




Southwest Florida Feasibility Study/Watershed Plan

Tentatively Selected Plan
Caloosahatchee Watershed
Working Group – March 2009



US Army Corps
of Engineers




Presentation Overview

- Objectives
- Plan Formulation
- Recommended Comprehensive Watershed Master Plan
- Cost Estimates
- Recommended Tentatively Selected Plan (TSP)
- Milestones

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Two Part Process

1. Develop Comprehensive Watershed Master Plan
2. Define U.S. Army Corps of Engineers (Corps) participation in the Comprehensive Watershed Master Plan and select a Tentatively Selected Plan


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Study Area

- 4,300 square miles
- Encompasses all of Lee County and portions of Collier, Charlotte, Hendry, Glades, and Monroe Counties
- Project boundary corresponds with the South Florida Water Management District's (SFWMD) Lower West Coast Water Supply Plan Planning Area



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Historical Condition

- Mosaic of wetlands, small scattered uplands, slow sheet-flow
- Seasonally-fluctuating shallow water tables
- Pine flatwoods, herbaceous wetlands and cypress dominate intermittently
- Rainfall provided most of the nutrients, resulting in a very low nutrient ecosystem
- Salinity regimes supported estuarine health and diversity

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Project Purposes


SWFFS was recommended by the Yellow Book as a comprehensive watershed study.

Specific project purposes include:

- Health of Aquatic Ecosystems
- Water Flows
- Water Quality (including appropriate pollution reduction targets)
- Water Supply (Lower West Coast Water Supply Plan)
- Flood Damage Reduction
- Wildlife and Biological Diversity
- Natural Habitat
- Recreation (Opportunity)

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Hydrologic Objective

- By the year 2050, **establish total freshwater flows discharging into coastal estuaries** within the project area from point discharges in channels, overland sheet flow, and groundwater seepage, to be within 10% of the pre-development natural system flow quantity conditions.

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Ecological Objectives

- By the year 2050, **decrease loss of habitat connectivity for large mammals** (such as the Florida panther and black bear) throughout the project area by 20 percent above 2050 without project.
- By the year 2050, **establish freshwater flows to the coastal estuaries in the study area to maintain an annual average salinity** of 10 - 25 ppt in the Caloosahatchee Estuary; 15 - 25 ppt in Estero Bay; 20 - 30 ppt in Rookery Bay, Blackwater Bay, Buttonwood Bay, and Pumpkin Bay; 10 - 30 ppt in Faka Union Bay; 20 - 30 ppt in Fakahatchee Bay; and 16 - 30 ppt in the Ten Thousand Islands and Barron River Estuary.

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Water Quality Objective

- By the year 2050, **establish an annual average Total Nitrogen load reduction** of 5.7 Million lbs/yr in the freshwater Caloosahatchee watershed, 12.0 Million lbs/yr in the tidal Caloosahatchee watershed, 753 Thousand lbs/yr amount in the Estero Bay watershed, and 3.5 Million lbs/yr in the Big Cypress Basin watershed.

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Plan Formulation Definitions

- **Management Measure** – the building blocks of alternative plans, both structural and non-structural, to meet the planning objectives: e.g. stormwater treatment area, reservoir, etc.
- **Component** – one or more management measures within a specific geographic area.
- **Functional Group** – one or more components that provide synergistic, comprehensive regional restoration and other water resources development opportunities for critical hydrologic locations resulting in achievement of project planning objectives.
- **Watershed Plan** – action that utilizes one or more functional groups to achieve project planning objectives and avoid project planning constraints.

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Phase 1 - Plan Formulation/Collaboration

- Initially over 300 components
- Components were arranged into 24 functional groups
- Functional groups were ranked using evaluation criteria and screened to 13

COMPREHENSIVE WATERSHED MASTER PLAN

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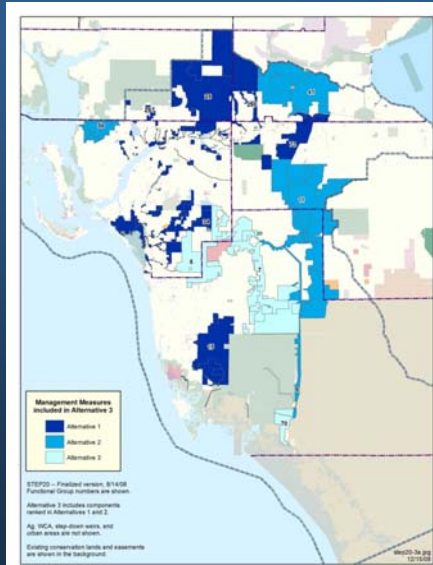
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Comprehensive Watershed Master Plan

- Estero Creeks & Headwaters Flowways (34)
- South Caloosahatchee Ecoscape (73)
- Caloosahatchee Creeks Tidal (29T)
- Caloosahatchee Creeks Freshwater (29F)
- Belle Meade Flow-way Restoration (15)
- Babcock Ranch (28)
- Okaloacoochee Slough (11)
- SR 29 / Barron River Flow-way Restoration (6)
- Yucca Pens (56)
- North Caloosahatchee Ecoscape (41)
- Corkscrew Watershed (5)
- Coastal Fakahatchee (70)
- Camp Keais Strand (7)

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Watershed Building Blocks

• Management Measures (MM) • Components • Functional Groups

“FUNCTIONAL GROUP”
ACHIEVES PROJECT
PLANNING OBJECTIVES

**TOWARDS A
WATERSHED PLAN**

(A)
Barron River
Flow-way

- Pump and spreader canal
- Canal backfill
- Culverts

(B)
Coastal
Fakahatchee

- Berm removal
- Backfill ditches
- Culverts
- Invasive species removal

2 FUNCTIONAL GROUPS
Achieving Water Quality and Large Mammal Connectivity


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Comprehensive Watershed Master Plan Summary

Total First Cost Tier 1 Only (\$000's)	Benefit Categories (HU's – Lift in 2050), Tier 1 Only				
	Landscape Connectivity	Water Quality	Landscape and Sensitive Lands	Surface Water Hydrology	Estuarine
15,437,680	113,210	272,863	662,232	70,554	36,380

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Phase 2 - Plan Formulation/Collaboration

- “Tiered” components within each functional group
 - Tier 1 = Corps / SFWMD Cost Sharing Interest & Keystone Features
 - Tier 2 = Other State Government Responsibility & Adjacent to Keystone Features but not Critical to Regional System
 - Tier 3 = Local Government Responsibility & Isolated from Regional System
- Evaluated functional groups (Tier 1 components only):
 - MIKE SHE and STELLA- hydrology and water storage
 - Water Management Model (WMM)-water quality
 - Large Mammal Connectivity Model- landscape connectivity
- Calculated benefits at a functional group level
- Conducted CE/ICA on the 13 functional groups within the Master Plan to determine TSP

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TSP

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Phase 2 – TSP Selection

- Utilized combined habitat units across four categories (excludes Landscape Connectivity)
- Utilized constraint to keep total first costs less than \$1billion
- Utilized constraint to keep percentage real estate less than 25%
- Evaluated with IWR-Plan software

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Functional Group Analysis Results For Selection of the TSP

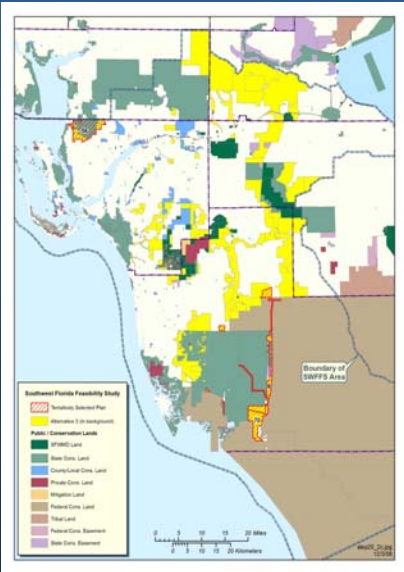
FG	Total First Cost, Tier 1 (\$000's)	%RE	Tier 1 Comb HUs	\$/HU/Yr	Cost Effective
70	\$88,760	47.7%	23,239	\$247	CE/BB
6,70	\$368,040	19.9%	41,883	\$729	CE/BB
6,56,70	\$780,300	31.3%	60,368	\$918	CE/BB

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Functional Group 56 Area:
13,886 acres

Total first Cost: \$412,260,000

Total HUs: 18,485

- restores natural flow-way through Gator Slough to the coast
- provides landscape connectivity from Babcock Ranch, through CM Webb Conservation Lands to Charlotte Harbor
- reduces pulses of freshwater discharge to the estuary (Matlacha Pass)
- removes exotics

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Functional Group 6 Area: 10,383 acres

Total First Cost: \$279,280,000


Total HUs: 18,644

- Backfill 50% of SR29 canal from estuary north to I-75
- Provides water quality improvement and spreads water out to the southwest through Fakahatchee Strand and to the southeast through the Big Cypress National Preserve to restore the natural flow-way to the coast
- Provides landscape connectivity between Okaloacoochee Slough and Fakahatchee Strand to the north, and Big Cypress National Preserve and Fakahatchee Strand to the south

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Tentatively Selected Plan continued

Functional Group 70 Area: 12,500 acres

Total First Costs: \$88,760,000


Total HUs: 23,239

- Provides water quality treatment for flows entering Picayune Strand
- Improves hydrology though out area with additional culverting, berm removal, and canal and weir improvements
- Provides landscape connectivity from 10,000 Islands estuary to Fakahatchee Strand and Big Cypress National Preserve



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Functional Group	Number of Components	Problem	Component Description
6: SR29/ Barron River Flow-way	3	Nutrient pollution effecting water quality, excessive drainage, and flows impeded across SR29	Create openings under SR 29, fill 50% of SR 29 and Copeland canal, construct pump and spreader canal to spread water into Fakahatchee Strand and Big Cypress National Preserve, and restore ~5000acres of wetlands
56: Yucca Pens	7	Bermed, channelized drainage between isolated wetlands, altered conveyance across Tamiami Trail, exotic coverage resulting in habitat loss, canal drainage	Construction of a 529 acre reservoir, provide control structures along Tamiami Trail in concert with upstream flow-way restoration, berm removal and ditch fill, construction of levees and weirs to reduce drainage, ~11,000 acres exotic removal
70: Coastal Fakahatchee	4	Spoil berm impeding hydrologic exchange with adjacent mangroves, impeding flows across and diverting flows along roads, exotic plant coverage, manmade ditches and associated spoil	Spoil berm removal (haul offsite), push spoil into associated ditches and restore footprints, increase culverting on unpaved roads, removal of exotics

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TSP Implementation

- Recommendation for construction
 - 30% Design to Congress
- Prioritization of three functional groups in TSP
 - SR29 Barron River Flow-way, Coastal Fakahatchee
 - Yucca Pens
- Collaborative Implementation Plan for Tiers 2 and 3

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Why Now?

- Opportunity to maintain natural hydrology
- Collaborative and willing stakeholder support
- Provide watershed plan for stakeholders to utilize for current budgeting and planning
- Provide additional landscape connectivity for critically endangered Florida Panther
- Rapid development could remove landscape connectivity opportunities
- No other efforts for comprehensive watershed planning in Southwest Florida
- Significant time and effort already invested

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Milestones

- Agency Technical Review Jan 09
- Draft Watershed Plan/TSP in Federal Register Aug 09
- Final Watershed Plan/TSP to Headquarters Nov 09
- Chief's Report May 10

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Questions?

Special thanks go out to all the PDT members who have worked so hard to get this project where it is today.




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Tentatively Selected Plan Cost Breakdown, Tier 1

Costs (\$000s)	FG 6	FG 56	FG 70	TSP
Construction	\$248,419	\$241,254	\$46,389	\$536,062
Real Estate	\$30,864	\$171,010	\$42,368	\$244,242
Total First Cost	\$279,280	\$412,260	\$88,760	\$780,300
IDC Construction	\$11,580	\$11,240	\$2,160	\$24,980
IDC Real Estate	\$3,300	\$18,310	\$4,540	\$26,150
Total Investment	\$294,160	\$441,810	\$95,460	\$831,430
O&M	\$8,526	\$453	\$453	\$9,431
Avg Annual Costs	\$24,800	\$24,890	\$5,730	\$55

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