SECTION 1

STUDY PURPOSE AND NEED

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SECTION 1
STUDY PURPOSE AND NEED

The Indian River Lagoon - South (IRLS) Feasibility Study was completed in August 2002 with a Division Engineers Notice issued in September 2002 and the final Environmental Impact Statement, filed in the Federal Register, on 11 October 2002. The feasibility study investigated water resource opportunities in Martin and St. Lucie Counties in relation to the Central & Southern Florida Project (C&SF) canal system including the Canals denoted C-23, C-24, C-25, and C-44 (***Figure 1 – 1***). Since the completion of that feasibility report, additional studies have been conducted to address requirements of Section 601 of the Water Resources Development Act of 2000 and Headquarters, U.S. Army Corps of Engineers policy compliance review comments. This Project Implementation Report (PIR) updates and revises the feasibility report and will serve as the decision document for seeking authorization of the recommended plan and therefore supersedes the final feasibility report.

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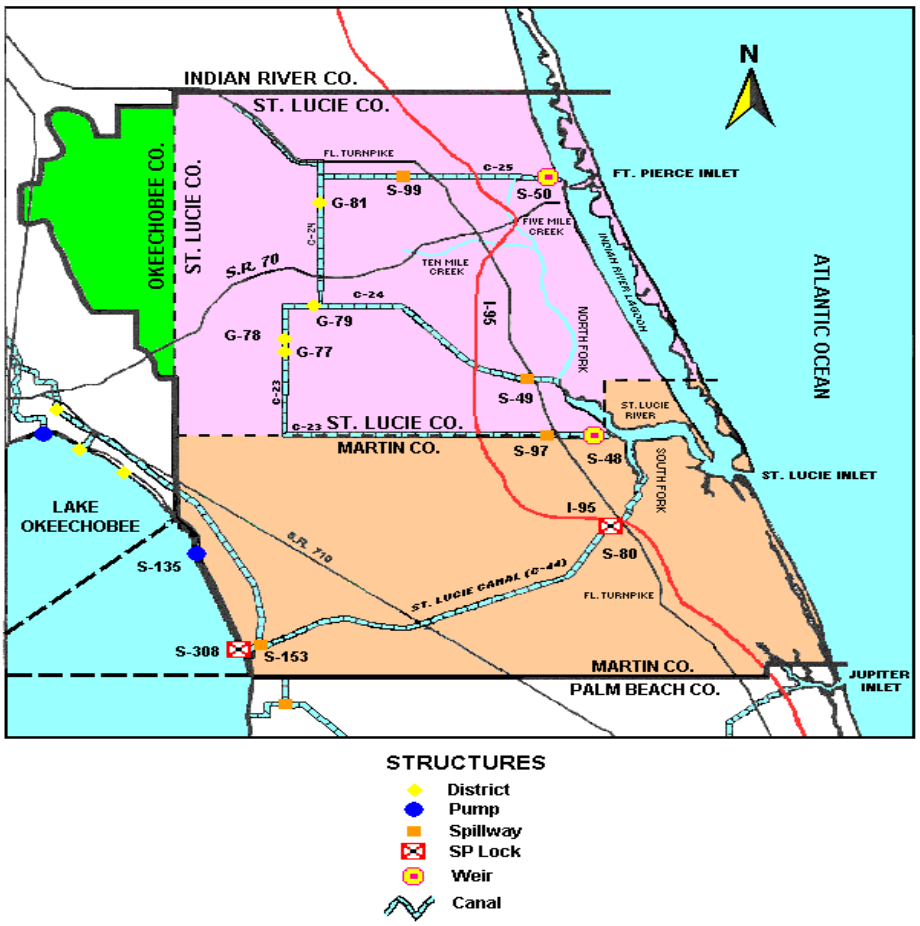
FIGURE 1 – 1: STUDY AREA



1.1 PROJECT IMPLEMENTATION REPORT

The Water Resources Development Act of 2000 requires completion of a Project Implementation Report (PIR) prior to implementation of a CERP project. The Project Implementation Report (PIR) is a new type of reporting document. The PIR is similar to a traditional feasibility report with the exception of additional studies and analyses required in Section 601 of the Water Resources Development Act of 2000. These studies include the savings clause and the determination of water to be reserved for the natural system requirement. These requirements specifically differentiate PIRs from traditional Corps of Engineers feasibility studies. The Savings Clause requires that, "until a new source of water supply of comparable quantity and quality as that available on the date of enactment of this Act is available to replace the water to be lost as a result of implementation of the Plan, the Secretary and the non-Federal sponsor shall not eliminate or transfer existing legal sources of water…". The Savings Clause also requires that implementation of the plan will not reduce levels of service for

flood protection. Further, the identification of water to be reserved for the natural system is another WRDA requirement to be completed during the preparation of the PIR.

Additionally, Florida State Law, Chapter 373.470 (3)(c), Florida Statute requires the completion of a PIR prior to the South Florida Water Management District entering into a Project Cooperation Agreement with the U.S. Army Corps of Engineers. Chapter 373.026 (8)b, of the Florida Statute requires the South Florida Water Management District to submit a PIR to the Florida Department of Environmental Protection. Chapter 373.1501(5), Florida Statute requires the South Florida Water Management District to analyze and evaluate water supply, water quality, flood protection, threatened and endangered species, and other natural system and habitat needs and to determine that components of the Plan are feasible, efficient, cost-effective, and consistent with the purposes of the Comprehensive Plan.

1.2 COMPREHENSIVE EVERGLADES RESTORATION PLAN

This report is a result of years of intensive problem identification, scientific investigations and modeling. The 1999 C&SF Project Comprehensive Review Study (Restudy) and Environmental Impact Statement discusses a conceptual solution to the environmental problems of the southern IRL: the construction of a series of reservoirs and stormwater treatment areas to detain and treat stormwater runoff prior to releasing it to the estuary, along with an investigation of muck and muck removal and habitat restoration actions.

During the reconnaissance phase of the Restudy, the need to begin restoration efforts in the St. Lucie Estuary (SLE) and southern IRL was identified as an early priority. This prioritization led to early initiation of the IRLS Feasibility Study. The "C&SF Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement" (USACE, 1999) recommends a comprehensive plan for the water resources of central and southern Florida. The overarching objective of this plan, known as the CERP, is the restoration, preservation, and protection of the South Florida ecosystem while providing for the other water-related needs of the region.

The CERP was formulated to achieve ecological restoration of the greater Everglades ecosystem while providing for other water resources needs of the region. Initial screening efforts revealed a pressing need to capture more water in south Florida to restore the Everglades, protect the estuaries, and to provide adequate water supply for urban and agricultural needs in the future. During the screening phase of the Restudy, hydrologic computer modeling was combined with an economic "best buy" approach to reduce the number of potential

components. This provided a range of cost-effective components to capture, store and convey water to the right parts of the system at the right time. These components were then combined to form "comprehensive" alternative plans that were evaluated in a regional or system-wide context. It is the synergistic effect of these components that achieve the goals and objectives of the CERP. Due to the size and complexity, implementation of the CERP required that it be divided into smaller packages of components that are referred to as projects.

The IRLS Project Implementation Report recommends a project that supports the goals and objectives of the CERP. The purpose of the IRLS study, like the CERP, was investigation of modifications to the C&SF project in the Martin and St. Lucie County area, but at a much finer level of detail. The goal for this study is to synergistically optimize the performance of the CERP by refining the design and operation of components such that the system-wide performance of the CERP equals or exceeds the performance of the CERP recommended by the Restudy in a cost effective manner. The IRLS study builds on the work done in the Restudy to address water resource problems in the Upper East Coast Region by providing a much finer level of detail gained through area specific hydrologic modeling, environmental analysis and a detailed problem definition and solution analysis process.

1.3 STUDY AUTHORITY

Along with the C&SF Restudy, the IRLS Restoration Feasibility Study is authorized by Section 309(l) of the Water Resources Development Act of 1992 (Public Law 102-580) which states:

"(1) CENTRAL AND SOUTHERN FLORIDA. -- The Chief of Engineers shall review the report of the Chief of Engineers on central and southern Florida, published as House Document 643; 80th Congress, 2nd Session, and other pertinent reports, with a view to determining whether modifications to the existing project are advisable at the present time due to significantly changed physical, biological, demographic, or economic conditions, with particular reference to modifying the project or its operation for improving the quality of the environment, improving protection of the aquifer, and improving the integrity, capability, and conservation of urban water supplies affected by the project or its operation."

This study is also authorized by two resolutions of the Committee on Transportation and Infrastructure, United States House of Representatives, dated
September 24, 1992. The first resolution states:

"Resolved by the Committee on Public Works and Transportation of the United States House of Representatives, That the Board of Engineers for Rivers and Harbors, is requested to review the report of the Chief of Engineers on Central and Southern Florida, published as House Document 643, Eighteenth Congress, Second Session, and other pertinent reports, to determine whether modifications of the recommendations contained therein are advisable at the present time, in the interest of environmental quality, water supply and other purposes."

The second resolution states:

"Resolved by the Committee on Public Works and Transportation of the United States House of Representatives, That the Board of Engineers for Rivers and Harbors, is requested to review the report of the Chief of Engineers on Central and Southern Florida, published as House Document 643, Eighteenth Congress, Second Session, and other pertinent reports, to determine whether modifications of the recommendations contained therein are advisable at the present time, in the interest of environmental quality, water supply and other purposes for Florida Bay, including a comprehensive, coordinated ecosystem study with hydrodynamic modeling of Florida Bay and its connections to the Everglades, the Gulf of Mexico, and the Florida Keys Coral Reef ecosystem."

The *Water Resources Development Act of 1996* was enacted on October 12, 1996. *Section 528 of the Act (Public Law 104-303)* entitled "Everglades and South Florida Ecosystem Restoration" authorizes a number of ecosystem restoration activities and also provides specific direction and guidance for the CERP. The specific provisions of *Section 528* concerning the IRL Restoration Feasibility Study are:

(b) RESTORATION ACTIVITIES-
(1) COMPREHENSIVE PLAN-
(A) DEVELOPMENT-

(i) PURPOSE- The Secretary shall develop, as expeditiously as practicable, a proposed Comprehensive Plan for the purpose of restoring, preserving, and protecting the South Florida ecosystem. The Comprehensive Plan shall provide for the protection of water quality in, and the reduction of the loss of fresh water from, the Everglades. The Comprehensive Plan shall include such features as are necessary to provide for the water-related needs of the region, including flood control, the enhancement of water supplies, and other objectives served by the Central and Southern Florida Project.

(ii) CONSIDERATIONS- The Comprehensive Plan shall—

(I) Be developed by the Secretary in cooperation with the non-Federal project sponsor and in consultation with the Task Force; and

(II) Consider the conceptual framework specified in the report titled "Conceptual Plan for the Central and Southern Florida Project Restudy," published by the Commission and approved by the Governor.

(B) SUBMISSION- Not later than July 1, 1999, the Secretary shall—

(i) Complete the feasibility phase of the Central and Southern Florida Project comprehensive review study as authorized by section 309(l) of the Water Resources Development Act of 1992 (106 Statue. 4844), and by two resolutions of the Committee on Public Works and Transportation of the House of Representatives, dated September 24, 1992; and

(ii) Submit to Congress the plan developed under subparagraph (A)(i) consisting of a feasibility report and a programmatic environmental impact statement covering the proposed Federal action set forth in the plan.

(C) ADDITIONAL STUDIES AND ANALYSES- Notwithstanding the completion of the feasibility report under subparagraph (B), the Secretary shall continue to conduct such studies and analyses as are necessary, consistent with subparagraph (A)(i).

The Water Resources Development Act of 1996, Section 528 further states:

(b) RESTORATION ACTIVITIES-

(4) GENERAL PROVISIONS. -

(A) WATER QUALTIY.-In carryng out activities described in this section and section 315 and 316, the Secretary-

(i) shall take into account the protection of water quality by considering applicable State water quality standards: and

(ii) may include in projects such features as are necessary to provide water to restore, preserve, and protect the South Florida ecosystem.

(e) COST SHARING. –

(1) IN GENERAL.- Except as provided in sections 315 and 316 and paragraph (2), the non-Federal share of the cost of activities described in subsection (b) shall be 50 percent.

(2) WATER QUALITY FEATURES.-

(A) IN GENERAL.- Except as provided in subparagraph (B), the non-Federal share of the cost of project features to improve water quality described in subsection (b) shall be 100 percent.

(B) EXCEPTION.-

(i) IN GENERAL.-Subject to clause (ii), if the Secretary determines that a project feature to improve water quality is essential to Everglades restoration, the non-Federal share of the cost of the feature shall be 50 percent.

> *(ii) APPLICABILITY.- Clause (i) shall not apply to any feature of the Everglades Construction Project of the State of Florida.*

Further, the *Water Resources Development Act of 1999* included specific language on the in-kind work accomplished by the local sponsor. *Section 208(d)(2)* of the *Water Resources Development Act of 1999* states:

> *(2) IN-KIND WORK –*
>
> *(A) IN GENERAL - During the pre-construction, engineering, and design phase and the construction phase of the Central and Southern Florida Project, the Secretary shall allow credit against the non-Federal share of the cost of activities described in subsection (b) for work performed by non-Federal interests at the request of the Secretary in furtherance of the design of features included in the comprehensive plan under that subsection.*
>
> *(B) AUDITS - In-kind work to be credited under subparagraph (A) shall be subject to audit.*

A design agreement to perform project engineering and design (PED) activities including adaptive assessment and monitoring in support of CERP was executed on May 12, 2000 between the U.S. Army Corps of Engineers (Corps) and South Florida Water Management District (SFWMD). This agreement provides for the SFWMD to receive in-kind credit for design work. A Master Program Management Plan (MPMP) for the CERP was executed on August 24, 2000, outlining the protocols and procedures by which project management plans for all projects included in the agreement would be completed. This document conforms to the guidance provided within the MPMP.

The *Water Resources Development Act of 2000 (WRDA 2000)* provides additional guidance and authority for implementing CERP. *Section 601, of the Act* states:

> *(b) Comprehensive Everglades Restoration Plan -*
>
> *(1) Approval -*
>
> *(A) IN GENERAL. —Except as modified by this section, the Plan is approved as a framework for modifications and operational changes to the Central and Southern Florida Project that are needed to restore, preserve, and protect the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection. The Plan shall be implemented to ensure the protection of water quality in, the reduction of the loss of fresh water from, and the improvement of the environment of the South Florida ecosystem and to achieve and maintain the benefits to the natural system and human environment described in the*

Plan, and required pursuant to this section, for as long as the project is authorized.

Further, initial authorization for the C-44 Basin Storage Reservoir is contained in *Section 601 of the Act*, which states:

(C) INITIAL PROJECTS. —The following projects are authorized for implementation, after review and approval by the Secretary, subject to the conditions stated in subparagraph (D), at a total cost of $1,100,918,000, with an estimated Federal cost of $550,459,000 and an estimated non-Federal cost of $550,459,000:

(i) C–44 Basin Storage Reservoir, at a total cost of $112,562,000, with an estimated Federal cost of $56,281,000 and an estimated non-Federal cost of $56,281,000.

(D) CONDITIONS.—

(i)PROJECT IMPLEMENTATION REPORTS. —Before implementation of a project described in any of clauses (i) through (x) of subparagraph (C), the Secretary shall review and approve for the project a project implementation report prepared in accordance with subsections (f) and (h).

(ii) SUBMISSION OF REPORT. —The Secretary shall submit to the Committee on Transportation and Infra-structure of the House of Representatives and the Committee on Environment and Public Works of the Senate the project implementation report required by sub-sections (f) and (h) for each project under this paragraph (including all relevant data and information on all costs).

(iii) FUNDING CONTINGENT ON APPROVAL. —No appropriation shall be made to construct any project under this paragraph if the project implementation report for the project has not been approved by resolutions adopted by the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Environment and Public Works of the Senate.

Finally, WRDA 2000 requires that PIRs:

(4) PROJECT-SPECIFIC ASSURANCES-

(A) PROJECT IMPLEMENTATION REPORTS-

(i) IN GENERAL- The Secretary and the non-Federal sponsor shall develop project implementation reports in accordance with section 10.3.1 of the Plan.

(ii) COORDINATION- In developing a project implementation report, the Secretary and the non-

Federal sponsor shall coordinate with appropriate Federal, State, tribal, and local governments.
(iii) REQUIREMENTS- A project implementation report shall--
(I) be consistent with the Plan and the programmatic regulations promulgated under paragraph (3);
(II) describe how each of the requirements stated in paragraph (3)(B) is satisfied;
(III) comply with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.);
(IV) identify the appropriate quantity, timing, and distribution of water dedicated and managed for the natural system;
(V) identify the amount of water to be reserved or allocated for the natural system necessary to implement, under State law, subclauses (IV) and (VI);
(VI) comply with applicable water quality standards and applicable water quality permitting requirements under subsection (b)(2)(A)(ii);
(VII) be based on the best available science; and
(VIII) include an analysis concerning the cost-effectiveness and engineering feasibility of the project.

1.3.1 Applicable Policy

In accordance with Corps of Engineers Guidance dated 7 November 1997, CECW-AG, Subject: Water Quality Policy for South Florida Ecosystem Restoration, as signed by the Director of Civil Works. From paragraph 4 of Enclosure 1, Proposed Water Quality Guidance for Provisions of WRDA '96:

For the purpose of analyzing Federal participation in water quality features, the future without project condition will be developed based on the assumption that non-Federal interests will meet the requirements of the Clean Water Act and State water quality standards. The without project condition assumes BMP's {Best Management Practices} and all reasonable measures within watershed are in place to assure that the waters being received by the C&SF Project system are of sufficient quality to meet published standards. ***If these measures still do not provide water of adequate quality for Everglades ecosystem needs, then additional features for water quality improvement***

will be formulated and included in C&SF Project modifications with 50-50 cost sharing. *Projects formulated under this guidance will be designated as: (1) water reclamation, or (2) water reuse projects.*

1.3.2 Initial Authorization

The features of the CERP deemed necessary to expedite ecological restoration of the south Florida ecosystems were recommended for initial authorization. One CERP component within the IRLS study area, the C-44 Basin Storage Reservoir, received contingent authorization through the WRDA 2000. Consistent with Section 601(C) of WRDA 2000, the C-44 Basin Storage Reservoir included in the IRLS Plan could be authorized for implementation by the Secretary of the Army, provided that the estimated cost to implement that component stays within the limits for cost escalation established by Section 902 of WRDA 1986. However, due to the dependency of this component with other recommendations contained herein, the Corps of Engineers requests that this component be de-authorized and will seek authorization of the C-44 component as presented in this report with the other IRL-S components included in the Recommended Plan.

1.4 STUDY PURPOSE

The purpose of the IRLS Project Implementation Report is to investigate making structural and operational modifications to those features of the C&SF Project in Martin and St Lucie Counties necessary to improve the quality of the environment, improve protection of the aquifer, and improve the integrity, capability, and conservation of urban and agricultural water supplies and other water-related purposes.

The IRLS Project Implementation Report shares its primary goals with those of the Restudy used for the development of the CERP. Objectives discussed in Section 5 focus on the specific problems of the SLR, SLE and the IRL and their associated watersheds. The study goals are:

TABLE 1 - 1. STUDY GOALS AND OBJECTIVES

Goal: Restore Ecological Values
• Reestablish a natural pattern of freshwater flows to the SLE and IRL
• Improve water quality in the SLE and IRL
• Improve habitat for estuarine biota
• Increase spatial extent and functional quality of watershed wetlands
• Improve spatial extent and functional quality of native upland/wetland habitat
• Increase diversity and abundance of native plant and animal species, including threatened and endangered species
Goal: Restore Economic Values and Social Well Being
• Increase water supply
• Maintain existing flood protection
• Improve opportunities for tourism, recreation and environmental education
• Enhance commercial and recreational fisheries and associated industries

1.4.1 Study Scope

This study examines alternative surface water management options in the southern IRL watershed in Martin and St. Lucie counties. This study area is a subset of that considered under the CERP. The CERP provided a conceptual look at the problems and potential solutions of the SLR and SLE and the associated portions of the IRL. This study considers the problems and solutions of the IRL study area at a greater level of detail. The result is a regional plan for addressing the water resource problems and opportunities of the SLR, SLE, & IRL watersheds in Martin and St. Lucie counties.

This report includes hydrologic and environmental modeling results, water quality analyses, and water supply studies performed to evaluate alternative plans to reduce the negative impacts of freshwater discharges through project canals (C-23, C-24, C-25, and C-44) to the SLE and southern IRL. The study focuses on alternative plans that benefit the receiving waterbodies and restore valuable native upland/wetland habitat in the watershed while increasing agricultural water supply and maintaining the current level of flood protection. The study also identifies an adaptive implementation strategy based on monitoring, evaluation, refinement and modeling. Further, this report addresses specific benefits and impacts for all plan components determined feasible and cost-effective.

1.4.2 Report Content and Organization

This Project Implementation Report (PIR) documents studies necessary to seek authorization for the recommended plan contained herein. This PIR supercedes the Indian River Lagoon Final Feasibility Report and Supplemental Environmental Impact Statement dated August 2002. This report significantly revised Sections and Appendices of the Final Feasibility Report and includes additional Appendices. The Draft PIR and Supplemental Environmental Impact Statement were circulated for comment in accordance with NEPA review processes. A Chief's report and Record of Decision will be prepared based on this Final Project Implementation Report and additional opportunities for public comment.

The IRLS Project Implementation Report was conducted to ensure the timely and economical completion of this report, which recommends a solution to water resources problems in inthe southern IRL and its watershed. This report:

1) presents study results and findings;
2) indicates compliance with applicable statutes, executive orders and policies;
3) provides a sound and documented basis for decision makers at all levels to judge the recommended solutions;
4) provides National Environmental Policy Act (*NEPA)* documentation including an integrated SEIS; and
5) provides detailed engineering design of plan components determined to be feasible and cost effective at a level of detail sufficient to obtain Congressional authorization for construction.

This report identifies an adaptive assessment strategy for implementation of the recommended plan. This strategy recognizes that after each project increment is constructed and tested, feedback based on new insights gained on the response of the system may require that subsequent adjustments be made to the project and future elements.

This Project Implementation Report also describes the economic, environmental, and social benefits and costs of the recommended plan and the alternatives evaluated. The report also describes the purposes, scope, scale, public acceptability, and the Federal and non-Federal participation for the implementation of the recommended plan. The report documents that the State of Florida, other non-Federal interests and Federal agencies have been consulted in the development of the recommended plan.

1.5 DESCRIPTION OF STUDY AREA

The southern IRL includes that portion of the IRL from the St. Lucie-Indian River County line south to the Martin-Palm Beach County line (approximately 41 miles, north to south). The contributing basins include both the SLE watershed and the C-25 basin, which drains directly to the IRL near the Ft. Pierce Inlet (on the north end of the study area) (***Figure 1 – 1*** *and* ***Figure 1 - 2)***. The western portion of the study area is predominantly agriculture with most urbanization within the coastal area. There are seven municipalities in the planning area including: Fort Pierce, Port St. Lucie, St. Lucie Village, Stuart, Sewalls Point, Jupiter Island, and Ocean Breeze Park. The SLE, IRL and Atlantic Ocean are a source of aesthetic beauty, recreation, and livelihood that have drawn people to the area for many years and serves as the economic foundation of the community.

1.5.1 Problems In Study Area

The southern IRL is an ecosystem rich in habitats and species containing the highest estuary species diversity in North America (Gilmore 1986). This fragile system has been deteriorating under the development pressure produced by the same people who are drawn by its beauty and richness.

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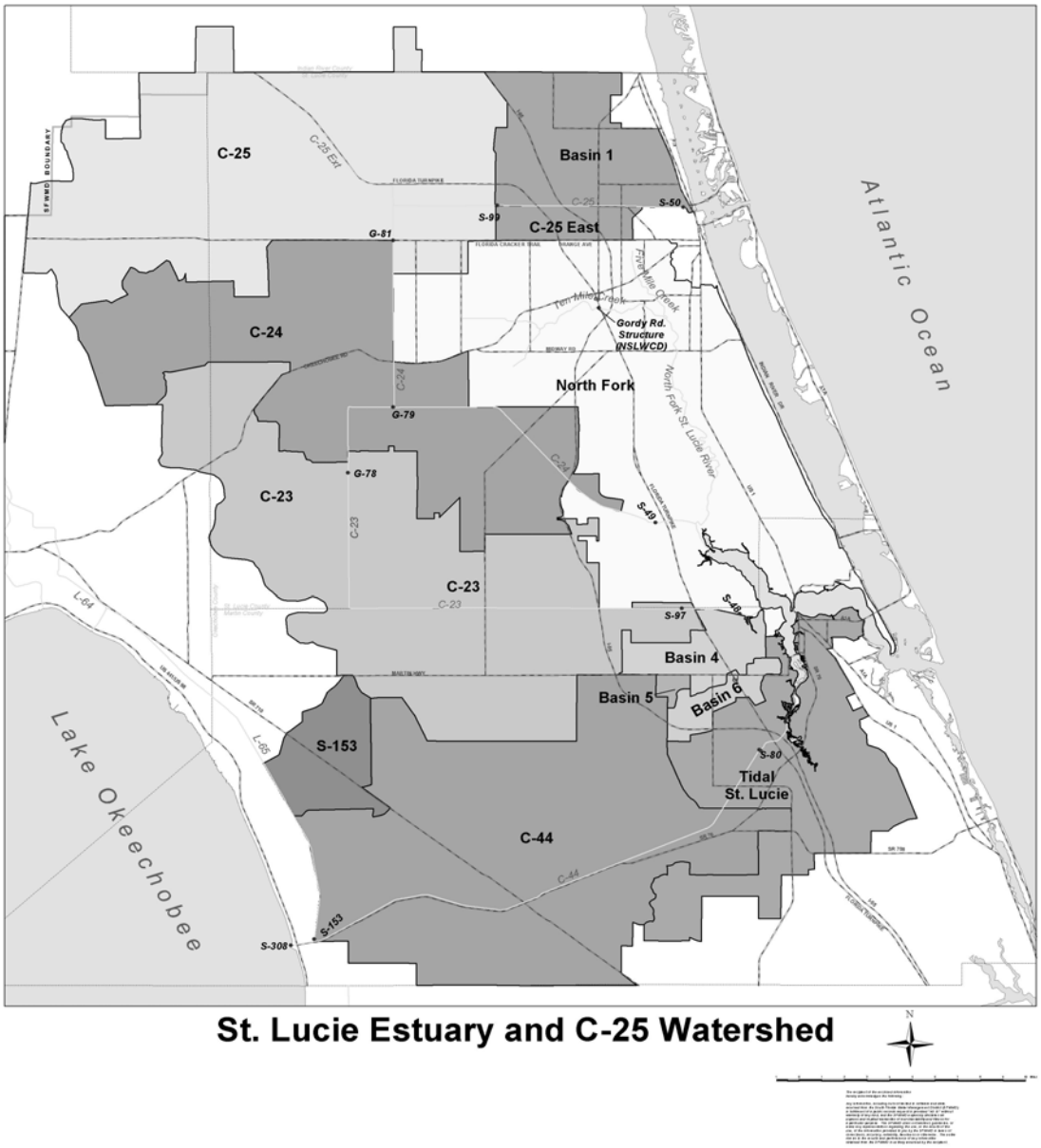
FIGURE 1 – 2: WATERSHED AND DRAINAGE BASINS



Over 2,200 floral and faunal species have been identified in the study area and at least 35 of these are threatened or endangered. In 1991, the IRL was listed as an estuary of national significance and included in the National Estuary Program (NEP) sponsored by the EPA.

The SLR is the largest tributary to the southern IRL and has been significantly altered by human activities. Until the late 1800's, the SLR was a freshwater river that provided freshwater inflow to the IRL. However, in the late

1800's the St. Lucie Inlet was constructed, permanently connecting the IRL to the Atlantic Ocean at the mouth of the SLR, thereby changing the character of the SLR from a freshwater river to a riverine estuary.

Before human modifications, rainfall in the SLR watershed gradually percolated into the groundwater or slowly flowed overland to natural creeks eventually reaching the river. Currently, rainfall runoff from the watershed flows quickly into major canals without the water quality treatment and flow quantity buffering once provided by natural systems. Additionally, the runoff now contains contaminants from urban and agricultural development including excess suspended solids, nutrients, pesticides, and other harmful pollutants. As a result, the water entering the river and estuaries is of poor quality, and the quantity and timing of inflows are substantially altered. Inflows are extremely variable and tend to be too great in the wet season and although dry season low flows have been detrimental to be adequate for a healthy estuarine ecosystem. The inflow extremes and degraded water quality severely compromise the viability of healthy, sustainable estuarine communities.

In addition to the impacts to the SLE from inlet construction, numerous watershed and shoreline impacts have altered the character and health of the SLE. Beginning in the 1920's, an extensive network of canals was constructed in an effort to promote agricultural and urban development by removing excess surface water and lowering high water tables. Consequently, the canals increased the volume of water discharging into the southern IRL and artificially enlarged the drainage basin boundaries by diverting flows from areas that were historically in the St. Johns River or Lake Okeechobee basins. These watershed modifications include construction of major C&SF Project canals (C-23, C-24, C-25 and C-44), which rapidly drain the associated watersheds into the SLE and southern IRL. In addition to watershed runoff conveyance, the C-44 Canal also known as the St. Lucie Canal, provides a route for Lake Okeechobee water to be discharged to the South Fork of the SLE in order to regulate Lake Okeechobee water levels to maintain safe lake levels and flood protection in the vicinity of Lake Okeechobee. The watershed and the Lake Okeechobee discharges cause rapid and dramatic salinity changes throughout the estuaries. Loss of natural habitat, increased urban development and agriculture activities have affected the timing, quality, quantity and distribution of runoff to the estuaries. Historical flows from the North Fork and South Fork of the SLR have been decreased and large volumes of water from the C-23 and C-24 Canals now enter the SLE at mid- estuary.

In addition to the watershed modifications, the estuary shoreline has also been severely impacted. Shorelines along the main body of the estuary that were formerly lined by mangroves and other estuarine vegetation now support very little natural shoreline vegetation. In many areas, seawalls and docks have

replaced mangrove and seagrass habitats. These natural shoreline vegetation communities once helped stabilize the substrate, filter storm water runoff, and provide habitat for numerous estuarine species. Within the estuary itself, sediments have rapidly accumulated in several locations, changing the bathymetry of the estuary at a far more rapid rate than would have occurred under natural conditions (Woodward Clyde International-Americas, 1998). Thick layers of muck (fine-grained sediments) have formed in many deeper portions of the estuary. In some areas a flocculent, highly organic floating layer of extremely fine-grained material, referred to as "ooze", sits above the muck. These accumulated sediments contribute to low dissolved oxygen levels near the bottom of the estuary and can be easily re-suspended by natural and man-made events, resulting in water quality degradation. Increased turbidity, decreased light attenuation, as well as nutrient and toxic substances being released from the bottom sediments can result from this re-suspension.

Habitats and species diversity in the SLE are affected by the decline in water and sediment quality. Historical oyster and seagrass beds are now almost nonexistent in the SLE. Without improvements to the quality of the water in the SLE, the 200 acres of oysters that currently exist in the SLE are predicted to disappear by 2050. The decline (and in some areas eradication) of these important indicator organisms is indicative of an unhealthy estuary. Restoration efforts focused upon during this study are directed toward creating a healthy estuarine system, not "restoring" the SLR to its historic condition as a freshwater river.

Further, one of the broader goals of the Comprehensive Everglades Restoration Plan (CERP) is to increase the spatial extent of short hydroperiod wetlands. The interspersion of uplands with wetlands plays a critical role in the life histories of the vast majority of terrestrial and semi-aquatic animals in the broader south Florida ecosystem. The ecologic restoration of the wetlands will not be complete unless they are integrated into the matrix of swamps, upland forests, and dry prairies that give south Florida its amazing diversity. Increases in the diversity and abundance of wetland-dependent wildlife would occur for wading birds, other waterfowl, amphibians, aquatic reptiles, fish, and macroinvertebrates. Scientists have identified the large spatial extent of south Florida wetlands as one of the defining physical characteristics of the pre-drainage ecosystem. The size of the south Florida wetlands, in combination with the complex mosaic of habitats, enabled multiple populations of plants and animals to thrive and persist over time. The size of the pre-drainage area in south Florida made it possible for the natural ecosystem to:

- support genetically viable numbers and sub-populations of species with large feeding ranges and/or narrow habitat requirements

- provide the aquatic production to support large numbers of higher vertebrate animals in a naturally nutrient-poor environment, and
- sustain habitat diversity despite natural disturbances. The ability of animal populations to recover from disturbances decreases as the available habitat area decreases since habitat diversity, the amount of seasonal refugia, and the number of dispersal options also decrease (USACE, 1999).

In south Florida roughly 50 percent of the pre-drainage wetland area and 90 percent of pinelands have been lost to development. Lake Okeechobee was much larger than it is at present with an extensive littoral/marsh system extending north, west, and south. The IRL watershed provides a unique opportunity for rehydration and habitat restoration due to the current availability of large tracts of land.

1.6 NATIONAL ENVIRONMENTAL POLICY ACT REQUIREMENTS

The National Environmental Policy Act (NEPA) of 1969, as amended, is the nation's charter for environmental protection. The NEPA establishes policy, sets goals, and provides means for carrying out the policy. Section 102(2) of the Act contains action-forcing provisions to make sure that federal agencies act according to the letter and spirit of the act, including a provision to prepare an EIS on the effects of a proposed Federal action. Compliance with NEPA will be accomplished in accordance with ER 200-2-2, and the council on Environmental Quality regulations (40 CFR Parts 1500-1508).

This report employed two concepts established to reduce duplication and paperwork. These concepts, integration and tiering, are not frequently used, but are appropriate to the planning and design process of this project. Integration allows for the combining of documents. In this case, the EIS is combined with the project implementation report. In other words, discussions that would normally appear in an EIS were included as part of this report. The project implementation report also follows the original intent of tiering, which encourages agencies to tier their EISs to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review. Due to the conceptual nature of the CERP and the associated uncertainties, site-specific documents such as this report are needed to address the region-specific problems and solutions at a level of sufficient detail for final decision making and for full compliance with NEPA requirements.

Included in the draft PIR was a draft Supplement to the Final IRLS Integrated Feasibility Study and Supplemental Environmental Impact Statement (SEIS). For the purpose of the draft PIR, the draft SEIS was

prepared as a separate document to be combined with the report. The SEIS was differentiated from the rest of the PIR by different color pages. The draft PIR and draft SEIS was circulated for public and agency review and comment in accordance with the NEPA review process. After the NEPA review was complete the revised sections of the PIR and SEIS were merged with the Final IRLS Feasibility Report to make a Final Integrated Project Implementation Report and Environmental Impact Statement.

1.7 STUDY PROCESS

The Corps planning process consists of six steps defined in the Principles and Guidelines (P&G) for Water and Related Land Resources Implementation Studies promulgated in 1983. The process identifies and responds to problems and opportunities associated with the study objectives and specific Federal, state, and local concerns. The planning process culminates in the selection of a recommended plan. The process involves a systematic approach to making determinations at each step so that the interested public and decision-makers are fully aware of the basic assumptions employed. The data and information analyzed, the areas of risk and uncertainty, the reasons and rationales used, and the significant implications of each alternative plan are all exposed through this process. This report will serve as the basis for obtaining Congressional authorization of the plan components determined to be feasible and cost-effective.

This Project Implementation Report and Environmental Impact Statement addresses all of the requirements for a PIR included in Section 601(h)(4)(A)(iii) of WRDA 2000.

The requirements identified in this report may change as project features are further refined during the Pre-construction Engineering and Design Phase of the project. The project features including actual lands required and estates to be acquired in those lands may change after approval of this report. As project features are further refined in subsequent implementation efforts, the Corps will review the siting determination for the various project features set out in the report in accordance with established policies. This review may result in changes in design or land requirements for specific project features, while maintaining the overall benefit levels presented in the recommended plan. If there are substantive changes in the recommended plan and/or the requirements of this project based on more detailed analysis, then the Jacksonville District will prepare necessary documentation.

1.8 OTHER STUDIES, REPORTS, PROJECTS AND REFERENCES

Prior to the beginning of the efforts under the Restudy, and more specifically the IRLS study, many efforts had begun to identify, quantify and seek funding to implement solutions to the environmental degradation of the southern IRL ecosystem.

In 1987, a joint IRL Reconnaissance Report was published by the St. Johns River Water Management District and SFWMD. This report summarized the resource and began to identify and define issues relating to the deteriorating health of the lagoon.

The Florida Legislature enacted the Surface Water Improvement and Management (SWIM) Act in 1987 and revised it in 1991. The first SWIM plan for IRL further defined problems and specific actions that needed to take place in order to slow down the negative impacts that were occurring and to begin a process of restoration. The IRL SWIM plan was then updated in 1994. Soon after the SWIM program was established and initial plans were created, the program ran into the problem of not having a dedicated state funding mechanism. This caused the levels of funding through the mid 1990's to the present to be low, inconsistent and in some years non-existent, and resulted in many recommended projects in the plan not being fully implemented.

In 1990, the IRL was nominated for inclusion in the EPA's National Estuary Program (NEP). A study initiated by the IRL NEP produced a technical report by Woodward-Clyde in 1994. This multi-volume report fully described the resource in terms of its biological and economic components, identified major issues, and quantified problems, threatening the long-term sustainability of the lagoon. The IRL NEP then organized an advisory committee and working groups to help facilitate the development of a management plan, the IRL Comprehensive Conservation and Management Plan (CCMP), published in 1996.

The Upper East Coast Water Supply Plan, which focused on urban and agricultural water supply in the two counties was developed by the SFWMD in 1994 and updated in 1998. Much of the scientific data gathering, analysis and modeling done during these numerous planning efforts have helped lay the foundation for continued work efforts under the IRL feasibility study.

Even with all of these efforts, little progress has been made to remedy the ever-increasing negative impacts on the Lagoon. Lack of funding at levels sufficient to tackle some of the larger problems has been the biggest hurdle. Progress during the mid to late 1990's was made toward remedying some of the smaller and more localized problems. Partnerships were established both to garner interest and local support for restoration activities and to supplement state and SFWMD funding. Local governments in many areas of the lagoon

became active partners with the SFWMD and began implementing stormwater management projects that focused on water quality, in addition to flood protection. Large areas of mosquito impoundments were reconnected to the lagoon to provide water quality and habitat benefits. Partnerships with not-for-profit organizations focused primarily on habitat restoration projects. The IRL snook license tag was designed and revenue from tag sales went directly to small-scale restoration projects in the lagoon. All of these efforts have helped slow down the degradation of and in some locations cause noticeable improvements to, habitat and water quality.

Despite all of these efforts the SLE, like some of its smaller, but also problematic sister tributaries to the north, continued to show declines in overall ecosystem health. Repeated high-level discharges of freshwater from both Lake Okeechobee and the SLE watershed have reduced the oyster population to only 200 acres, with projections to disappear by 2050. Muck sediment deposits continued to grow in depth and area and algal blooms and low levels of dissolved oxygen became a common problem in the late spring and early summer. Fish abnormalities are being documented at higher than normal rates and outbreaks of lesions were correlated with large freshwater releases. In the spring of 1998 high-volume regulatory releases were made to both the SLE and the Caloosahatchee River from Lake Okeechobee. The SLE and surrounding community once again faced major ecological damage. This event resulted in the formation of the St. Lucie Issues Team under the auspices of the South Florida Ecosystem Restoration Working Group, which is made up of agency and stakeholder members. The team documented the devastating effects of the 1998 releases in a report released in the summer of 1998. The report includes a list of projects that, if funded, could help the estuary while waiting for this study to be completed, authorized and funded. The work of the Issues Team resulted in substantial state funding which, when matched with local dollars from the project sponsors, totaled approximately $20 million in 1999, $14 million in 2000 and $8 million in 2001.