

# Kissimmee Basin Update

*Lawrence Glenn*  
*November 11, 2008*



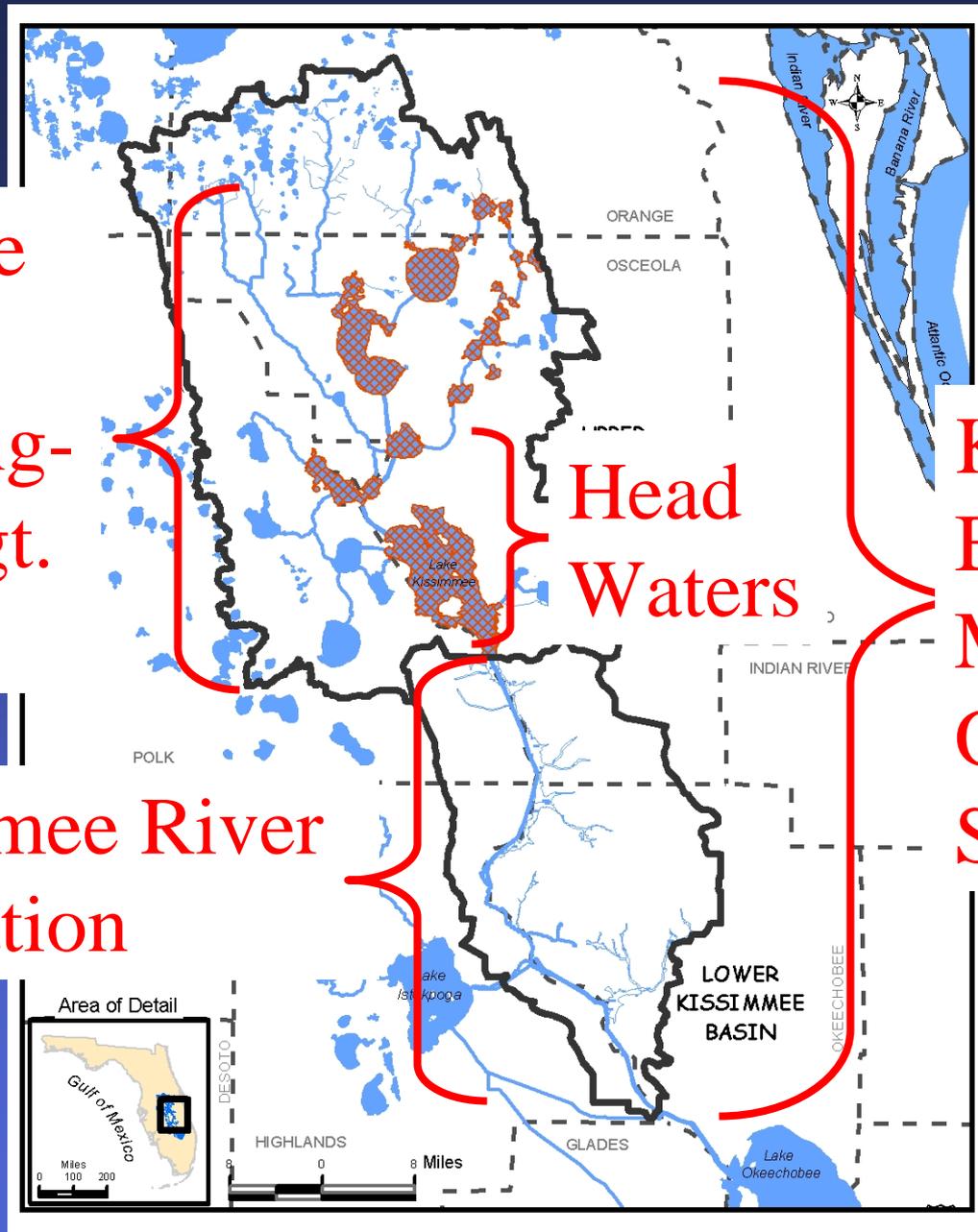
[sfwmd.gov](http://sfwmd.gov)

Kissimmee  
Chain of  
Lakes Long-  
Term Mngt.  
Plan

Kissimmee River  
Restoration

Head  
Waters

Kissimmee  
Basin  
Modeling &  
Operations  
Study



# Kissimmee Basin Modeling and Operations Study KBMOS



# Management Challenges



# Kissimmee Basin Modeling and Operations Study Goal

- Assess how existing operating criteria for water control structures can be modified to achieve a more acceptable balance between resources in upper and lower Kissimmee basins.



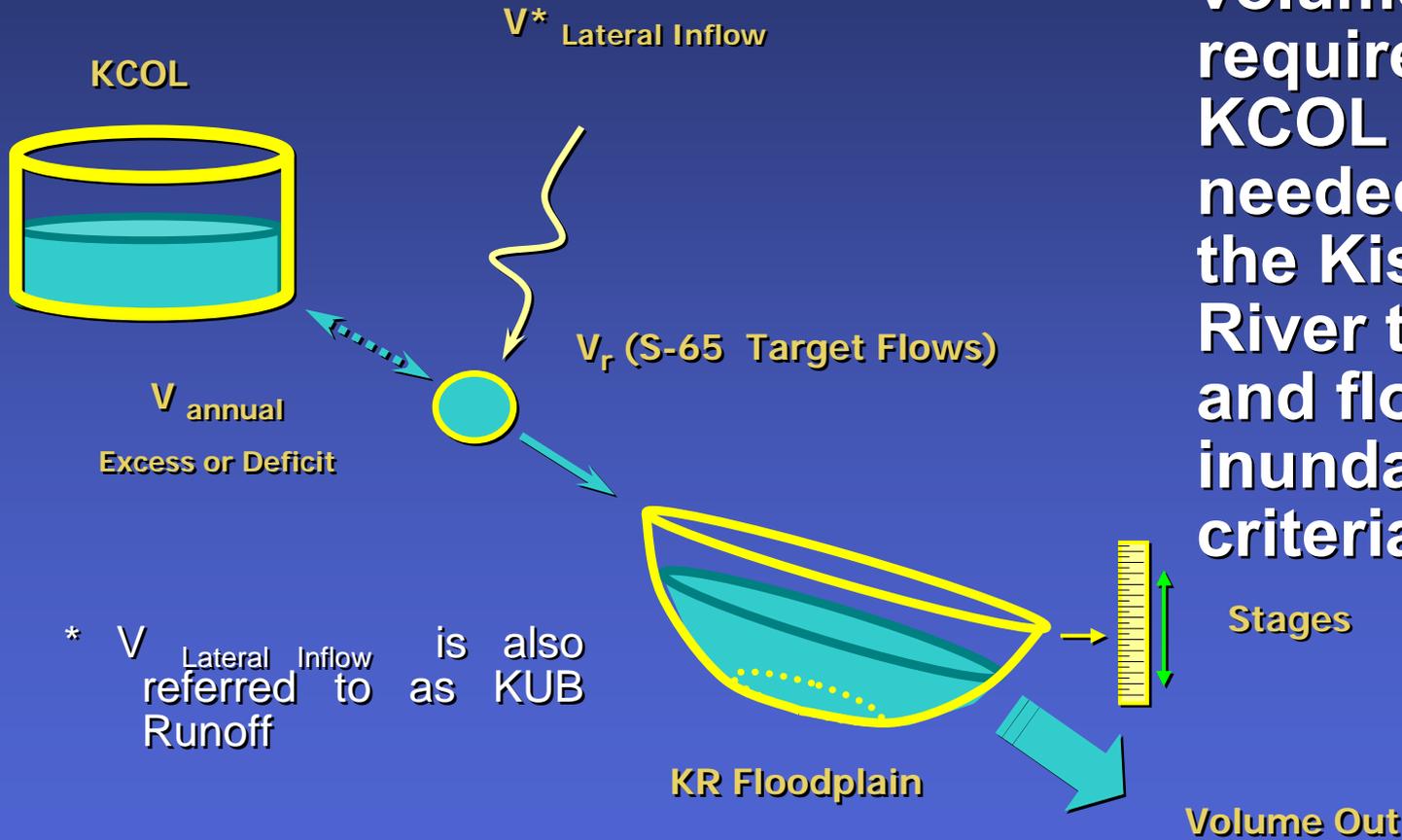
# Approach

- Develop a set of three modeling tools that simulate:
  - Structure operations
  - Basin hydrology and hydraulics
  - Land use
  - Climatic conditions
- Develop performance measures to evaluate alternatives



# Water Supply Opportunities

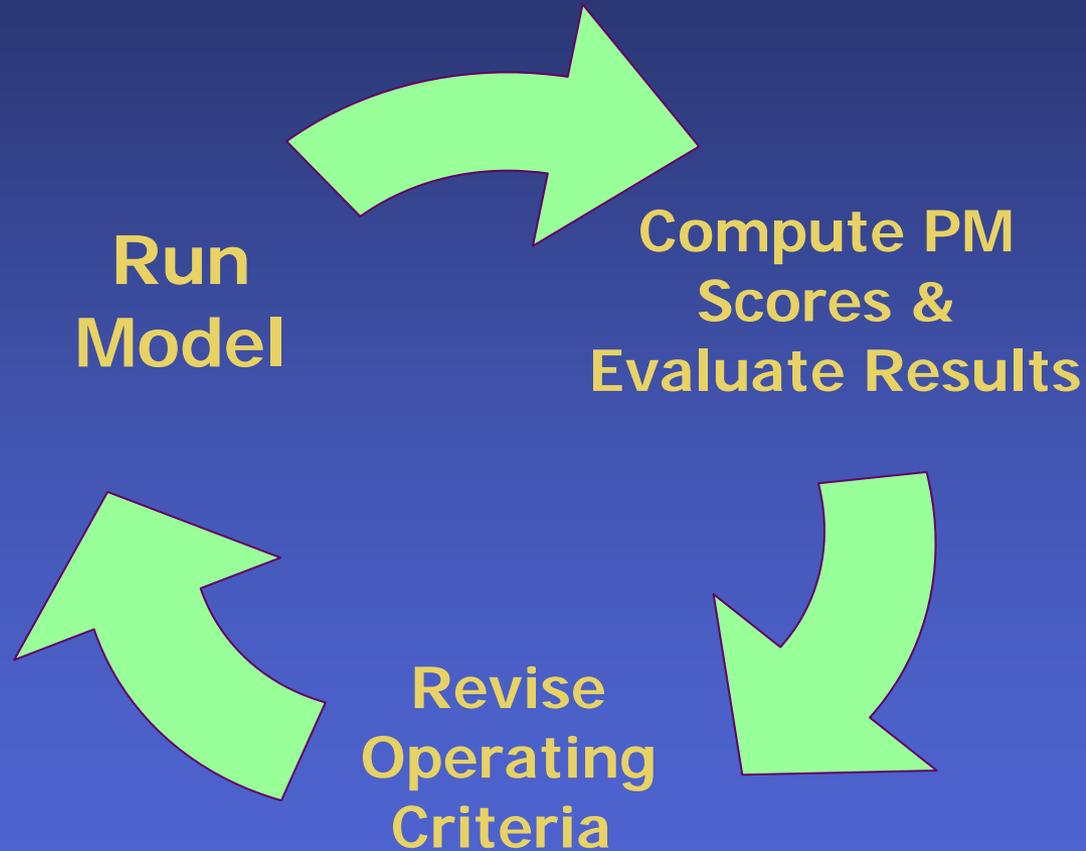
- Defined as the volume of water required in the KCOL that is not needed to meet the Kissimmee River target flows and floodplain inundation criteria



\*  $V_{\text{Lateral Inflow}}$  is also referred to as **KUB Runoff**

# Use of Computer-Aided Participation (CAP) Workshops to Screen Alternative Plans

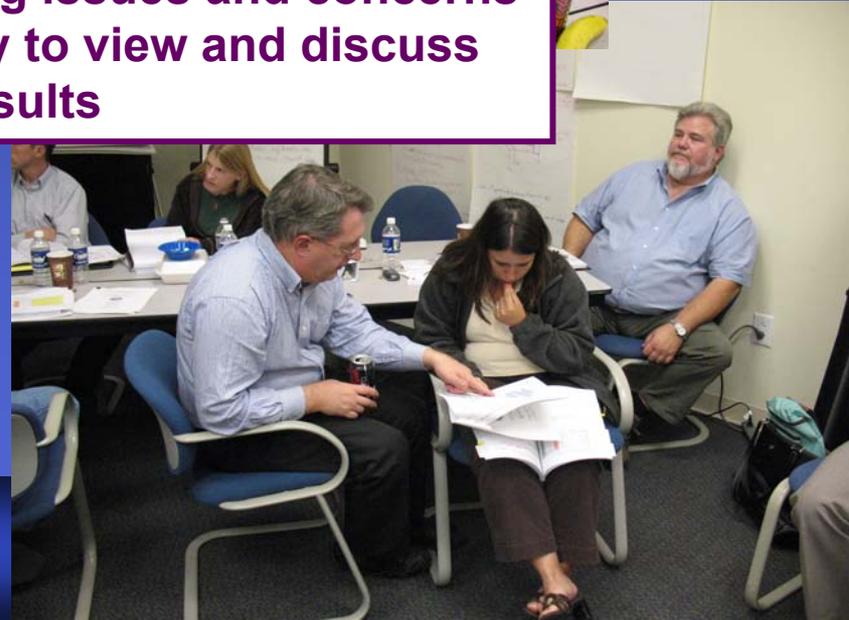
- CAP Sessions are used to gather and model Stakeholder input
- Stakeholders evaluate results of suggested revisions and provide additional criteria to be evaluated



# Computer-Aided Participation Workshops



**Engage Stakeholders**  
**Share knowledge and understanding**  
**Create an open forum of raising issues and concerns**  
**Provide real-time opportunity to view and discuss modeling results**



# Status

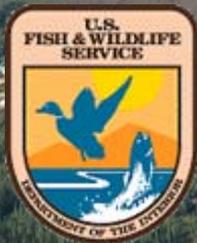
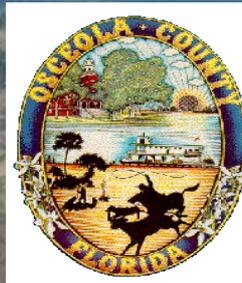
- Screening on hold until new base conditions are run and revisions to performance measures and performance measure evaluation tool are complete
- AFET model recalibration and new base condition runs are complete

# Remaining KBMOS Activities

- Conclusion of Screening Process (Now through end of Jan '09)
- Formulation Process (Feb – March '09)
- Evaluation Process (March – April '09)
- SFWMD Governing Board Selection of the Recommended Alternative Plan (May – June '09)



# Kissimmee Chain of Lakes Long Term Management Plan (KCOL LTMP)



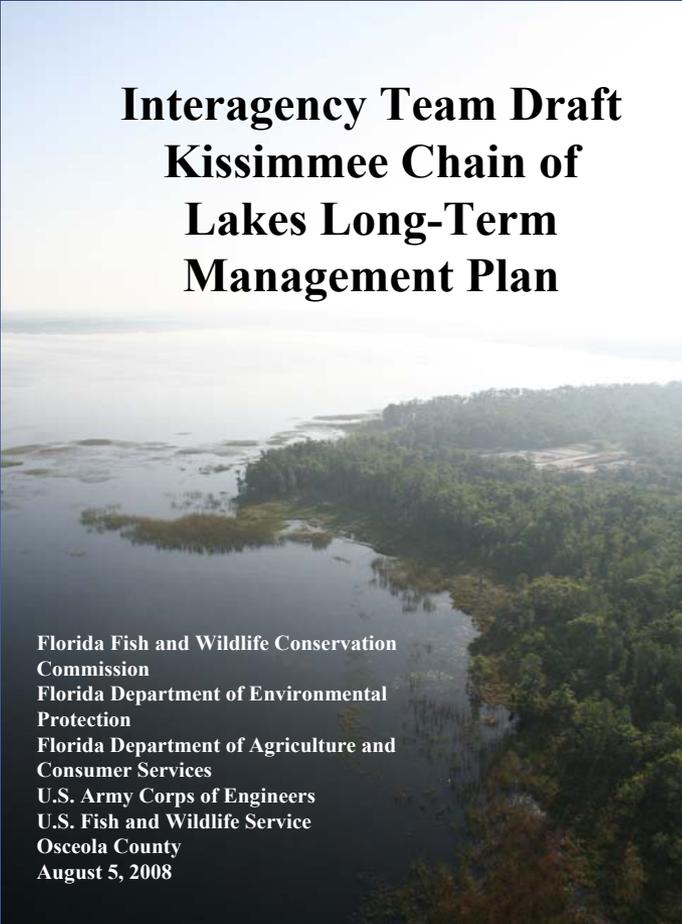
# Purpose



- Enhance and/or sustain lake ecosystem health while balancing impacts across ecosystems including the Kissimmee River and Lake Okeechobee

# Schedule

- **August 2008:**  
Interagency Team  
DRAFT of Planning  
Document released  
for partner agency  
review and comment
- **December 2008:**  
Interagency Team  
Meeting to discuss  
Agency reactions to  
the IAT DRAFT



## Interagency Team Draft Kissimmee Chain of Lakes Long-Term Management Plan

Florida Fish and Wildlife Conservation  
Commission  
Florida Department of Environmental  
Protection  
Florida Department of Agriculture and  
Consumer Services  
U.S. Army Corps of Engineers  
U.S. Fish and Wildlife Service  
Osceola County  
August 5, 2008

# Proposed Agency Actions

- **Part 1: Become a Plan Partner**
  - **Allocate agency staff to serve on the IAT and Science Teams**
  - **Adopt KCOL LTMP management objectives**
  - **Allocate resources and/or realign current resources to support implementation of the KCOL LTMP Monitoring and Assessment Program**
- **Part 2: Fill Management Gaps**
- **Part 3: Near-Term Coordination**
- **Part 4: Develop an Integrated Watershed Management Plan specific to the KCOL**

# Kissimmee River Restoration



# Kissimmee River Restoration Goal: Restoration of Ecological Integrity

“Reestablish conditions on the river and floodplain that will support biological communities comparable to a natural system in the region”

# Reconstruct the Physical Form



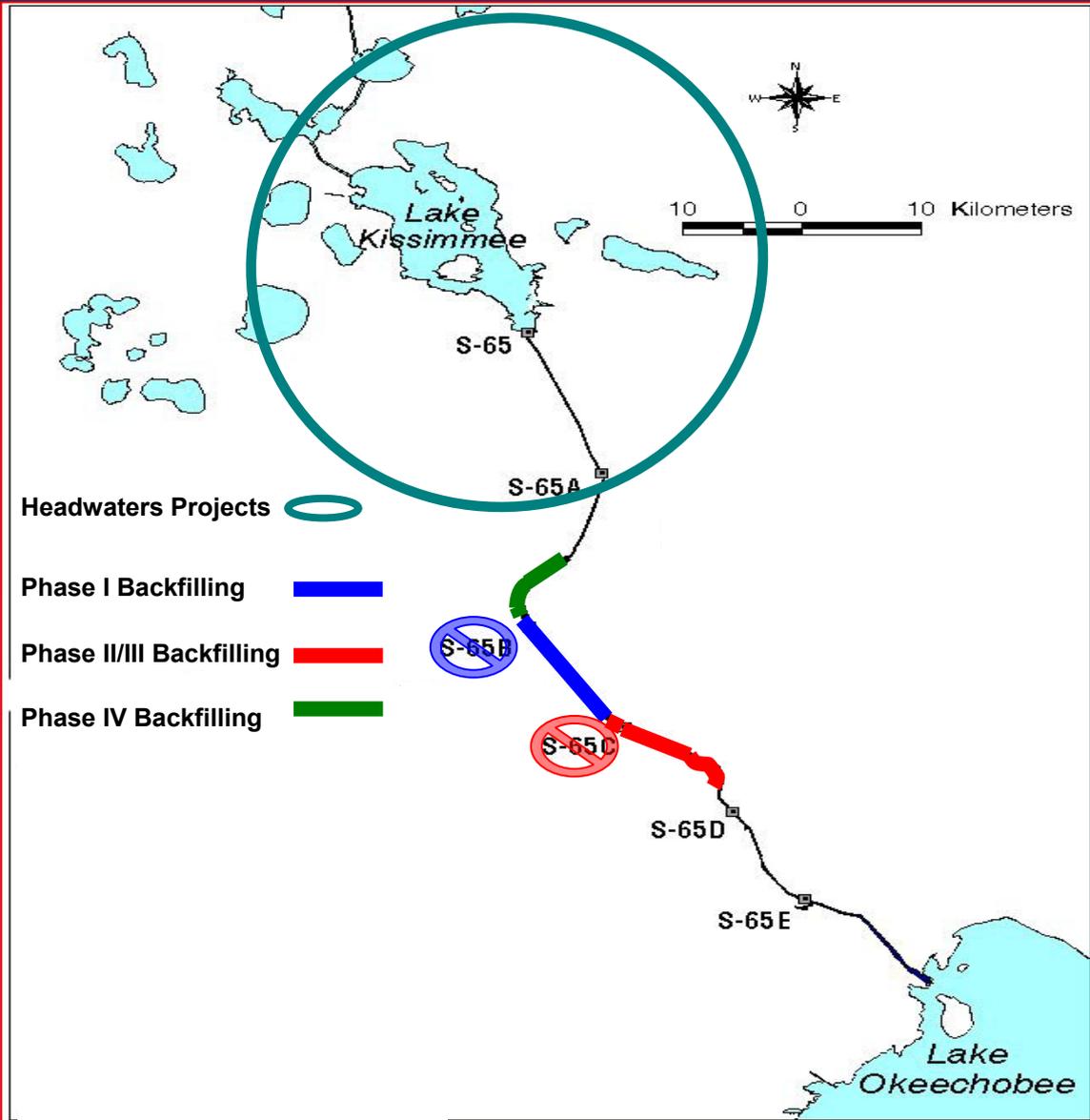
**Restored River  
Channel**

**Backfilled C-38**

# Operate the System to Mimic Natural Flow and Stage Patterns



# Major Construction Components



# Phase IVA Construction



Pre-construction



December 6, 2006



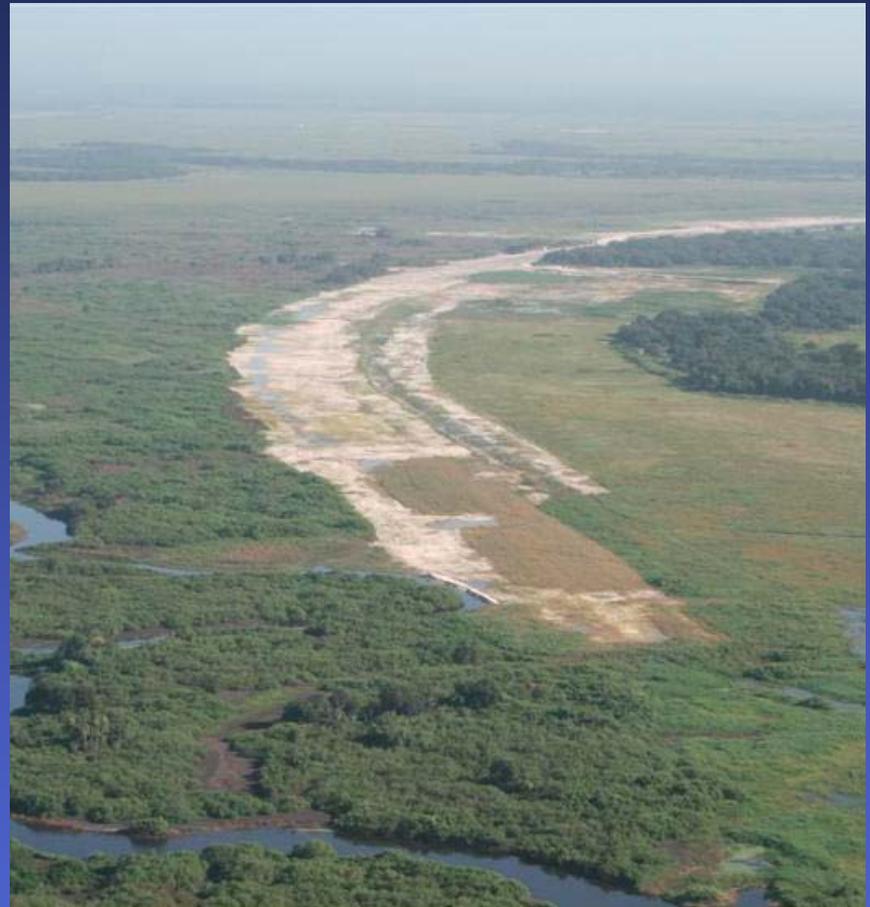
April 24, 2007



May 21, 2007



June 9, 2007



August 28, 2007

## Phase 4A Backfill Area



April 10, 2008

## Phase IV B Construction



October 7, 2008



## Phase IVB Backfilling



October 8, 2008

## Phase IVB Backfilling



October 8, 2008

## Phase IVB Backfilling



October 7, 2008

# USACE Construction Schedule

Kissimmee River...			CONSTRUCTION GANTT CHART																								08-May-08				
Start	Finish	Budgeted Total Cost	2003				2009				2010				2011				2012				2013				2014				2015
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	C1
01-Oct-04	30-May-08	\$ 7,600,000.00																													
01-Sep-06	07-Jan-09	\$ 13,728,785.63																													
30-Apr-07	25-Nov-08	\$ 12,679,485.83																													
23 Jul 08	28 Jan '11	\$ 41,500,000.00																													
02-Nov-09*	13-Jan-'11	\$ 12,767,000.00																													
02-Nov-09*	13-Jan-'11	\$ 9,500,000.00																													
01-Feb-10*	10-Feb-12	\$ 6,743,000.00																													
01-Jul-10*	02-Dec-11	\$ 8,506,000.00																													
24-Nov-10*	07-Nov-11	\$ 16,789,000.00																													
18-Oct-11*	22-Apr-13	\$ 77,969,000.00																													

Actual Work  
 Remaining Work

An aerial photograph of a river meandering through a dense, green forest. The river flows from the top left towards the bottom right, forming several large, rounded loops. The water is a deep blue-grey color, reflecting the sky and the surrounding trees. The forest is a vibrant green, with some areas appearing darker, possibly due to shadows or different types of trees. The overall scene is peaceful and natural.

# Phase I Environmental Response

# KR Hydrologic Responses

- Water Year 2008 (May 1, 2007 – April 30, 2008)
- Drought was less severe than in WY2007 but still below average rainfall
- Upper basin rainfall totaled 35.5 inches (87% of average)
- Lower basin rainfall totaled 43.6 inches (98% of average)





June 3, 2008

**Above average rainfall in July has increased flow and stages along the Kissimmee River. Sandbars that were exposed in June (above) and submerged in July (below).**



July 31, 2008

# Phase I Restored River



June 3, 2008

# River Channel Vegetation Response

■ Since restoration of flow in Phase I river channels:

- Cover of littoral vegetation in river channels declined from about 60% to 15% of the channel
- Plants rooted on the river bottom now dominate plant communities, replacing floating species
- Three of four expectation components have been met



Pre-restoration



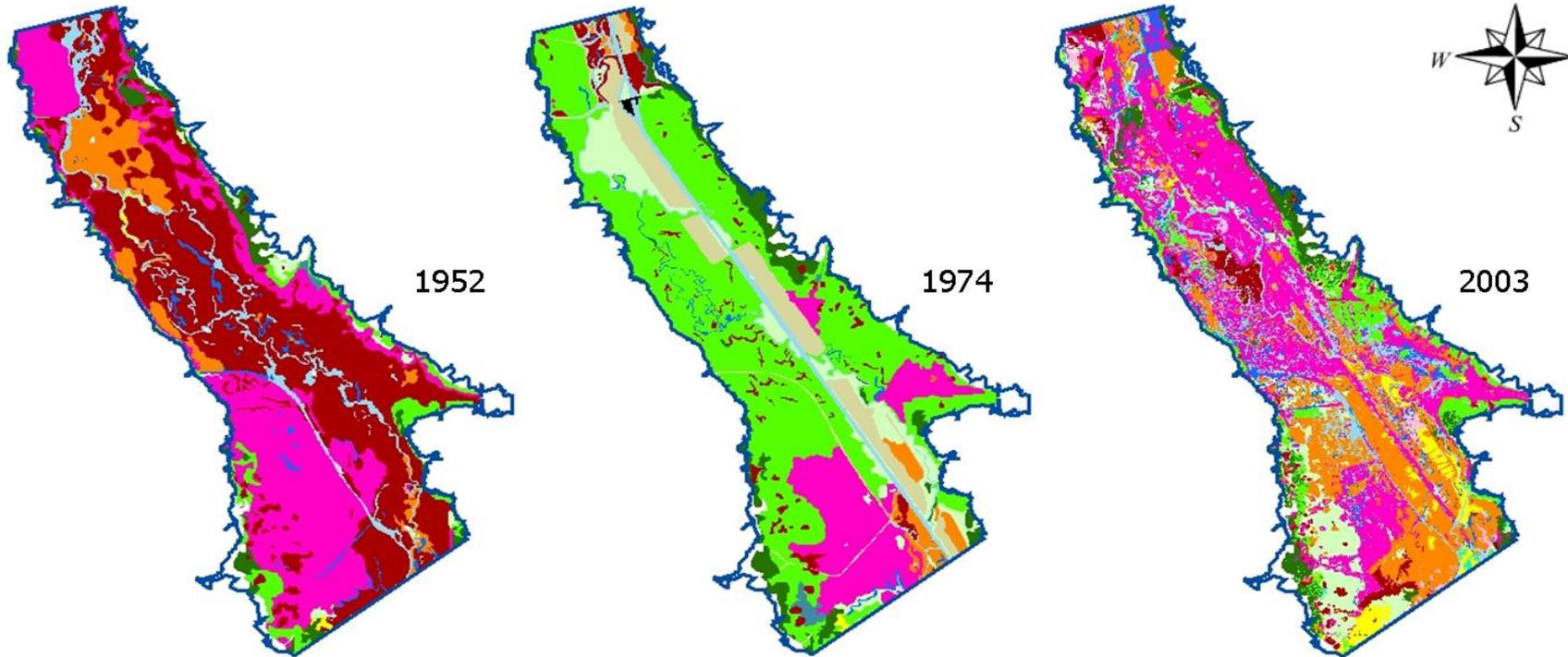
Post-restoration

# Floodplain Vegetation Response



April 16, 2008

# Floodplain Vegetation Mapping



1952

1974

2003



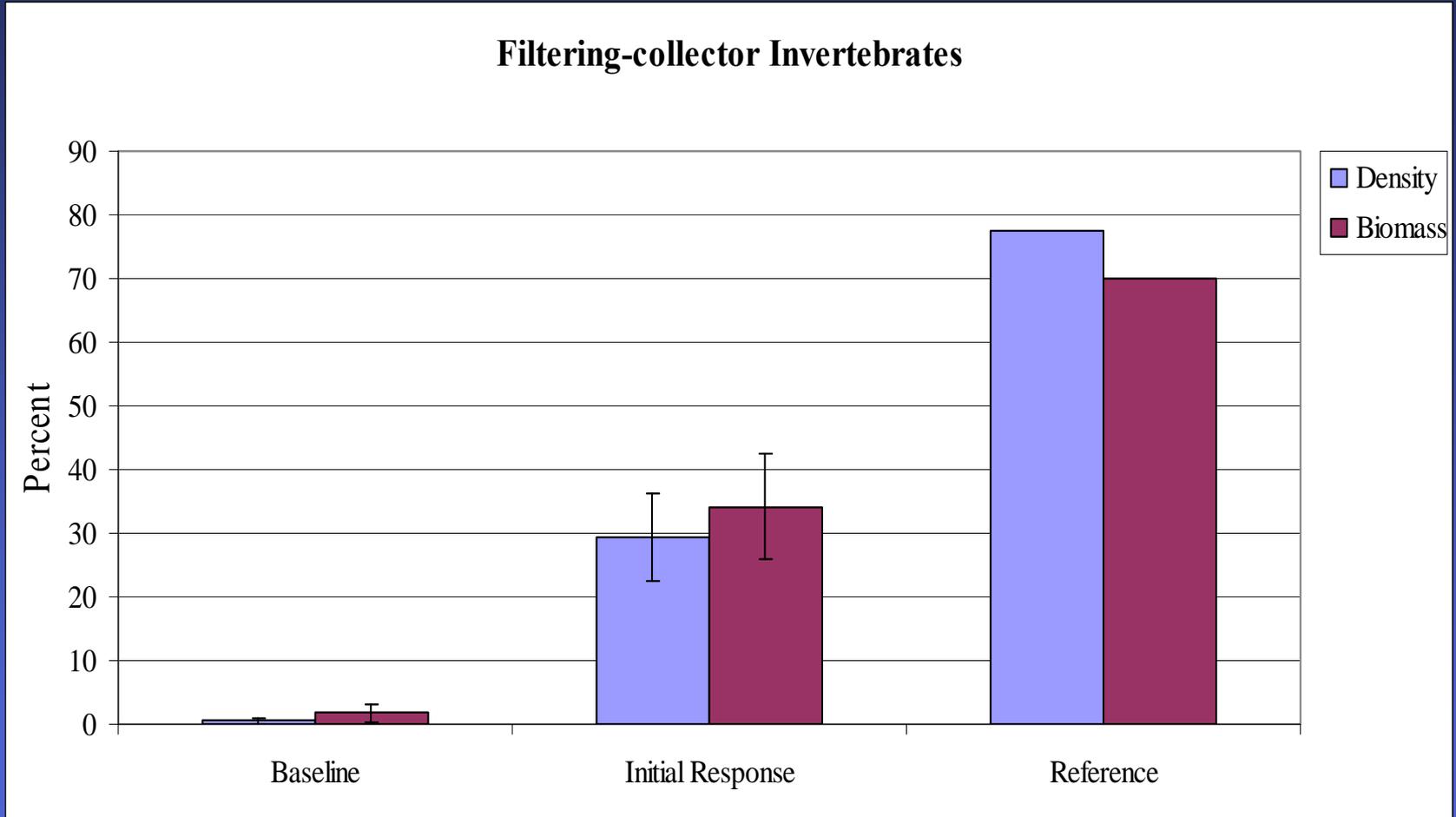
## Vegetation Types

Aquatic Vegetation	Upland Forest
Broadleaf Marsh	Upland Herbaceous
Human-made Structures	Upland Shrub
Miscellaneous Wetlands	Vines
Non-vegetated Bare Ground	Wet Prairie
Open Water	Wetland Forest
Unclassified and Unknown	Wetland Shrub

# Invertebrate Response



# Invertebrate Response

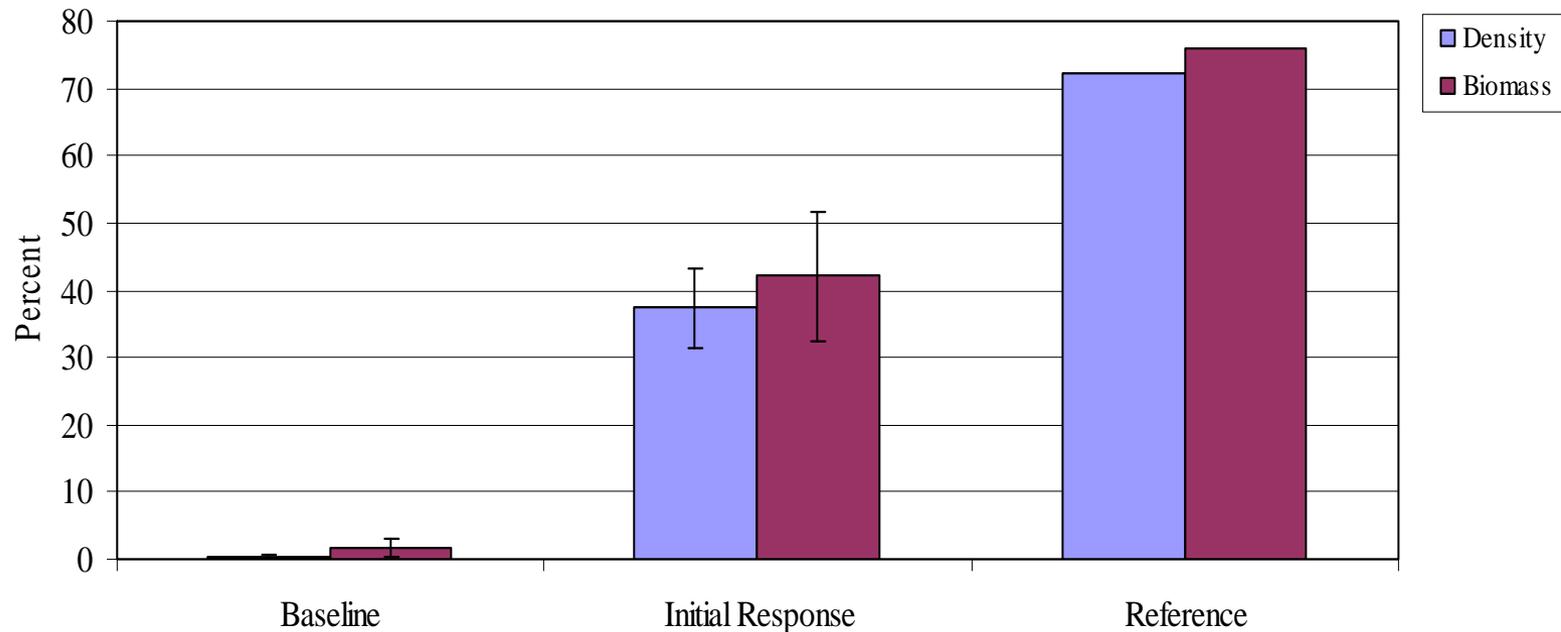


# Invertebrate Response



# Invertebrate Response

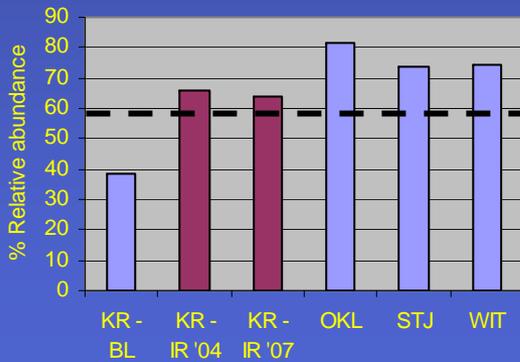
Density and Biomass of Indicator Taxa on Woody Debris  
(Indicates Restoration of Food Base)



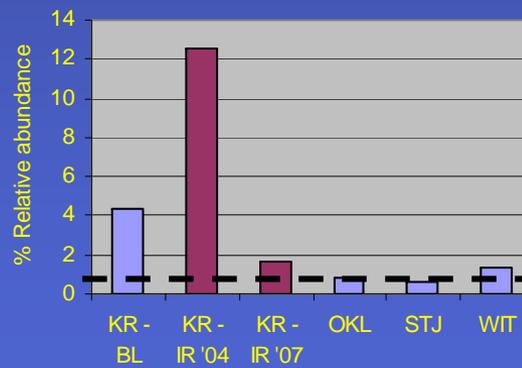
# Fish Response



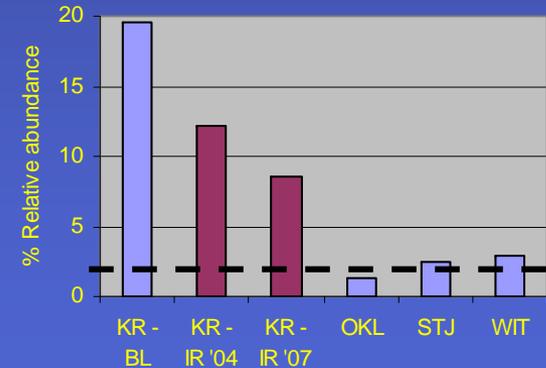
Centrarchids - bass and sunfish



*Amia calva*- bowfin



*Lepisosteus platyrhincus*-  
Florida gar



# Expected Waterfowl Response to Restoration

- Winter (Nov-Mar) waterfowl densities  $\geq 3.9$  ducks/km<sup>2</sup>

9 species return

Species richness  $\geq 13$



# Phase I Floodplain



October 1, 2008

# Restoration Expectation for Wading Birds

• Mean annual dry season (Dec-May) density will be  $\geq 30.6$  wading birds/km<sup>2</sup> (excluding cattle egrets)

~ 35 wading birds/km<sup>2</sup> in 2008

October 1, 2008

# Phase I Floodplain



October 1, 2008

# Restoration Expectation for Shorebirds

- Historical diversity and species richness ( $\geq 11$ ) have returned



## Other Noteworthy Species Returning to the Floodplain

**Black skimmer**



**Wood stork**



## Other Noteworthy Species Returning to the Floodplain



Roseate spoonbills

## Other Noteworthy Species Returning to the Floodplain



**American white pelican**

# Effect of Tropical Storm Fay

August 27, 2008

[sfwmd.gov](http://sfwmd.gov)

# Phase I Floodplain



August 27, 2008



September 3, 2008

Changes in floodplain water levels over the course of a month can be seen here in the Phase IVA area.



October 8, 2008



September 3, 2008

**Phase I area floodplain stages September vs. October 2008.**



October 8, 2008

# Phase I Floodplain and River Channel



October 1, 2008

# Phase I Floodplain



# Phase I River Channel

Carolina willow  
(Native)



Primrose willow  
(Invasive)



October 1, 2008

# Phase I River Channel



October 1, 2008

[sfwmd.gov](http://sfwmd.gov)

# Phase I River Channel



# Phase I Floodplain



October 1, 2008

# Floodplain Drying Pools



October 1, 2008



This black-bellied whistling duck was observed in the Oak Creek floodplain

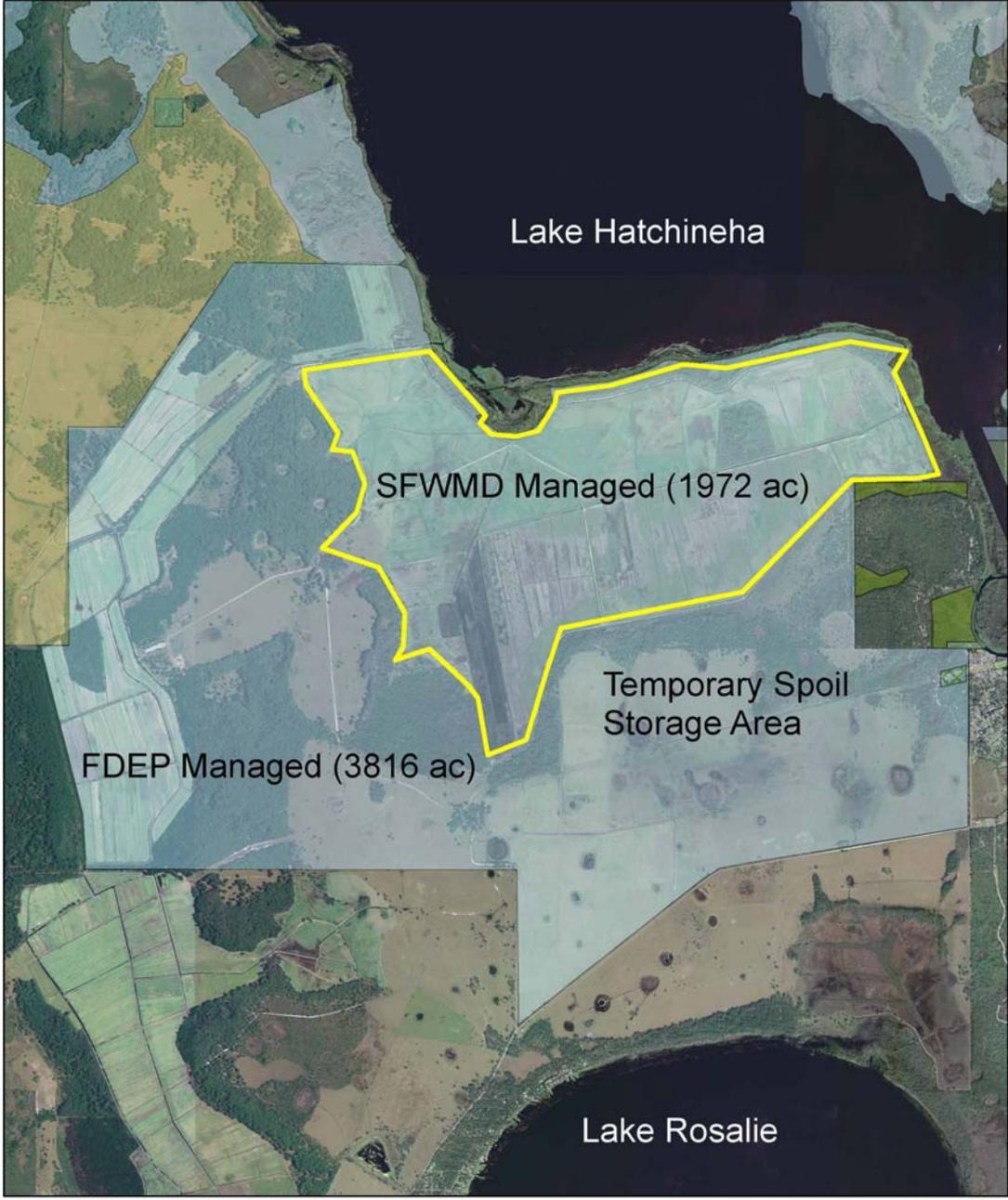


October 1, 2008

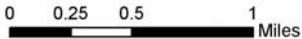
# Rolling Meadows/Catfish Creek Restoration



[sfwmd.gov](http://sfwmd.gov)

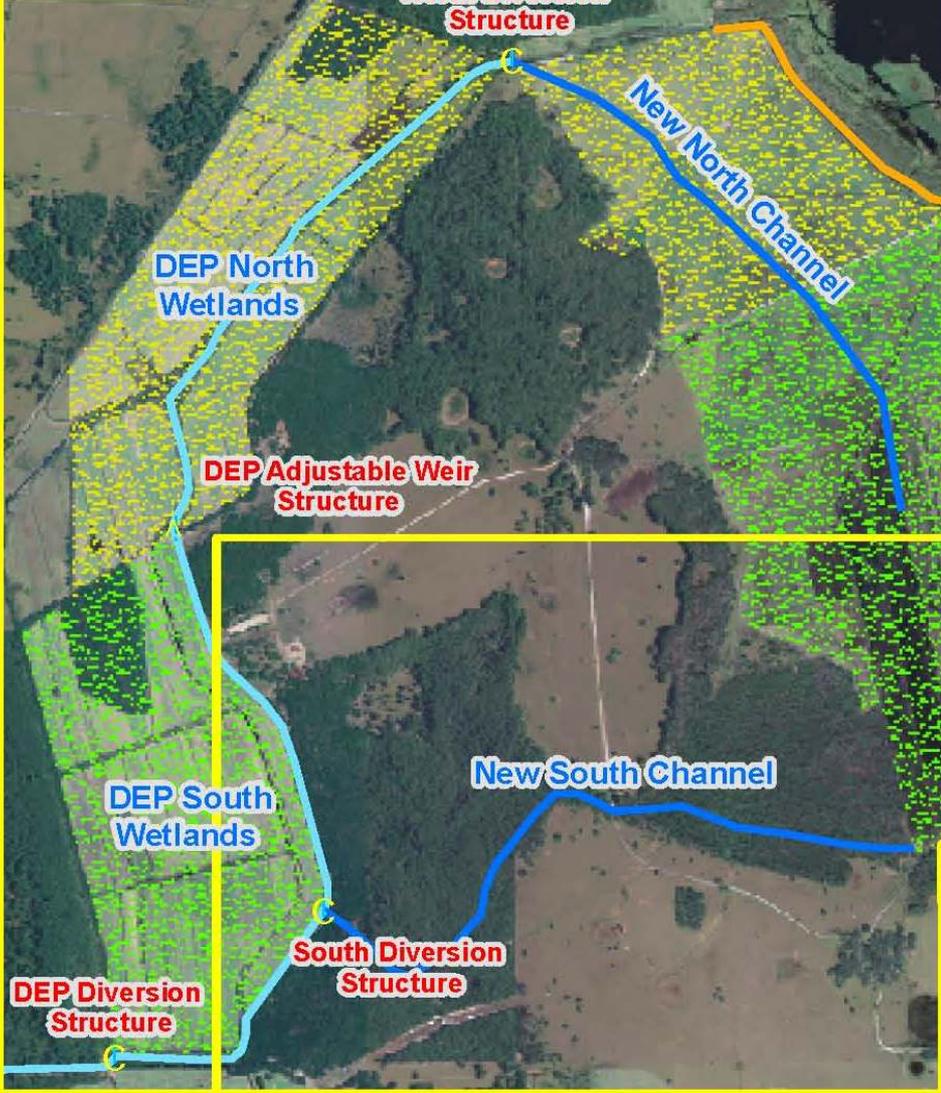


Rolling Meadows

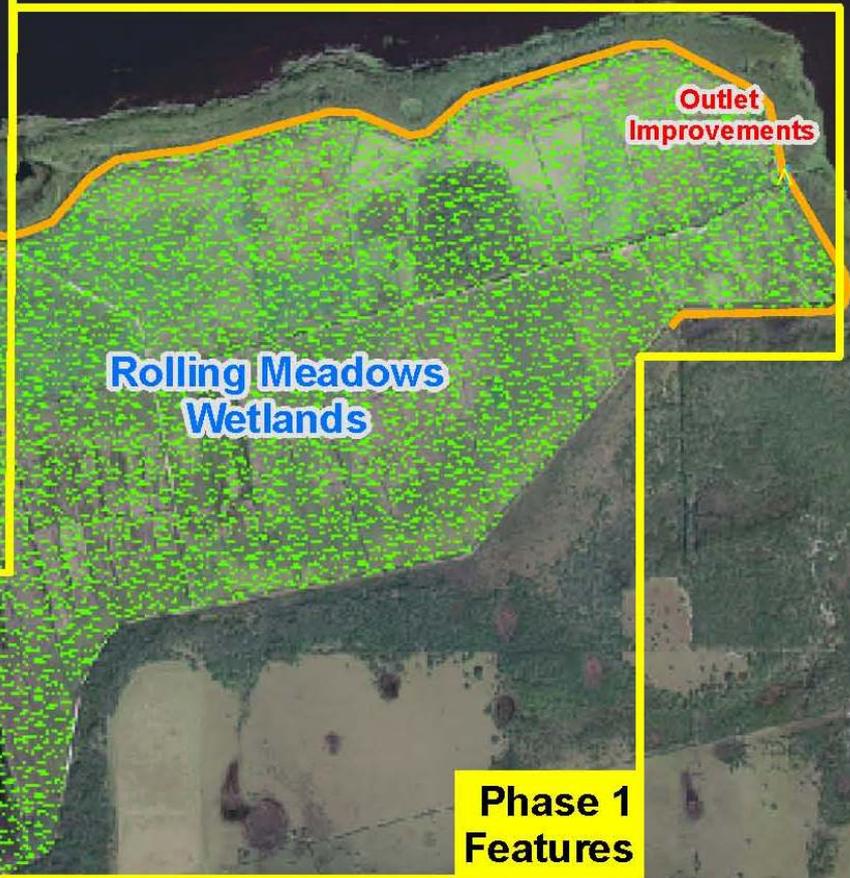


DRAFT

# Phase 2 Features

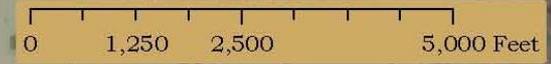


# Phase 1 Features



**Preferred Alternative**  
**Rolling Meadows & DEP - Wetland Reestablishment**  
**PHASE 1 & 2**

- Check Dam/Adjustable Weir
- Diversion Structure
- Primary Restored Wetlands
- Additional Restored Wetlands
- New Drainage Channel
- Existing Irrigation Channel
- Existing Levee
- Levee Breached
- New Berm



# Kissimmee Water Reservation

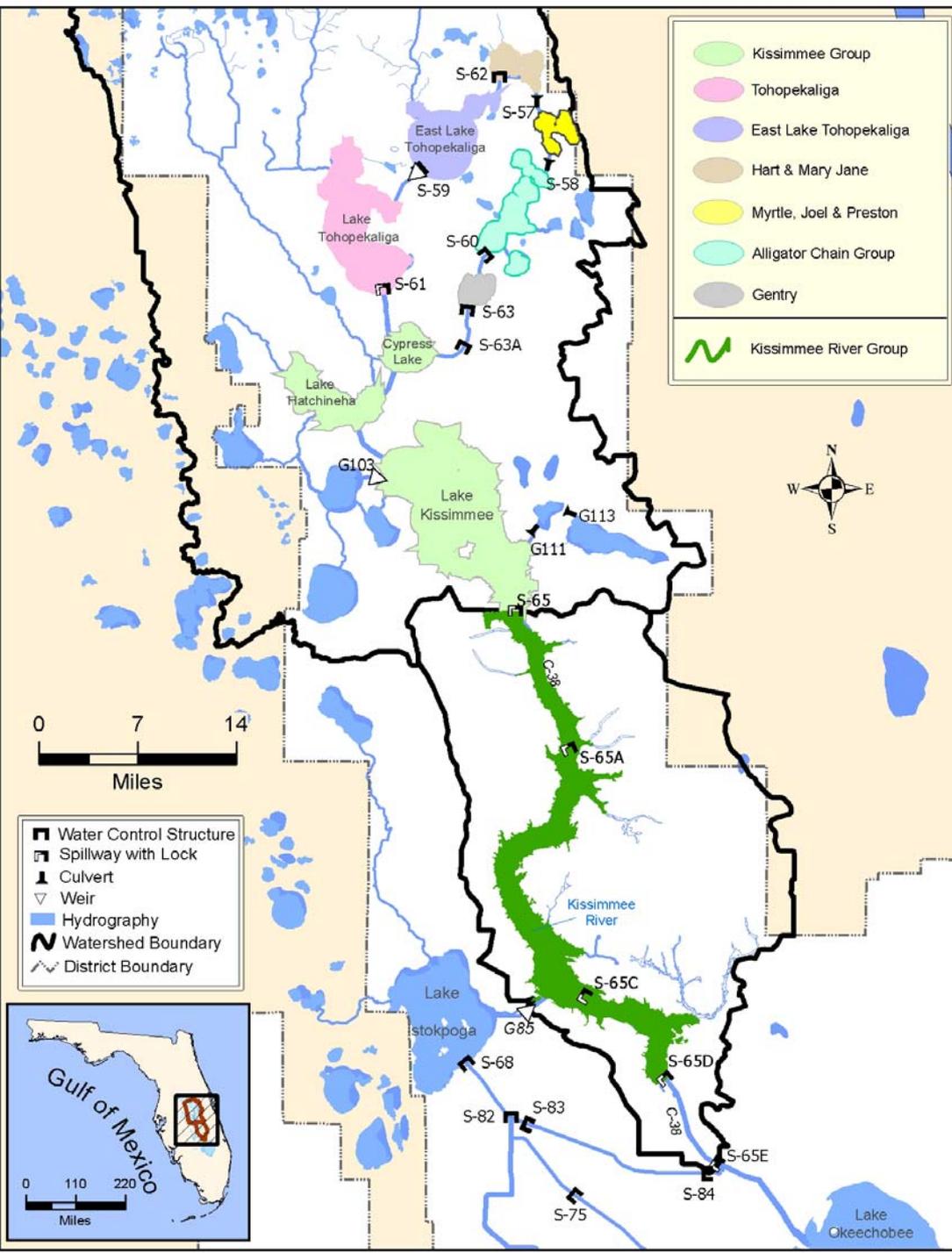
## June 2008 SFWMD Resolution

Authorize publication of a *notice of rule development* in the Florida Administrative Weekly to adopt new rule Chapter 40E-10, F.A.C., regarding *Reservations and Allocations of Water for the Natural System*, and to amend Chapters 40E-2, 40E-20, 40E-21, and 40E- 22, F.A.C., *to protect water necessary for the protection of fish and wildlife in the Kissimmee River, the Floodplain and the Upper Chain of Lakes.*

# Kissimmee Basin Water Reservations

8 Water Reservation Bodies

- Kissimmee River/floodplain
- 7 Lake Management Areas



# What does a reservation do?



- Prevents new uses from accessing reserved water
- Existing legal uses that are not contrary to the public interest are protected



# What a reservation doesn't do

- Establish an operating regime by rule
- Drought proof the natural system
- Ensure wildlife proliferation



# Major Milestones

- ☑ Initiate rule development: **June, 2008**
- Identify regulation schedules associated with protection of fish and wildlife: **November, 2008**
- Scientific peer review of data, analysis, and assumptions used to determine water reservation (if needed): **January through March, 2009**
- Workshop draft rule language and criteria: **January through June, 2009**
- Seek Board approval to publish the final draft rule in Florida Administrative Weekly: **June, 2009**



**Thank You**