

Surface Water Improvement and Management (SWIM) Plan Update



St. Marks River and Apalachee Bay Watershed

January 26, 2017



Surface Water Improvement and Management (SWIM) Program

Created through passage of the Surface Water Improvement and Management Act in 1987; Sections 451-459, Florida Statutes.

Purpose: Developed to address major watershed (coastal/ surface water) issues throughout the State.

Plans will provide:

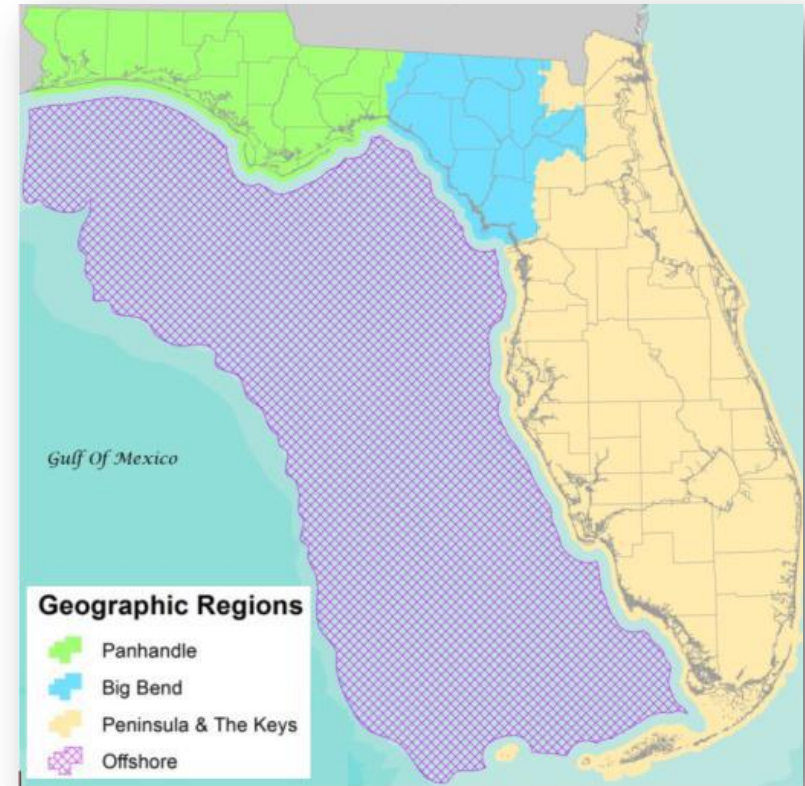
- Watershed description;
- Assessment of watershed and water resource conditions;
- Evaluation of accomplishments and improvements since previous SWIM Plan;
- Project plan to address identified watershed needs and challenges; and
- Estimate funding needs and funding alternatives.

Gulf Environmental Benefit Fund (GEBF)

GEBF Restoration Strategy:

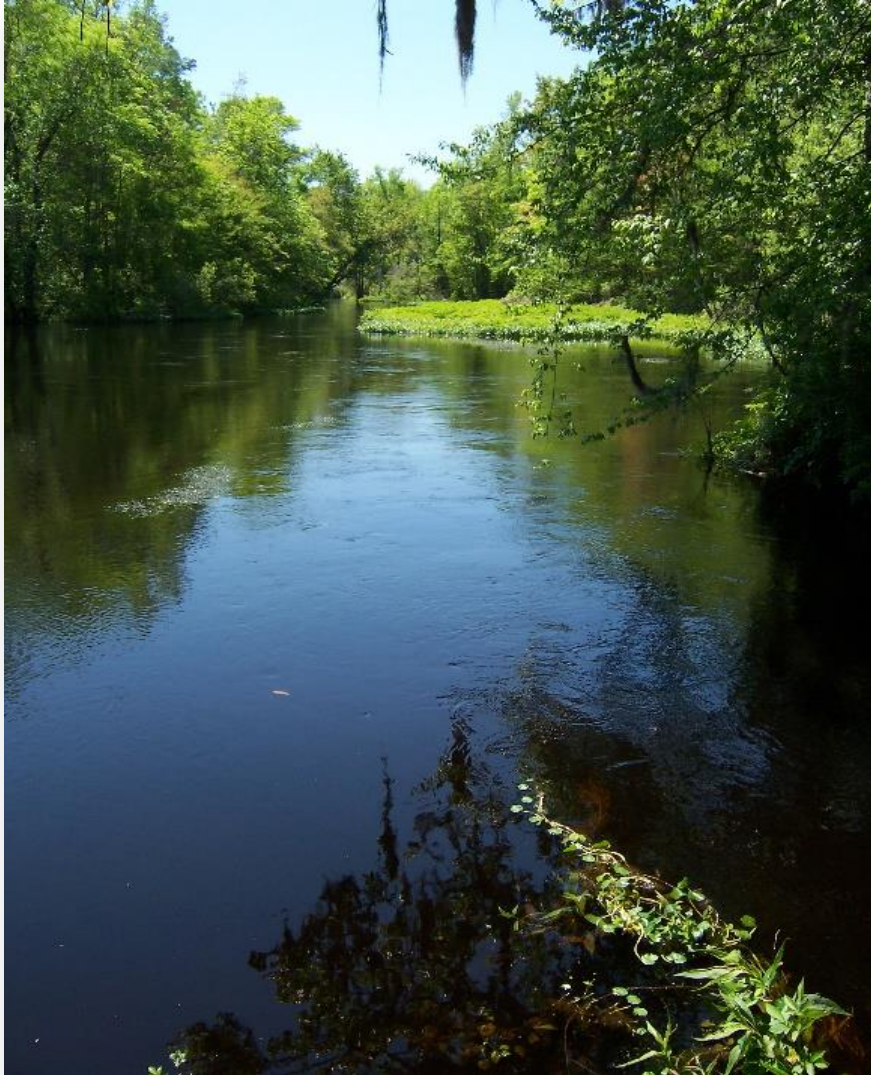
- SWIM Plan Updates (NWF & Suwannee WMDs).
- Seagrass Assessment (Fish and Wildlife Research Institute).

Goal: Prioritized Project List





St. Marks River & Apalachee Bay Watershed





St. Marks River & Apalachee Bay Watershed

- Approximately 748,800 acres
- 91% in Florida
- Conservation lands encompass about 34% of the watershed in Florida
- Diverse water resources: karst landscape, Floridan aquifer springs, spring run streams, tidal creeks, and major estuarine system
- 2010 watershed population estimated at over 263,000 in Florida alone



St. Marks River & Apalachee Bay Watershed

- Combined groundwater contribution area extends well to the north and east
- Woodville Karst Plain encompasses approximately 44% of the surface watershed
- Three First Magnitude Springs:
 - Wakulla Spring
 - St. Marks River Rise
 - Spring Creek Springs Group
- Three Second Magnitude Springs



St. Marks River & Apalachee Bay Watershed

- Big Bend Seagrasses Aquatic Preserve – largest of Florida’s aquatic preserves encompassing the largest seagrass beds in the state
- Over 149,000 acres of seagrasses mapped by FWRI in the northern Big Bend of Florida; over 200,000 acres in total estimated
- Over 137,000 acres of coastal marsh regionally
- Oyster fishery, including Oyster Bay and Dickerson Bay





Watershed Challenges



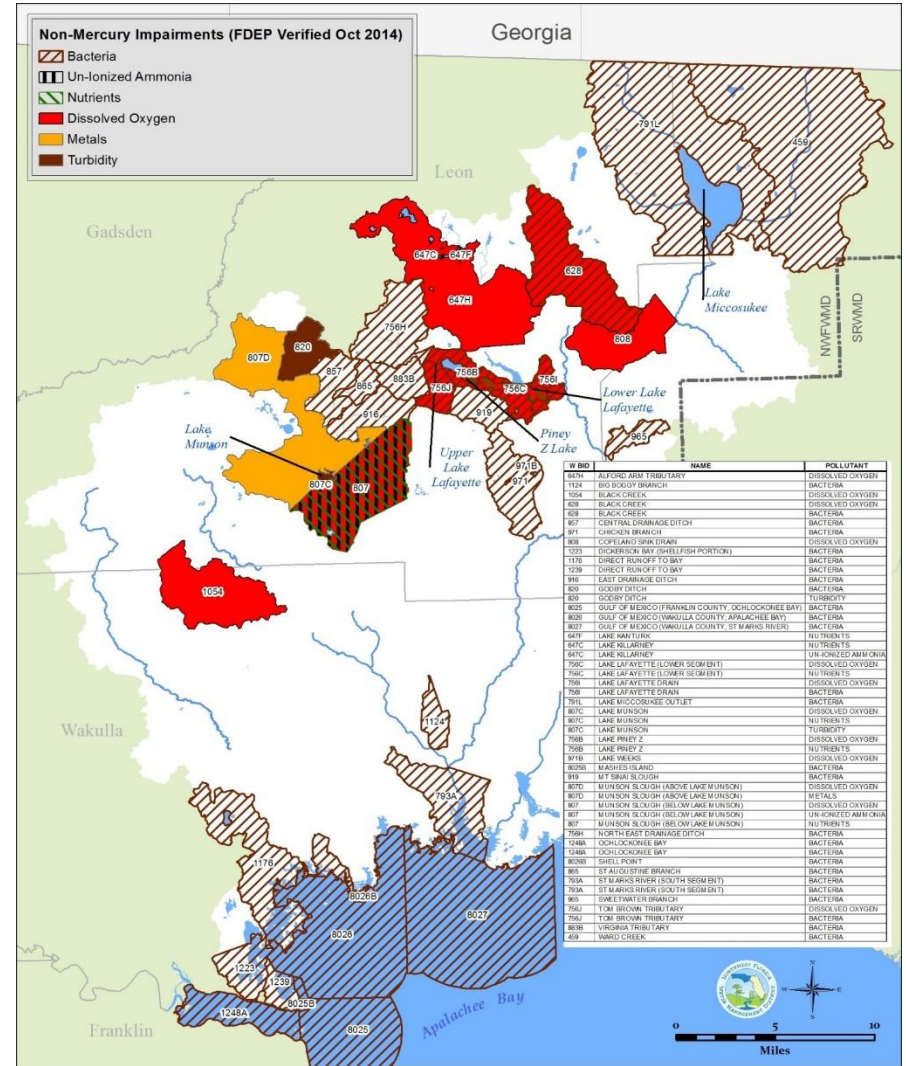
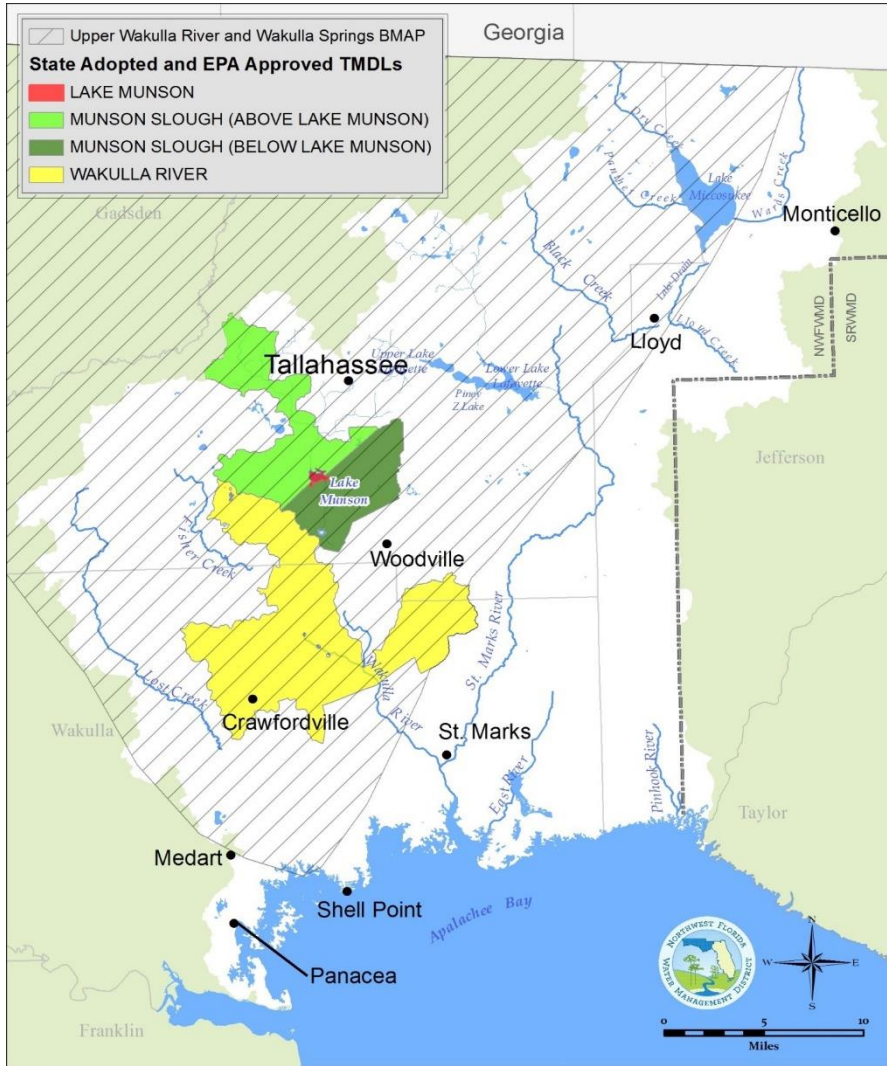


Watershed Challenges

- Water quality
 - Elevated nitrate concentrations at Wakulla Spring, manifested through biological impacts (including hydrilla and filamentous algae growth) in the Wakulla River
 - Basin Management Action Plan (BMAP) adopted for nutrients – Wakulla Springs basin and upper Wakulla River
 - Potential water quality concerns identified in Apalachee Bay, associated with deterioration of seagrass beds – thinning and conversion of beds from continuous to patchy.
 - Water quality impairments in Lake Munson and Lake Lafayette complex



Watershed Challenges





Watershed Challenges

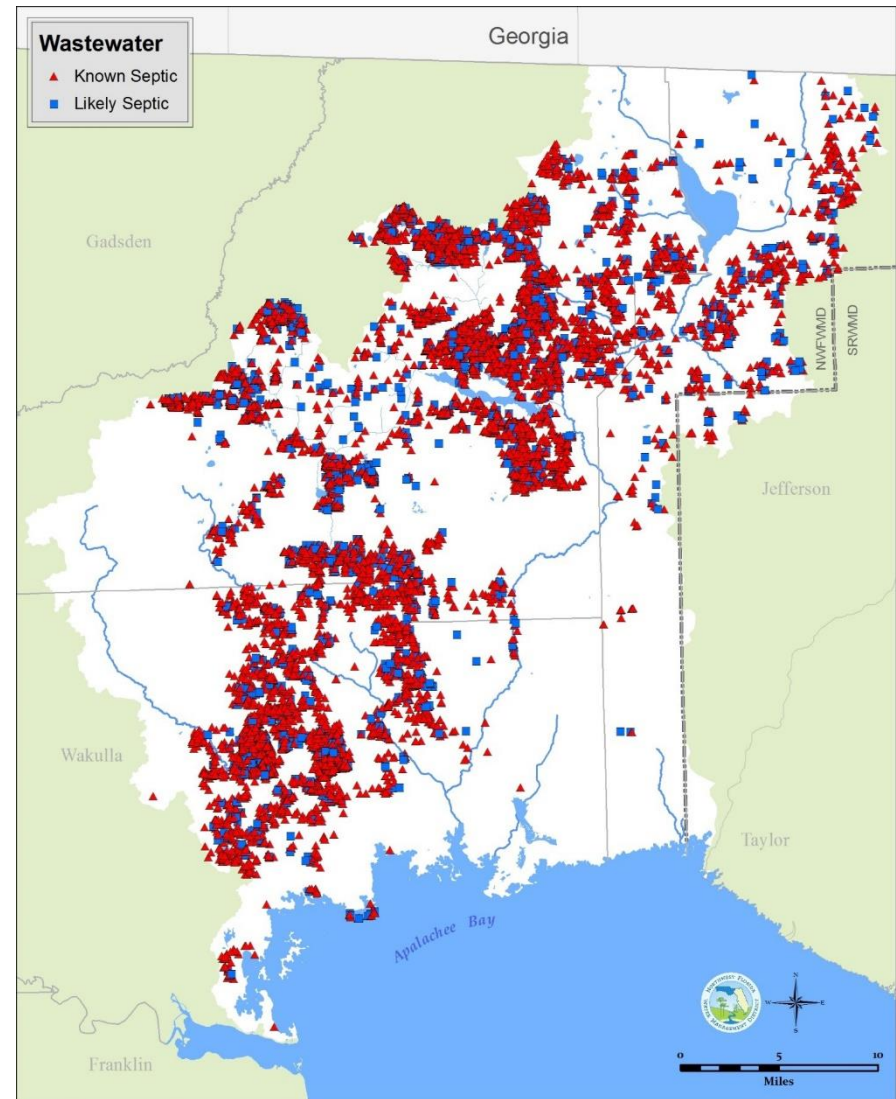
Established Total Maximum Daily Loads

Dissolved Oxygen	Nutrients	Bacteria
Munson Slough	Wakulla River (biology)	Munson Slough
Lake Munson	Lake Munson (TSI)	
	Munson Slough (NH ₄)	

Plus an additional 18 watershed segments with TMDLs established for Mercury

Watershed Challenges

Over 33,000 septic systems identified throughout the Florida portion of the watershed in 2015 (FDOH Water Management Inventory)





Watershed Challenges

- Habitat quality
 - Biological impacts of water quality impairment, including within the Wakulla River and Lake Munson
 - Deterioration of seagrass beds in Apalachee Bay – reduction in continuous seagrass beds from 2001-2006
 - Seagrass scarring, particularly in the vicinity of the mouth of the St. Marks River
 - Deep accumulation of nutrient rich sediments in Lake Munson



Roadblocks to Seagrass Recovery

Project Update – Florida Fish and Wildlife
Research Institute



Watershed Specific Priorities and Objectives

Strategic Priorities	Conceptual Objectives
<p>Point and Nonpoint Source Pollution</p> <ul style="list-style-type: none"> • Stormwater runoff • Pollutant export from septic tanks • Impacts to specific waterbodies, including - <ul style="list-style-type: none"> • Wakulla Spring and River • Lake Munson • Lake Lafayette complex • Apalachee Bay 	<p>Retrofit stormwater infrastructure to improve water quality treatment and reduce hydrologic impacts of landscape development.</p> <p>Prioritize water quality protection within spring groundwater contribution areas as well as other inland and coastal receiving waterbodies.</p> <p>Invest in connecting residences and businesses to central sewer.</p> <p>Make advanced passive onsite sewage treatment and disposal systems available for areas not practical for central sewer.</p> <p>Support wastewater collection and treatment improvements.</p>



Watershed Specific Priorities and Objectives

Strategic Priorities	Conceptual Objectives
<p>Aquatic and Wetland Habitat</p> <ul style="list-style-type: none"> • Degradation and vulnerability of springs • Degradation and vulnerability of lakes • Submerged aquatic vegetation (SAV) loss • Wetland and tidal flat loss and degradation • Invasive species • Protection/restoration of shellfish habitat 	<p>Protect, restore, and enhance benthic habitats – SAV, shellfish habitat, tidal flats.</p> <p>Restore wetland and floodplain functions</p> <p>Support management efforts to control, eradicate, and minimize the introduction or spread of invasive species.</p>
<p>Coastal Resiliency</p> <ul style="list-style-type: none"> • Sea level rise (SLR) • Coastal storm impacts • Effects of land cover/land use changes • Shorelines destabilization/erosion 	<p>Improve understanding of regional and local SLR effects.</p> <p>Evaluate adaptation options in response to projected land use changes.</p> <p>Continue investments in projects to protect shorelines and adapt to changes in sea level.</p> <p>Identify and implement a proactive approach to incorporating coastal resiliency concepts into planning, infrastructure, and future land uses.</p>



Watershed Specific Priorities and Objectives

Strategic Priorities	Conceptual Objectives
<p>Floodplains and Hydrology</p> <ul style="list-style-type: none">• Headwater degradation/channelization• Riparian buffer loss• Sedimentation and physical impacts from unpaved roads, erosion, construction sites, and other sources• Hydrologic effects of landscape development	<p>Prioritize and correct hydrologic alterations (including channelized streams).</p> <p>Identify and address needs for restoration of wetland and floodplain functions.</p> <p>Identify and implement methods to restore the function of vegetated riparian buffers.</p> <p>Reduce effective impervious surface area.</p> <p>Prevent erosion and sedimentation from construction and agricultural and silvicultural operations</p>



Watershed Specific Priorities and Objectives

Strategic Priorities	Conceptual Objectives
<p>Public Awareness and Education</p> <ul style="list-style-type: none"> • Need for expanded community engagement opportunities • Need for opportunities for public engagement with resource management decision-making • Support and expand public awareness of basis for management programs and projects • Litter and debris entering inland and coastal waters 	<p>Expand watershed resource awareness and understanding through innovative, hands-on community-based restoration.</p> <p>Create effective, long-term partnerships among stakeholders, including government, academic institutions, non-governmental organizations, businesses, residents, and others, to maximize effectiveness of project implementation and funding efforts.</p> <p>Reduce amount of trash that enters waterways.</p>



Implementation





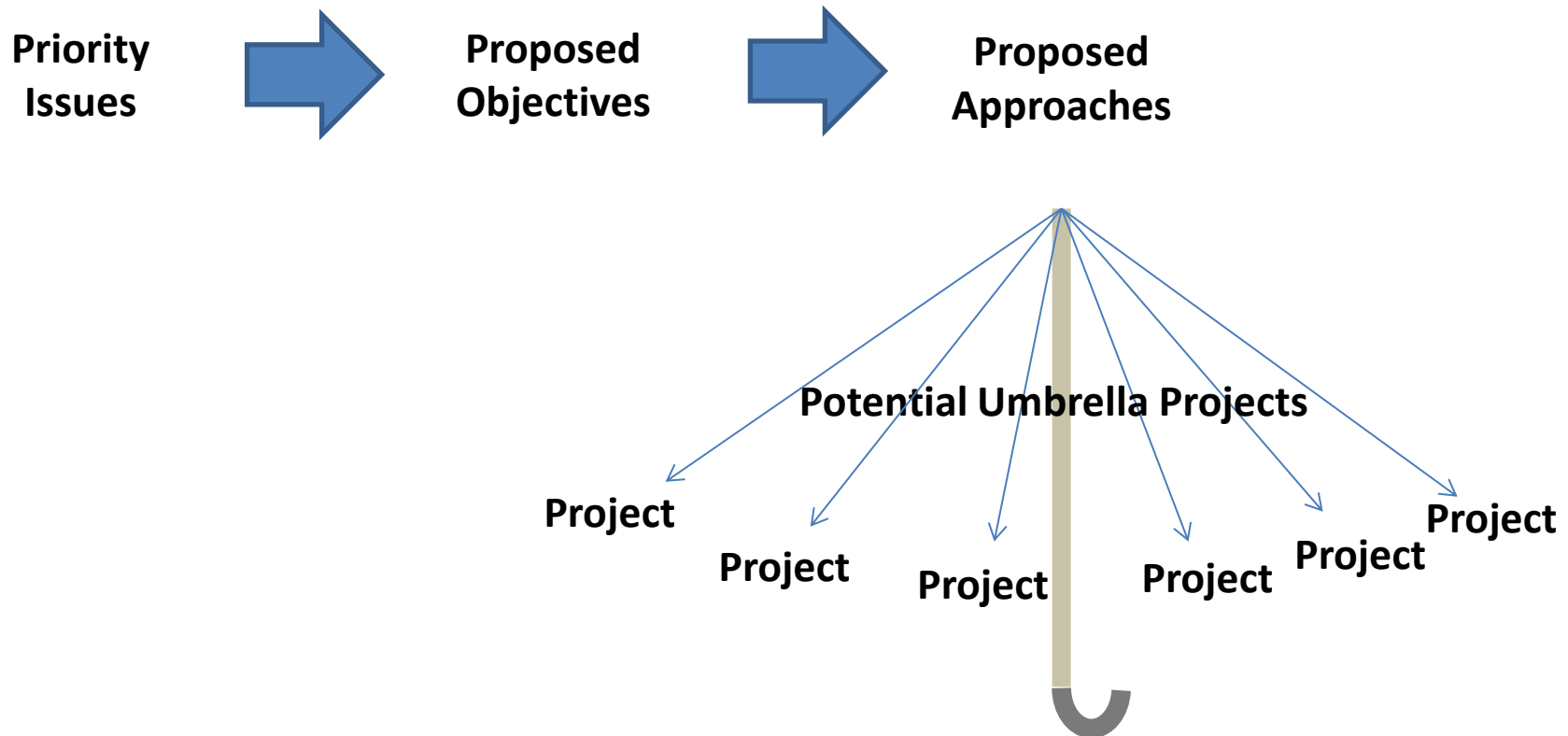
An Array of Funding Resources

<p>RESTORE Bucket 1 County MYIPs</p>	<p>NFWF Gulf Environmental Benefit Fund</p>	<p>Florida Legislature</p>
<p>RESTORE Bucket 2 Gulf Coast Ecosystem Restoration Council</p>	<p>Florida Springs Restoration Funding</p>	<p>US EPA Section 319 Grants</p>
<p>RESTORE Bucket 3 Florida Gulf Consortium</p>	<p>NRDA Natural Resource Damage Assessment</p>	<p>Triumph Gulf Coast Inc.</p>
<p>RESTORE Bucket 4 NOAA Science Program</p>	<p>Florida Land Acquisition Trust Fund</p>	<p>TMDL Water Quality Restoration Grants</p>
<p>RESTORE Bucket 5 FL Inst. of Oceanography</p>	<p>Clean Water State Revolving Fund</p>	<p>FL Coastal Mgt Program</p>



Project Planning

Identification of “umbrella” projects addressing priority issues and objectives and encompassing known specific project priorities.





Projects and Management Practices

Project/Practice	Objectives	Lead Entities
Urban Stormwater Retrofits	<ul style="list-style-type: none"> • Water quality improvement • Flood protection • Hydrologic restoration 	<ul style="list-style-type: none"> • Local governments
Basinwide Sedimentation Abatement	<ul style="list-style-type: none"> • Watershed assessment of impacts from unpaved roads and other sedimentation and erosion sites • Prioritize sites • Support implementation 	<ul style="list-style-type: none"> • Local governments
Monitoring Program Development and Enhancement	<ul style="list-style-type: none"> • Develop targeted monitoring program • Identify trends • Support adaptive management 	<ul style="list-style-type: none"> • Local governments • FDEP • FFWC



Projects and Management Practices

Project/Practice	Objectives	Lead Entities
Agricultural Best Management Practices (BMPs)	<ul style="list-style-type: none"> • Water quality protection • Water use efficiency <p><i>Building on current FDACS agricultural BMP programs, including cost-share grants and BMP certification; cooperative efforts between public agencies and private landowners</i></p>	<ul style="list-style-type: none"> • FDACS • Jefferson County • NRCS • Private producers
Silviculture BMPs	<ul style="list-style-type: none"> • Water quality protection • Habitat protection <p><i>Building on Florida's silviculture BMP program (FDACS); cooperative effort between public agencies and private landowners</i></p>	<ul style="list-style-type: none"> • FDACS • Private landowners • Public landowners
Upper Wakulla River and Wakulla Springs Basin BMAP	<ul style="list-style-type: none"> • Comprehensive restoration plan <p><i>Stormwater treatment</i></p> <p><i>Septic connections to centralized wastewater treatment</i></p> <p><i>Advanced septic systems pilot project</i></p> <p><i>Public education and outreach</i></p> <p><i>And more</i></p>	<ul style="list-style-type: none"> • City of Tallahassee • Wakulla County • Leon County • NFWFMD • FDEP • FDOH • Talquin Electrical Coop.



Projects and Management Practices

Project/Practice	Objectives	Lead Entities
Hydrologic Restoration	<ul style="list-style-type: none">• Restoration of natural wetland, floodplain, and estuarine hydrology• Stream channel restoration• Enhance resiliency through biodiversity and natural adaptation enhancement	<ul style="list-style-type: none">• State and federal resource agencies• Local governments
Wetland Restoration	<ul style="list-style-type: none">• Restore wetland functions: fish and wildlife habitat, floodwater storage, discharge regulation, water quality protection, aquifer recharge, and more• Enhance resiliency through biodiversity and natural adaptation enhancement	<ul style="list-style-type: none">• Local governments• State and federal resource agencies



Projects and Management Practices

Project/Practice	Objectives	Lead Entities
<p>Subbasin Plans</p>	<ul style="list-style-type: none"> • Comprehensive restoration plans for targeted basins <p><i>Lake Munson Management Plan – evaluation of alternatives</i></p> <ul style="list-style-type: none"> - Stormwater treatment - Sediment quality remediation - Vegetation and habitat restoration 	<ul style="list-style-type: none"> • Local governments
<p>Estuarine habitat Restoration</p>	<ul style="list-style-type: none"> • Seagrass restoration • Oyster bed restoration • Tidal marsh hydrologic restoration <p><i>Oyster bed restoration</i></p> <p><i>Seagrass impacts prevention – boater education</i></p>	<ul style="list-style-type: none"> • Florida FFWC/FWRI • Local governments
<p>Wastewater Infrastructure Improvements</p>	<ul style="list-style-type: none"> • Expand central sewer service • Connect residences and businesses served by septic systems • Reduce inflow and infiltration 	<ul style="list-style-type: none"> • Utilities • Local governments



Projects and Management Practices

Project/Practice	Objectives	Lead Entities
<p>Water Reclamation and Reuse</p>	<ul style="list-style-type: none"> • Protect water quality through improved treatment and reduced discharges • Water conservation/demand management • Conserve potable water sources <p><i>Water reclamation and reuse within Leon, Wakulla, and Jefferson counties</i></p>	<ul style="list-style-type: none"> • Utilities • Local governments
<p>OSTDS to Central Sewer Connections</p>	<ul style="list-style-type: none"> • Connect areas served by OSTDS to central sewer systems • WWTF/WRF Improvements <p><i>Progressive extension of wastewater service in Wakulla County</i></p> <p><i>Priority Focus Area sewer service extensions in Leon and Wakulla counties</i></p>	<ul style="list-style-type: none"> • Utilities • Local governments • FDOH • FDEP
<p>Advanced Technology OSTDS</p>	<ul style="list-style-type: none"> • Implement affordable, new technology passive OSTDS in areas where connection to central sewer is not cost-effective <p><i>Advanced septic systems pilot project</i></p>	<ul style="list-style-type: none"> • Utilities • Local governments • FDEP • FDOH • NFWMD



Projects and Management Practices

Project/Practice	Objectives	Lead Entities
Evaluation and Planning for Strategic Land Acquisition and Conservation	<ul style="list-style-type: none"> • Water resource protection for water quality, floodplain, and aquatic and wetland habitat protection 	<ul style="list-style-type: none"> • Local governments • Private non-profit initiatives • FDEP
Watershed Stewardship Initiatives	<p>Build citizen engagement opportunity and capacity, including:</p> <ul style="list-style-type: none"> • Citizen science • Monitoring • Training and outreach 	<ul style="list-style-type: none"> • Local Governments • IFAS Extension/Sea Grant



Projects and Management Practices

Project/Practice	Objectives	Lead Entities
Riparian Buffer Zones and Littoral Zone Management	<ul style="list-style-type: none">• Water quality protection• Shoreline Stability• Habitat• Enhance resiliency through biodiversity and natural adaptation enhancement• Targeted living shoreline projects for previously altered/eroding shorelines	<ul style="list-style-type: none">• Private landowners• Local governments• Public land management agencies

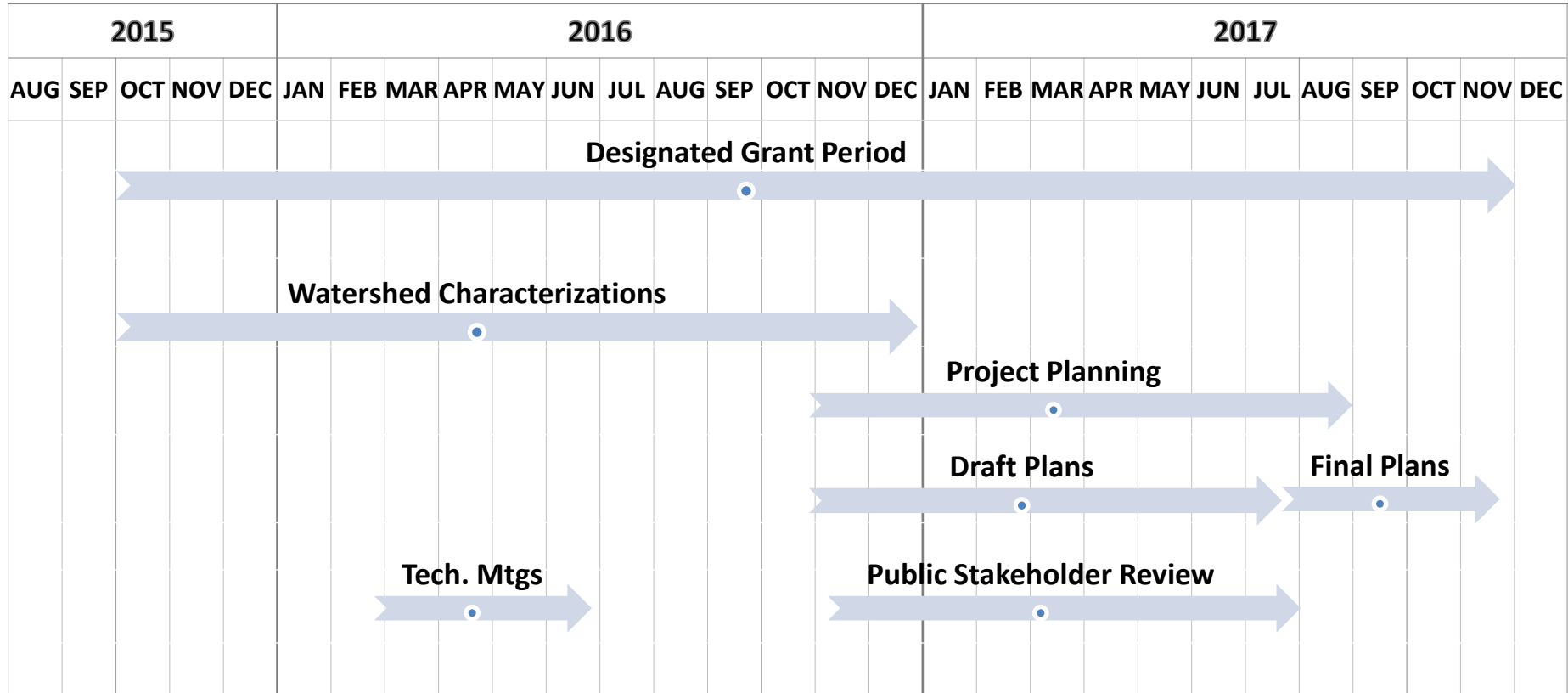


Criteria for Project Planning and Evaluation

- Infrastructure projects (stormwater and wastewater)
 - Projects should have responsible parties that will implement, own, operate, and maintain the facilities
 - Responsible parties should have dedicated funding source for operation and maintenance
- Restoration and habitat enhancement
 - Completed project should be naturally self-sustaining; not requiring frequent human intervention
 - Restoration should reflect ecosystems or habitats that are naturally supported in the watershed and physical environment
 - Completed restoration sites should be adaptable to natural change and variability – short-term and long-term



SWIM Plan Updates – Schedule





Thank you!

**St. Marks River and Apalachee Bay Watershed Resource
Characterization:**

<http://www.nfwwater.com/Water-Resources/SWIM/SWIM-Plan-Updates>

**Please provide comments, recommendations, and questions
to: SWIM@nfwwater.com**

Comments requested by March 10, 2017

For more information:

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