Revisiting Ecological Integrity on the Kissimmee River

"Are we there yet?"

Erik Powers, EPJV
Cathy Byrd, USACE

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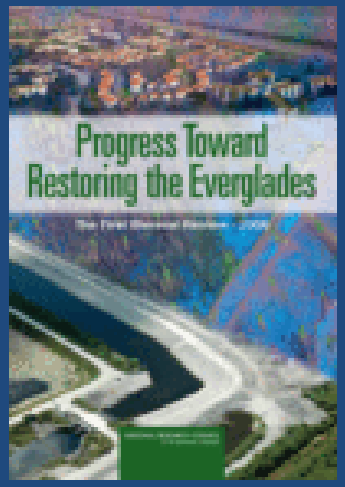
"Our unparalleled efforts to restore and protect the Kissimmee River are providing environmental benefits downstream to Lake Okeechobee and America's Everglades.“ –Governor Bush (2004)

“The Kissimmee River Restoration Project has shown demonstrable improvement and benefits to the natural system of the restored portions of the formerly channelized river” – 2006 CISRERP Report



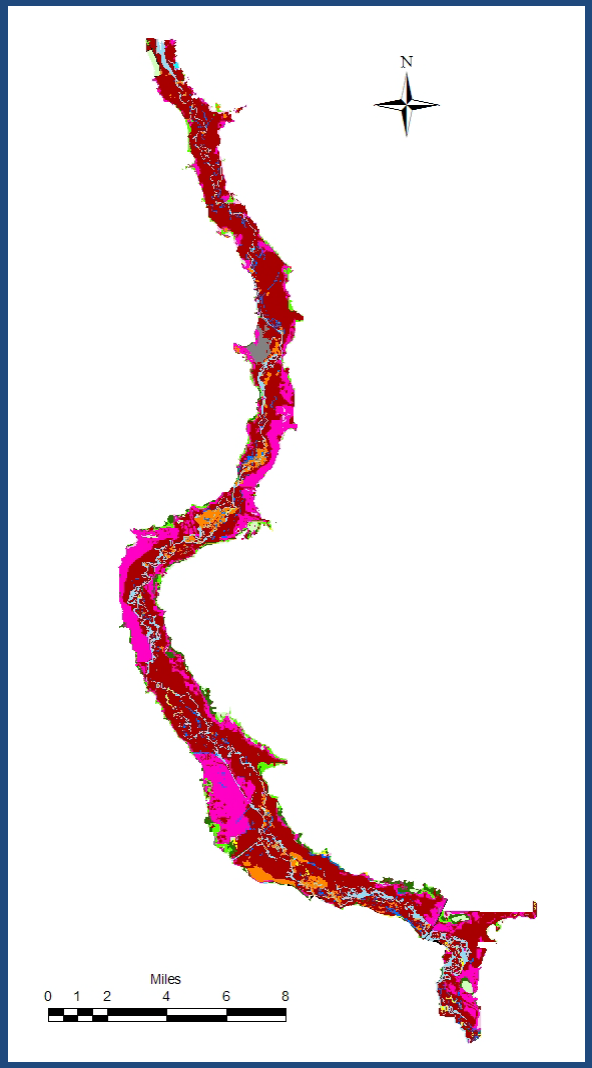
“This restoration is so exciting: The river is actually recovering” – Clarence Tears, SFWMD (2009)

Ecological Integrity

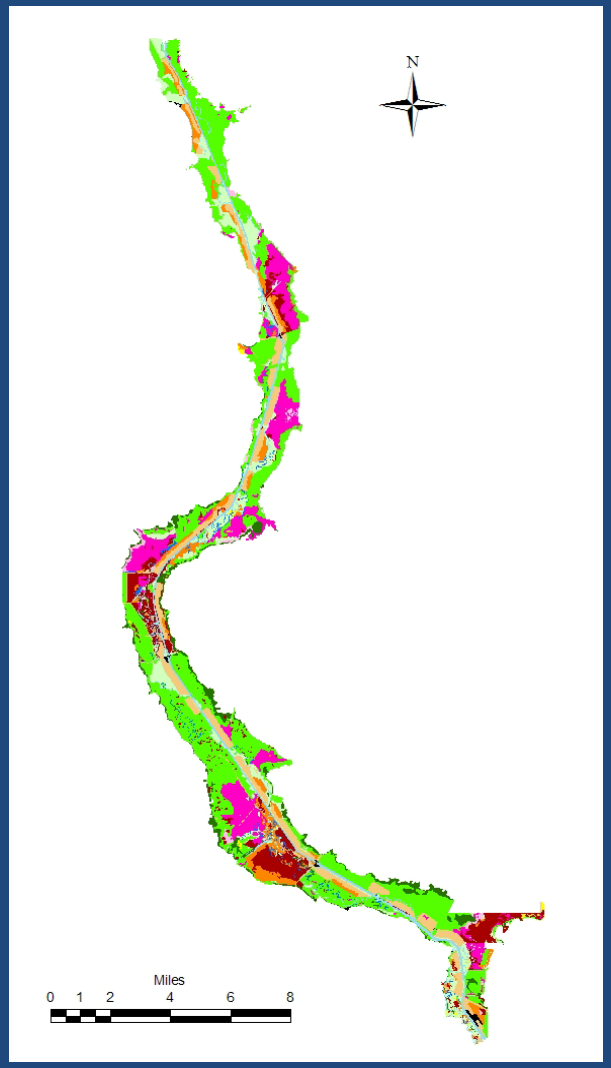
- “reestablishment of a river/floodplain ecosystem that is capable of supporting and maintaining a balanced, integrated, adaptive community of organisms having a species composition, diversity and functional organization comparable to that of the natural habitat of the region” (Karr and Dudley, 1981)
- Ecologically-based performance measures as planning criteria
- A plan that did not meet any one criterion was insufficient.

Expectations achieved	Expectations not yet achieved		Unassessed Expectations
River bed deposits	Continuous river channel flow	River channel plant community structure	Aquatic invertebrate community structure in broadleaf marsh
Sandbar formation	Variability of flow	Areal coverage of floodplain wetlands	Macroinvertebrate drift composition
Turbidity	Stage hydrograph	Areal coverage of broadleaf marsh	Floodplain reptiles and amphibians
Width of littoral vegetation beds	Stage recession rate	Areal coverage of wet prairie	Floodplain amphibian reproduction and development
Snag invertebrate community structure	Flow velocity	Benthic invertebrate community structure	Small fishes in floodplain marshes
Wading bird density	Dissolved Oxygen	River channel fish community structure	Floodplain fish community composition
		Waterfowl	

Floodplain Vegetation

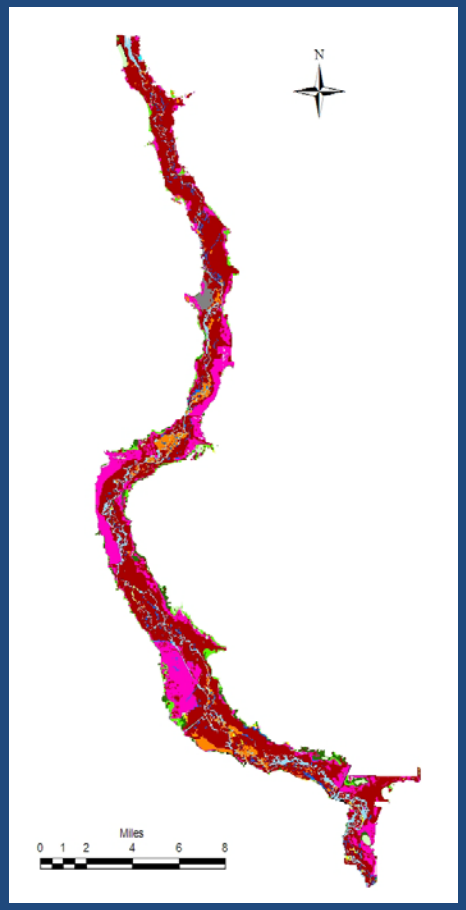


1950



1970

Floodplain Vegetation



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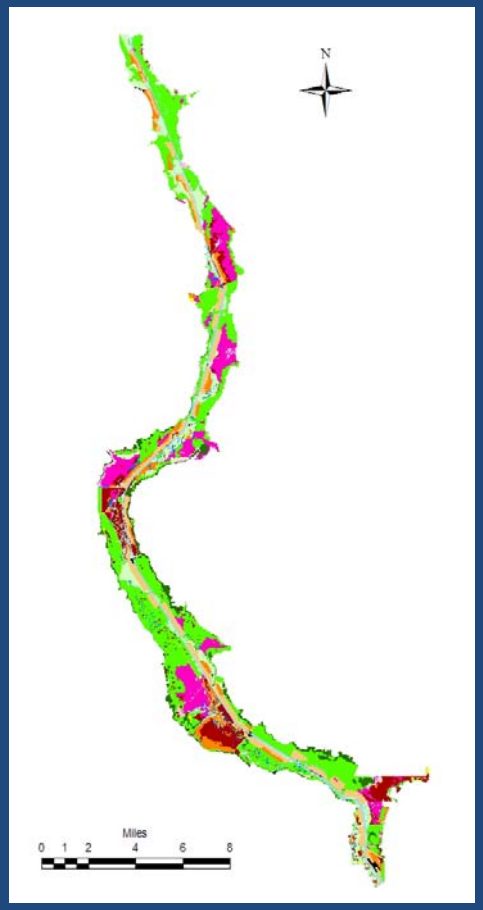

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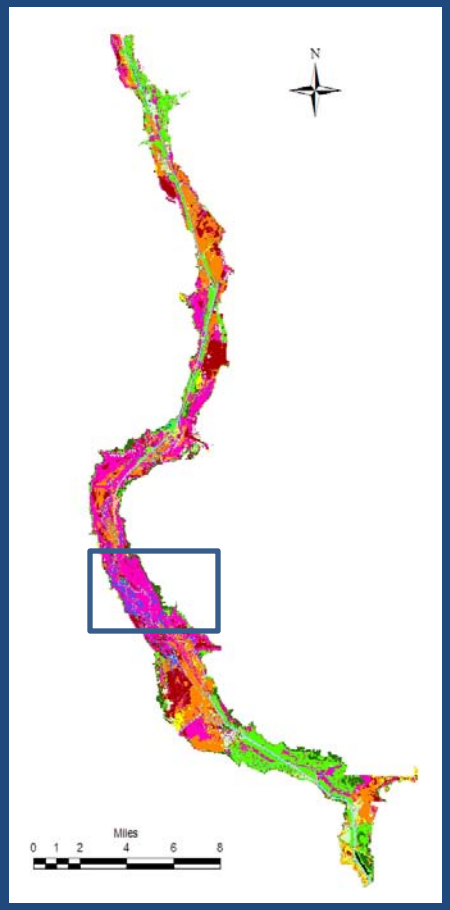
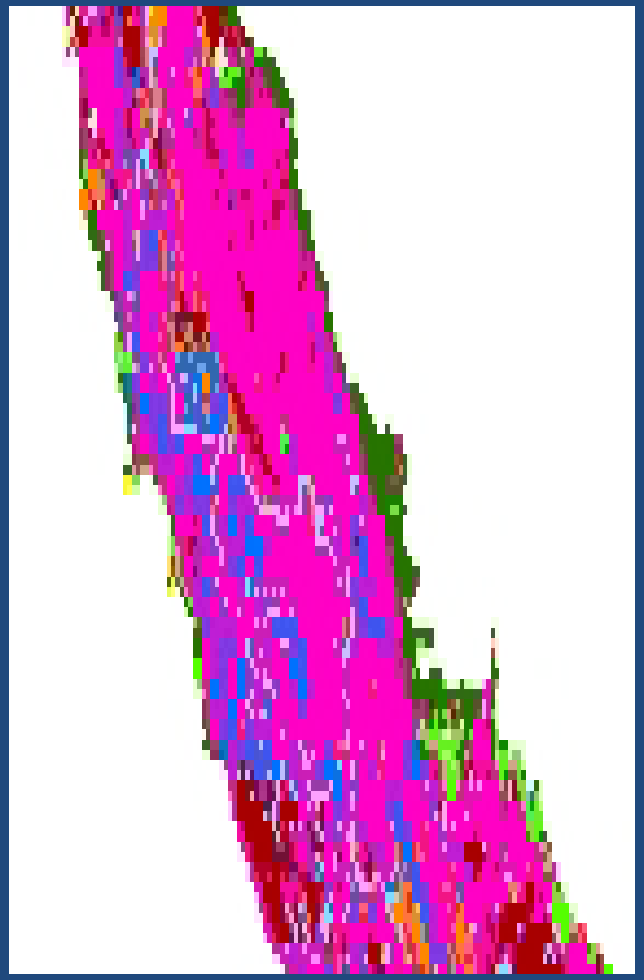


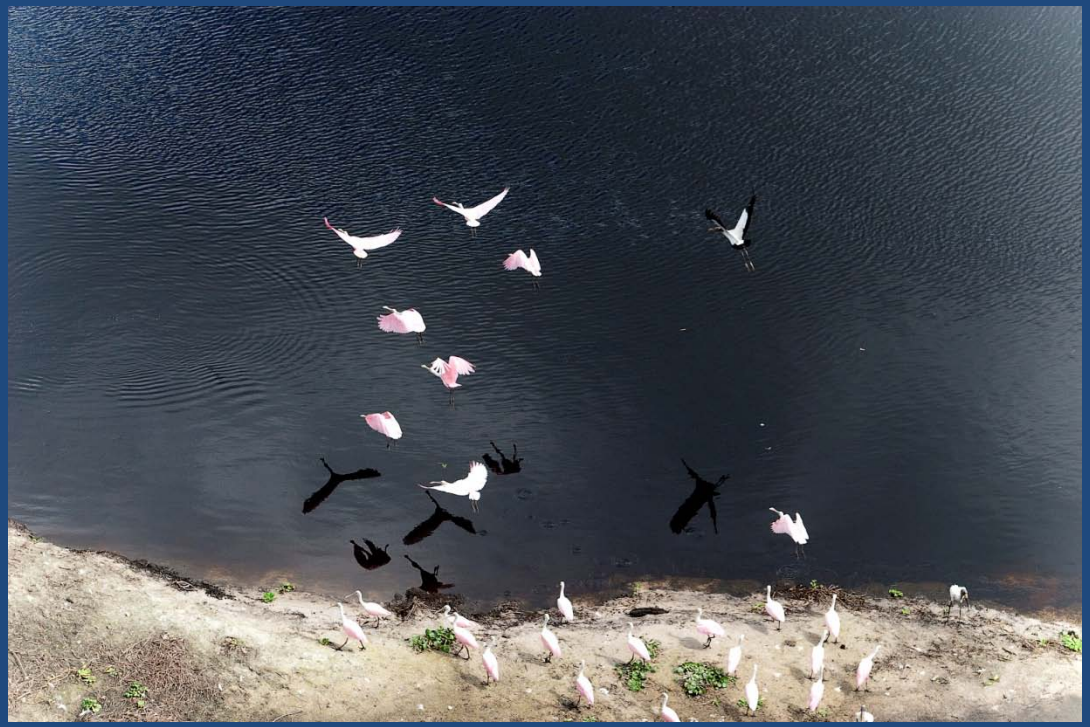
2008

Reach 1 (Channel Restored in 2001)



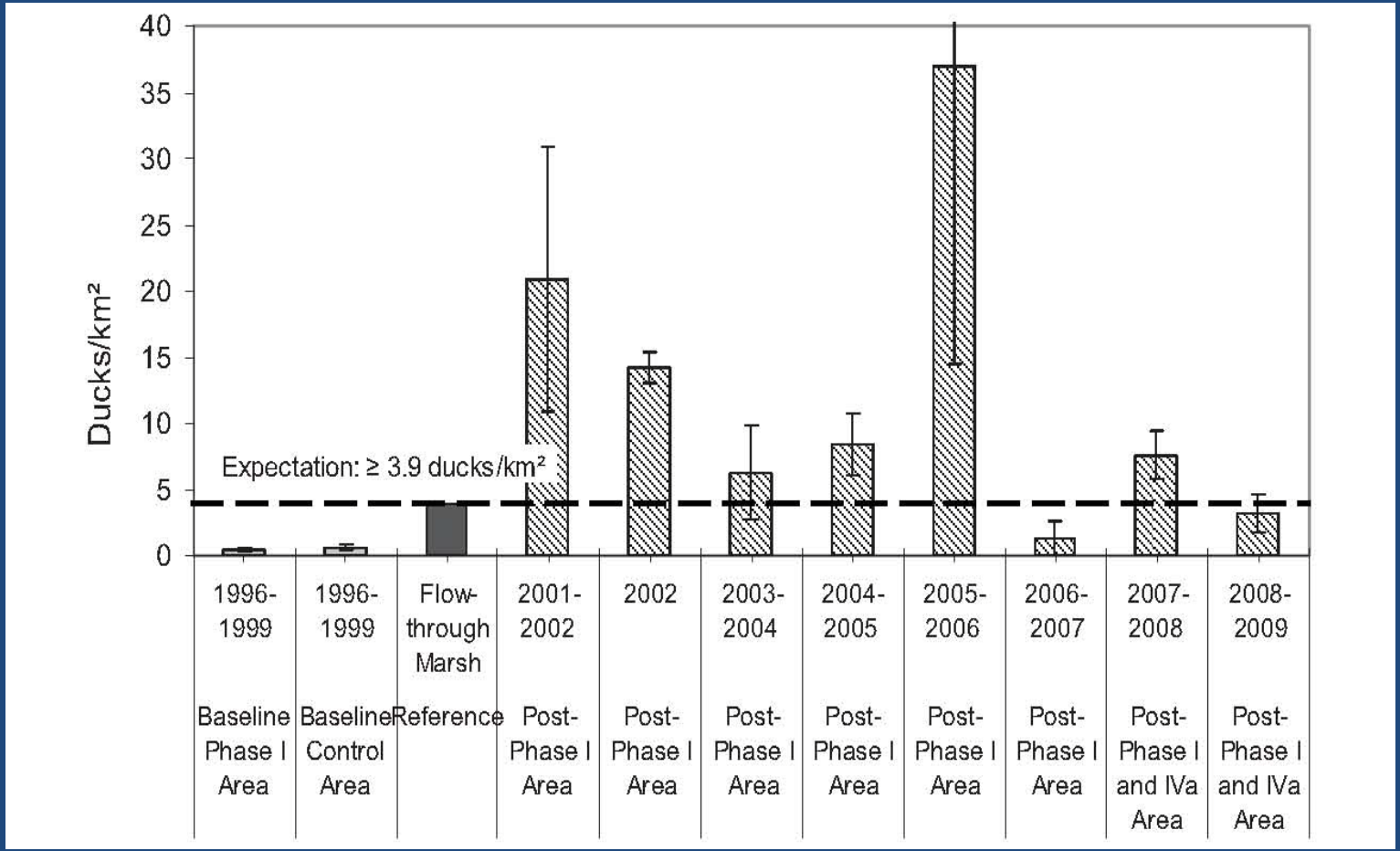
Wading Bird Utilization

- Target (30.6 birds/km2 during the dry season) achieved most years
- Dry years result in substantially lower wading bird densities.

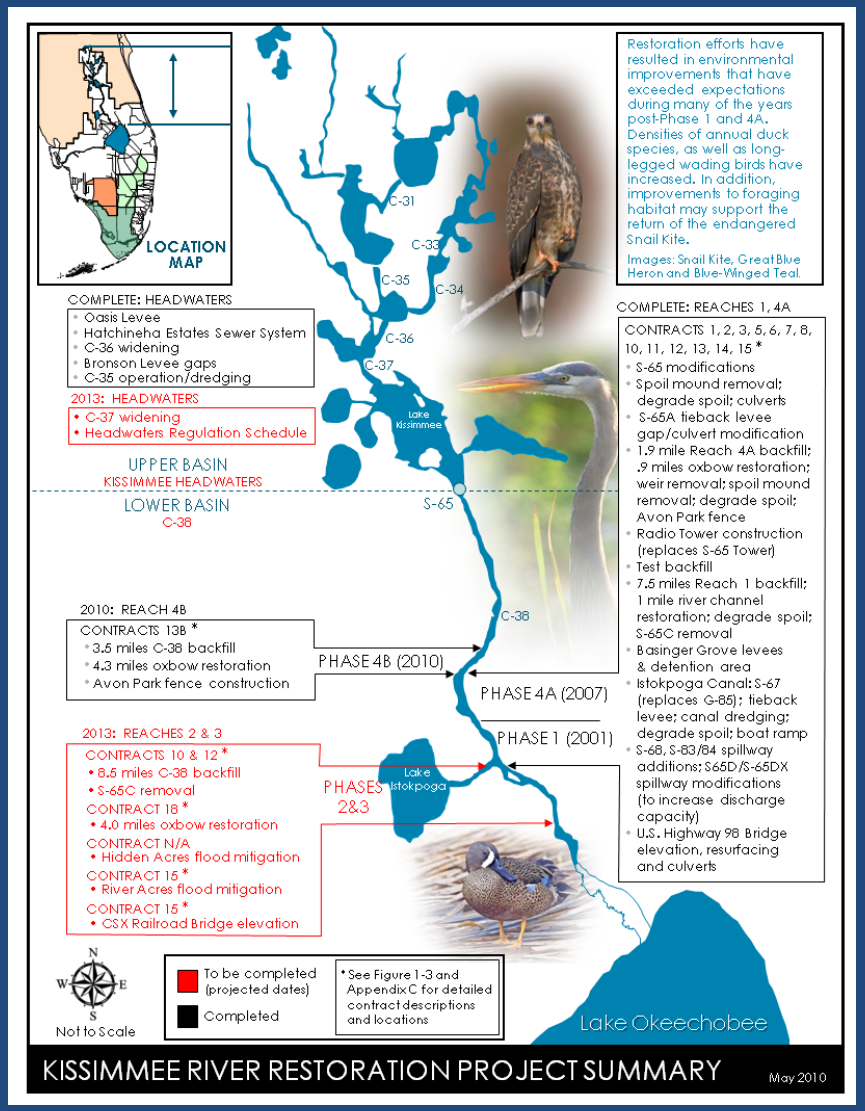


- Nest abandonment is common
- Increasing the magnitude of flooding is necessary.
- Potentially a population “sink”.

Densities of Waterfowl



Project Status



- 13 miles of filled channel; 9 miles remaining
- Final phases expected to be complete in 2014
- New schedule raises water levels 1.5 feet and increases water storage capacity in the upper basin by 100,000 acre-feet
- Appropriation of additional funds needed to complete

Conclusions

- Ecological response will be limited unless sufficient length of the Kissimmee River can be restored and the natural flows restored through a complementary headwaters project.
- It is imperative that funding be sufficient to see the project through fully, and an appropriate level of post-restoration monitoring be implemented to assess the effectiveness of the project

Phase IVB restoration area looking north from southern extent.

Phase IVA restoration area looking south from northern extent

Phase IVA floodplain looking east toward oakline.

Phase I restoration area.

Phase I restoration area floodplain near the south end of MacArthur Impoundment.

Phase I restoration area.

Continuous high flows this winter scoured the bank near the Micco Shelter, and it will have to be removed. This is a very sad time since the Micco Shelter has been used as a shelter from storms during field work since the project began.

Only three wild mustangs and one small colt remain on the Kissimmee River land. The others were captured and auctioned off earlier this spring.

Phase I restoration area looking north. The re-vegetated C-38 backfill scar can be seen here in the upper right.