

# CENTRAL EVERGLADES PLANNING PROJECT

## How Monitoring for Endangered Species Informs Water Management and Project Implementation

GEER Conference 2015 Session 9

Linking Hydrology to Ecology in Restoration Planning,  
Design, and Implementation

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# CENTRAL EVERGLADES PLANNING PROJECT

## SELECTED PLAN (Alt 4R2)

### STORAGE AND TREATMENT

- Construct A-2 FEB and integrate with A-1 FEB operations
- Lake Okeechobee operation refinements within LORS

### DISTRIBUTION/CONVEYANCE

- Diversion of L-6 flows, Infrastructure and L-5 canal improvements
- Remove western ~2.9 miles of L-4 levee (west of S-8 3,000 cfs capacity)
- Construct 360 cfs pump station at western terminus of L-4 levee removal
- Backfill Miami Canal and Spoil Mound Removal ~1.5 miles south of S-8 to I-75

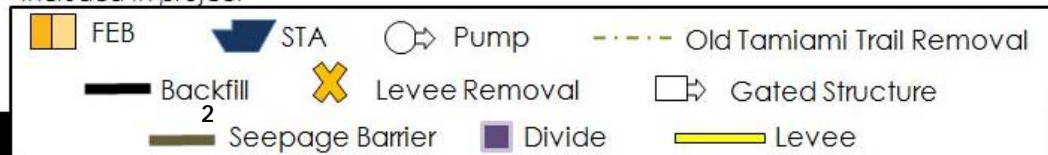
### DISTRIBUTION/CONVEYANCE

- Increase S-333 capacity to 2,500 cfs
- Two 500 cfs gated structures in L-67A, 0.5 mile spoil removal west of L-67A canal north and south of structures
- Construct ~8.5 mile levee in WCA 3B, connecting L-67A to L-29
- Remove ~8 miles of L-67C levee in Blue Shanty flowway (no canal back fill)
- One 500 cfs gated structure north of Blue Shanty levee and 6,000-ft gap in L-67C levee
- Remove ~4.3 miles of L-29 levee in Blue Shanty flowway, divide structure east of Blue Shanty levee at terminus of western bridge
- Tamiami Trail western 2.6 mile bridge and L-29 canal max stage at 9.7 ft (FUTURE WORK BY OTHERS)
- Remove entire 5.5 miles L-67 Extension levee, backfill L-67 Extension canal
- Remove ~6 mile Old Tamiami Trail road (from L-67 Ext to Tram Rd)

### SEEPAGE MANAGEMENT

- Increase S-356 pump station to ~1,000 cfs
- Partial depth seepage barrier south of Tamiami Trail (along L-31N)
- G-211 operational refinements; use coastal canals to convey seepage

Note: System wide operational changes and adaptive management considerations will be included in project



# CENTRAL EVERGLADES PLANNING PROJECT

- 75 Federally and State Listed Threatened & Endangered Species
- 13 Candidate Species for Federal Listing under Endangered Species Act
- 8 Critical Habitat Designations
- Presentation Focus:
  - Wood Stork
  - Cape Sable Seaside Sparrow
  - American Crocodile
  - Florida Manatee
  - Smalltooth Sawfish



Wood Stork



# WOOD STORK

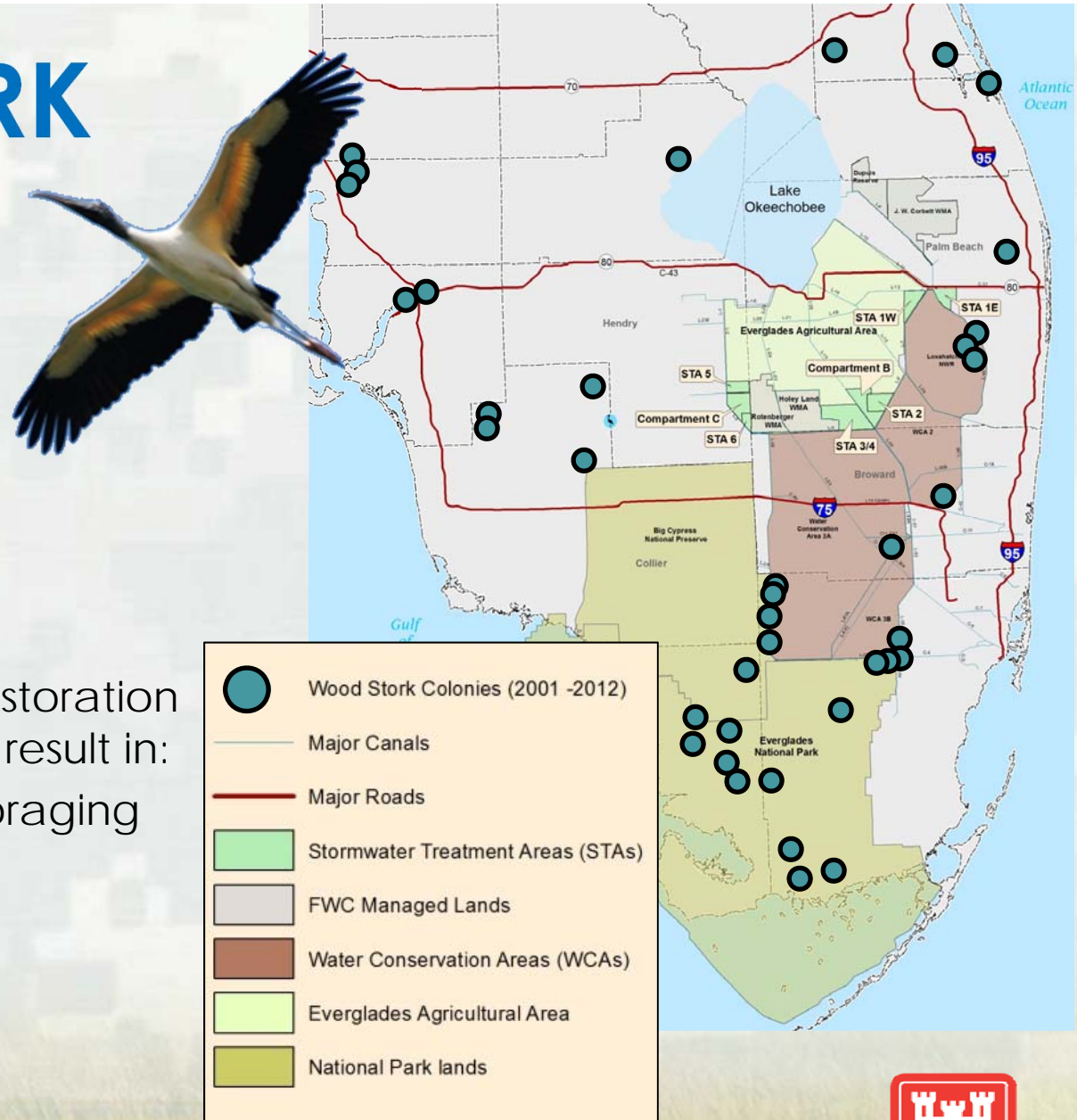
## Current Issues:

- Water Depth
- Recession Rates
- Reduction of short hydroperiod wetlands
- Nest Initiation

## Project Uncertainty:

How much will hydrologic restoration & vegetation management result in:

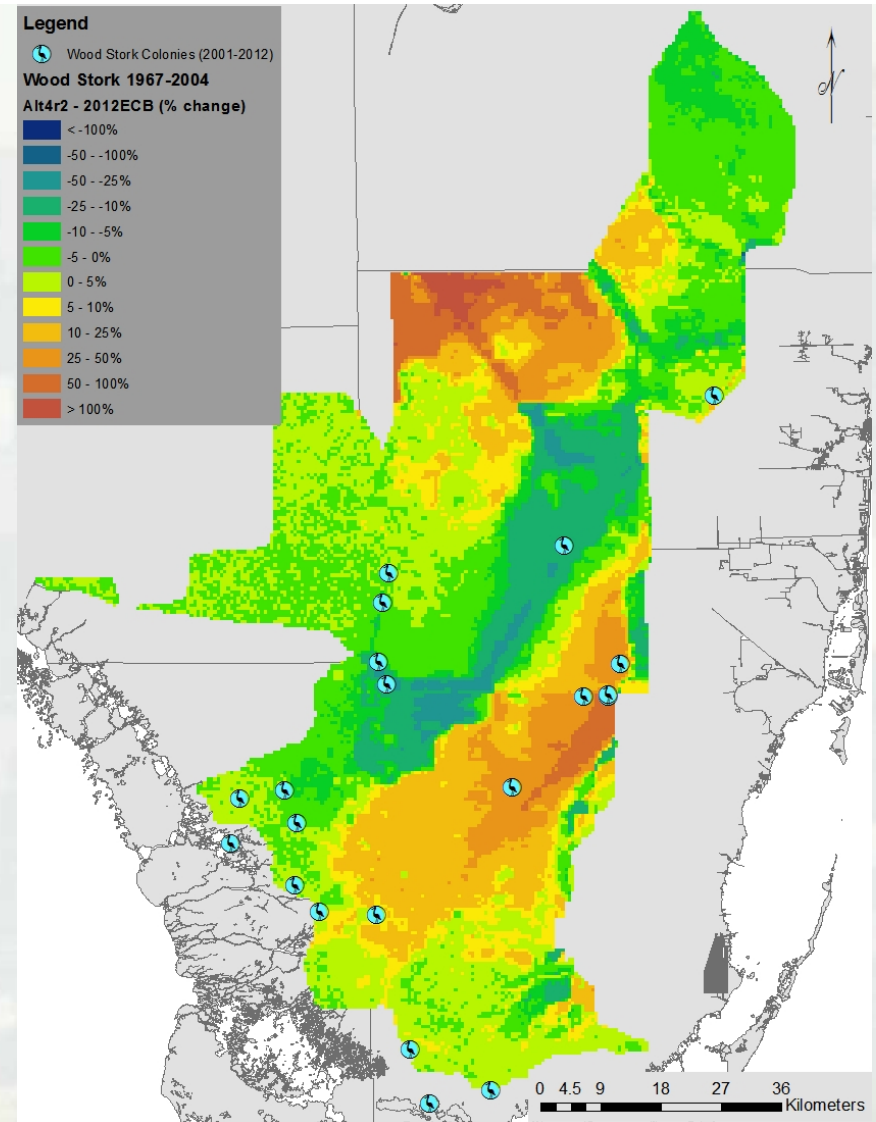
- increases in wading bird foraging conditions
- increased nest number
- success of Wood Storks



# WOOD STORK

## Expected Results:

- Increase in foraging conditions within short hydroperiod wetlands along flanks of Shark River Slough
- Shift in timing of nest initiation to November/December
- Increase in nest success in southern Everglades
  - Earlier fledge dates
  - Decrease in nest abandonment
  - Decrease in nest predation



**MEAN PERCENT CHANGE IN WADING BIRD CELL USE (JAN – MAY, 1967-2004) FOR CEPP (4R2) RELATIVE TO EXISTING CONDITIONS FOR WOOD STORKS. (Beerens 2013)**



# CAPE SABLE SEASIDE SPARROW

## Eastern Marl Prairies

- Hydroperiod (over-drainage)
- Exotic tree invasion
- Frequent human-induced fires

## Western Marl Prairies

- Hydroperiod (too long)



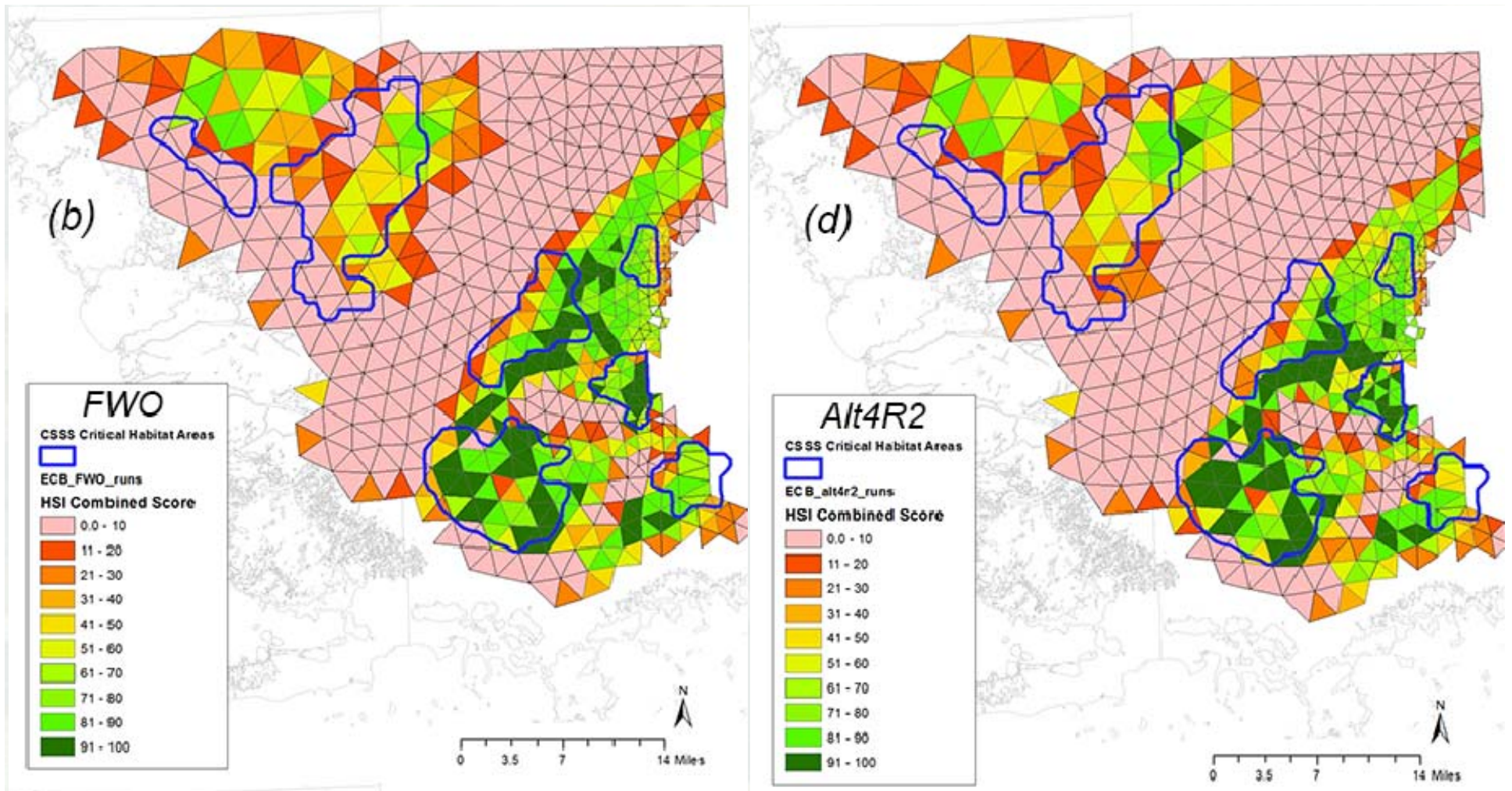


Figure 2. Marl prairie habitat suitability for the combined marl prairie indicator scores at each RSM-GL cell for the No Action Alternative and CEPP (4R2). Scores range from 0.0 (Not Suitable) to 100 (Most Suitable). Cape Sable seaside sparrow subpopulations are outlined in blue. (Pearlstone et al. 2013)



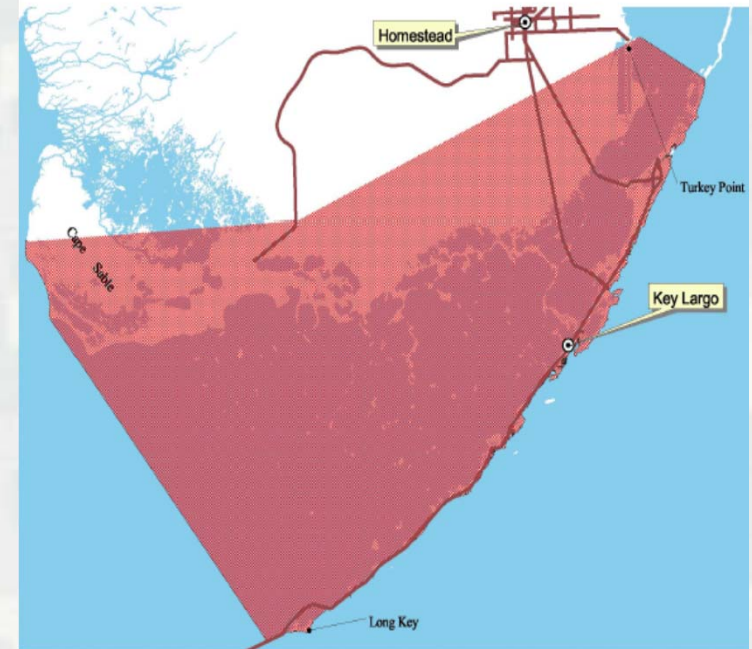


# AMERICAN CROCODILE

## Anticipated Benefits:

- Improved quality, quantity, timing, & distribution of freshwater delivered to Everglades National Park & the southern estuaries
- Restoring more natural salinities in estuarine habitats in designated critical habitat
- Potential for positive effects on tidal wetlands & nearshore salinities that lie within American crocodile critical habitat

## General locations of the designated critical habitat for the American crocodile.

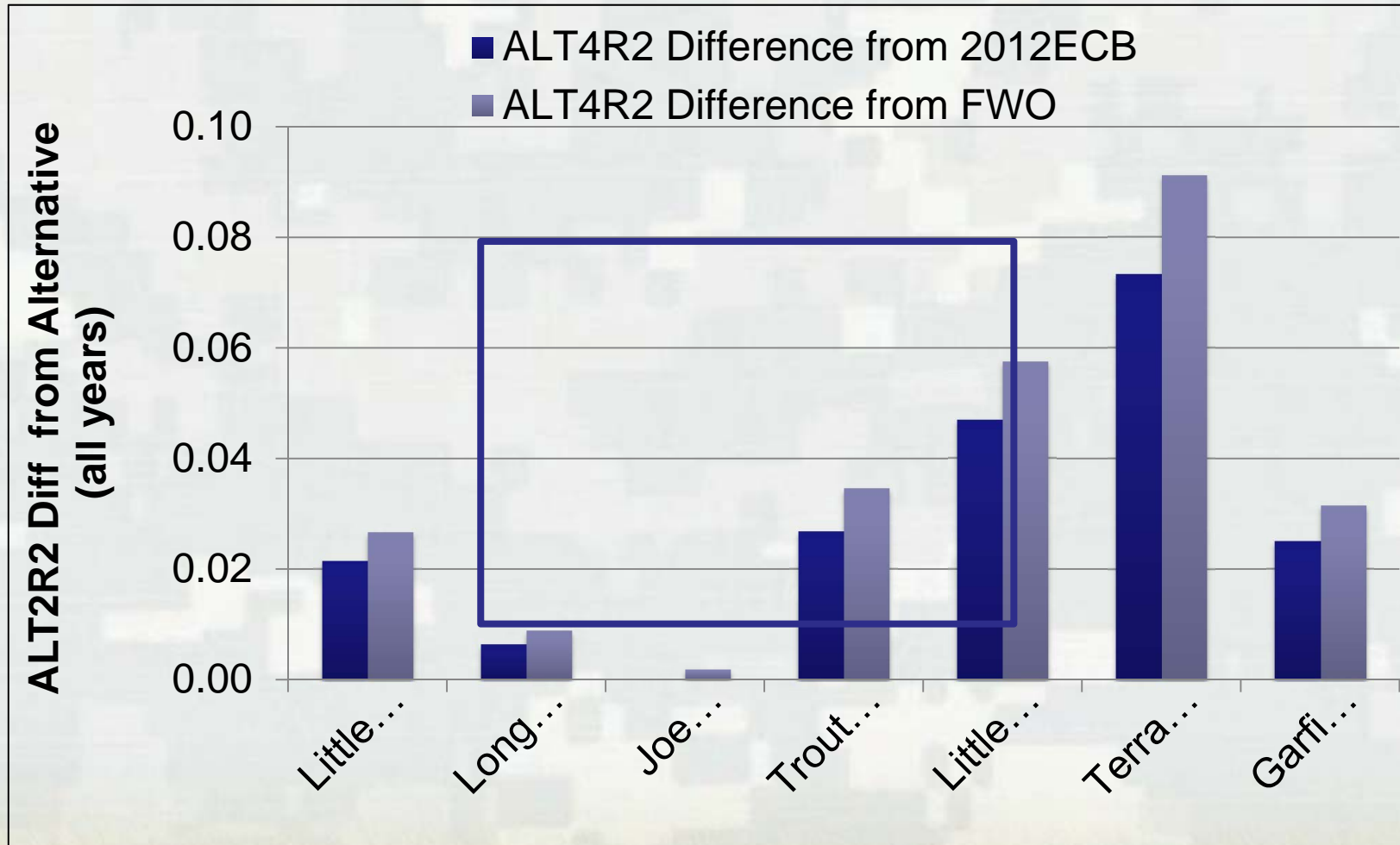


Use Constraints: This map is intended to be used as a guide to identify the general areas where critical habitat has been designated. Refer to the narrative description published in the Code of Federal Regulations (CFR) 50, Parts 1 to 199 (a copy of this text is printed on the reverse of this map).





# AMERICAN CROCODILE



INDEX VALUES SHOW LIFT PROVIDED BY CEPP (4R2) AS COMPARED WITH THE EXISTING CONDITIONS AND FWO (BRANDT 2013)



# FLORIDA MANATEE



# SMALLTOOTH SAWFISH

## GENERAL LOCATIONS OF CRITICAL HABITAT



## LOCATIONS OF CRITICAL HABITAT



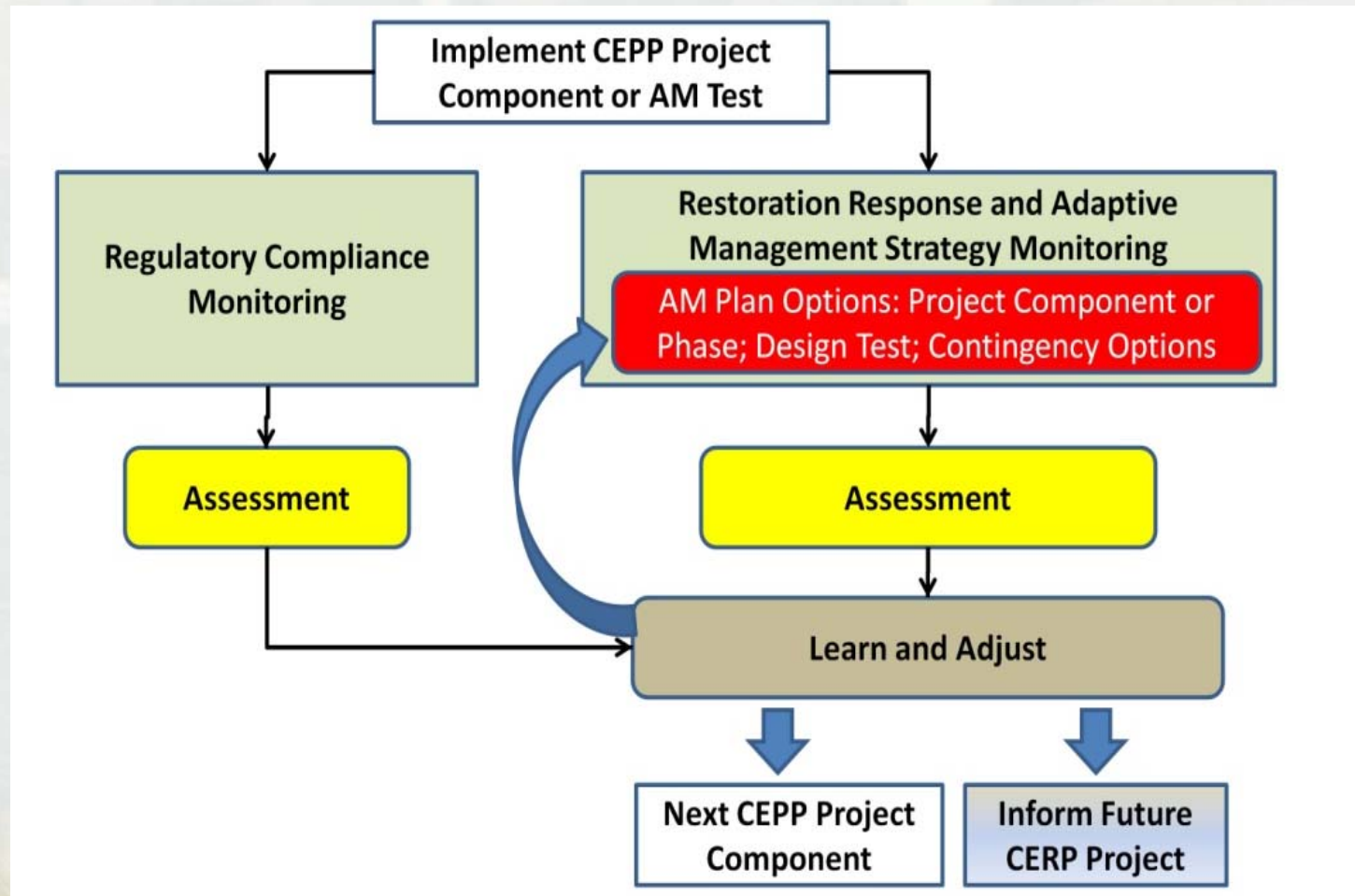
# ADAPTIVE MANAGEMENT & MONITORING PLAN FOR SHARK RIVER SLOUGH

Adaptive Management options  
evaluated that:

- Expand the Shark River Slough habitat
- Increase hydroperiods where wading bird are expected to forage
- Reduce Florida Bay salinities
- Allow wet prairie habitat to be maintained or transition to new areas

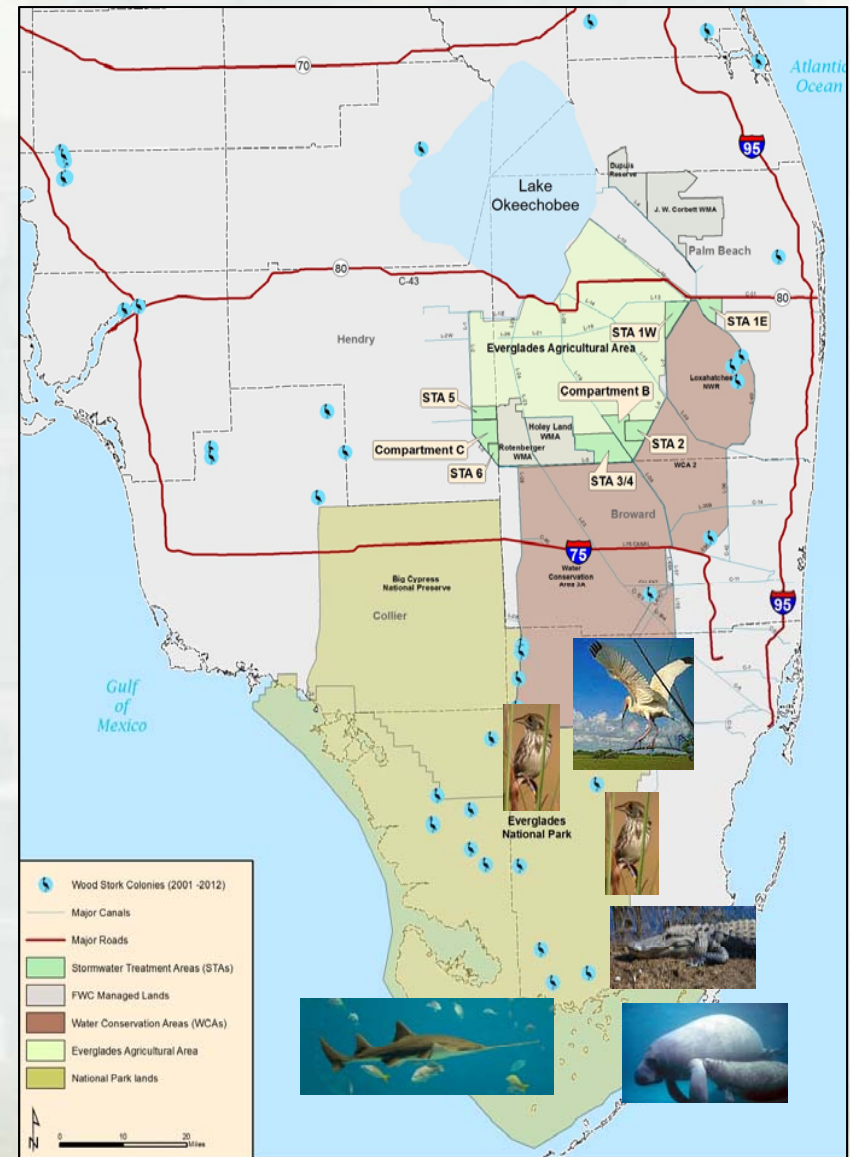


# ADAPTIVE MANAGEMENT STRATEGIES & PROJECT IMPLEMENTATION DIAGRAM



# MONITORING ACTIONS

- Hydrology
- Aquatic Prey
- Vegetation Community Structure
- Vegetation Mapping
- Water Quality
- Periphyton
- Wading Birds
- Cape Sable Seaside Sparrows
- Crocodiles
- Salinity



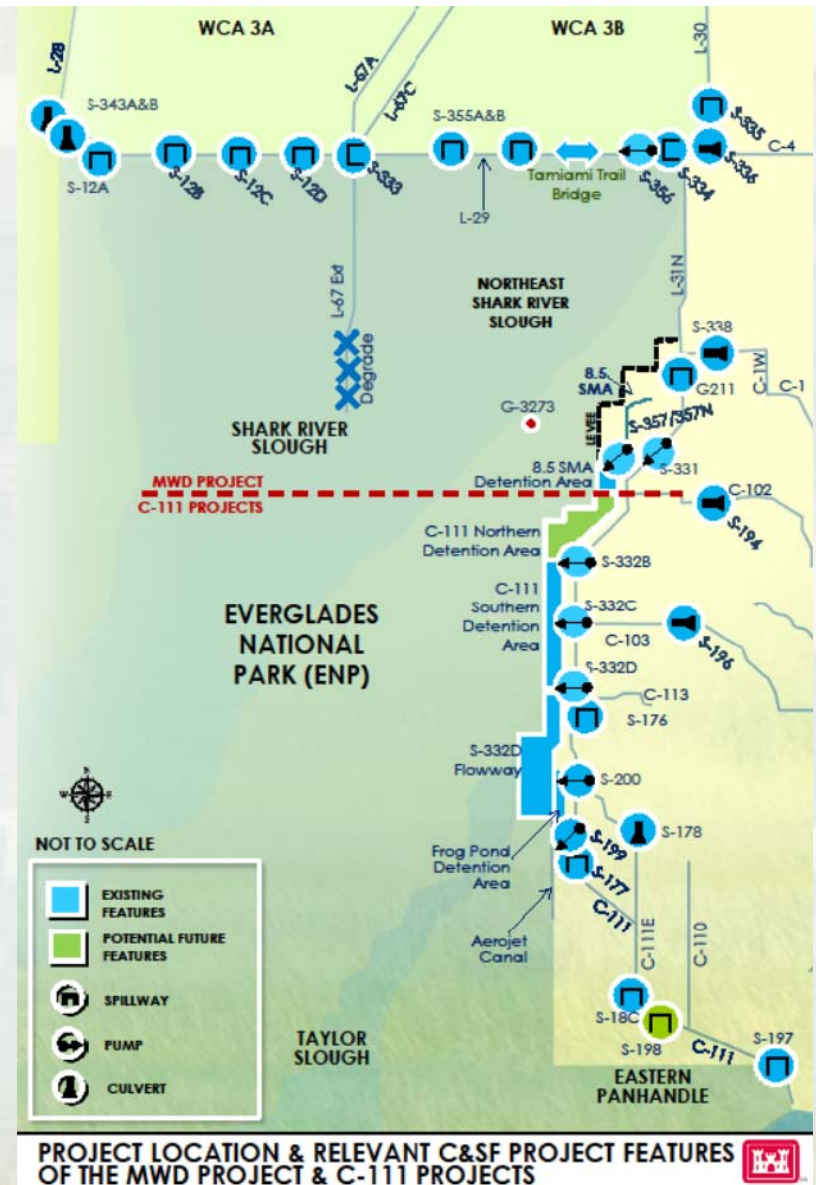
# ADAPTIVE MANAGEMENT ACTIONS

## Operations:

- Incremental increases in flow
- Adjustments to change spatial and/or temporal

## Vegetation Management:

- Removal of woody shrubs
- Prescribed fire
- Harvesting
- Herbicide
- Physical Stress



# ACKNOWLEDGEMENTS

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CEPP Project Delivery Team Members

Restoration Coordination and Verification (RECOVER)  
Team Members



# QUESTIONS?

