

# working group meeting

2006  
april



*south florida ecosystem restoration*



**Lake  
Okeechobee  
PIR**

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# Project Status Reminder

1. Identify Problems and Opportunities



2. Inventory and Forecast Conditions



3. Formulate Alternative Plans



4. Evaluate Alternatives



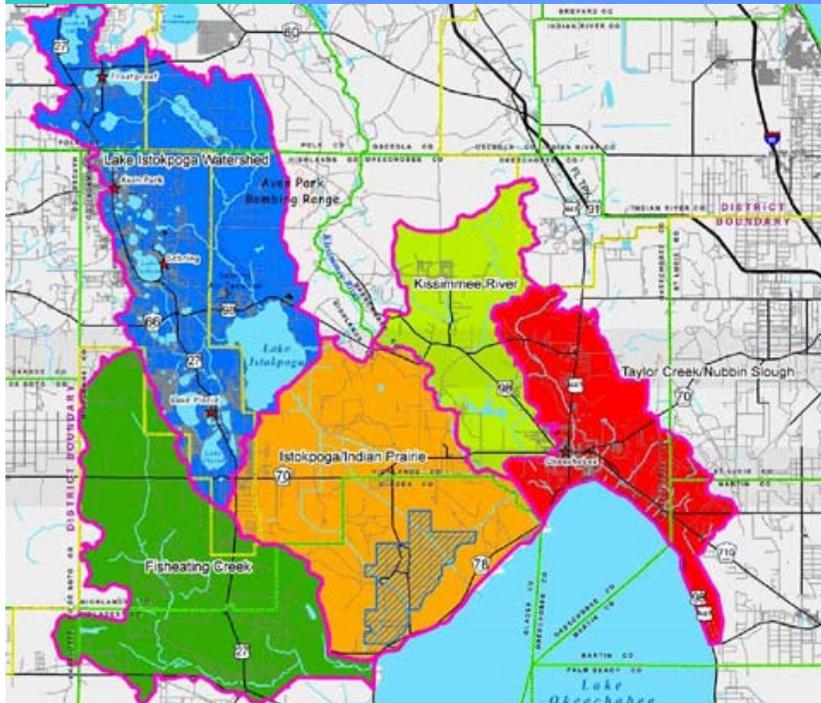
5. Compare Alternative Plans



6. Select Preferred Plan



**SOUTH FLORIDA  
WATER MANAGEMENT DISTRICT**



# Project Location

**Lake Okeechobee PIR**

# Compilation of 5 Restudy Components

- Component A - North of Lake Okeechobee Storage Area
- Component W - Taylor Creek/Nubbin Slough Storage and Treatment Area
- OPE - LOW Water Quality Treatment Facilities
- OPE - Lake Okeechobee Tributary Sediment Dredging
- OPE - Lake Istokpoga Regulation Schedule



# Compilation of 5 Restudy Components

- Component A = 201,250 ac-ft Reservoirs; 2,500 acres STAs
- Component W = 50,000 ac-ft Reservoirs; 5,000 acres STAs
- OPE - LOW Water Quality Treatment = 4,375 acres RaSTAs; 3,500 acres Wetland Restoration
- OPE - Lake Okeechobee Tributary Sediment Dredging
- OPE - Lake Istokpoga Regulation Schedule

# Planning Goals & Objectives

- Attenuate the extreme highs and lows in Lake Okeechobee
- Reduce damaging releases to the estuaries
- Reduce Phosphorus loading to Lake Okeechobee

# Performance Measures (Initial Surrogates)

- Storage
- Ecosystem Output
- Phosphorus Load Reduction

# Development of Alternatives

- Management Measures - Studied Feasibility of a wide range of management measures, but focused on 2 based on cost-effectiveness and proof of concept
  - Reservoirs
  - STAs

# What LOW Team Has Done

- The Team evaluated a large array of management measures, and determined the best-10 alternative combinations
- The alternatives were very costly
- The Team was requested to re-evaluate the management measures to seek more cost-effective and efficient designs

# What LOW Team Has Done

## continued

- Reservoir Depth Analysis
  - Reduce acres, cost and evapotranspiration
- STA Re-Sizing and Efficiency Analyses
  - Increase efficiency, reduce acres, cost and evapotranspiration
- Operations Analysis
  - Ensure most efficient operation of STAs and Reservoirs

# What LOW Team Has Done

continued

- Alternative Treatment Technology Update
  - Review of technologies and selection of potential measures to improve efficiency
- Revised Real Estate Cost Estimates
  - Ensure use of most up-to-date real estate costs
- Revised Fisheating Creek Basin Features
  - Avoid resource impacts and increase efficiency

# What LOW Team Has Done

continued

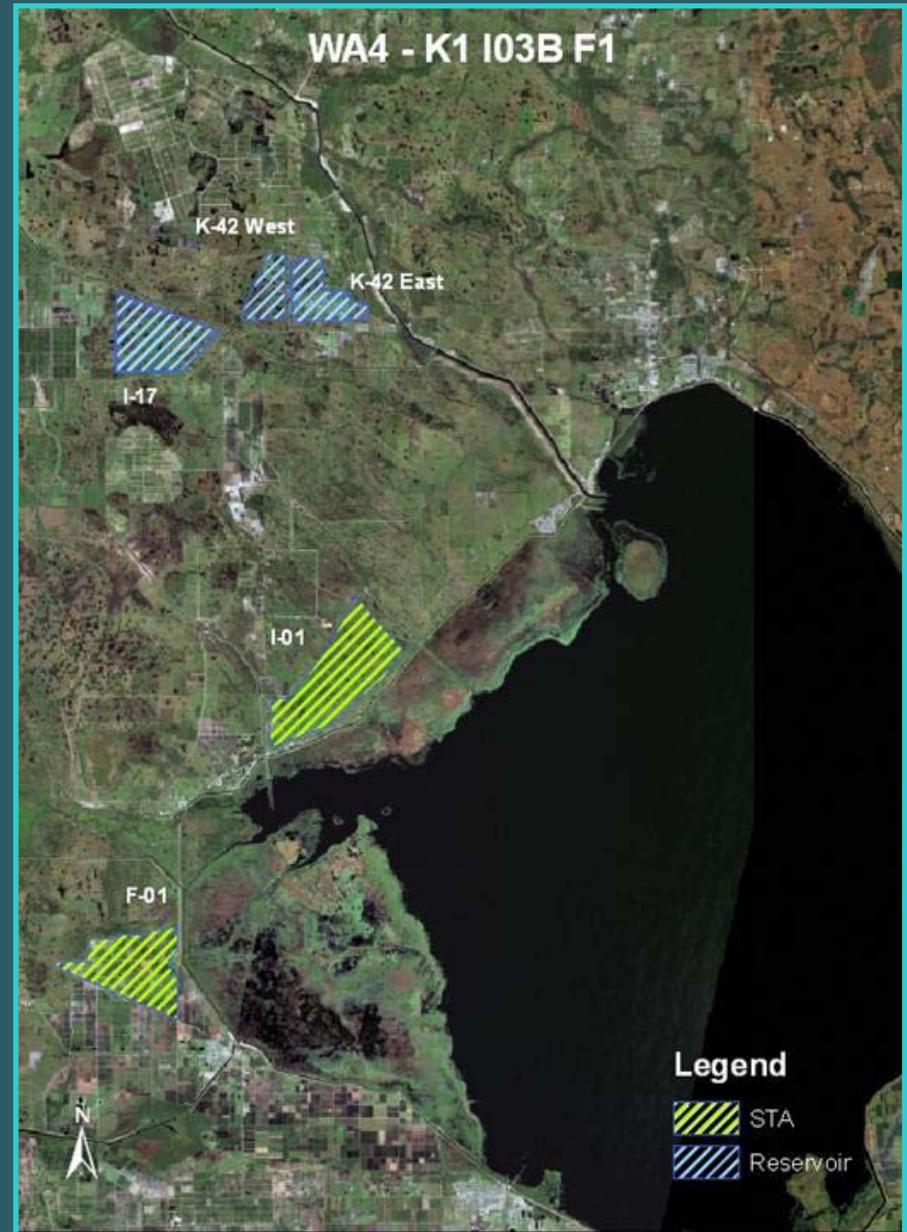
- A new Top Ten Alternative Array was developed
- From this alternative array, the Final Three Alternative array was determined

# Watershed Alternative 2



Lake Okeechobee PIR

# Watershed Alternative 4



Lake Okeechobee PIR

# Watershed Alternative 6



Lake Okeechobee PIR

# New Issues Arise

- Although the Fisheating Creek STA was designed to avoid environmental and cultural resource impacts, it impacted navigation
- Options were created for new Fisheating Creek STA designs, but were found to be not cost-effective

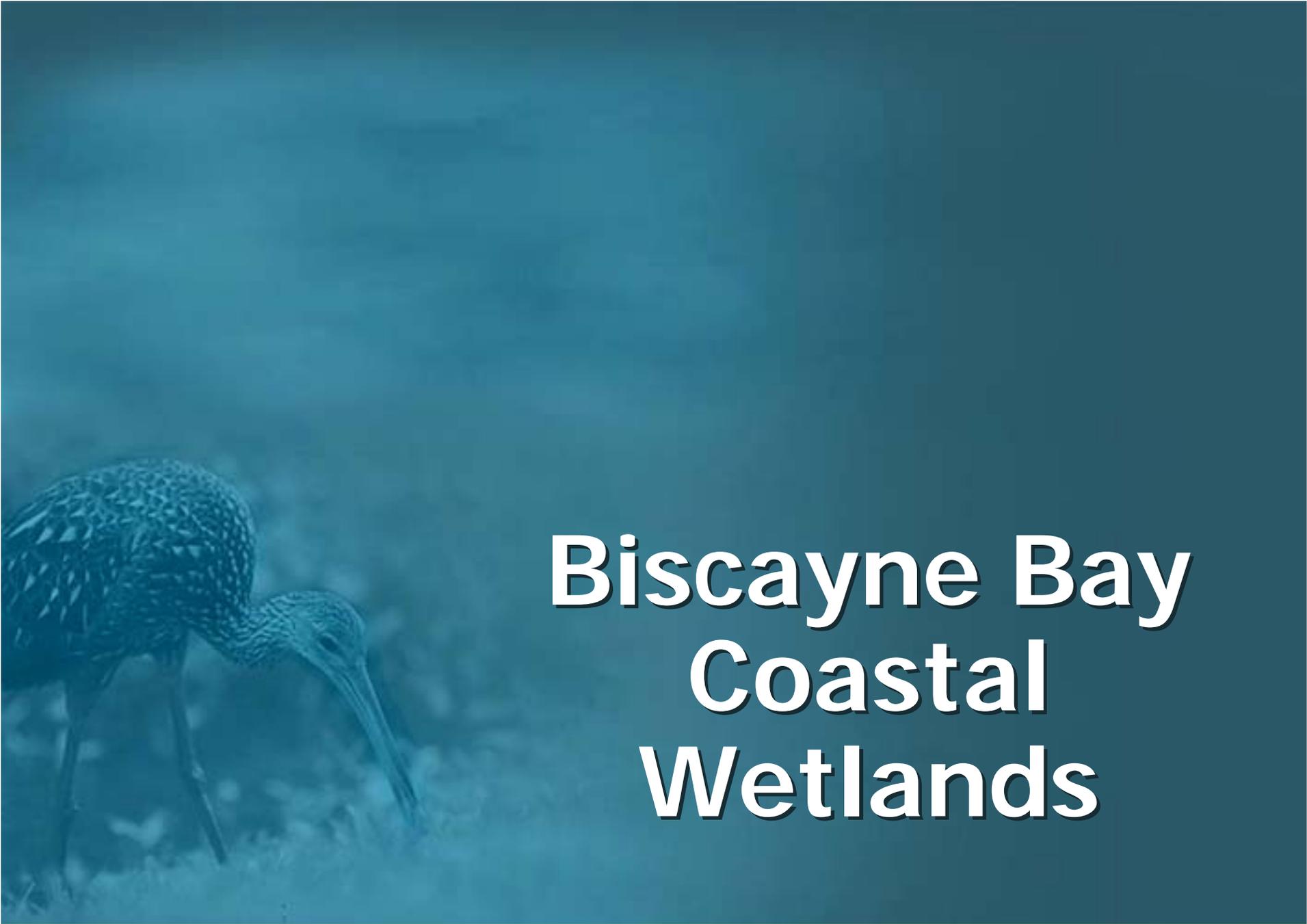
# New Issues Arise

continued

- The Yellow Book primary goal for this project is to provide storage to attenuate the flows into Lake Okeechobee, which will re-establish the littoral zones, allow phosphorus to settle, and provide water during low-water events
- Post-Yellow Book studies recommend more phosphorus-load reduction going into the lake to maintain the lake at 40-ppb through STAs and Best-Management Practices

# Re-Evaluation of Final Array

- The Team is re-looking at the combinations of management measures to maximize storage, then incrementally add water quality features (STAs)
- Currently developing a new Final Array to determine the Tentatively Selected Plan



# Biscayne Bay Coastal Wetlands

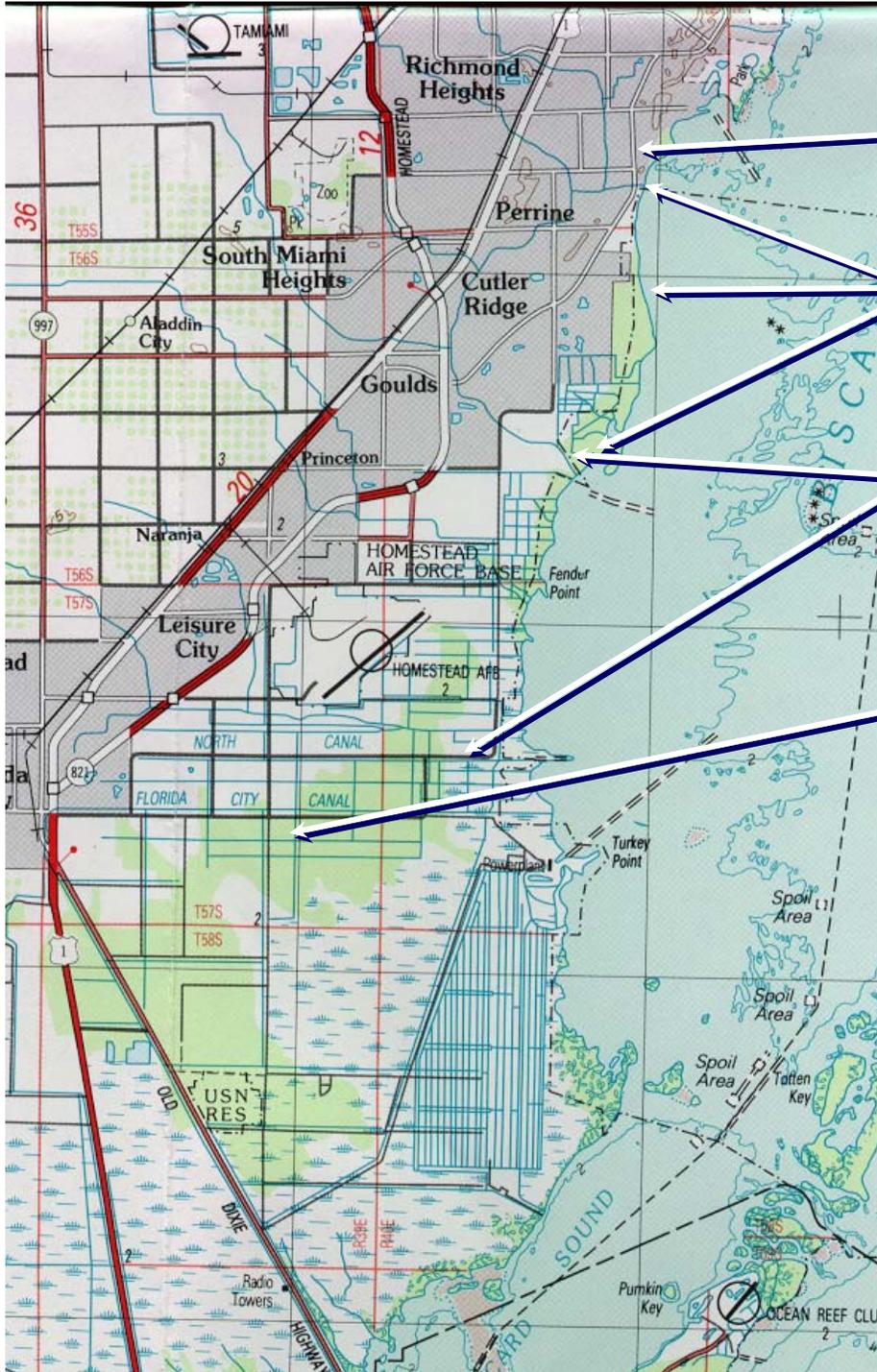


# Yellow Book

- Yellow Book
  - Outlined planning region
  - No specific alternative “plans” or maps
  - Identified objectives
- Project Delivery Team
  - Utilized Yellow Book objectives
  - Formulated four alternative plans

# Objectives

- Reestablish productive nursery habitat along the shoreline
- Redistribute freshwater flow to minimize point source discharges to improve freshwater and estuarine habitat
- Enhance and improve quantity, quality, timing and distribution of freshwater to the Bay, including BNP
- Preserve and restore spatial extent of natural coastal glades habitat
- Reestablish connectivity between Biscayne Bay Coastal Wetlands, C-111 Basin, Model Lands and adjacent basins



Deering Estate

Cutler Wetlands

L-31E Flow Way

Model Land/Barnes  
Sound Wetlands

# Biscayne Bay Coastal Wetlands Regions

# Screening Criteria

- Affect on protected species and habitat
- Enhance near shore salinity regime
- Improve functional value of estuarine wetlands
- Protect against salt water intrusion
- Decrease canal point source discharge
- Improve water quality in the Bay
- Reduce freshwater flow barriers
- Increase spatial extent of transverse glades and freshwater wetlands
- Land suitability and cost

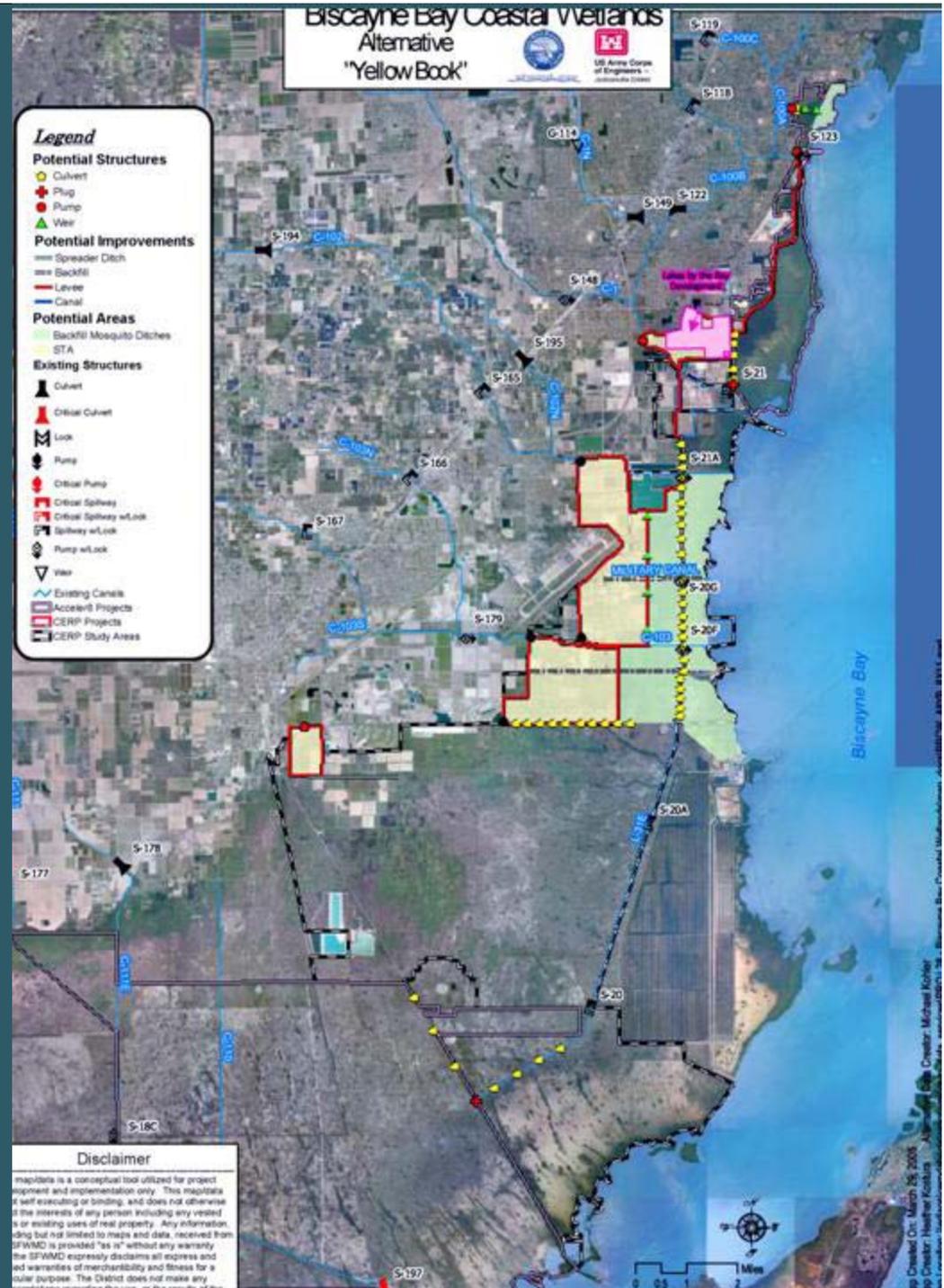
# Final Array of Alternatives

- No-Action (FWOP)
- Yellow Book
- Alt E
- Alt J
- Alt Q
- Alt M

# Yellow Book

## Biscayne Bay Coastal Wetlands

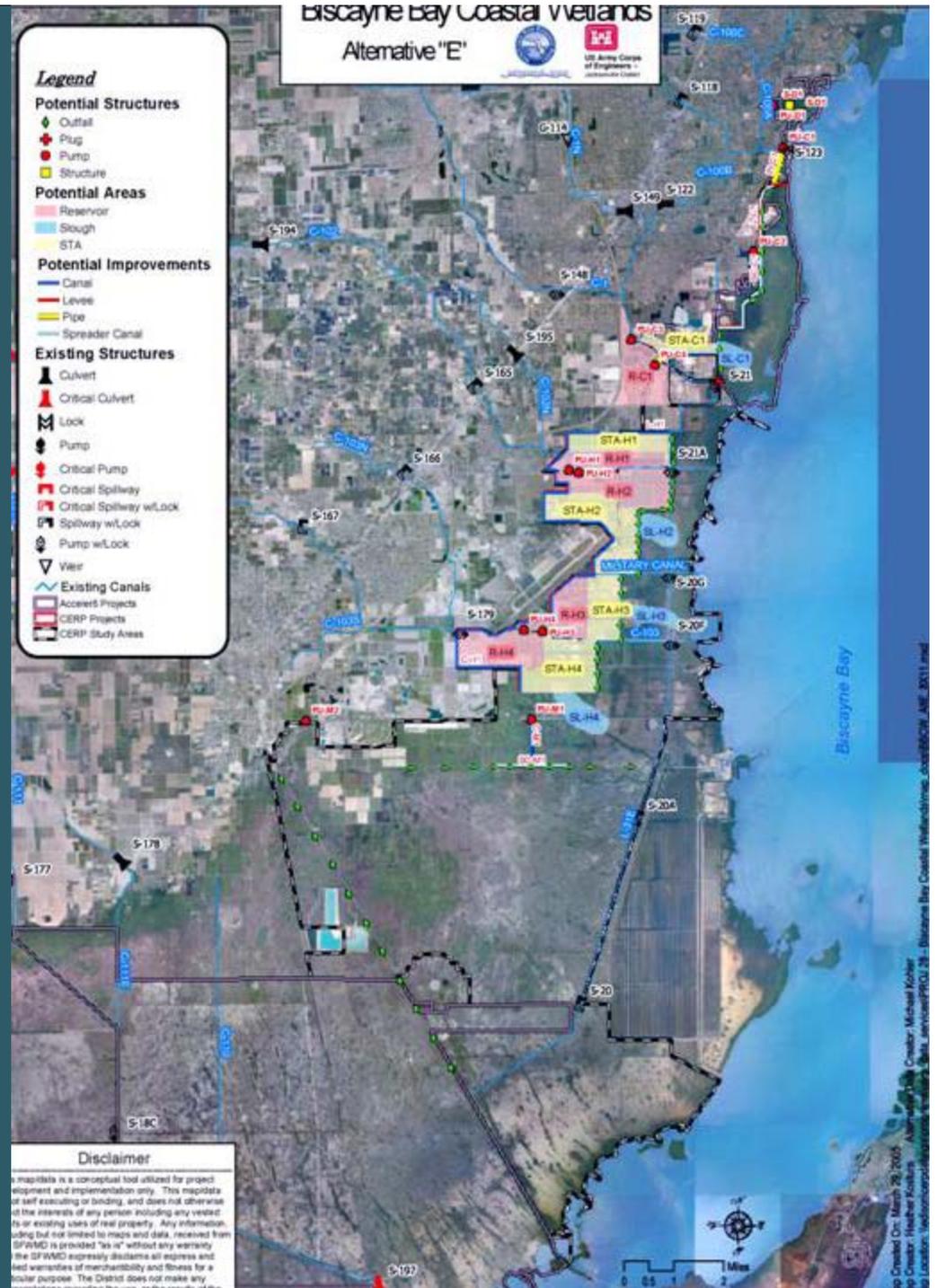
- Outlined study area
- No specific "plans"



# Alt E

## Biscayne Bay Coastal Wetlands

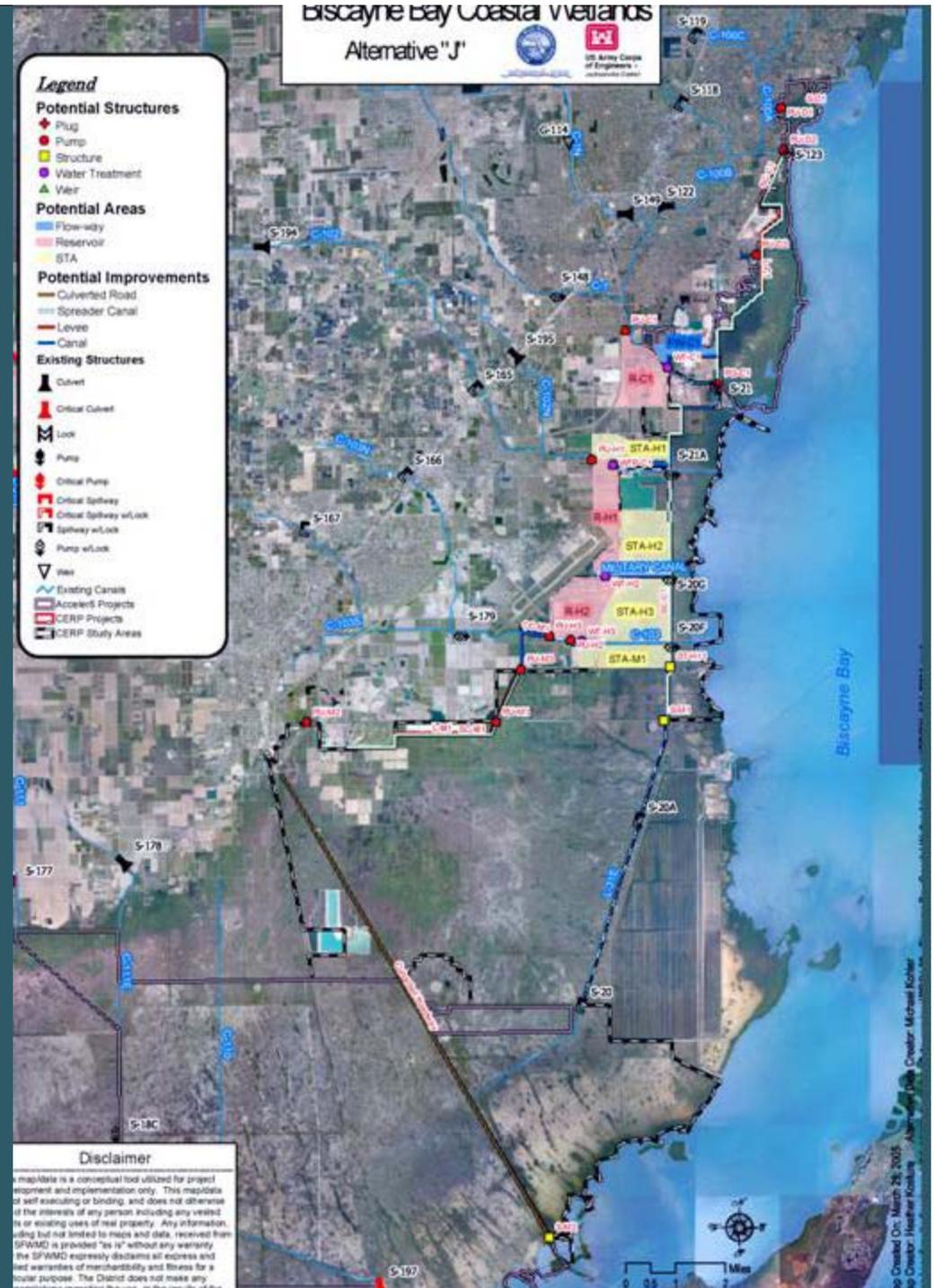
- Large reservoirs
- Several STAs
- Spreader canals
- Slough creation



# Alt J

## Biscayne Bay Coastal Wetlands

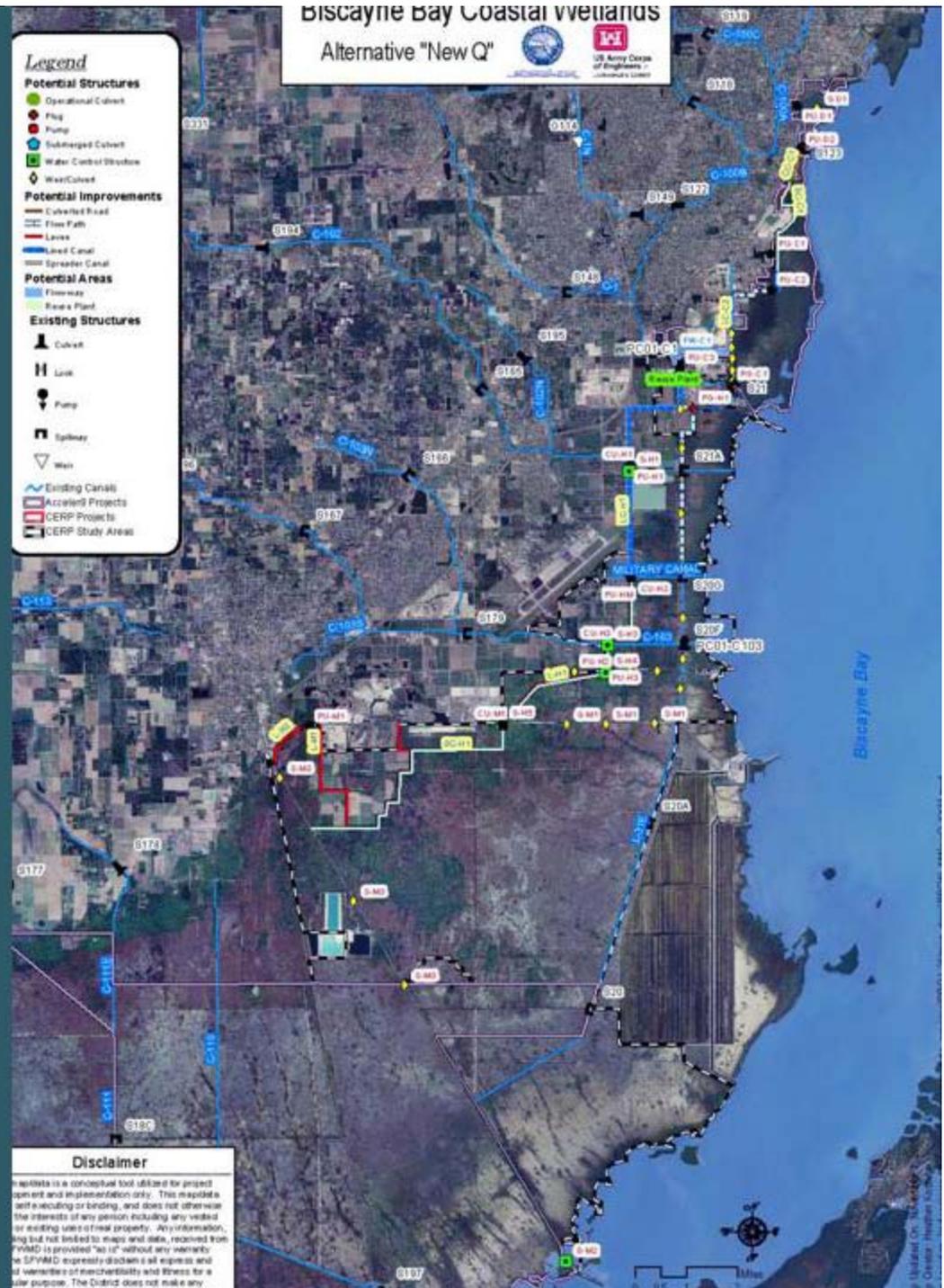
- Smaller version of Alternative E
- Reservoirs
- STAs
- Flow ways



# Alt Q

## Biscayne Bay Coastal Wetlands

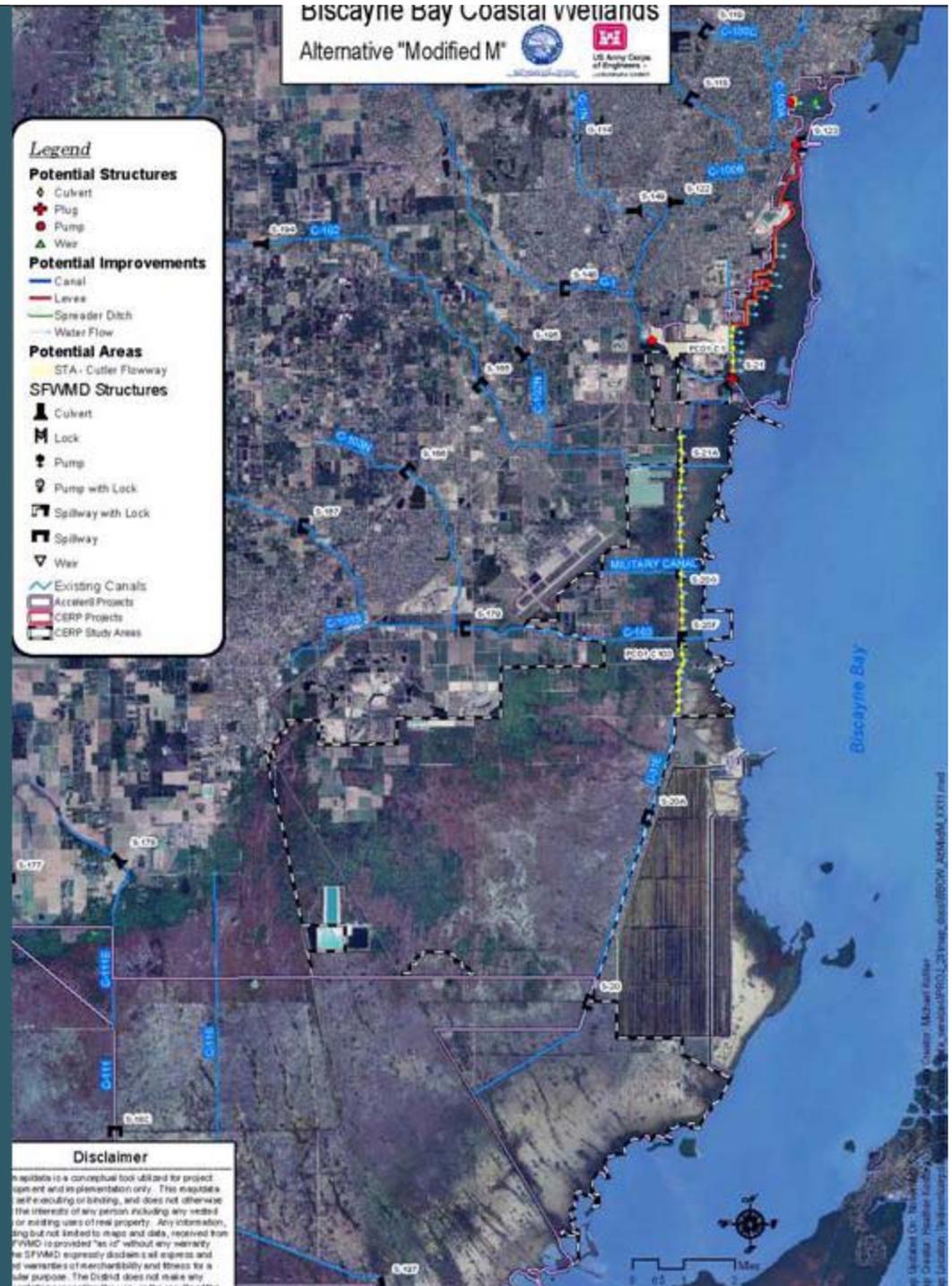
- STA
- Flow ways
- Spreader Canals
- Canal discharge redistribution



# Alt M

## Biscayne Bay Coastal Wetlands

- Optimizes use of existing canals
- Spreader canals
- Canal discharge redistribution
- Less intensive land acquisition

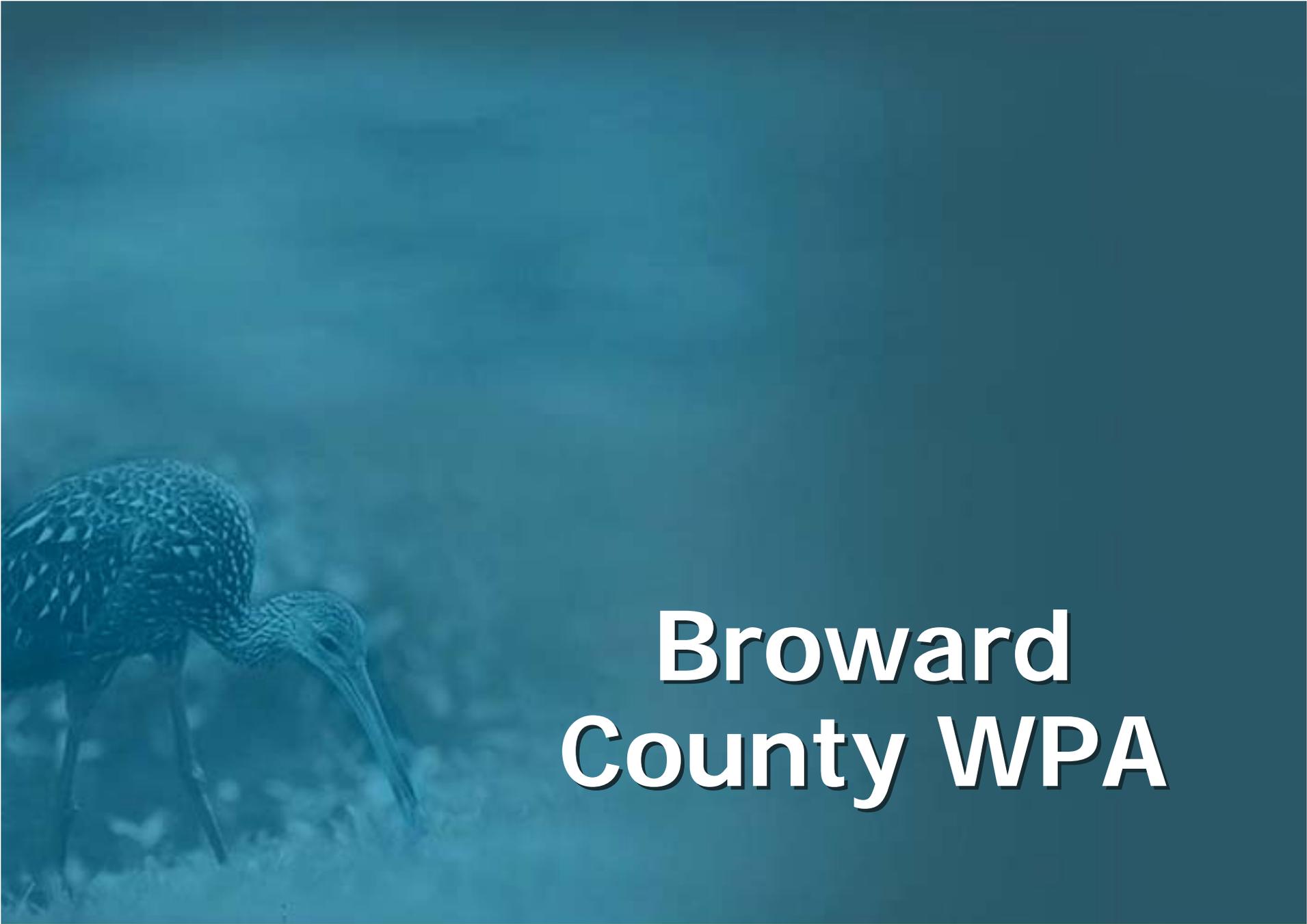


# Cost Estimates

Alternative	Construction Costs	Real Estate Cost	Total Project Cost
YB	291,000,000	555,426,130	846,426,130
E	1,595,000,000	767,814,820	2,362,814,820
J	522,000,000	556,166,570	1,078,166,570
Q	238,000,000	366,033,980	604,033,980
M	79,000,000	145,295,120	224,295,120

# Milestones

- Tentatively Selected Plan Complete Apr 06
- Alternative Formulation Briefing Jun 06
- Draft PIR/NEPA Report Posted in Federal Register Oct 06
- Final PIR/NEPA Posted in Federal Register May 07
- 1502 Permit Decision Jun 07
- 404 Permit decision Jul 07
- Start Construction on A8 Features Aug 07



# Broward County WPA

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# Briefing Purpose

- To advise the Working Group of the status of the Draft PIR/EIS currently out for public review
- To provide a brief overview of the project, project milestones, costs and alternatives outlined in the Draft PIR/EIS

# BCWPA Project Purpose

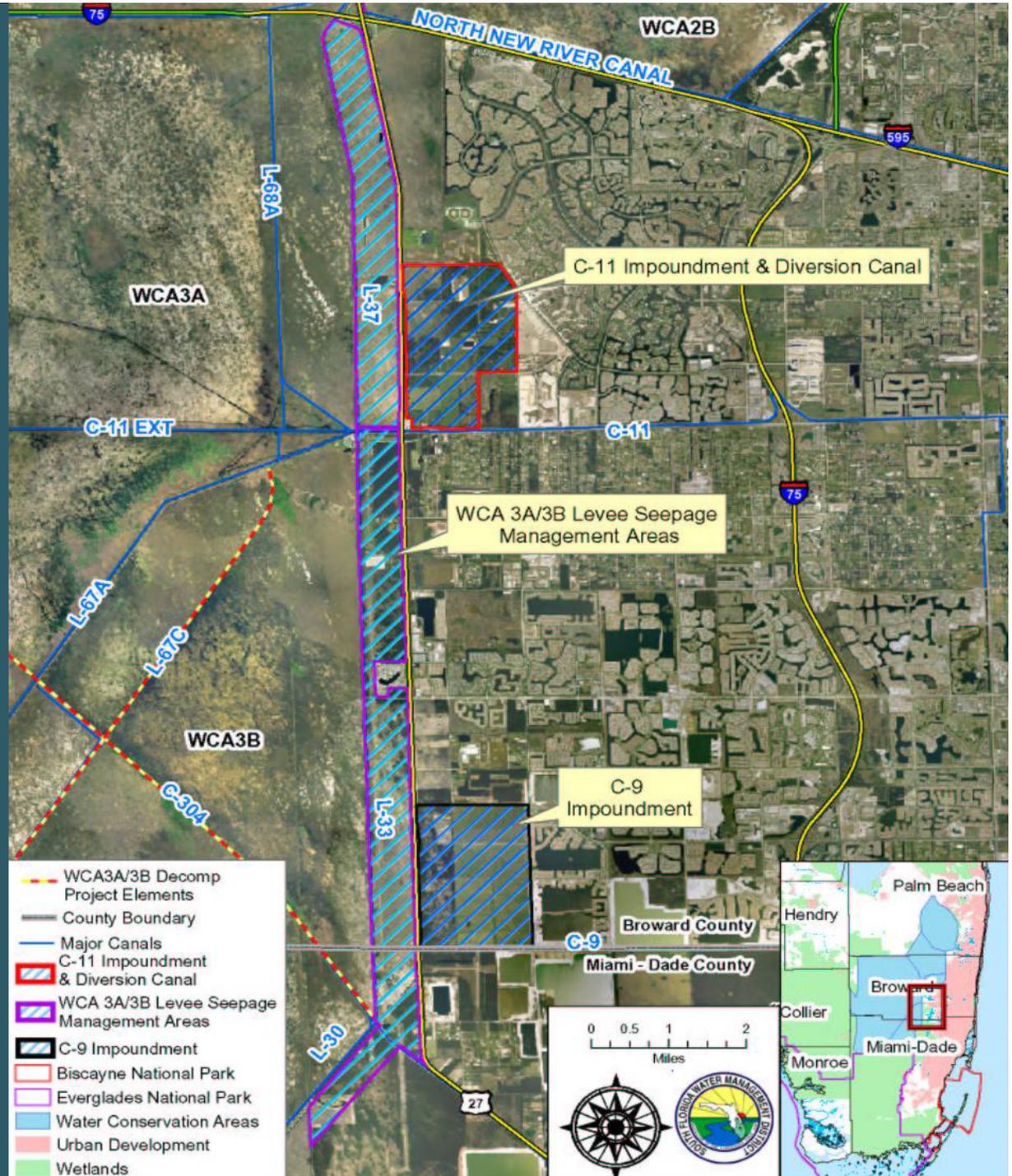


- Reducing undesirable losses from the natural system through seepage
- Capturing and redistributing stormwater runoff previously discharged to WCA 3

# Study Area

## Broward County WPA

- Eastern reaches of Water Conservation Areas (3A and 3B)
- Village of Weston, Town of Davie, Cooper City, Miramar, Southwest Ranches and Pembroke Pines



# Status & Upcoming Milestones

## PAST

- Draft Project Implementation Report/Environmental Impact Statement (PIR/EIS) out for public release: March 17, 2006

## PRESENT

- Team is updating PIR/EIS to current Guidance memo format
- Team is responding to public comments that have been received
- Public Meeting: April 18, 2006
- Stakeholders meeting: April 19, 2006
- Working Group briefing: April 20, 2006

## FUTURE

- Public comment period on D PIR/EIS closes: May 1, 2006
- Final PIR/EIS scheduled for completion: June 1, 2006
- Final PIR/EIS published in Federal Register: mid July 2006
- A8 construction start: Late August 2006

# Recommended Plan – Alternative A4

The BC WPA Project includes the following features:

- C-9 Impoundment: 1,739 acres, 4 ft deep
- C-11 Impoundment: 1,695 acres
  - Northern Compartment "A" 1,490 acres, 4 ft deep
  - Southern Compartment "B" 205 acres, 2 ft deep
- Seepage management: buffer strip (4,312 ac), 3 structures
- North New River Channel Modifications from C-11 Impoundment to Seepage Management Area
- Recreation features of Recommended Plan
- Produces the greatest amount of NER benefits
- Cost effective and best buy after Cost Effectiveness/Incremental Cost Analysis (CE/ICA)

# **Broward County, WPA Comparison of Alternatives**

Alternatives for Broward Co, WPA were optimizations of the Restudy (D-13 R Alternative)

*Restudy (D-13 R) Alternative*

C-11: 1,600 acre impoundment @ 4' deep

C-9: 2,500 acre impoundment @ 4' deep

Seepage Management Area: levees, canals, divide structures

# Comparison/Optimization of Restudy Alternative

- Alt 2: Design attempt to solve seepage problems
  - C-9: 2,091 ac (divided into 3 compartments)
    - a) 1,232 ac @ 6' deep
    - b) 474 ac @ 2' deep
    - c) 385 ac @ 2' deep
  - C-11: 1,734 ac (divided into 2 compartments)
    - a) 1,119 ac @ 6' deep
    - b) 615 ac @ 2' deep
  - Seepage management: buffer strip, 3 structures, operations adjusted

# Comparison/Optimization of Restudy Alternative

- Alt 3: Design attempt to solve seepage problems
  - C-9: 2,091 ac
    - a) 1,232 ac @ 6' deep
    - b) 474 ac @ 4' deep
    - c) 385 ac @ 4' deep
  - C-11: 1,734 ac
    - a) 1,281 ac @ 6' deep
    - b) 453 ac @ 4' deep
  - Seepage management: buffer strip, 3 structures, operations adjusted

# Comparison of Alternatives

Alternatives for Broward Co, WPA were optimizations of the Restudy (D-13 R Alternative)  
*Restudy (D-13 R) Alternative*

C-11: 1,600 acre impoundment @ 4' deep

C-9: 2,500 acre impoundment @ 4' deep

Seepage Management Area: levees, canals, divide structures

# Restudy vs. PIR

## Restudy Plan

(Oct 2005 price levels)

- Cost - \$405-million
- Features:
  - Reservoir Impoundments (C-9, and C-11)
  - Seepage Management Area

## PIR Plan

(Oct 2005 price levels)

- Cost - \$520 mil (total sum of components)
- Features:
  - Reservoir Impoundments (C-9, and C-11)
  - Seepage Management Area
  - North New River channel modifications (within Broward County WPA project limits) - initially authorized in WRDA 2000

# Why Alternative 4 was selected

- Results of Cost Effectiveness/ Incremental Cost Analysis: cost effective plan & best buy plan (efficiency) in accordance w/ Corps guidance (ER 1105-2-100).
- Lowest per unit cost of any alternative (for combined, normalized output)
- Fully meets Broward County, WPA planning objectives.
- Strong public & resource agency support (USFWS, FDEP, EPA, Broward County, Miami-Dade County)

# Project Costs – Recommended Plan

BCWPA (Alternative A4)

## Pre-Construction

Engineering Design (PED): \$ 22,732,000

Real Estate: \$281,526,000

Construction: \$215,073,000

**Total:** **\$520,073,000**

Recreation: \$ 494,000

# Acceler8 Approach

- Develop PIR option using latest site data
- Optimize retained water depth comparing embankment height vs. seepage quantity
- Refine pumping quantities based on further modeling
- Include value engineering



# Everglades Agricultural Area

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# Background

- SFWMD and USACE completed Draft Project Implementation Report (PIR) for Everglades Agricultural Area (EAA) Storage Reservoir Project
- Implementation of Recommended Plan described in PIR will provide structural storage component essential to Everglades restoration
- Project authorized in WRDA 2000 and being implemented under Acceler8

# Project Objectives

- Provide storage for releases from Lake Okeechobee to reduce the harmful effects of flood control releases on the St. Lucie and Caloosahatchee Estuaries
- Enable more effective management of water levels in Lake Okeechobee to promote recovery of fish and wildlife habitat
- Provide a source of additional water to improve fish and wildlife habitat in the everglades
- Provide an alternative source of water for agricultural water supply needs in the EAA

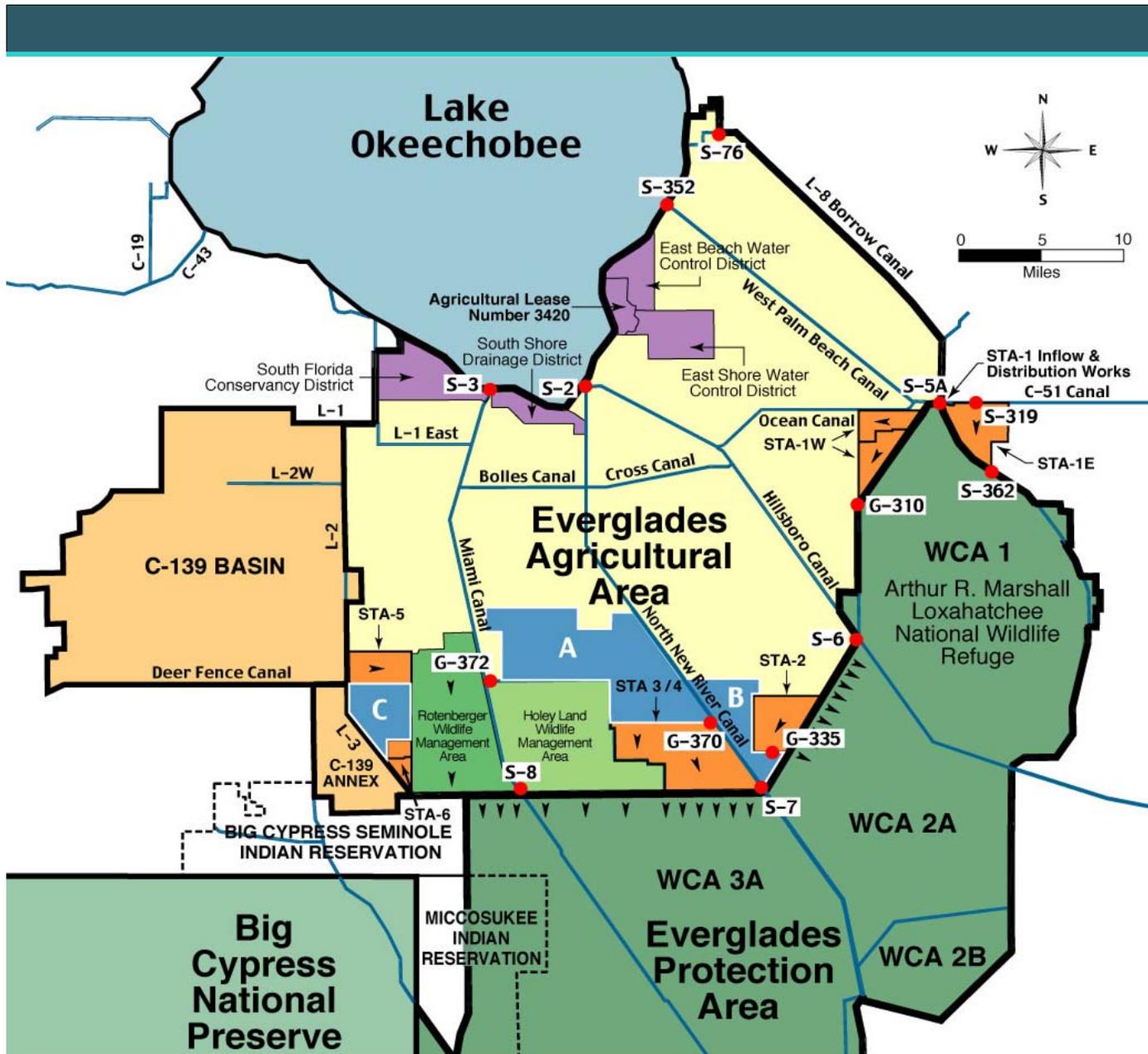
# Plan Evaluation

- Minimize adverse impacts to productive lands and local economy
- Maximize operational efficiency by utilizing existing water management features
- Work in tandem with STAs
- Maximize cost effectiveness

# Alternative Comparison

Alternative Number	Storage Depth (feet)	Footprint Area (acres)	Storage Volume (acre-feet)
2	6	62,000	360,000
3	10	38,000	360,000
4	12	31,500	360,000
5	14	26,500	360,000

- Tentatively Selected Plan is Alternative 4



# Project Location

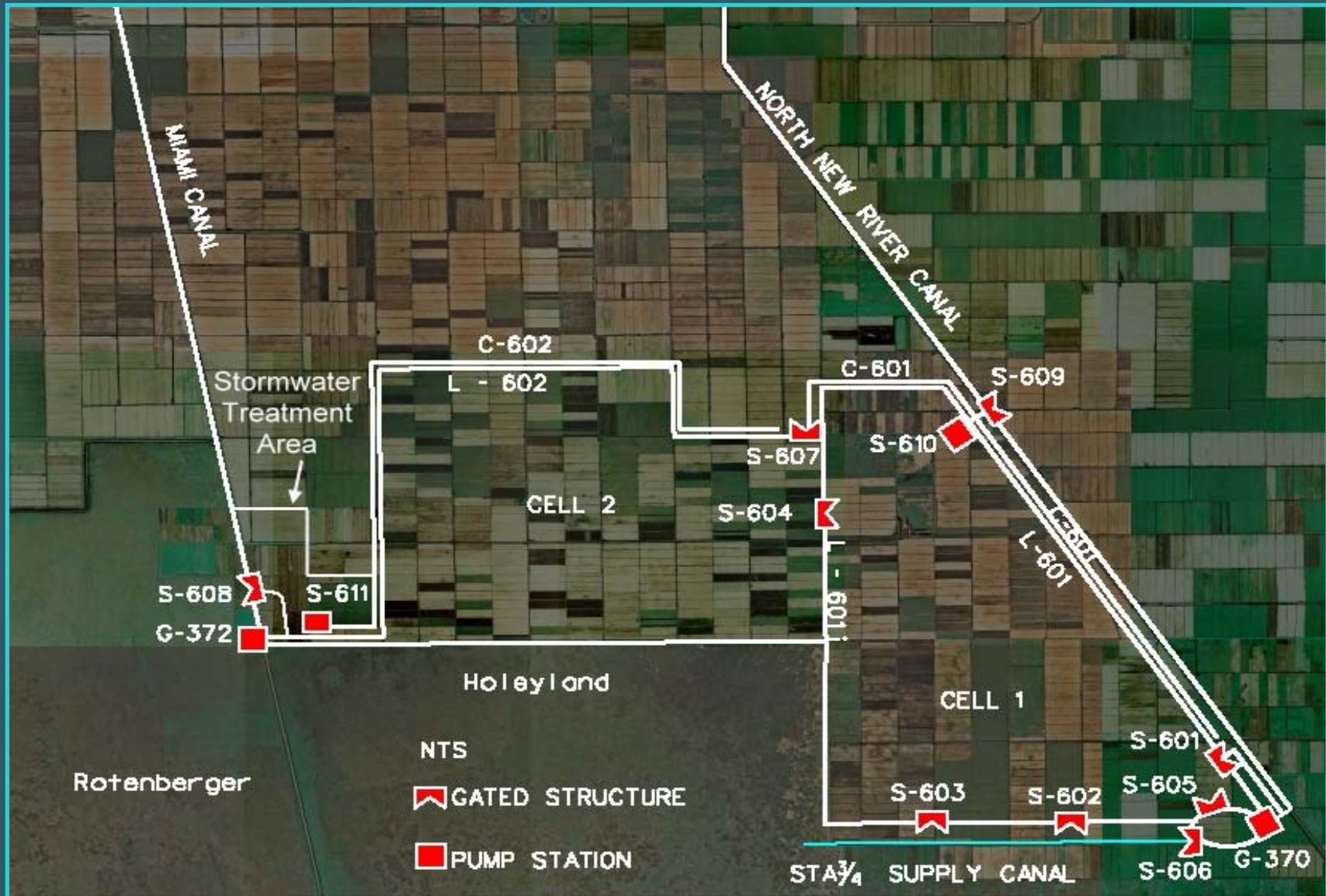
Everglades Agricultural Area

# Project Site



**Everglades Agricultural Area**

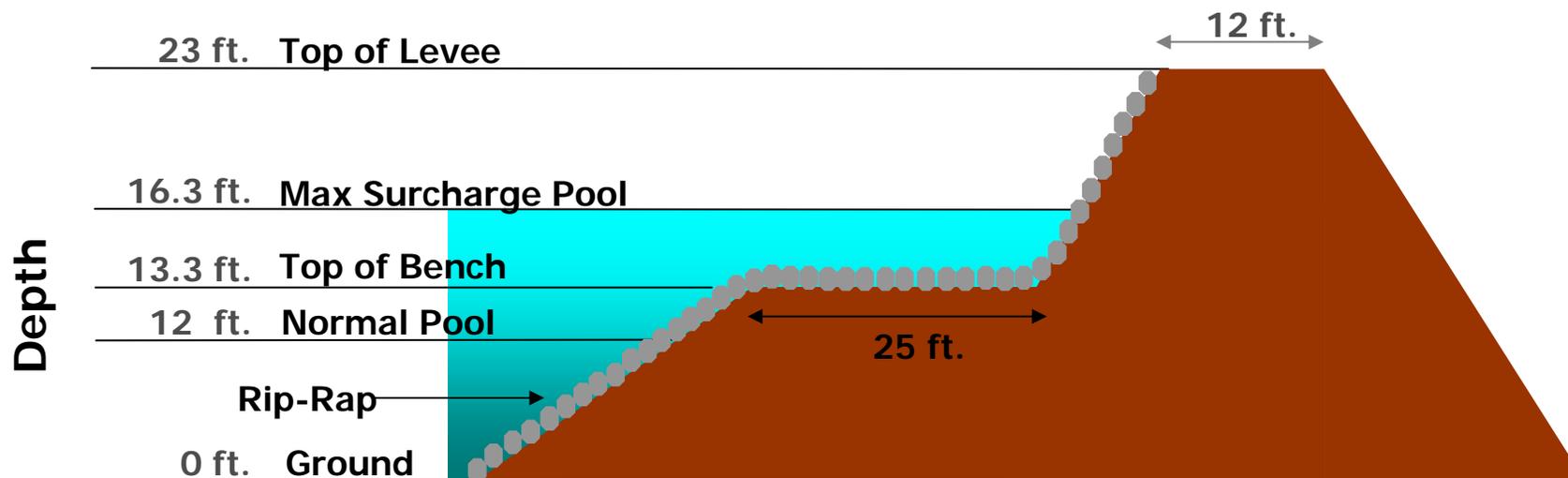
# Selected Plan – Alternative 4



Everglades Agricultural Area

# Earthen Levee Design

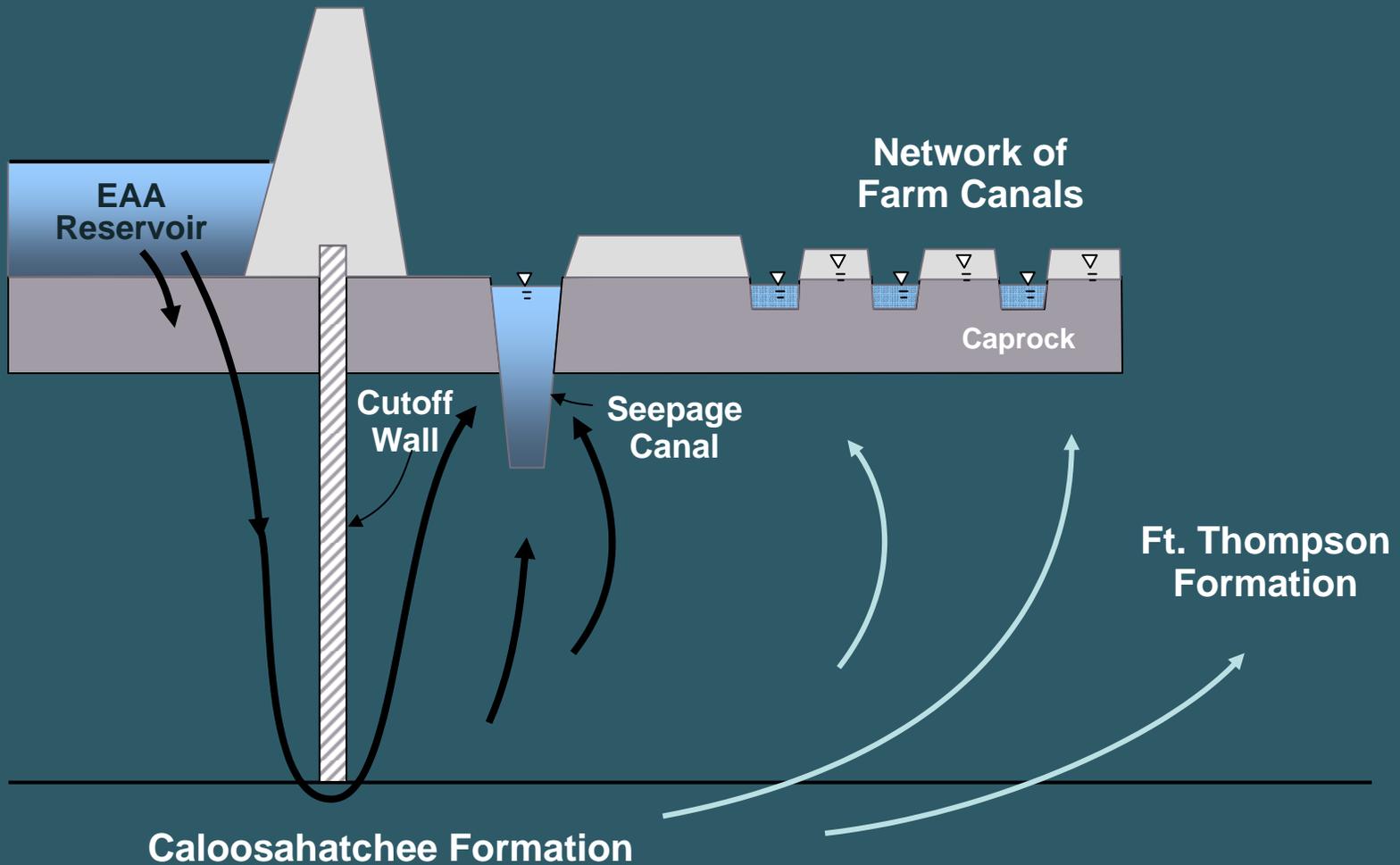
**Earthen Levee**  
(360,000 acre feet at 12' Design Depth)



Not to Scale

**Everglades Agricultural Area**

# Seepage Cut-Off Wall



Everglades Agricultural Area

# Estimated Project Costs

## Construction Costs

Sub-Total \$ 761,511,089

## Non-Construction Costs

Lands \$ 80,134,000

Design & Construction Mgt \$ 71,250,000

Sub-Total \$ 151,384,000

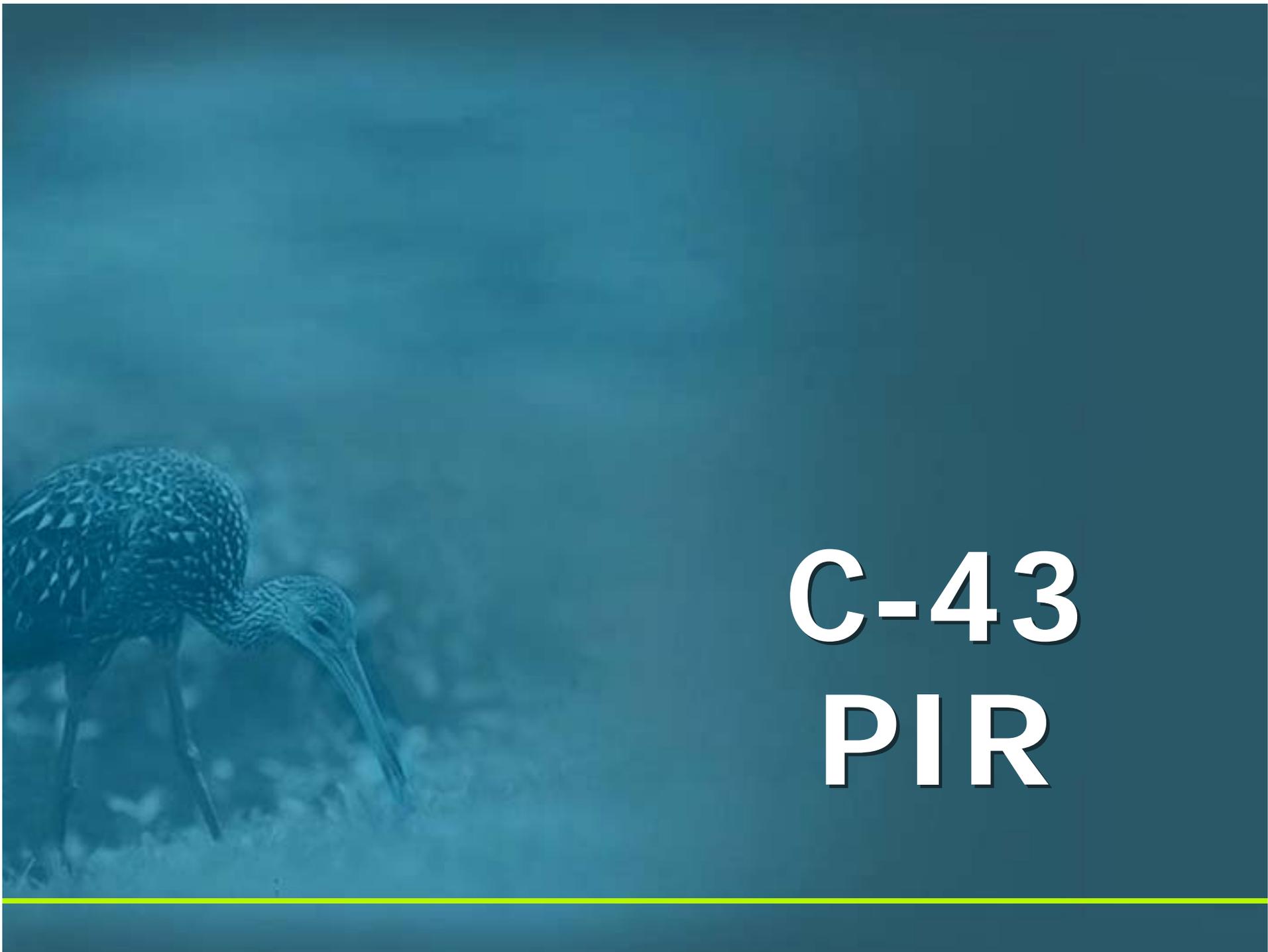
Total Initial Cost \$ 912,895,089

Annual O&M Cost \$ 2,413,982

Annual Monitoring Cost \$ 350,000

# PIR Milestones

<b>Completed Milestones</b>	
Draft PIR Posted in Federal Register	Feb 24, 2006
Public Review of Draft PIR Complete	Apr 10, 2006
Final FWS Coordination Report Received	Apr 14, 2006
<b>Upcoming Milestones</b>	
Publish Final PIR	Jun 06, 2006



**C-43**  
**PIR**

# Briefing Purpose

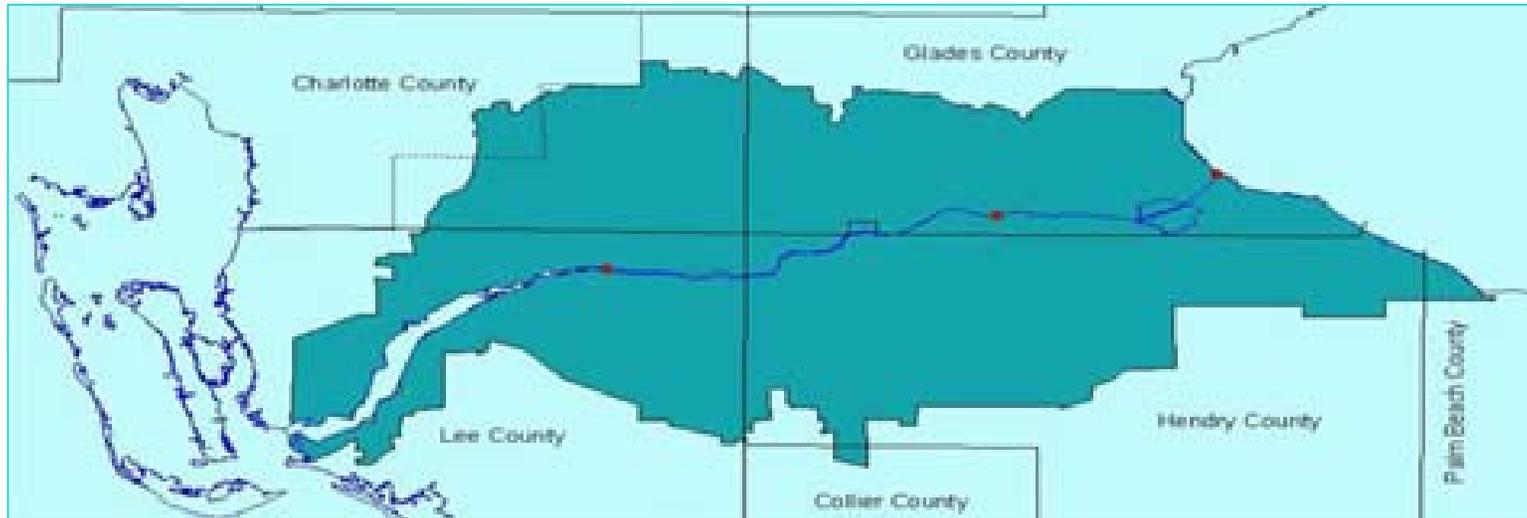
- To advise the Working Group of the status of the scope and schedule of the PIR that is currently being developed



# C-43 Project Purpose

- Address the declining health of the Caloosahatchee River and estuarine ecosystems
- Improve water deliveries to the estuary by reducing excessive high flows and increasing the availability of water for the estuary during the dry season
- Provide a salinity range suitable for a healthy estuarine ecosystem
- Reduce dependence on Lake Okeechobee

# Study Area



## Caloosahatchee Basin



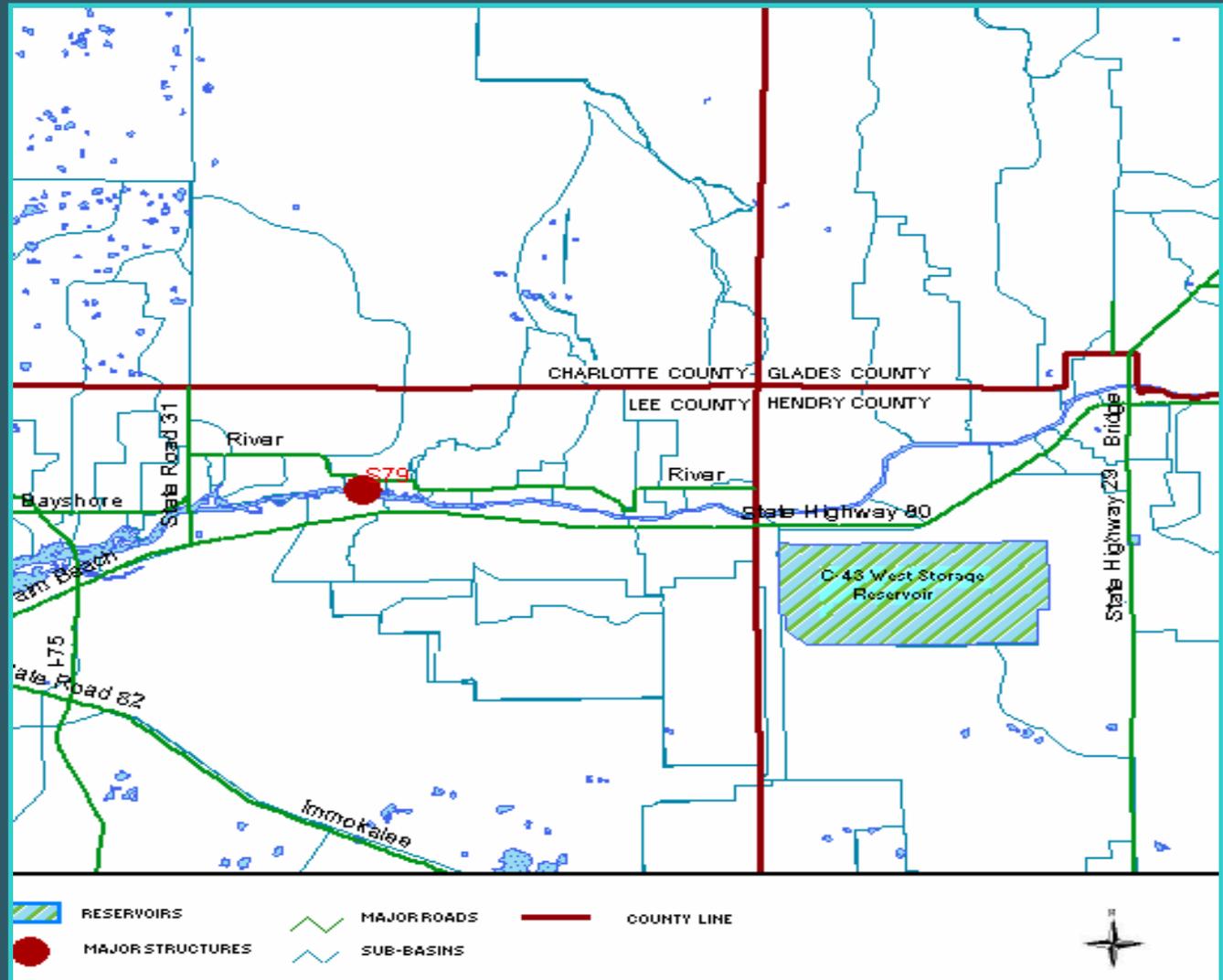
# C-43 Part 1 Scope

- The C-43 Basin Part 1 Project will be divided into two phases: an “Interim PIR” and a “Final PIR”
- The “Interim PIR” would address formulation, evaluation, and justification of a project at the Berry Groves (the SFWMD Acceler8 project) site, while acknowledging that the project is a part of a more comprehensive plan for the C-43 Basin
- The “Final PIR” would include formulation and evaluation of additional management measures (particularly in the upper basin) to address basin planning objectives that can not be addressed by a reservoir at the Berry Groves site

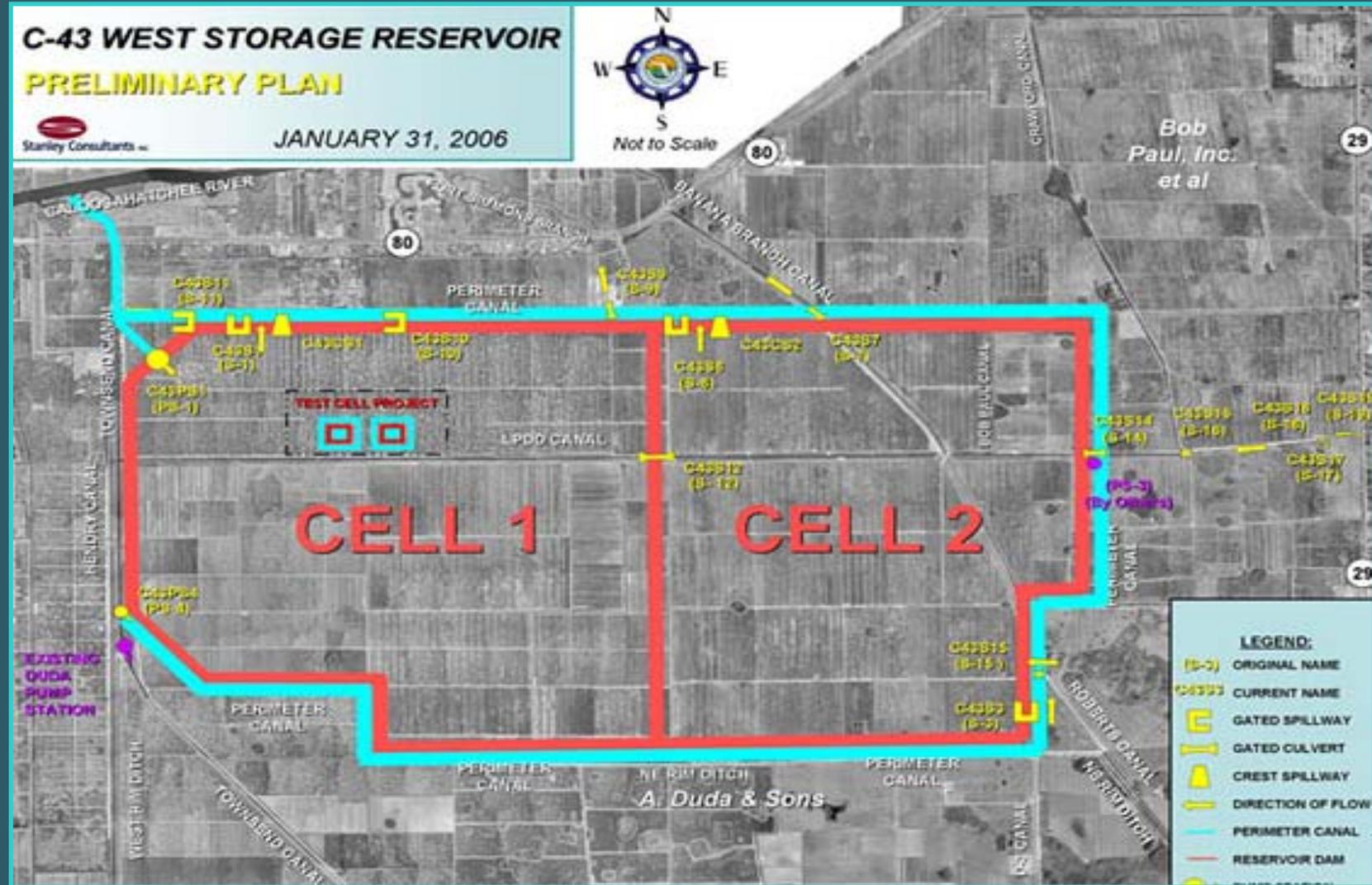
# C-43 Basin Part 1 - Phasing

- “Interim PIR” (C-43 West Reservoir) =  
C-43 Basin Part 1, Phase 1
- “Final PIR” =  
C-43 Basin Part 1, Phase 2

# C-43 West Reservoir Site Location



# C-43 West Storage Reservoir



# C-43 BSR Part 1, Phase 1

- Reaffirmation of the “Yellow Book” Plan:
  - Smaller reservoir: 100,000 acre-feet
  - Acceler8 design: 170,000 acre-feet
    - Resembles Yellow Book alternative
  - Larger reservoir: 220,000 acre-feet

# C-43 BSR Part 1, Phase 1

- C-43 West Reservoir currently being evaluated in Part 1, Phase 1 will not require STA unless it causes water quality to worsen
  - Current evaluations show STA is not warranted
  - Options for water quality improvements for restoration to be evaluated in Part 1, Phase 2

# C-43 Basin Part 1 – Phase 1 PIR and A8 Schedule

- Selection of TSP 31 May 2006
- Proceed to Greater than 30% Design 30 June 2006
- Hold AFB 1 Aug 2006
- Draft PIR/EIS for C-43 Basin Part 1, Phase 1 28 Dec 2006
- C-43 Basin Part 1, Phase 1 Final PIR MSC Notice 23 May 2007
- Complete Final P&S under Acceler8 May 2007
- Obtain FDEP 1502 permit Jun 2007
- Obtain 404 Permit Jun 2007
- Initiate Construction under Acceler8 Jul 2007
- Woodley - Allbright May 07 / Jun 07

**Green = PIR schedule**

**White = Acceler8 Schedule**

# C-43 Basin Part 1, Phase 2

The Part 1, Phase 2 PIR will address the following:

- The Needs of the Upper Basin including:
  - Water supply issues
  - Water quality issues
- The needs of the Lower Basin that were not met in the interim PIR
- TSP will be selected based upon the alternative that best meets the needs of the Upper/Lower Basins

# Part 1, Phase 2

## Next Steps

- Revisions to PMP
  - To be Prepared and Proposed by C-43 Project Team
- Utilize Modeling From Part 1, Phase 1 to continue formulation
- Provide Updated Schedule at Next Briefing



**C-111  
Implementation  
Plan**

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# Project Background

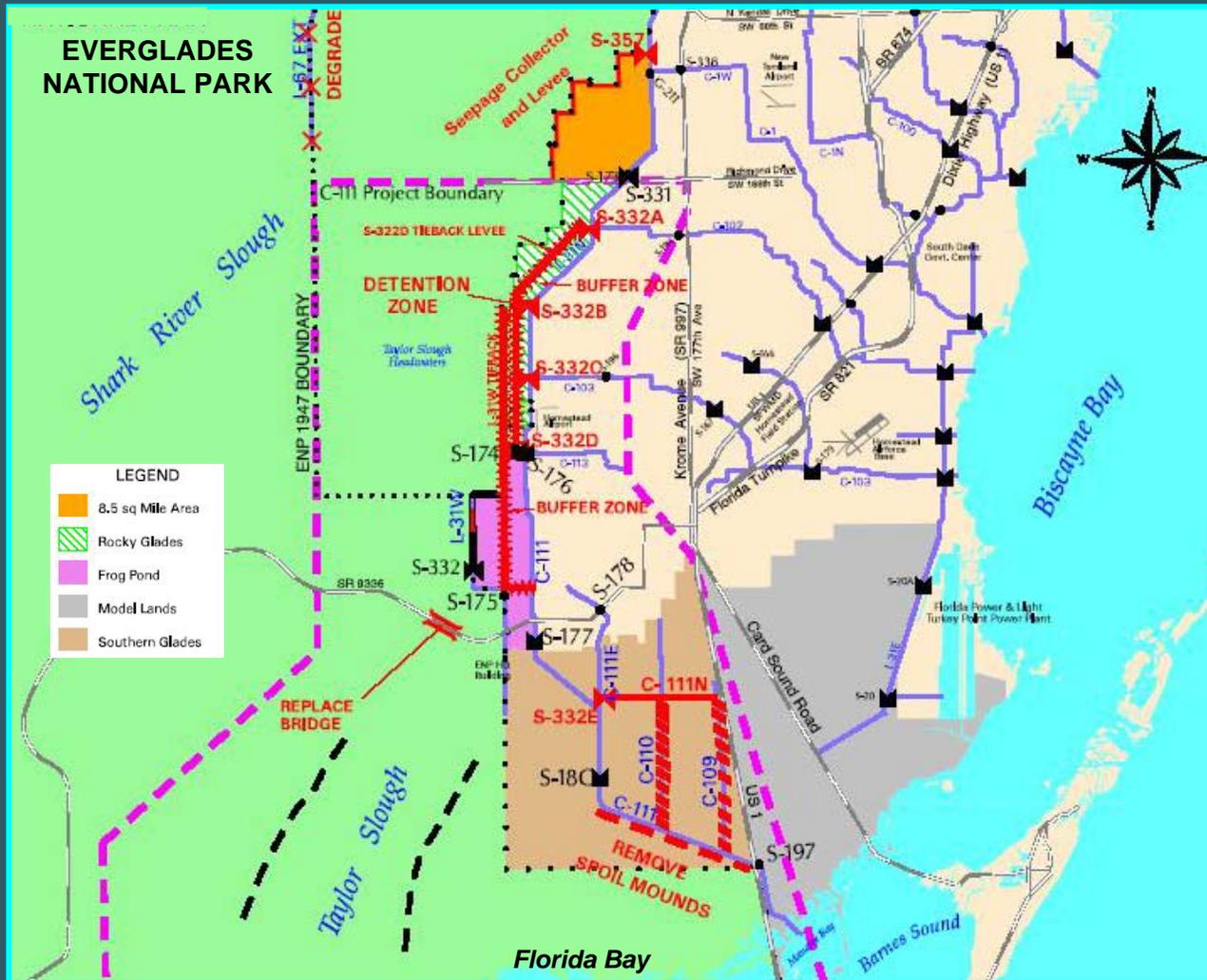
## Project Purpose:

The purpose of this project is the restoration of the ecosystem in Taylor Slough and eastern panhandle of ENP that were affected by construction of the flood control project in the C-111 basin while preserving the current level of flood protection in the C-111 basin

## Estimated Project Cost:

Estimated Federal Cost	\$143,800,000
Estimated Non-Federal Cost	\$143,800,000
<b>Total Estimated Project Cost</b>	<b>\$287,600,000</b>

# C-111 Project Features



## Pump Stations

- S-332A, S-332B, S-332C, S332D and S-332E

## Levees

- Levee 31W Tieback
- S-332D Tieback

## Bridge Crossing

- SR 9336 Bridge

## Other Project Features

C-111 South Dade

# Construction Schedule

Contract 6 – S-331 Command & Control

Description: S-331 Command & Control Facilities Telemetry for S-332B, S332C, & S332D

Advertise	Nov 2005
Award	May 2006
Complete	Oct 2007

Contract 7 – L-31W tieback levees

Description: S-332D Tieback levee between S-332B and S-332C  
L-31 West Tieback Levee and other features

Advertise	Jul 2006
Award	Sep 2006
Complete	Sep 2007

# Construction Schedule continued

Contract 8 – L-31W connection levees

Description: L-31W Connection between 8.5 SMA to Northern Detention Area

Advertise	Jul 2007
Award	Sep 2007
Complete	Sep 2008

Contract 9 – Partial backfilling of L-31W and C-110 canals (plugs)

Description: Partial backfilling of L-31W (backfill to borrow canal)

Advertise	Jul 2008
Award	Sep 2008
Complete	Oct 2009

# Construction Schedule continued

**Contract 10** – Permanent S-332B & S-332C Pump Stations

**Description:** Permanent pump station S-332B and discharge canal; Permanent pump station S-332C and discharge above ground flow way

Advertise	Jul 2009
Award	Sep 2009
Complete	Mar 2011