreational fishing area, news broadcast site, boat access, and an access and parking area for LOST.

Site Specific Objectives: Maintenance of the boat ramp. Control of the spread of invasive, exotic reptiles such as the red-headed agama lizard that are becoming established on the HHD levee in Martin County.

Development Needs: N/A

5.2.6. South Florida Operations Office (SFOO)

Management Agency: Corps

Land Classification: Project Operations, Recreation Access

Location: The SFOO is in Hendry County on Ridgelawn Road accessible via highway US 27 or by water via the Rim Canal in Clewiston.

Description: The site, located on the Clewiston Canal, is the main operations center for the CS&F and OWW projects

consisting of office space, a work compound with warehouses, tug basin, and the lower yard for heavy equipment and equipment storage. It provides a small visitors lobby and LOST access and parking. Several historic buildings remain on the project site including the main office, some out buildings, and a Quonset hut structure that housed prisoners-of-war during World War II.

Site Specific Objectives: SFOO has a large population of green iguanas and brown basilisk lizards that have become established on the compound. They are spreading to natural marsh habitat near the Federal facility. In accordance with Executive Order 13112, directing Federal agencies to address invasive exotic species, the Corps has entered into an agreement with the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, for the control of invasive reptiles.

Development Needs: N/A

5.3. St Lucie River

5.3.1. St Lucie Lock (Recreation Area, Campground, and Visitors Center).

Management Agency: Corps

Land Classification: Project Operations, Recreation

Recommended Future Use: Project Operations, Recreation, Multiple Resource Management.

Rationale: Same rationale for High Density Recreation areas and Multiple Resource Management areas.

Location: The site is just west of Jupiter in Martin County, along the southern shore of the St. Lucie Canal via access from highway SR 76.

Description: The site consists of about 155 acres of Corps land west of Jupiter. The St Lucie Canal divides it into two parcels. St. Lucie South is located on the south bank and is about 34 acres, consisting of a campground with 9 RV and 3 tent sites with 8 additional boat-in campsites, a volunteer village with RV hookups, a day use area, and a visitor center. The South Recreation Area offers a playground and mature trees providing beneficial shade.

Operations Lands – The St. Lucie Lock and spillway was completed in 1944. The lock chamber is 50' by 250' and provides a lift of approximately 14.5' between sea level and the St. Lucie Canal. The 1920's lock, and a more recent powerhouse, remain as part of the newer structure.

Multiple Resource Management Lands

The parcel on the north bank of the St. Lucie canal is classified as multiple resource management lands. The north bank is approximately 121 acres accessible by foot across the lock and provides a picnic shelter, tables, fishing pier, and two self-guided nature trails. The sodded central area, closest to the canal, is managed as low density recreation allowing primitive camping for groups or day use. The rest of the property is primarily managed for wildlife and vegetation and has 2 hiking trails that traverse slash pine flatwoods. There are two areas totaling approximately 5-7 acres that are maintained with succession vegetation and shrubs for gopher tortoises. The forested areas have a creek flowing thru the western section.

The site provides scenic vistas of the canal. Steep canal banks restrict the development of swimming areas. Fishing is popular on both banks of the spillway.

Site Specific Objectives: Due to the dense population of gopher tortoises at St. Lucie North, special management plans should be developed. Continue with the 2016 prescription for management in gopher tortoise habitat and with keeping some successional habitat. Encourage some light pine overstory to shade out invasive grasses. Develop partnerships with county and wildlife agencies to manage St. Lucie North in such a way as to assist with recovery of the gopher tortoise. Continue to seek funds for control of exotic vegetation and opening up the denser forested habitat.

Development Needs: Narrow the width of roadways in St. Lucie North. Reduce mowing to only the trails and sodded areas. At St. Lucie South, maintain or replace amenities in accordance with operational ER and OCA results.

Table 5-1: OWW Recreational Facilities managed by Others

	OWW Recreational Facilities managed by Others	Corps of Engineers	Campsites w/ Electric	Campsites w/o Electric	Showers	Restrooms	Drinking Water	Sanitary Dump Station	Picnic/Day Use	Launch Ramp	Marina	Boat-In Campground	Visitor Information	Fishing Pier
1	Alva Access Area									*				
2	Bob Mason Park					*			*					
	LaBelle Access Area					*			*	*				
3	LaBelle City Boat Docks											*		
	Barron Park					*	*		*					
5	Belle Hatchee Marina					*	*			*	*			
6	Port LaBelle Marina				*	*	*	*			*			
9	Old Sportsman's Village								*	*				
10	Fisheating Creek									*				
11	Harney Pond Canal					*	*		*	*				
12	Bare Beach									*				
13	Indian Prairie Canal									*				
14	Okee-Tantie					*	*	*	*	*	*			
15	C. Scott Driver Jr.					*	*			*				
16	Okeechobee, Lock 7					*	*		*	*				*
17	Nubbin Slough									*				
18	Henry Creek									*				
19	Chancy Bay									*				
20	Canal Point	*							*	*				
21	Pahokee		*		*	*	*	*	*	*	*	*	*	*

	OWW Recreational Facilities managed by Others	Corps of Engineers	Campsites w/ Electric	Campsites w/o Electric	Showers	Restrooms	Drinking Water	Sanitary Dump Station	Picnic/Day Use	Launch Ramp	Marina	Boat-In Campground	Visitor Information	Fishing Pier
22	Paul Rardin Park					*	*		*	*				
23	Belle Glade		*		*	*	*	*	*	*				
24	South Bay		*		*	*	*	*	*	*				*
25	John Stretch Park					*	*	*	*	*				
26	Clewiston Park					*			*	*				*
27	Liberty Point		*	*	*	*	*	*	*	*				
28	Alvin Sard Sr.					*	*		*	*				*
29	Port Mayaca Wayside Park								*					
30	Indiantown Marina		*	*	*	*	*		*	*	*	*		
31	Timer Powers Park				*	*			*	*				
32	Phipps Martin County Park		*	*	*	*	*	*	*	*				

6. Special topics/issues/considerations – NEPA analysis

This section of the Master Plan includes the analysis of environmental effects on different resources. The Alternatives are described in Chapter 3.

6.1. Evaluation of Alternatives/Environmental Effects

This section will describe the environmental effects first on the Moore Haven Recreation Area West Site Alternatives, then on the W.P. Franklin Beach Alternatives for each resource. The Preferred Alternatives are converting the Moore Haven Recreation Area West Site (former RV campground) to a wildlife management area with the addition of a canoe/kayak launch and closure of the W.P. Franklin Beach with the potential for the addition of a canoe/kayak launch.

6.2. Soils

6.2.1. Moore Haven Recreation Area West site

All Alternatives

The soils in the Lake Okeechobee region would remain the same as existing conditions for all alternatives. No additional soil disturbance is necessary where floating docks were previously secured. Restoring grasses to previously disturbed camp pad sites to smooth ridges can be accomplished in soils by dragging a chain harrow. Subsidence of adjacent agricultural lands is expected to continue as a result of oxidation of soils.

6.2.2. W.P Franklin Beach

All Alternatives

The soils in the Lake Okeechobee region would remain the same as existing conditions for all alternatives. Subsidence of

adjacent agricultural lands is expected to continue as a result of oxidation of soils.

6.3. Land Use/recreation

6.3.1. Moore Haven Recreation Area West site

6.3.1.1. No Action

The No Action Alternative would result in the campground remaining unmaintained in the area. The unmaintained campground does not provide recreational activities for the public.

6.3.1.2. Alternative 2: Restore the campground site

This area has been leased out to multiple entities as a campground, however, the economics of the area do not seem to support this use. The lessees have abandoned the campground and have not renewed their leases, therefore resulting in unused land.

6.3.1.3. Alternative 3: Convert the abandoned campground to a wildlife management area and add a canoe/kayak launch

Removal of the campsites and replacement of the area with native plantings in order to convert it to a wildlife management area. This would provide recreational opportunities, such as birding and walking throughout the 32 acres. The addition of a canoe/kayak launch would allow for additional recreational use of the area.

6.3.2. W.P. Franklin Beach

6.3.2.1. No Action

No action would result in the swim beach remaining in operation through the Corps. The location of the beach and swim area is between a boat ramp and the lock.

6.3.2.2. Alternatives 2 and 3

Alternatives 2 and 3 would result in closing the swim area by removing the buoys and replanting the beach with native plants to restore the shoreline. In addition to plantings, Alternative 3 would add access paths for fishermen and a canoe/kayak launch. Closing the swimming beach as a federally maintained beach would not result in closure of the recreational area as a whole. The public use this area for birthday parties and fishing, which would still be available. Additional access to the shoreline for fishermen and paddle craft (canoes and kayaks) could increase the recreational opportunity in the area.

6.4. Hydrology and Hydraulics

The hydrology and hydraulics would remain essentially unchanged for all alternatives for the Moore Haven Recreation Area West Site and the W.P. Franklin Beach.

6.5. Water Quality

Water quality would remain unchanged for the No Action Alternative and all other alternatives for the Moore Haven Recreation Area West and the W.P. Franklin Beach. The water quality within the beach area at W.P. Franklin has been poor for the last several years, resulting in 27 beach closures in the last two years.

6.6. Wetlands

Wetlands would not be effected by the No Action or Action Alternatives for either the Moore Haven Recreation Area West Site or the W.P. Franklin Beach.

6.7. Threatened and Endangered Species

The Corps is seeking concurrence from the USFWS on the Corps' species effect determinations documented in this EA through the 60 day NEPA public review period. The Corps coordinated via email with the USFWS on February 12, 2018 (Appendix B). The Corps expects there to be No Effect to any listed species based on the update to the Master Plan and as a result of any of the Alternatives for the Moore Haven Recreation Area West Site or the W.P. Franklin Beach Closure. However, if the Corps decides to pursue installation of a canoe/kayak launches, they will initiate consultation for potential effects to Essential Fish Habitat (EFH), smalltooth sawfish (National Marine Fisheries Service), and manatees based upon Corps of Engineers, Jacksonville District, and State of Florida Effect Determination Key for the Manatee in Florida, 2013. Use of the Key resulted in the following sequential determination: B. (7) may affect determination for any type of in-water activity, since the Franklin Lock is classified as a manatee "Warm Water Aggregation Area".

The Action and No Action Alternatives would not be expected to affect threatened and endangered species in either the W.P. Franklin Beach or the Moore Haven Recreation Area West Site. The addition of potential native plants in the Action Alternatives could provide more forage and refuge for State and federally listed species.

All standard protection measures for the Eastern indigo snake and West Indian manatee, and all other guidelines for species are required to be followed for routine maintenance and construction activities. Routine maintenance activities includes removal of invasive species, where pre-clearing surveys should be completed for Big Cypress fox squirrel and gopher tortoise and their burrows. Any other actions would need to be coordinated with the USFWS to determine effects.

6.8. Noise

Noise sources and levels are not expected to change as a result of the No Action Alternative or Action Alternatives for the Moore Haven Recreation Area West Site or the W.P. Franklin Beach.

6.9. Air Quality

The No Action or Action Alternatives would not affect air quality for the Moore Haven Recreation Area West or the W.P. Franklin Beach. Relative to the existing condition, it is expected that traffic and other practices affecting air quality would increase marginally in most of the study area due to expected population growth.

6.10. Socioeconomics

6.10.1. Moore Haven Recreation Area West Site

The No Action Alternative would result in the campground remaining unmaintained in the area, therefore diminishing recreational activities for the public and possibly reducing economic activity in the study area.

Alternatives 2 and 3 may result in socioeconomic impacts in the form of jobs and other economic benefits; however, some of these jobs may be temporary in nature. The addition of a canoe/kayak launch would allow for additional public day use of the area along with other recreational opportunities such as birding and walking/hiking.

6.10.2. W.P. Franklin Beach

The No Action Alternative would not result in any changes to socioeconomics in the project area. The No Action Alternative would result in the swim beach remaining in operation through the Corps.

Alternatives 2 and 3 would result in closing a beach that people use to swim. Because the Corps is responsible for this land and feature, it is expected to be safe, however, there is no lifeguard and there is potentially dangerous wildlife, such as alligators, in the area. Closure of the beach would not result in closure of the whole area; recreational opportunities in the area could increase with additional access to shoreline for fishermen and paddle boats.

6.11. Public Safety

6.11.1. Moore Haven Recreation Area West site

The No Action Alternative or the Action Alternatives would not be expected to affect public safety in the area.

6.11.2. W.P. Franklin Beach

The No Action Alternative leaves the public beach access as is. The swimming area is located in between the lock and the boat ramp, potentially lending to public safety risks. There is also

risk of wildlife, such as alligators, that could harm swimmers in the area. The Action Alternatives would close the beach, therefore removing that risk.

6.12. Real Estate

No project lands would need to be acquired to implement the No Action or Action Alternatives.

6.13. Aesthetic Resources

6.13.1. Moore Haven Recreation Area West site

With the No Action Alternative, the campground site would remain bare ground and unmanaged. Alternatives 2 and 3 would provide a wildlife area that would be more aesthetically pleasing to walk through and/or drive by.

6.13.2. W.P. Franklin Beach

The No Action Alternative would not alter the existing aesthetics of the swim beach. Alternatives 2 and 3 would provide the area with native plants along the shoreline rather than a sandy beach.

6.14. Cultural Resources

6.14.1. Moore Haven Recreation Area West site

The Moore Haven Lock and Dam complex are the only known cultural resources listed or eligible for listing in the NRHP within the old campground. The Moore Haven Lock and Dam were mitigated as part of a HABS/HAER Level 2 survey. There are no previously recorded archaeological sites within the area of the Moore Haven Recreation Area West. Completion of a

cultural resource survey may be required prior to any ground disturbance activities at this location.

6.14.1.1. Alternative 1

The No Action Alternative would have no effect on archaeological sites eligible for listing in the NHRP.

6.14.1.2. Alternative 2

The restoration of the above ground facilities of the campground would have no effect to historic properties eligible for listing in the NHRP.

6.14.1.3. Alternative 3.

The removal of below-ground infrastructure has the potential to adversely affect archaeological sites eligible for listing in the NHRP, if present. If the Corps decides to pursue ground-disturbing activities, consultation with the Florida SHPO and appropriate federally-recognized tribes would be required prior to the expenditure of Federal funds. As a result of this consultation, a cultural resource survey of the property may be required.

6.14.2. W.P. Franklin Beach

There are no known archaeological sites within the vicinity of the W.P. Franklin Beach. The W.P. Franklin Lock and Dam are the only known cultural resources listed, or eligible for listing, in the NRHP at the W.P. Franklin Beach.

6.14.2.1. Alternative 1

No action would result in the swim beach remaining in operation through the Corps. This action would not adversely affect historic properties eligible for listing in the NHRP.

6.14.2.2. Alternative 2

This alternative would result in closing the swim area by removing the buoys and replanting the beach with native plants to restore the shoreline. This action would not adversely affect historic properties eligible for listing in the NHRP.

6.14.2.3. Alternative 3

The installation of access paths and a kayak/boat launch has the potential to adversely affect archaeological sites eligible for listing in the NHRP if present. If the Corps decides to pursue ground-disturbing activities, consultation with the Florida SHPO and appropriate federally-recognized tribes would be required prior to the expenditure of Federal funds. As a result of this consultation, a cultural resource survey of the property may be required.

6.15. Tribal Resources

No portion of the proposed action is located within or adjacent to known Native American-owned lands, reservation lands, or Traditional Cultural Properties. Their descendants continue to live within the State of Florida and throughout the United States.

6.15.1. Moore Haven Recreation Area West site

Native Americans would not be effected by Alternatives 1 and 2. Alternative 3 has the potential to adversely affect archaeological sites eligible for listing in the NHRP, if present. If the Corps decides to pursue ground-disturbing activities, consultation with the appropriate federally-recognized tribes would be required prior to the expenditure of Federal funds. As a result of this consultation, a cultural resource survey of the property may be required.

6.15.2. W.P. Franklin Beach

Native Americans would not be effected by Alternatives 1 and 2. Alternative 3 has the potential to adversely affect archaeological sites eligible for listing in the NHRP, if present. If the Corps decides to pursue ground-disturbing activities, consultation with the appropriate federally-recognized tribes would be required prior to the expenditure of Federal funds. As a result of this consultation, a cultural resource survey of the property may be required.

6.16. Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable commitments include resources that would not be able to be replaced upon removal due to the proposed project. The proposed project would not cause permanent removal or consumption of any renewable resources.

6.17. Unavoidable Adverse Environmental Effects

No adverse environmental effects are expected to occur due to closing the beach or creating a wildlife management area at Moore Haven Recreation Area West Site.

6.18. Conflicts and Controversy

Areas of conflict or controversy were not identified based upon input received thus far through a scoping letter sent on August 31, 2017. Comments to the scoping letter were received and responded to and are located in Appendix B – Public Involvement and Pertinent Correspondence . There may be concerns regarding the beach closure from local community members with children that swim at the beach at W.P. Franklin. Recreational user groups will have opportunities to express any concerns during this 60-day comment period and during a public meeting, expected to occur in August. Circulation of the scoping letter, this EA, and the proposed FONSI will provide people with an opportunity to express concerns with any of the elements within the Master Plan.

6.19. Environmental Commitments

Regular maintenance activities for the recreational uses within the Master Plan include, but are not limited to, clearing of invasive plant species, easement boundary clearing, small construction projects such as building of ranger facilities, and mowing grasses. These activities would not be expected to have negative environmental effects on the resources listed within this master plan update; they are typically activities to improve recreation or wildlife management. Any clearing, mowing, mechanical or chemical removal of invasive species, or regular maintenance activities should have preconstruction surveys for endangered species on site. Such plans will be reviewed by the South Florida Operations Biologist for potential impacts. Any in-water work will incorporate provisions within the Jacksonville District Manatee Protection Plan and Standard Construction Conditions. The contractor, or person performing the activities will be provided the standard protection measures

for threatened and endangered species on site, and should contact the South Florida Operations Biologist, USFWS or FWC upon discovery of species. Current consultation protocol and standard protection measures for threatened or endangered species can be found at: <http://www.saj.usace.army.mil/Missions/Regulatory/Source-Book>. Standard Protection Measures for the eastern indigo snake, Florida bonneted bat, and Florida manatee are included in Appendix C of this Master Plan.

The Corps and contractors commit to avoiding, minimizing, or mitigating for adverse effects during construction activities by taking the following actions:

1. Employ best management practices with regard to erosion and turbidity control in accordance with Federal and State requirements. Prior to maintenance activities or construction, the Corps should examine all areas of proposed erosion/turbidity control in the field, and make adjustments to the plan specified as warranted by actual field conditions at the time of construction or other work.
2. Contract specifications will require management of hazardous materials, oil, fuel, or hazardous wastes in the work area in accordance with regulation and Corps policy and will require that the contractor adopt safe and sanitary measures for the disposal of solid wastes. The contractor will be required to prepare a spill prevention plan.
3. Demolition debris would be transported to a landfill or otherwise disposed of in accordance with Federal, State, and local requirements. Concrete or paving materials

would be disposed of in accordance with Federal, State, and local requirements.

4. Inform all personnel of the potential presence of threatened and endangered species in the project area, the need for precautionary measures, and the ESA prohibition on taking listed species, including preparation of a traffic plan.
5. Incorporate in plans or contracts any commitments required by the appropriate regulatory agencies identified during the BCOE, NEPA, and ESA process.
6. The Corps or their contractor will prepare an environmental protection plan and provide a tailgate training for listed species onsite.

6.20. Cumulative Effects

Cumulative effects are defined in 40 CFR 1508.7 as those effects that result from:

...the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Cumulative environmental effects for the proposed project were assessed in accordance with guidance provided by the President's Council on Environmental Quality (CEQ).

Regular maintenance activities for the recreational uses within the Master Plan include, but are not limited to, clearing of invasive species, small construction projects such as building of ranger facilities, and mowing grasses. If the activities follow the clearing and construction protocol for threatened and endangered species, these activities would not result in negative cumulative effects. Removal of invasive species would be a positive effect throughout the project area. The proposed actions within this EA would improve public health and safety and potentially increase the recreational value of the area.

The following table includes a description of past, present, and reasonably foreseeable future projects within and around the project area.

Table 6-1: Past, Present, and Reasonably Foreseeable Future Projects

	Past Actions/Authorized Plans	Current Actions and Operating Plans	Reasonably Foreseeable Future Actions and Plans
Status of Non-CERP Projects	<ul style="list-style-type: none"> - C&SF Project (1948) - ENP Protection and Expansion Act (1989) - MWD GDM and Final EIS (1992) - C-111 South Dade GRR (1994) -Herbert Hoover Dike (HHD) Culvert Replacement (2010) -HHD Dam Safety Modification Study (2015) 	<ul style="list-style-type: none"> - MWD 8.5 SMA GRR (2000) - MWD Tamiami Trail Modifications Limited Reevaluation Report (2008) - C&SF C-51 West End Flood Control Project - Kissimmee River Restoration - Seepage Barrier near the L-31 N Levee (Miami-Dade Limestone Products Association) - Tamiami Trail Modifications Next Steps (TTMNS) Project - SFWMD Florida Bay Initiatives 	<ul style="list-style-type: none"> - SFWMD Restoration Strategies Project - MWD Closeout - C-111 South Dade Project (Contracts 8, 8A, and 9)
Operations Plan for Lake Okeechobee, WCA 3A, ENP and the SDCS	<ul style="list-style-type: none"> - Water Supply and Environment (WSE) Lake Okeechobee Regulation Schedule (2000) - IOP 2002 to Present 	<ul style="list-style-type: none"> - Lake Okeechobee Regulation Schedule (LORS 2008) - SFWMD LEC Regional Water Supply Plan - Everglades Restoration Transition Plan (ERTP) October 2012 to present; deviation includes Increment 1 and Increment 1.1 and 1.2 and 2.0 Operational Strategies - Herbert Hoover Dike Dam Safety Modification Study (HHD DSMS) risk reduction measures (2011 through 2025) 	<ul style="list-style-type: none"> - LORS 2008 to be replaced by revised Lake Okeechobee Regulation Schedule by 2024-2025 (per Integrated Delivery Schedule) - SFWMD periodically revises the LEC Regional Water Supply Interim Plan - ERTP to be replaced by COP to be anticipated 2020 to include MWD and C-111 components.

	Past Actions/Authorized Plans	Current Actions and Operating Plans	Reasonably Foreseeable Future Actions and Plans
CERP Projects		Congressional Authorization Received: - Broward County Water Preserve Areas Project - Caloosahatchee River (C-43) West Basin Storage Reservoir - Central Everglades Planning Projects Congressional Authorization Received and Construction in Progress: - Indian River Lagoon-South Project - Picayune Strand Restoration Project - Site 1 Impoundment Project - Biscayne Bay Coastal Wetlands Project - C-111 Spreader Canal Western Project (operated by SFWMD)	- Future CERP Projects (Lake Okeechobee Watershed Restoration Project, Western Everglades Restoration Project) -Section 203 Everglades Agricultural Area Southern Reservoir and Stormwater Treatment Area - CEPP PPA South , including DOI removal of portions of the old Tamiami Trail roadway and SFWMD construction of the increased S-333 structure

7. Environmental Compliance

The Preferred Alternatives were considered in relation to compliance with Federal environmental review and consultation requirements. The following paragraphs document compliance with applicable Federal statutes, Executive Orders, and policies.

CLEAN AIR ACT OF 1972, AS AMENDED

This project would be coordinated with FDEP, Air Quality Division, and EPA. No air quality permits are required, and no permanent sources of air emissions are part of the Preferred Alternatives. The Corps would be in compliance with Sections 176 and 309 of the Clean Air Act.

CLEAN WATER ACT OF 1972, AS AMENDED

Full compliance would be achieved with issuance of Water Quality Certification under Clean Water Act Section 401 from the State of Florida. A Section 404(b) (1) Evaluation was not prepared because no wetlands would be affected by implementation of the Preferred Alternatives. Section 402(b) (2) requires that a NPDES construction activities permit be acquired for construction activities that disturb more than five acres of land. The FDEP issues these permits within 48 hours of application. This permit will be acquired prior to initiation of construction activities required to have a NPDES permit.

COASTAL BARRIER RESOURCES ACT

This Act is not applicable. The study area is not in a designated Coastal Barrier Resources Act unit.

COASTAL ZONE MANAGEMENT ACT OF 1972, AS AMENDED

A Federal Consistency Determination has been prepared in accordance with the provisions of 15 CFR 930 and is located in

Appendix A. The State has not yet concurred with this determination. Upon review and concurrence of this EA and Federal Consistency Determination, the project would be in compliance.

ENDANGERED SPECIES ACT OF 1973, AS AMENDED

The Corps has determined there would be No Effect on all species within the scope of this project. If warranted by the USFWS, the Corps would initiate informal or formal consultation as appropriate. The proposed actions would be in compliance with the Endangered Species Act through formal or informal consultation.

ESTUARY PROTECTION ACT OF 1968

No estuaries under the Act are in the direct project area. The project is in compliance.

FARMLAND PROTECTION POLICY ACT OF 1981

Prime or unique farmland exists within the project footprint. Coordination with NRCS was completed April 23, 2014 for the DSMS which included the footprint for this project. The NRCS noted there are delineations of Important Farmland soils (Farmland of Unique Importance) within the regional scope of this project. There are no delineations of important farmland soils within the direct footprint at W. P. Franklin Lock and Dam Recreation Area or Moore Haven Recreation Area West that are being considered with regard to the alternatives analysis. All soils within the two recreation areas are Arents (Anthropogenic soils). Farmland would not be adversely affected, and the project is in compliance.

FEDERAL WATER PROJECT RECREATION ACT OF 1965, AS AMENDED

This project would be in compliance with this Act. Recreation will potentially increase by creating a wildlife management area at the Moore Haven Recreation Area West. The closure of the W.P. Franklin Beach could decrease recreational use for swimming purposes, however, it would potentially increase recreational opportunities to fish, kayak, or canoe.

FISH AND WILDLIFE COORDINATION ACT OF 1958, AS AMENDED

This project is being coordinated with the USFWS. Coordination is ongoing and this project is compliance with this Act.

MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service works with the regional fishery management councils to identify the essential habitat for every life stage of each federally managed species using the best available scientific information. Essential Fish Habitat has been described for approximately 1,000 managed species to date. No proposed changes to the master plan would affect Essential Fish Habitat. This project is in compliance with this Act.

MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT OF 1972, AS AMENDED

This Act is not applicable. Ocean disposal of dredged material is not part of the Master Plan.

MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT

Under the Migratory Bird Treaty Act, project construction shall not destroy migratory birds, their active nests, their eggs, or their hatchlings. Monitoring for such would be required by the construction contractor. A buffer zone around active nests or nesting activity would be required during the nesting season. No migratory birds (other than those described under threatened and endangered species) would be affected by project activities; however, the bald eagle has been identified in the project area. The toe ditch wetlands provide low quality habitat foraging habitat for migratory birds. Alternative and higher quality habitats are available along the Lake Okeechobee shoreline and in adjacent canals. This project is in compliance with these Acts.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) OF 1969, AS AMENDED

A scoping letter was sent and available for public comment between August 20, 2017 and September 30, 2017. Comments were received and are located in the Pertinent Correspondence Appendix B. A Notice of Availability (NOA) of the EA was prepared and sent June 18, 2018 to begin the public review period. A letter retracting the EA was sent on June 19, 2018. A NOA was prepared and sent for a 60-day public review period beginning July 23, 2018. The EA is in compliance with this Act.

NATIONAL HISTORIC PRESERVATION ACT OF 1966 (INTER ALIA)

Consultation with the Florida State Historic Preservation Officer (SHPO) and the appropriate federally-recognized tribes was initiated on June 4, 2018, and is ongoing in accordance with the National Historic Preservation Act of 1966, as amended, and as part of the requirements and consultation processes contained

within the NHPA implementing regulations of 36 CFR 800. This project is also in compliance, through ongoing consultation with the SHPO and Native American tribes having ancestral ties to this region, including the Seminole Tribe of Florida, the Seminole Nation of Oklahoma, Thlopthlocco Tribal Town, and the Miccosukee Tribe of Indians of Florida, with the Corps' trust responsibilities to federally-recognized Native American tribes, the Archeological Resources Protection Act (96-95), the Abandoned Shipwreck Act of 1987 (PL 100-298; 43 U.S.C. 2101-2106), the American Indian Religious Freedom Act (PL 95-341), Executive Orders (E.O) 11593, 13007, and 13175 and the Presidential Memo of 1994 on Government to Government Relations.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), AS AMENDED BY THE HAZARDOUS AND SOLID WASTE AMENDMENTS (HSWA) OF 1984, COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA) AS AMENDED BY THE 5.26.21 SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) OF 1996, TOXIC SUBSTANCES CONTROL ACT OF 1976

Removal of buoys in the swim area and conversion of the bare ground at Moore Haven to a wildlife area would not involve digging into the ground or lead to any discovery of hazardous waste. Previous ground water and soils testing (Heartland Pump, 2015, Environmental Risk Management, Inc., 2018) associated with fuel facilities on the site were negative. The project is in compliance with these Acts.

RIVER AND HARBOR APPROPRIATION ACT OF 1899

The project is in compliance. The proposed work would not obstruct navigable waters of the United States.

SAFE DRINKING WATER ACT (SDWA) OF 1974, AS AMENDED

Lake Okeechobee, as well as local ground and surface waters, supplies drinking water for several communities around Lake Okeechobee. Implementation of the project would not impact the water quality of Lake Okeechobee or ground and surface water used to supply drinking water. This project complies with the Act.

UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION POLICIES ACT OF 1970 (PUBLIC LAW 91-646)

No real estate would need to be acquired and therefore, the project would be in compliance with the provisions of this law. The Uniform Act sets forth procedures for the acquisition of private property for public use and specifically requires that the acquiring agency appraise the real property interests it wishes to acquire and provide the owner a written summary of the basis for the amount established as just compensation.

WILD AND SCENIC RIVER ACT OF 1968, AS AMENDED

No rivers designated under the Act are in the project area. This Act is not applicable.

WATER RESOURCES DEVELOPMENT ACT (WRDA) OF 1986, SECTION 904

Section 904 of the 1986 Water Resources Development Act requires that the plan formulation and evaluation process consider both the quantifiable and unquantifiable benefits and

costs of the quality of the total environment and preservation of cultural and historical values. This EA is in compliance.

EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS

The Preferred Alternative would not result in impacts to wetlands. The EA is in compliance with the goals of this Executive Order (EO).

EXECUTIVE ORDER 11988, FLOODPLAIN MANAGEMENT

The Preferred Alternative would not affect flooding of the area. The study is in compliance.

EXECUTIVE ORDER 12898, ENVIRONMENTAL JUSTICE

EO 12898 requires agencies of the Federal Government to review the effects of their programs and actions on minorities and low-income communities. The Alternatives would potentially provide increased shoreline fishing in the W.P. Franklin area, however, it would close the swim beach used by people in the surrounding area. This project is not expected to have disproportionately high and adverse human health or environmental impacts on minority or low-income populations.

EXECUTIVE ORDER 13112, INVASIVE SPECIES

Exotic and invasive plant species are within drainage swales, connecting canals, wetlands, and some uplands within the project area. However, the project would not contribute to nutrient loading that could favor invasive species. Further, some removal of invasive species would be necessary within the project footprint. Ballast water organisms or terrestrial exotic

wildlife species would not be affected. This project is in compliance.

EXECUTIVE ORDER 13045, PROTECTION OF CHILDREN

EO 13045, requires each Federal agency to “identify and assess environmental risks and safety risks [that] may disproportionately affect children” and ensure that its “policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.” This project has no environmental or safety risks that may disproportionately affect children. The project is in compliance.

EXECUTIVE ORDER 13653, CLIMATE CHANGE CONSIDERATIONS

EO 13653 requires Federal agencies to review the effect of climate change on their programs. Closure of the beach and establishment of a wildlife management area would not be predicted to affect climate change. The project is in compliance.

7.1. List of Preparers for NEPA

Table 7-1: List of Preparers

Name of Person	Specialty
Stacie Auvenshine	NEPA
Mark Wolff	Plan Formulation
Al Walker	Plan Formulation
Nelson Colon	Project Manager
Jason D. Moser	Cultural Resources
George Ebai	Economics
Sharon Tyson	Biologist

7.2. List of Agencies

A NOA for the EA and FONSI was mailed to Federal and State agencies, tribal representatives, and members of the general public. A complete mailing list is available upon request. The Proposed EA and FONSI was also posted on the internet at the following address under multiple counties:

<http://www.saj.usace.army.mil/About/Divisions-Offices/Planning/Environmental-Branch/Environmental-Documents/>

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