



Watershed Management Plan

Identification of Potential Projects and Regulatory Issues

October 6, 2010



Watershed Management Plan Objectives

- Develop watershed management plans that will help protect estuaries and wetland systems to
 - Restore historical water quantity and estuarine discharges
 - Improve water quality within the watersheds and estuaries
 - Address flood control and water supply issues
- Project will be completed in December 2010.

Watershed Management Plan

Specific Tasks

- Update the BCB hydrologic/hydraulic computer model
- Evaluate watershed and estuarine existing conditions
 - Water quantity
 - Water quality
 - Natural resources
- Define performance measures
- Identify potential projects, evaluate alternatives and provide recommended improvements
- Prepare Watershed Management Plans

Watershed Management Plan Specific Tasks

- Update the BCB hydrologic/hydraulic computer model
- Evaluate watershed and estuarine existing conditions
 - Water quantity
 - Water quality
 - Natural resources
- Define performance measures
- **Identify potential projects**, evaluate alternatives and provide recommended improvements
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Presentation Topics

- Identification of Potential Projects
 - Methodology
 - Watershed specific projects
 - County-wide projects
- Regulatory and Policy Issues
 - Water Quality
 - Water Quantity
 - Land Development Code

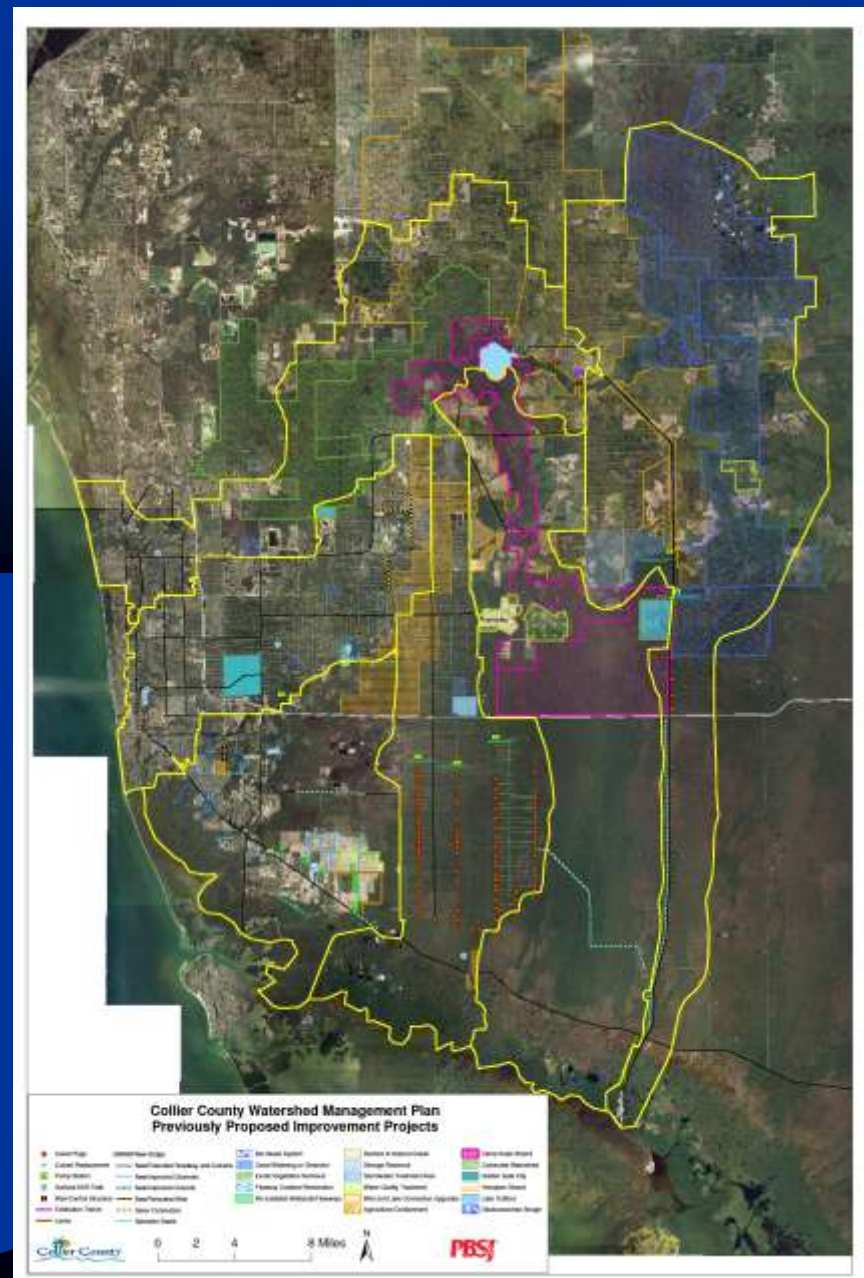
Identification of Potential Projects

- Methodology
 - Identify previously considered projects or projects that are scheduled for implementation
 - Better define previously identified projects
 - Identify new project opportunities based on:
 - Estuary freshwater surplus/deficit
 - Current property ownership
 - Existing conservation easements
 - Location within Sending/Receiving areas

Identification of Potential Projects

- Methodology
 - Previously considered projects or projects that are scheduled for implementation
 - Picayune Strand Restoration Project
 - Southwest Florida Feasibility Study
 - Belle Meade Area Stormwater Master Plan
 - Lely Area Stormwater Improvement Project
 - Immokolee Stormwater Master Plan
 - Master Plan for Regional Irrigation Distribution System (RIDS)

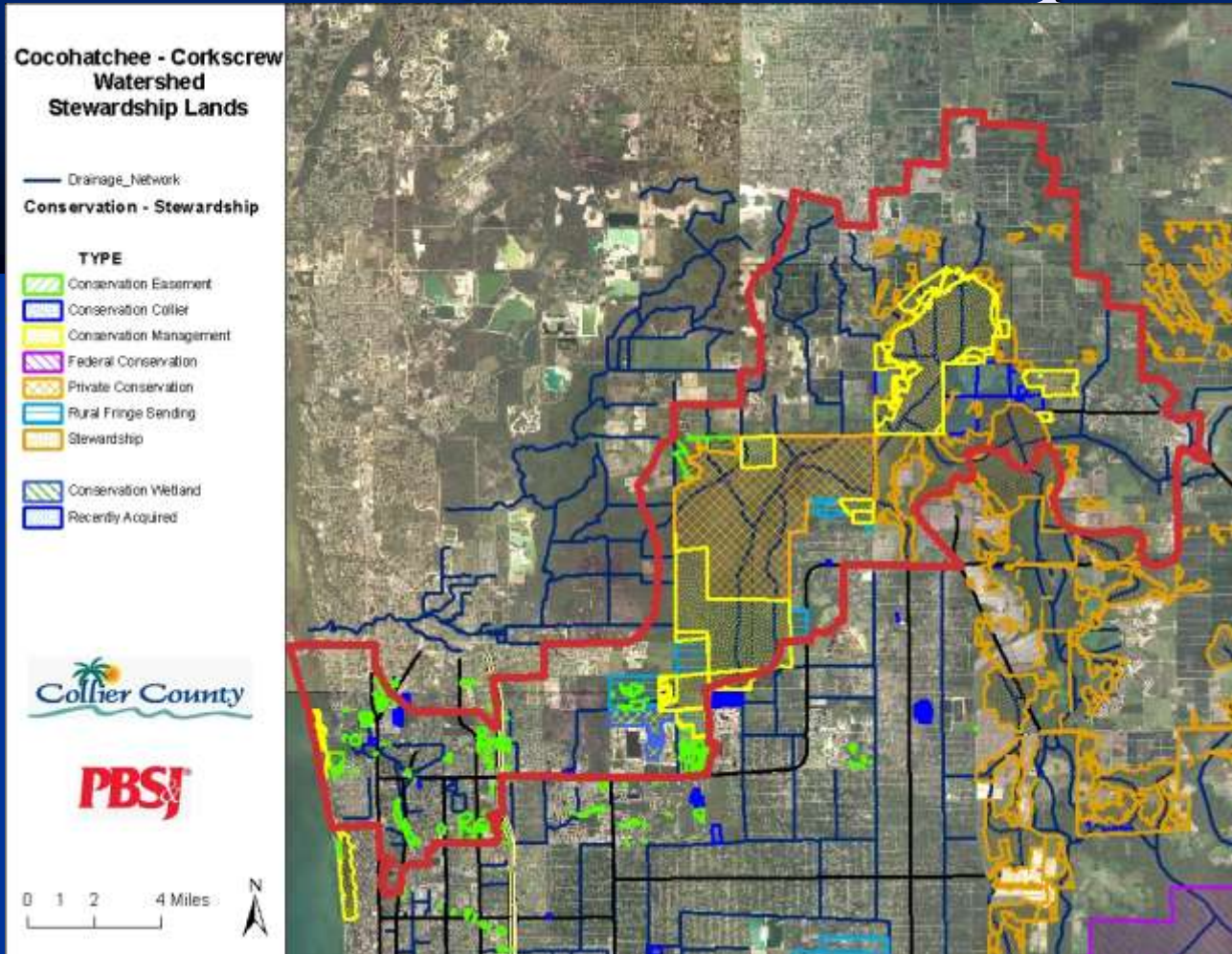
Location of Previously Considered Projects



Potential Projects by Watershed

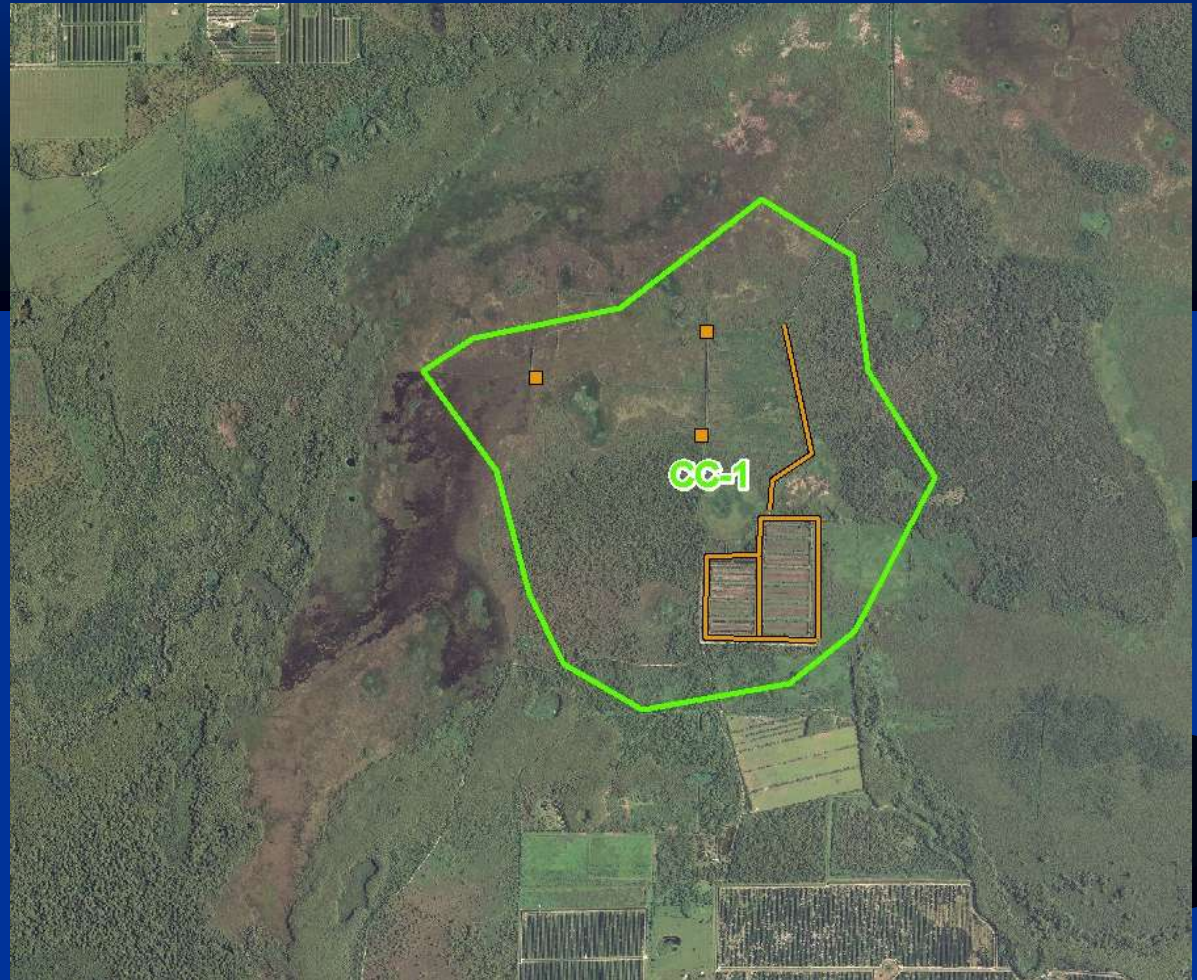
- Cocohatchee – Corkscrew
- Golden Gate – Naples Bay
- Rookery Bay
- Other watersheds
 - Faka Union
 - Fakahatchee
 - Okaloacoochee Slough/SR29 Canal

Cocohatchee-Corkscrew Conservation/Stewardship Lands



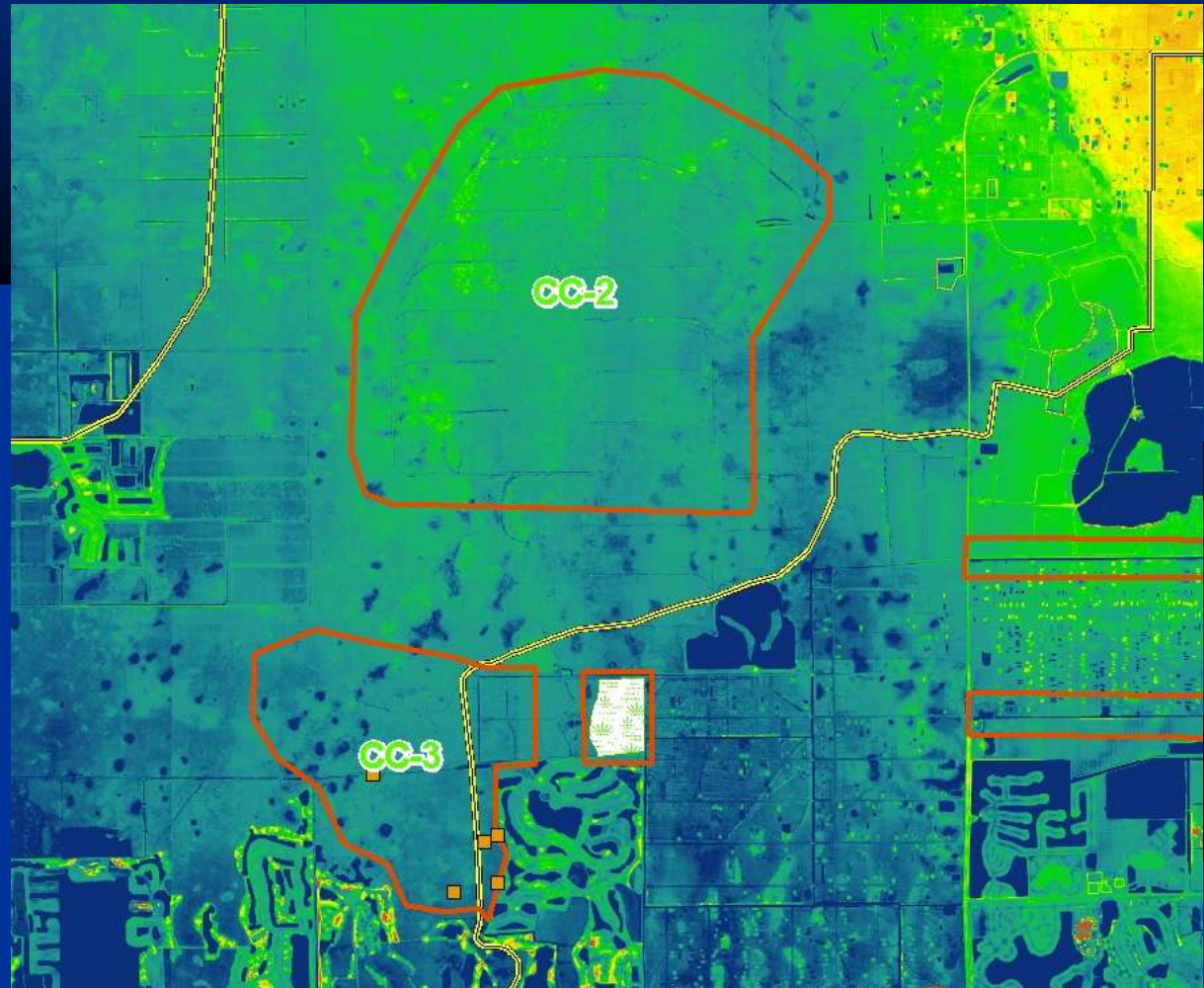
Potential Projects: Cocohatchee-Corkscrew

- CC-1
 - Ditch blocks to force overland flow
 - Regrade area to remove berms

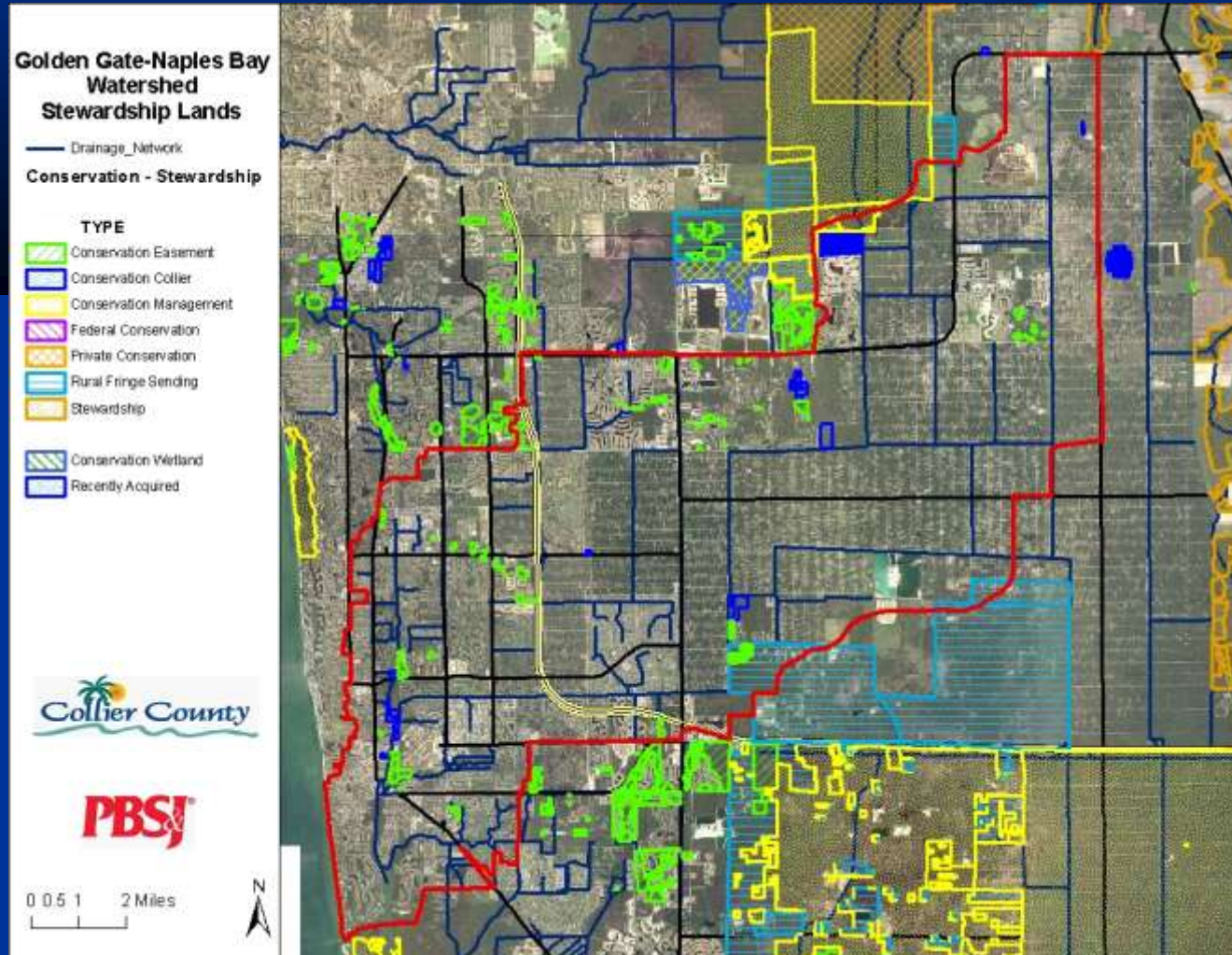


Potential Projects: Cocohatchee-Corkscrew Watershed

- CC-2
 - Regrade to natural elevation
- CC-3
 - Ditch blocks to encourage overland flow

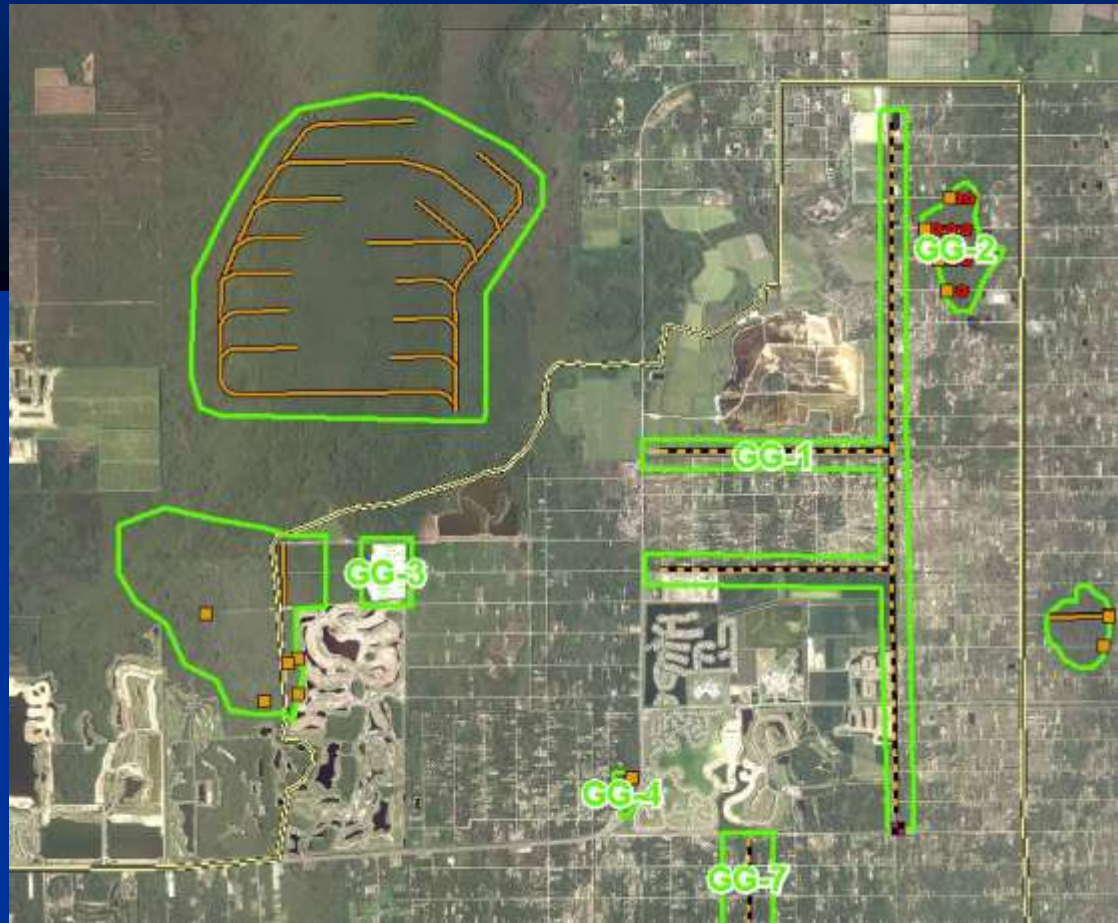


Golden Gate - Naples Bay Watershed Conservation/Stewardship Lands



Potential Projects: Golden Gate – Naples Bay Watershed

- GG-1
 - New weirs to stage water in canals
- GG-2
 - Ditch blocks and equalization culverts to allow more storage
- GG-3
 - Ditch blocks to force overland flow



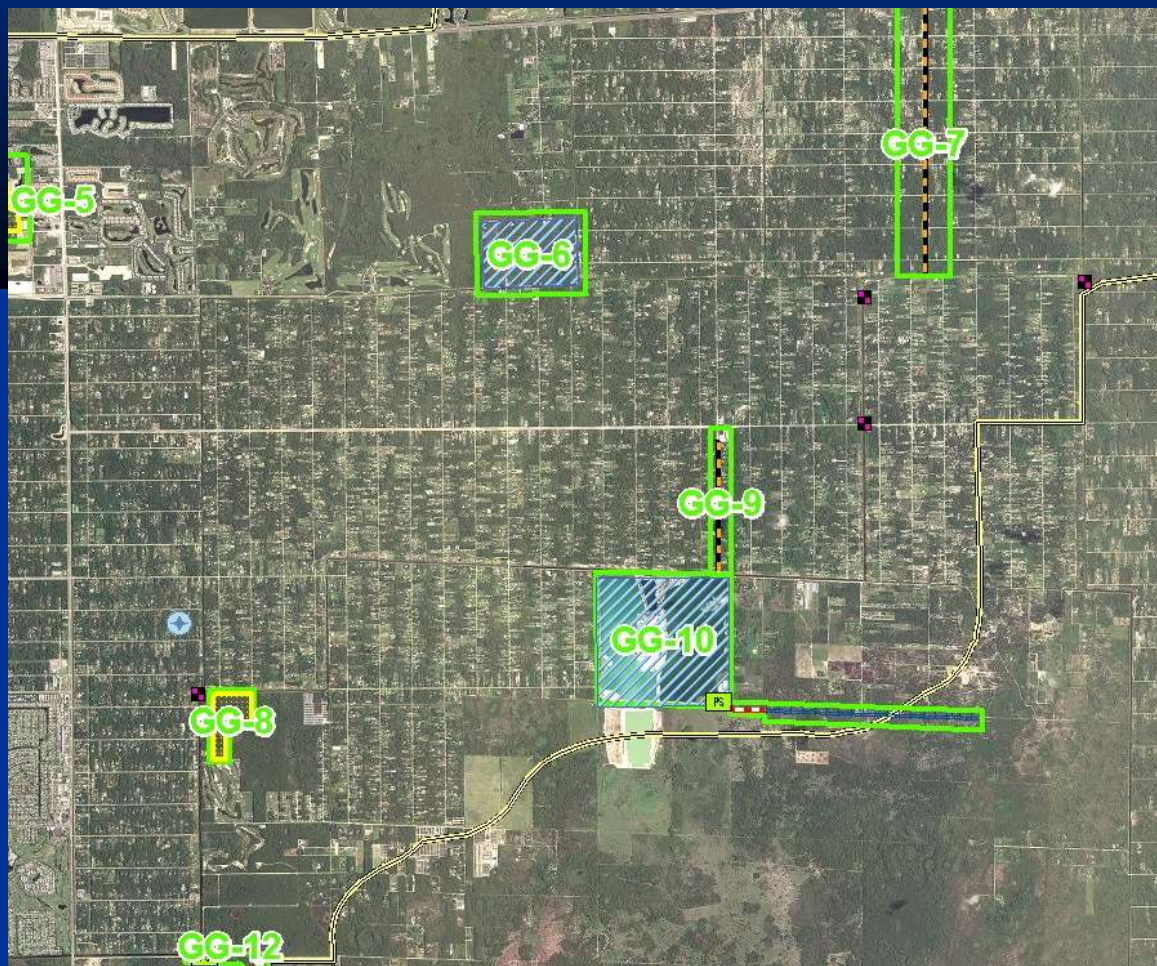
Potential Projects: Golden Gate – Naples Bay Watershed

- GG-4
 - Ditch blocks to force overland flow
- GG-5
 - Divert water for water treatment
- GG-6
 - Off-line stormwater reservoir
- GG-7
 - New weirs in canal



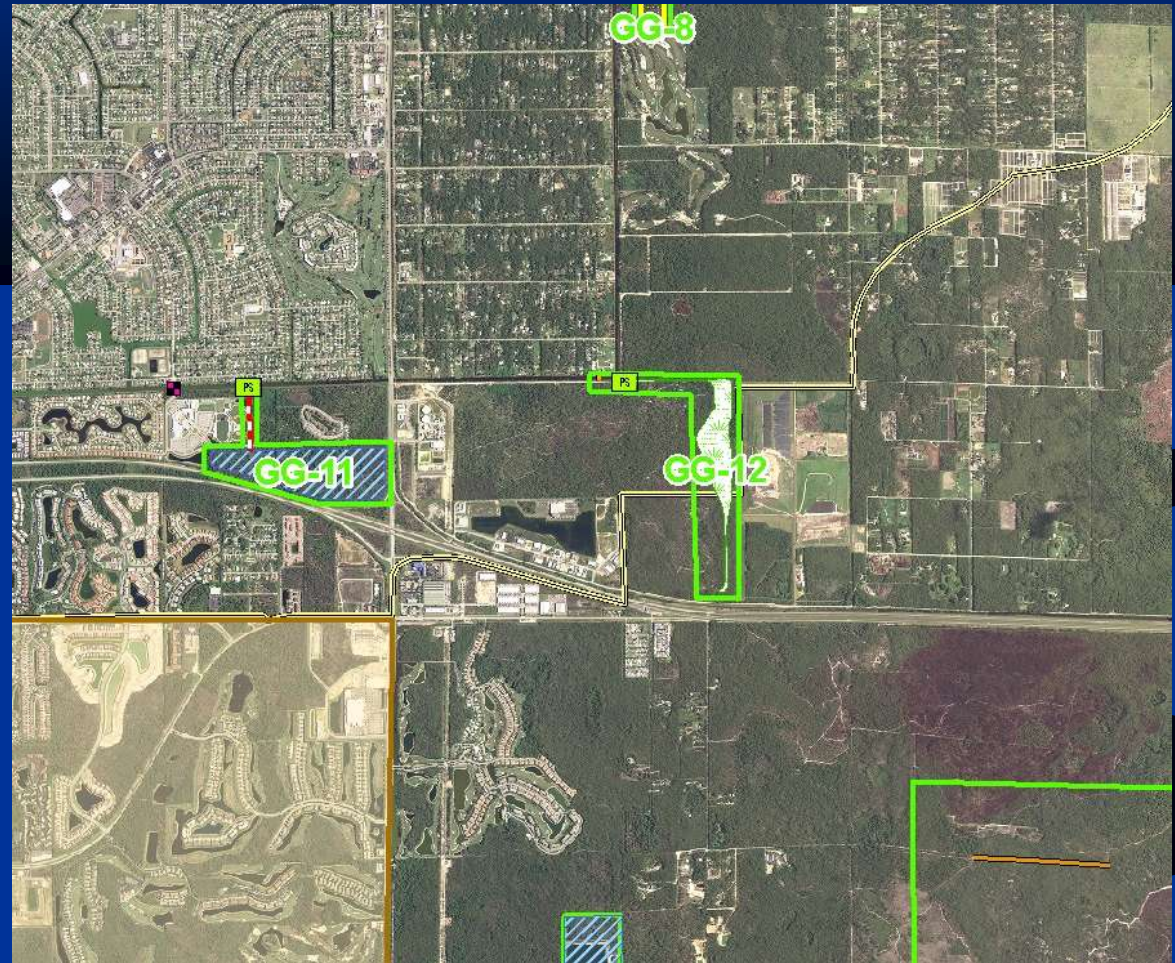
Potential Projects: Golden Gate – Naples Bay Watershed

- GG-8
 - Wetland flow
- GG-9
 - New weirs to stage water
- GG-10
 - Off-line storage reservoir

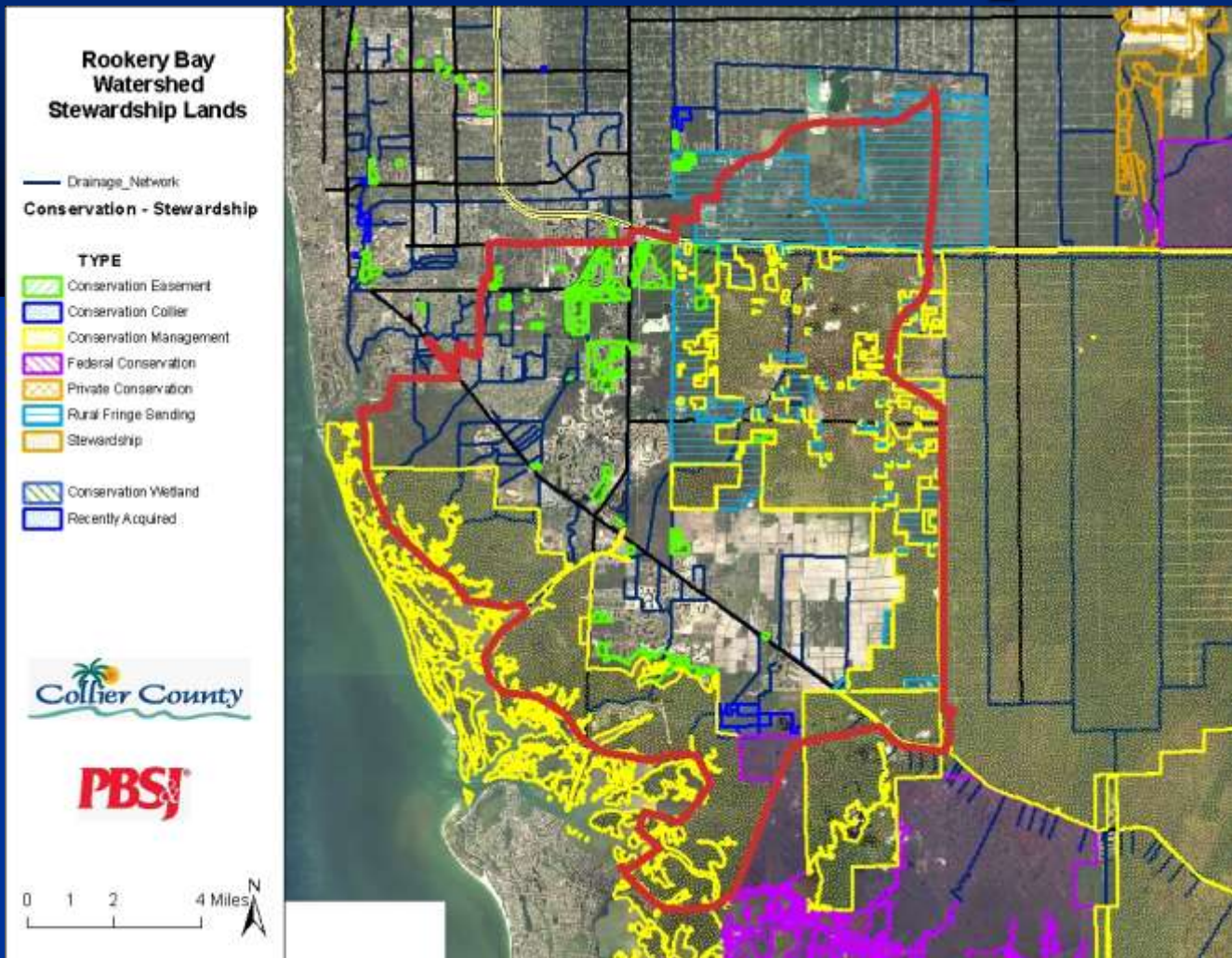


Potential Projects: Golden Gate – Naples Bay Watershed

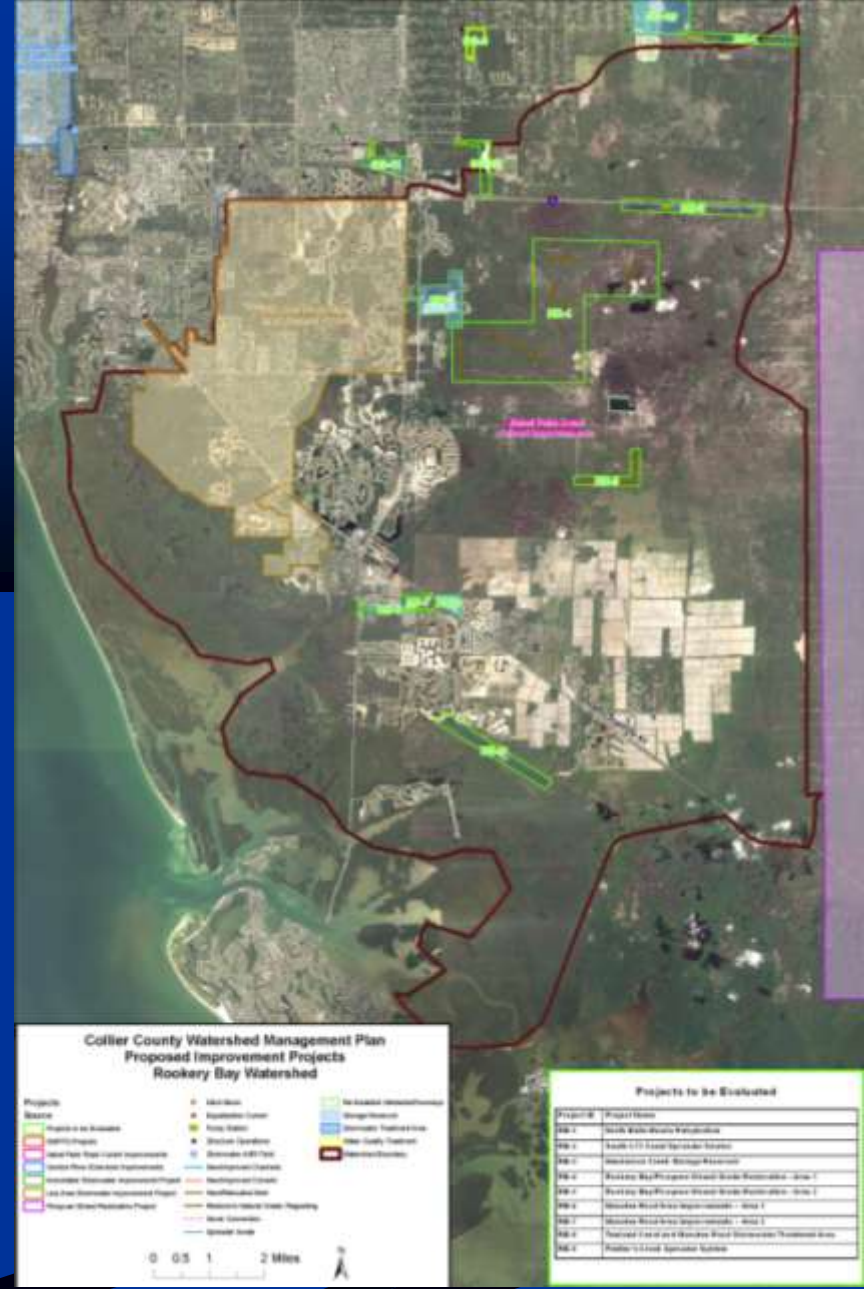
- GG-11
 - Off-line storage reservoir
- GG-12
 - Diversion to Rookery Bay watershed



Rookery Bay Watershed Conservation/Stewardship Lands



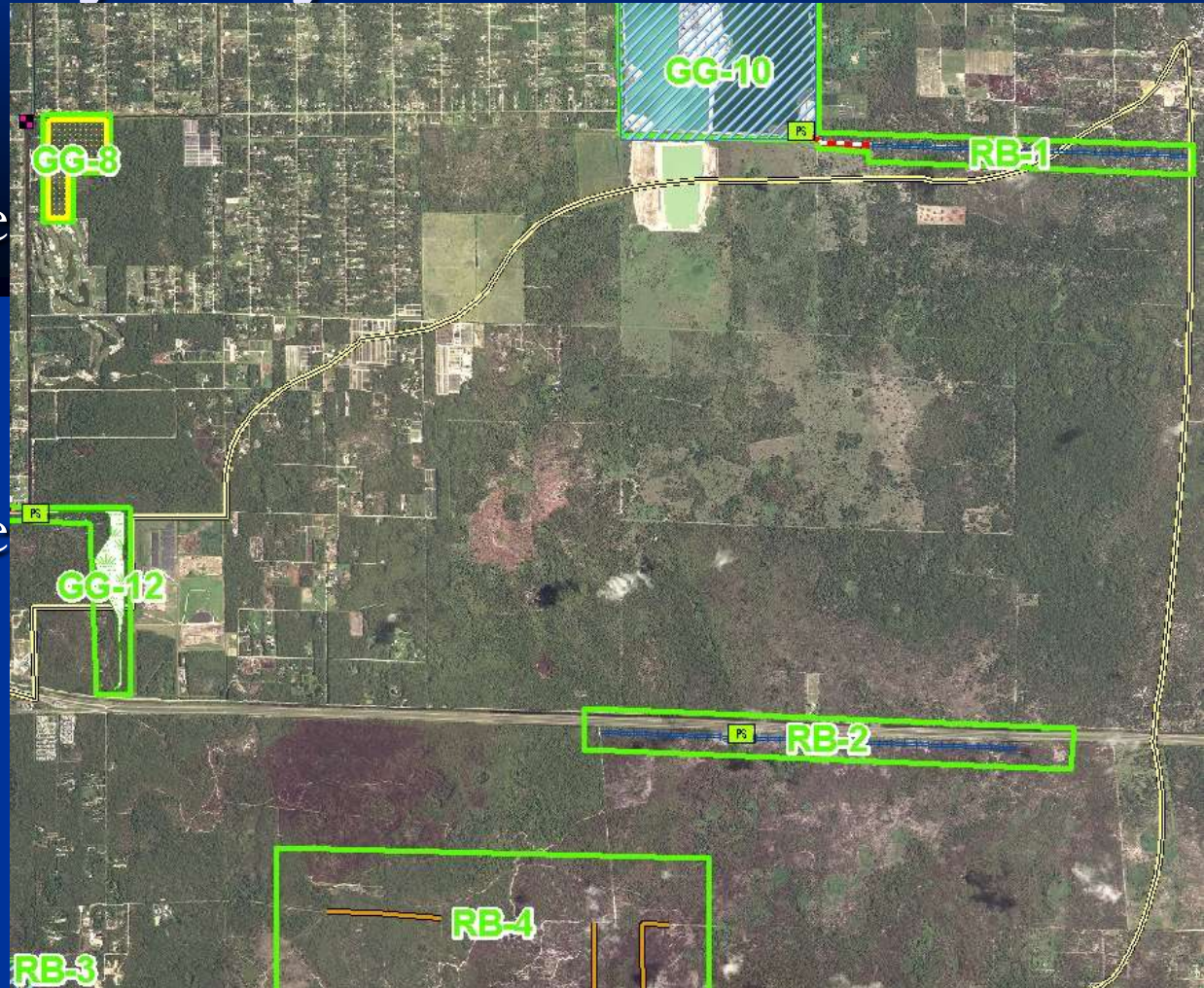
Potential Projects: Rookery Bay Watershed



Potential Projects

Rookery Bay Watershed

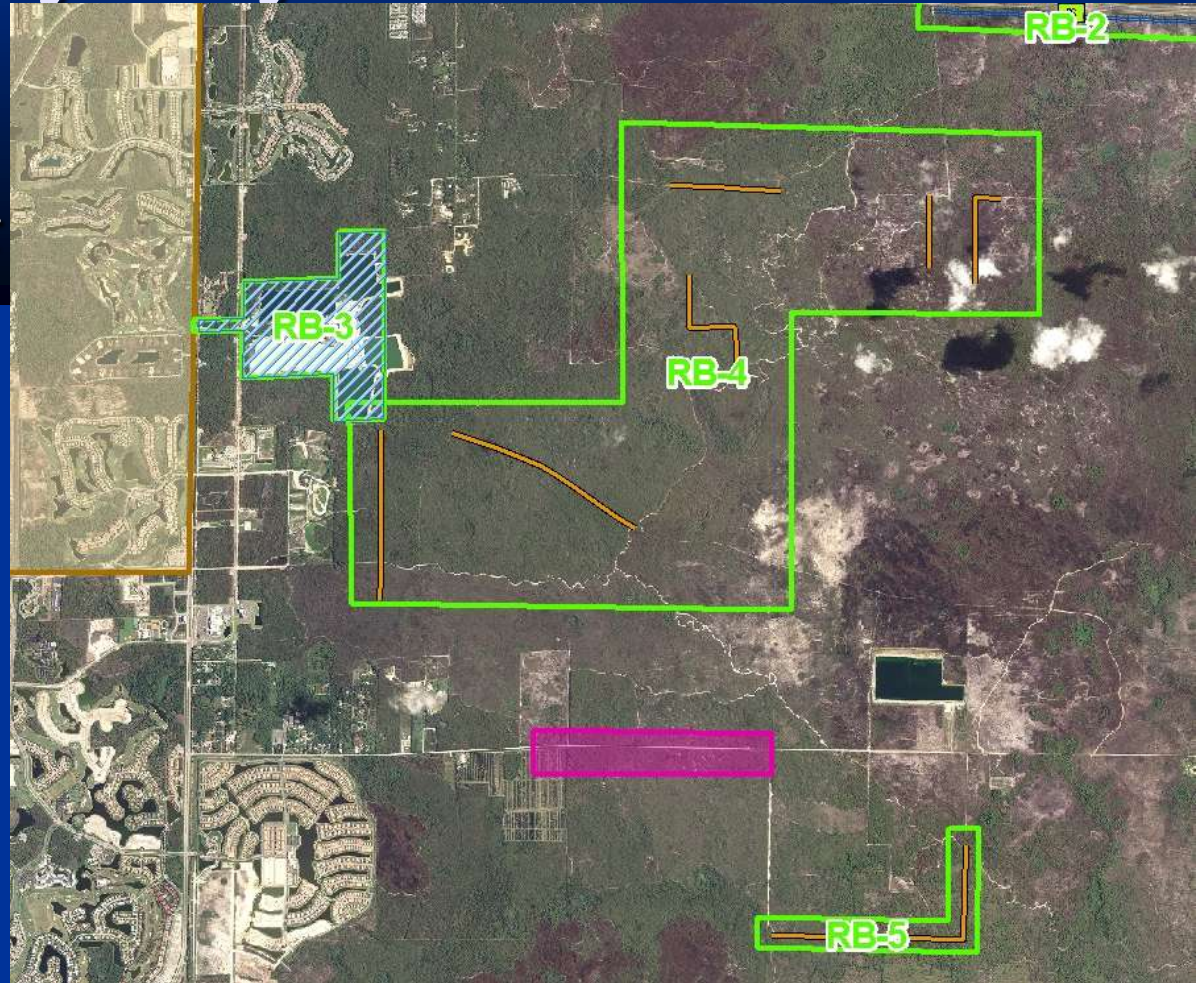
- RB-1
 - Spreader swale in RFS lands
- RB-2
 - Spreader swale south of I-75



Potential Projects

Rookery Bay Watershed

- RB-3
 - Storage reservoir (SWFFS)
- RB-4 and RB-5
 - Regrading of roads and horse trails in PSSF



Potential Projects

Rookery Bay Watershed

- RB-6 and RB-7
 - Drainage upgrades and spreader swale
- RB-8
 - Stormwater treatment area
- RB-9
 - Spreader swale



Other Watersheds Conservation/ Stewardship Lands

Faka Union, Fakahatchee, Okaloacoochee/SR29 Watersheds Stewardship Lands

— Drainage_Network

Conservation - Stewardship

TYPE

Conservation Easement

Conservation Collar

Conservation Management

Federal Conservation

Private Conservation

Rural Fringe Sending

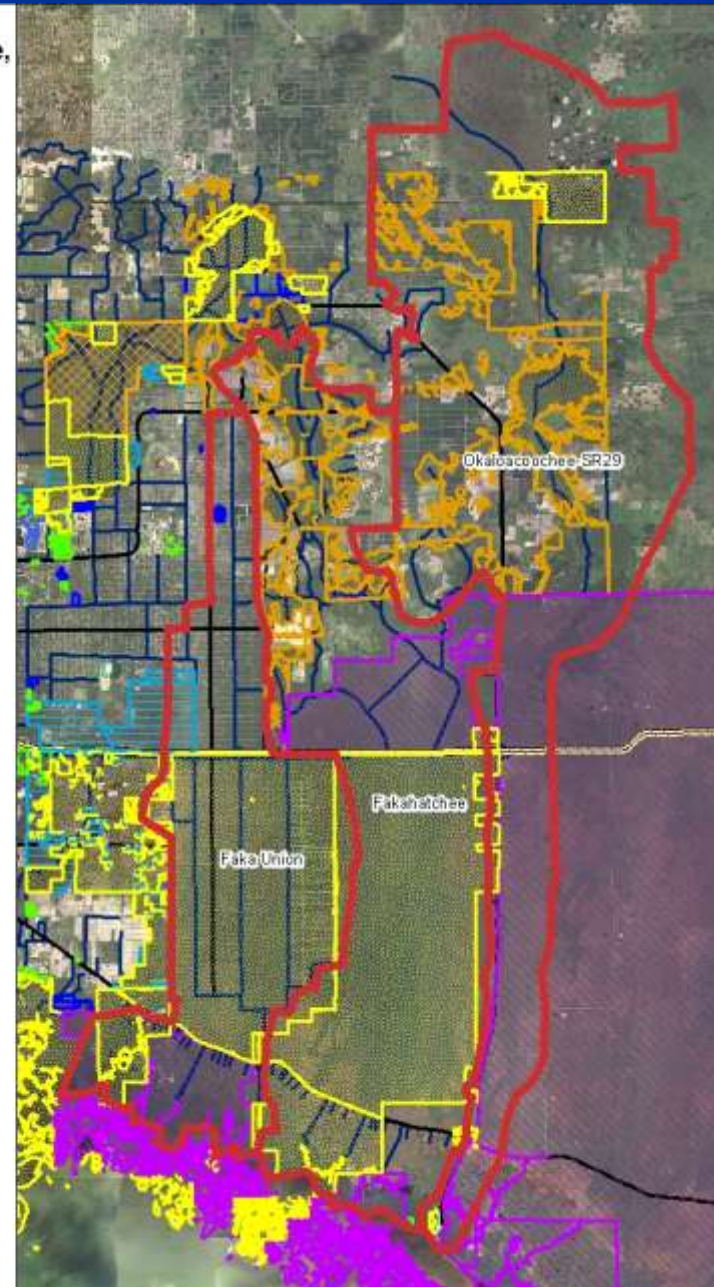
Stewardship

Conservation Wetland

Recently Acquired



0 1.5 3 6 Miles



Potential Projects

Other Watersheds

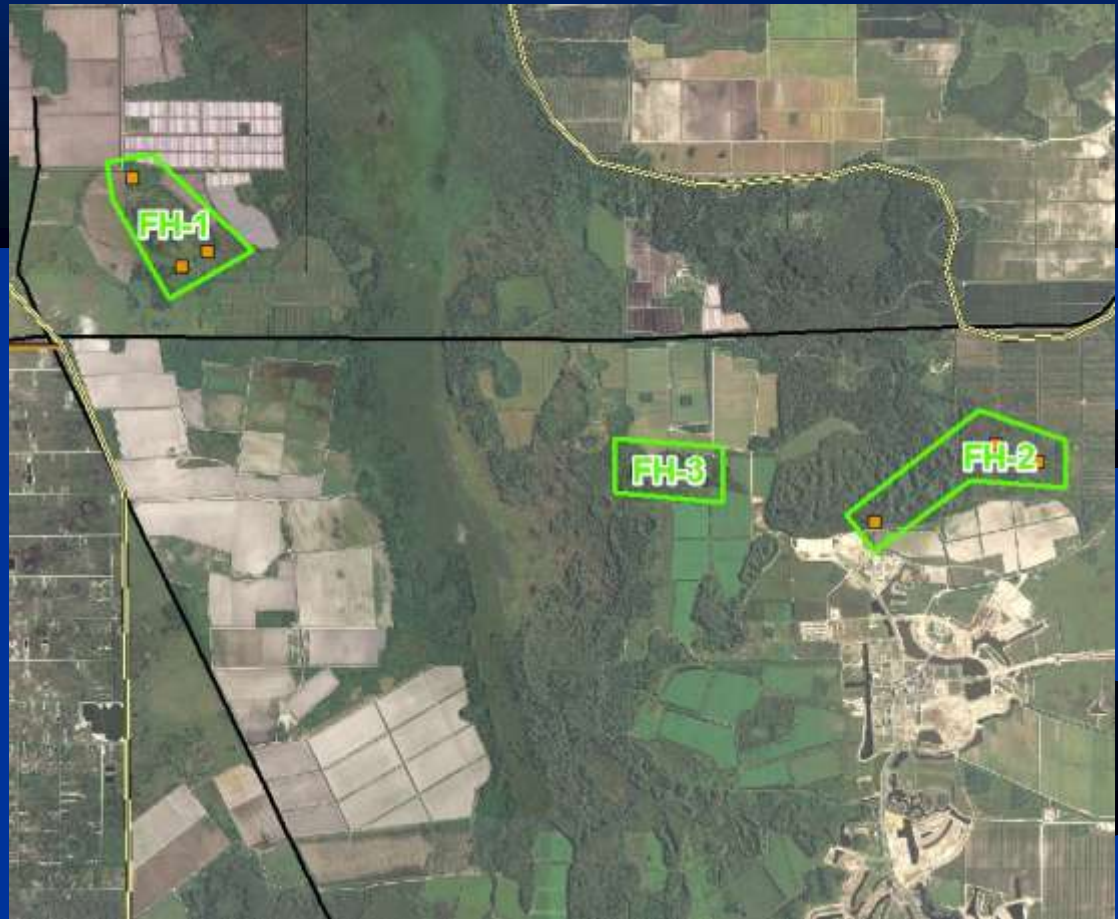
- FA-1
 - Ditch blocks and equalization culverts for more storage



Potential Projects

Other Watersheds

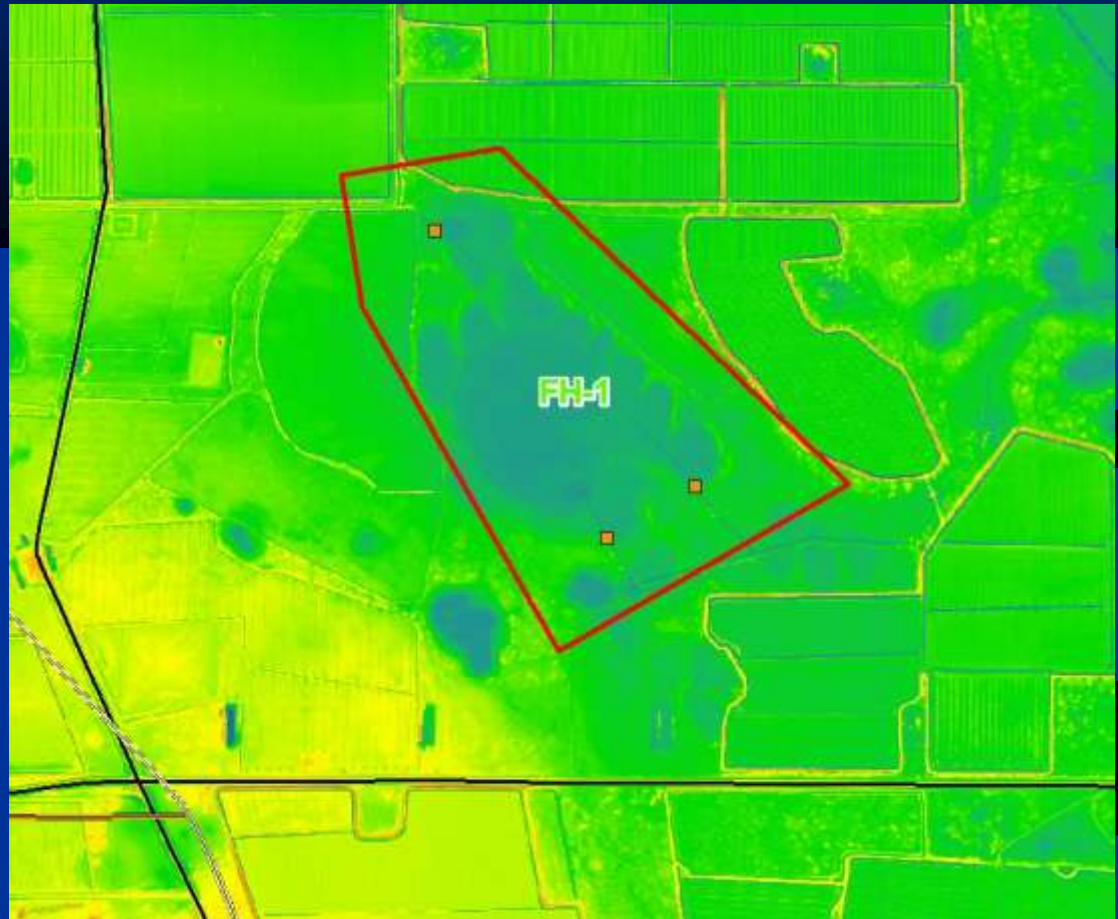
- FH-1 to FH-3
 - Ditch blocks to reduce drainage of isolated wetlands



Potential Projects

Other Watersheds

- FH-1
 - Ditch blocks to reduce drainage of isolated wetlands



County-wide Projects

- Structure operations
- Public facilities (schools and parks) retrofits
 - Pervious paving
 - Infiltration basins
 - Rain gardens
- Incentive programs for retrofit of private property
- Aquifer Storage and Recovery (stormwater)



Golden Gate High School

Potential Retrofits



- Utilize islands as infiltration basins
- Install pervious pavement in low traffic areas
- Install rain gardens to capture roof runoff



Presentation Topics

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- Regulatory and Policy Issues
 - Water Quality
 - Water Quantity
 - Land Development Code

Regulatory Issues

- Background
- Objectives
- Low Impact Development

Background

- State Water Policy, the TMDL Program, the Current ERP Process, and the Proposed Stormwater Rules
- Current Applicable Regulations from SFWMD and Collier County
- Regulatory Review Categories:
 - Water Quality
 - Water Quantity
 - Land Development
 - Zoning

Objective

- Help implement a Sustainable Stormwater Management Program
- The programs should aim to:
 - Promote more effective site planning to minimize anthropogenic impacts,
 - Promote preservation of the natural system
 - Help reduce development costs
 - Help reduce cost of future drainage system improvements

Low Impact Development (LID)

- The program is based on the concept of LID
- LID promotes management of stormwater by:
 - Encouraging management of stormwater at the site
 - Minimize the extent of directly connected impervious areas.
 - Minimize site disturbance
 - Maintain or restore a site's natural hydrology
 - Maximize the site's assimilative capacity

Current Stormwater Management Approach



Low Impact Development (LID)



Regulatory Review Categories

- Water Quality
- Water Quantity
- Land Development
- Zoning

Water Quality Regulations Must Promote LID

- Main Issue: How to provide water quality credits for development
- Not feasible under current State regulations. Feasible under proposed new stormwater rules.
- Recommendation:
 - Modify Ordinance 90-10 requiring 150% of ERP treatment.
 - Develop incentives to retrofit private property

Water Quantity and Flood Risk

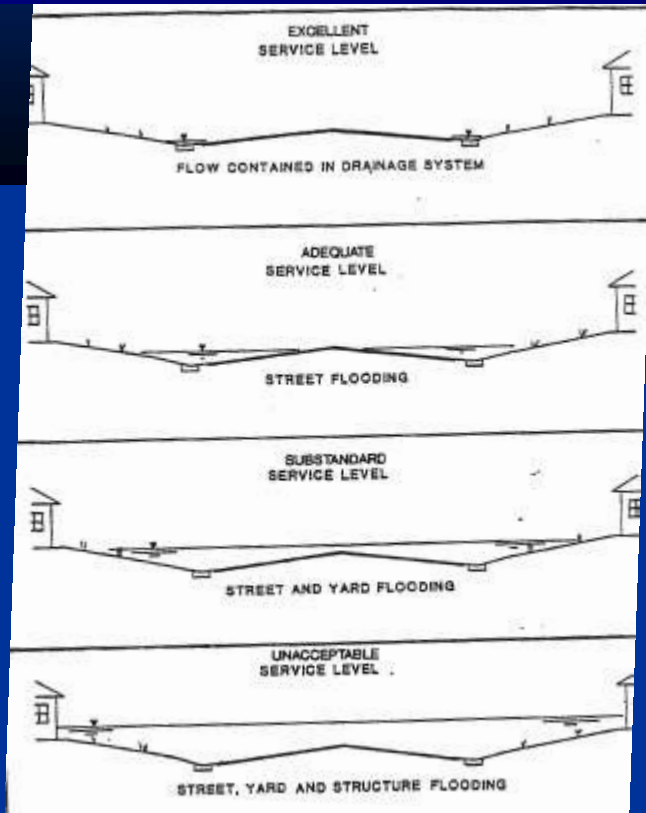
- Issue: Current regulations for large storms focus on control of peak discharge for the 25-year/24-hour design event.
- Recommendation:
 - Require volume control for the 25-year/24-hour design event.
 - It allows control of peak, volume and timing of stormwater discharges

Water Quantity and Flood Risk

- Issue: Most County watersheds do not meet current flood protection levels of service (FPLOS).
- Recommendation:
 - Modify FPLOS to set realistic goals.

Water Quantity and Flood Risk

Current FPLOS



Proposed FPLOS

	Storm Return Period (years)		
	10	25	100
Roadways	10	25	100
A. Evacuation Routes	None	None	None
B. Arterials	None	None	6 inches
C. Collectors	None	6 inches	9 inches
D. Neighborhood	6 inches	9 inches	12 inches
Open Space	Flooding of open space is acceptable if it does not compromise public health and safety		

Land Development Regulations

- Recommendations:
 - Promote cluster development
 - Modify road width requirements based on actual ADT
 - Modify required lot setbacks (“zero lot lines”)



Zoning Regulations

- Current “large lot zoning” has limitations:
 - Increases cost of development - utilities
 - Increases road lengths, which increases pollution
 - Promotes use of septic tanks
- Zoning must support cluster development:
 - Zoning should not be based exclusively on population density, but also on extent of impervious cover.

Summary

- There are opportunities to modify current regulations related to water quality, water quantity, land development, and zoning.
- The objective should be to implement a “sustainable stormwater management program”.
- Encourage application of LID concepts and promote cluster development.

Questions and Comments

