



Hierarchy 1 Numeric Nutrient Criteria for Sweetwater Branch

**Level II Water Quality Based Effluent Limitations for
Gainesville Regional Utilities' Main Street Water Reclamation
Facility and Kelly Generating Station**

**Florida Department of Environmental Protection
June 21, 2022**



Agenda

- **Introduction**
- **Purpose**
- **Sweetwater Wetlands Project Background**
- **Water Quality Based Effluent Limit (WQBEL)**
Development Overview
 - Stream Characterization & Stressor Identification
 - Sweetwater Branch Modeling
 - Sweetwater Wetlands Modeling
 - Proposed WQBELs as NNC
- **Schedule**
- **Questions and public comments**



Webinar Logistics

- **Public participants will be muted during presentations**
- **To ask questions, use question box**
- **Questions will be answered at the end of the presentation, followed by public comments**
- **To make a public comment, use the “raise hand¹” function and we will unmute you individually**
- **Please provide your name and affiliation**
- **If you want to comment but don’t want to speak, you can type comment in question box**
- **Webinar will be recorded (typed questions and comments will also be part of public record)**

¹ Raise hand function will be disabled until comment period.



Purpose

- **Present proposed Level II WQBELs for GRU Main Street Water Reclamation Facility (MSWRF) and the John R. Kelly Generating Station (KGS) as the Hierarchy 1 site specific interpretation of the narrative nutrient criteria pursuant to sub-subparagraph 62-302.531(2)(a)1.d., F.A.C. for Sweetwater Branch**



Basic Concepts of FDEP's Nutrient Criteria

- **The narrative nutrient criterion in paragraph 62-302.530(48)(b), F.A.C., states that “in no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna.”**
- **The method for numerically interpreting this narrative nutrient criterion is provided in Rule 62-302.531, F.A.C.**
 - **Uses a hierarchical process for determining the NNC that apply to a given waterbody**



Hierarchical Approach

Hierarchy 1 (H1)



Site specific (Level II WQBELs, Nutrient Total Maximum Daily Loads, Nutrient Site Specific Alternative Criteria, Estuary-specific Criteria)



Stressor-Response Relationships (lakes and springs)



Reference stream-based thresholds combined with biological data (flora and fauna)



Narrative (wetlands, intermittent streams, South Florida flowing waters)

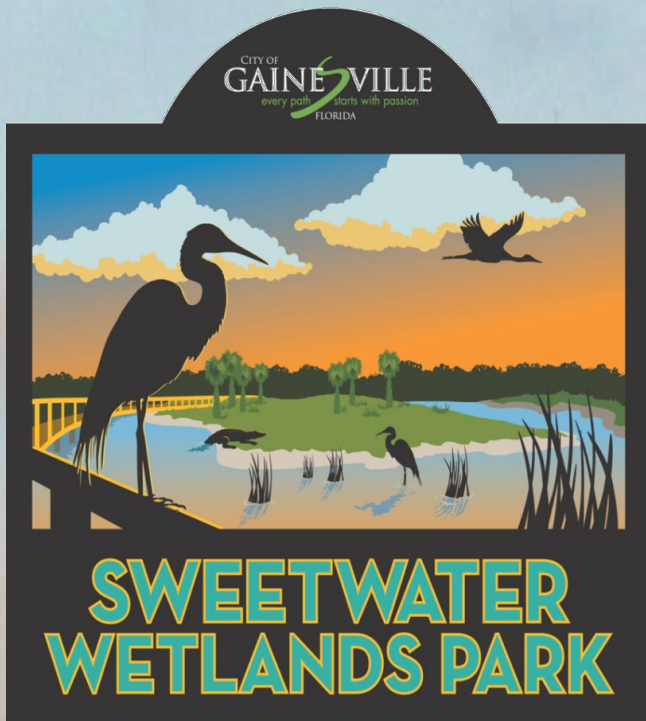


WQBELs in the Hierarchical Context

- **The Water Quality Based Effluent Limitation (WQBEL) process, pursuant to Chapter 62-650, F.A.C., is the mechanism for determining the levels of nutrients in a point source discharge (i.e., effluent nutrient limits) that attain the applicable nutrient criteria.**
- **For a Level II WQBEL to serve as an H1 interpretation of the narrative nutrient criterion, the WQBEL has to include both effluent limits for the discharge and the total allowable nutrient load to the receiving waterbody.**
- **The applicable interpretations, if available, include both nutrient [e.g., TN or TP] and response variables (e.g., chlorophyll *a*).**

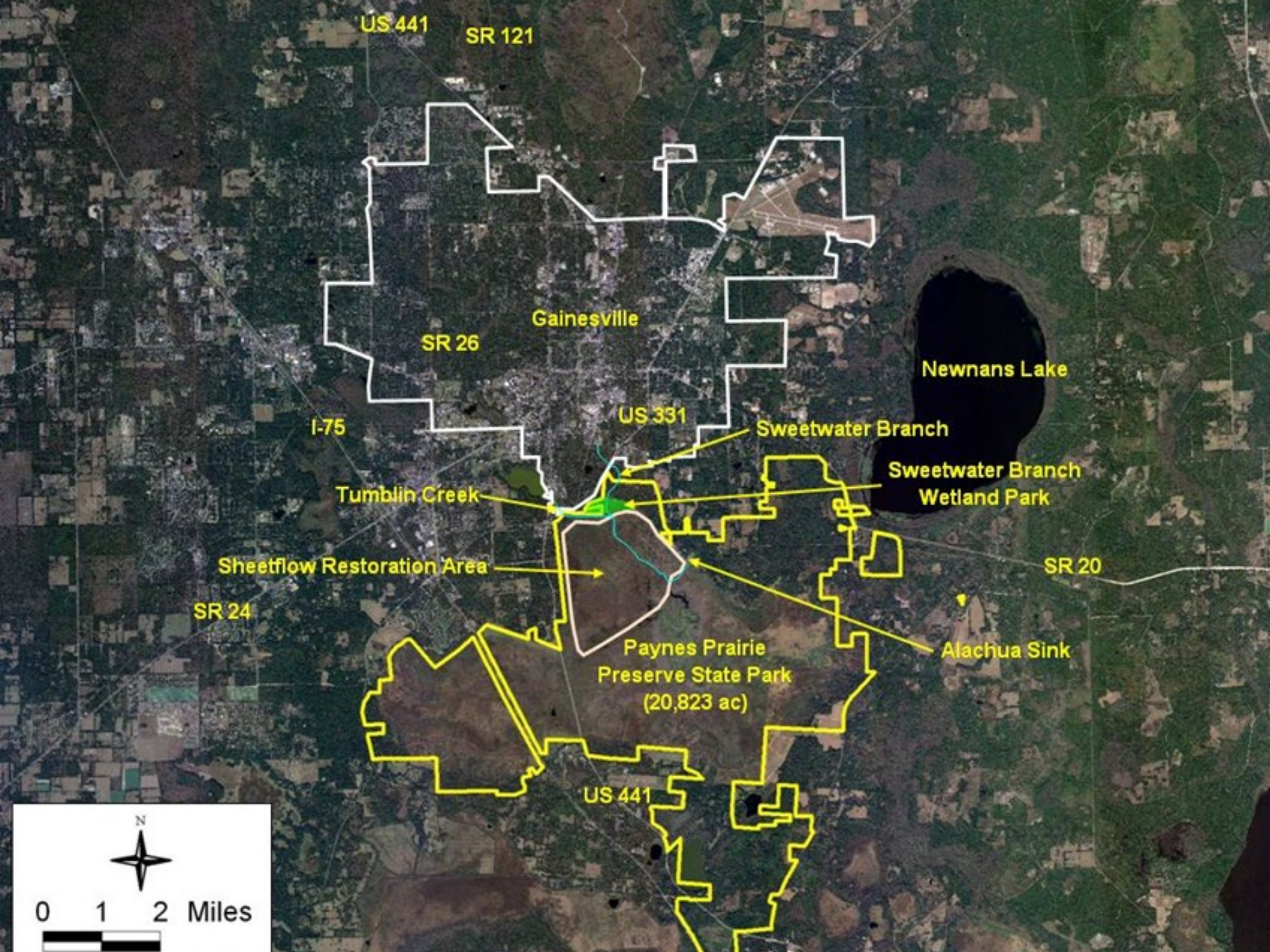
Sweetwater Wetlands Project: Proposed Water Quality Based Effluent Limits (WQBELs) to Protect Sweetwater Branch

Rick Hutton, PE
Gainesville Regional Utilities



Presentation Outline

- Review Sweetwater Wetlands Project Concept and Outcomes
- Why are WQBELs needed?
- Describe Proposed Numeric Nutrient Criteria



Pre-Project



Kelly Generating Station

Main Street WRF

Sweetwater Branch

Bivens Arm

Man-made canal

Alachua Sink

Paynes Prairie Preserve State Park

Newnans Lake

Prairie Creek Control Structure

Historical Impacts

- Urbanization of Watershed (1800s-)
 - Stormwater runoff
 - Trash & sediment
 - WW Effluent
 - Septic Tanks
- Sweetwater Branch channeled directly to Alachua Sink (1930s)
 - 1,300 acres of wetlands impacted.
 - Direct flow path from Gainesville to Alachua Sink
- Portion of Prairie Creek flow diverted away from Paynes Prairie
 - Water balance to Paynes Prairie impacted



Alachua Sink TMDL



- **2006 TMDL Adopted by FDEP**
 - 55% N Reduction in Point Sources
 - GRU Main Street WRF and JR Kelly Generating Station (KGS)
 - 45% N Reduction in Non-Point Sources
 - City of Gainesville MS4
 - FDOT & Alachua County
 - Other Non-point

Basin Management Action Plan

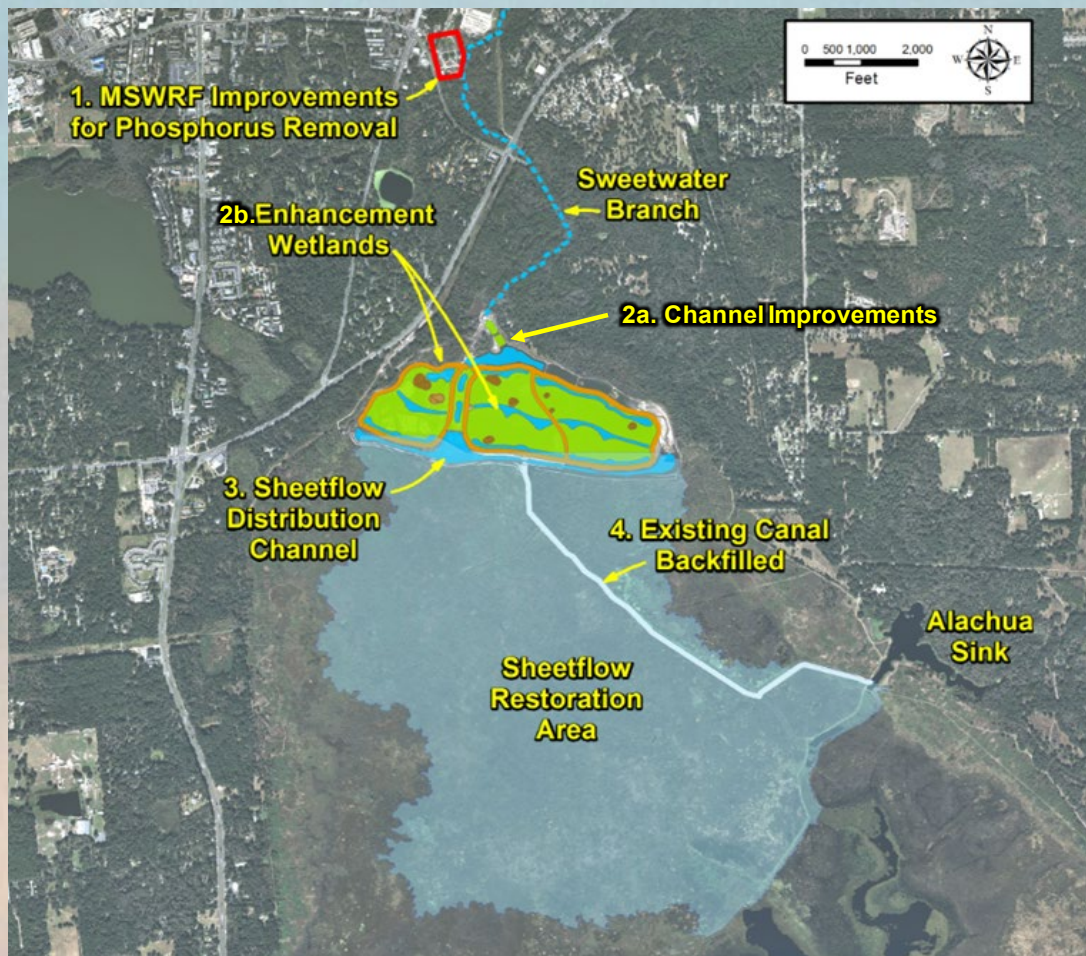
Orange Creek Basin

- **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
- FDOT
- DCA
- UF
- Women for Wise Growth
- Alachua County EPAC
- SJRWMD
- DACS Forestry
- Private Sector
- Town of Micanopy

- **BMAP Adopted by FDEP Secretarial Order**

Project Concept



- **Upgrade Main Street WRF for P Removal**
 - TP < 0.3 mg/l
- **Enhancement Wetland**
 - Reduce TN from all sources in SWB
 - TN < 3.0 mg/l
- **Re-establish Natural Flow Regime**
 - Sheetflow Dist Channel
 - Backfill Sweetwater Canal
- **Additional Nutrient Attenuation on Paynes Prairie**
 - TP < 0.09 mg/l
 - TN < 1.42 mg/l

Sweetwater Wetlands Project Goals

- Reduce N&P and meet TMDL for all sources in Sweetwater Branch (SWB) watershed
- Provide N & P removal to meet current & future needs of MS4, MSWRF & Kelly GS
- Improve water quality in Alachua Sink
- Remove trash & sediment
- Restore wetlands & water budget in Paynes Prairie Preserve State Park
- Create nature park

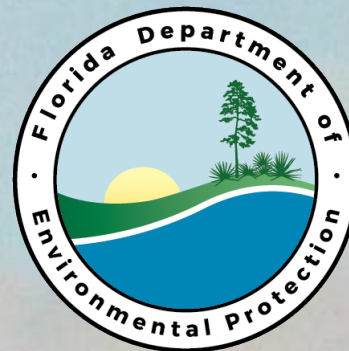
Sweetwater Wetlands Park

- GRU & Gainesville Public Works Joint project
- Completed 2015
- \$27.5 Million
- Operated as City park by Gainesville Parks Dept



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



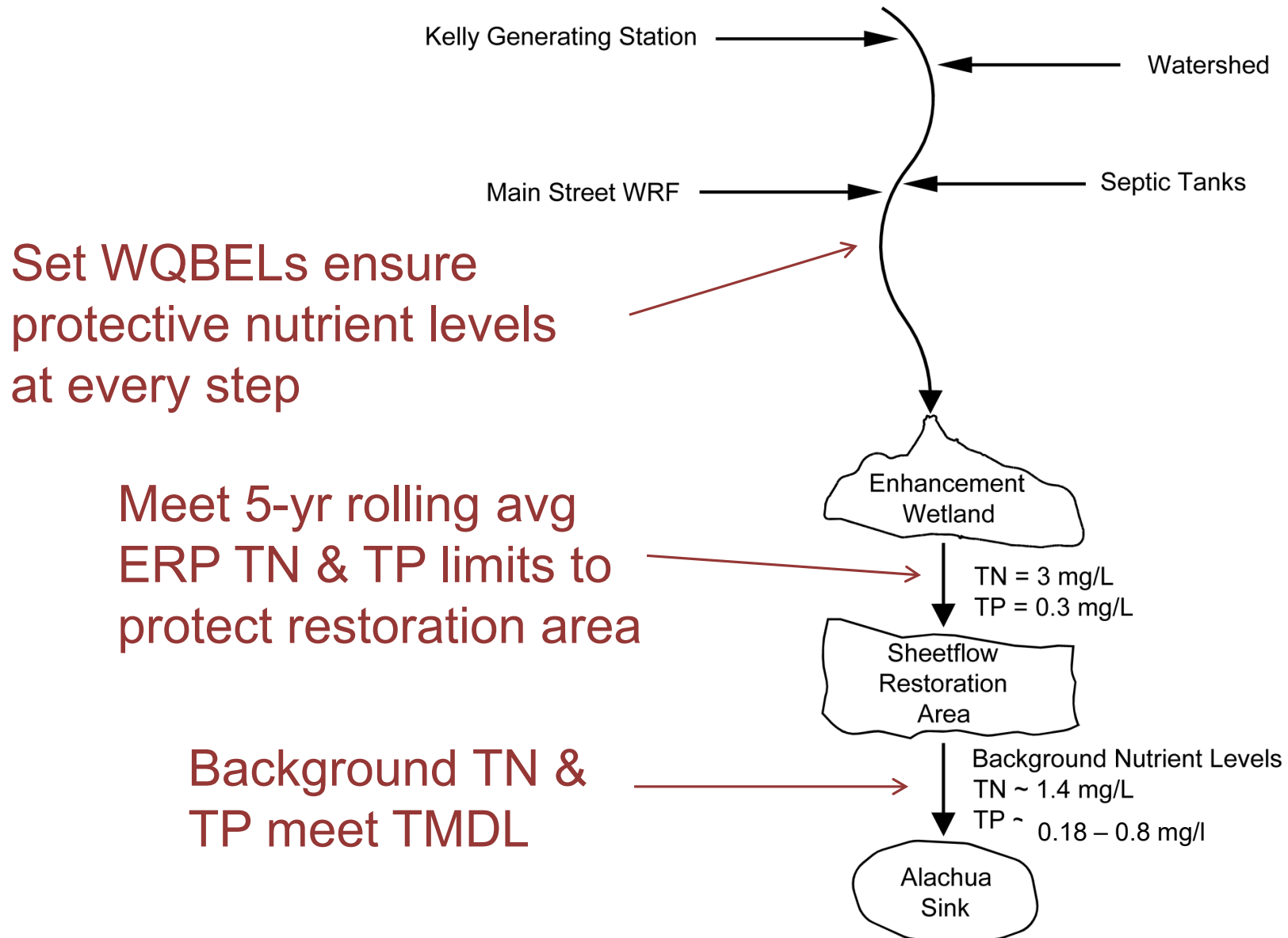
Sweetwater Wetlands Park— Gainesville, FL



Why are WQBELs Needed?

- Need to set nutrient limits for SWB itself to ensure its ecology will not be adversely affected by nutrients
 - ensure that Nutrient levels do not cause imbalance in flora and fauna
- WQBEL is mechanism to set water quality criteria for SWB & set permit limits for GRU's facilities that will ensure SWB & all downstream waters are protected
- GRU/City has been working with FDEP & EPA to develop WQBEL since start of the project

Project Nutrient Removal Concept



WQBEL Objectives

- Set TN & TP Criteria for Sweetwater Branch & discharge limits for MSWRF & Kelly
 - Provide allowance for stormwater and non-point source loads
- Ensure that:
 - Sweetwater Branch protected
 - TN & TP not impact flora & fauna
 - Paynes Prairie & Alachua Sink Protected
 - Meet Sweetwater Wetland discharge TN & TP limits
 - Meet TMDL for Alachua Sink
 - Meet Outstanding Florida Water rule for Prairie

WQBEL Evaluation Overview



- **Stream Characterization & Stressor ID**

- Physical, chemical, and biological data analyzed to determine health of SWB under current permitted conditions
- In-stream vegetation and algae measures (LVS, RPS, chlorophyll *a*) meet DEP stream requirements
- In-stream macroinvertebrate community does not meet expectations for streams due to channelization & smothering (not nutrients)
- Current nutrient levels not causing imbalance of flora or fauna in Sweetwater Branch

WQBEL Evaluation Overview

- **Sweetwater Branch Modeling**



- Modeling (QUAL2K) tested various potential future conditions to determine if higher TP and TN loading would cause imbalance in flora (attached algae)
- Proposed WQBELs and NNC for TN and TP will not cause imbalance of flora or fauna in SWB

WQBEL Evaluation Overview



- **Wetland Modeling**

- Modeling of nutrient removal through enhancement wetland & restoration area
- Original wetland project design provided capacity for future needs
- Wetland models run w/ proposed WQBEL conditions to verify:
 - Meet Sweetwater Wetland discharge TN & TP limits
 - Meet TMDL for Alachua Sink
 - Meet Outstanding Florida Water rule for Prairie

Summary

- Sweetwater Wetlands Project
 - Captures and treats pollutants from all sources in Sweetwater Branch watershed
 - Flow of clean water onto Paynes Prairie helps to restore wetlands & maintain water balance
- WQBEL
 - Sets nutrient criteria for Sweetwater Branch to ensure flora & fauna protected from nutrient impacts
 - Rigorous field testing and modeling done to verify appropriate criteria
 - Sets nutrient limits for GRU Main Street WRF and Kelly Generating Station



Proposed Level II WQBELS

WQBELS	TN (lbs/yr)	TP (lbs/yr)	TP (mg/L)	Chlorophyll a (µg/L)
MSWRF WQBELS	182,646	11,644	-	-
KGS WQBELS	3,060	843	-	-
Stormwater Loads	29,910	3,551	-	-
Sweetwater Branch H1 NNC	215,616	16,038	0.3	1.9



Proposed Level II WQBELs

- **Achievement of floral measures under current conditions downstream of outfalls**
- **Stressor ID evaluation provided supporting evidence that while Sweetwater Branch (in-stream fauna) was adversely affected by artificial channelization, habitat disturbance, and sedimentation, its flora and fauna were not being impaired due to nutrients.**
- **Modeling of flow conditions and anticipated nutrient concentrations provides reasonable assurance that in-stream flora will be protected, and the facilities will comply with the ERP Permit, Alachua Sink TMDL, and be protective of downstream waters**



Spatial Extent of Sweetwater Branch Level II WQBELs





Schedule

- **Written comment period through July 5th, 2022**
- **Send comments to Avril Wood-McGrath at**
 - **Avril.Wood-McGrath@FloridaDEP.gov, or**
 - **2600 Blair Stone Road, Mail Station 6511, Tallahassee, FL 32399-2400**
- **Final Order process at state level**
- **Submittal to EPA for approval as a change to water quality standards**
- **Subsequent modification of MSWRF and KGS permits**

