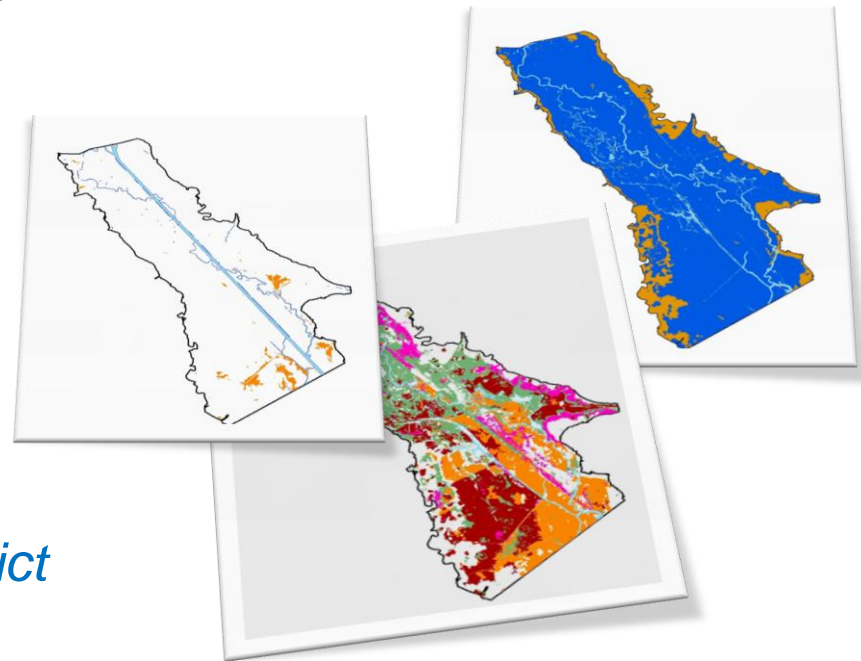


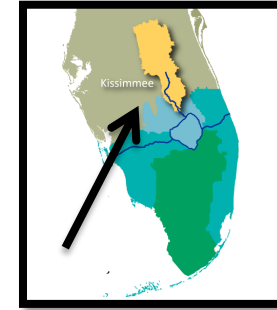
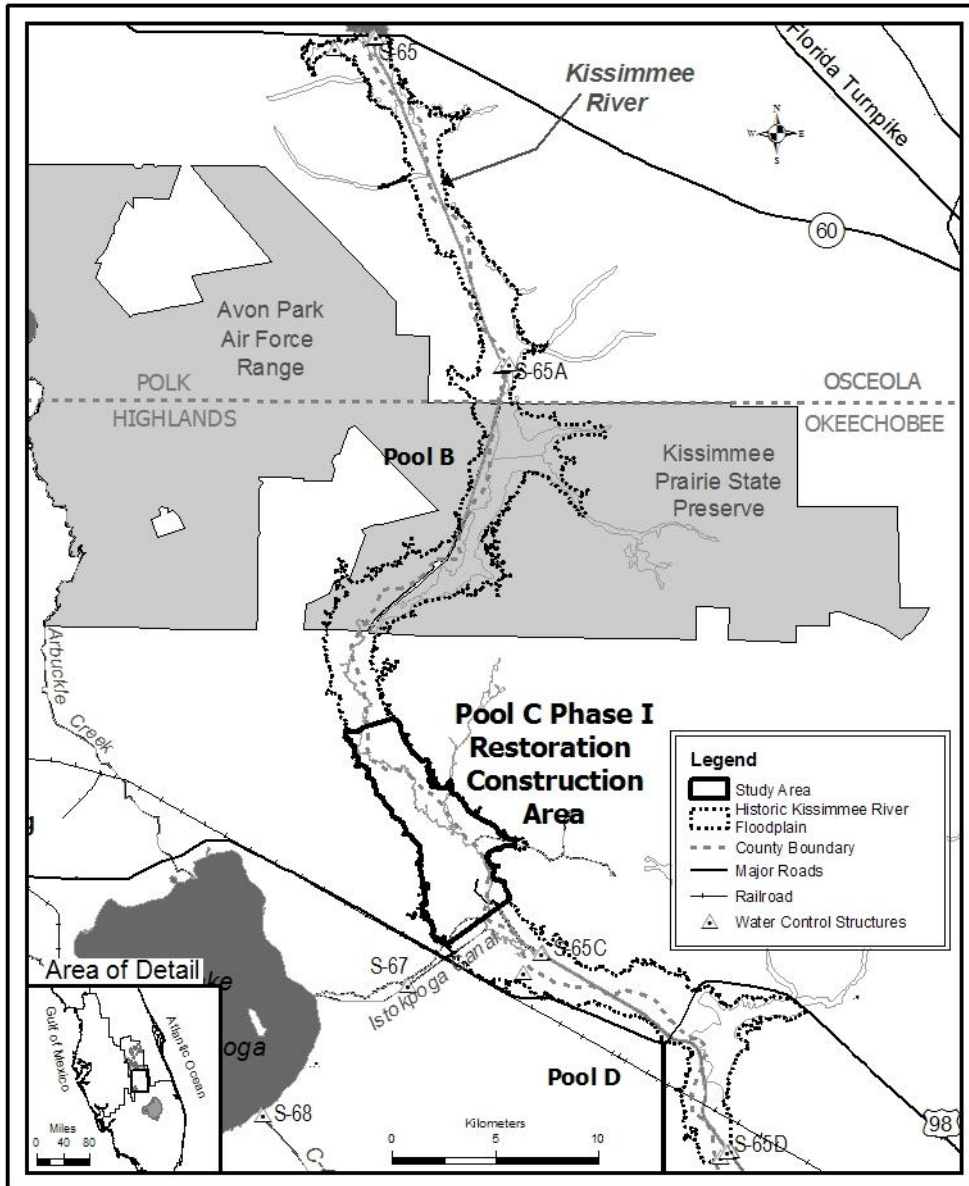
Responses of Floodplain Wetland Vegetation to Kissimmee River Restoration Project PHASE I

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Area of Interest: Kissimmee River

- Location: Central Florida, USA, 50 miles south of Orlando Metro Area
- Land Use: cattle ranching, some orange groves and row crops
- Channelized river divided into five pools, A-E
- Today's presentation will concentrate on the Phase I area

- 
- An aerial photograph showing a wide, meandering river flowing through a vast, flat floodplain. The river's path is highly irregular, with several large loops and turns. The surrounding land is dark and appears to be a mix of vegetation and open fields. The sky is a pale, hazy grey, suggesting an overcast day or a misty atmosphere. The overall scene conveys a sense of a slow-moving, undisturbed natural waterway.
- Blackwater slow-moving river
 - Meandered through 1 – 2 mile-wide floodplain
 - Flat topography (30 ft/50 miles)
 - Inundated over 300 days/yr
 - Highly productive and diverse ecology



**B. & B. CASH
GROCERY STORE**

SODAS
AGENCY
Nunnally's
THE CANDY OF THE SOUTH

B&B CASH GROCERY

SODAS

CIGARS

CIGARS

ICE CREAM



Canal C-38 dredging:
1962-1971

C-38 Characteristics:

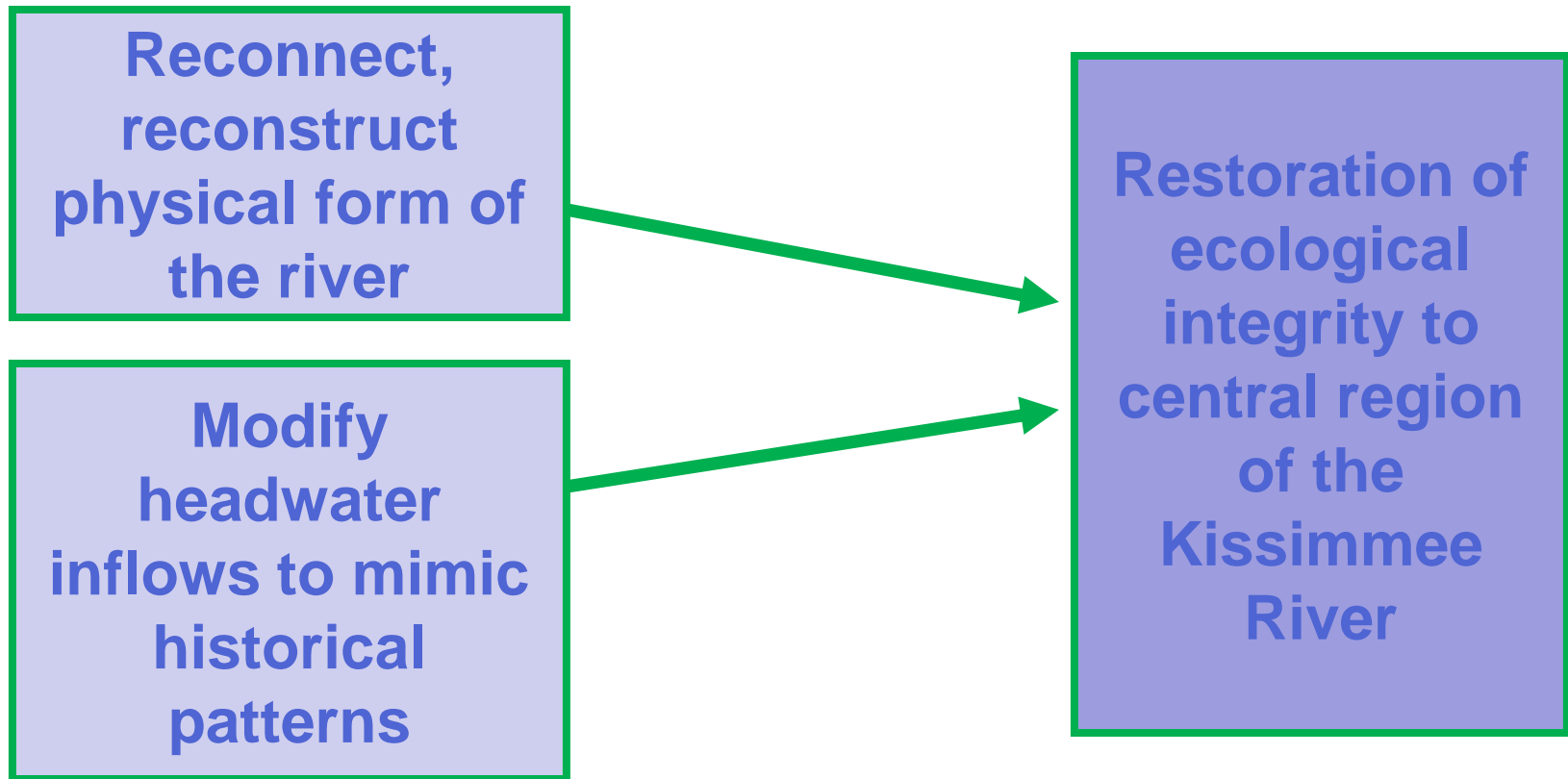
- 50-100 m wide
- 10 m deep
- 6 water control structures
- 5 flat water pools
- Drained thousands of hectares of wetlands
- Fish and wildlife diversity plummeted



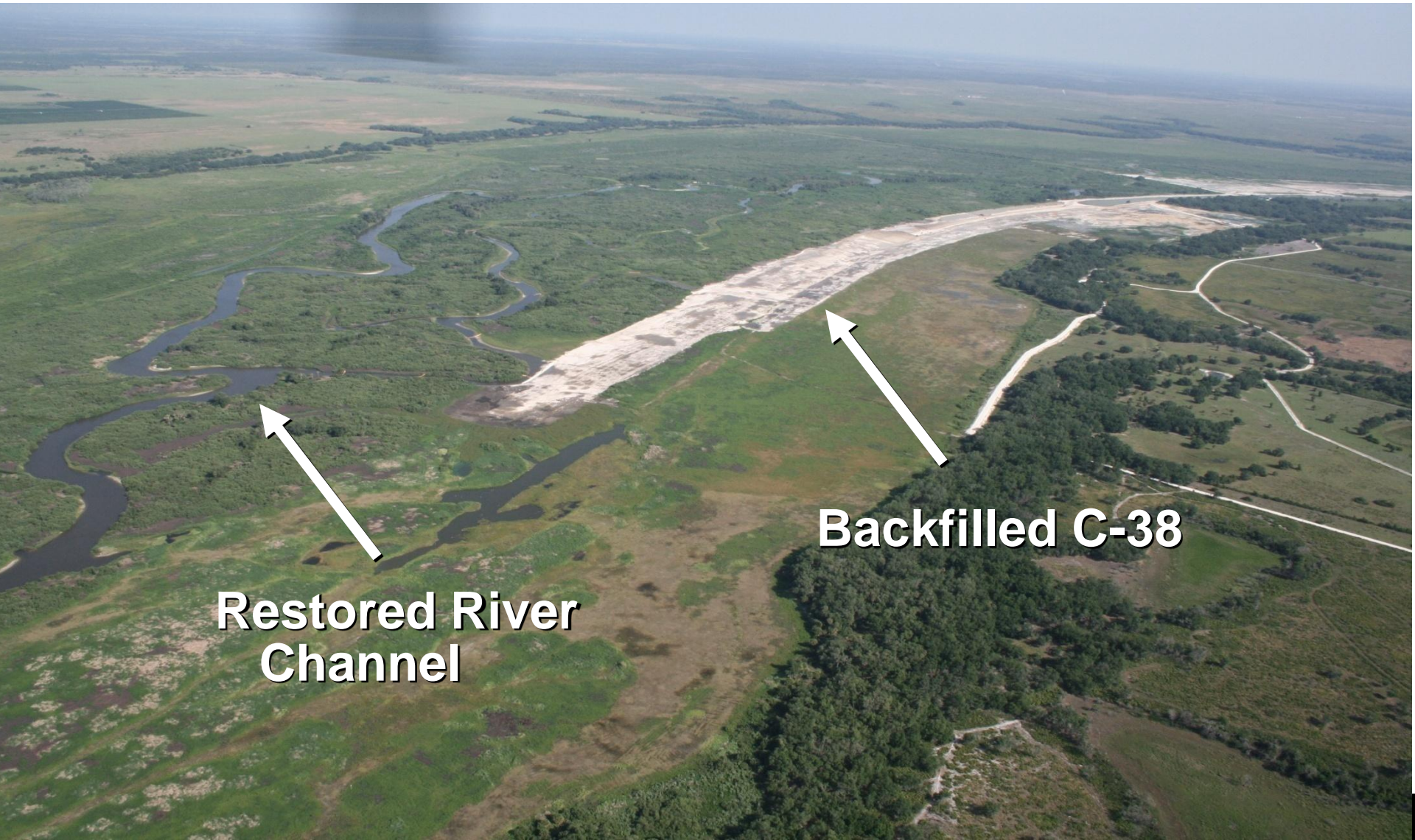
Kissimmee River Restoration:

- Construction initiated: 1999
- 3 of 5 phases now complete
- Backfilled 21 km canal
- Reconnected 40 km of river channel
- Construction Complete: ~ 2014
- Evaluation Complete: ~ 2020

Approach for the Kissimmee River Restoration Project



Reconstruct the Physical Form



**Restored River
Channel**

Backfilled C-38

Operate the System to Mimic Natural Flow and Stage Patterns



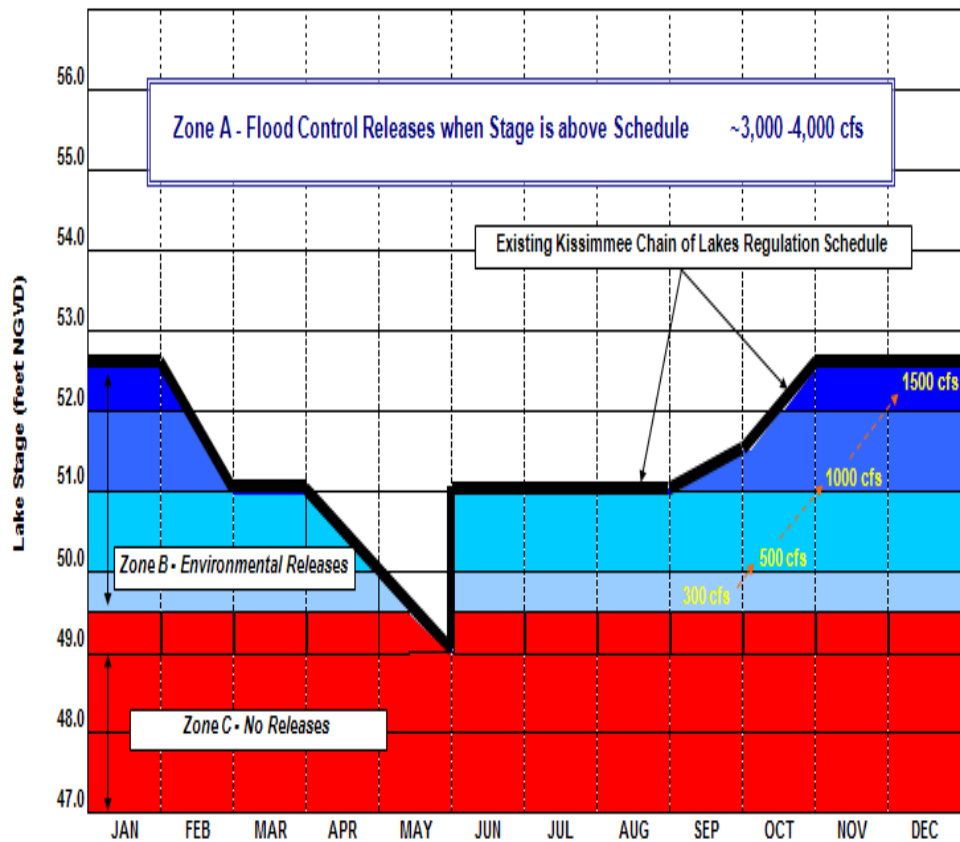
Changes to Operations

- “Interim Management” –
in effect since Phase I complete in 2001
- System is operated under an interim schedule to mimic natural system **as much as possible**
 - Flood pulses in correct seasons
 - Constant water flow
- However, incomplete construction of remaining project features, interim flood control requirements, and certain other perturbations mean that the current system cannot deliver inflows as expected
- Headwaters Revitalization Project
 - Increase storage capacity upstream of the river
 - Alter management to take advantage of added storage

Operations Schedules

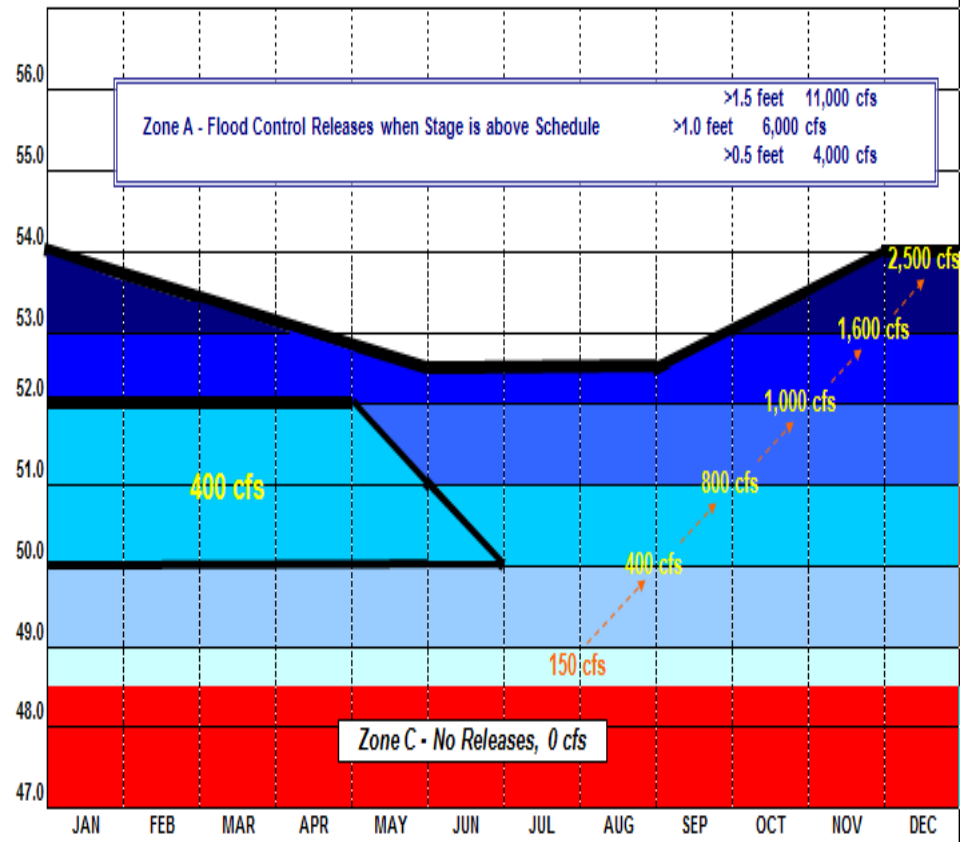
Interim Schedule

Interim Operational Schedule for the Upper Kissimmee Basin Chain of Lakes @ October 2000
(Lakes Kissimmee-Hatchineha-Cypress-Tiger controlled by S-65)



Final Headwaters Schedule

Revised Regulation and Operational Schedule for the Upper Kissimmee Basin Chain of Lakes
(Lakes Kissimmee-Hatchineha-Cypress-Tiger controlled by S-65)



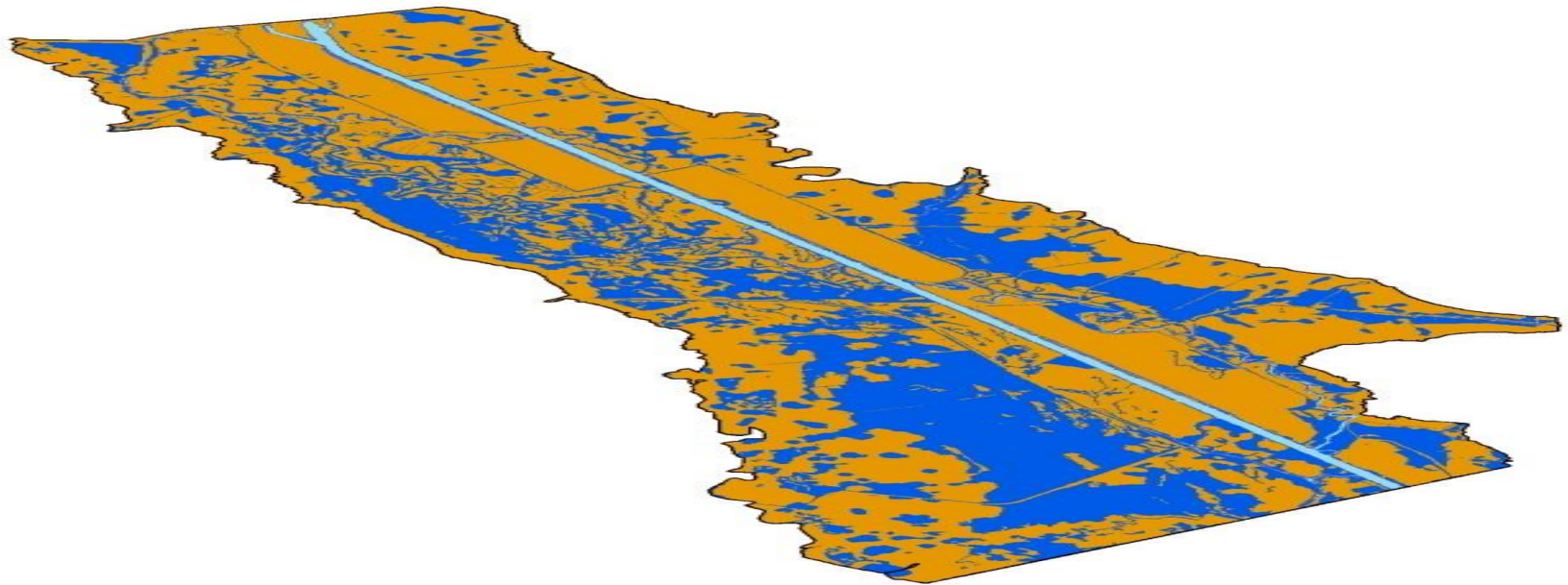
Kissimmee Vegetation Restoration Expectations

1. Wetland plant communities will cover >80% of the area of the restored floodplain
2. Broadleaf Marsh will cover at least 50% of the restored floodplain
3. Wet Prairie communities will cover at least 17% of the restored floodplain

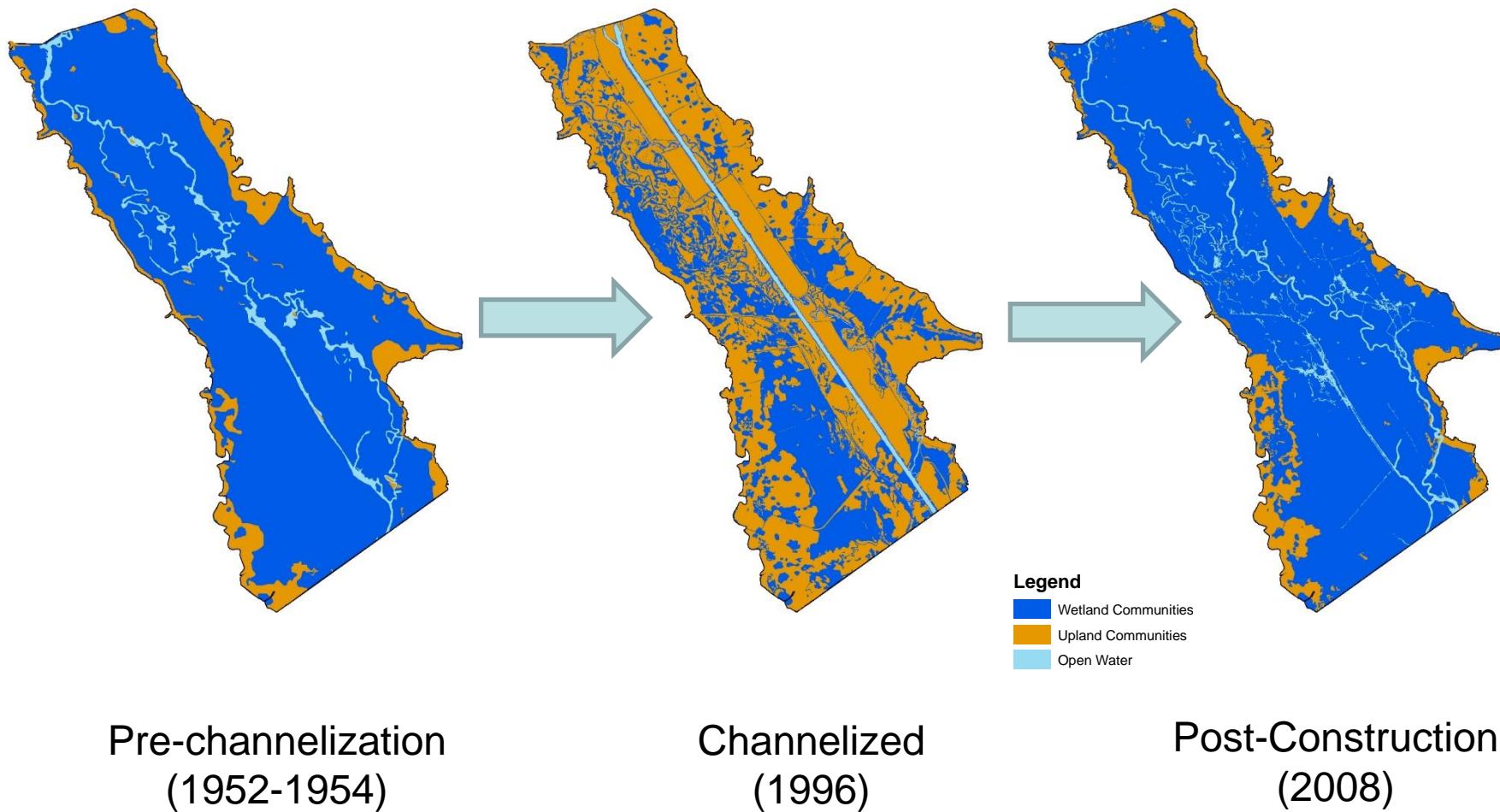
Vegetation Mapping Methods

- For today's presentation, I will be using three vegetation maps representing different periods in the history of the Kissimmee River:
 - 1954 (Pre-channelization)
 - 1996 (Channelization + 25 years)
 - 2008 (Phase I Construction + 7 years)
- All vegetation maps are based on high-resolution aerial imagery taken during the target time period.

Result 1: Overall Wetland Community Trajectory (Expectation 1)



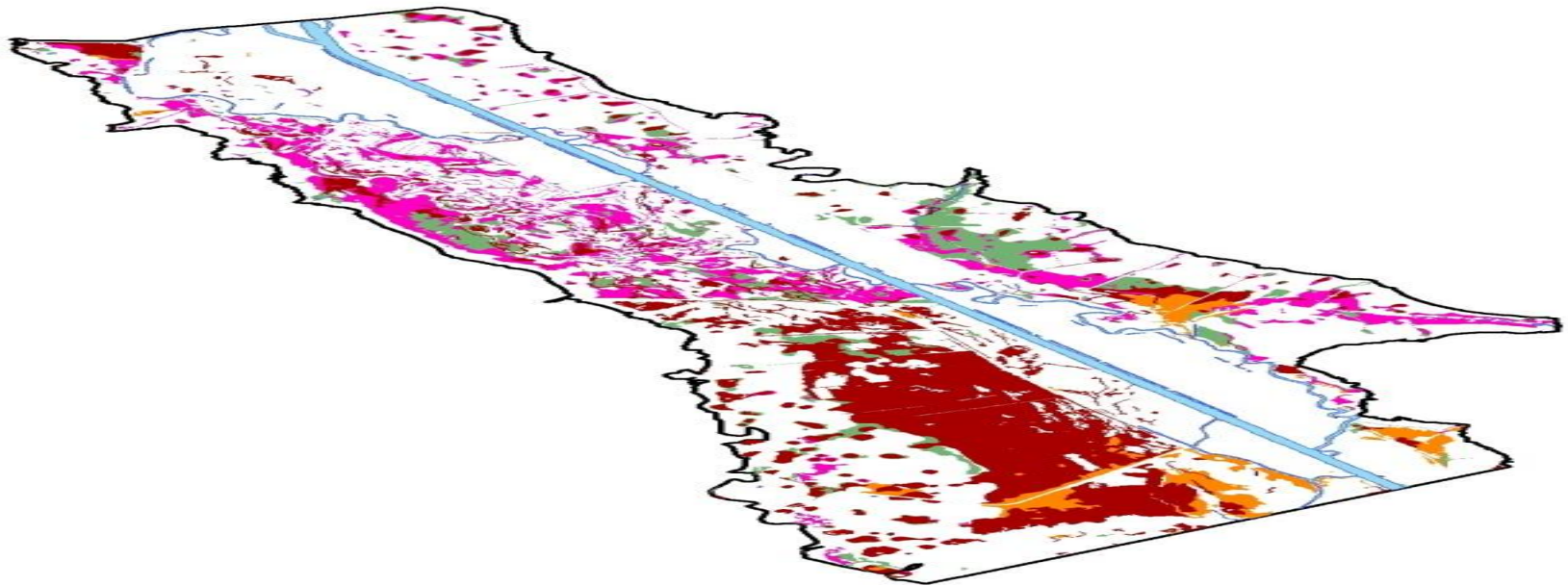
Community Status Over Time: Wetland vs. Upland



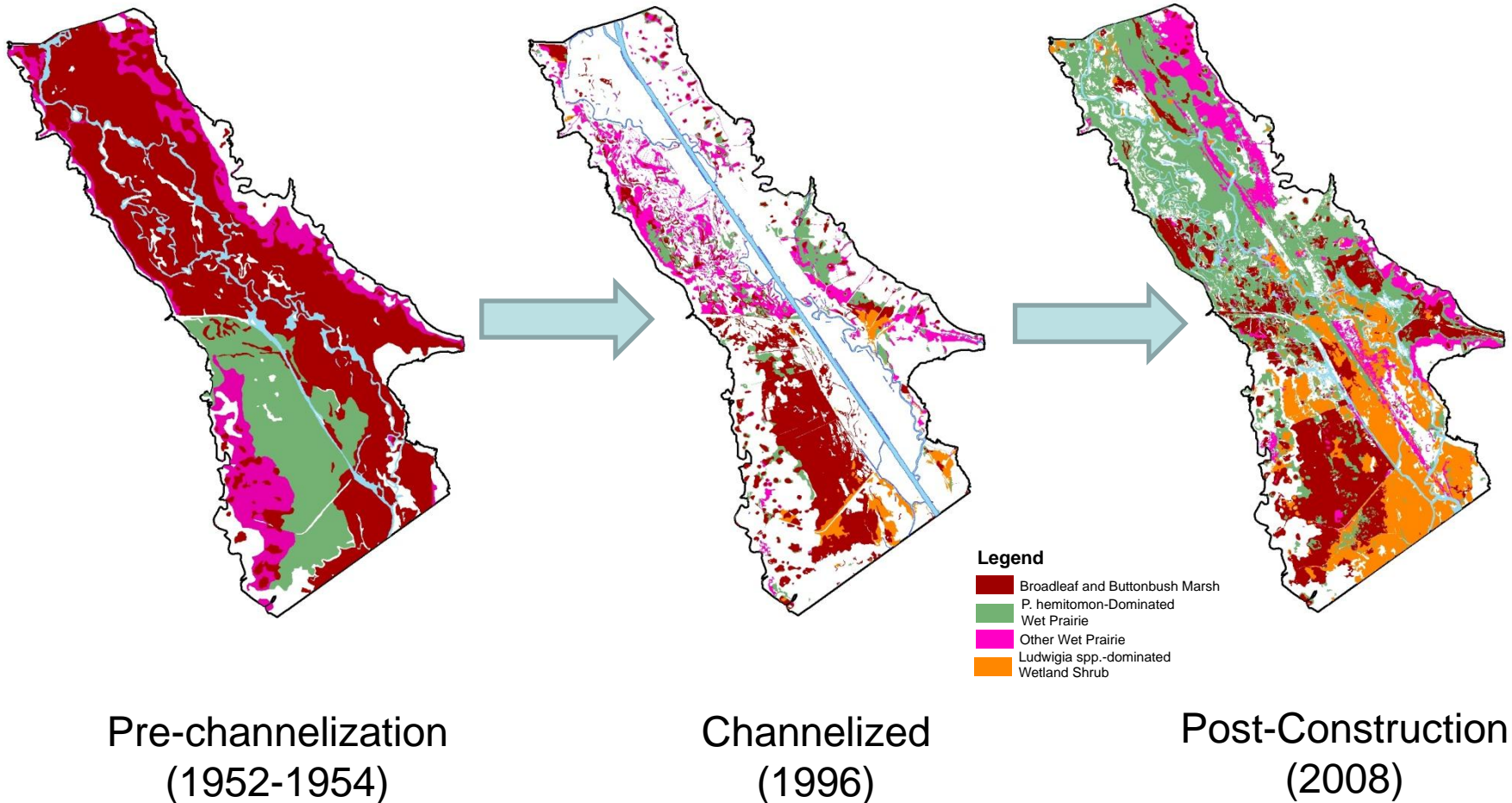
Expected Wetland Community Coverage Met

- 82% of reconstructed Phase I floodplain is now wetland plants, almost exactly as much as before channelization
- Interim hydrologic conditions have been sufficient for conversion from predominantly upland to predominantly wetland vegetation community

Result 2: Wetland Community Relative Abundances (Expectations 2 & 3)



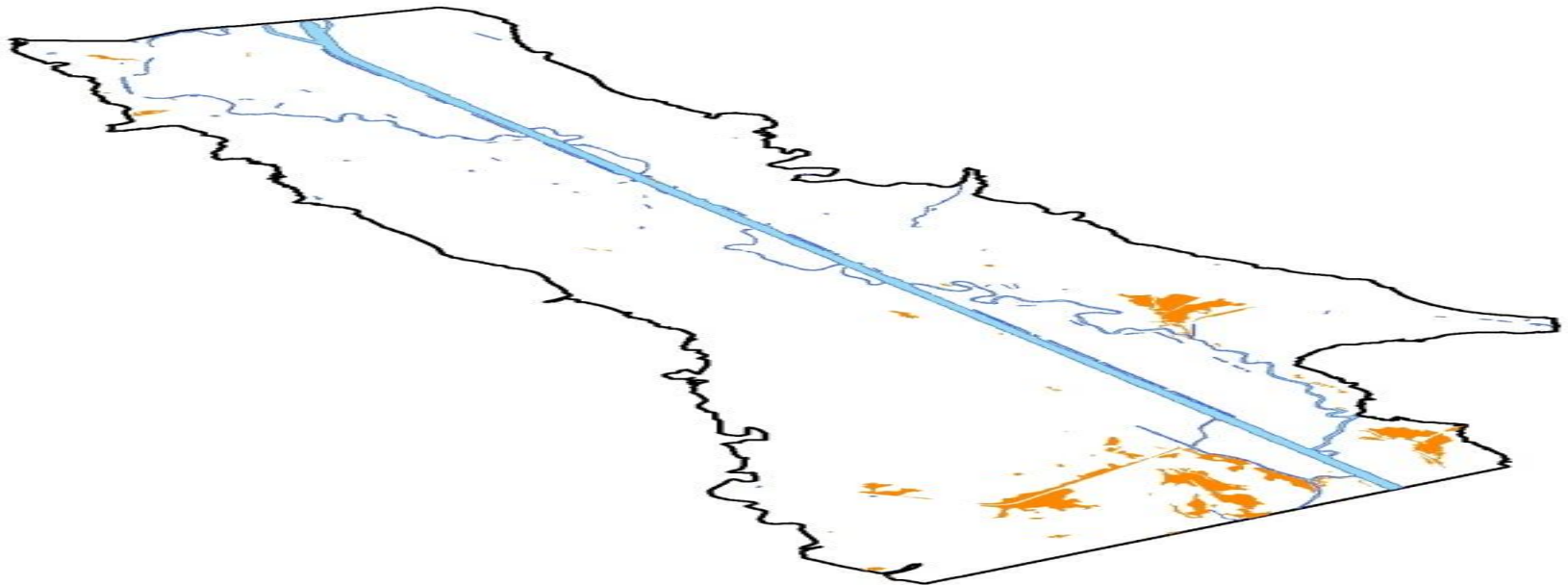
Community Status Over Time: Relative Abundances of Wetland Community Types



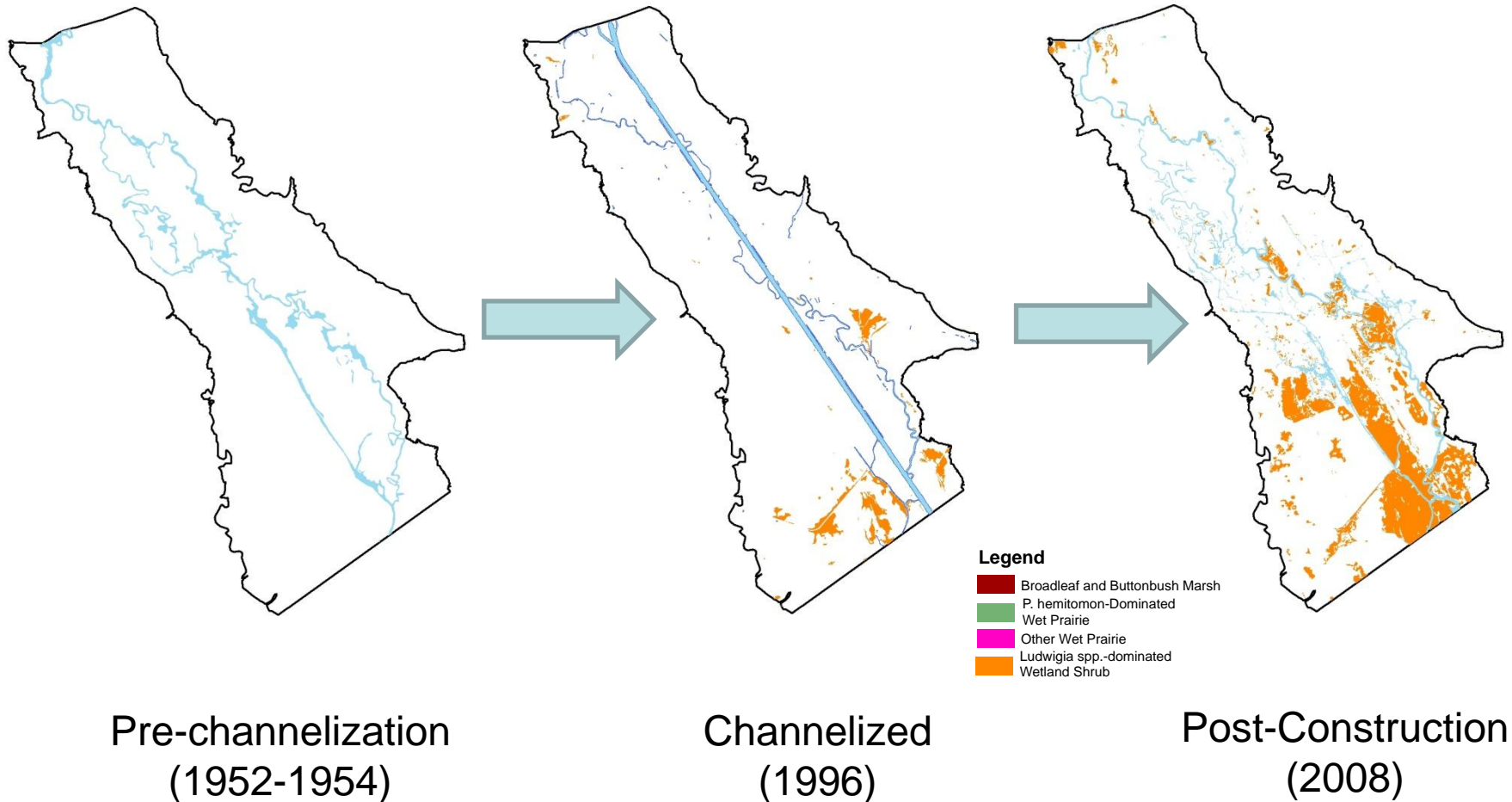
More Wet Prairie than Expected

- Expectations 2 and 3 not met
- Higher relative abundance of maidencane (*Panicum hemitomon*) community than expected
- Good News #1: BLM appears to be increasing over time
- Good News #2: Maidencane at “wet” end of wet prairie continuum and occurs as constituent of broadleaf marsh
- Hypothesis: hydrologic change not yet sufficient for BLM to predominate floodplain
- Note that further changes in hydrology will come from implementation of Headwaters Revitalization

Result 3: Invasive Wetland Shrub Increasing (Not expected!)



Community Status Over Time: Increased Invasive Shrub Community Type



More Invasive Shrub than Expected

- Peruvian primrose willow (*Ludwigia peruviana*) tends to invade areas with stable water levels
- Southern end of restoration area has had stable water levels for a number of years because of water control structure and levees
- When water control structure is gone, we expect a change in the status of *Ludwigia* in this area
- We are also testing the efficacy of herbicide spraying on limiting primrose willow expansion

Conclusions

- The restoration program has been successful in restoring wetlands to the Kissimmee floodplain
- However, short hydroperiod types are more prevalent than expected
 - Suggests that the interim hydrologic regime is not sufficient to see the expected change in vegetation classes
- Invasive shrubs are increasing in frequency
 - This condition may alter with continuing hydrologic changes, but this warrants continued vegetation management response
- Restoration of the physical river form is not enough without modifying inflows from the headwaters
- Full benefits of the restoration will not be realized until we apply the appropriate hydrologic conditions

THANK YOU

**Responses of Floodplain Wetland
Vegetation to Kissimmee River
Restoration Project**

PHASE I

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