

Historical Overview of Current Kissimmee Basin Projects: How the Pieces Fit and Overlap

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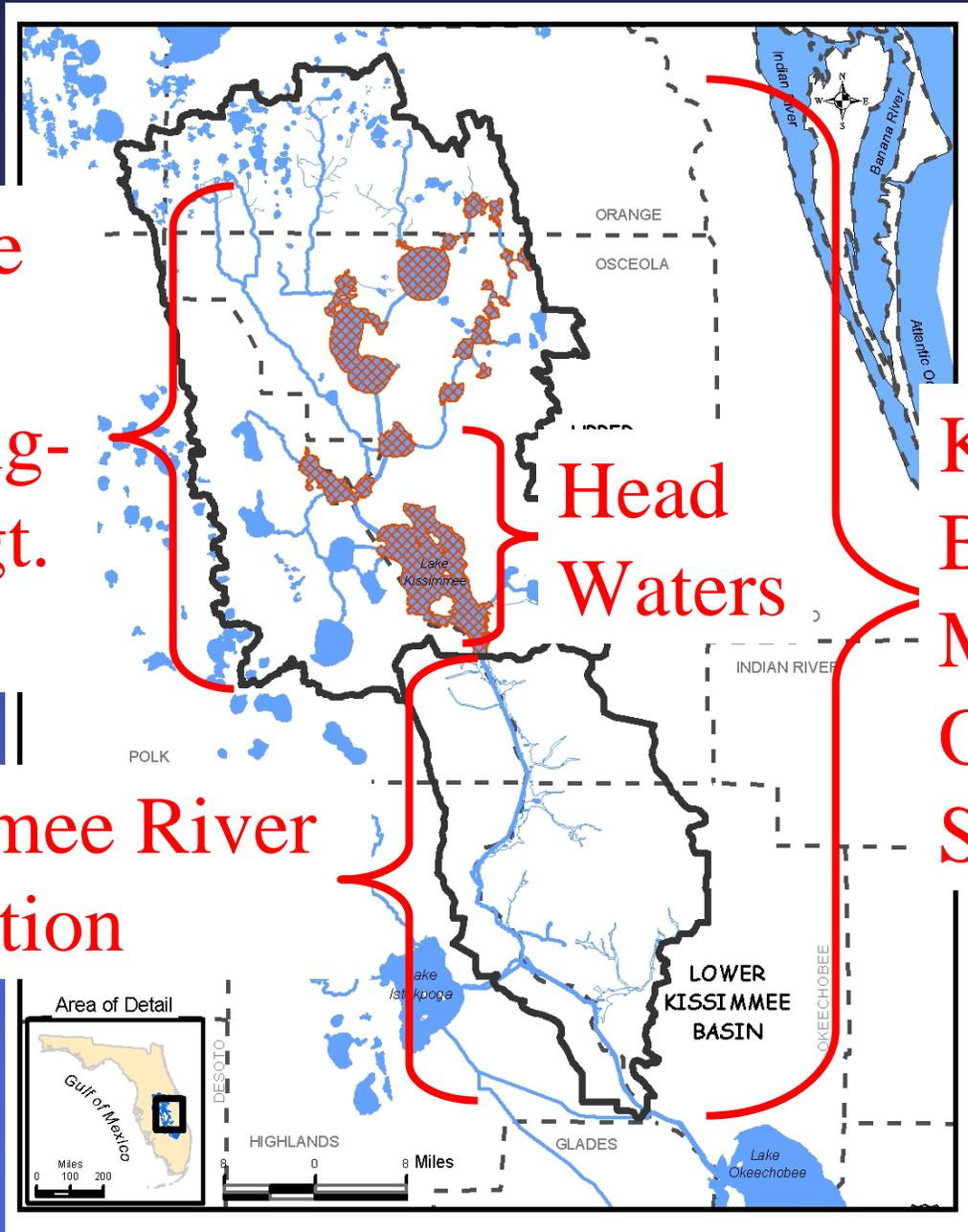
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Kissimmee
Chain of
Lakes Long-
Term Mngt.
Plan

Kissimmee River
Restoration

Head
Waters

Kissimmee
Basin
Modeling &
Operations
Study



Project	Kissimmee River Restoration	Headwaters Revitalization	Kissimmee Basin Modeling & Operations Study	Long-Term Management Plan
Basis	Ecosystem Restoration	Storage and Wetland Quantity and Quality	Assess Current Operations	Coordinate Management Actions and Operations
Goal	Ecological Integrity	Water for KRR	Operations criteria	Enhance and Sustain Lake Health
Evaluation	Ecosystem – level Performance Measures	Monitoring	Hydrologic Performance Measures	Hydrologic & Ecologic Performance Measures

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Kissimmee River Valley, circa 1955



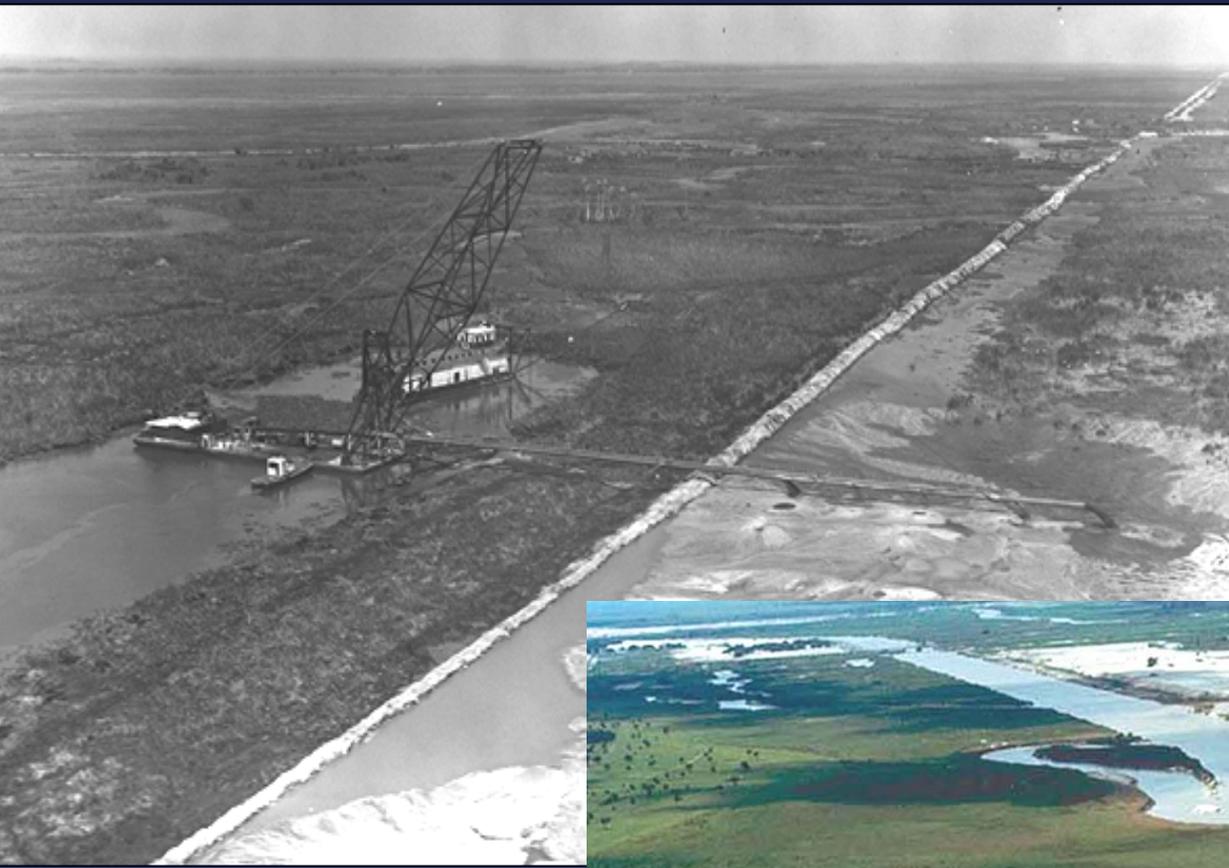


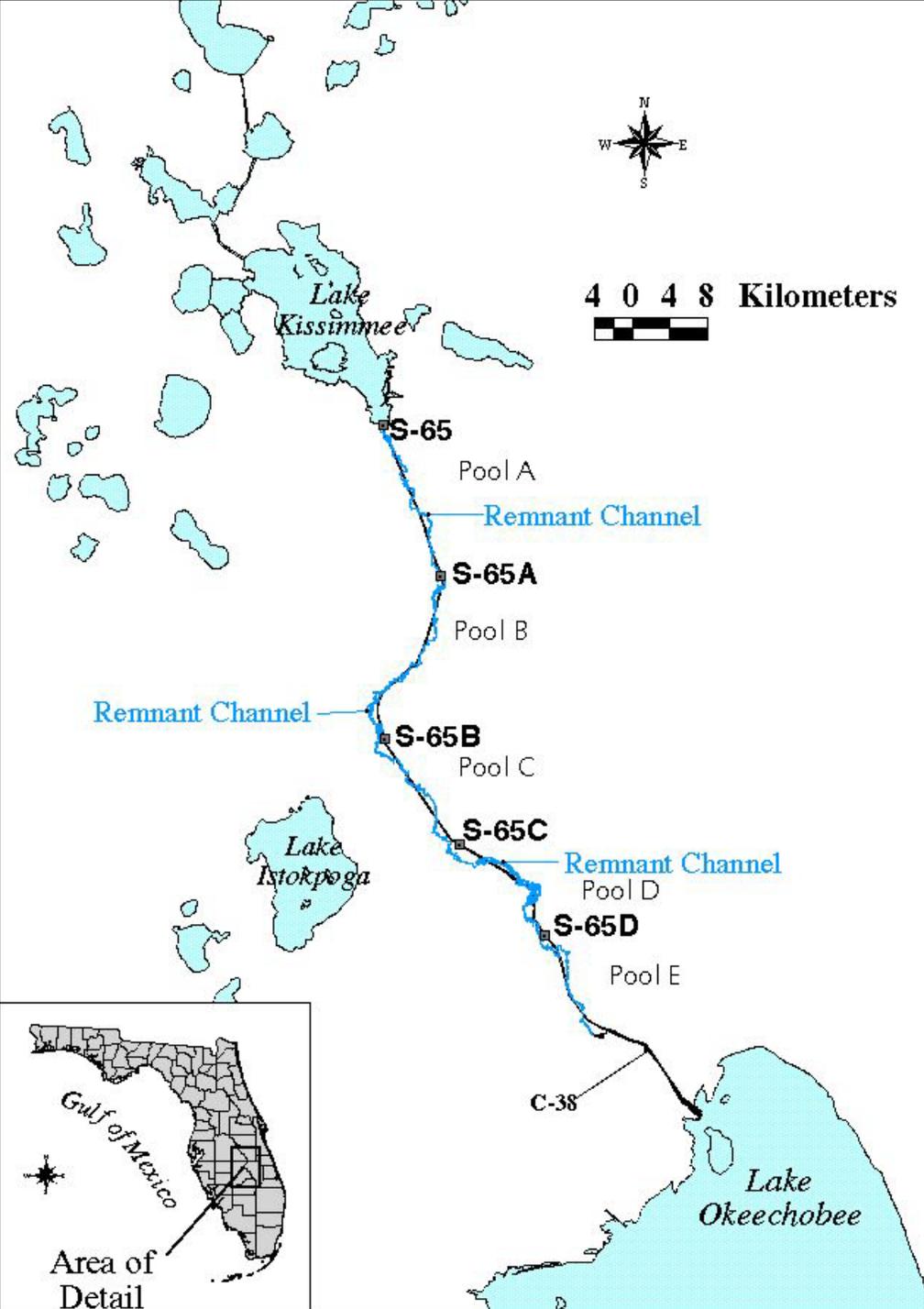
**City of Kissimmee Flooding
circa 1948**



Channelization

1962-1971





Channelized Kissimmee River

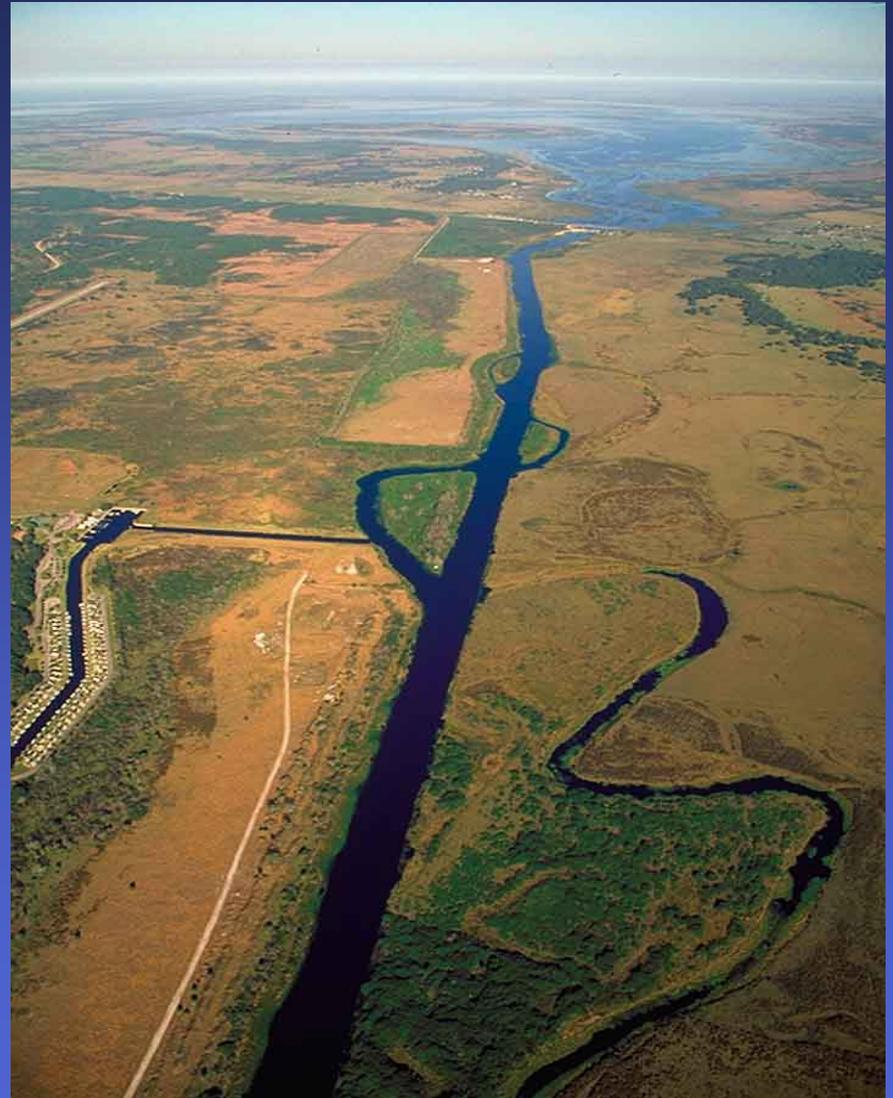
Effects of Channelization

- **Elimination of Floodplain Inundation**

- Shift to terrestrial plant communities
- Fewer wading birds, ducks using floodplain
- Loss of highly productive habitats for fish and aquatic invertebrates

- **Loss of flow in remnant river channels**

- Increases in floating vegetation
- Increases in organic matter deposition
- Lower dissolved oxygen
- Shift in fish, invertebrate communities



Pre-channelization

Post-channelization

Restoration Initiative

- 1971 – USGS Report
- 1976 – Kissimmee River Restoration Act (FL legislature)
- 1978 – 1st Feasibility Study
- 1984 – SFWMD Demonstration Project
- 1990 – 2nd Feasibility Study
- 1992 – Water Resources Development Act authorizes KRR (Federal legislature)
- 1994 – Project Cooperative Agreement

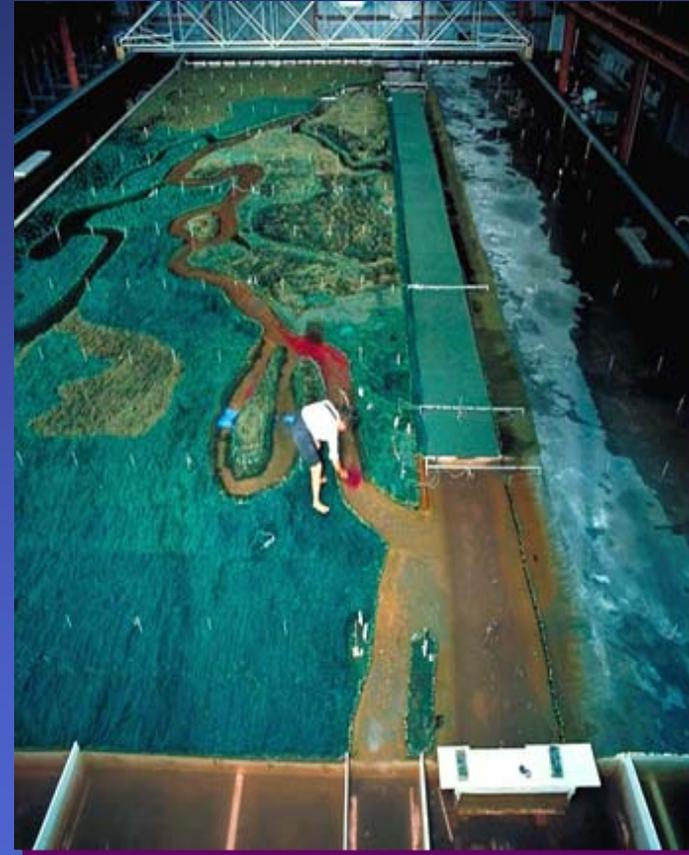


Mandates

- **1976 Kissimmee River Restoration Act**
 - Restore seasonal water level fluctuations in the floodplain
- **1992 Water Resources Development Act**
 - Restore river/floodplain ecosystem according to criteria outlined in 1990 Alternative Plan Evaluation and Preliminary Design report and 1991 Integrated Feasibility Report/EIS

5 Restoration Criteria

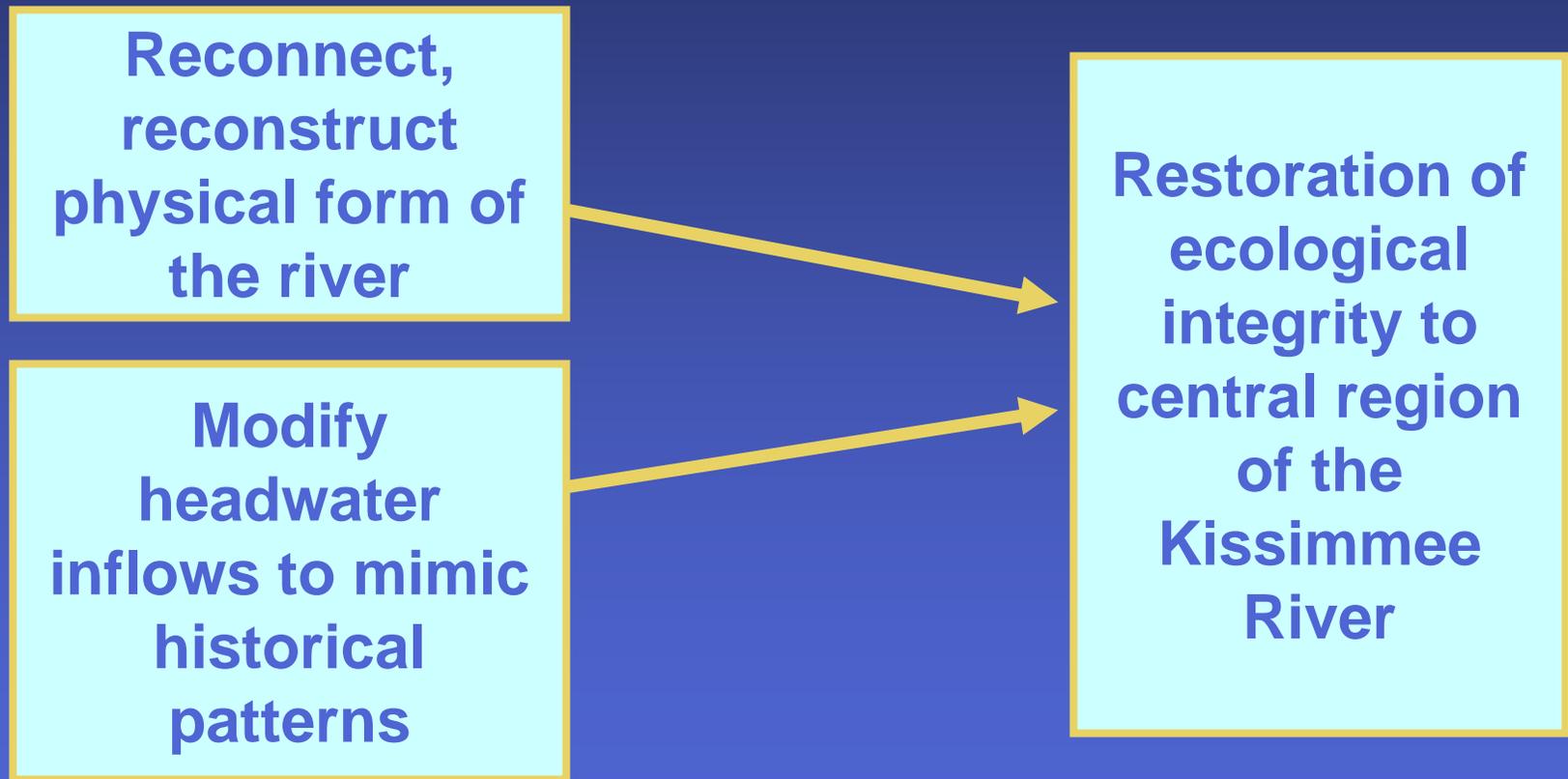
- Continuous flow with duration and variability comparable to pre-channelization periods
- Average flow velocities between 0.8-1.8 ft per second, when flow within bank
- Stage discharge relationship resulting in overbank flow $>1400 \text{ ft}^2/\text{sec}$ and $>2000 \text{ ft}^2/\text{sec}$
- Stage recession rates on floodplain $<1 \text{ ft/month}$
- Floodplain inundation comparable to historic hydrographs



Ecological Integrity Goal

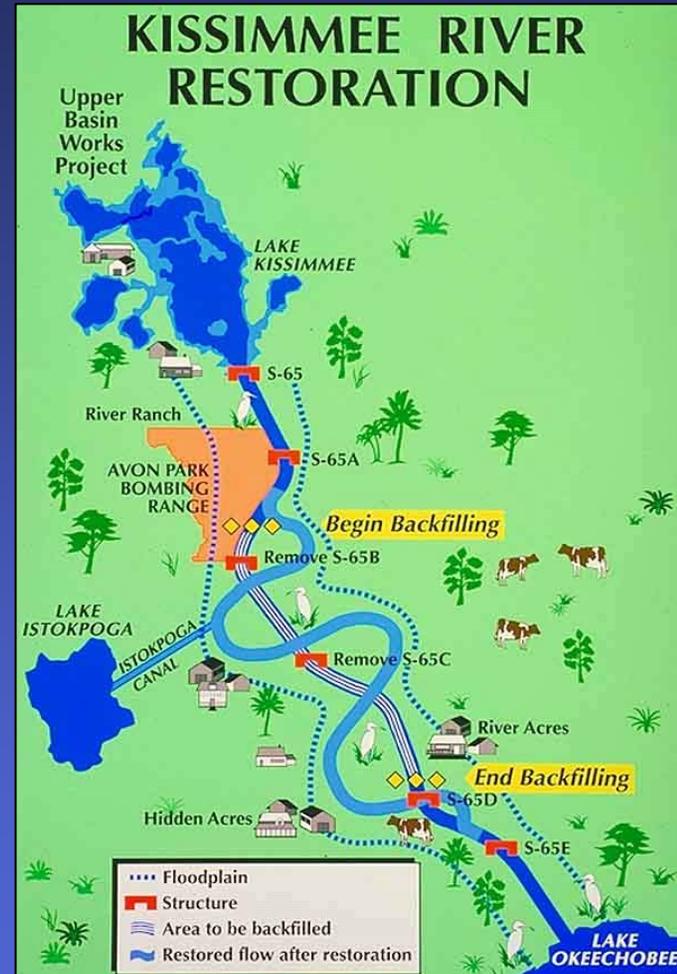
Defined as “the capability of supporting and maintaining a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to natural habitat of the region”. (Frey 1975, Karr and Dudley 1981)

Approach for the Kissimmee River Restoration Project



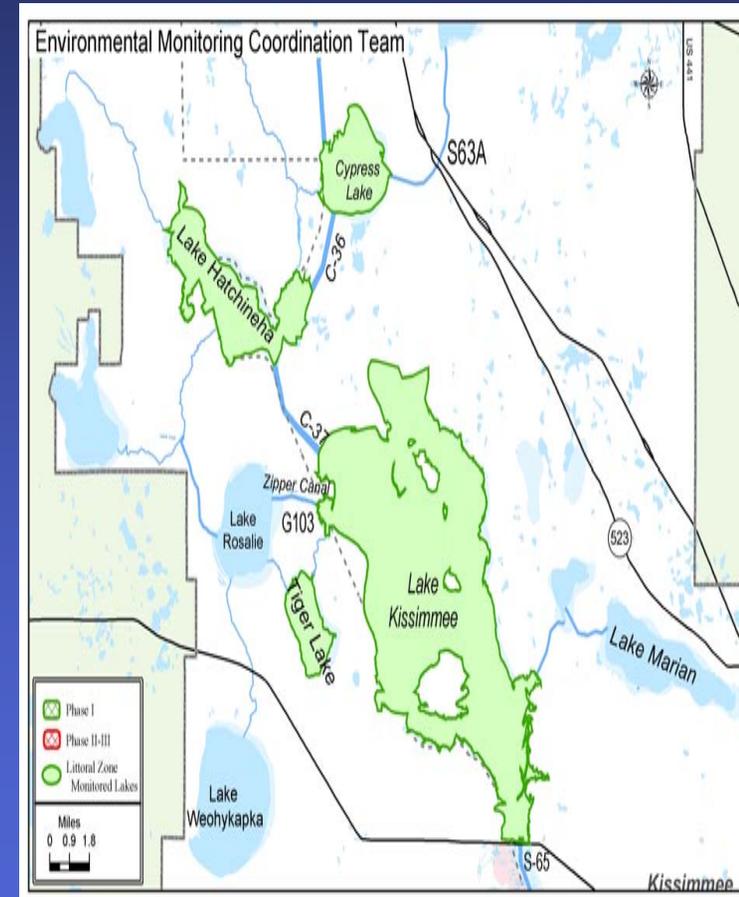
Kissimmee River Restoration Project

- 50/50 cost share USCOE/SFWMD
 - \$620 Million
- Backfill 22 mi of C-38 canal
- Recarve/reconnect more than 40 mi of river channel
- Remove 2 water control structures (one has been removed)
- Headwaters Revitalization Project – to provide outflows from headwater lakes needed to restore the Kissimmee River - 2011
- Comprehensive restoration evaluation program – thru 2017

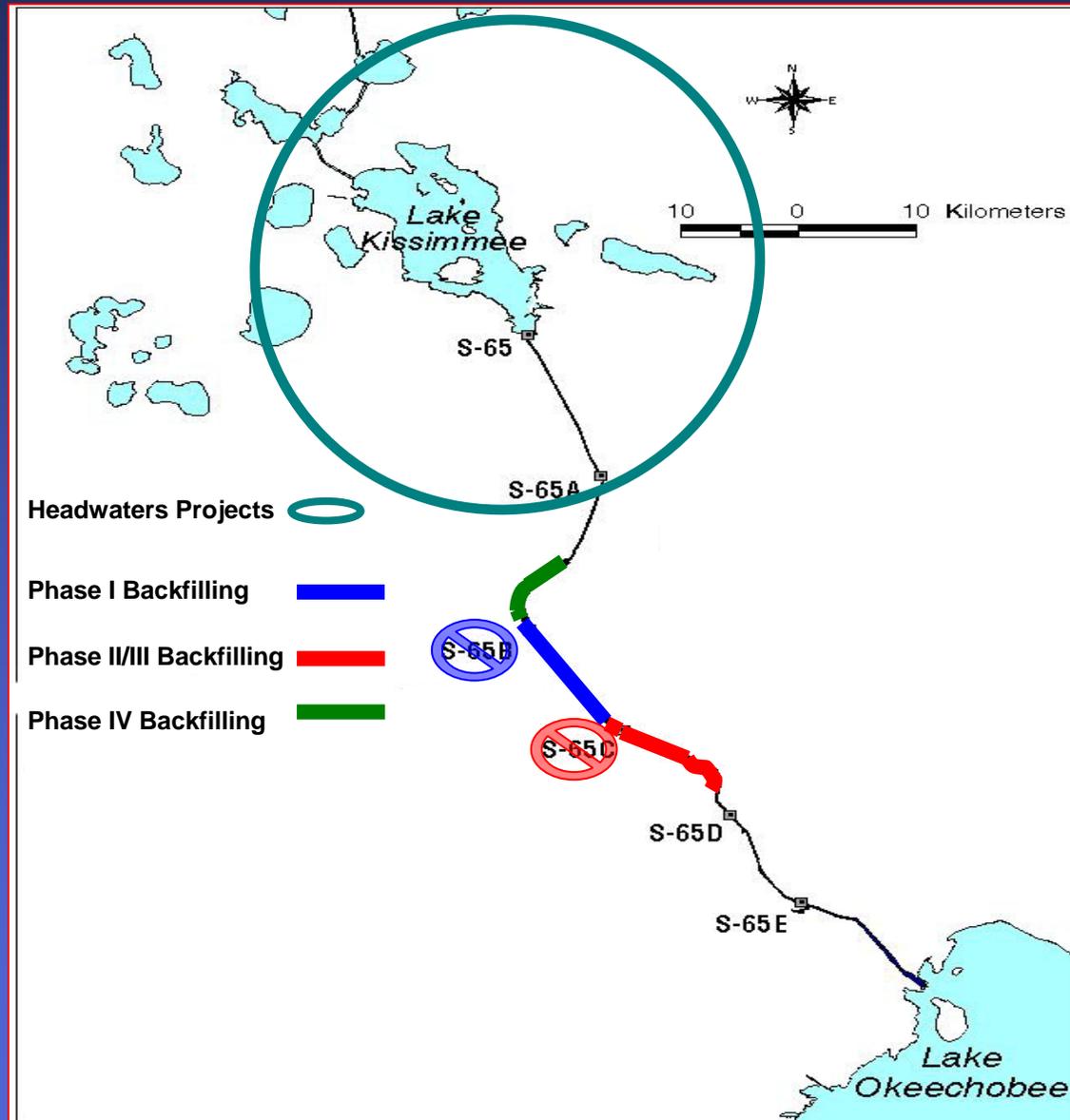


Headwaters Revitalization (Lakes Kissimmee, Hatchineha, Cypress, Tiger)

- Changes how S-65 structure is operated at south end of Lake Kissimmee – 1996 Project Report/EIS
- Provide greater and more natural lake level fluctuations and delivery to Kissimmee river
- Expand existing peripheral marsh habitats (~7200 acres)
- Provide adequate operational flexibility to incorporate management strategies that meet the needs of the Kissimmee River and lower chain of lakes.



Major Construction Components



Phase I Backfilling

- Fill 7 miles C-38 canal
- Re-carve 1.2 miles river channel
- Remove S-65B
- Restore 15 miles contiguous river channel
- Completed in Feb 2001







Degraded
Spoil
Area

Backfilled
C-38

Remnant
River
Channel

New River
Connection

Remnant
River
Channel

Phase 1 Construction

KRR Comprehensive Restoration Evaluation Program Components

- Hydrology
- Geomorphology
- Dissolved Oxygen and Water Quality
- Plant communities
- Invertebrate communities
- Reptile and Amphibian communities
- Fish communities
- Bird communities
- Threatened and Endangered species



Kissimmee River Restoration Studies Compendia

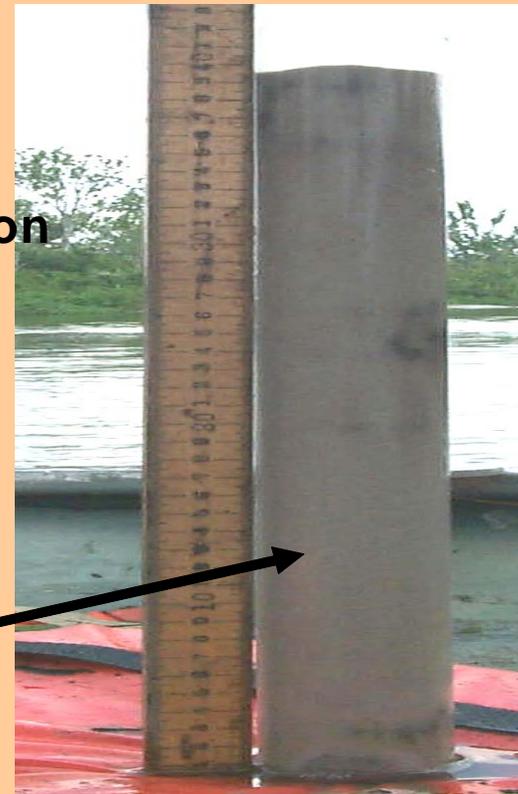


- Results of Baseline Studies 1995-1999
- 25 Performance Measures “Restoration Expectations”
- Executive Summary

Initial Ecological Response

Remnant Channel

Restored Channel



Deposition

Sand

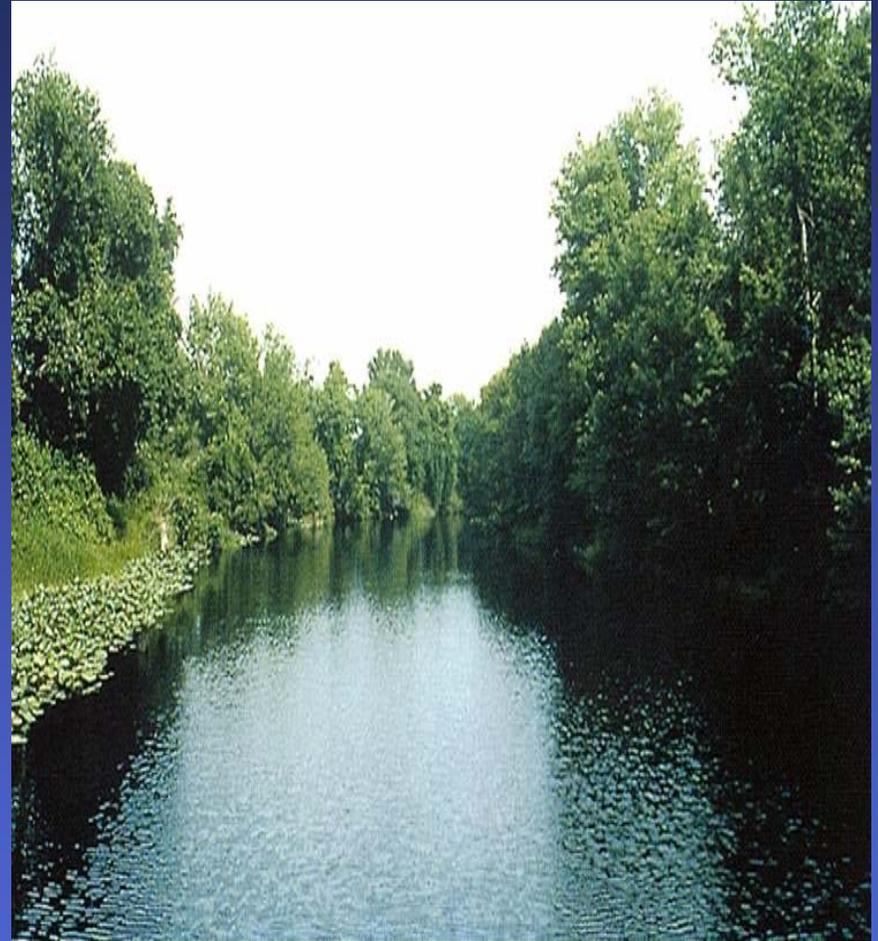
Sandbar Formation



Phase I Response – River channel vegetation



Pre-restoration



Post-restoration

Phase I Response –Floodplain vegetation

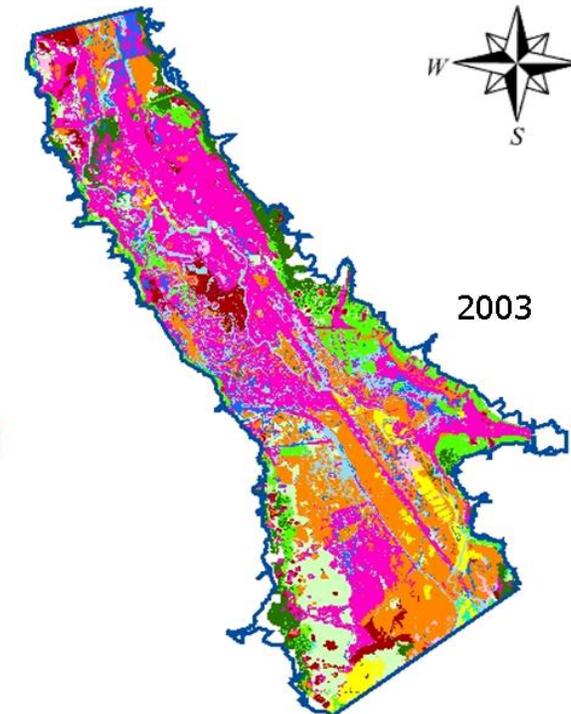
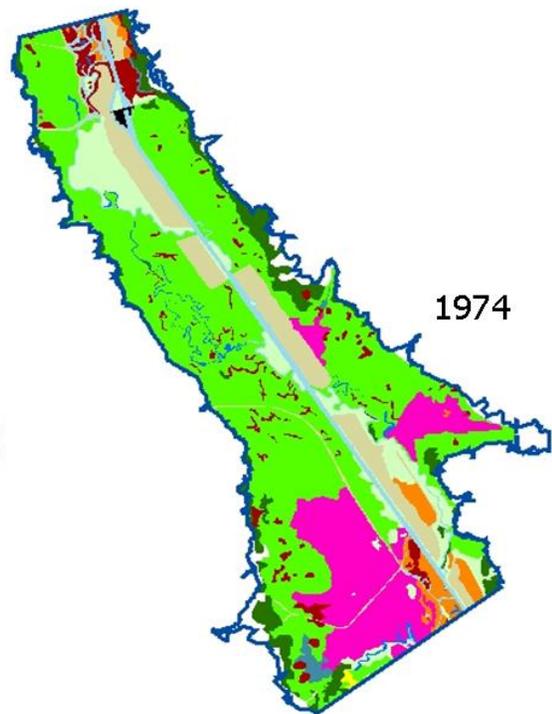
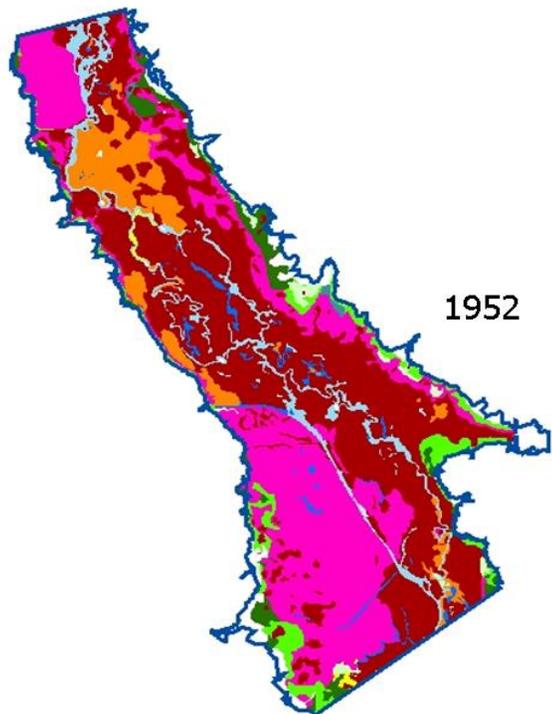


Pre-restoration



Post-restoration

SOUTH FLORIDA WATER MANAGEMENT DISTRICT



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

Phase I Response – River channel invertebrates



Phase 1 Response - Fish





Ducks of the Kissimmee River/floodplain

Species	Before	After Phase 1 backfilling
Blue-winged Teal	Yes	Yes
Green-winged Teal	Yes	Yes
Mottled Duck	Yes	Yes
Wood Duck	Yes	Yes
Hooded Merganser	Yes	Yes
Fulvous Whistling Duck	No	Yes
Northern Pintail	No	Yes
Northern Shoveler	No	Yes
American Wigeon	No	Yes
Ring-necked Duck	No	Yes

Returning Species



The fulvous whistling duck, northern pintail, northern shoveler, American wigeon and ring-necked duck were not encountered during Baseline (before Phase 1 backfilling) surveys; all five species were present during 2003/2004.

Returning Shorebirds

Species	Before	After Phase 1 Backfilling
Common Snipe	Yes	Yes
Killdeer	Yes	Yes
American Avocet	No	Yes
Black-necked Stilt	No	Yes
Dowitcher sp.	No	Yes
Greater Yellowlegs	No	Yes
Semipalmated Plover	No	Yes
Least Sandpiper	No	Yes
Spotted Sandpiper	No	Yes
Western Sandpiper	No	Yes



A black-necked stilt forages on floodplain restored during Phase 1 backfilling. The species was confirmed breeding in the restored area during 2003 and 2004. Migrant, resident, and overwintering shorebirds are commonly found on restored portions of the Kissimmee river and floodplain.

1955

2006



GOOD!!!

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