

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Interim Response of Wading Birds and Waterfowl to the Kissimmee River Restoration Project

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South Florida Water Management District**



**GEER Conference
April 22, 2015**

Photo: Kissimmee Valley Rainstorm

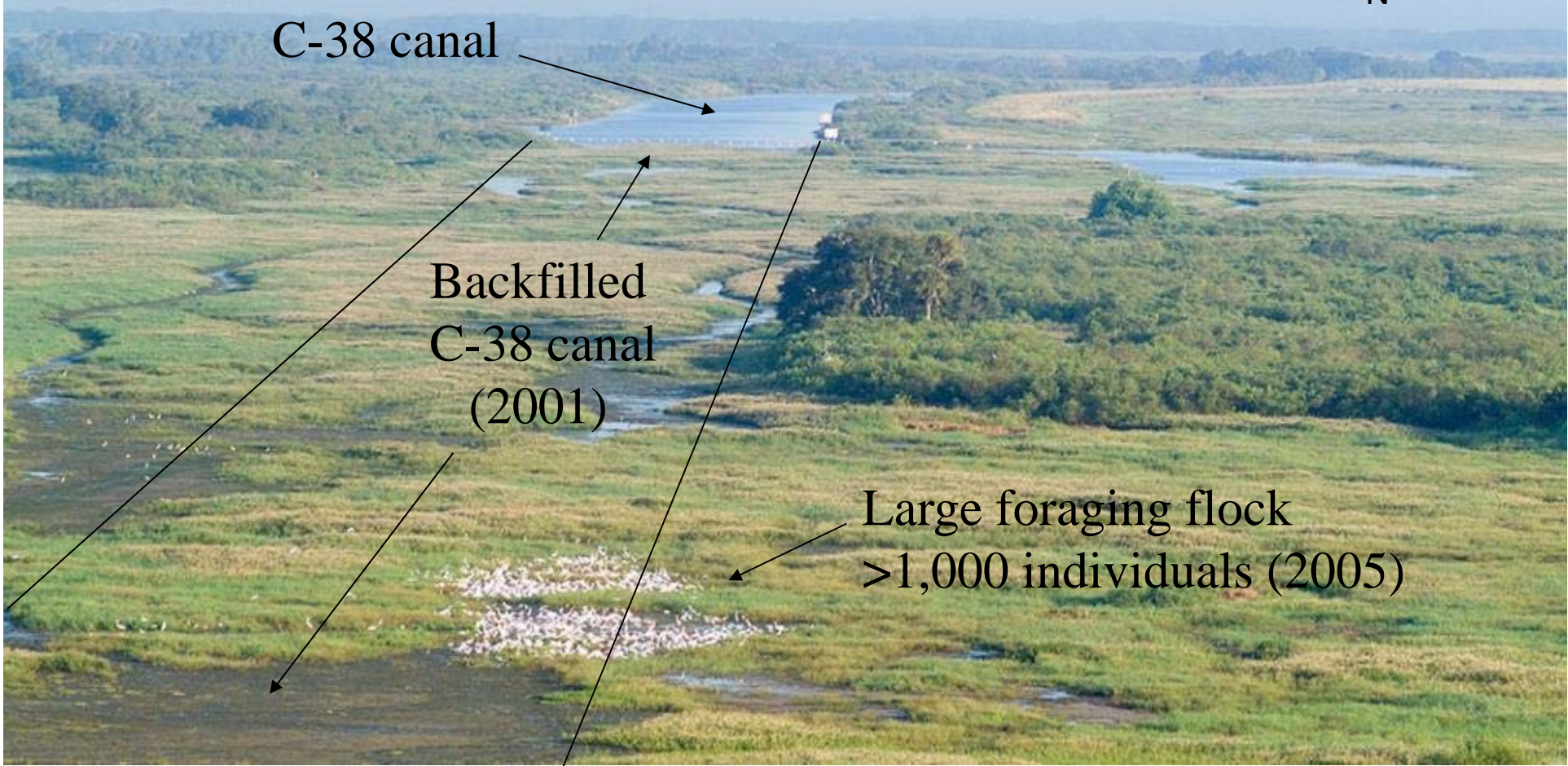
Kissimmee River Restoration Project (Phase I Area)



C-38 canal

Backfilled
C-38 canal
(2001)

Large foraging flock
>1,000 individuals (2005)



RUNDOWN

- Kissimmee River Restoration Project overview (*not yet complete; construction completion in 2019*)
- Interim period (2001-2008) bird response to partial restoration (Phases I, IVA, and IVB *only physically restored*)
- Current ecological conditions (2009-2015) and management issues within the restoration area
- Future challenges and adaptive management of restoration area hydrology

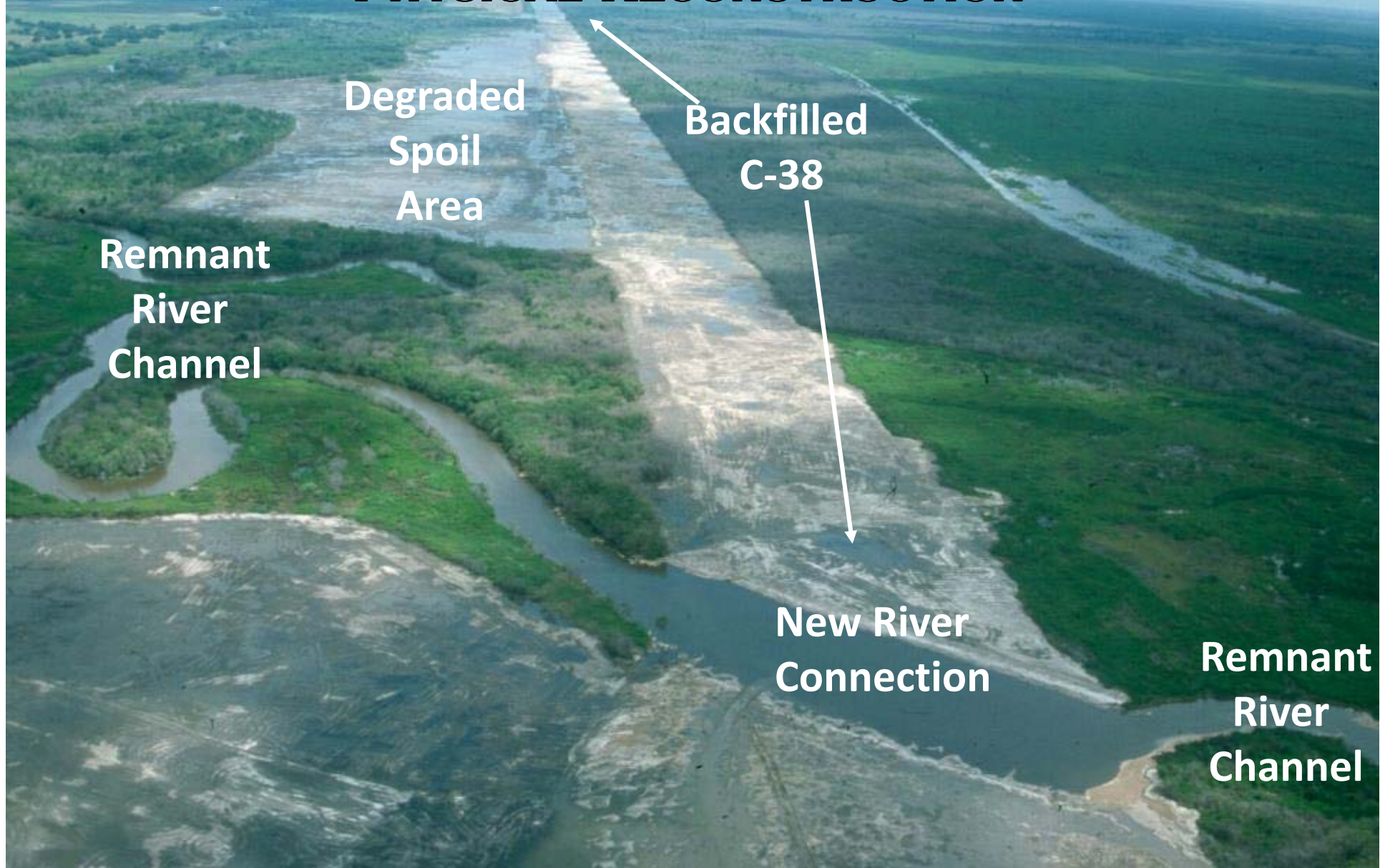
APPROACH FOR THE KISSIMMEE RIVER RESTORATION PROJECT

Reconnect,
reconstruct physical
form of the river

Modify headwater
inflows to mimic
historical patterns
(Headwaters
Regulation Schedule
by 2019)

Restoration of
ecological
integrity to
central region of
the Kissimmee
River

KISSIMMEE RIVER RESTORATION PROJECT PHYSICAL RECONSTRUCTION



Degraded
Spoil
Area

Remnant
River
Channel

Backfilled
C-38

New River
Connection

Remnant
River
Channel

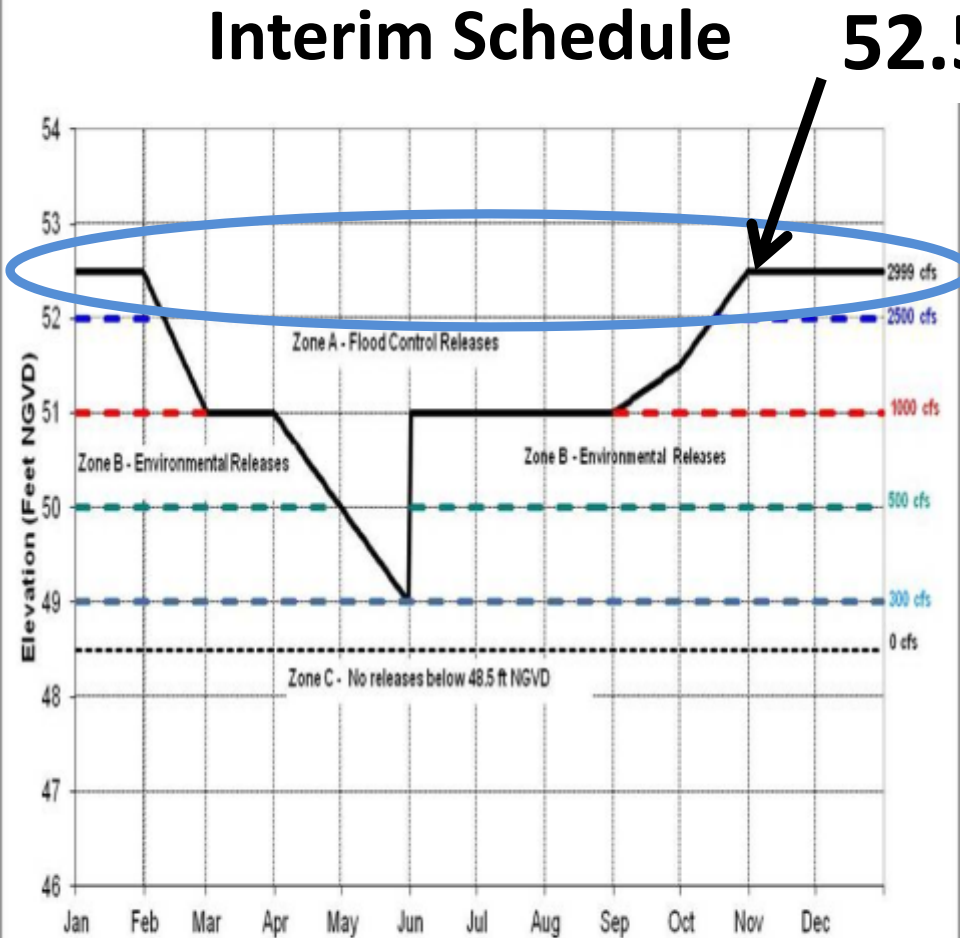
KISSIMMEE RIVER RESTORATION PROJECT

HYDROLOGICAL RESTORATION

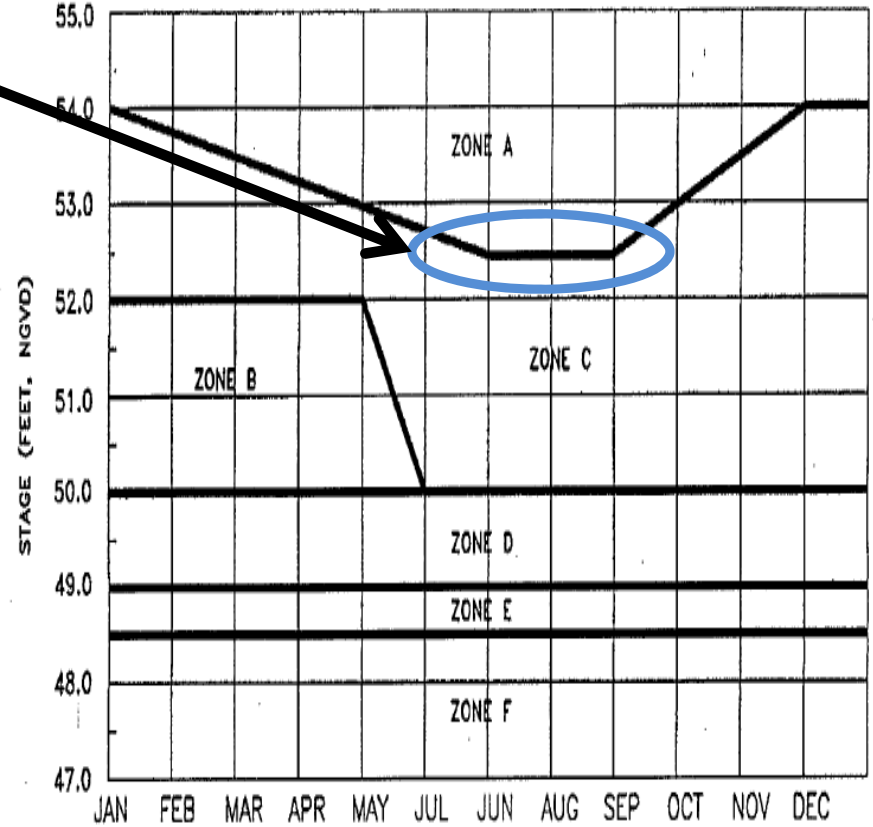
INTERIM VS. HEADWATERS REGULATION SCHEDULE @ S65

Interim Schedule

52.5'

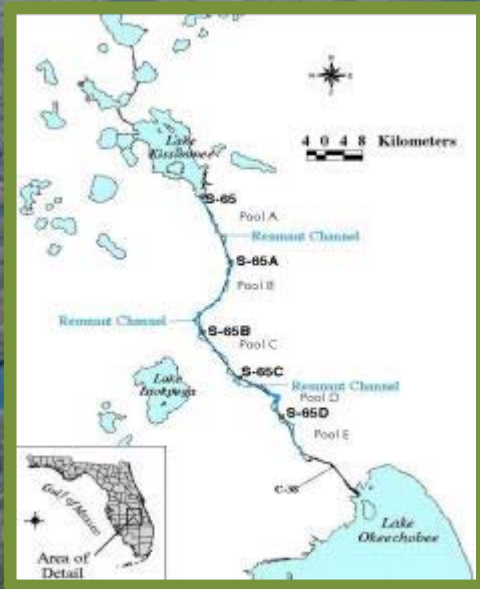


Implementation of the recommended Zone B releases should be flexible and consider prevailing conditions.

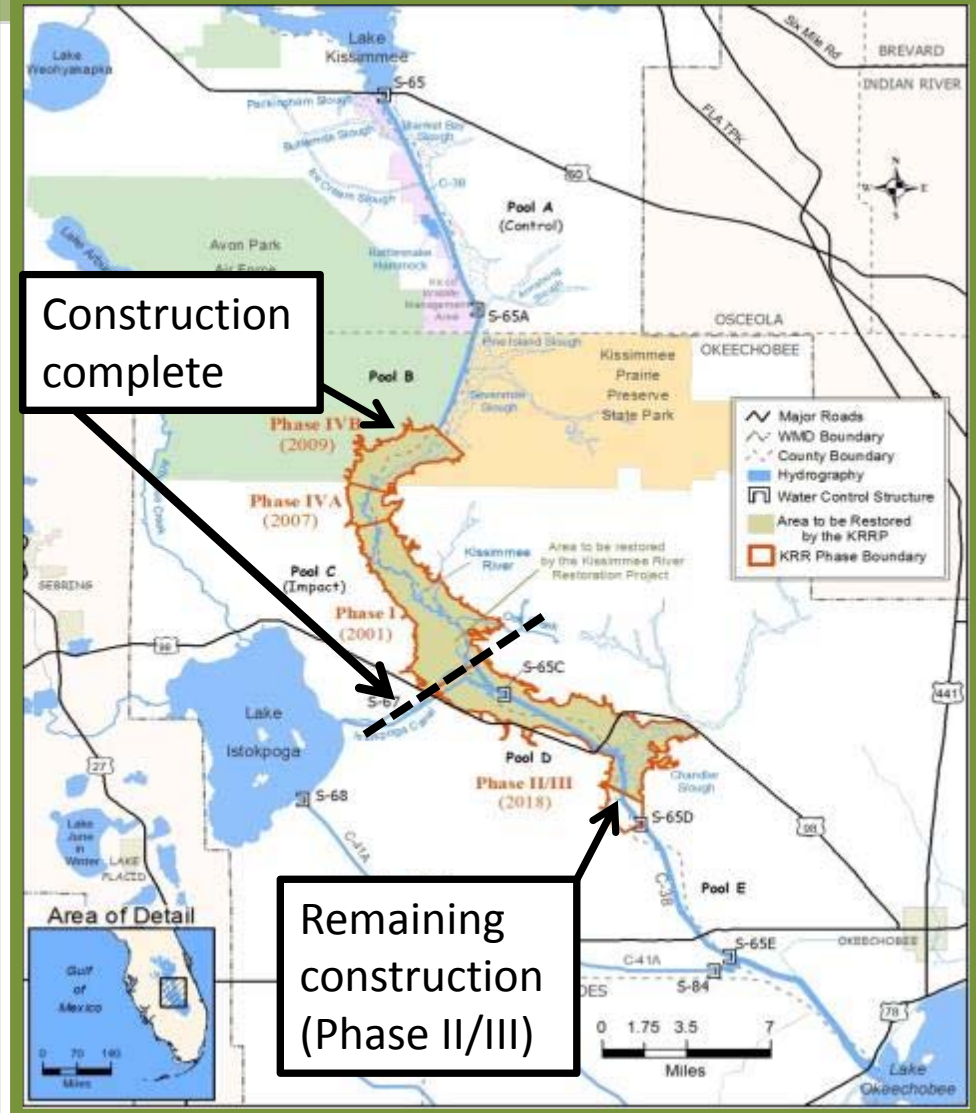
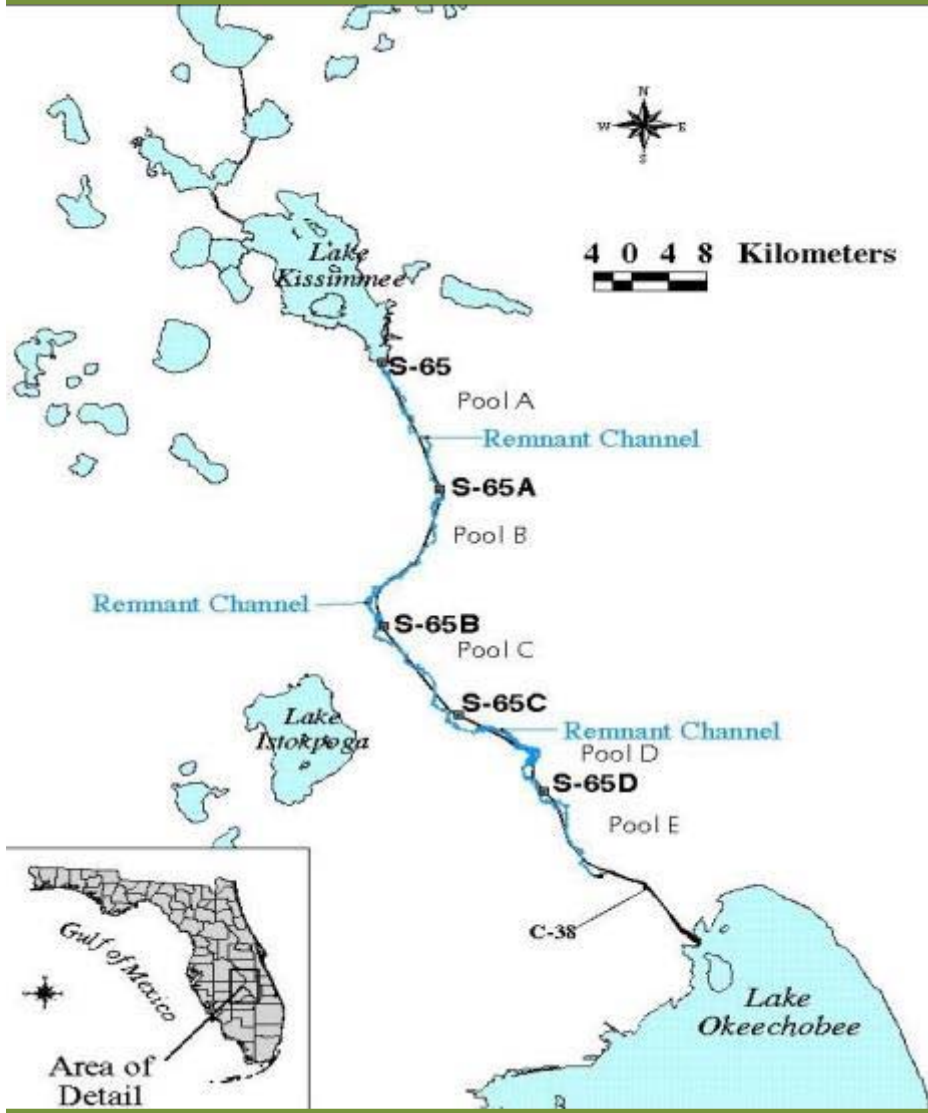


Headwaters Regulation Schedule

PRE-CANNELIZATION KISSIMMEE RIVER

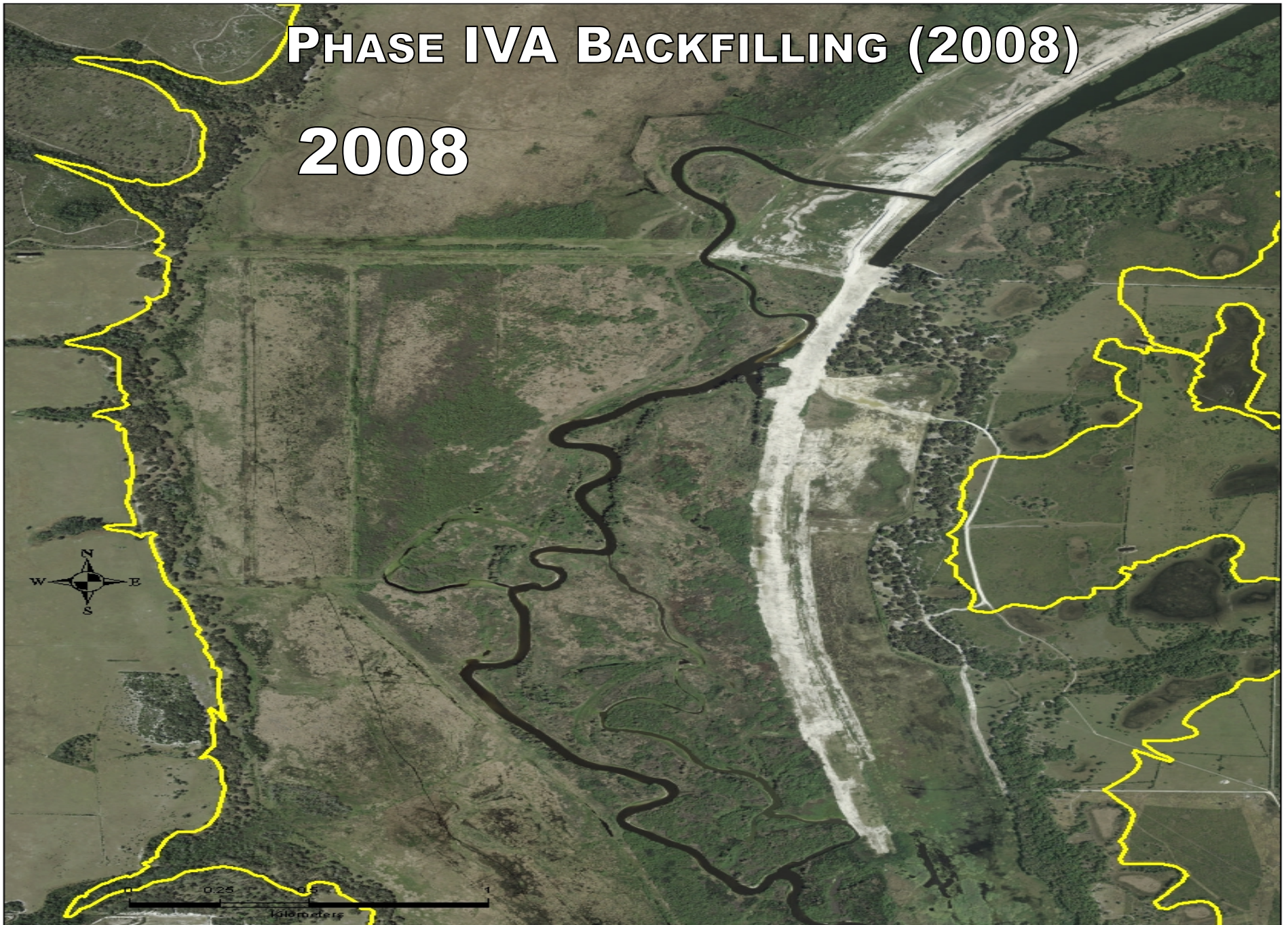


RESTORATION PROJECT CHANNELIZED (2001-CURRENT)

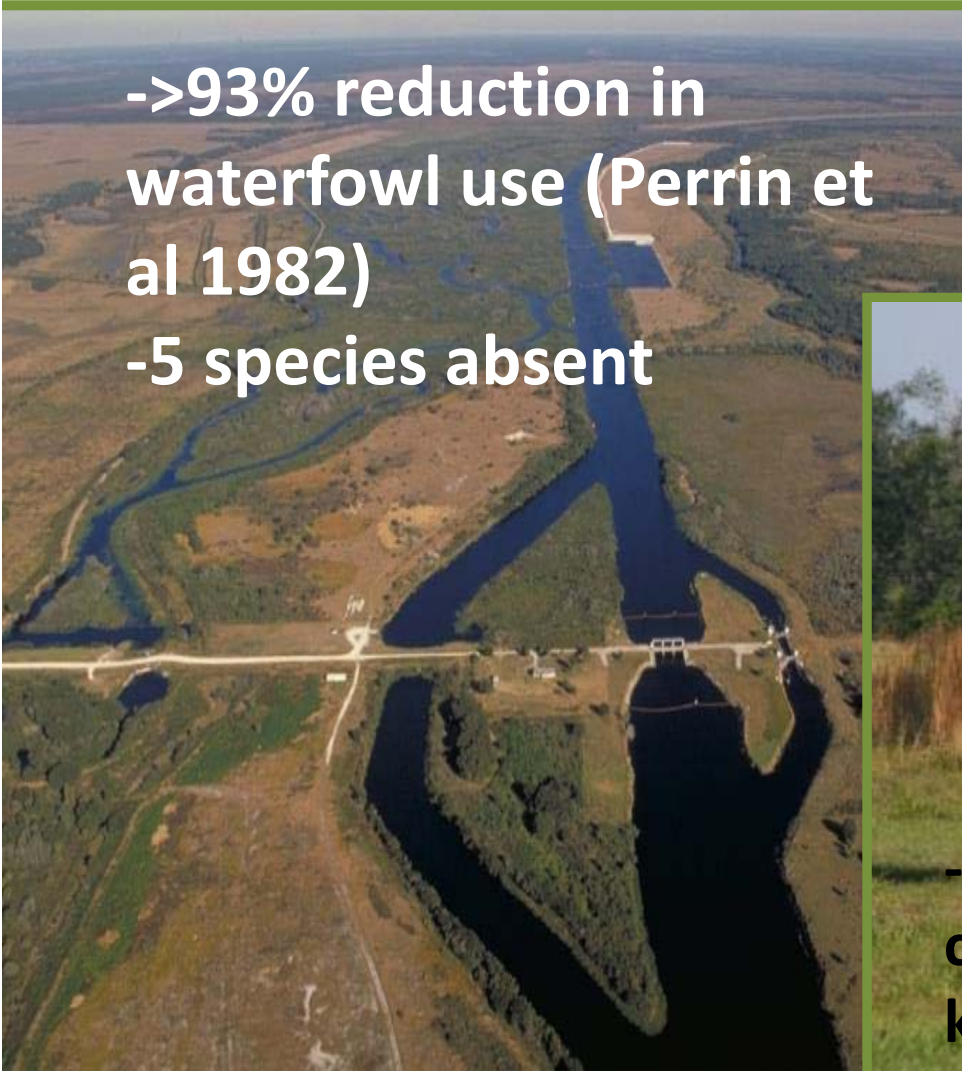


PHASE IVA BACKFILLING (2008)

2008




KNOWN IMPACTS OF CHANNELIZATION ON WADING BIRDS



->93% reduction in waterfowl use (Perrin et al 1982)
-5 species absent

-Decreased aquatic wading bird abundance and diversity

-Cattle egrets accounted for 80%



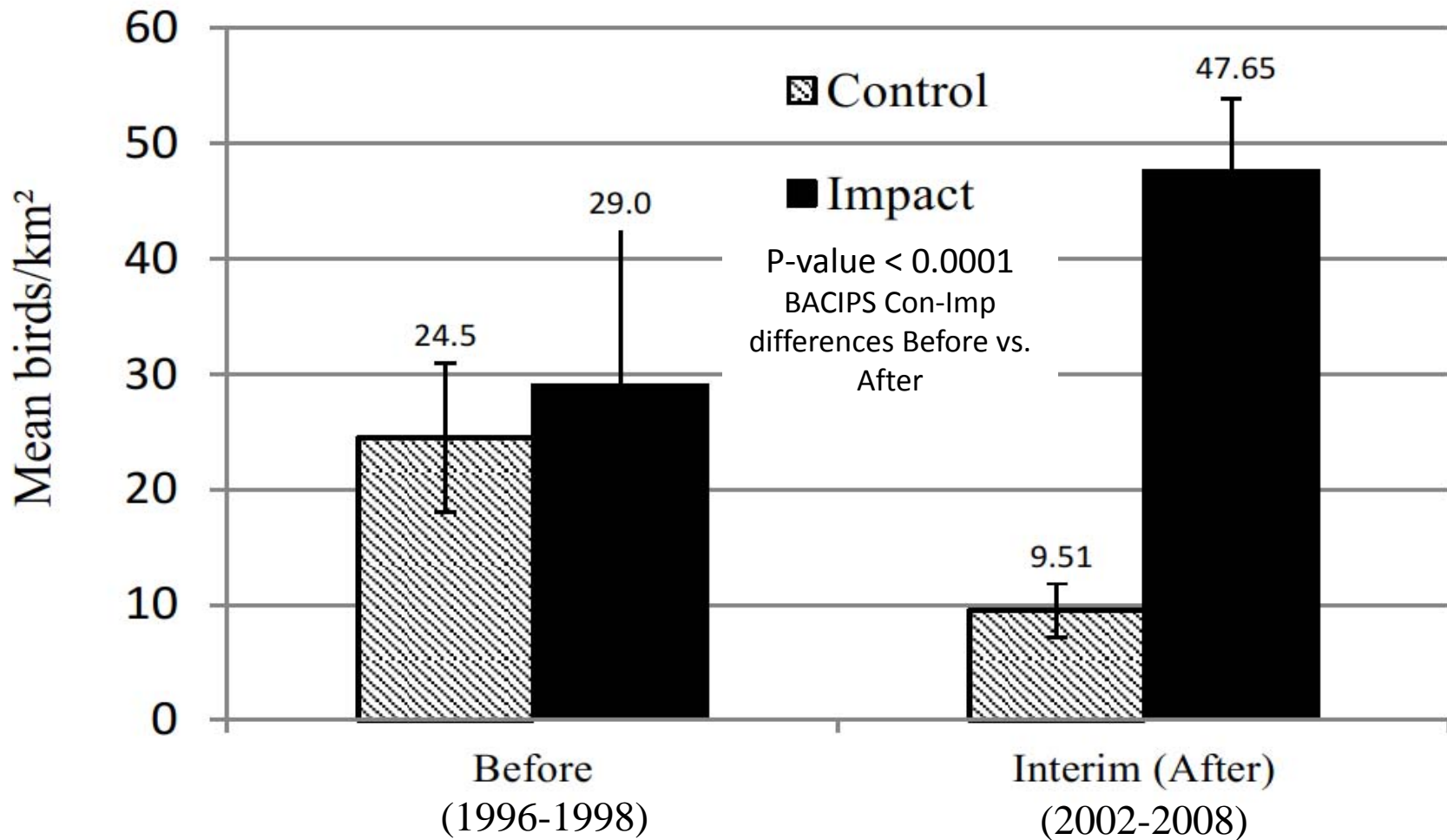
-Loss of wading bird breeding colonies along the floodplain (4 known historical colonies inactive)

AVIAN RESTORATION EXPECTATIONS

Wading bird foraging abundance ≥ 30.6 birds/km²
(Dec-May, 3-year running mean)

Waterfowl abundance ≥ 3.9 ducks/km²; richness ≥ 13
(Nov-Mar, 3-year running mean)

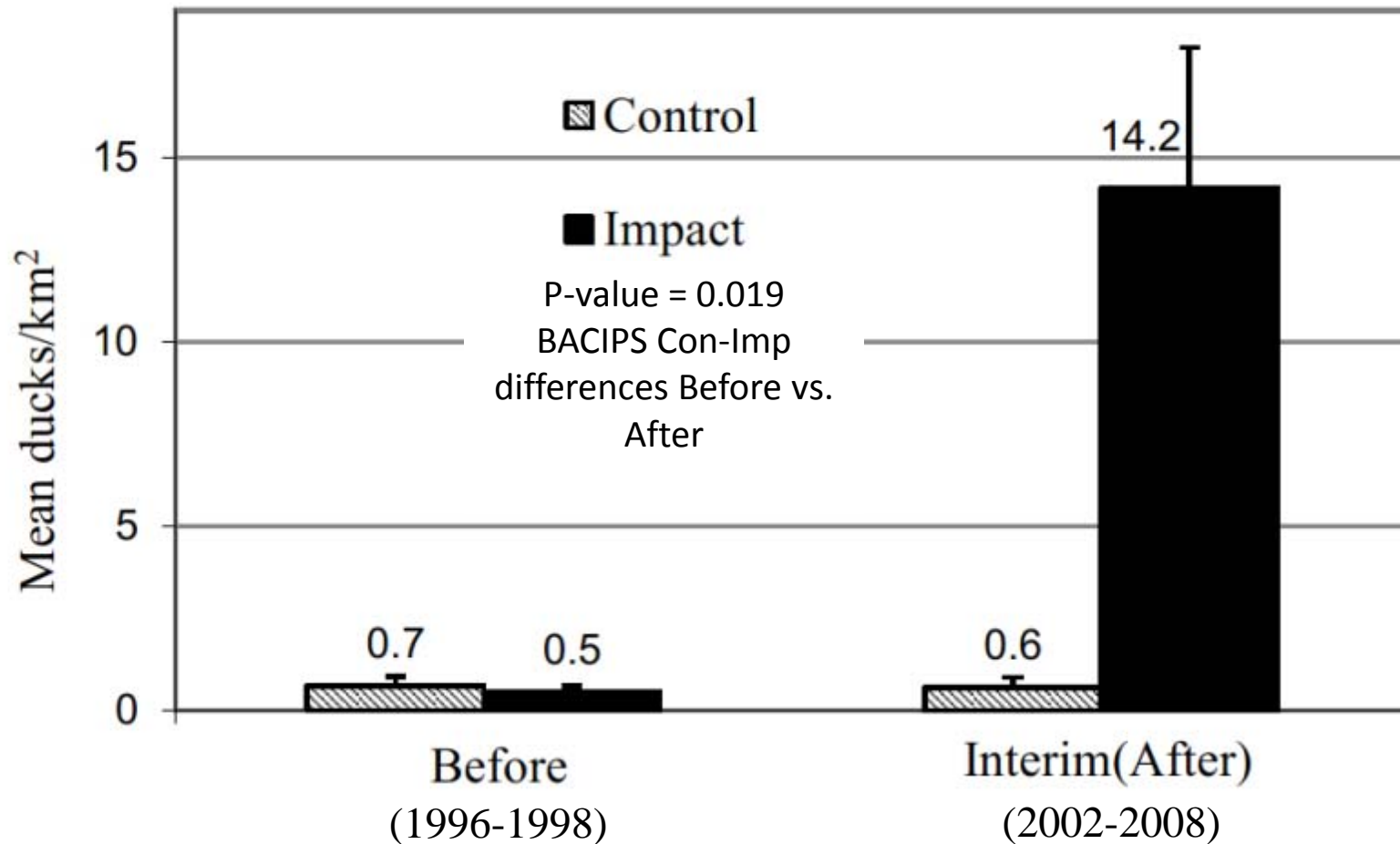
MEAN MONTHLY WADING BIRD FORAGING ABUNDANCE (WET AND DRY SEASONS COMBINED)



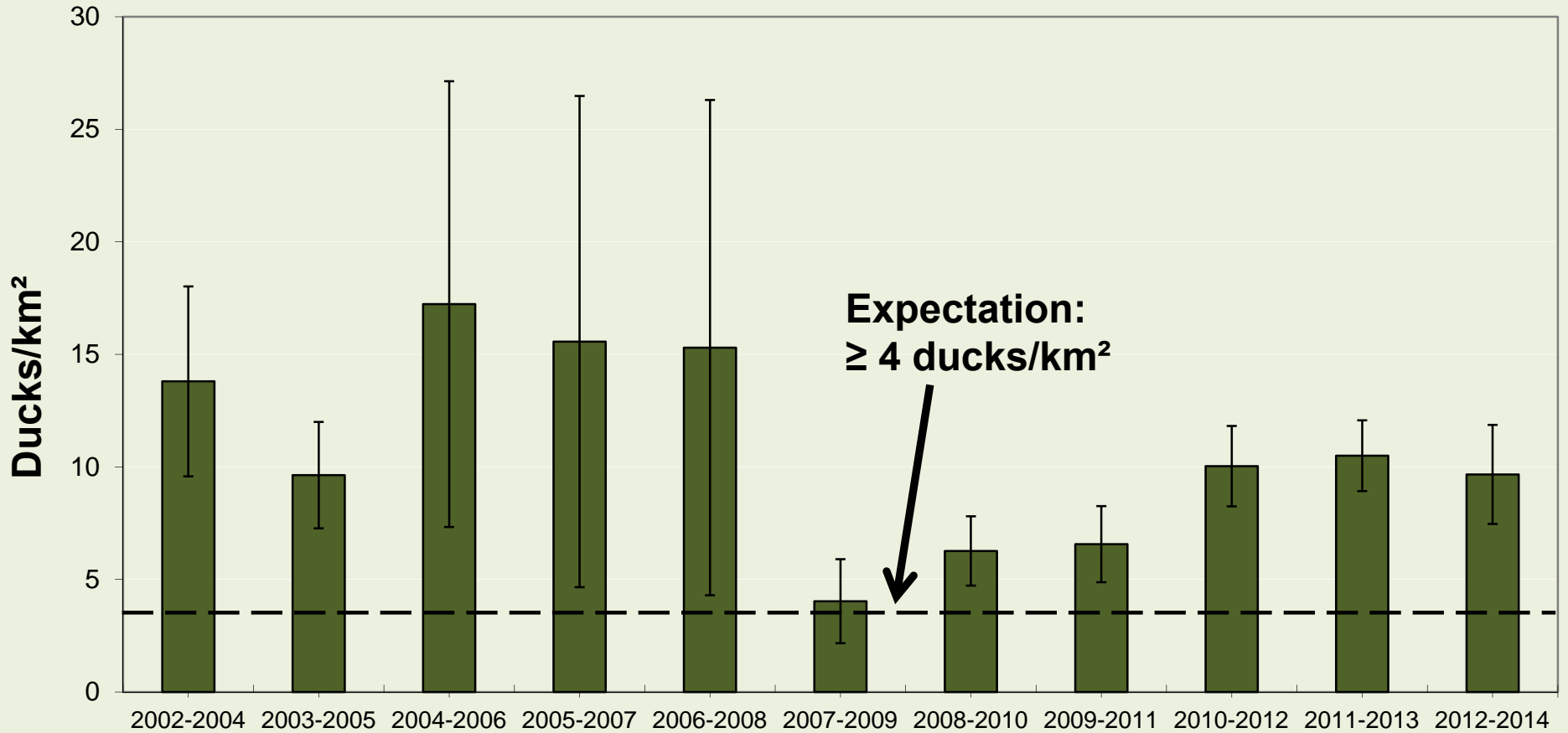
THREE-YEAR RUNNING MEAN RELATIVE TO RESTORATION EXPECTATION (WADING BIRDS)



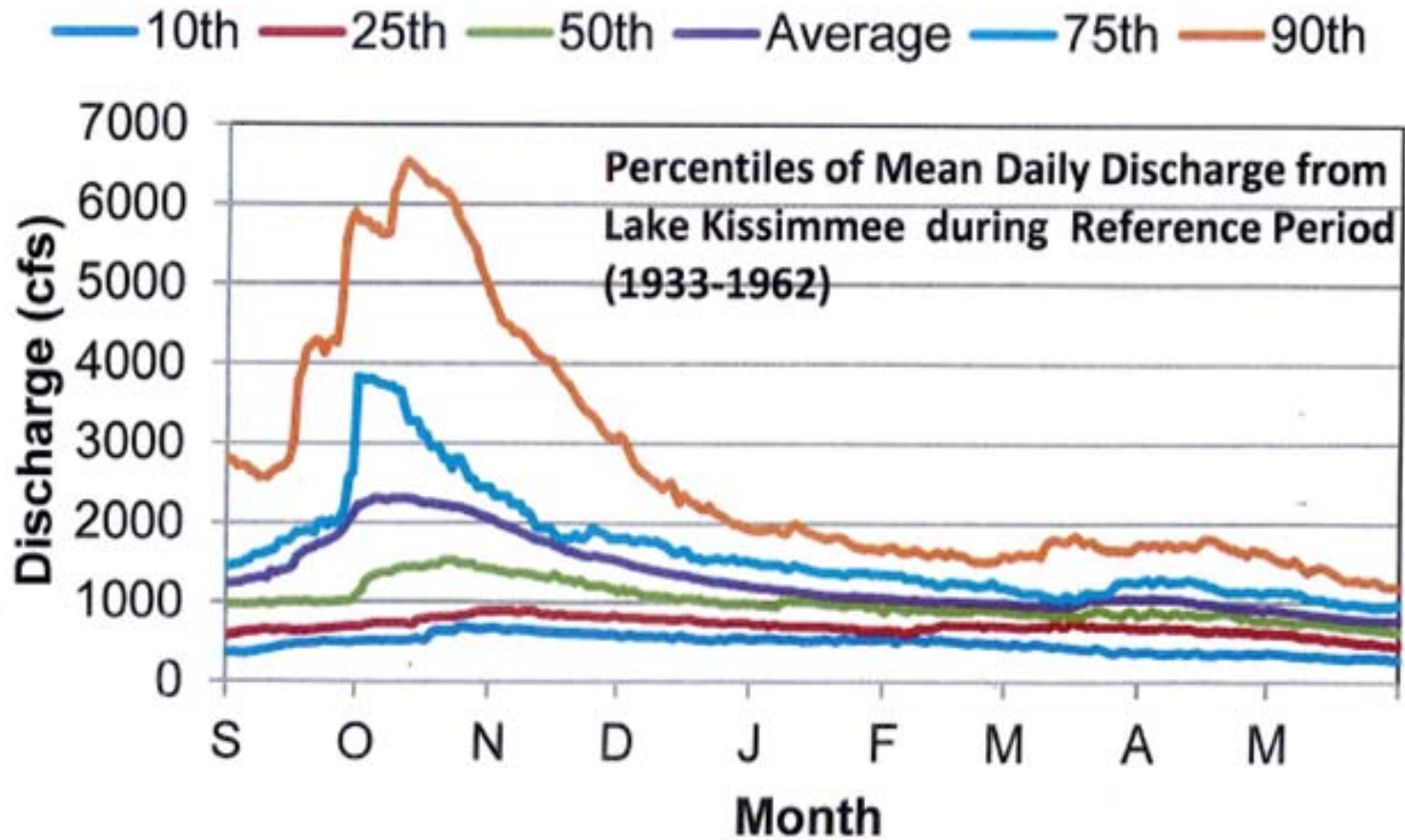
MEAN MONTHLY WATERFOWL ABUNDANCE (NOV-MAR)



THREE-YEAR RUNNING MEAN RELATIVE TO RESTORATION TARGET (WATERFOWL)



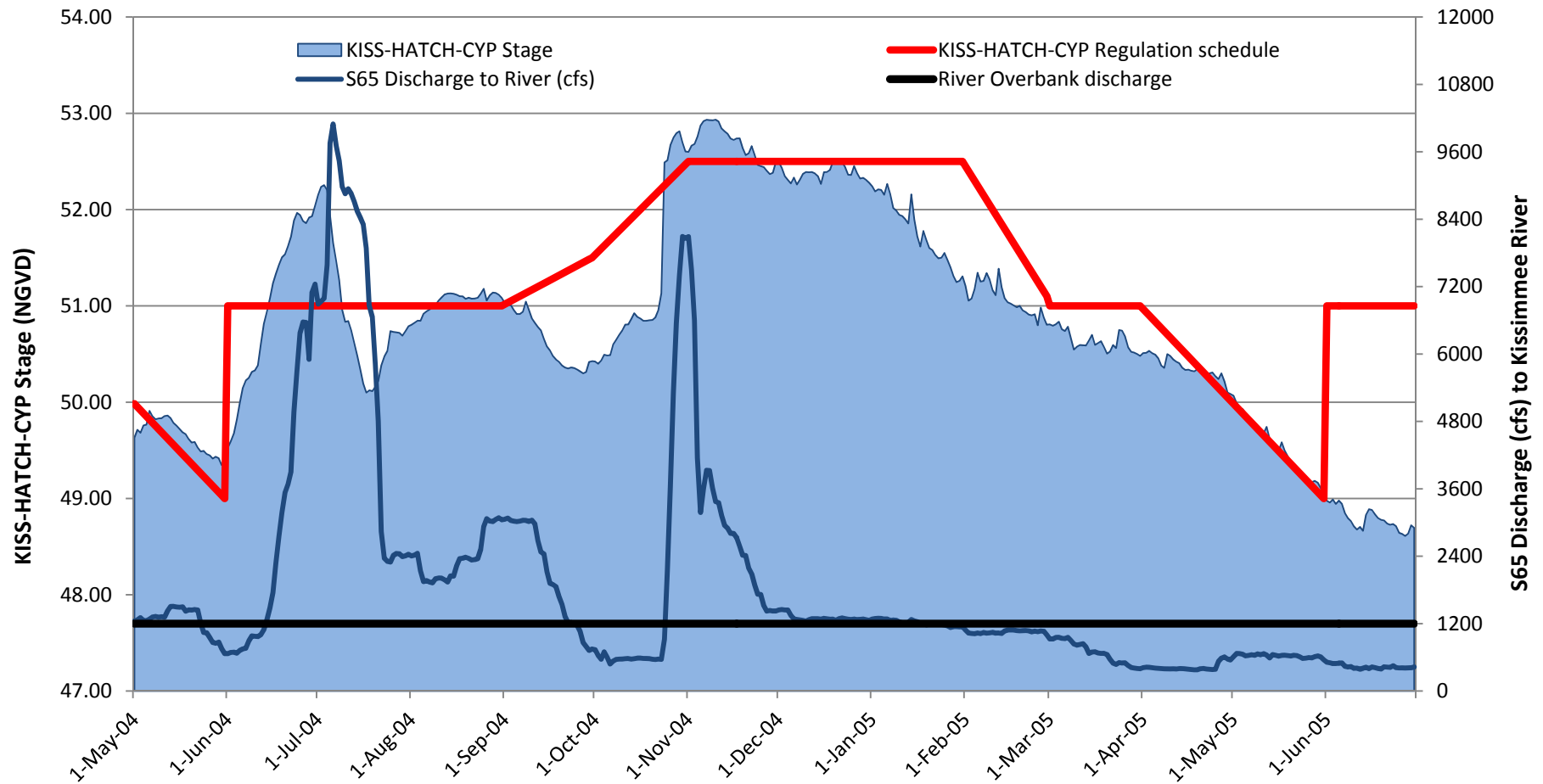
PRE-CHANNELIZATION HYDROGRAPH



KISSIMMEE RIVER RESTORATION PROJECT

HYDROLOGICAL RESTORATION

INTERIM SCHEDULE @ S65



AUGUST 19, 2014
DISCHARGE \approx 2,900 CFS AT S65
FLOODPLAIN \approx 2.1' DEEP

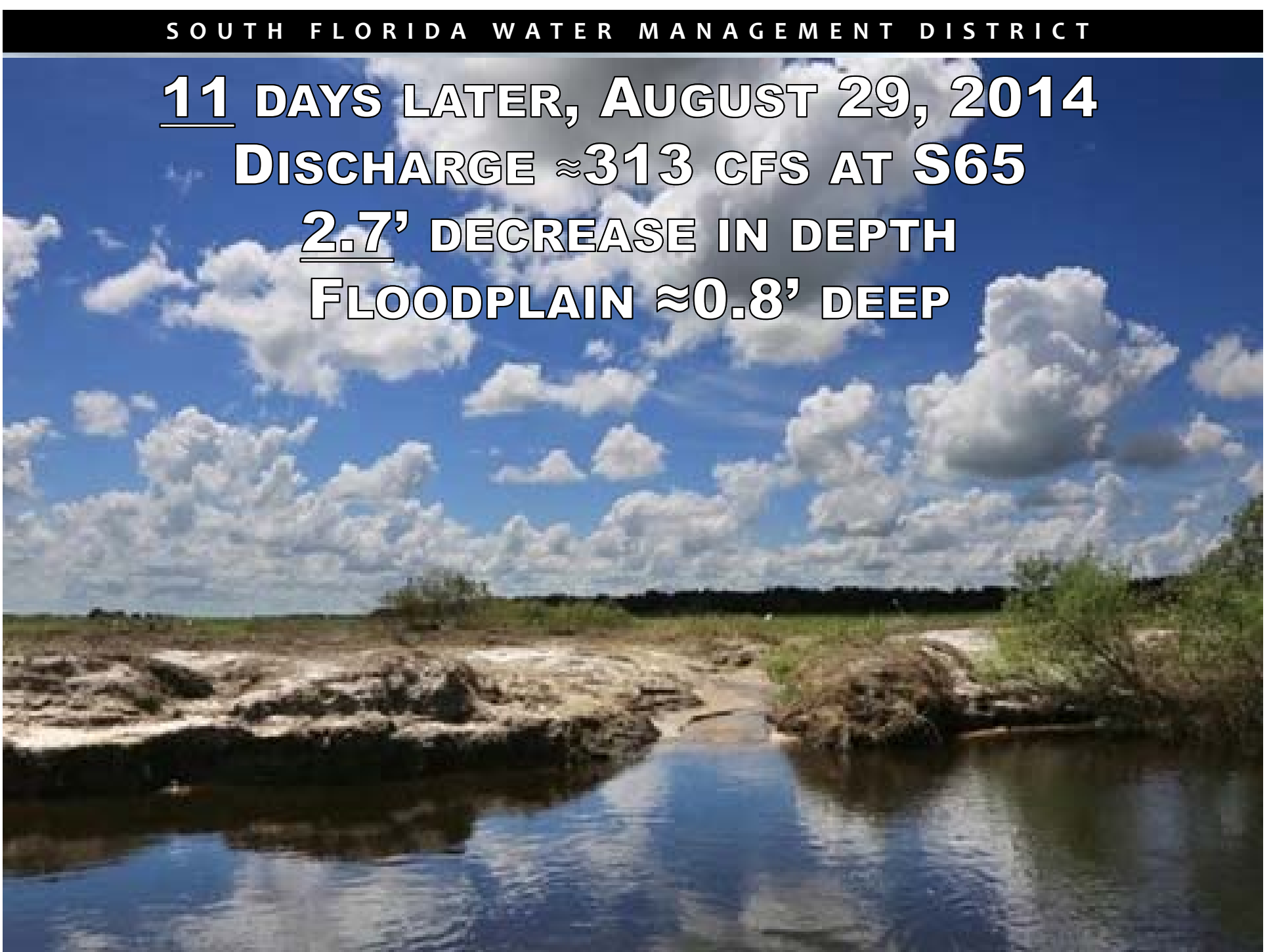


11 DAYS LATER, AUGUST 29, 2014

DISCHARGE \approx 313 CFS AT S65

2.7' DECREASE IN DEPTH

FLOODPLAIN \approx 0.8' DEEP



34 DAYS LATER, OCTOBER 1, 2014
DISCHARGE \approx 6,000 CFS AT S65
4.5' INCREASE IN DEPTH
FLOODPLAIN \approx 3.5' DEEP



14 DAYS LATER, OCTOBER 14, 2014

DISCHARGE \approx 286 CFS AT S65

4.3' DECREASE IN DEPTH

FLOODPLAIN \approx 1.2' DEEP

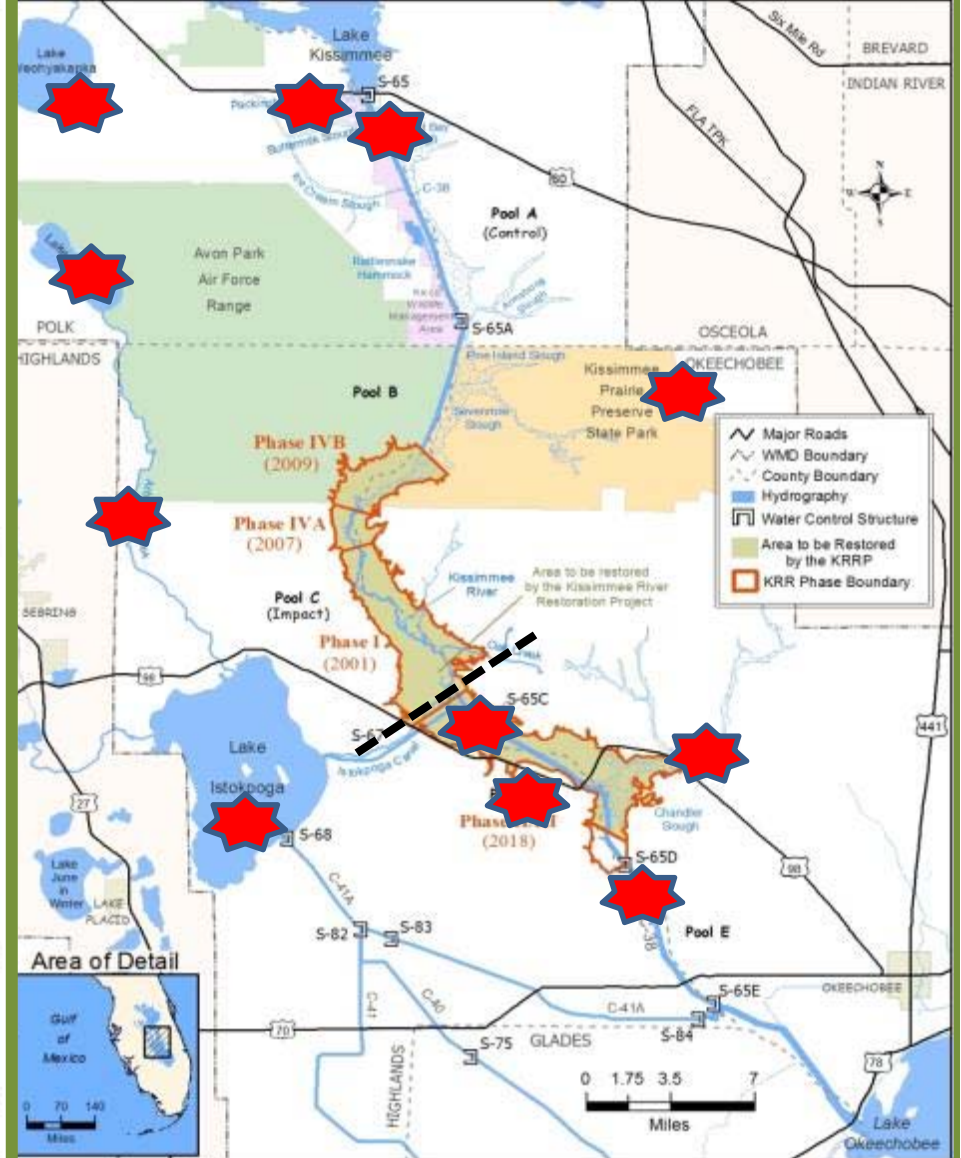
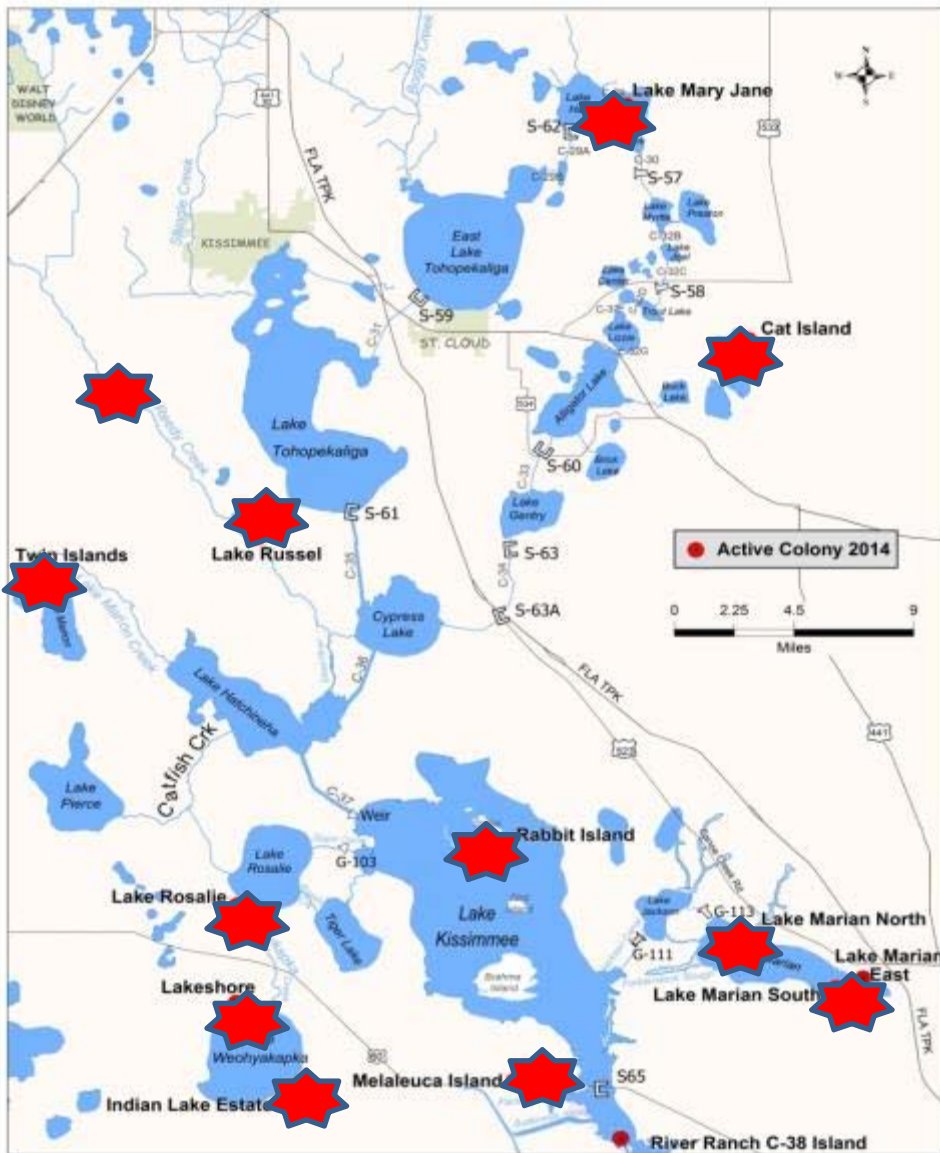


**TEMPORARY “BOOM” FOR WADING BIRD FORAGING, THEN
“BUST” LATER IN DRY SEASON DURING HISTORICAL PEAK OF
BREEDING**



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

NO SIGNIFICANT BREEDING COLONIES WITHIN 3KM OF RESTORED FLOODPLAIN



INTERIM PERIOD (2001-2008) BIRD RESPONSE TO PARTIAL RESTORATION

- Not yet reaching waterfowl species richness restoration expectation of ≥ 13 spp.
- Only blue-winged teal and mottled ducks regularly seen, *not* the other 5 species expected to return



INVASIBILITY INCREASING BECAUSE OF FLASHINESS?

- West Indian marsh grass (*Hymenachne amplexicaulis*)
- para grass (*Urochloa mutica*)
- limpograss (*Hemarthria altissima*)



LONG-TERM AVIAN RESPONSE TO RESTORATION

Positive thus far, but still dependent upon:

- Completion of final Phase II/III
- Implementation of Headwaters Revitalization Schedule
- Adaptive Management of Hydrology (Operations)
- Land Management Practices (Fire and herbicide)
- Habitat conditions on northern breeding grounds, wintering grounds, and connectivity between them
- Site fidelity of many migratory species and breeding wading birds

THANK YOU!

Co-authors 2014:

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James Colee, University of Florida

Stefani Melvin, US Fish and Wildlife Service

Restoration Ecology 22(3): 426-434.

QUESTIONS?