Investigating Active Marsh Improvement Approaches for Restoring Water Bird Habitat in the P-Enriched Everglades

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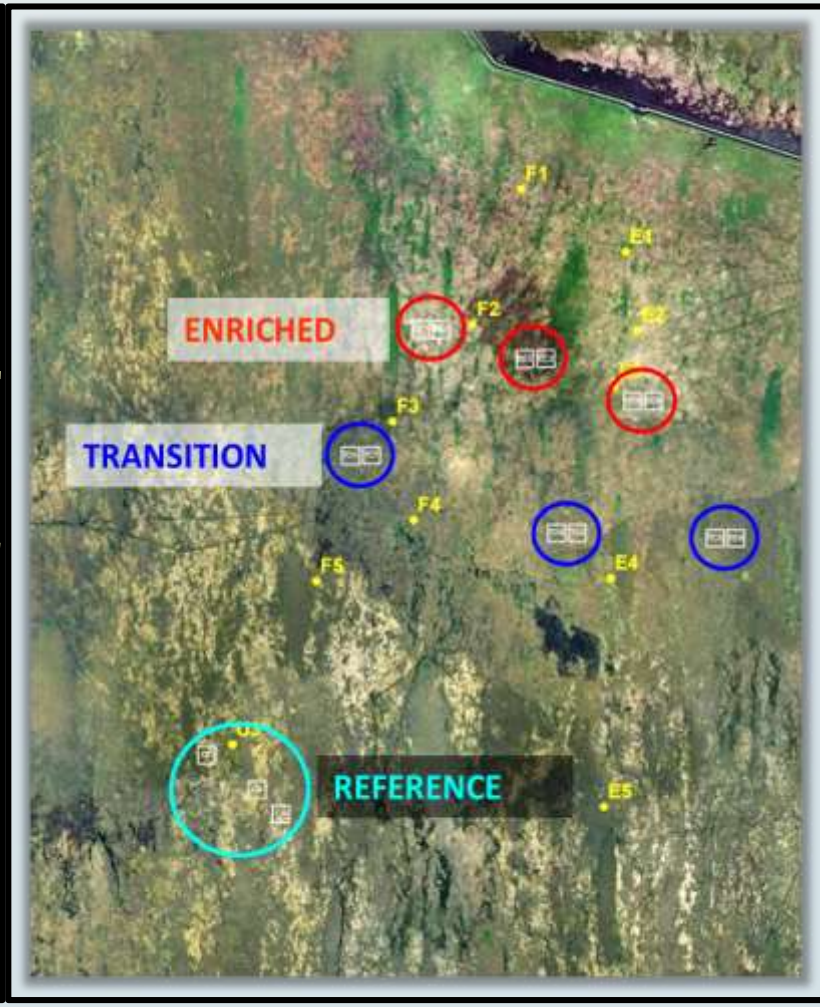
1. Cattail Habitat Improvement Project (CHIP)

WCA-2A

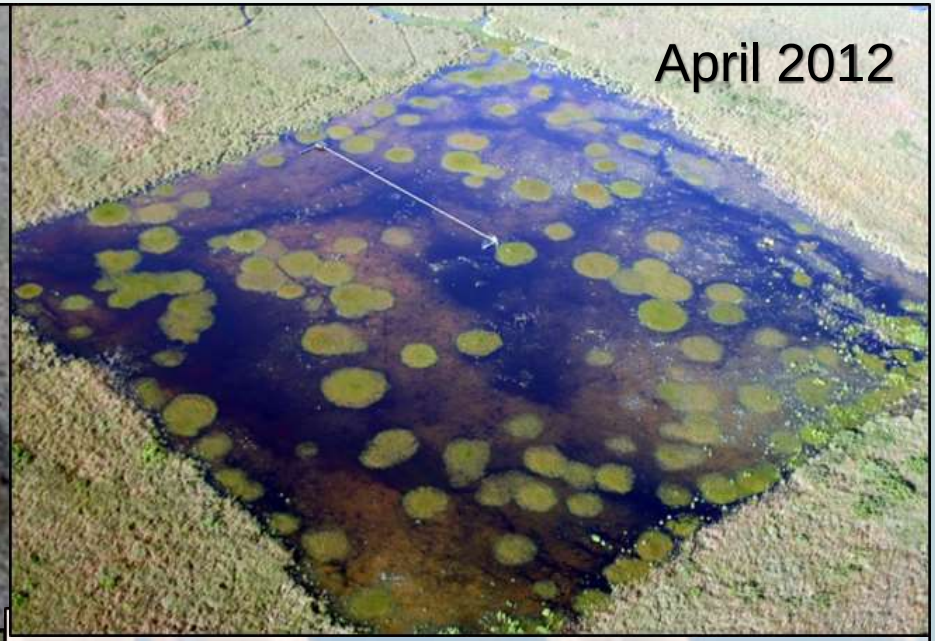


Summary Results 2007-2009 (means ± SD)

	Control	Open
***Periphyton (g m^{-2})**	3 ± 8	30 ± 41
***Dissolved oxygen (mg L^{-1})**	1.4 ± 1.0	3.9 ± 3.6
***Prey biomass (g m^{-2})**	12.84 ± 5.79	10.83 ± 7.79
***Aquatic prey community**	Crayfish (detritivore)	Fish (herbivore)
***C:P (*Procambarus fallax*)**	74.5 ± 21.2	85.5 ± 15.8
***C:P (*Poecilia latipinna*)**	43.5 ± 3.1	57.0 ± 12.6
[+]Wading birds per plot/week	0.1 ± 0.4	51.3 ± 39.3

*Data from Hagerthey et al. (2014) Freshwater Biology; [+]2007 data

Maturation of the Open Plots

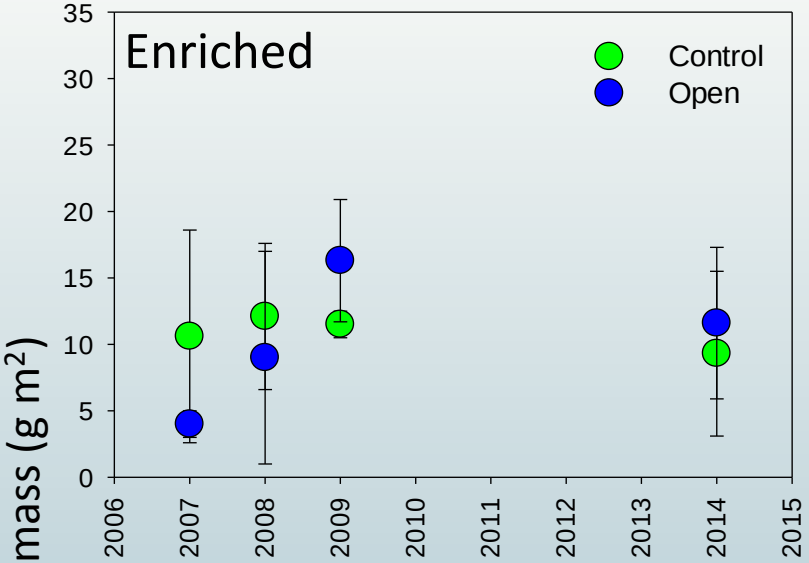


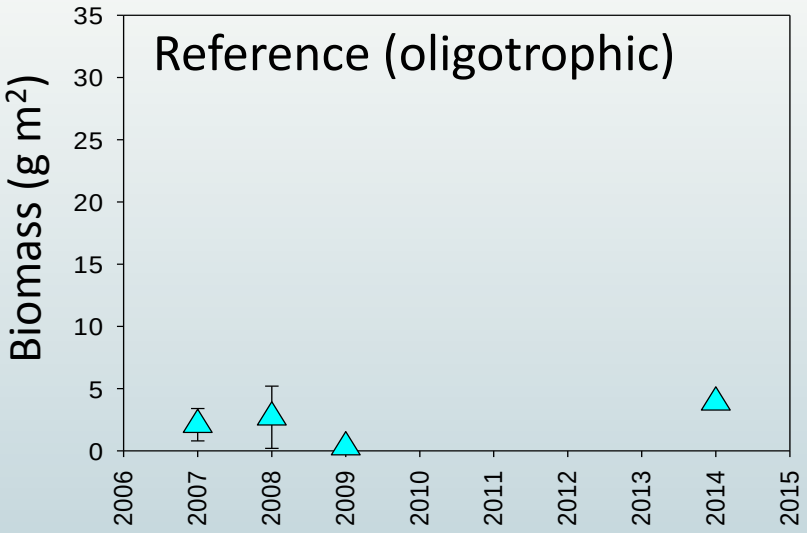
Questions:

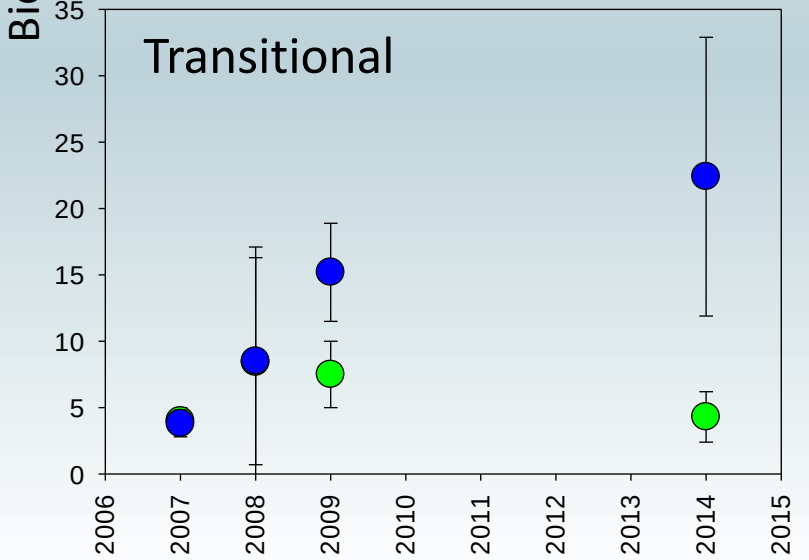
1. How do the aquatic faunal and avian communities respond over the long term (10 years)?

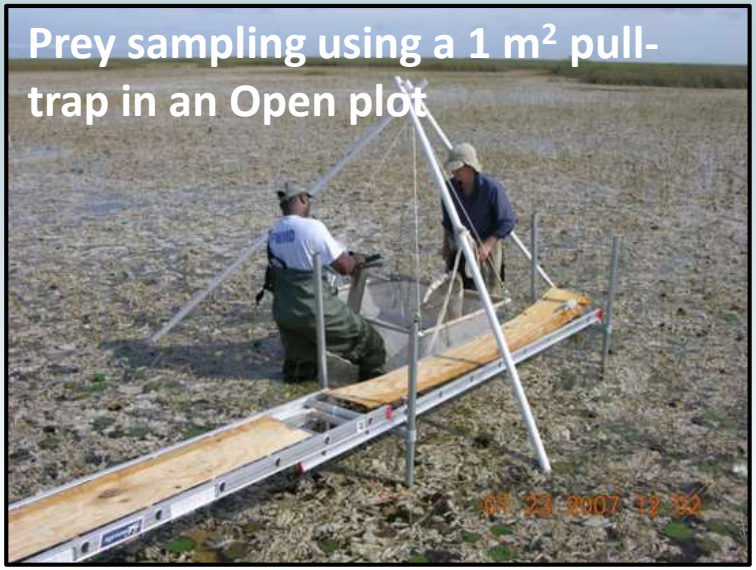
2. What factors affect wading bird prey availability in nutrient enriched openings and how do they differ from those in the oligotrophic ridge and slough?

Aquatic faunal Biomass (mean ± SD) in Open Plots Initially Increased then Stabilized Over Time

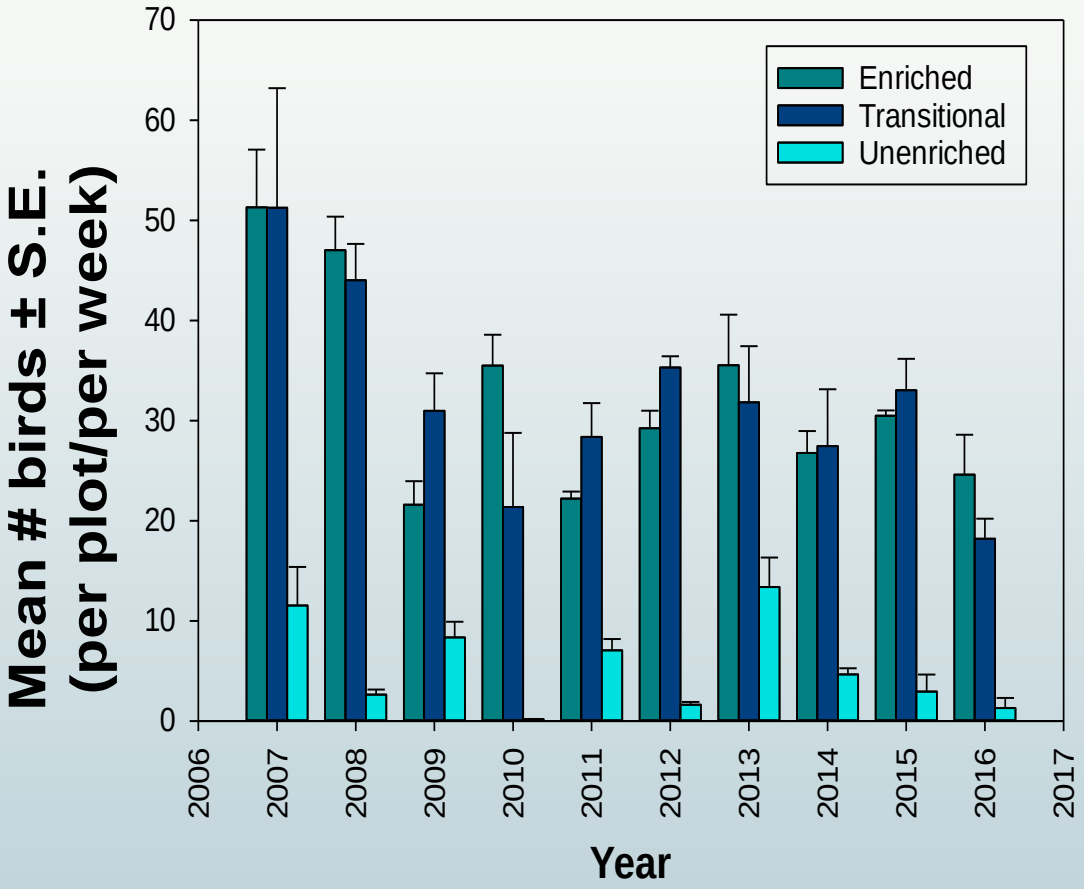








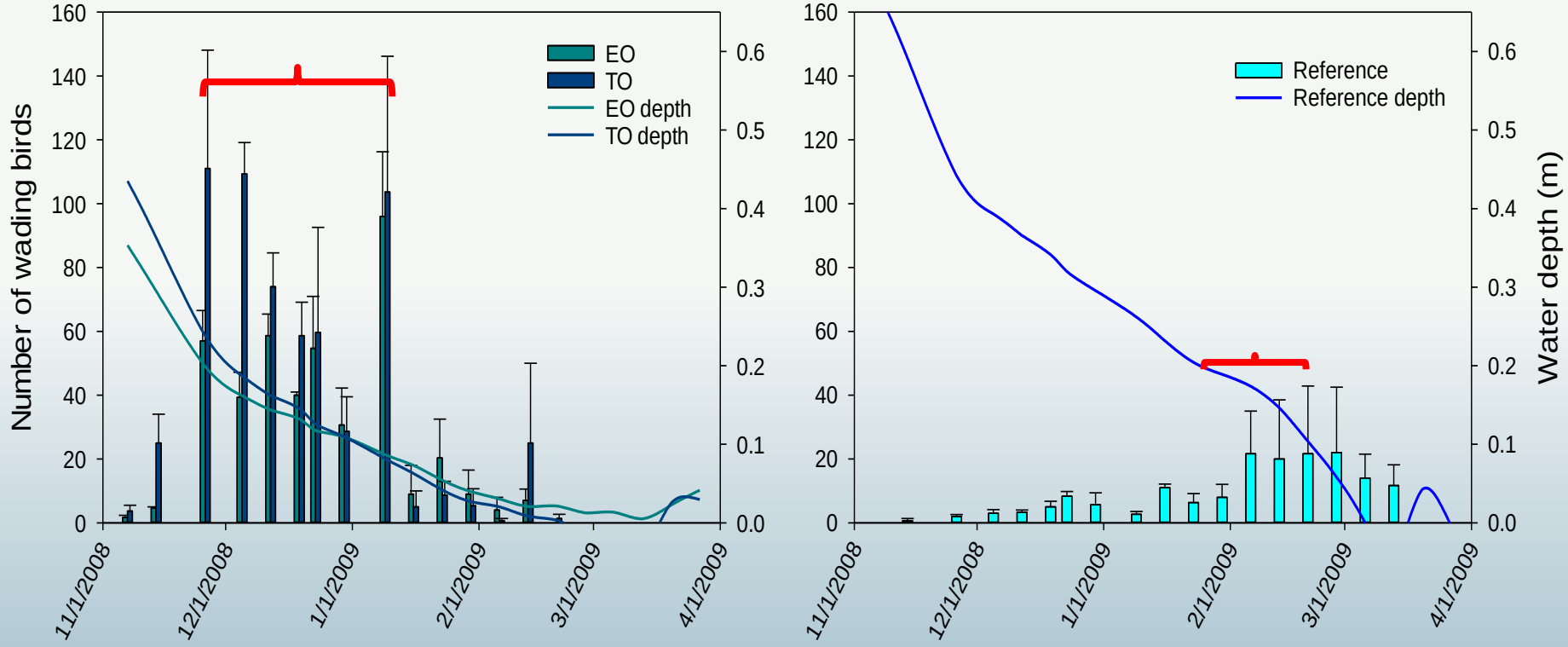
Wading Bird Use of Open Plots was Consistently Greater than in the Unenriched Reference Region



CHIP Plots-WCA2A

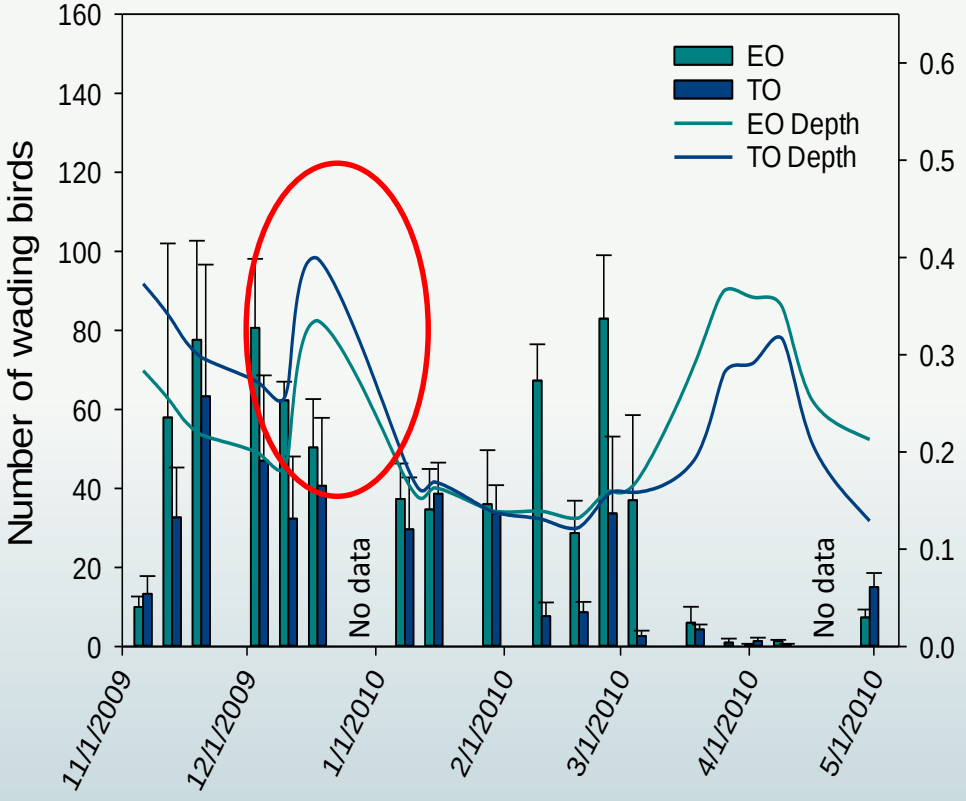
The Open Plots Attract More Foraging Birds (Mean ± S.E.) than the Reference Plots for a Given Water Depth

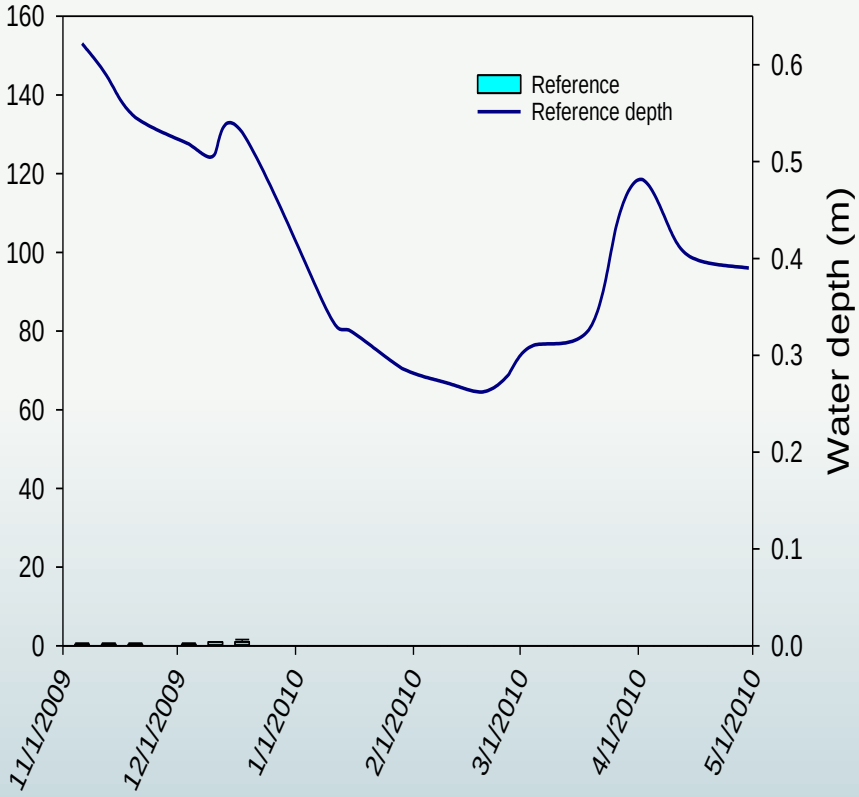
2009 (optimal foraging/nesting year)



Foraging in Open Plots Occurs at Greater Depths, and is Less Affected by Recession Rate and Reversal Events Compared to Reference Plots

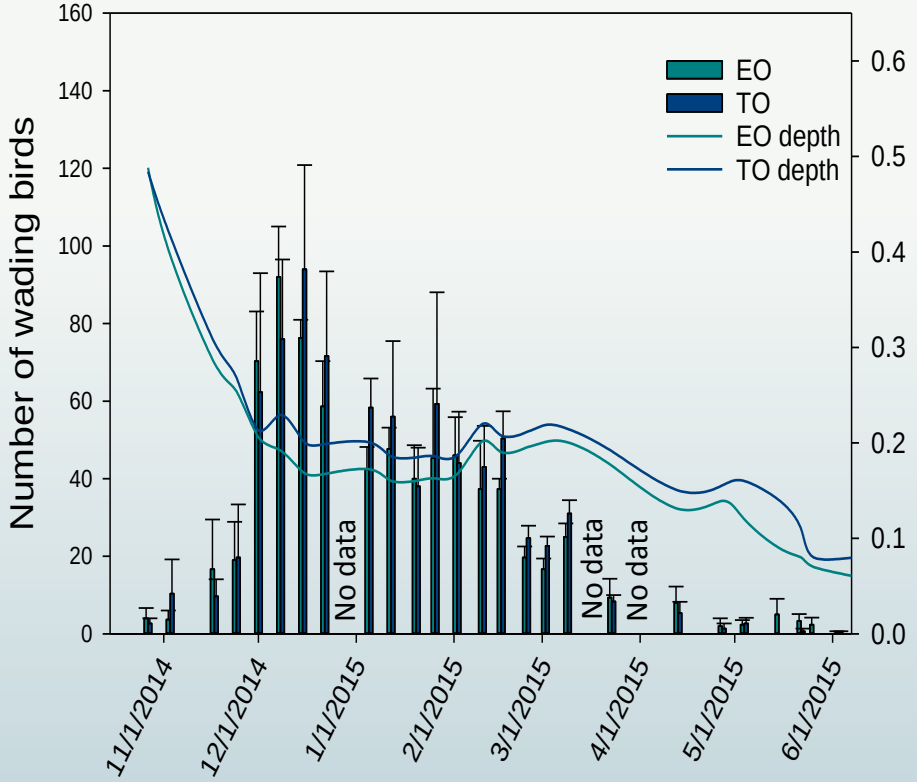
2010 (wet year, water-level reversals, poor nesting effort)

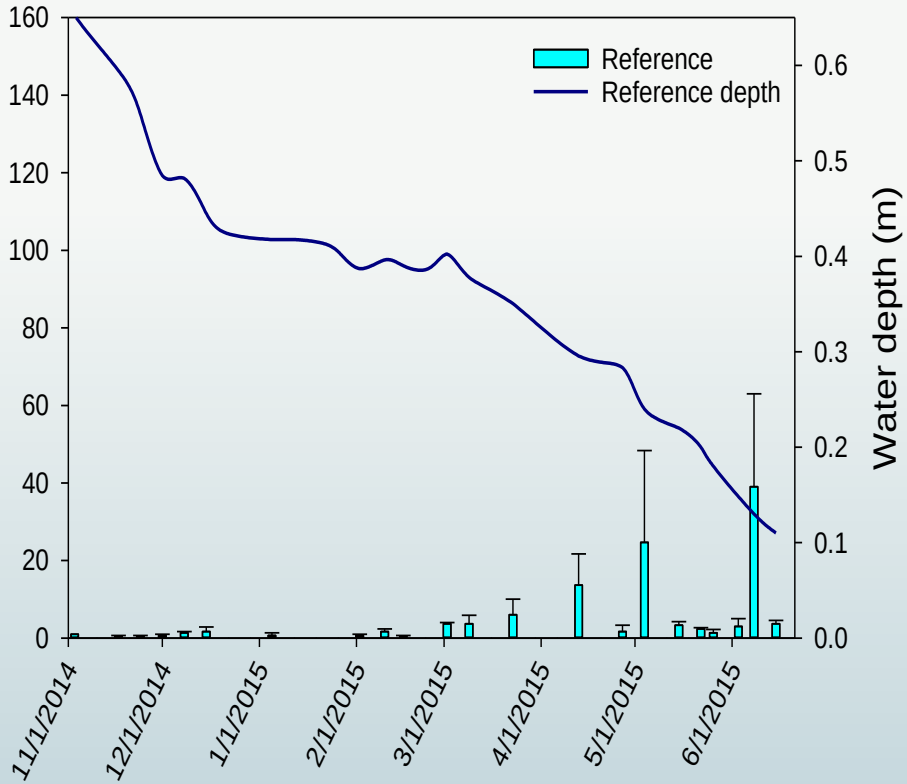




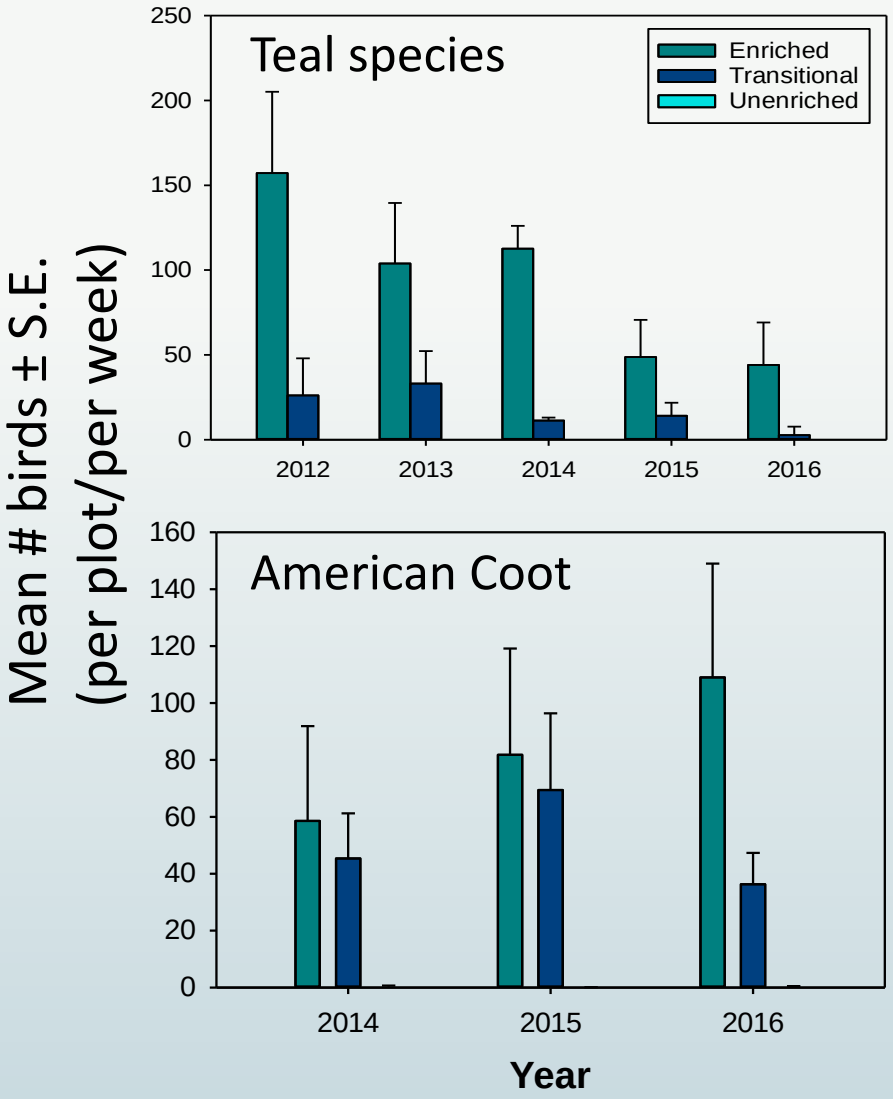
Foraging in Open Plots Occurs for a Considerably Longer Period of Time than in Reference Plots

2015 (average hydrology, average nesting effort)





Greater Waterfowl Use of Open Plots than Unenriched Reference Area



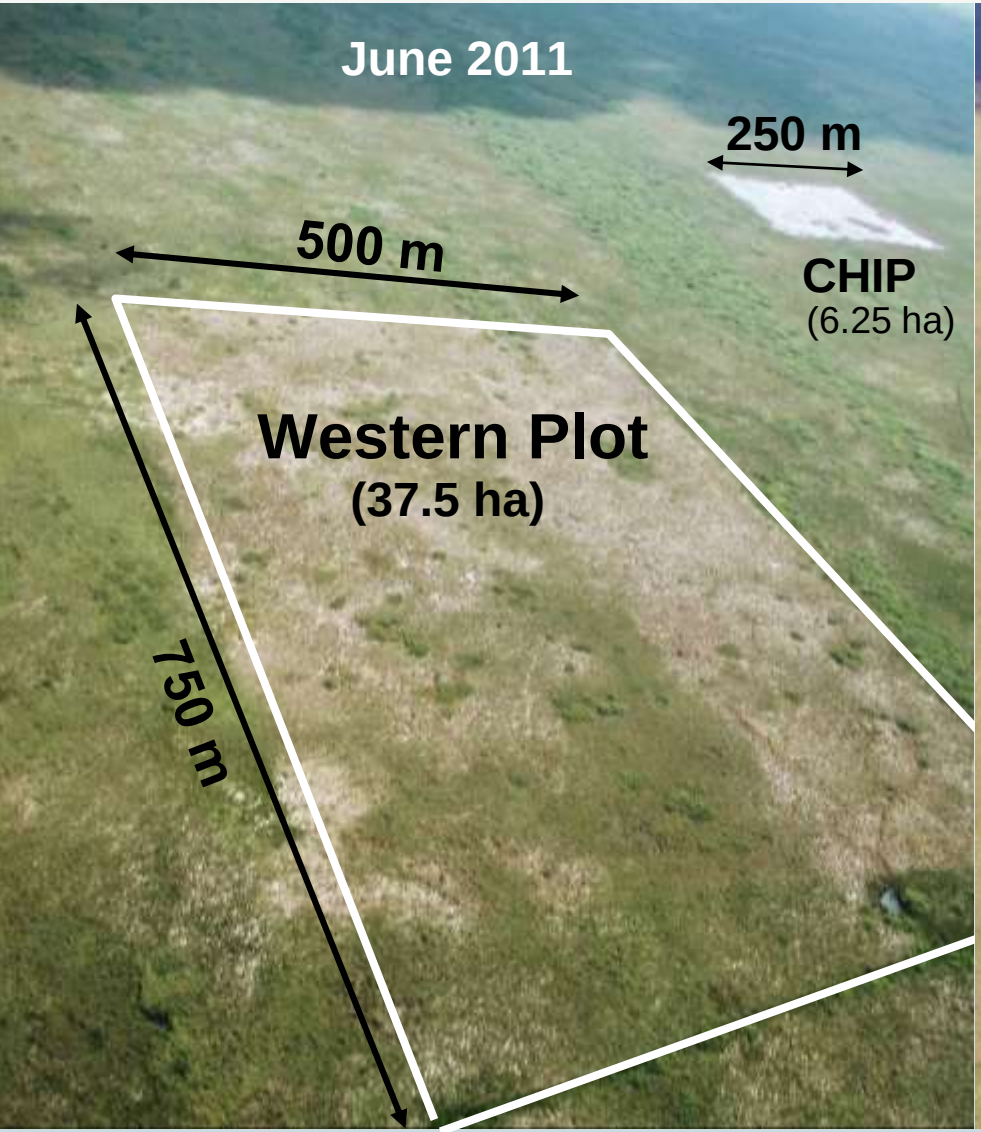
CHIP Plots-WCA2A

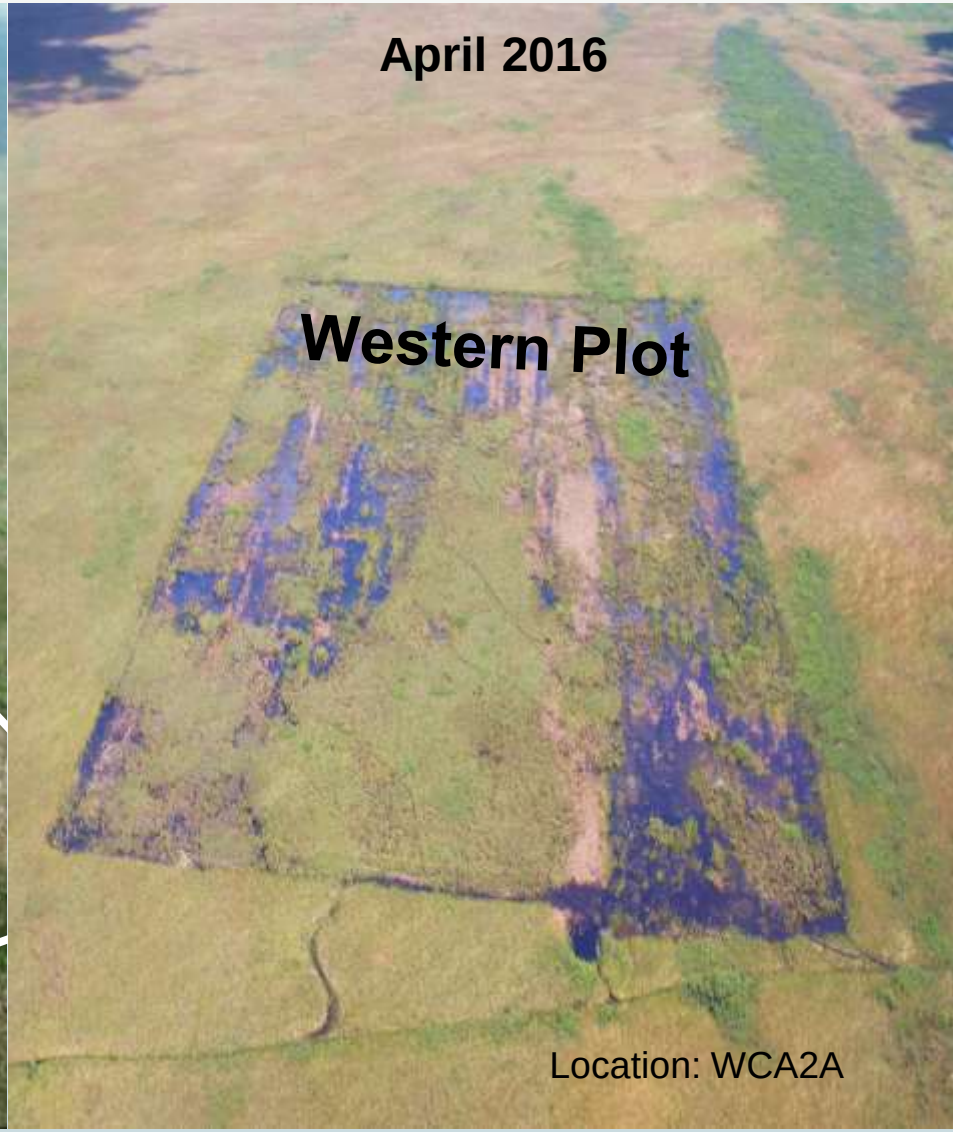
2. Ridge & Slough Pattern Restoration

CHIP

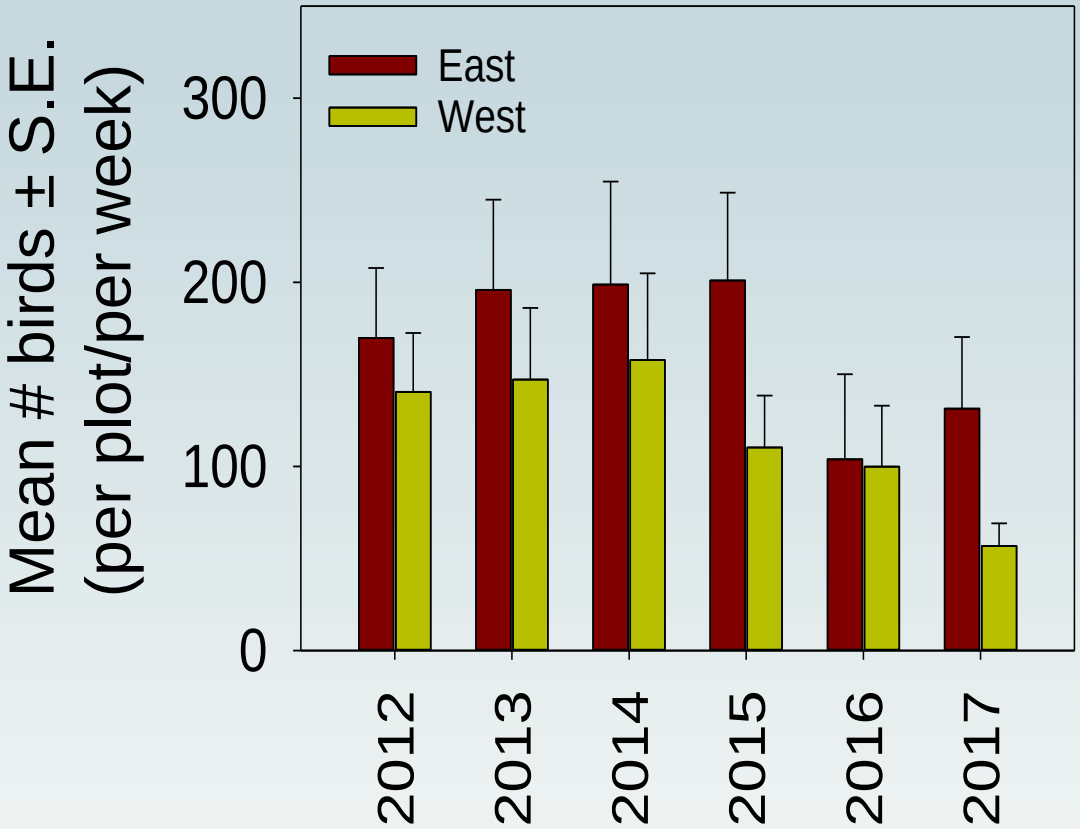
Pattern Restoration

Landscape Pattern Restoration





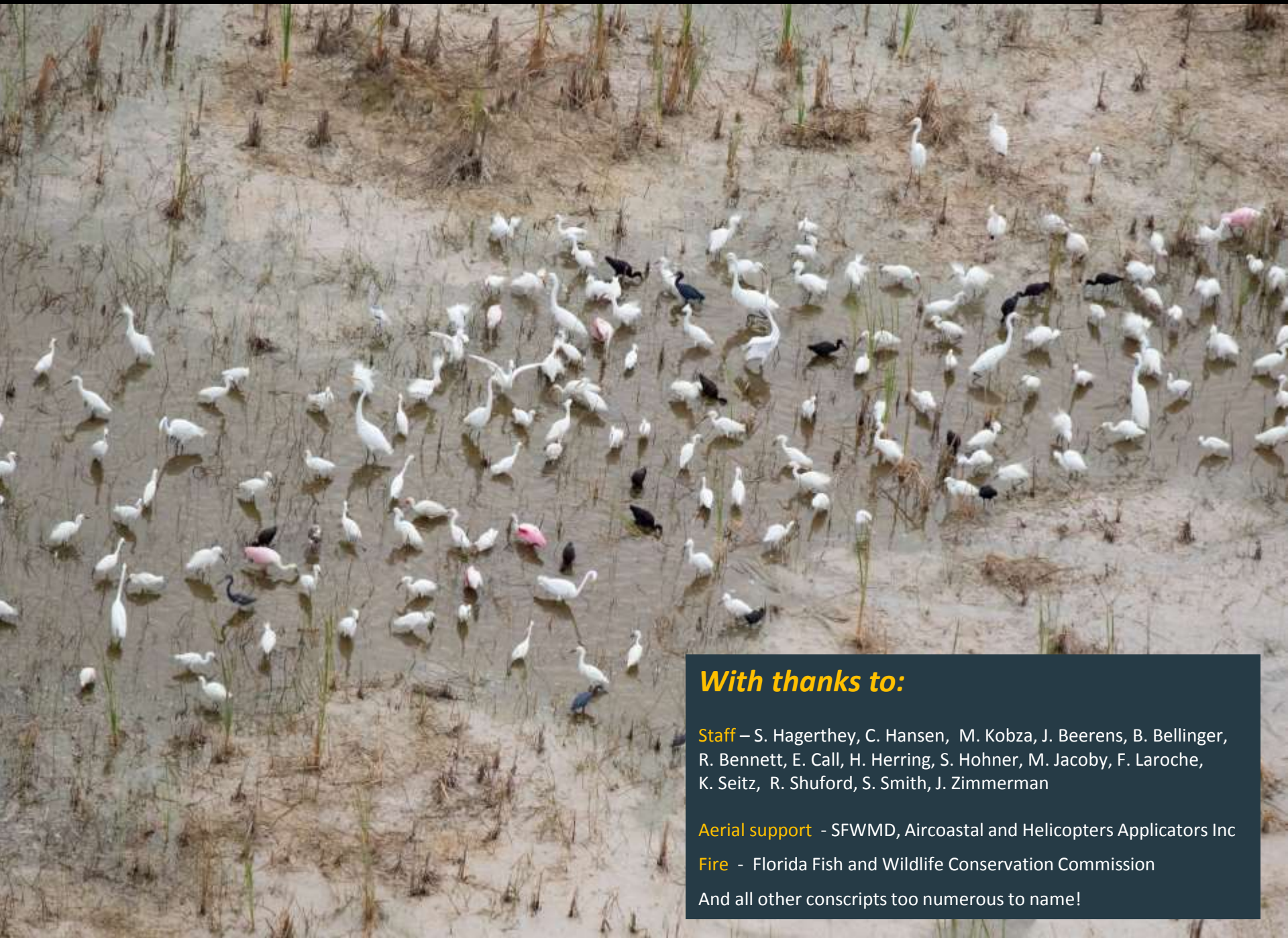
Landscape Pattern Plots Attracted Large Numbers of Wading Birds



Summary

- Improved habitat for wildlife can be sustained in the long-term.

- Mechanisms driving prey availability appear to differ from those in the oligotrophic Everglades
  - Less reliance on prey concentration
  - Implications for management nutrient enriched areas
  - Mitigation for reversal events



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Fire - Florida Fish and Wildlife Conservation Commission

And all other conscripts too numerous to name!