

Paynes Prairie Sheetflow Restoration

Rick Hutton PE | GRU

Chris Keller PE | Wetland Solutions

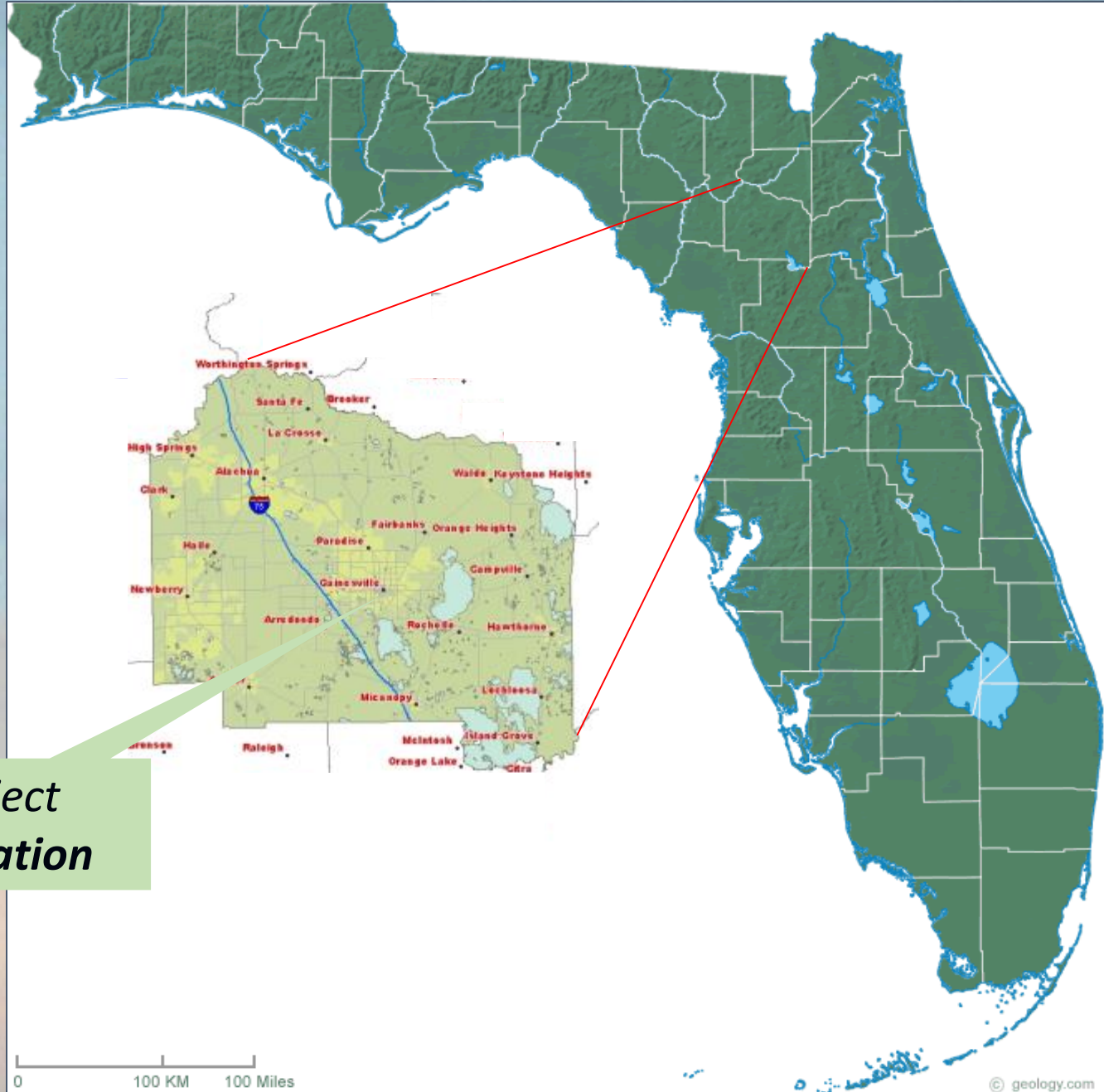
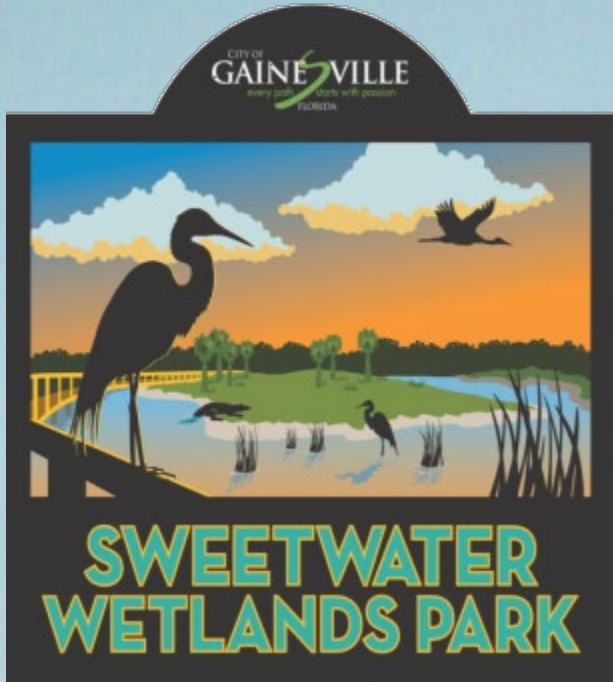
**Alice Rankeillor PE |
City of Gainesville Public Works**

Walt Nickel PE | Jones Edmunds

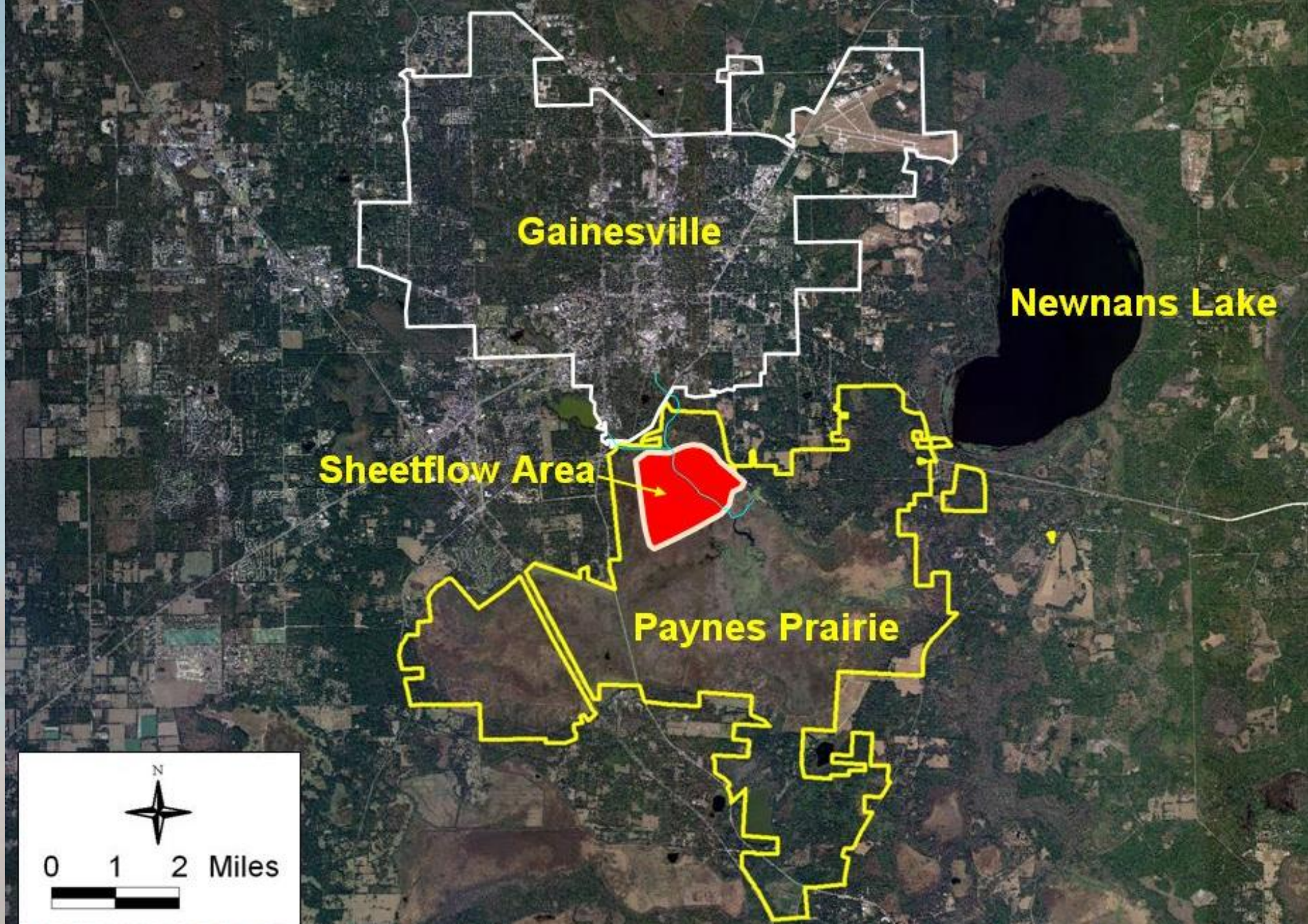
Amy Goodden, PE | Jones Edmunds



UF Water Symposium 2020 | February 25, 2020



Project Location



Gainesville

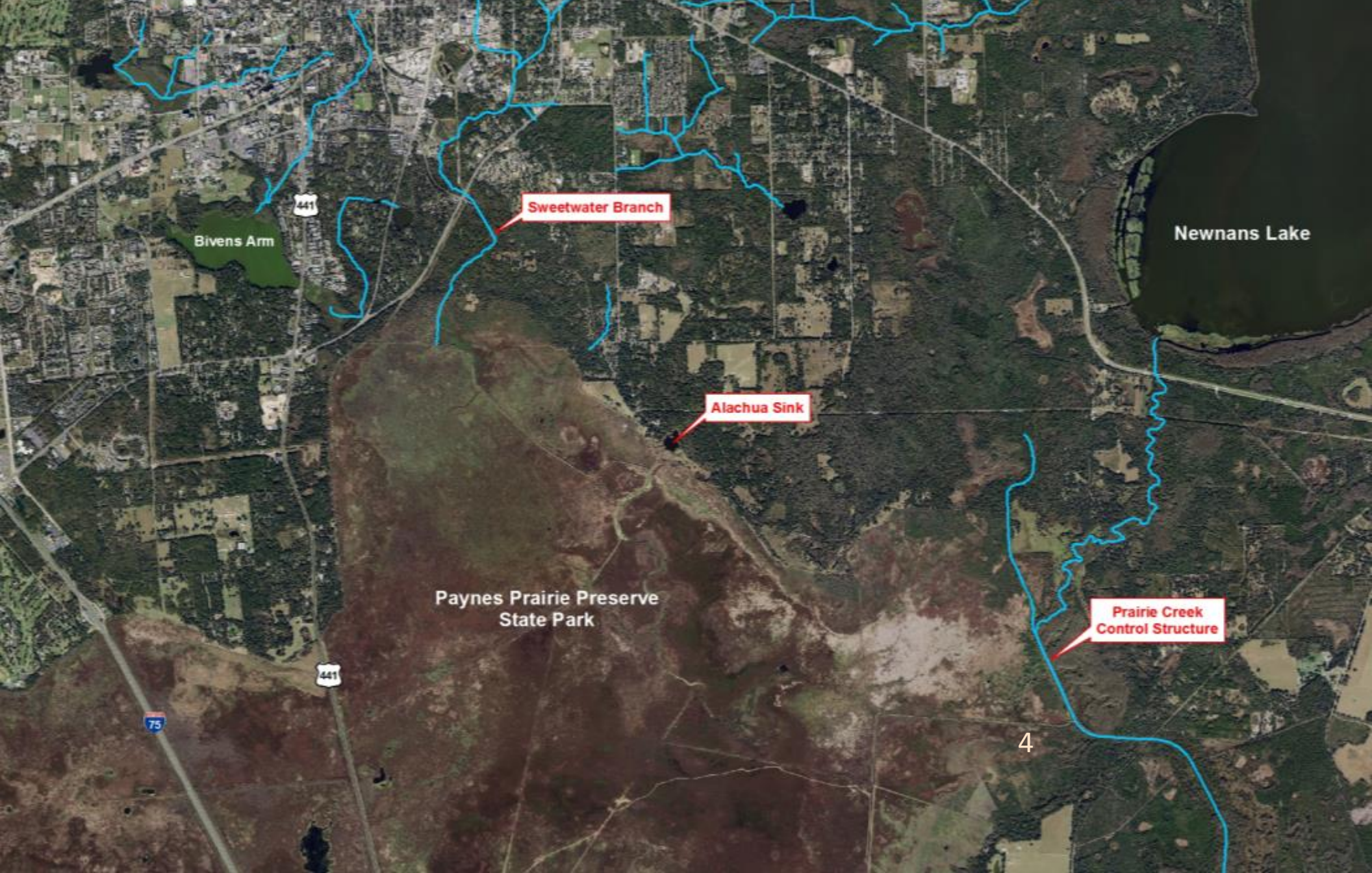
Newnans Lake

Sheetflow Area

Paynes Prairie



0 1 2 Miles



Bivens Arm

441

Sweetwater Branch

Newnans Lake

Alachua Sink

Paynes Prairie Preserve
State Park

Prairie Creek
Control Structure

75

441

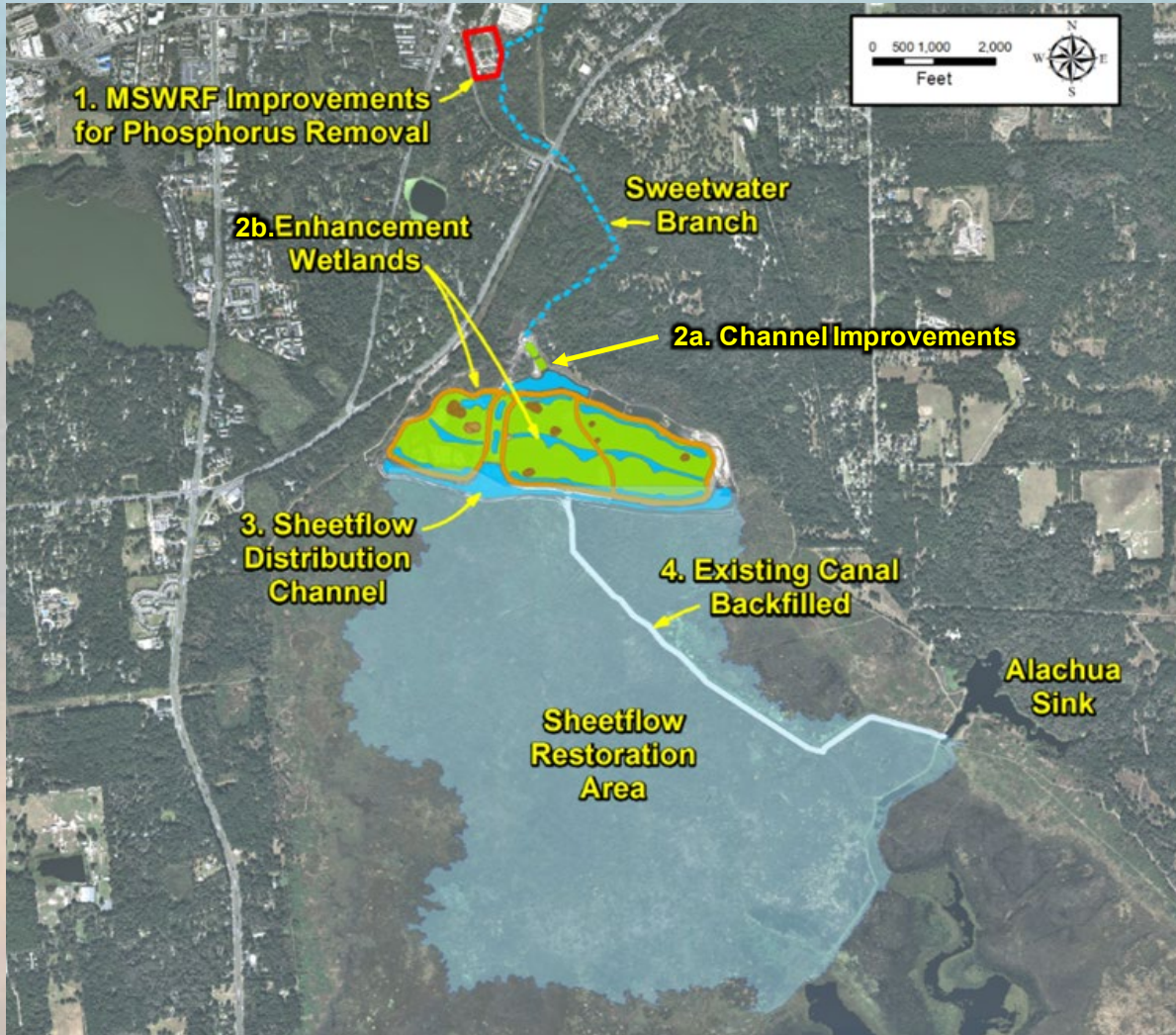
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Alachua Sink



- 2006 TMDL Adopted by FDEP
 - 55% N Reduction in Point Sources
 - 45% N Reduction in Non-Point Sources

Project Concept



- Upgrade Main Street WRF P Removal
 - TP < 0.3 mg/l
- Enhancement Wetland
 - Reduce TN from all sources in SWB
 - TN < 3.0 mg/l
- Fill in Sweetwater Canal
 - Additional Nutrient Removal on Paynes Prairie
 - TP < 0.09 mg/l
 - TN < 1.42 mg/l
- Overall Cost \$27.5M

Project Partners

- FDEP: \$3.2 M
 - Legislative, Section 319, TMDL & RTP
- SJRWMD: \$1.4 M
 - SWIM & Land Acquisition Programs
- FDOT: \$0.6 M
 - NPDES Cost Share
- FWC: \$0.5 M
 - AHRES Cost Share
- Alachua County: \$0.5 M
 - Land Conservation Program



Design Considerations

- WQ Improvement
 - TN < 3 mg/L and TP < 0.3mg/L
- Sediment Loads
 - 1700 CY per year
- Cut and Fill Balance
- Trash Removal
- Peak Flows
- Mean Daily = 13 cfs
- Peak Hourly = 4000 cfs
- Floodplain – no rise criteria



Wetlands Process Design

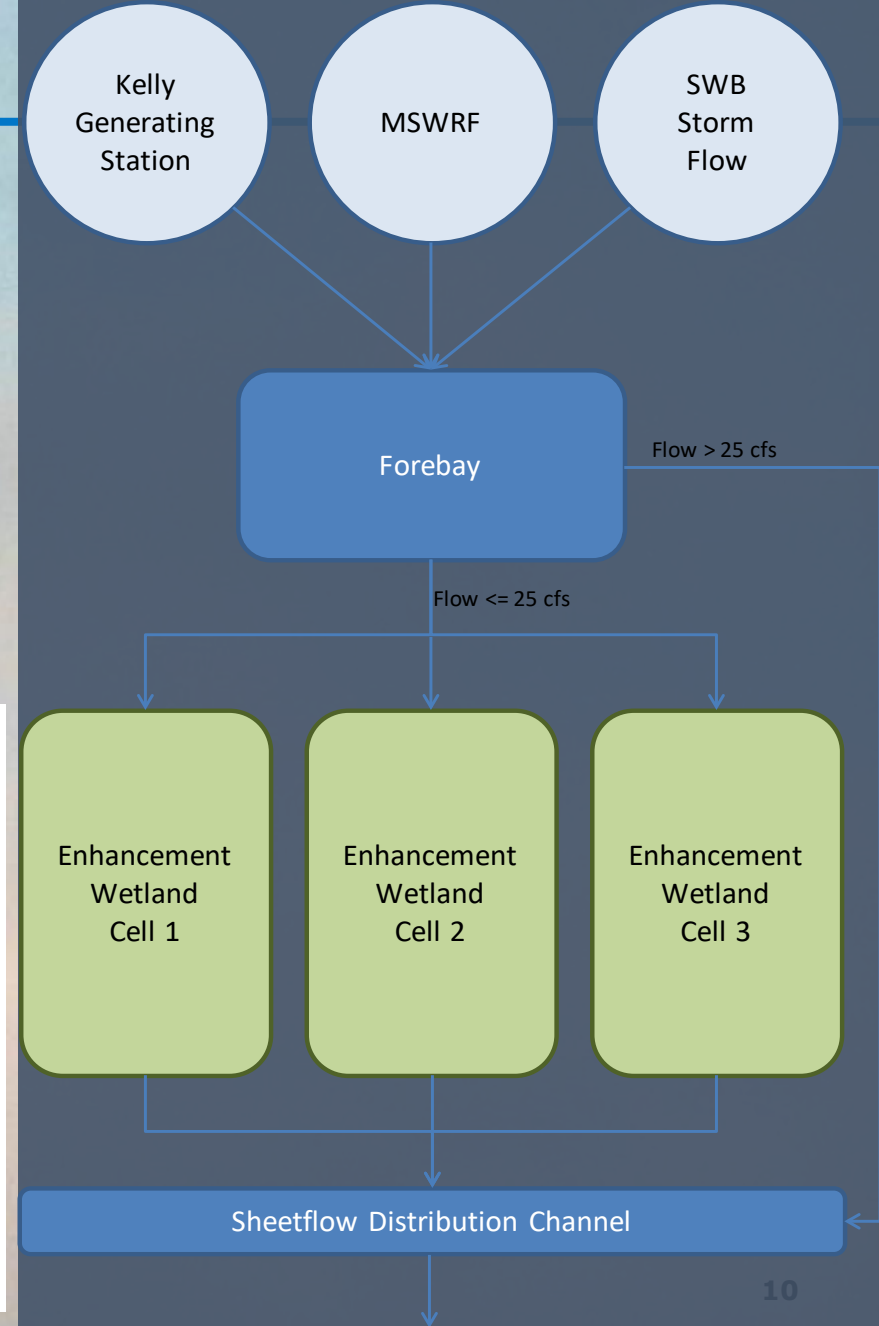
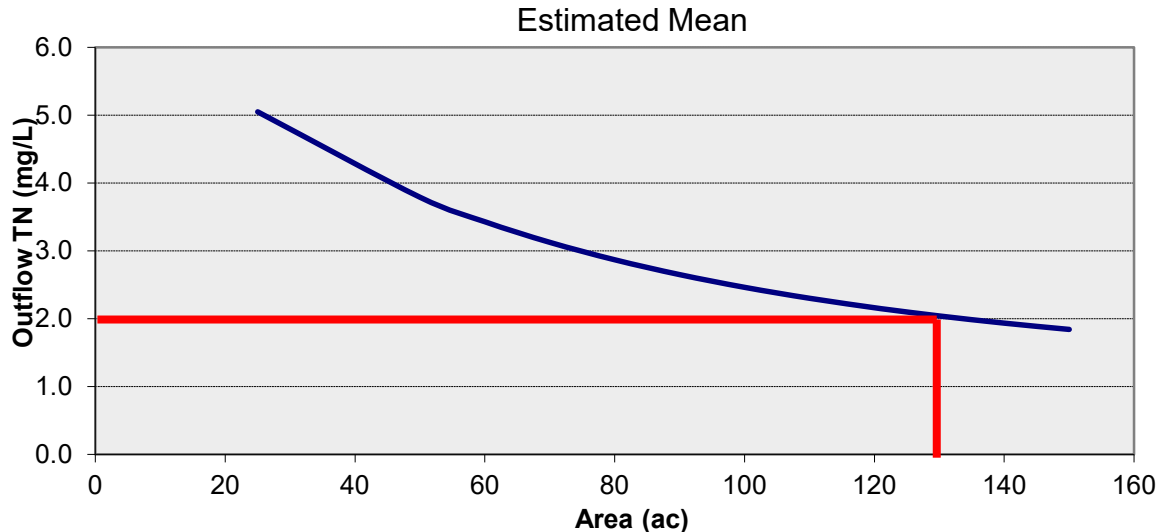
- Characterize source water variability in flows and concentrations
 - MSWRF
 - SWB base flow and storm flow
 - Kelly Generating Station
- Establish receiving water quality limits
- Estimate wetland area requirement
- For ultimate compliance with TMDL, account for additional polishing in the restoration area



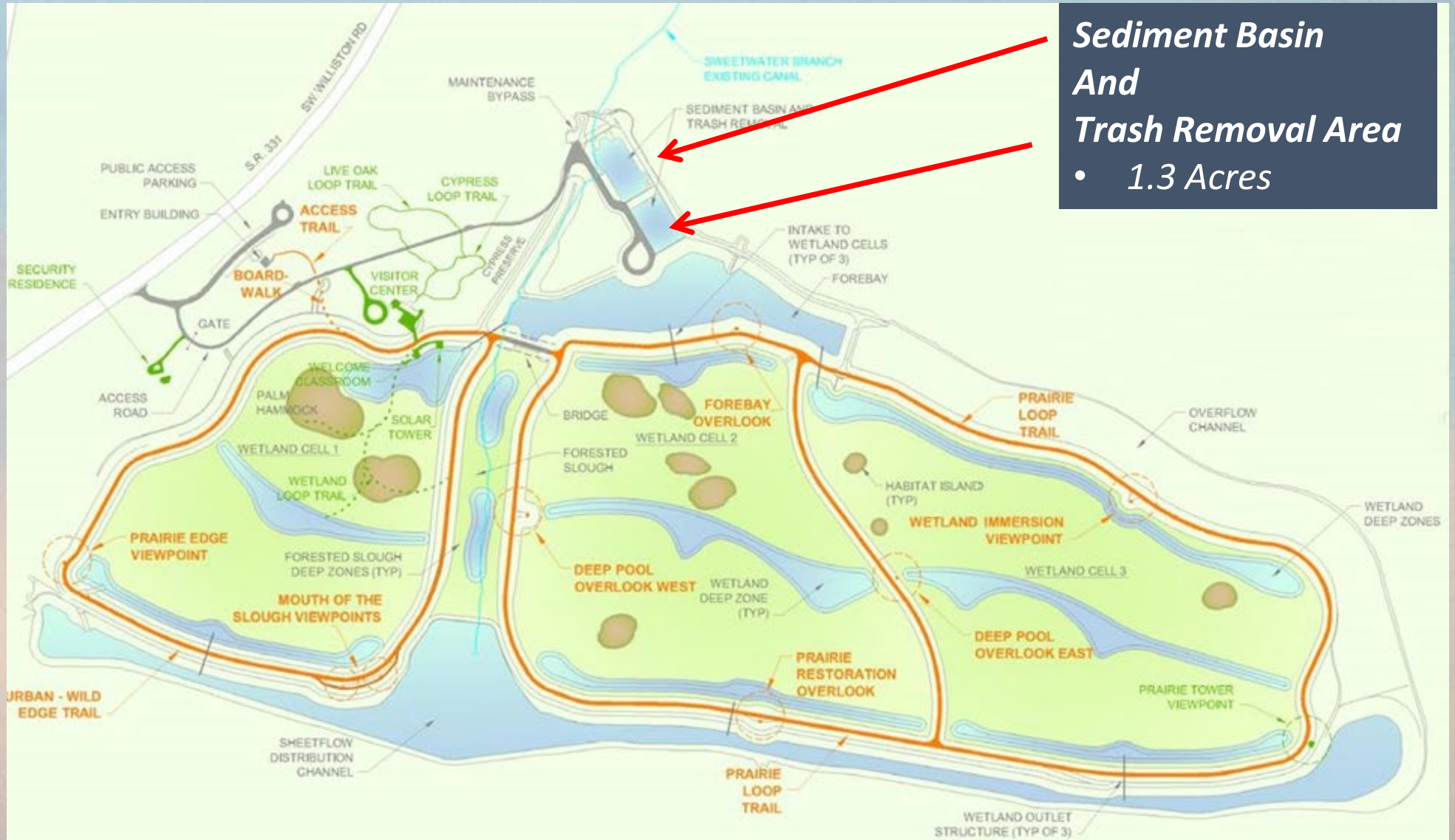
Wetlands Process Design

Combined Inflows

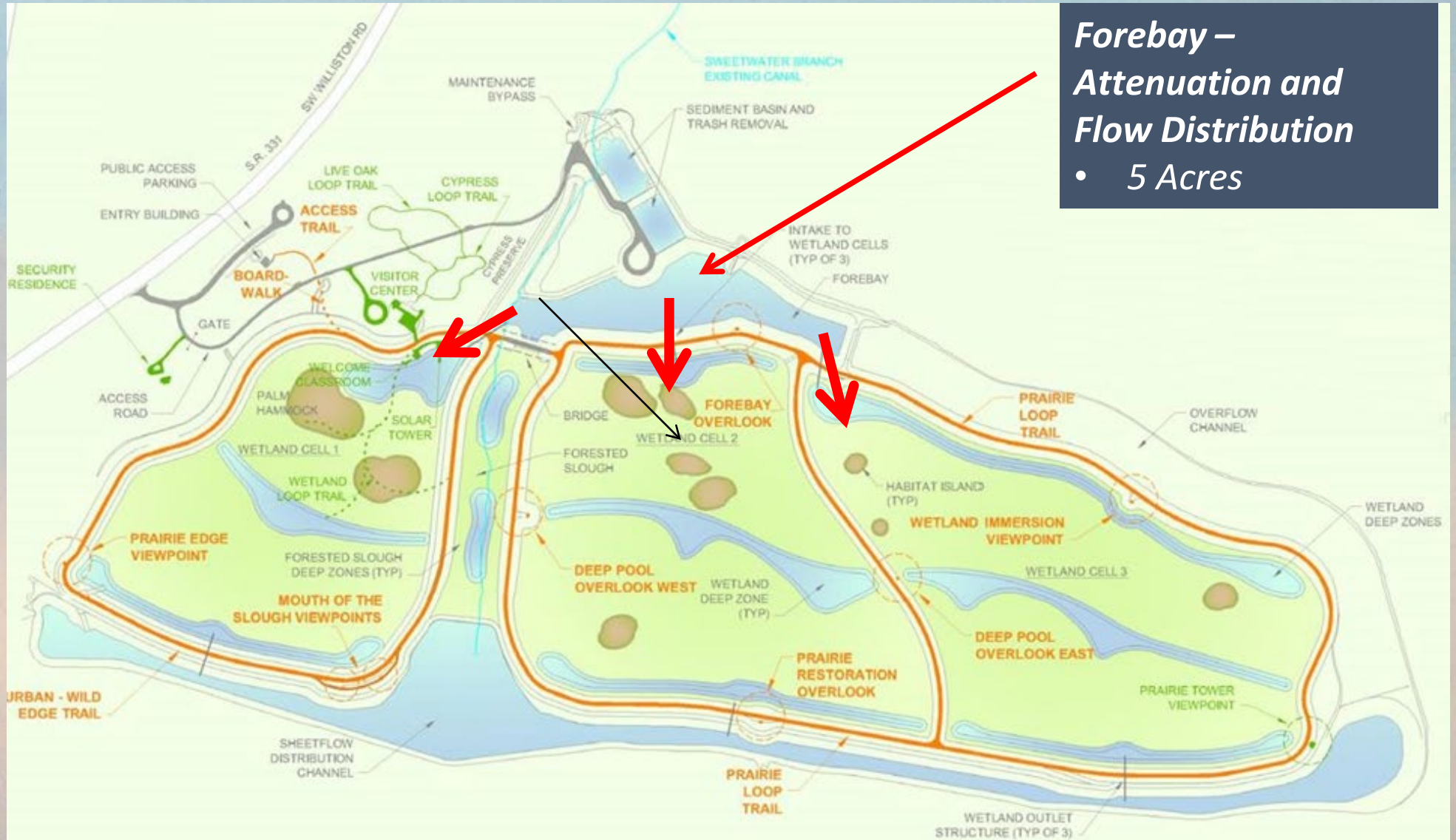
- Avg. Flow = 13 cfs
- Peak Flow = 25 cfs
- TN = 3 - 10 mg/L
- TP = 0.3 mg/L
- 97% TN load capture



Design Elements



Design Elements



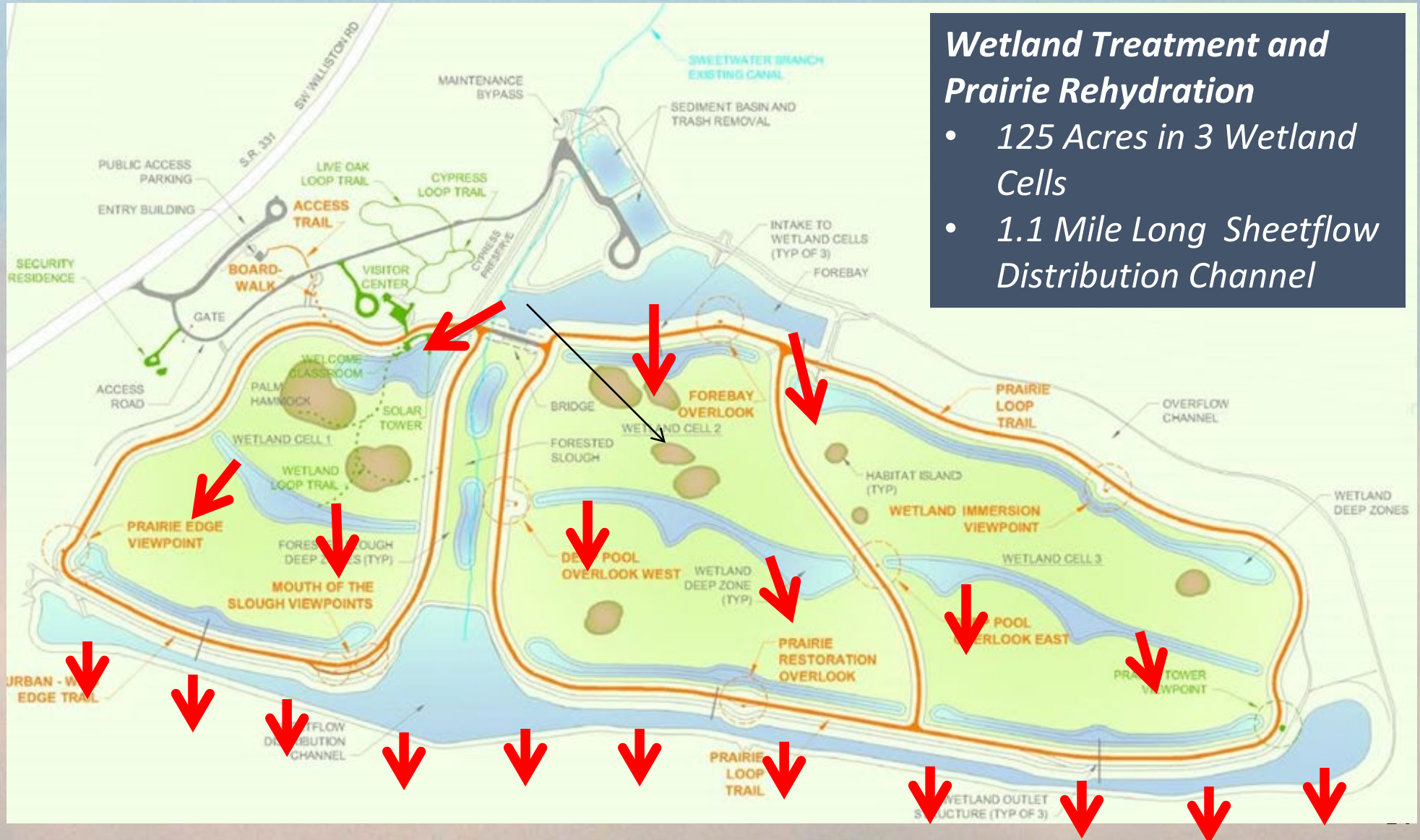
**Forebay –
Attenuation and
Flow Distribution**

- 5 Acres

Design Elements



Design Elements



Design Elements

Public Access
3.6 mile berm

1,800 ft of boardwalks

Shaded viewing platforms

Interpretive signage



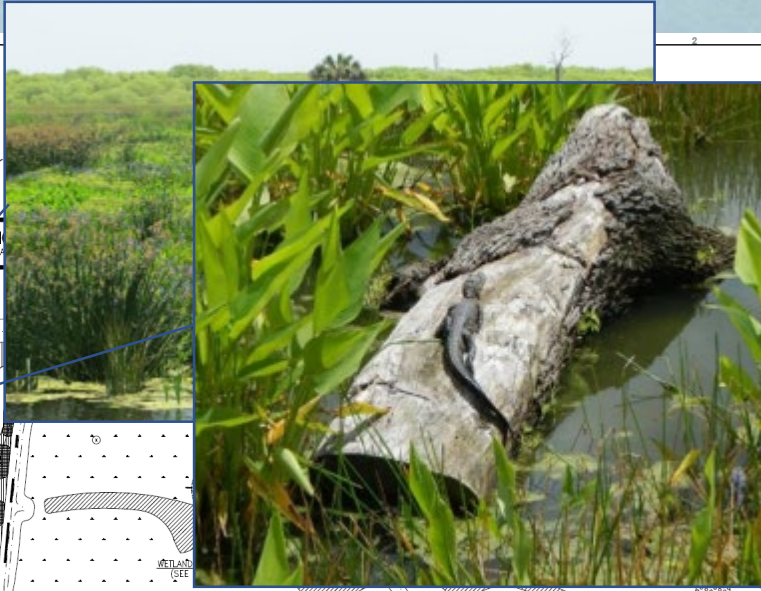
Construction Challenges

- Flow Control During Construction
- PPPSP Outstanding Florida Water
- Highly variable stormwater flows
- Turbidity Limits to PPPSP
- Vegetation Establishment Periods





Wetlands Planting Plan



PLAN #1841	DATE	PROJECT NO.
	APR 2012	07125-050-
	SCALE	DWG. NO.
	AS NOTED	WL1

Quantities
 Emergent = 434,000
 Submerged = 2,400
 Floating = 800
 Trees/shrubs = 8,000

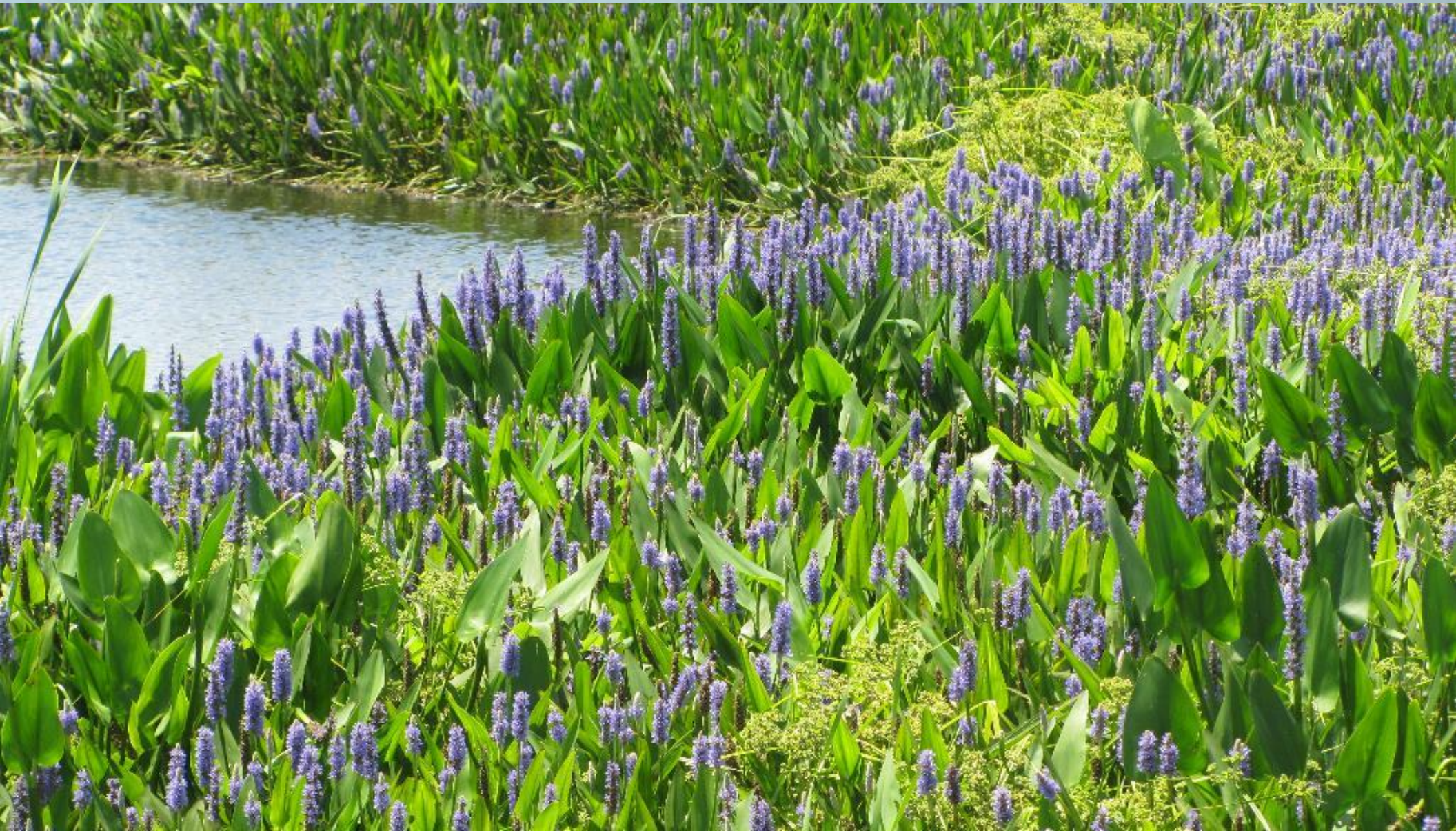
Plant Establishment (+1 Month)



Plant Establishment (+2 Months)



Plant Establishment (+9 Months)



Transformation



Transformation



Transformation



Transformation



Transformation



Transformation

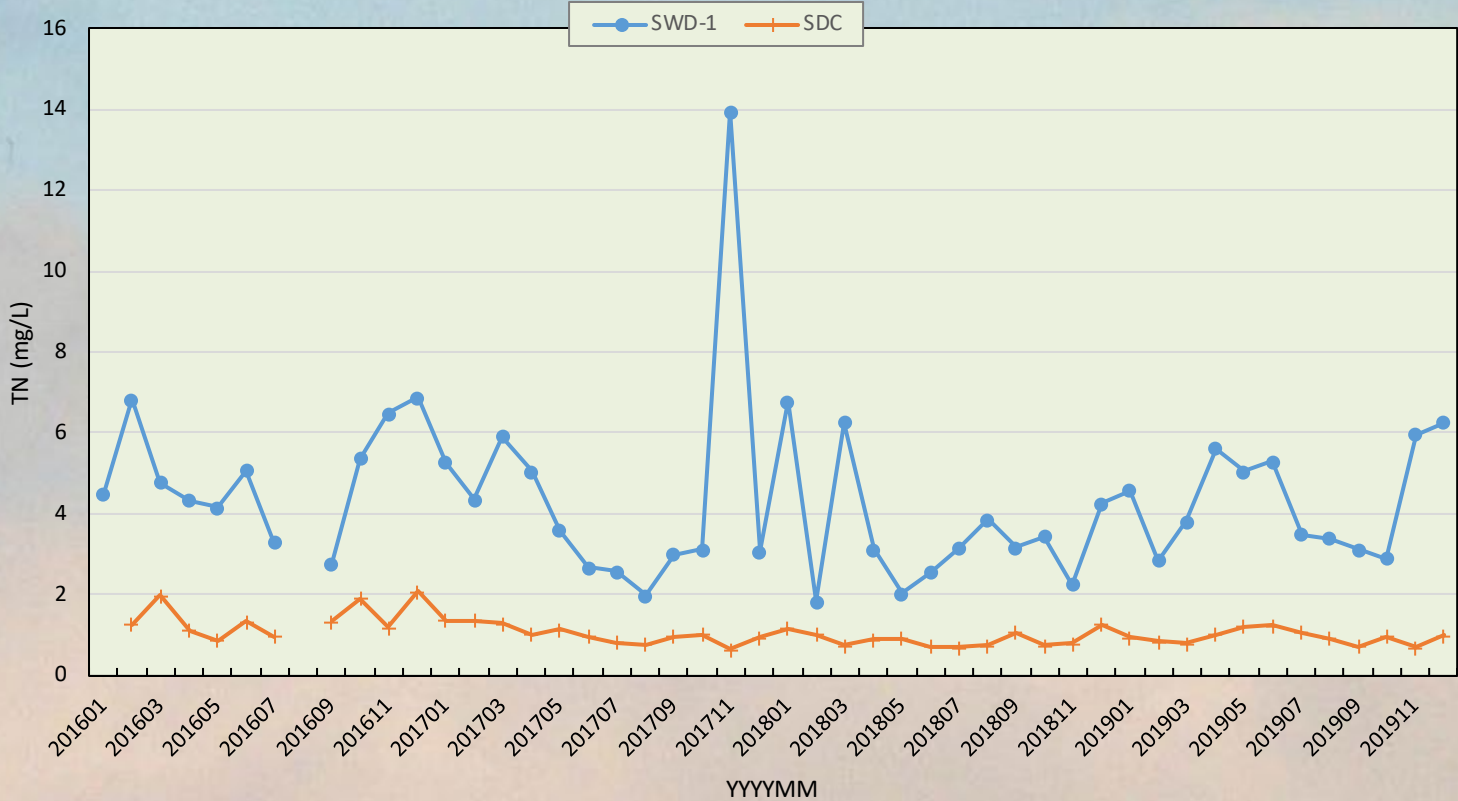


Sweetwater Wetlands Park



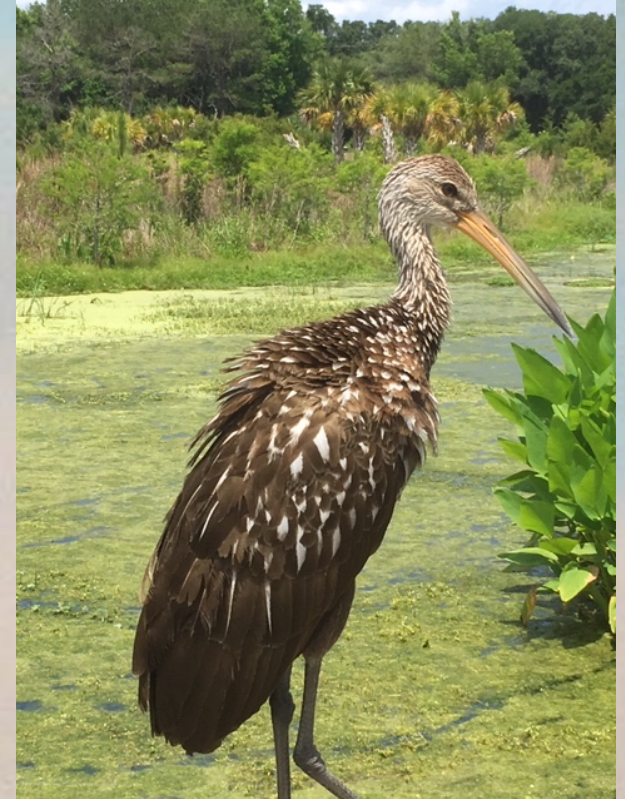
Nutrient Removal Performance

Total Nitrogen



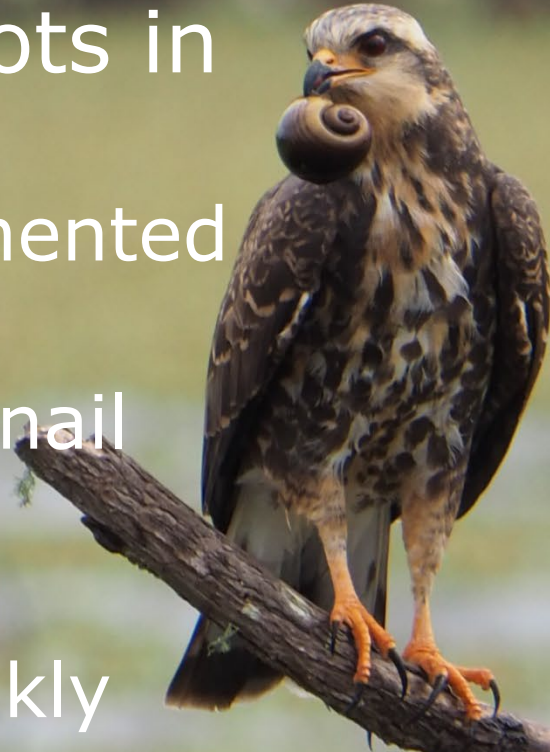
Benefits

- Cost-effectively improves water quality and meets TMDL for Alachua Sink
- Removes trash and sediment
- Rehydrates 1,300 acres of prairie wetlands
- Restores portion of prairie water budget
- Creates diverse wildlife habitat
- Creates new City of Gainesville park



- One of most popular bird & wildlife observation spots in Florida

- 250 Bird species documented
- >6,000 Ebird entries
- Largest population of Snail Kites in US
- 80,000 visitors/yr
- Ranger led tours & weekly Audubon bird walks



Questions?

