#061100

A Conceptual Plan for Restoring Sweetwater Branch Sheetflow to Paynes Prairie

April 9, 2007

Presentation Outline

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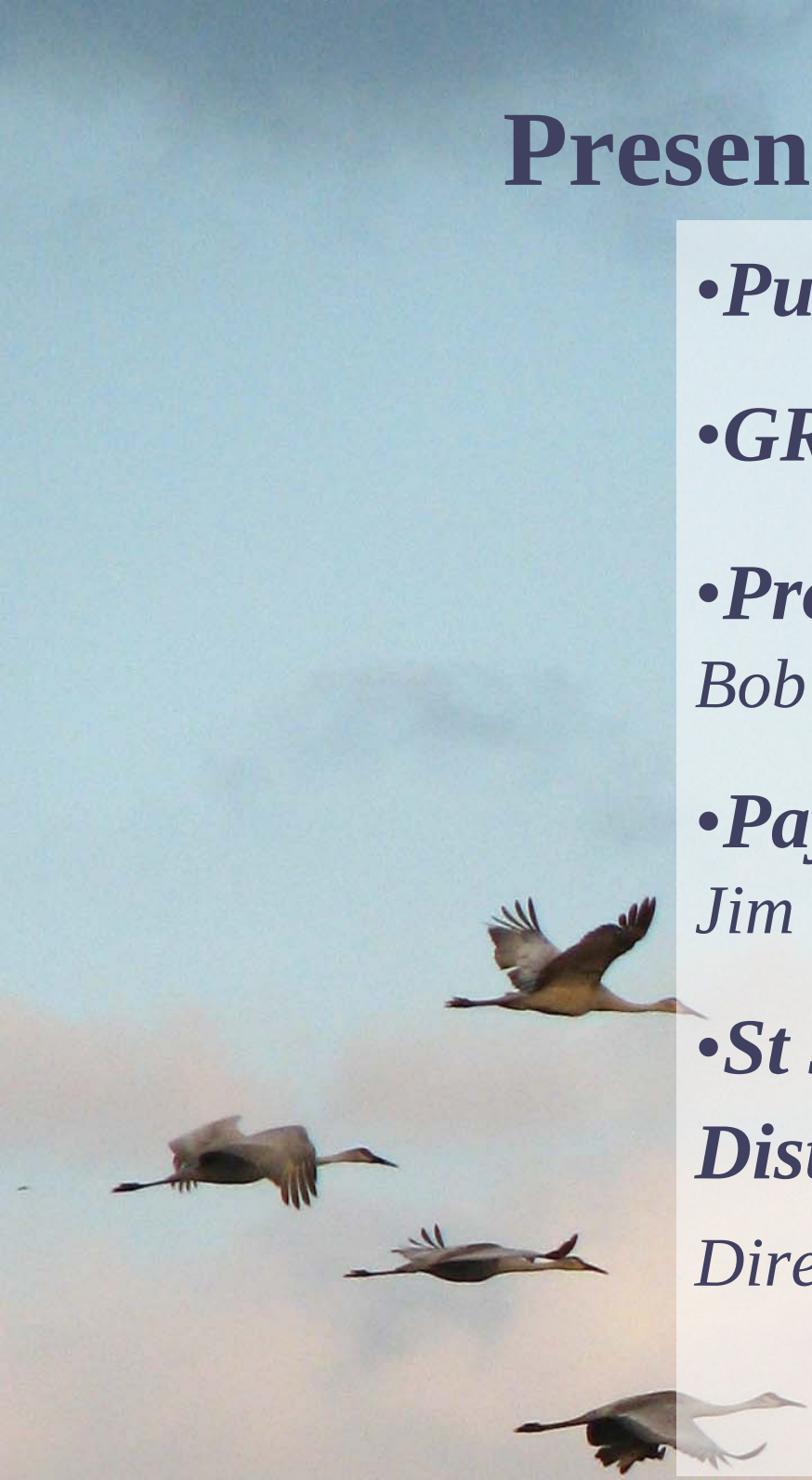
- ***Public Works - Project Background***
- ***GRU Perspective***
- ***Project Description***
  Bob Knight, Wetland Solutions, Inc.
- ***Paynes Prairie State Park Preserve***
  Jim Weimer, Park Biologist
- ***St Johns River Water Management District*** *Casey Fitzgerald, Assistant Director Department of Water Resources*



Project Background

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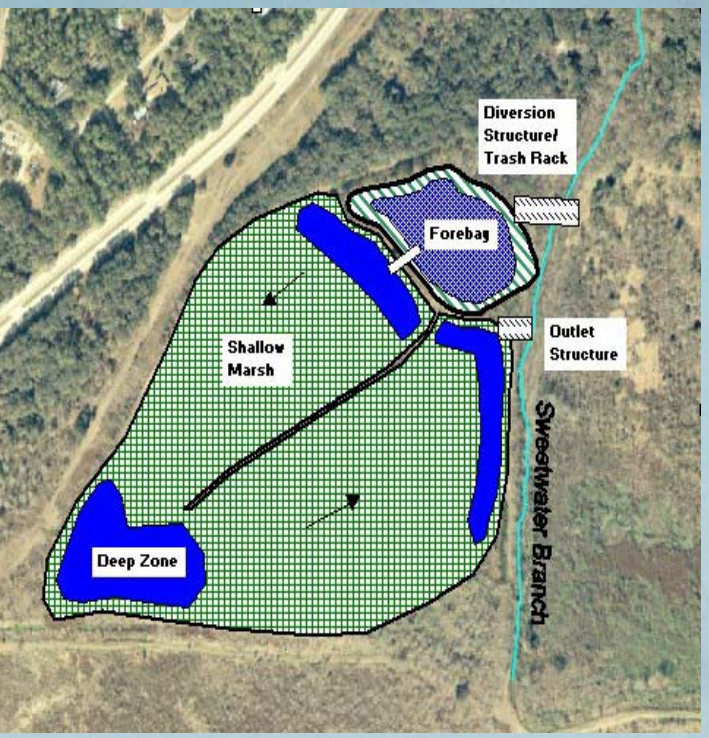

- *1992 Stormwater Management Master Plan*
- *2004 Watershed Management Plan Update – Getting ready for TMDLs*
- *2004 50 acre Wetland Project added to the CIP*
- *2005 Land Exchange Between SJRWMD and Paynes Prairie halted*
- *Find a solution that will restore sheetflow onto the Prairie*

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Pollutant Load Reductions

Sweetwater Branch

Water Quality Improvement Projects

	Total Surface Area (acres)	Total N (lb/year)	Total P (lb/year)
2 Existing Basins	4.1	376	142
9 Identified Basins	26.2	1,821	387
Enhancement Wetland	125.0	125,000	2,900

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Slides Presented at 2007/2008 GRU Budget Presentation

Total Maximum Daily Load

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- TMDL Finalized for Alachua Sink
- Basin Management Action Plan (BMAP) – 12/06
- Stakeholder Group Developing BMAP:
  - Gainesville Public Works
  - Alachua County Public Works
  - Marion County
  - DEP (DWRM, NE District, Parks, Aquatic Plant Management)
  - DOH
  - FWCC
  - Sierra Club
  - Sustainable Alachua County
  - City Water Management Committee
  - DACS Agriculture
  - Forestry Industry
  - GRU
  - Alachua County EPD
  - Town of McIntosh
  - DOT
  - DCA
  - UF
  - Women for Wise Growth
  - County EPAC
  - SJRWMD
  - DACS Forestry
  - Private Sector
  - Town of Micanopy
- BMAP will be Signed by all Stakeholders
- BMAP will be Adopted by FDEP Secretarial Order

Basin Management Action Plan

- Facility Cost for GRU to Meet the BMAP could range from $10 to $40 Million
- GRU Facilities would Accomplish 26% of Required Reduction
- 69% of Required Reduction from Natural Systems

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Basin Management Action Plan

- Uncertain if/how Reductions from Natural Systems will be Accomplished
- Uncertain if Utility Expenditures would Improve Water Quality at Alachua Sink if other Reductions not Accomplished

- FDEP will Request that City Commission Commit to BMAP Projects
- Could Increase Wastewater Rates Additional 4% to 17%

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GRU
Compliance with Alachua Sink TMDL

Outline

- TMDL Explanation
- Alachua Sink TMDL Development
- GRU's Alternatives for meeting TMDL
- Project Costs

Total Maximum Daily Load (TMDL)

- Mandated by EPA and FDEP
- Sets maximum allowable pollutant loads to “impaired” water bodies
- Requires all sources to reduce loads of pollutant(s) causing water body to impaired
- Basin Management Action Plan (BMAP) establishes how TMDL will be met

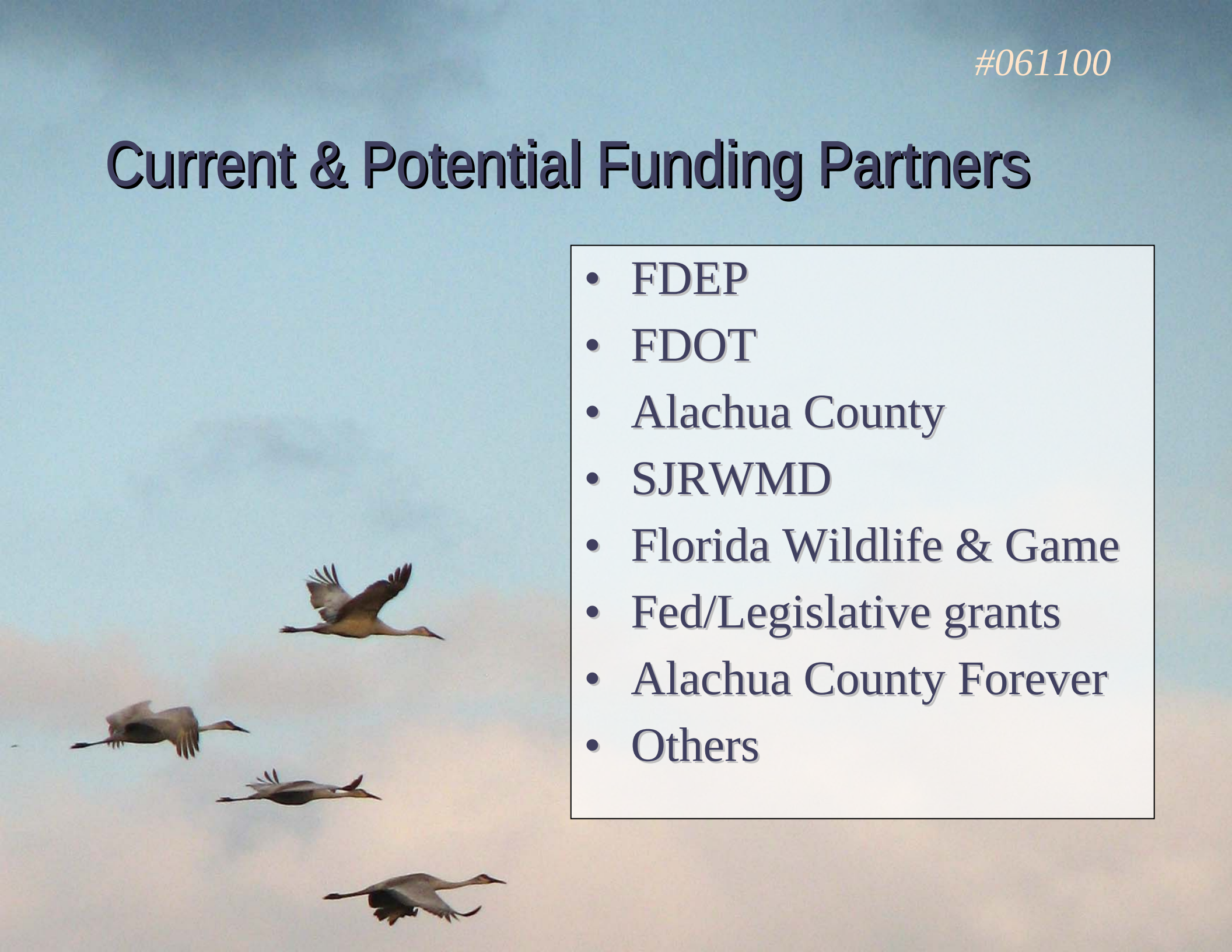
Alachua Sink TMDL

- TMDL for Total Nitrogen (Jan 2006)
  - Wastewater (MSWRF) — 55% N reduction
  - Stormwater — 45% N reduction
  - Other Sources — 45% N Reduction

GRU Alternatives to Meet Alachua Sink TMDL

- Water Reuse from MSWRF
  - 5.8 mgd reuse
    - Rapid Infiltration Basis
    - Irrigation/Public Access Reuse
  - $21-$35 M
- Proposed Sweetwater Branch/Paynes Prairie Sheetflow Restoration Project
  - $20-25 M estimated total cost
  - Cost share between GRU & PWD & other funding partners

Current & Potential Funding Partners



- FDEP
- FDOT
- Alachua County
- SJRWMD
- Florida Wildlife & Game
- Fed/Legislative grants
- Alachua County Forever
- Others

Preliminary Costs

- Approximate City Cost ~$21M
  - Additional outside funding sought
  - Not including public access facilities
- GRU & PWD split of City's costs
  - Cost for each project component split based on design load from each source
  - Agreement on allocating grants
  - ***Preliminary*** Cost split:

	GRU	PWD
» Capital	73%	27%
» O&M	80%	20%

Summary

- Alachua Sink TMDL
  - 55% N reduction from MSWRF
  - 45% N reduction from stormwater & non-point sources
  - Will be binding in GRU MSWRF & PWD Stormwater permits
- SWB/PP Restoration
  - Meets TMDL for GRU, PWD, FDOT
  - Cost-effective compared to reuse alternative
  - Environmental & Public benefits
  - Optimize outside funding partners/sources
  - Partnership

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A Conceptual Plan for Restoring Sweetwater Branch Sheetflow to Paynes Prairie

Robert Knight, Ph.D.
Wetland Solutions, Inc.

April 9, 2007

Presentation Outline

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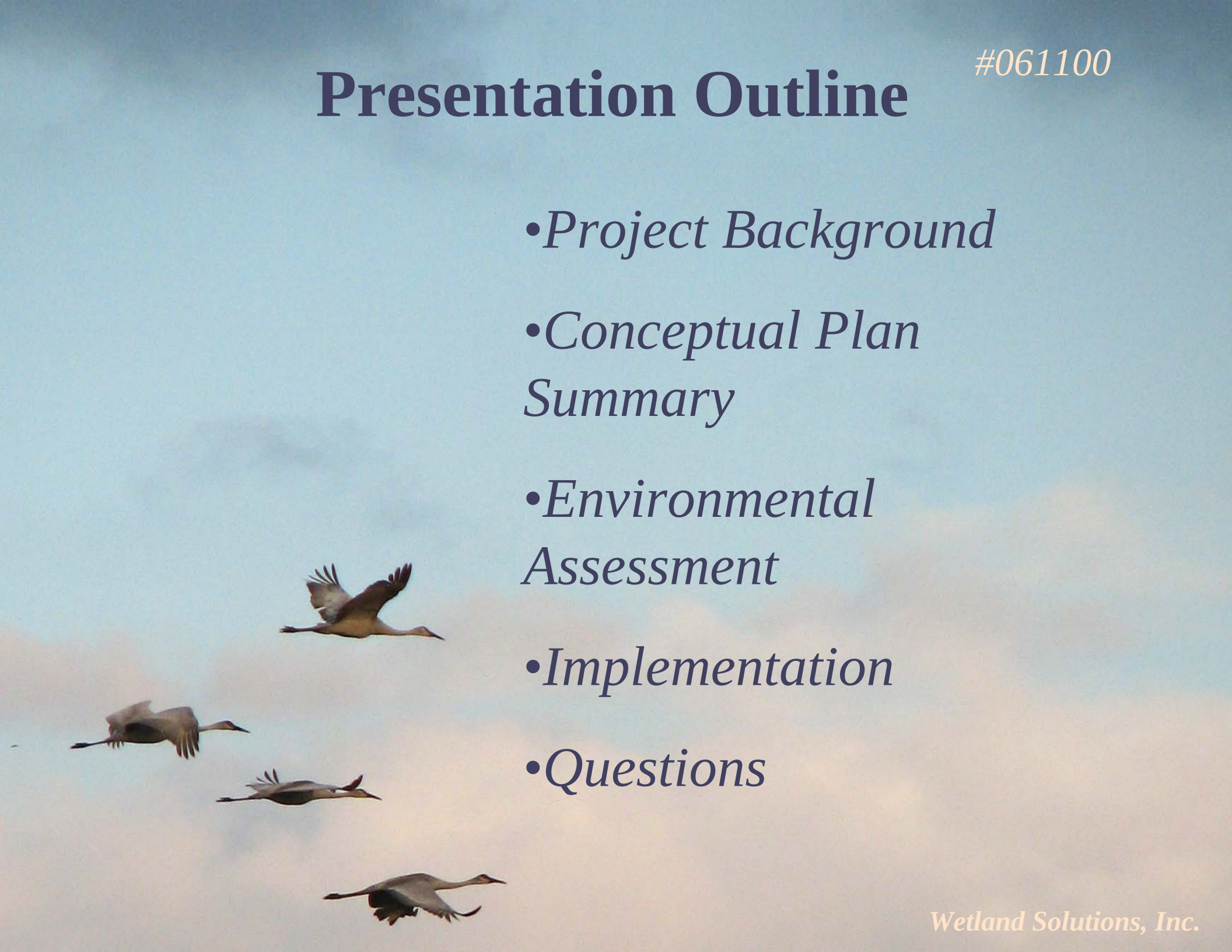
- *Project Background*
- *Conceptual Plan Summary*
- *Environmental Assessment*
- *Implementation*
- *Questions*



Project Location

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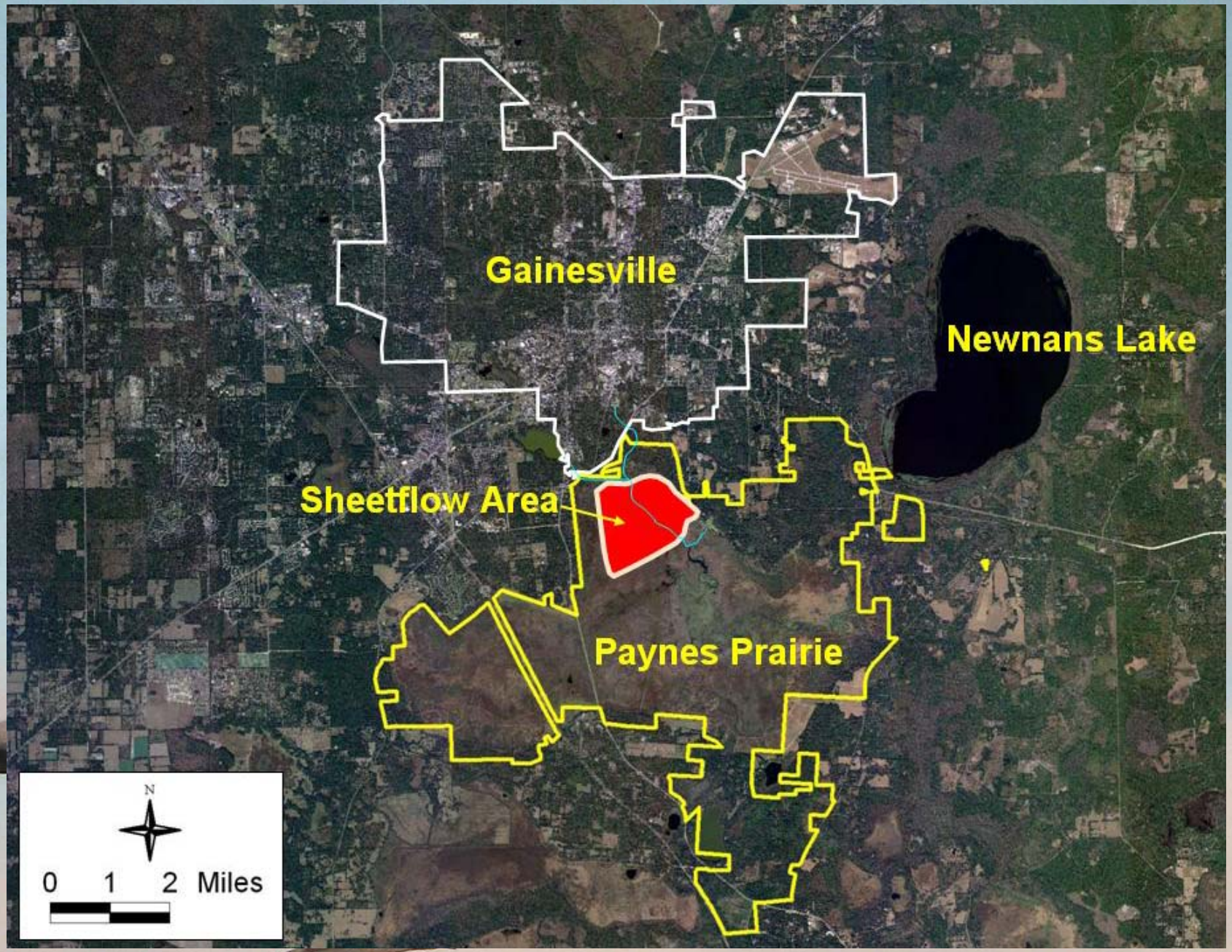

Description of the Problem

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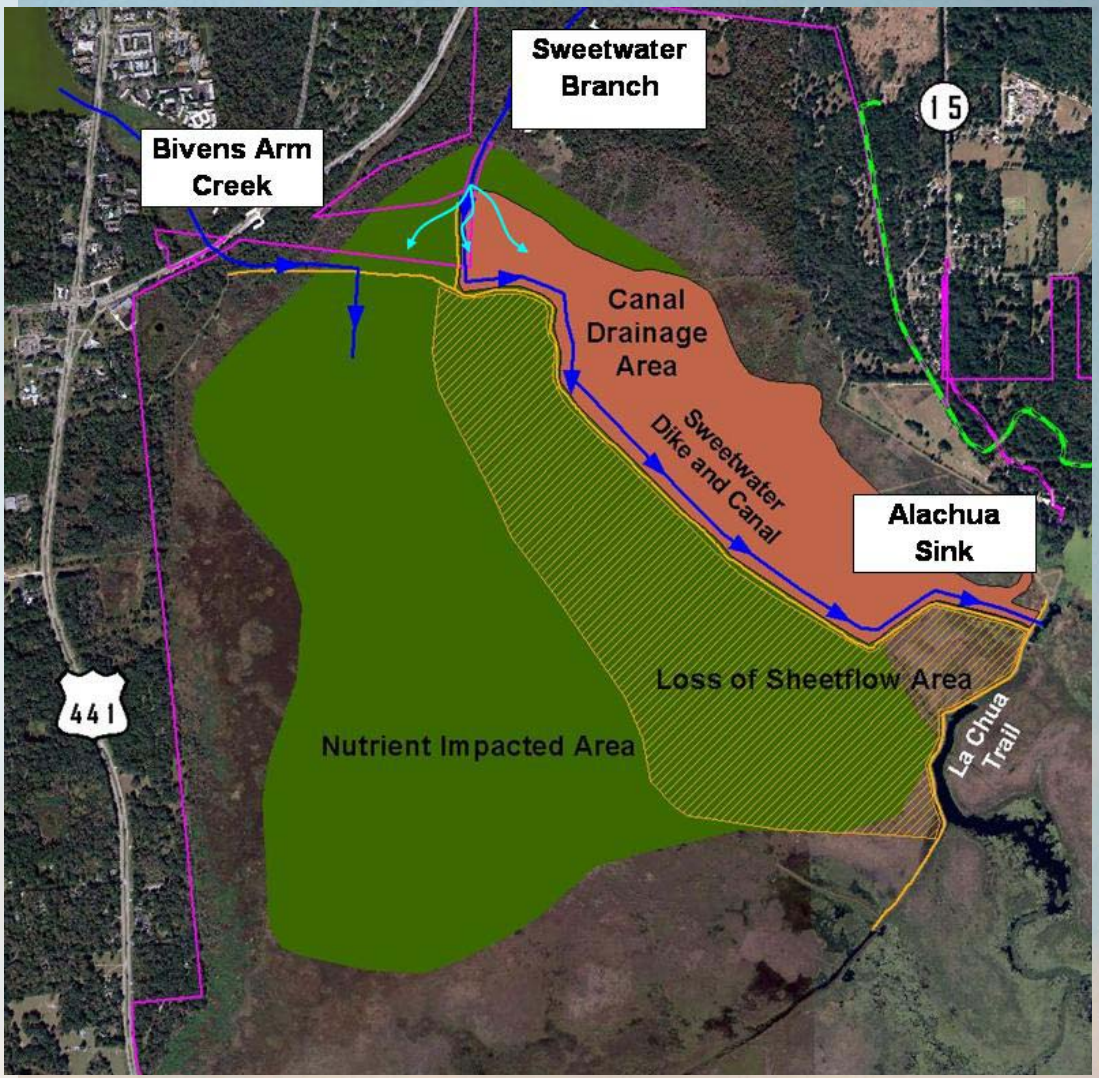
- *Sweetwater Branch Channelized Directly to Alachua Sink*
- *Increased Nutrients on Paynes Prairie due to Main Street WRF and Gainesville Stormwater*
- *Natural Sheetflow of Sweetwater Branch Lost, Resulting in Shortened Hydroperiod*
- *Estimated Impact Area 1,300 acres*



Project Background
Previous Studies

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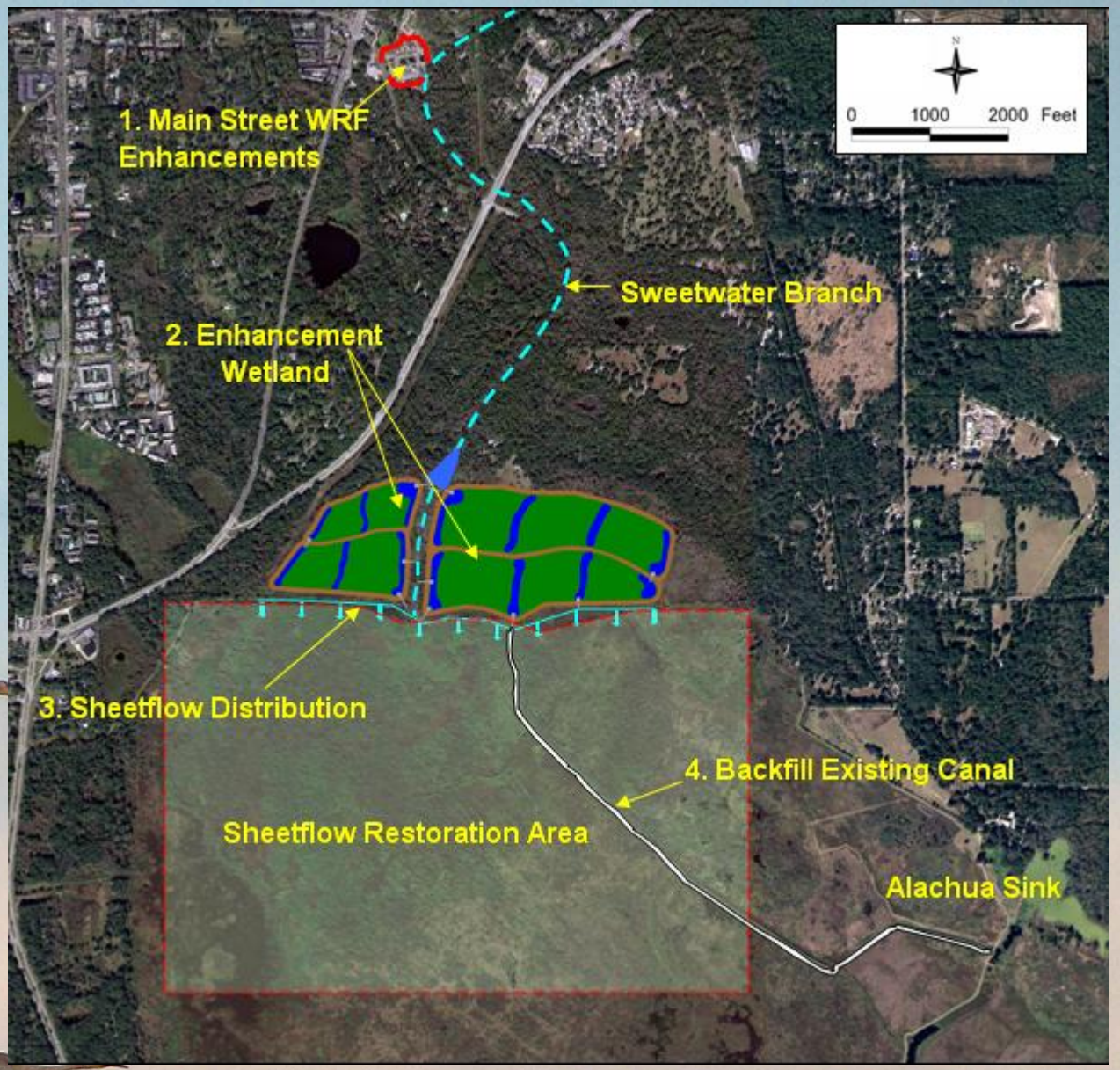
- *Paynes Prairie Management Plan (1970s)*
- *Wastewater Polishing Studies (1980s)*
- *Sheetflow Restoration (1990s)*
- *Watershed Management Plans (2003)*
- *Updated Sheetflow Feasibility (June 2006)*
- *Nutrient Removal Alternatives (Dec. 2006)*

Sheetflow Conceptual Plan #061100

Principal Plan Components

1. *Main Street WRF Upgrades*
2. *SWB Enhancement Wetland*
3. *Sheetflow Distribution*
4. *Backfill SWB Canal*



Sheetflow Conceptual Plan #061100

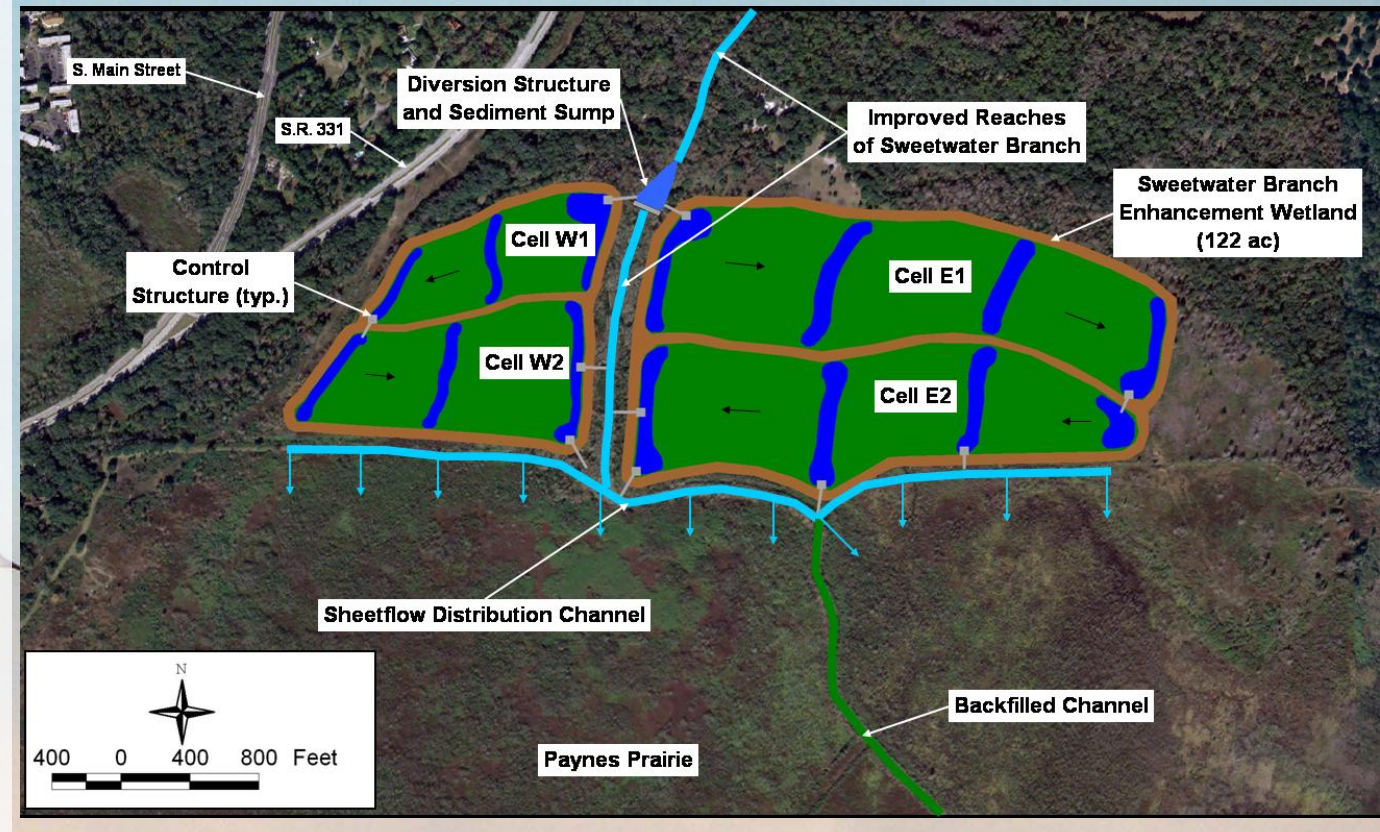
Main Street WRF Upgrades

- *Chemical (alum) P removal to TP <0.3 mg/L*
- *N optimization through mechanical equipment upgrades to TN <8 mg/L*

Sheetflow Conceptual Plan #061100

Sweetwater Branch Enhancement Wetland

- *Located offline*
- *Channel diversion structure w/sediment pond*
- *Four cells in two trains*
- *122 ac wet area*
- *Emergent marsh/open water*



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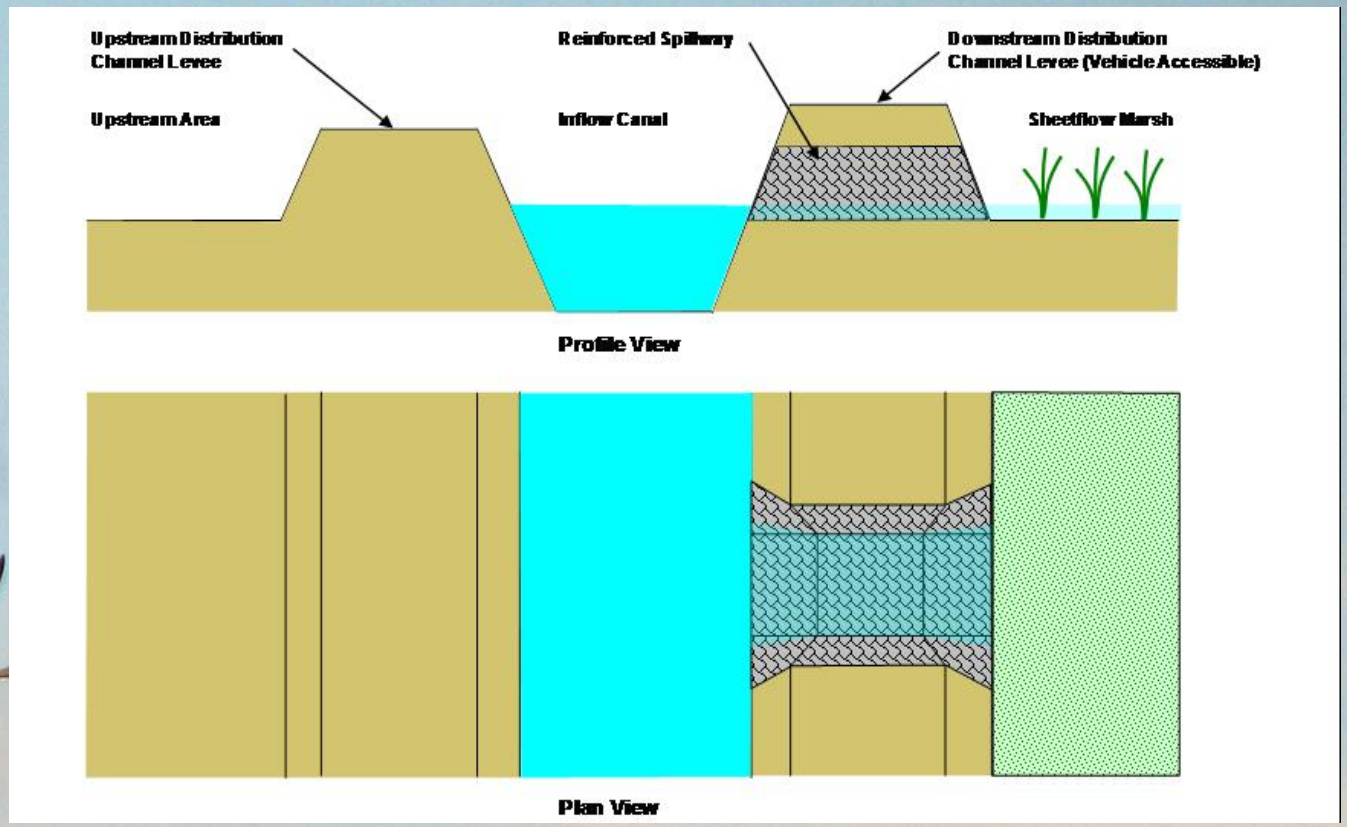
Sheetflow Conceptual Plan #061100

Sheetflow Distribution Channel

- *Mostly on Existing Channel Footprint*
- *5,000 ft in Length*
- *40-ft Bottom Width*
- *11 Outlet Spillways*



Sheetflow Conceptual Plan

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Sweetwater Canal Restoration

- *Backfill about 10,000 ft of existing Sweetwater Branch Canal*
- *Replant 33 ac with native wetland vegetation*
- *Eliminate direct connection to Alachua Sink*

Environmental Assessment

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- *Water Quality Benefits*
  - *Exceeds total N TMDL*
  - *Achieves background total N and P on Prairie*
  - *Removes suspended sediment loads from Prairie*
- *Hydrologic Restoration Benefits*
  - *Restores Sweetwater Branch sheetflow to about 1,300 ac*
  - *Reduces current water deficit on Prairie*

Environmental Assessment (cont.)

- *Wetlands Restoration*
  - *Removes 10,000 ft of Sweetwater Branch Canal, restores pre-existing grade, and re-plants native emergent wetland vegetation on 33 ac*
  - *Removes woody vegetation in vicinity of Sheetflow Distribution Channel and re-plants emergent wetland vegetation on about 10 ac*
- *Wetlands Creation*
  - *Creates 100+ ac of high-value emergent marsh and aquatic habitat in formerly impacted areas*

Public Use Benefits

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- *Sweetwater Branch Wetland Park*
  - *Hiking trails*
  - *Environmental education*
- *Sheetflow Area*
  - *Prairie overview*

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Comparable Constructed Wetlands

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Orlando Wilderness Park

- *Start 1987*
- *1,200 ac*
- *Reuse to St. Johns River*

Orlando Wilderness Park

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- *TN reduced from 2.4 to 0.8 mg/L*
- *TP reduced from 0.28 to 0.06 mg/L*

Indian River County Wetland

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- *Start 1996*
- *135 ac*
- *Reuse to Indian River Lagoon*

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Indian River County Wetland

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Questions?

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Paynes Prairie Preserve State Park

Jim Weimer, Park Biologist

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Sweetwater Branch / Paynes Prairie Sheetflow Restoration

A Partnership With The St. Johns River Water Management District

Casey Fitzgerald, Assistant Director

Department of Water Resources

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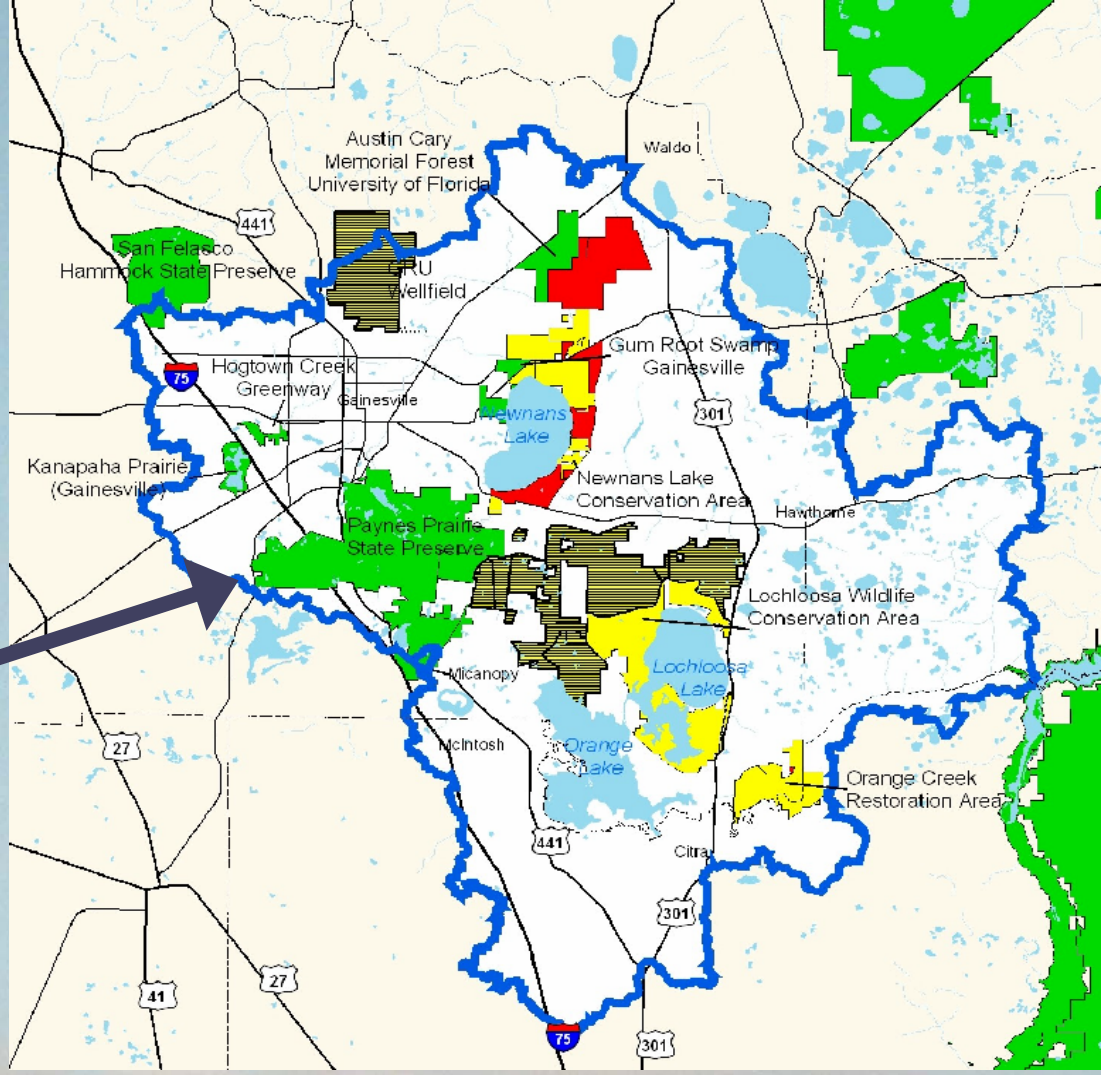
Paynes Prairie



- an Outstanding Florida Water, State Park, and National Natural Landmark
- in the Orange Creek Basin “Surface Water Improvement and Management” (SWIM) program

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St. Johns River Water Management District *Participation*

COST-SHARING

- ***To date, obtained $850,000 in legislative appropriations for construction of enhancement wetland***
- ***Cost-share with City on purchase of land to lease or exchange for enhancement wetland site***

PERMITTING

- ***District will review Environmental Resource Permit applications for project construction in wetlands***

Project Benefits

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- *Water Quality Benefits*
  - *Exceeds total N TMDL*
  - *Achieves background total N and P on Prairie*
  - *Removes suspended sediment loads from Prairie*
- *Hydrologic Restoration Benefits*
- *Wetlands Restoration*
- *Wetlands Creation*
- *Public Recreation Opportunity*

Next Steps

- Develop Land Exchange MOU
- Develop PW / GRU Cost Share MOU
- Seek Grants and New Project Partners
- Begin Consultant Selection for Project Design

Planning-Level Cost Estimate

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Project Component	Construction Cost ($)	Mobilization, Contingency, Engineering ($)	Capital Cost ($)	Operation & Maintenance Costs ($/yr)
Main Street WRF Upgrades	$ 1,300,000	$ 650,000	$ 1,950,000	$ 640,000
Sweetwater Branch Channel Improvements	$ 831,600	$ 415,800	$ 1,247,400	$ -
Sweetwater Branch Sediment Forebay/Trashrack/Weir Diversion Structure/Sediment Removal	$ 485,450	$ 242,725	$ 728,175	$ 150,000
Sweetwater Branch Constructed Wetland	$ 7,320,600	$ 3,660,300	$ 10,980,900	$ 150,000
Sheetflow Distribution Channel	$ 2,898,702	$ 1,449,351	$ 4,348,053	$ 75,000
Sweetwater Branch Canal Restoration	$ 657,890	$ 328,945	$ 986,835	$ -
Public Use Amenities	$ 1,850,000	$ 925,000	$ 2,775,000	$ 150,000
Project Monitoring	$ 14,000	$ 7,000	$ 21,000	$ 100,000
Estimated Total	**$ 15,358,242**	**$ 7,679,121**	**$ 23,037,363**	**$ 1,265,000**

Note: Assumes mobilization, contingency, engineering = 0.5 x construction cost