

KISSIMMEE RIVER RESTORATION

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US Army Corps
of Engineers®



LOSOM WEBINARS



- Webinar 1 – Overview of the Central & Southern Florida Project – 20 May
- Webinar 2 – Lake Okeechobee Ecology – 22 May
- Webinar 3 – Dam Safety and Herbert Hoover Dike – 24 May
- Webinar 4 – Estuary Ecology – 28 May
- Webinar 5 – Water Management and the 2008 LORS – 30 May
- **Webinar 6 – Kissimmee River Restoration – 4 June**



WHAT YOU WILL LEARN



- **How the C&SF Project changed the natural function of the Kissimmee River Basin**
- **What the Kissimmee River Restoration Project is intended to restore and what it does not directly address**
- **How the inflow to Lake Okeechobee is influenced by the Kissimmee River Basin**



AGENDA

- **Kissimmee River Basin**
- **Historic Kissimmee River**
- **Kissimmee Flood Control Project**
- **Kissimmee River Restoration**
- **Key Takeaways**
- **Questions**





HISTORIC KISSIMMEE RIVER



Dry Season



Wet Season





KISSIMMEE FLOODING 1948

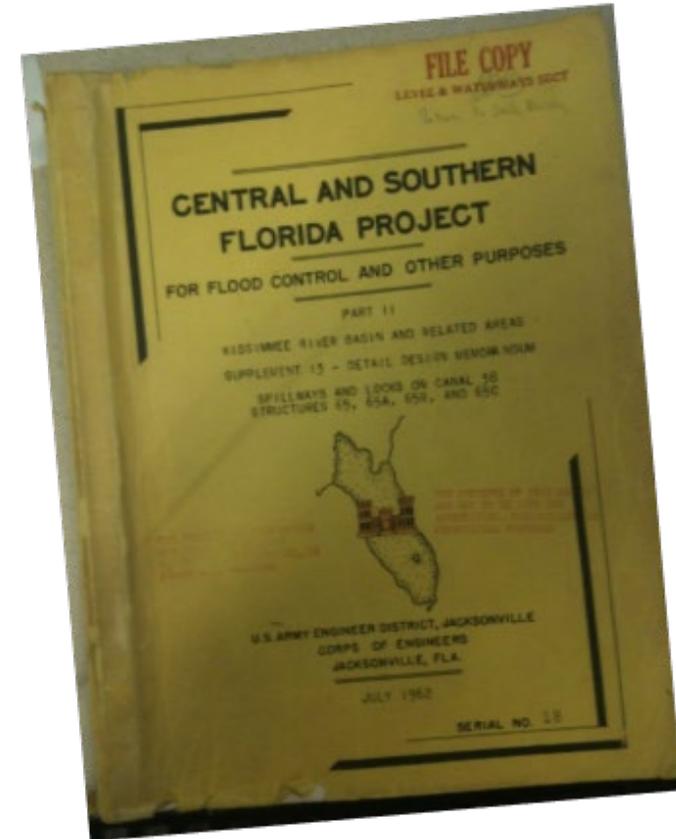




KISSIMMEE FLOOD CONTROL PROJECT



- Original Flood protection project authorized in 1954 as part of the C&SF Project to alleviate flooding in the Kissimmee River basin
- Channelized a 113 mile meandering river to a 56 mile canal and added 6 step down control structures from Lake Kissimmee to Lake Okeechobee (the S-65's) and 7 in the Chain of Lakes
- System designed to accommodate 10-yr event also lowering the peak and duration of flooding from larger events
- This project is why flooding is not experienced currently in the Kissimmee Basin





KISSIMMEE FLOOD CONTROL PROJECT



Kissimmee River Channelization, circa 1962-1971

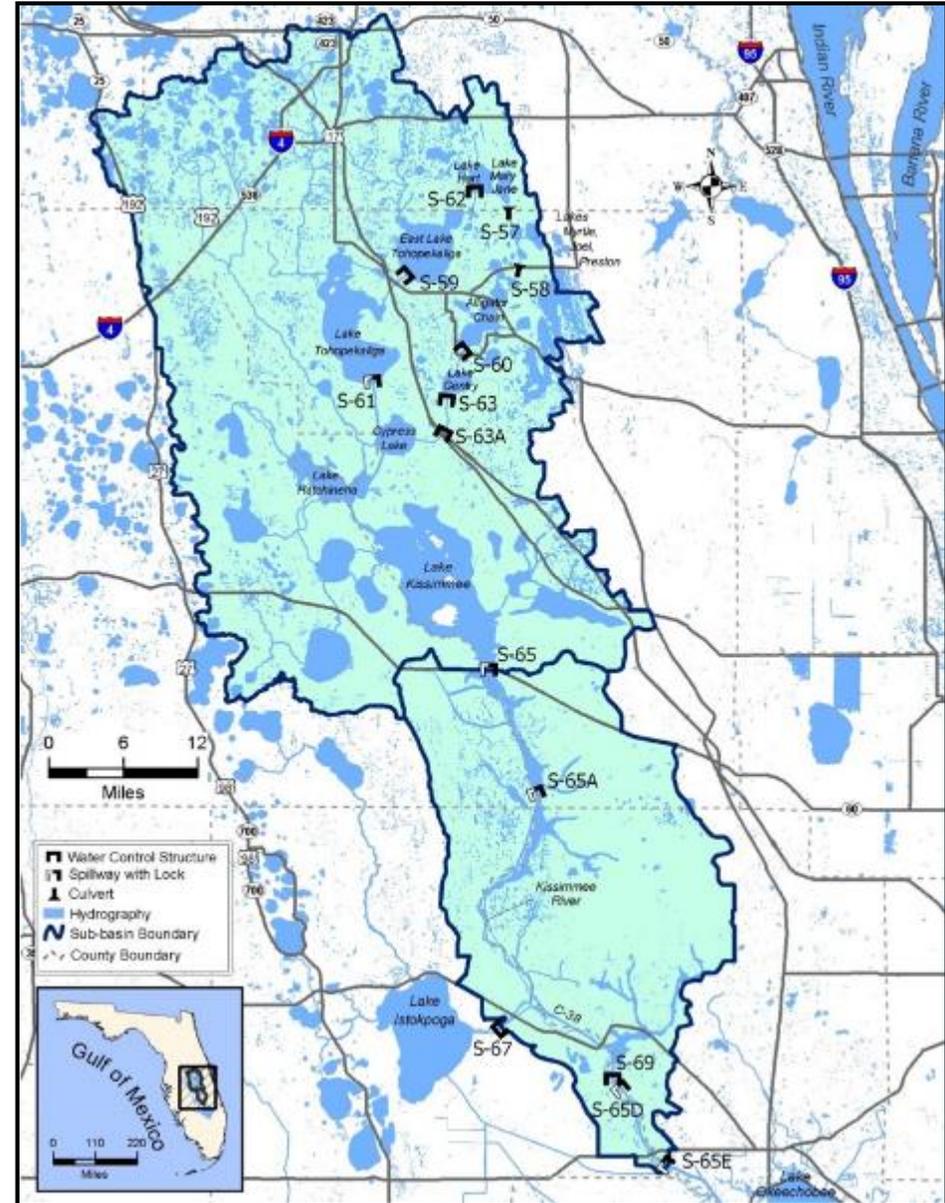




KISSIMMEE FLOOD CONTROL PROJECT



- Designed to maximize protection benefits at minimum costs with minimum amounts of structural modifications
- Designed to utilize Lake Kissimmee to store Upper Chain of Lake discharges until Lower Basin flood conditions recede
- Lower Basin flood hydrograph includes two peaks
 - First flood peak is generated by local rainfall and runoff
 - Second flood peak occurs in response to Lake Kissimmee discharges after the local flood peak passes





KISSIMMEE FLOOD CONTROL PROJECT

Pre-Channelization



Post-Channelization





KISSIMMEE RESTORATION



- 1976 Kissimmee River Restoration Act
 - Restore seasonal water level fluctuations in the floodplain by utilizing the natural and free energies of the river system to the greatest extent possible
- Restoration Studies
 - 1978 – 1st Feasibility Study
 - 1984 – Demonstration Project
 - 1990 – 2nd Feasibility Study
 - 1994 – Test Fill Project





KISSIMMEE RIVER RESTORATION AND HEADWATERS REVITALIZATION AUTHORIZATION



Environmental degradation resulting from the channelization and altering of natural water level fluctuations led to the 1992 authorization of the KRR and Headwaters Revitalization component

- Restore over 40 square miles of river and floodplain ecosystem, including 43 miles of meandering river channel and 27,000 acres of wetlands
- Increase storage in the Middle Basin to provide water delivery to the river to meet the 5 hydrologic restoration criteria
- Comprehensive Ecological Restoration Evaluation Program
- Maintain existing level of flood reduction and ensure continued navigation access

102d Congress, 2d Session - - - - - House Document 102-286

KISSIMMEE RIVER RESTORATION STUDY

COMMUNICATION

FROM

THE ASSISTANT SECRETARY OF THE ARMY
(CIVIL WORKS)

TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, DEPARTMENT OF THE ARMY DATED MARCH 17, 1992, SUBMITTING A REPORT TOGETHER WITH ACCOMPANYING PAPERS AND ILLUSTRATIONS, PURSUANT TO SECTION 116(h) OF THE WATER RESOURCES DEVELOPMENT ACT OF 1990



APRIL 7, 1992.--Referred to the Committee on Public Works and Transportation and ordered to be printed

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1992

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KISSIMMEE RESTORATION



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)

5 Hydrologic Restoration Criteria

- Continuous flow with duration and variability comparable to pre-channelization periods
- Average flow velocities between 0.2-0.6 m per second, when flow within bank
- Stage discharge relationship resulting in overbank flow $>130 \text{ m}^2/\text{sec}$ and $>185 \text{ m}^2/\text{sec}$
- Stage recession rates on floodplain $<0.3 \text{ m/month}$
- Floodplain inundation comparable to historic hydrographs



Restored river channel and floodplain in Reach 1.

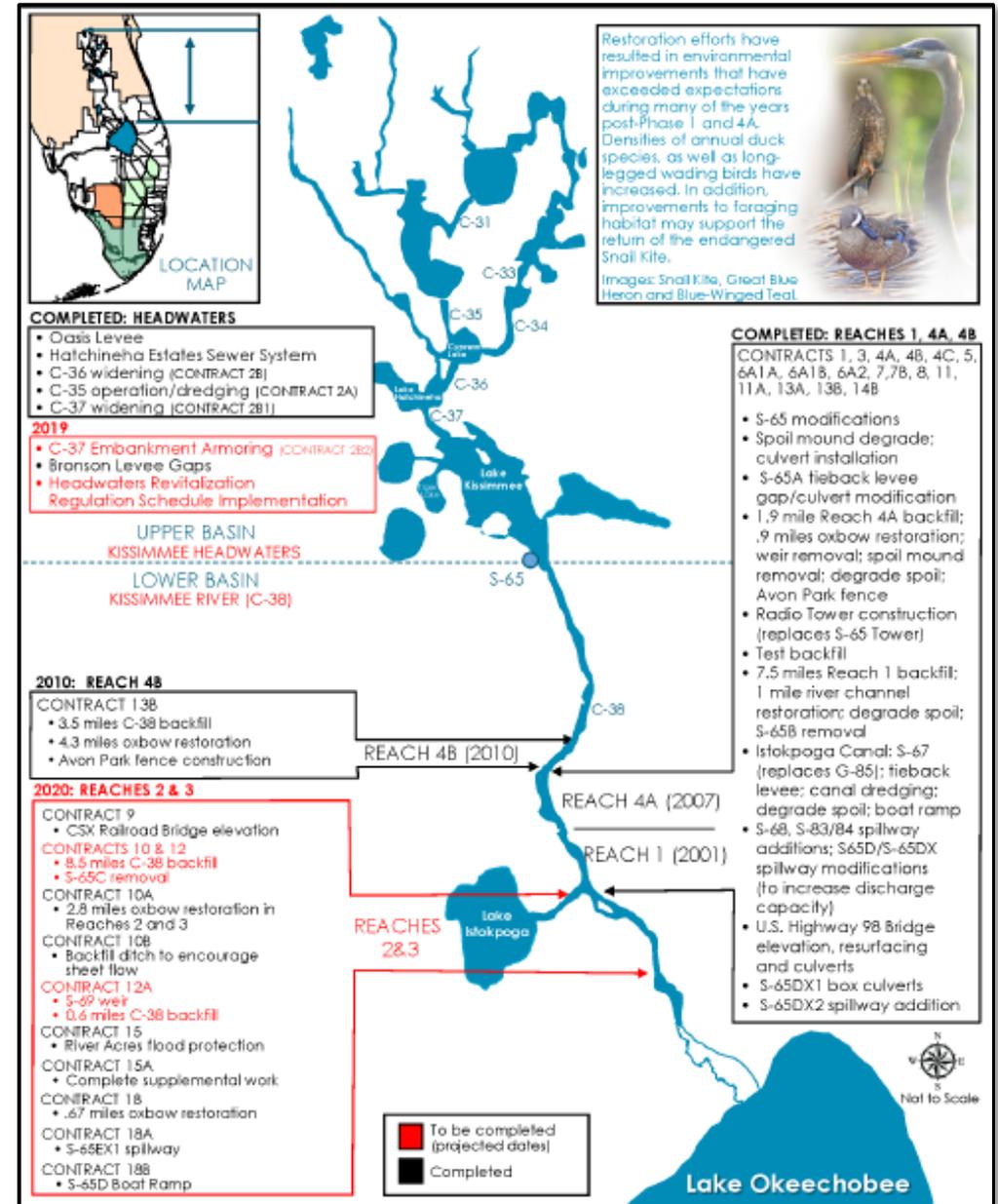


KISSIMMEE RESTORATION



KCOL and River Basin Basin Restoration Construction Plan

- Widening of C-35, C-36 and C-37 canals
- Backfill 29 miles of C-38 in 5 phases
- Structure modification and additions to S-65, S-65A, S-65D and S-65E
- Remove S-65B and S-65C
- Excavate 11.6 miles of new river channel
- Modification to bridge crossings at US98 and CSX Railroad
- Various local berms and tributary work
- Real estate acquisition





KISSIMMEE RESTORATION



C-38 Backfill Construction in Reach 4A; Restored river section in Reach 1

S-65DX2 Construction; S-65DX2 in operation



06/24/2015 11:28



KISSIMMEE RESTORATION



CSX Railroad Bridge Construction; Completed CSX Railroad Bridge over restored river channel



Excavation of river section in Reach 3; Completed oxbow section in Reach 3



KISSIMMEE RESTORATION



- Restoration is incomplete
- Response by many ecosystem components on trajectory to target values
- Bulk of environmental benefits expected following construction completion and implementation of new Headwaters Schedule in 2021





KRR EFFECT ON LAKE OKECHOBEE INFLOW



- About 60% of inflow to Lake O comes from the Kissimmee Basin
- Since C&SF construction water flows into Lake O 6 times faster than it can be released.
- Peak inflows to Lake O from large storm events are expected to be dampened. Total volume of water from large storms flowing into the lake is not expected to substantially change.
- The average annual inflow to Lake O from the river is not expected to change dramatically, with only a 15,000 ac-ft reduction (1.6%) from evapotranspiration associated with floodplain sheet flow
- The restoration project is expected to provide some ancillary level of nutrient reduction through uptake by floodplain vegetation during periods of floodplain inundation. Loads entering Lake O are not expected to be reduced significantly.





KEY TAKEAWAYS



- **The C&SF Project changed the natural function of the Kissimmee River Basin by eliminating much of the flood plain storage and changing conveyance from slow overland flow to rapid canal flow.**
- **The Kissimmee River Restoration Project is intended to restore the natural riverine and flood plain ecosystems, while maintaining flood risk management. The KRR project purposes do not include providing long term storage north of Lake O or water quality improvement.**
- **The majority of surface inflow to Lake Okeechobee comes from the Kissimmee River Basin. The loss of natural floodplain storage resulted in inflow 6 times greater than can be released from the Lake. The KRR project will help change timing of inflow to the lake aiding operational flexibility in the system, but will not solve inflow volume or quality concerns.**



PLEASE TYPE QUESTIONS INTO THE WEBINAR

**LOSOM website
www.saj.usace.army.mil/LOSOM**

**LOSOM Email for comments
LakeOComments@usace.army.mil**

**USACE Water Management Page
www.saj.usace.army.mil/WaterManagement/**