



# Watershed Planning - Wetland Health, ERP and Section 404 Perspectives

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July 9, 2015

**Brown** AND  
**Caldwell**

# Watersheds are getting a lot of attention

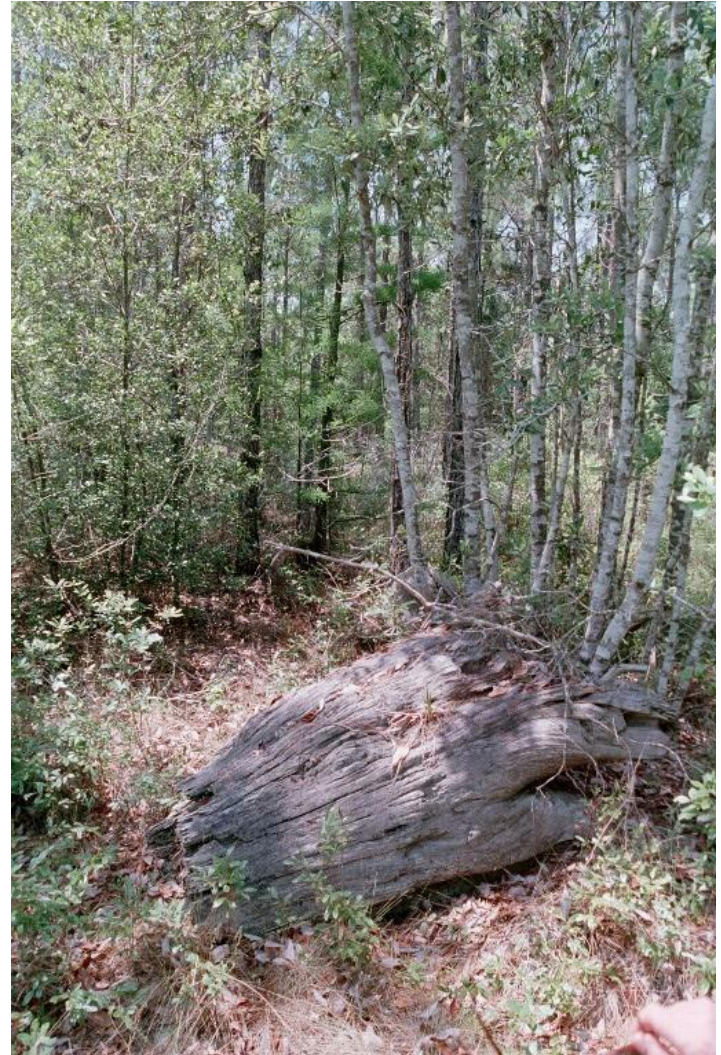
- Watershed Approach
  - ERP Permitting
  - Wetlands Mitigation – Sec. 404 Clean Water Act (CWA)
  - Stream Mitigation – Sec. 404 CWA
- Water Quality & Nutrients – Sec. 402 CWA
- Integrated Watershed Approach
  - NPDES Permitting
  - Wastewater Permitting
- Overlaps with watersheds
  - Species – Sec.s 7 & 10 Endangered Species Act
    - Aquatic – watershed-based
    - Non-Aquatic – habitat based (not watershed-specific)

# Chesapeake Bay TMDL Litigation

- U.S. Court of Appeals for the Third Circuit issued a much anticipated ruling in litigation over the final Chesapeake Bay total maximum daily load (TMDL), upholding the TMDL.
- Court upheld the TMDL's holistic "watershed" approach under which nonpoint sources were assigned specific allocations for pollution reduction, thus giving nonpoint sources shared responsibility with point sources for reducing water quality impairments under the TMDL program.
- Key legal win for the municipal clean water community because it bolsters the watershed approach and reaffirms EPA's ability to include nonpoint sources in the TMDL program.

# Why a Watershed Approach?

- Magee *et al.* (1999) found that both natural and mitigation wetlands in Portland, Oregon had been degraded due to hydroperiod alteration and land use changes in rapidly urbanizing areas.



# Watershed Approaches in Florida

- “A Watershed approach would Improve permit decision-making.” NRC 2001
  - Why? - “Wetland functions must be understood within a watershed framework in order to secure the purposes of the Clean Water Act.” (p. 3)
- This has been Florida’s way of doing business for many years.



# Watershed Approach to Managing Florida's Water Resources





**Northwest Florida  
Water Management  
District**

**Suwannee River  
Water Management  
District**

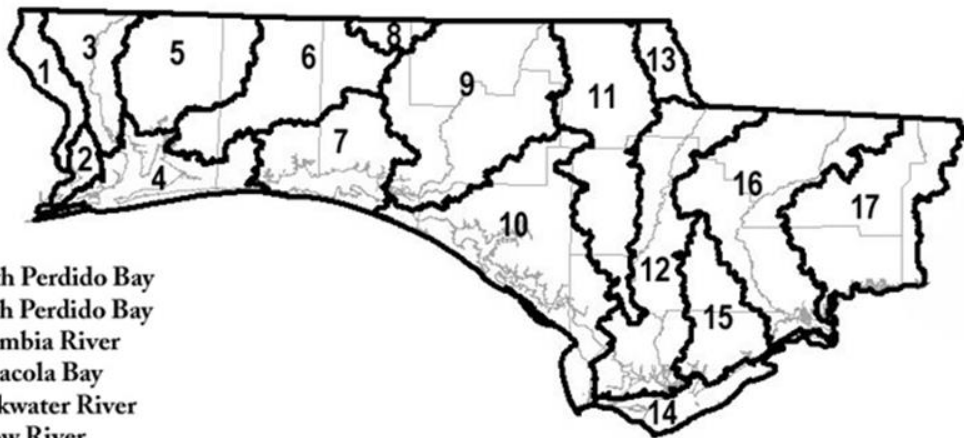
**St. Johns River  
Water Management  
District**

**Southwest Florida  
Water Management  
District**

**Florida's Five  
Water  
Management  
Districts**

**South Florida  
Water Management  
District**

# Northwest Florida WMD



- 1 North Perdido Bay
- 2 South Perdido Bay
- 3 Escambia River
- 4 Pensacola Bay
- 5 Blackwater River
- 6 Yellow River
- 7 Choctawhatchee Bay
- 8 Pea River
- 9 Choctawhatchee River
- 10 St. Andrews Bay
- 11 Chipola River
- 12 Apalachicola River
- 13 Chattahoochee River
- 14 Apalachicola Bay
- 15 New River
- 16 Ochlockonee River
- 17 St Marks River

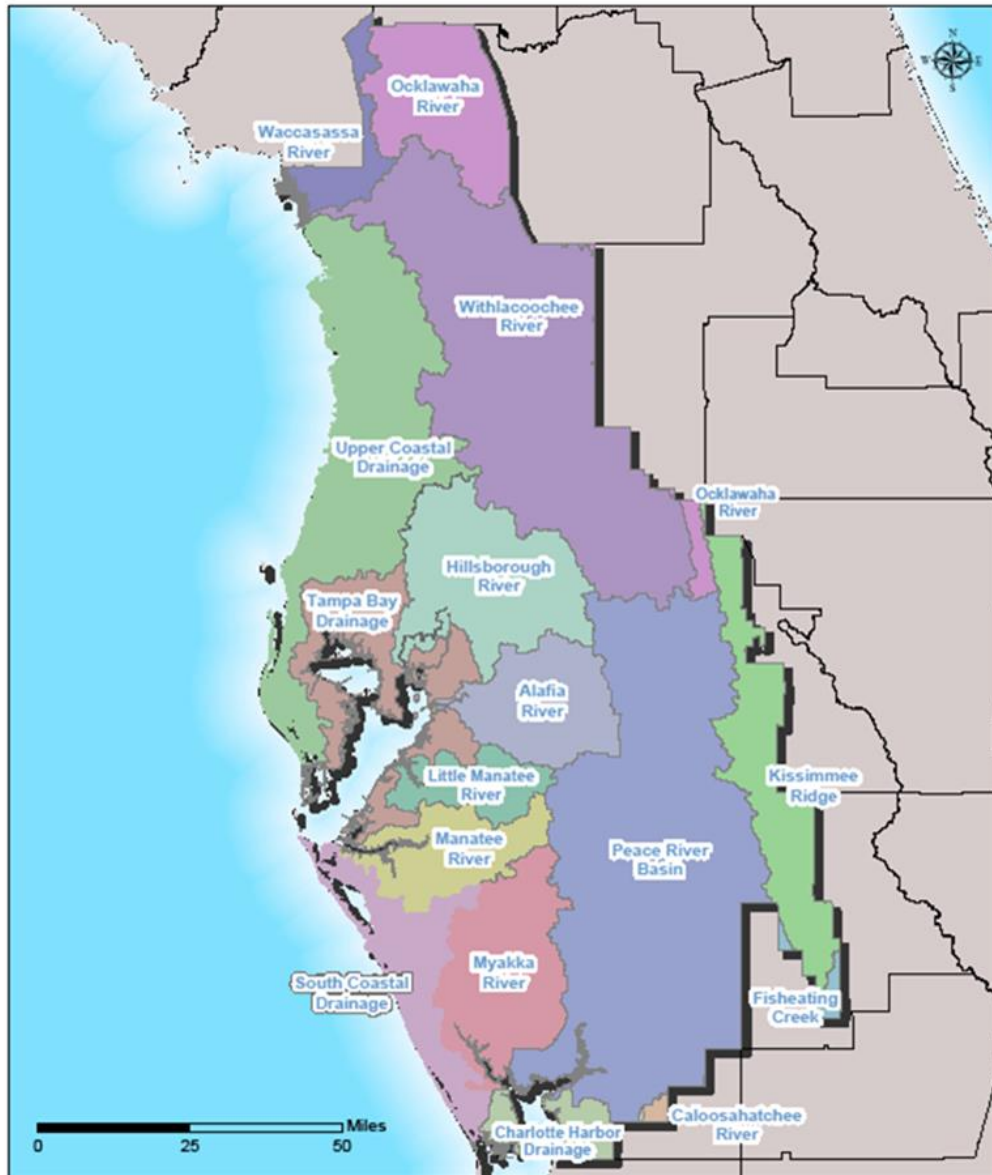
**Figure 10.2.8-1** Drainage Basins within the geographical territory of the Northwest Florida Water Management District  
(Source: USGS Hydrologic Unit Code (HUC) Basins, 1:24K, HPGN)

- Based on HUC-8 basins
- Drainage divides as basin boundaries
- All affected by waters originating OUT of state



## Drainage Basins and Watersheds within the Southwest Florida Water Management District

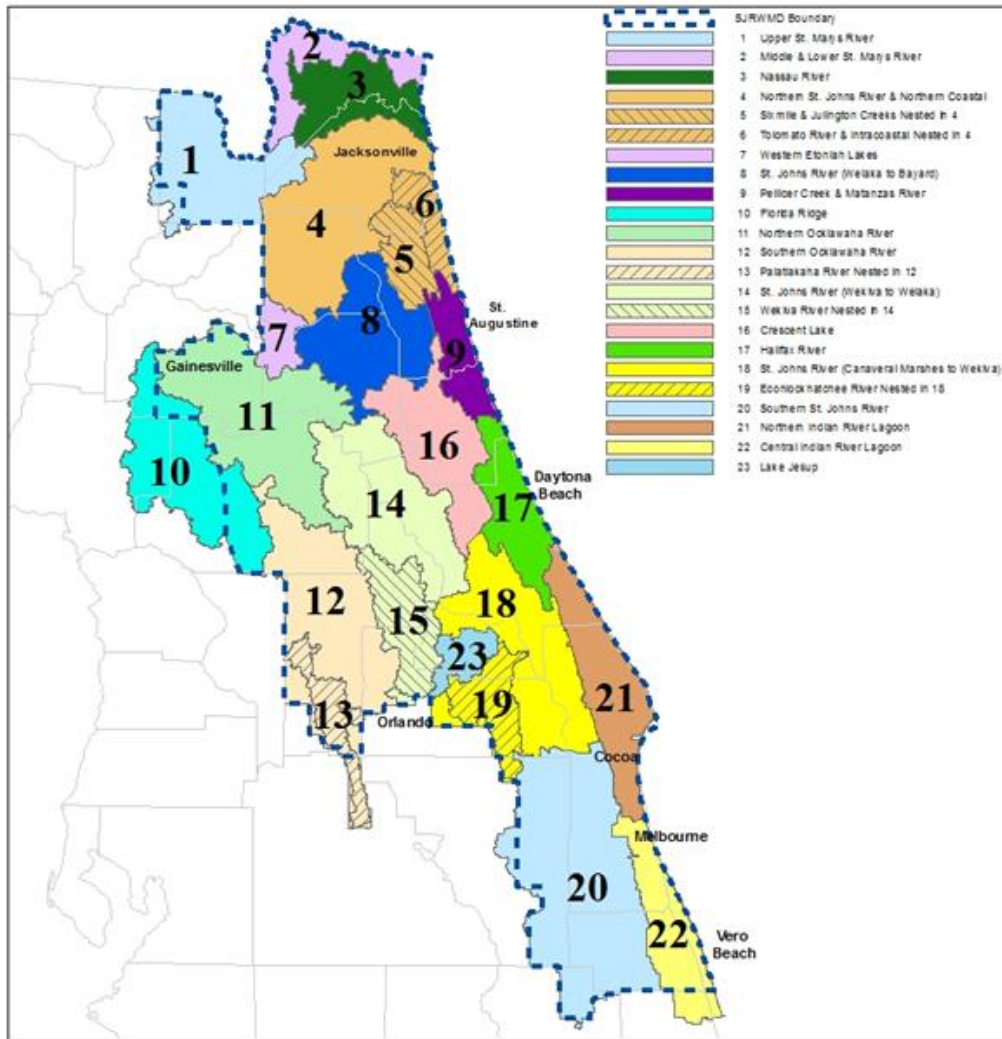
# Southwest Florida WMD



- Based on HUC-8 basins
- Drainage divides as basin boundaries
- All affected by waters originating IN-state

# St. John's River WMD

- Ecologically-based drainage basins
- Drainage divides as basin boundaries
- Nested basins for significant habitats
- Only 3 affected by OUT of state waters



**Figure 10.2.8-2**

Drainage Basins for  
Cumulative Impacts Evaluation



**NOTE FOR NESTED BASIN:**

Basins 5, 6, 13, 15, and 19 above are designated as nested basins, which means that these areas are both individual basins and part of larger basins. The effect of this designation is that, for impacts that are outside of a nested area, but within the larger basin of which it is a part, mitigation within the nested area will be considered to be in the same drainage basin for cumulative impact review purposes. For impacts that are located within a nested area, mitigation that is located outside of the nested area but within the larger basin of which it is a part will be considered to be outside of the drainage basin for cumulative impact review purposes.

# Watershed Approach- **Federal** Mitigation Rules

§332.3/230.93 (c)(1)

*“The district engineer must use a watershed approach to establish compensatory mitigation requirements in DA permits to the extent appropriate and practicable.”*

*Where an applicable watershed plan is available, the watershed approach should be based on the existing plan.*

*Where no such plan is available, the watershed approach should be based on information provided by the project sponsor or available from other sources.”*

# Federal Mitigation Rule

- “Watershed” is mentioned 192 times
- §332.3/230.93 General Requirements
- Watershed approach
  - – Consistent with plan or principles
  - – Considerations and information needs
- • Absence of watershed plan/approach
  - – On-site/in-kind
  - – Off-site/out-of-kind
  - – “near”

# Watershed Approach- Federal Mitigation Rules

- §332.3©/230.93© General Requirements
  - (1) “Ultimate goal ... is to maintain and improve the quality & quantity of aquatic Resources within watersheds through strategic selection.”
  - (2) Consider landscape position & resource type for functioning & sustainability of aquatic Resources in watershed

# Watershed Approach- Federal Rules

- §332.3©/230.93© General Requirements
- (2)(i) Consider:
  - Habitat requirements of “important species”
  - Habitat loss or conversion trends
  - Sources of watershed impairment
  - Current development trends
  - Requirements of other regulatory & non-reg. programs

# Watershed Approach- Federal Rules

- §332.3©/230.93© General Requirements
- (2)(ii) Locational factors (hydrology, surrounding land use)
- (2)(iii) may want/need to inventory historic & existing aq. resources & PRIORITIZE aquatic resources that are important for maintaining & restoring watershed function.

# Watershed Approach- Federal Rules

- §332.3©/230.93© General Requirements
- (3) Information needs- includes:
  - *Current trends habitat loss*
  - *Past cumulative impacts*
  - *Development trends*
  - *Presence & needs of sensitive species*
  - *Site conditions that bolster/hinder performance*
  - *Local goals & priorities*



# Florida's Watershed Approach

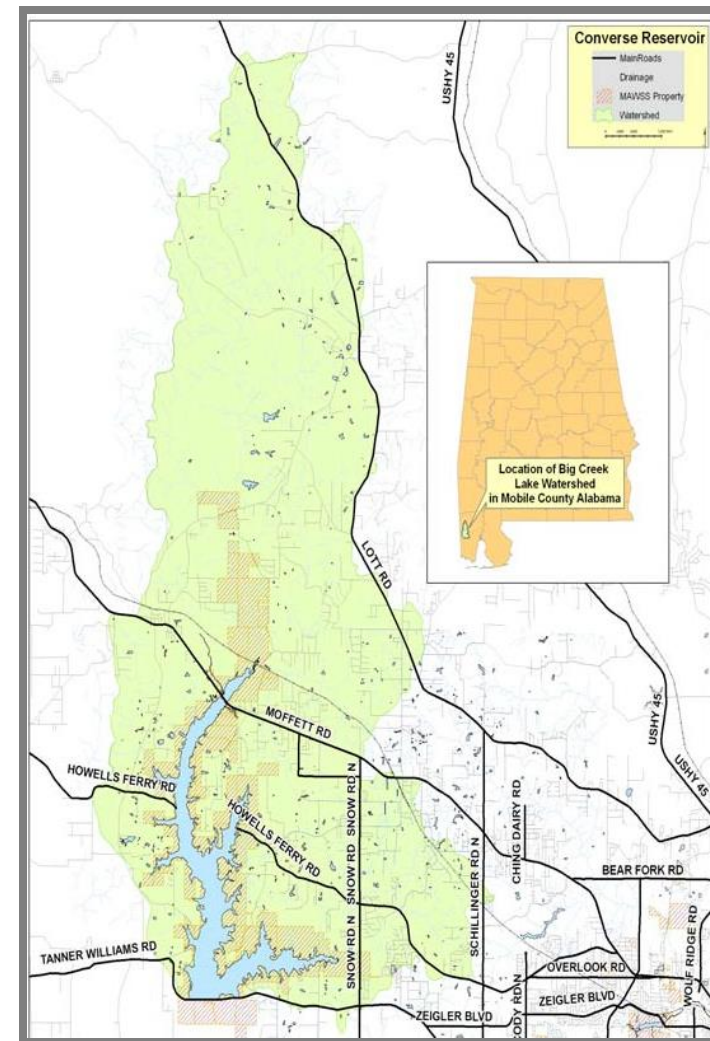
- Mitigation banking - §373.4135 & .4136, FS
- Regional offsite mitigation areas – §373.4135, FS
- DOT Mitigation - §373.4137, FS
- Wildlife Corridors under various planning processes
  - DRI's - §380.06, FS (*formerly*)
  - Sector Planning - § 163.3177(11)(b) & 163.3245, FS
  - Rural Land Stewardship - § 163.3177(11)(d), FS

# All watershed studies have to start somewhere

- What are the over-riding ecosystem services and watershed issues?
  - Loss of flood storage?
  - Habitat corridors?
  - Fishery reductions?
  - Pollinator losses?
  - Poor water quality?
  - Flashy runoff due to impervious surfaces
  - Channelized stream corridors
  - Lack of open space
  - Nutrients -> water quality degradation
  - Low biodiversity
  - Safe outdoor spaces
  - *Etc. ....*

# Watershed Plans Need to be Multi-Faceted

- Develop long term sustainable solutions >20 years
- Preserve/improve water quality
- Manage existing lands and conserve additional land
- Maximize revenue from properties (i.e. timber, etc.)
- Engage residents to promote water quality protection
- Achieve responsible growth and land management



# Field Assessment for Status & Pollution Sources

- Lake
  - Water Chemistry
  - Vertical Profiles
- Tributary
  - Water Flow Rate
  - Water Chemistry
  - Qualitative (Stream Walks)
    - Physical Characteristics
    - Water Quality
    - Channel Alteration
    - Bank Erosion
    - Buffer Encroachment

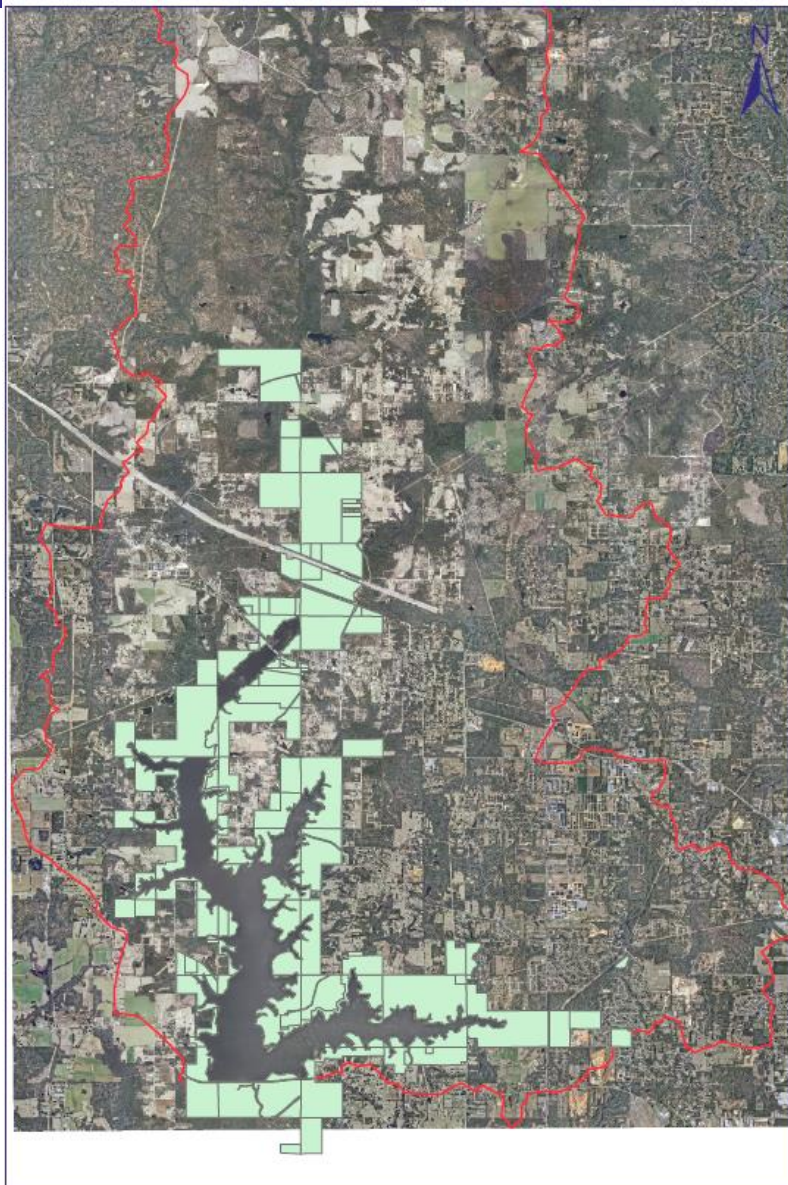


# Big Creek Lake Watershed Management Plan

- Plan recommendations
  - Non- structural activities
    - Land Uses
    - Fertilizer and Ag Practices
    - MS4s
  - Structural activities
    - BMPs
    - Septic to Sewer
    - Restoration Projects
- Implementation
  - CMMS & LIMS
  - Staffing
  - Contracting
  - Funding



# Land Acquisition and Land Sale



Provide buffer around lake and tributaries. Possibly sell land outside of buffer to raise \$ for lake protection activities.

# Recommended Actions - Field

- Forest Management Practices
  - Silviculture Recommendations
  - Prescribed Burning and Site Preparation
  - Pine Straw Raking
  - Best Management Practices (BMPs)
  - Public Education
  - Revenues and Expenses
- Compatible Recreational Uses
  - Hiking and Walking
  - Nature Observation, Bird Watching, and Photography
  - Environmental Education and Exploration
  - Geocaching
  - Picnicking
  - Boating
  - Fishing
  - Hunting



Convert to “natural” longleaf pine management



Photo courtesy Greg Seamon, Prescribed Fire Training Center

Prescribed fire as management tool

# Recommended Actions - Field

## Invasive Species Control

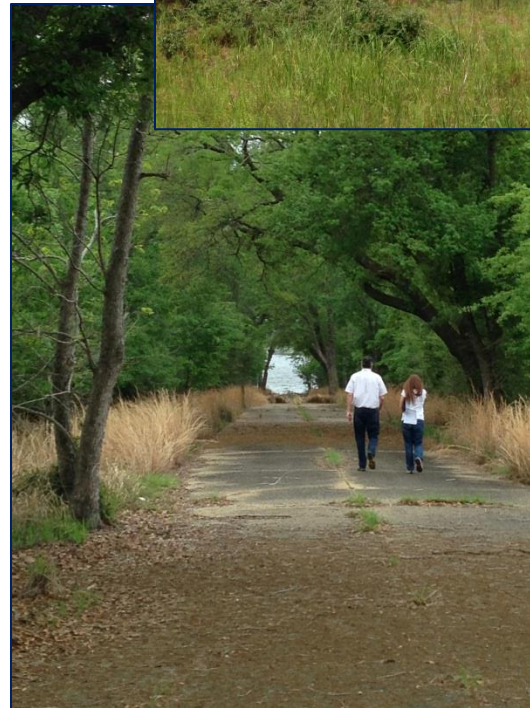
- Cogongrass
- Chinese Tallow
- Chinese privet
- *Island Apple Snail* - future

## Gopher Tortoise Bank

- Continue management

## Security

- Continue existing practices
- Increased is recreational property access is allowed





Lots of ways!

# **How Can You Implement a Watershed-Based Approach?**

# Tampa Bay's Watershed Plan

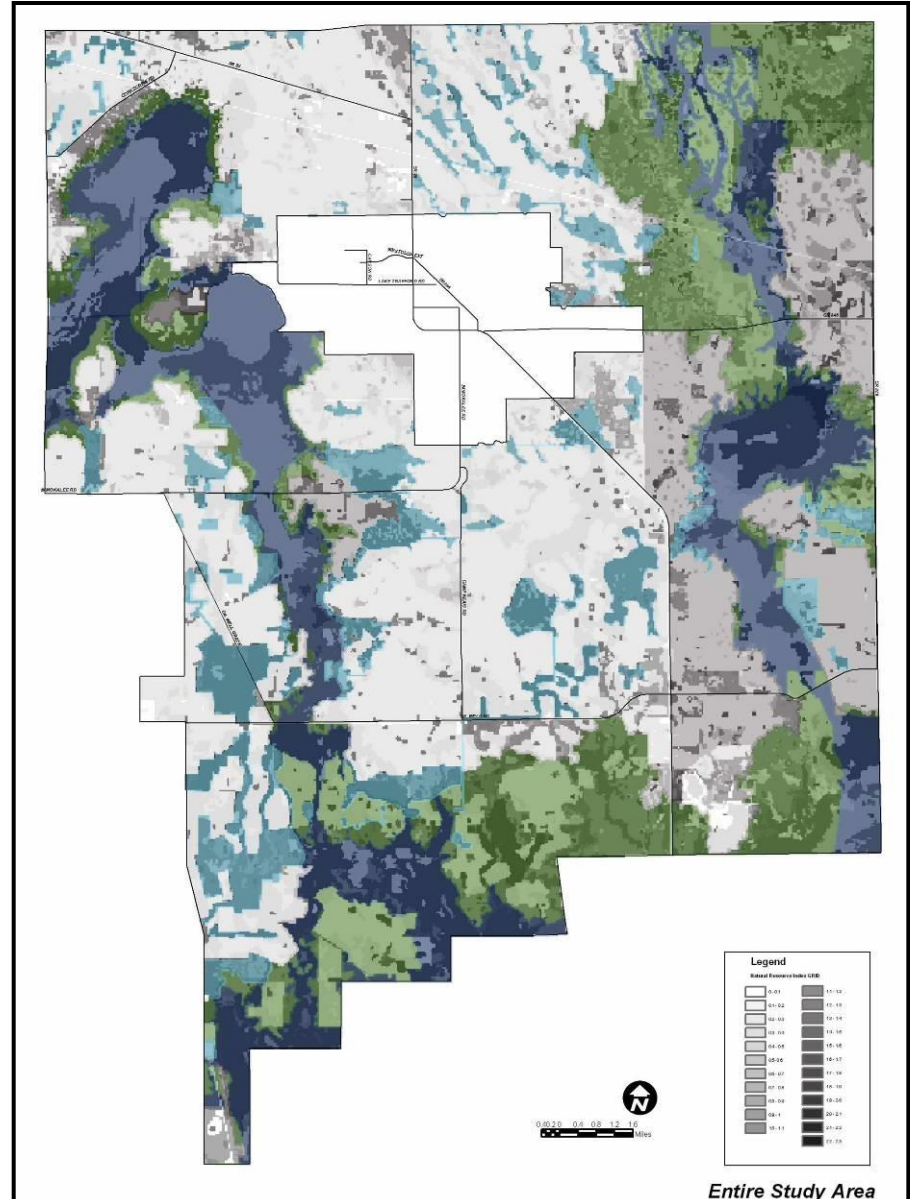
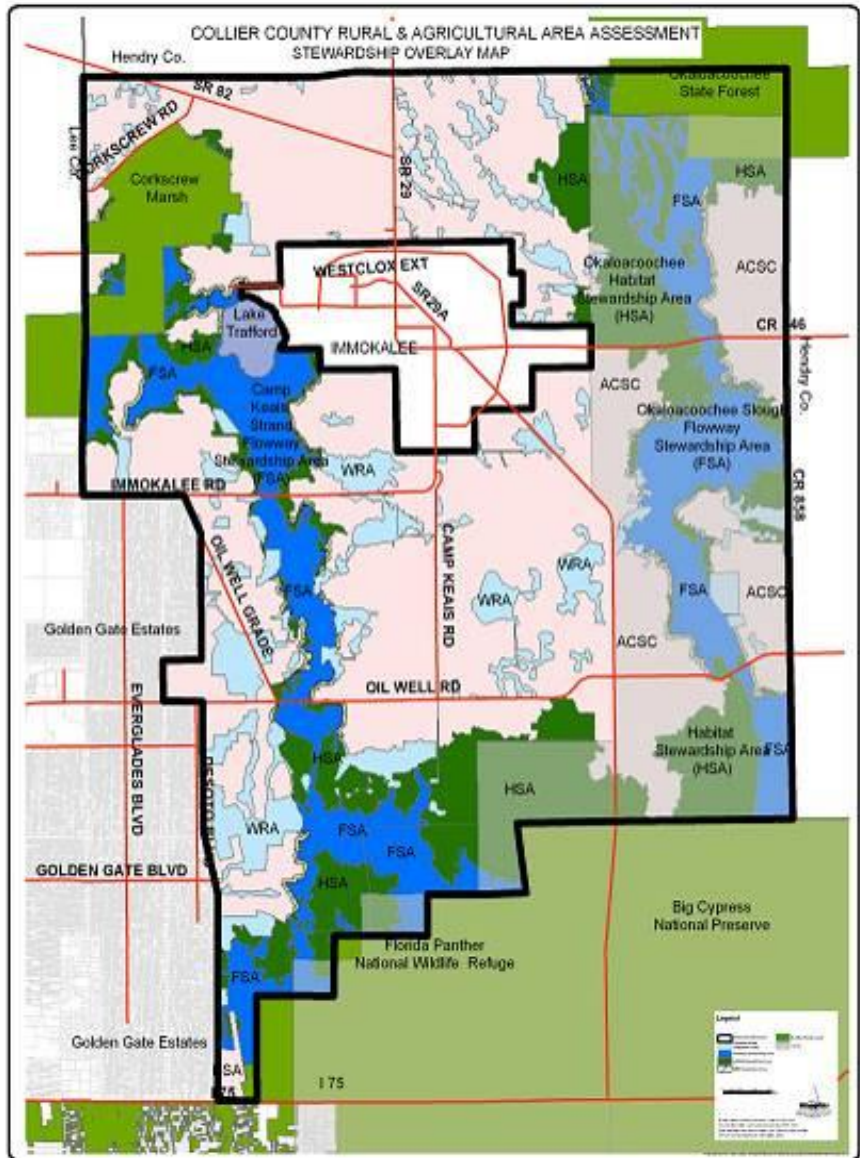
**Tampa Bay sea grass beds herald environmental recovery**



The acreage of seagrass beds has not only met a goal set in the 1990s, but exceeds it by more than 2,000 acres. SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

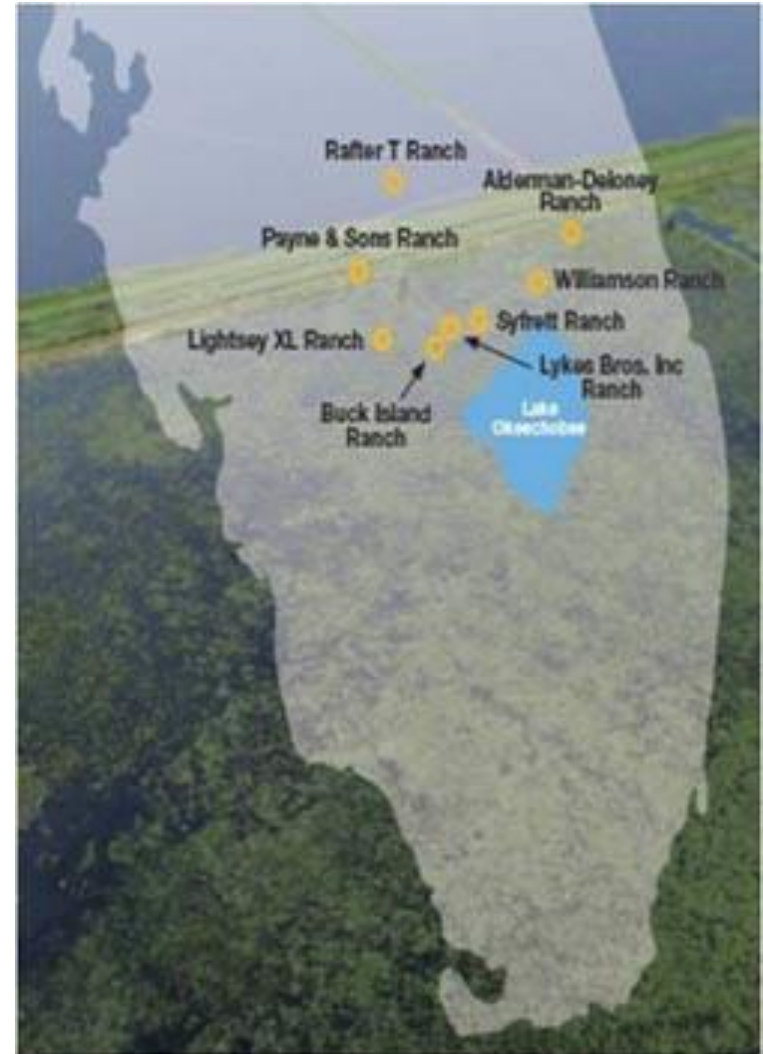
- Tampa Bay's sea grass beds as robust they were 60 years ago
  - The acreage of beds has exceeded a goal set in the 1990s by more than 2,000 acres.
- Great success from building on ongoing actions
  - Example used by NRC, 2001
  - The management plan for 2006 with specific strategies for addressing the five priority problems identified in Tampa Bay:
    - water and sediment quality;
    - bay habitats;
    - fish and wildlife;
    - dredging and dredged material management; and
    - spill prevention and response

# Collier County Rural Land Stewardship



# Florida Ranchlands Environmental Services Project – “FRESP”

- Dispersed Water Management using ranchlands
- Reduce the volume and rate of flow to Lake Okeechobee
- Help keep the Lake within a preferred stage envelope in both wet and dry years
- Reduce damaging discharges to the estuaries
- Contribute to achievement of the Lake Okeechobee TMDL for total phosphorus & other WQ criteria
- Reduce nutrients entering the estuaries
- Provide for habitat enhancement for multiple species at a watershed scale
- Create a new revenue for ranchers

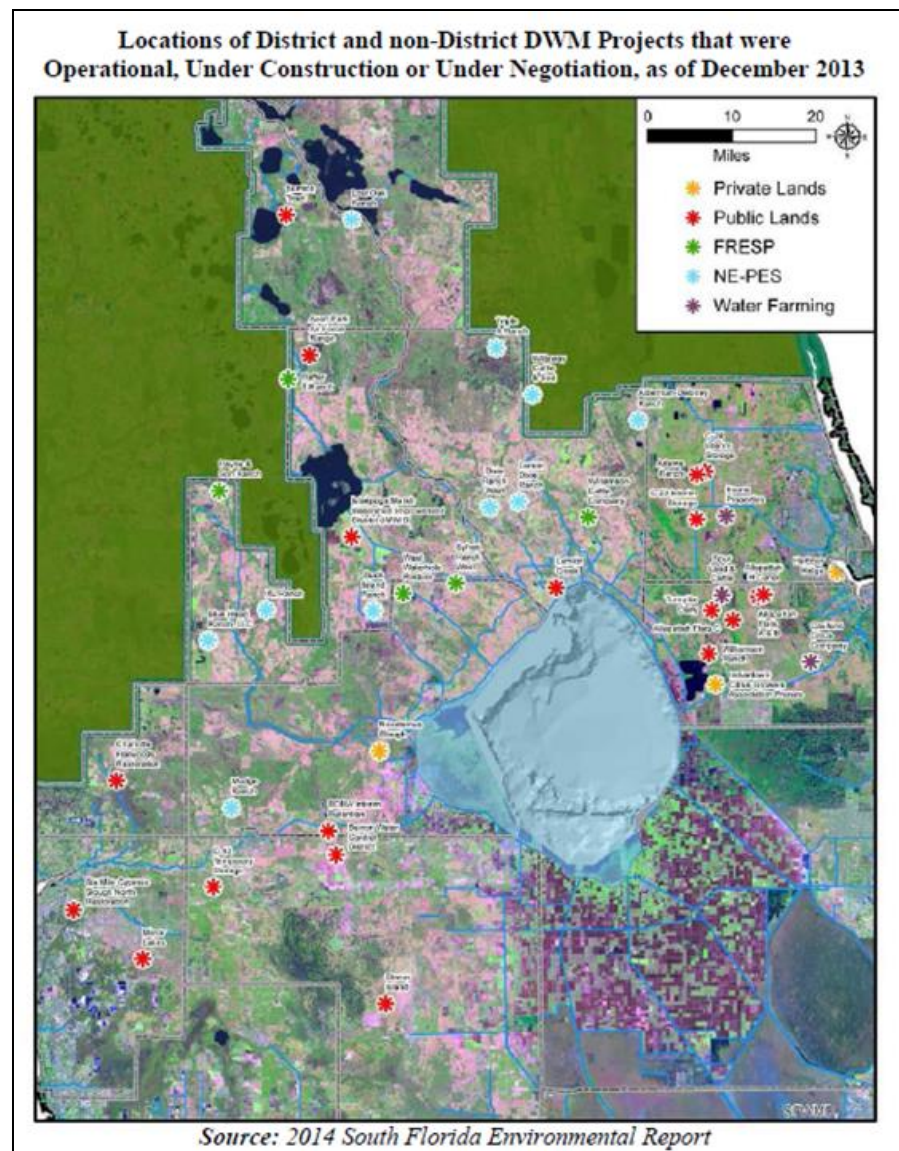


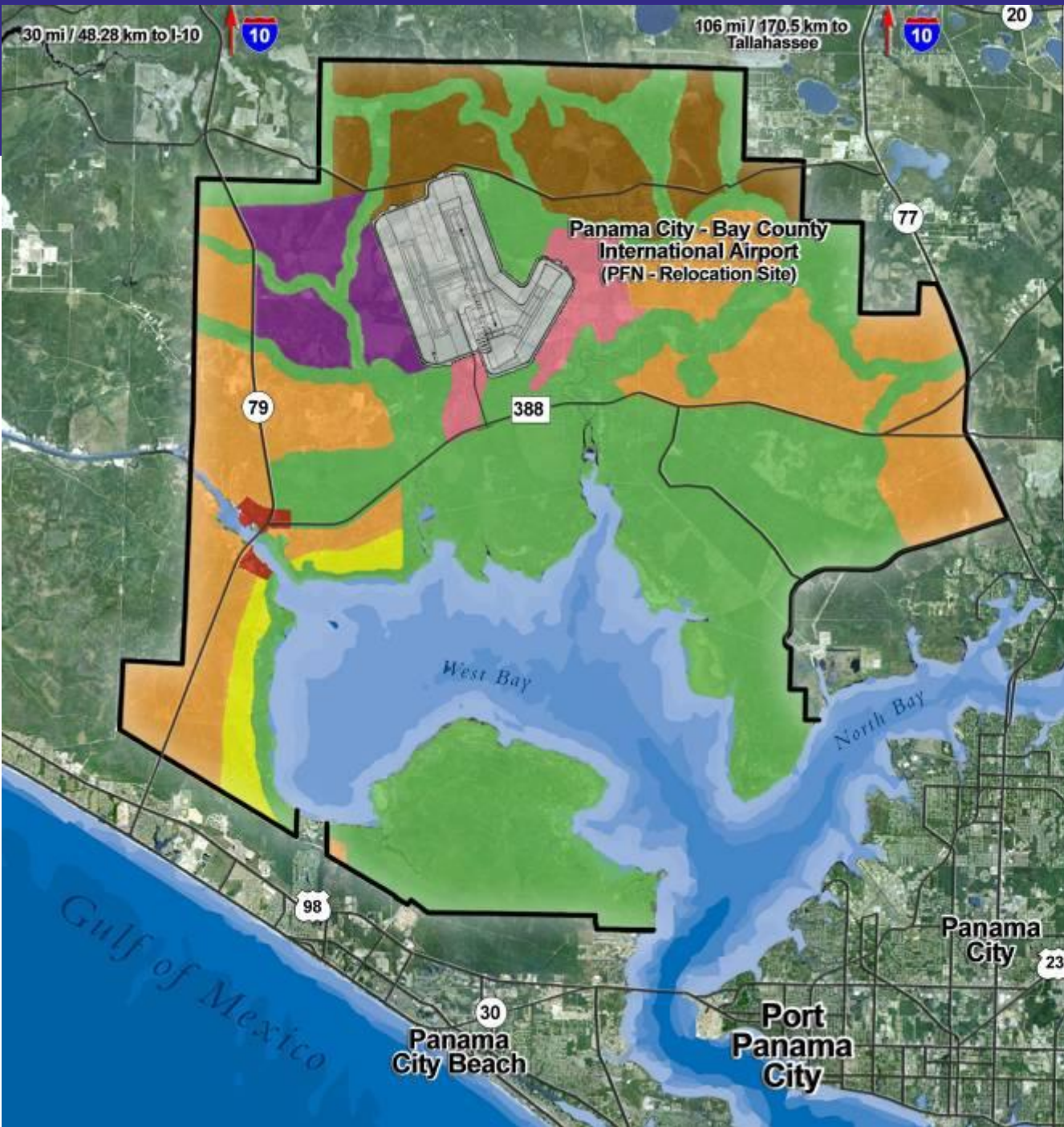
Graphic from <http://www.fresp.org/>

# Dispersed Water Management

Good news gets around!  
From the Philadelphia Water Department:

- “ .... The South Florida Management District’s *Dispersed Water Management Plan* pays cattle ranchers and other farmers to develop surface storage on their land, reducing the need for expensive measures like building dams or underground storage tanks.”
- **SRWMD implementing a Dispersed Water Storage Program**





**WestBay Sector Plan**

- Agricultural / Timberland
- Airport / Industrial
- Business Center
- Preservation Area
- Low-Impact Residential
- Regional Employment Center
- WestBay Center
- Village Center (Residential)

# St. Joe Ecosystem Management Agreement & Regional General Permit

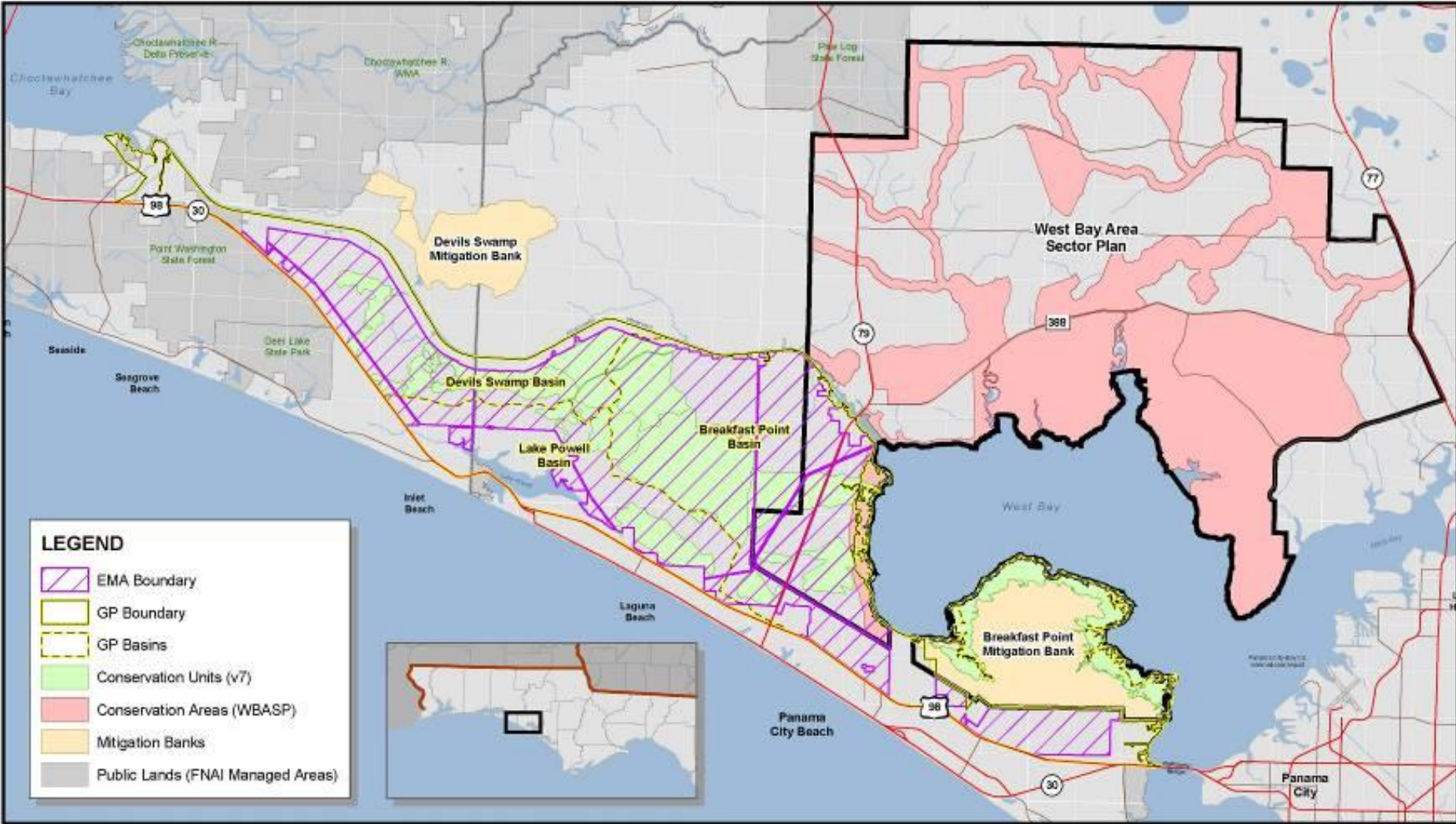
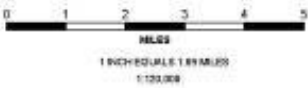
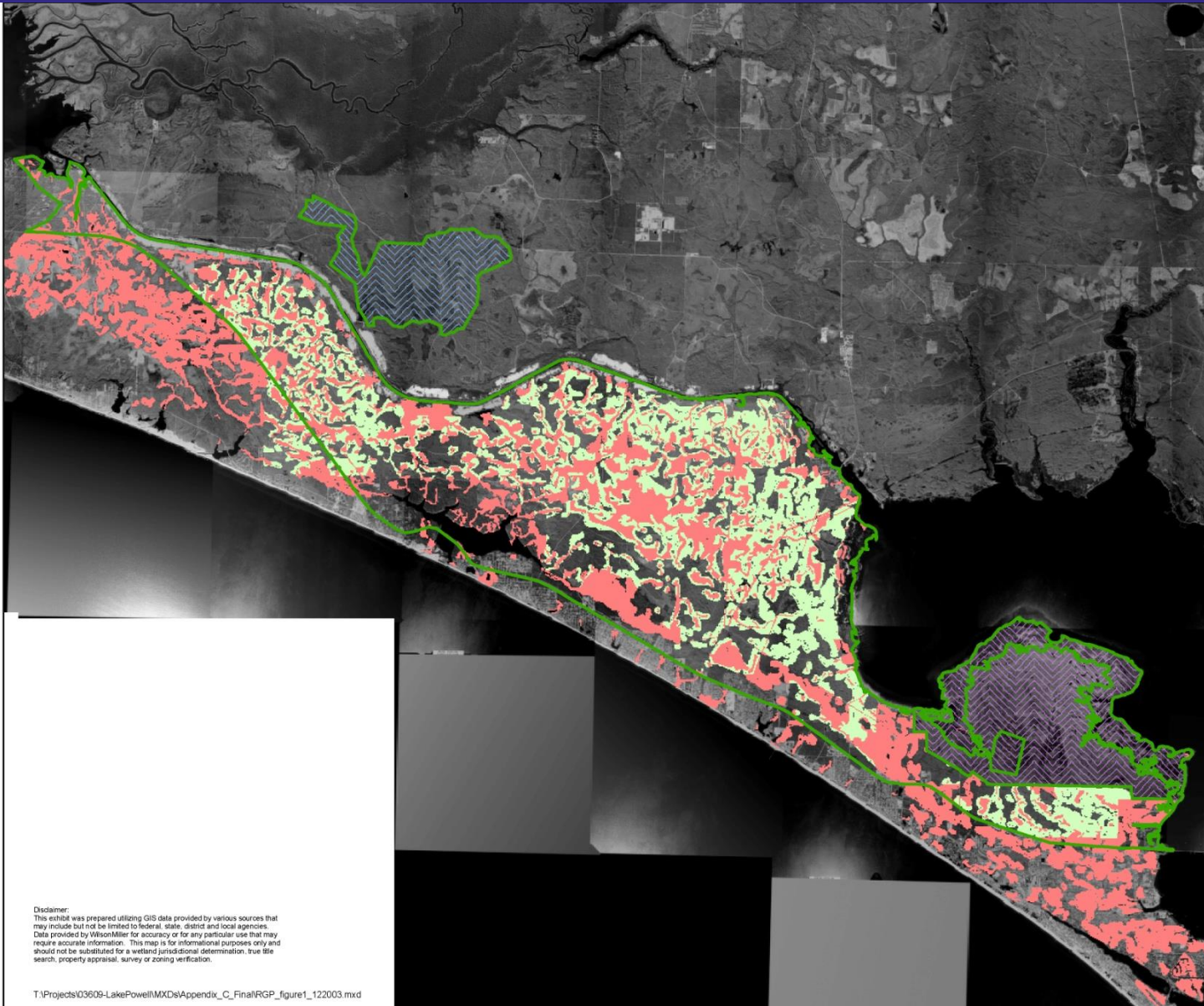


EXHIBIT 04

## MITIGATION STRATEGY



# GIS Modeling of Ecosystem/Watershed Condition

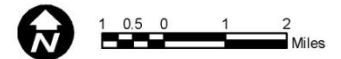


**Figure 1**

**High and Low Quality Wetlands  
within the  
West Bay to East Walton  
Study Area**

**Legend**

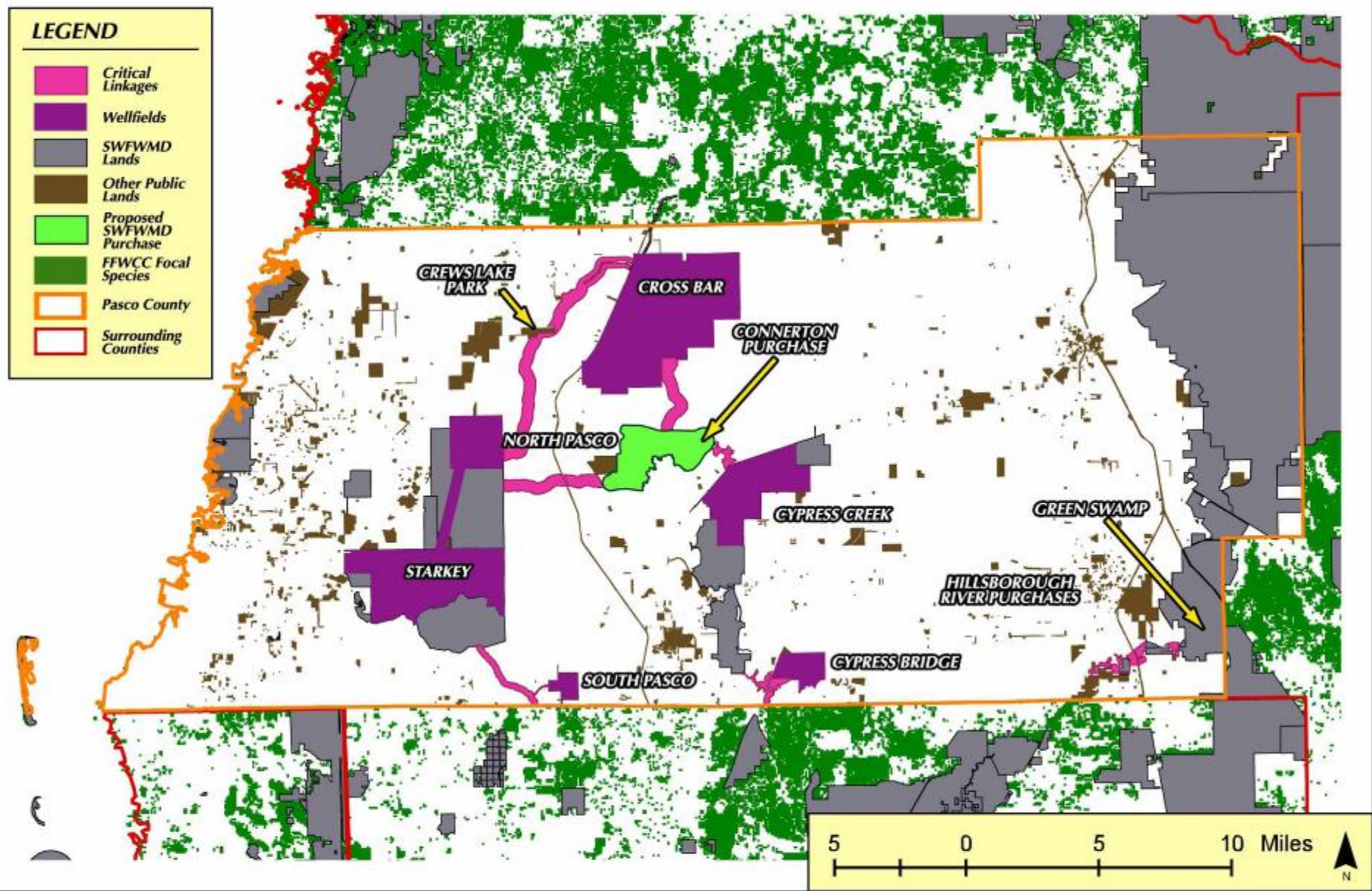
-  Devil's Swamp Mitigation Bank
-  Breakfast Point Mitigation Bank
-  Study Area
- Wetland Quality**
-  High Quality
-  Low Quality



Disclaimer:  
This exhibit was prepared utilizing GIS data provided by various sources that may include but not be limited to federal, state, district and local agencies. Data provided by WilsonMiller for accuracy or for any particular use that may require accurate information. This map is for informational purposes only and should not be substituted for a wetland jurisdictional determination, true title search, property appraisal, survey or zoning verification.







Source: Glatting Jackson and Pasco County

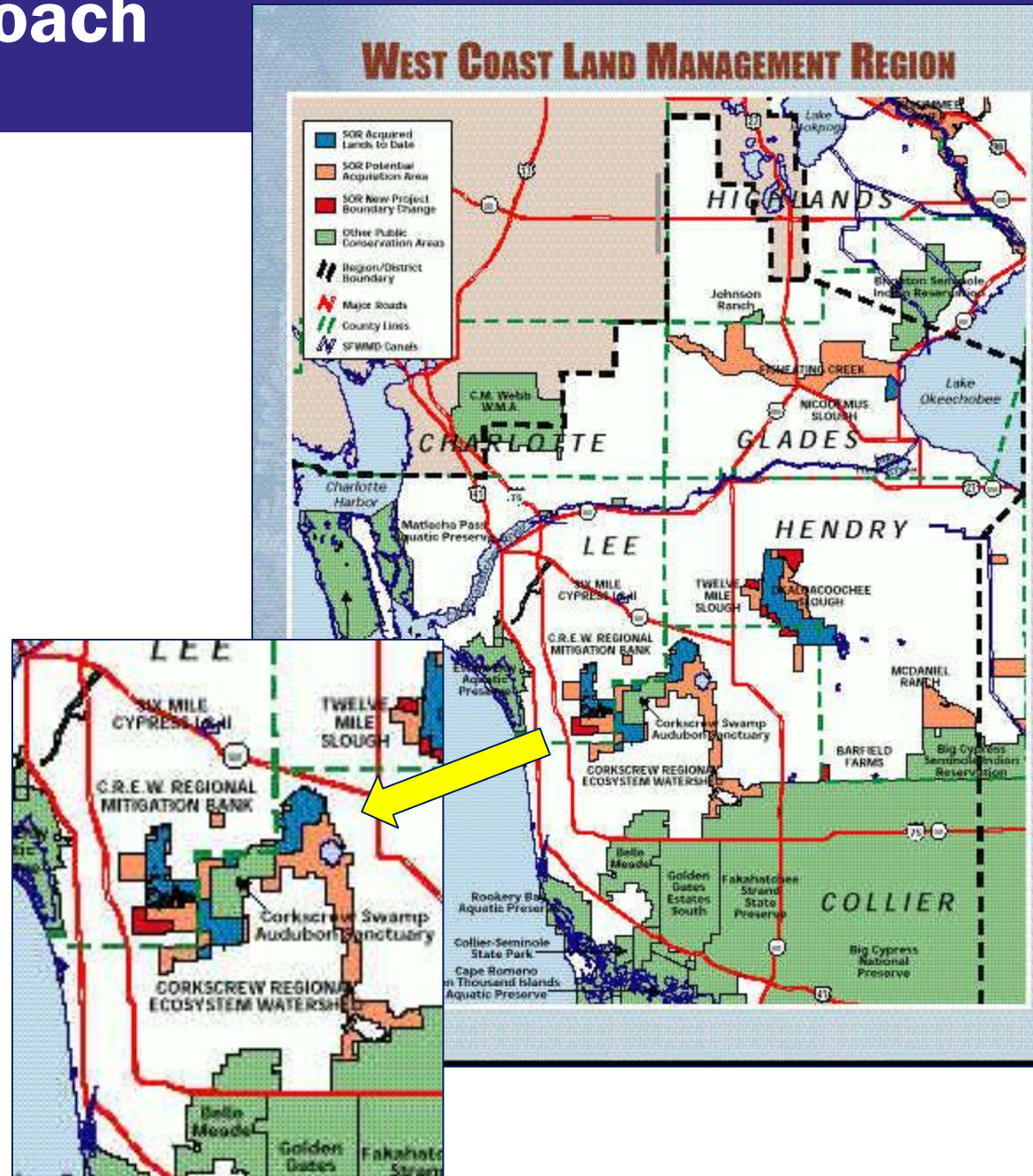


**Pasco County, Florida**

**Figure 7**  
**Critical Linkages (Corridors) of Wildlife Habitat**  
**Between Existing Public Lands**

# Watershed Approach @ CREW

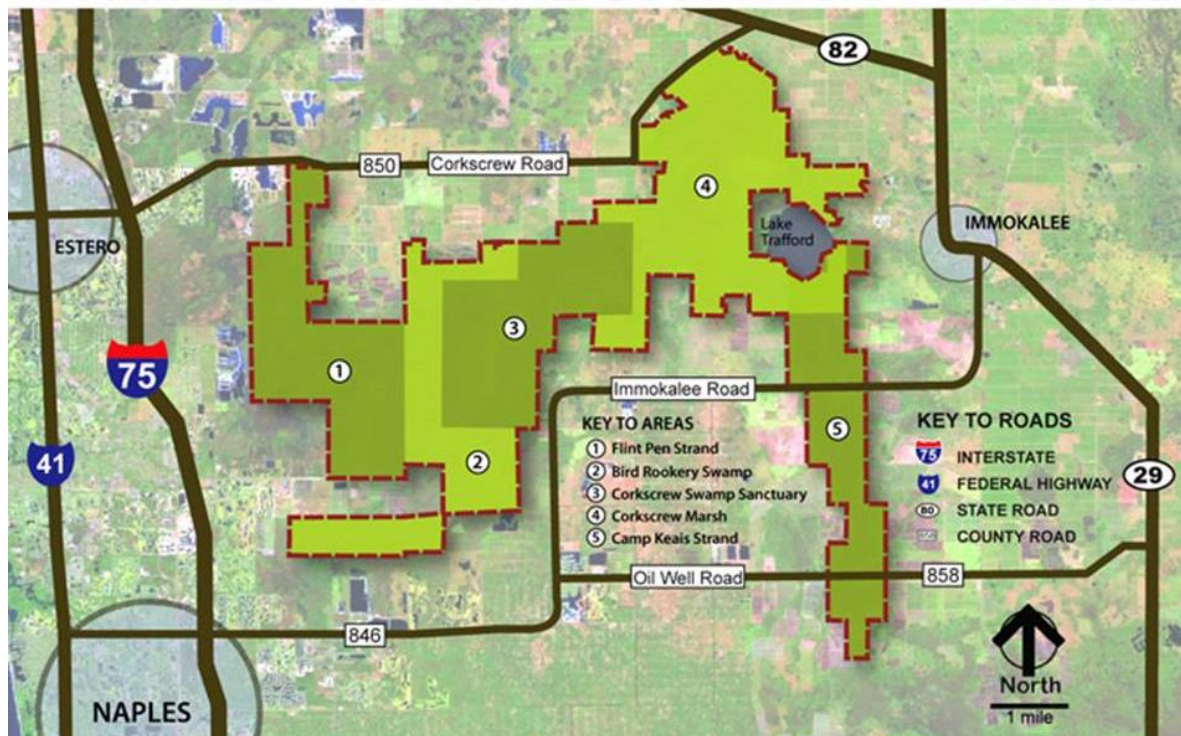
- Audubon's Corkscrew Swamp Sanctuary
- South Florida Water Management District land acquisition
- State of Florida land acquisition
- Local land trust land acquisition
- Two wetland mitigation banks
  - 1 private
  - 1 public



# Corkscrew Regional Ecosystem Watershed (CREW)


- Watershed divides had been cut through to send water to the gulf MORE quickly (*i.e.* – to drain lands). Result:
  - Drained lands
  - Flashy runoff
  - Freshwater starvation in western Everglades & Fakahatchee Strand
  - Flooding to the west
  - Habitat corridor shifts
  - Altered freshwater flows to Florida Bay
- Long Term plan made to restore historic flow patterns & processes
- *CREW boundary map* –> *not all parcels on this map are purchased or protected – yet.*

CORKSCREW REGIONAL ECOSYSTEM WATERSHED



# EPA-funded Watershed Approach Project for Section 404 projects



- 6-step process
  1. Identify watershed needs – *the most often overlooked aspect*
  2. Identify desired outcomes
  3. Identify potential sites
  4. Assess the potential of sites to sustainably meet watershed needs
  5. Prioritize sites, areas, and desired outcomes
  6. Data sources to support the watershed approach
- ***Addressing Step 1 will lead to the most effective results***



Watershed Approach Handbook

Improving Outcomes and Increasing Benefits  
Associated with Wetland and Stream Restoration and  
Protection Projects

September 2014



Protecting nature. Preserving life.®

# EPA-funded Watershed Approach Project for Section 404 projects

- Watershed needs identified in existing plans, reports, or analyses, such as:
  - CWA 303(d)/305(b) reports and related TMDLs
  - CWA 319 watershed plans
  - USACE Watershed Assessments/Plans
  - CZMA Coastal Zone Management Plans/Measures
  - State Wildlife Action Plans/Comprehensive Wildlife Conservation Strategies
  - State and local flood management and flood hazard mitigation plans

## 2.1: Identify Watershed Needs

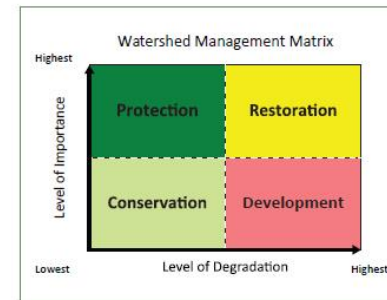


Figure 11: Puget Sound Characterization Watershed Management Matrix. Washington Department of Ecology. 2010. Puget Sound Watershed Characterization: Introduction to the Water Flow Assessment for Puget Sound. Publication No. 10-06.014. [www.pointblue.org/sfbaysr](http://www.pointblue.org/sfbaysr)

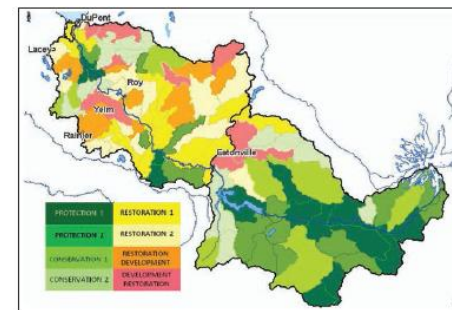


Figure 12: Puget sound characterization watershed map. Washington Department of Ecology. 2010. Puget Sound Watershed Characterization: Introduction to the Water Flow Assessment for Puget Sound. Publication No. 10-06.014. [www.pointblue.org/sfbaysr](http://www.pointblue.org/sfbaysr)

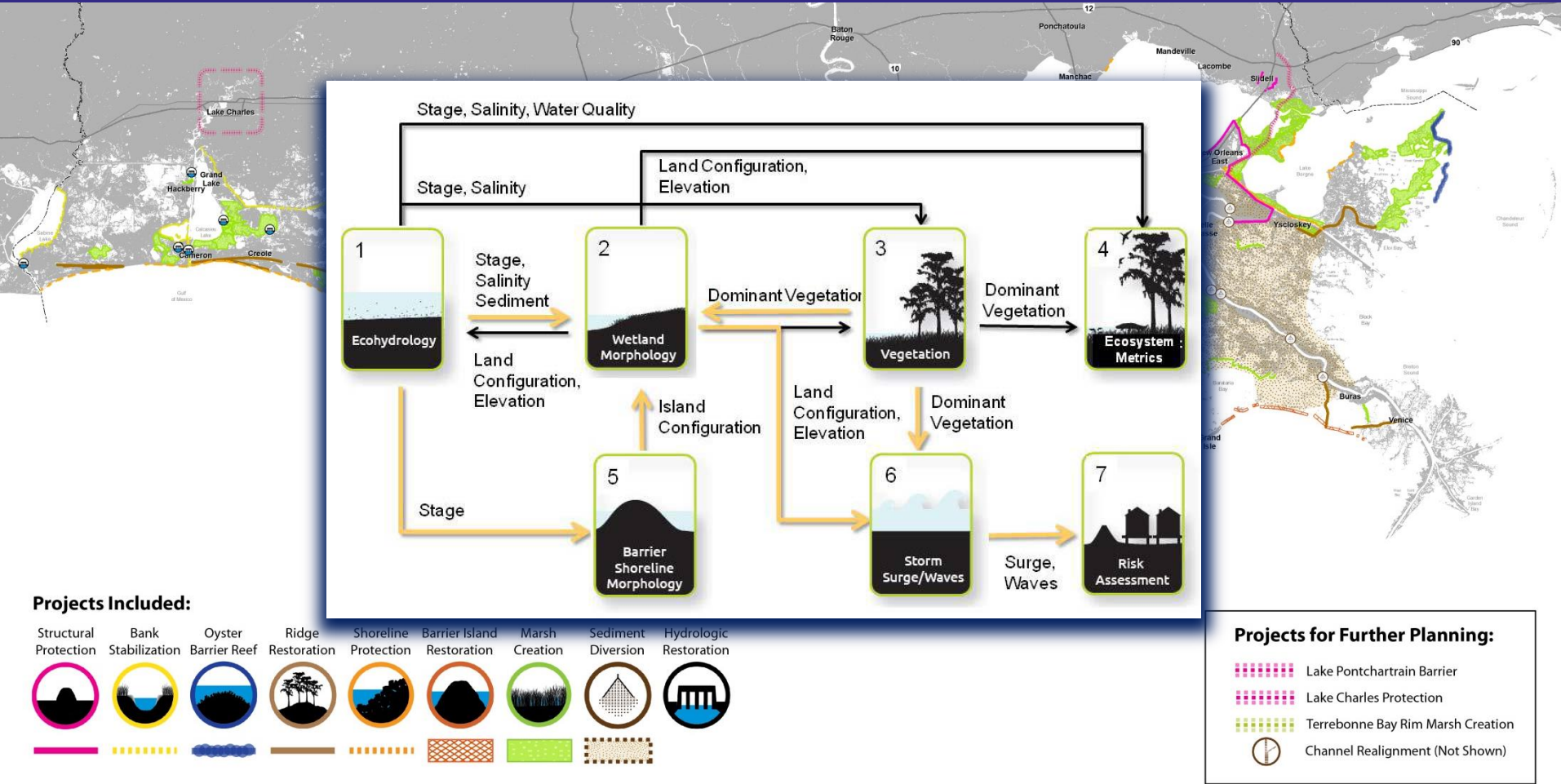
[characterization/index.html](#)

# Approaches around the US

- Watershed-informed decisions
  - Utilizes watershed and landscape factors to *guide decision-making*.
- Watershed analyses: non-prescribed outcomes
  - Use GIS and other analyses of watershed attributes to help *inform* site selection for wetland and stream projects.
- Watershed plans: prescribed outcomes
  - Seek to define *more specific*, desired watershed outcomes.



# Louisiana Coastal Restoration and Protection Master Plan



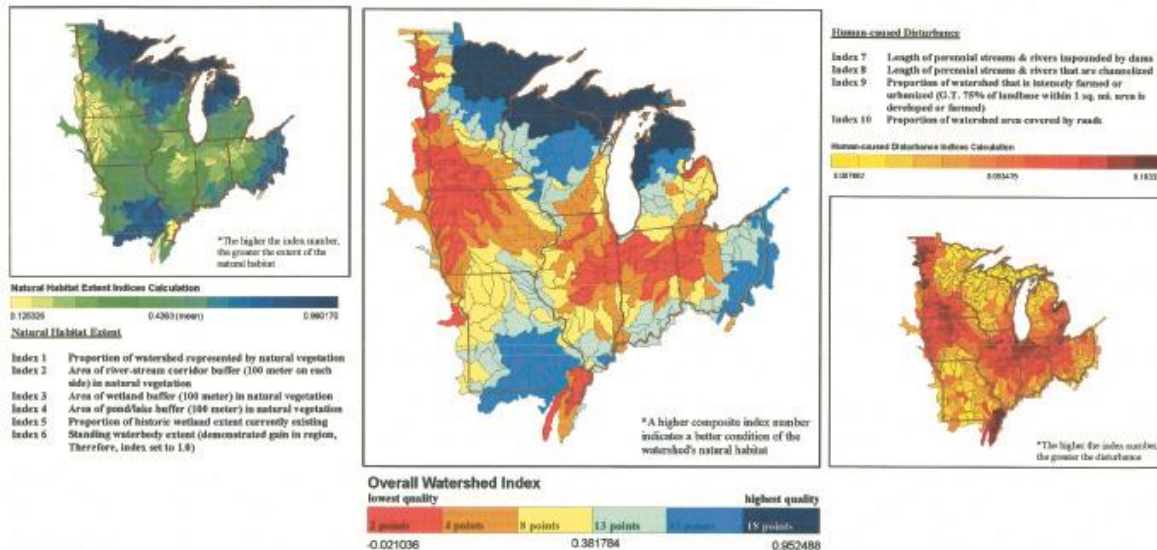
- Watershed-informed decision framework
- Goal to ensure a sustainable working coast, 3 major watersheds, Analytic models integrated across the coastal environment

# USFWS Watershed-based Assessment of "Natural Habitat Integrity"

Existing data (NWI, land use/land cover, and aerial imagery) used to produce a relatively inexpensive overview of the condition of a watershed.

- Very cost-effective and rapid method for describing the condition of a watershed.
- The approach includes metrics for assessing
  - condition of buffers around wetlands and waterbodies
  - extent of "natural habitat" in a watershed (vs. development)
  - historic wetland area relative to current acreage.

## An Evaluation of Watershed Health in Region 3



## Watershed Analysis: Non-Prescribed outcomes



# Watershed-Level WI Study by TNC & ELI

- Water quality objectives to be met via wetland restoration
- Map current functioning wetlands
- Use GIS to assess low functioning or non-functioning (former) wetlands

Watershed Analysis: Non-Prescribed outcomes

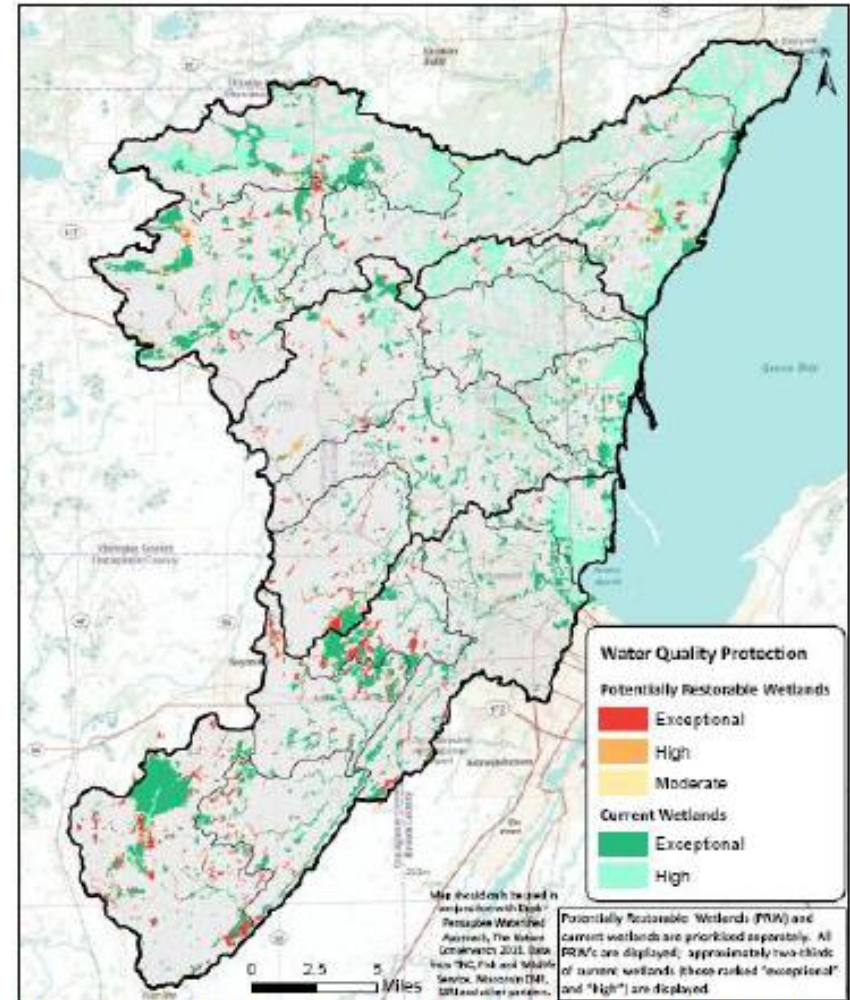


Figure 3: Water quality suitability analysis based on WET, TNC-ELI Duck-Pensaukee, WI watershed approach pilot

# Potentially restorable wetlands - WI

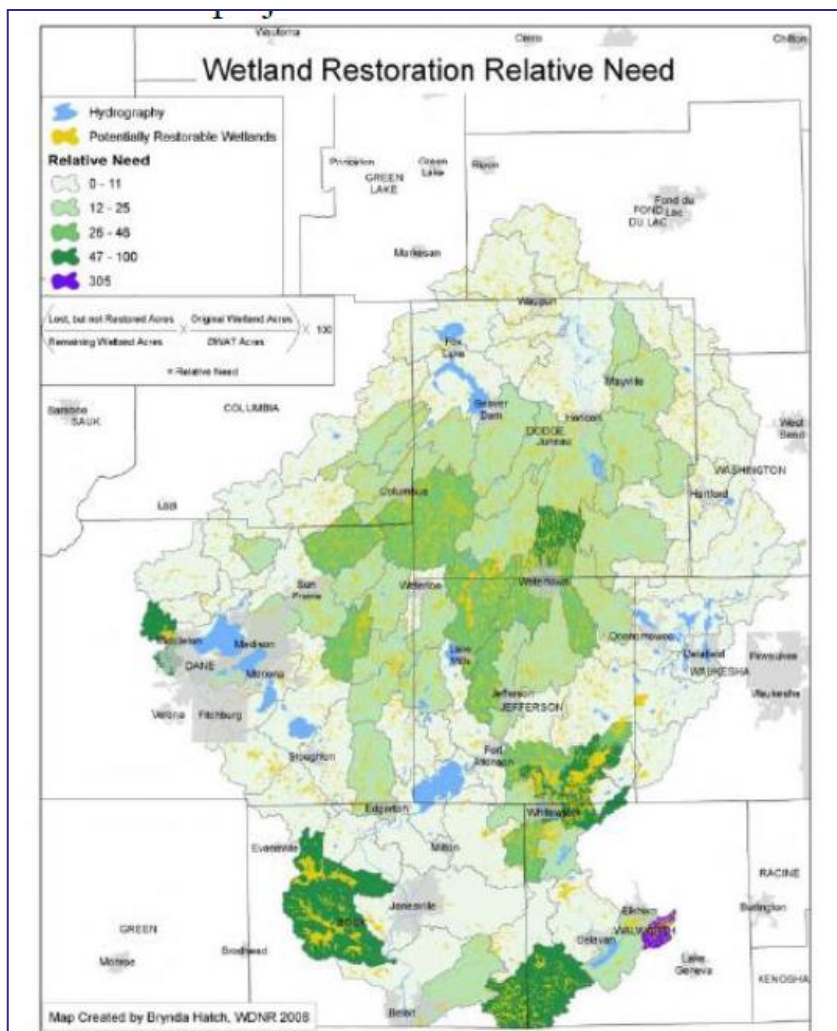


Figure 1: Wetland restoration relative need by subbasin in the Rock River watershed, WI

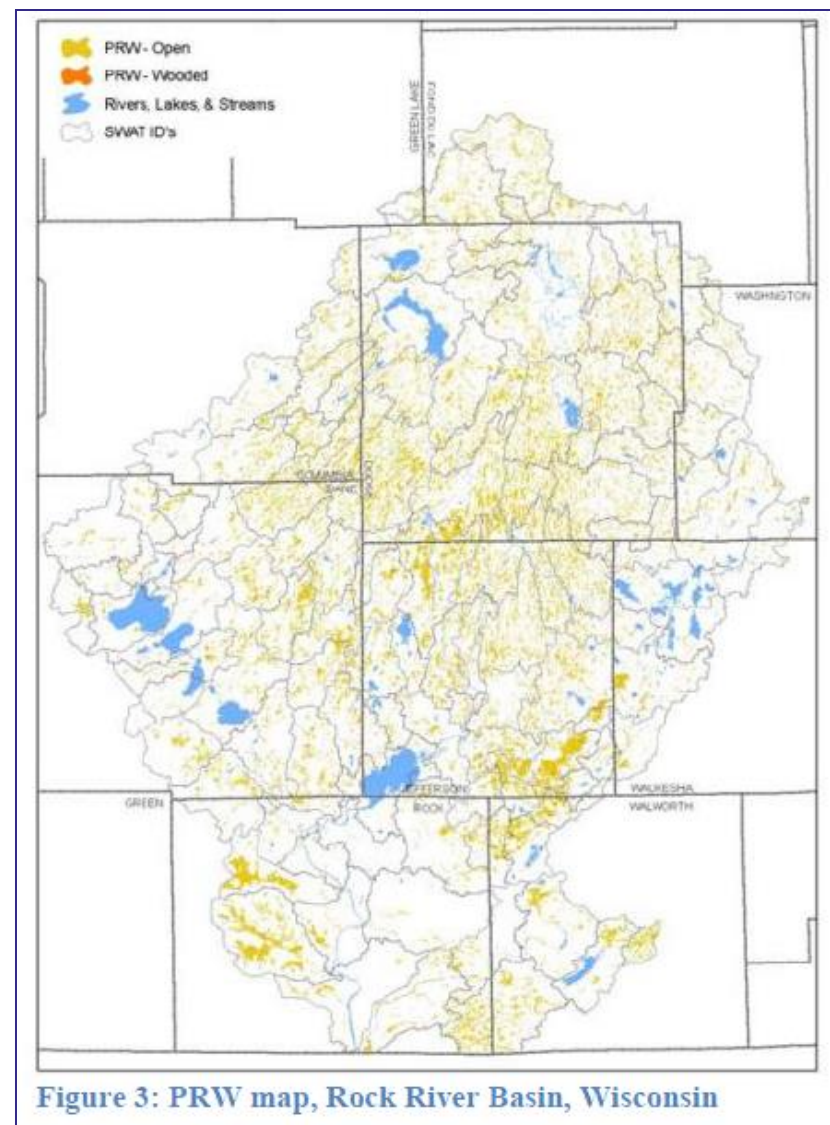


Figure 3: PRW map, Rock River Basin, Wisconsin

# Aquifer-based watershed

Can relate to recharge activities and surface restoration

Meets multiple goals

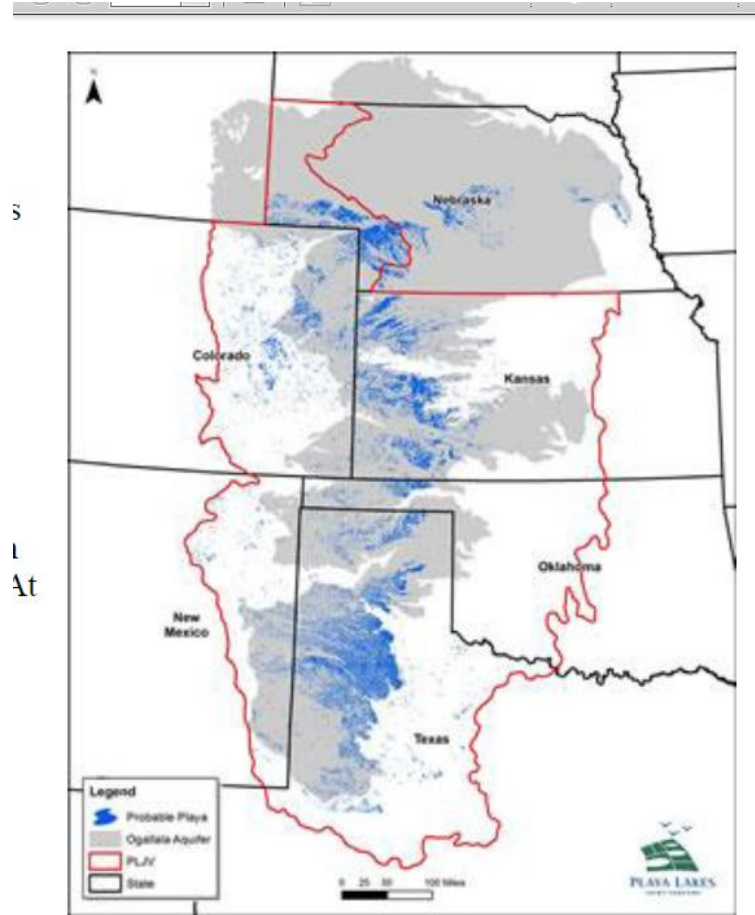


Figure 2: Probable playas in Ogallala Aquifer region, Playa Lakes Joint Venture

General locations identified

<http://www.pljv.org/>



# Maryland Water Resources Registry

Watershed Resources Registry - Windows Internet Explorer provided by Brown and Caldwell

http://watershedresourcesregistry.com/Default.aspx

File Edit View Favorites Tools Help

Watershed Resources Registry

EPA USACE EWS FHWA SHA MDE DNR Help

## Watershed Resources Registry

Location Details Results

Find Opportunities

Select a County:  
Prince George's

Select a Watershed:  
All Watersheds

Select Potential Opportunities:

- Upland Preservation
- Upland Restoration
- Wetland Preservation
- Wetland Restoration
- Riparian Preservation
- Riparian Restoration
- Stormwater Natural Infrastructure Preservation
- Stormwater Compromised Infrastructure Restoration

Select Score:  ★

Select Score Operator: =

Where Acres is Greater Than (>): Any Area

Where Acres is Less Than (<): Any Area

Find Opportunities

- 1 - 31.3 acres
- 1 - 31.1 acres
- 1 - 31.0 acres

Address Results

Map Contents

0 1 2 3 4 Miles

DC

Prince George's

Open WRR Tools

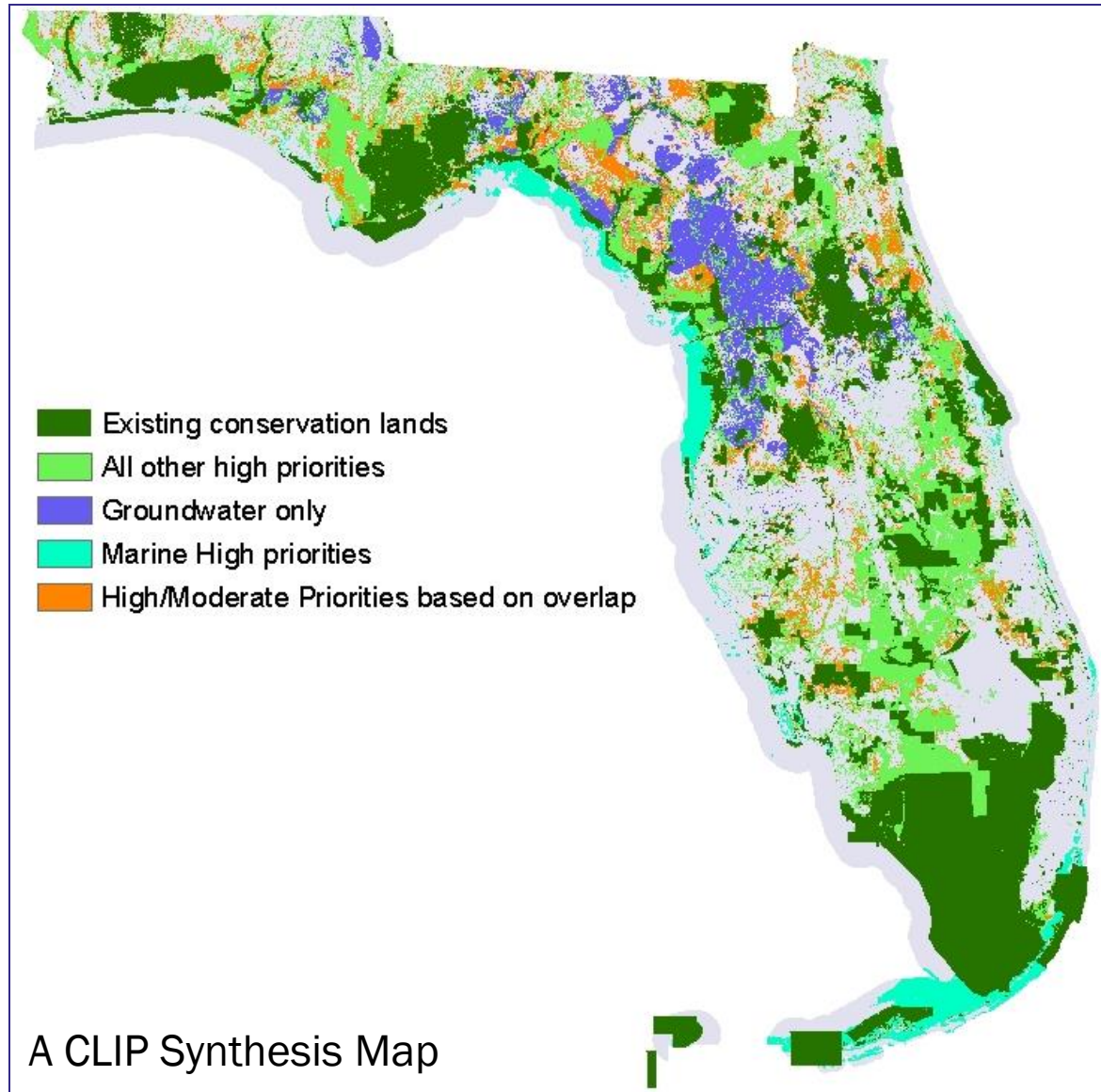
Sites identified w/in watersheds

Watershed Analysis: Non-Prescribed outcomes

Start Office Communicator C:\Documents and Sett... Microsoft PowerPoint - [I... Watershed Resource... 7:41 PM

# Watershed Approach

- Each area has its own priorities
- Federal and State both focus on watershed as the unit of interest
- Need collaborative watershed plan development
- Use the IRT (Interagency Review Team) model?
- Use techniques relevant to your situation
- Work Together



# Questions?

Graphics provided by:

- ✓ *The CLIP Project*
- ✓ *FRESP/SFWMD*
- ✓ *The St. Joe Company*
- ✓ *TNC*
- ✓ *WilsonMiller/Stantech*
- ✓ *Family Lands Remembered*
- ✓ *The CLIP project*
- ✓ *Photos by Ann Redmond*



Dispersed Water Storage Site in the SFWMD