

RESTORE Act Ecosystem Restoration Project Proposals
for consideration in the Gulf Coast Ecosystem Restoration Council's Comprehensive Plan
2012

Contact Information: Jerry Kurtz, P.E., Principal Project Manager					Date of Submittal: November 5, 2012		
Name of Project: South I-75 Canal Spreader Swale					Org and Rank: Collier County, Florida		
Project Description: This project would include the design and construction of a 50 cfs pump station to pump water from the interconnected I-75 canal network into a feeder channel. Subsequently, a spreader swale would be constructed to facilitate movement of water out of the canals that parallel I-75 and direct the water south via overland flow. This project focuses on rehydration of wetland areas in the Rookery Bay Watershed, the Southern Belle Meade area, and northern portion of the Picayune Strand State Forest.							
Project Location: Collier County (Attachment 1).							
Responsible Party: Collier County Natural Resources Department				Partners: Collier County, SFWMD, USACE			
NEP: CHNEP		Project Cost: \$3,100,000 (Attachment 2)			Dollars Needed: \$3,100,000		
Start: 2016				Completion: 2018			
Status of Project Design and Permitting: The project has been conceptually designed by SFWMD, and in the Collier County Watershed Management Plan.							
What Date or Year could Construction Feasibly Begin: 2016							
Your Proposed Timing of Funding (given permits, phasing, staging, etc.)							
FY	12/13	13/14	14/15	15/16	16/17	17/18	Total
				\$600,000	\$1,000,000	\$1,500,000	\$3,100,000
Quantify Environmental Results and How to Measure Them: Results will be measured in increased freshwater discharge into Rookery Bay.							
Economic Benefits (including ecosystem services): This project will result in increases in the hydrology of wetland areas in the Rookery Bay Watershed including the Southern Belle Meade area and northern portions of the Picayune Strand State Forest. Based on the ecosystem service values derived in Costanza et. Al. (1996), this project will benefit areas with combined ecosystem services values of over \$100,000,000 per year (Attachment 3).							
Estimated number of Jobs Created or Preserved: 31 (estimate based on 1 job per \$100,000)							
How much Habitat will be restored and conserved? The project will restore wetlands in the South Belle Meade Area and northern portion of the Picayune Strand State Forest within the Rookery Bay watershed, approximately 27,000 acres. The project will also restore timing and discharge rates of freshwater flows into Rookery Bay which has a surface area of 1034-acres.							
Quantify pollutant reductions: The project provides water quality treatment to the flows diverted from the I-75 canal to the spreader swale. The first calculation below assumes some limited amount of treatment occurs during the diversion process due to filtering. Some water is assumed to be lost due to							

infiltration/ET. The second calculation estimates treatment as the additional water moves through the system.

Water Quality		South I-75 Spreader	Complete Removal	Total Volume Pumped	
Pollutant Loadings to the wetland		Pollutant Loading (mg/L)	Removal Efficiency	Flow volume (ft3/yr)	Load Removed (lbs/yr)
	N	0.645	20%	172,800,000	1391
	P	0.022	20%	172,800,000	47
	TSS	2	20%	172,800,000	4314
Water Quality (Wetland Treatment Portion)					
Detention Time = Shallow Concentrated TC					
Flow length = 42000 ft					
Total hydraulic drop = 5.0 ft (8.5 to 3.5)					
TC = 66.27 hrs (2.76 days)					
80% of Flow after losses					
Detention Time / 14 Days * Wet Detention Removal = Efficiency	N	0.645	0.059	138,240,000	329
	P	0.022	0.128	138,240,000	24
	TSS	2	0.158	138,240,000	2721

What living coastal/marine resources will be improved and by how much?:

The construction of the canals changed the pattern of discharge to the estuary through a dry season deficit and wet season surplus, resulting in excessive fresh water discharge and thus ultimately affecting the salinity of the Naples Bay estuaries. This project will improve wetland hydrology and restore through slow release diverting water to the Picayune Strand State Forest. The project would result in improvements in water quality, wetland hydrology/habitat and timing of discharges to the Rookery Bay estuary.

How will community resilience be enhanced?

Improving the timing and duration of freshwater discharges to Rookery Bay will enhance the resilience of the Bay which is currently threatened by seasonal variability in freshwater discharges, namely freshwater deficits during the dry season.

Additional Justification:

The Rookery Bay watershed has decreased by about 100 sq. mi. due to construction of canals. As a result, the hydrology of remaining wetlands has changed by shorter hydro-period and less water stored, negatively affecting native wildlife and fauna. This project would redistribute and alter the timing of freshwater discharges.

This project is part of a larger program to restore the hydrology of the entire Belle Meade Flowway which extends from the Golden Gate Main Canal north of I-75 in the north, U.S. 41 and the Ten Thousand Islands in the south, and reaching from the Picayune Strand CERP Restoration Project to the east and urban development and C.R. 951 to the west. The entire Belle Meade Flowway encompasses several thousand acres of wildlife habitat and wetlands that have been severely altered by development, as well as a canal system sending water west to Naples Bay (Attachment 5).

Though Collier County is outside the study area of the CHNEP CCMP, this project would support several of the quantifiable objectives and priority actions identified in the plan (pg 86), including:

- HA-2...[to] restore, enhance and improve where practical historic watershed boundaries and natural hydrologies...
- HA-G: Reestablish hydrologic watersheds to contribute flows to their historic receiving

water bodies.

- HA-J: Build and restore water conveyances to have shallow, broad, vegetated and serpentine components that also restore floodplains.

Add any photos or maps that explain project:

Attachment 1: Conceptual Design from the Collier County Watershed Management Plan

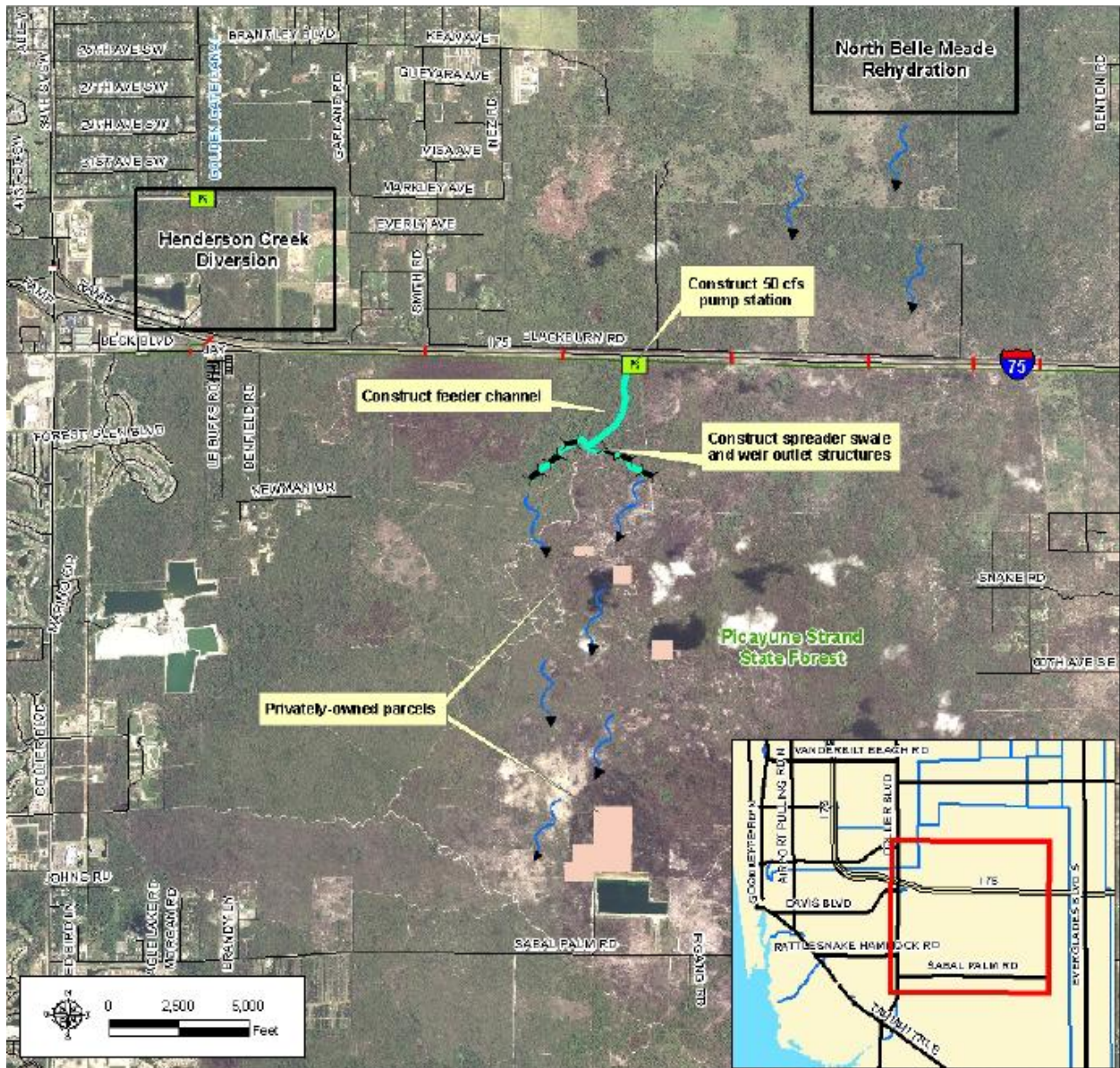


Image source: <http://www.colliergov.net/Modules/ShowDocument.aspx?documentid=38448>

Attachment 2: Cost Estimate from the Collier County Watershed Management Plan

Item	Unit	Quantity	Unit Price	Total Price*
Site Demolition/Removal				
Clearing & Grubbing (Spreader swale only)	AC	16	\$15,000	\$234,000
				\$234,000
Storm Structures & Pipes				
Concrete-Set Aluminum Spreader Weirs	LF	190	\$500	\$95,000
				\$95,000
Grading & Earthwork				
Channel & Swale Excavation and Construction	CY	27,111	\$10	\$271,100
Sodding	SY	16,000	\$1.75	\$28,000
				\$299,100
Miscellaneous				
50 cfs Pump Station	LS	1	\$1,500,000	\$1,500,000
				\$1,500,000
Subtotal				\$2,129,000
Mobilization & Demobilization (5%)				\$107,000
			Estimated Construction Cost	\$2,236,000
Land Acquisition				
	AC	0	\$0	\$0
			Land Cost Total	\$0
Engineering and Contingency (40% of Construction)				
				\$895,000
ESTIMATED TOTAL COST =				\$3,131,000

*Rounded to the nearest \$100

Hyperlink to Collier County Watershed Management Plan Vol. 2:

<http://www.colliergov.net/Modules/ShowDocument.aspx?documentid=42436>

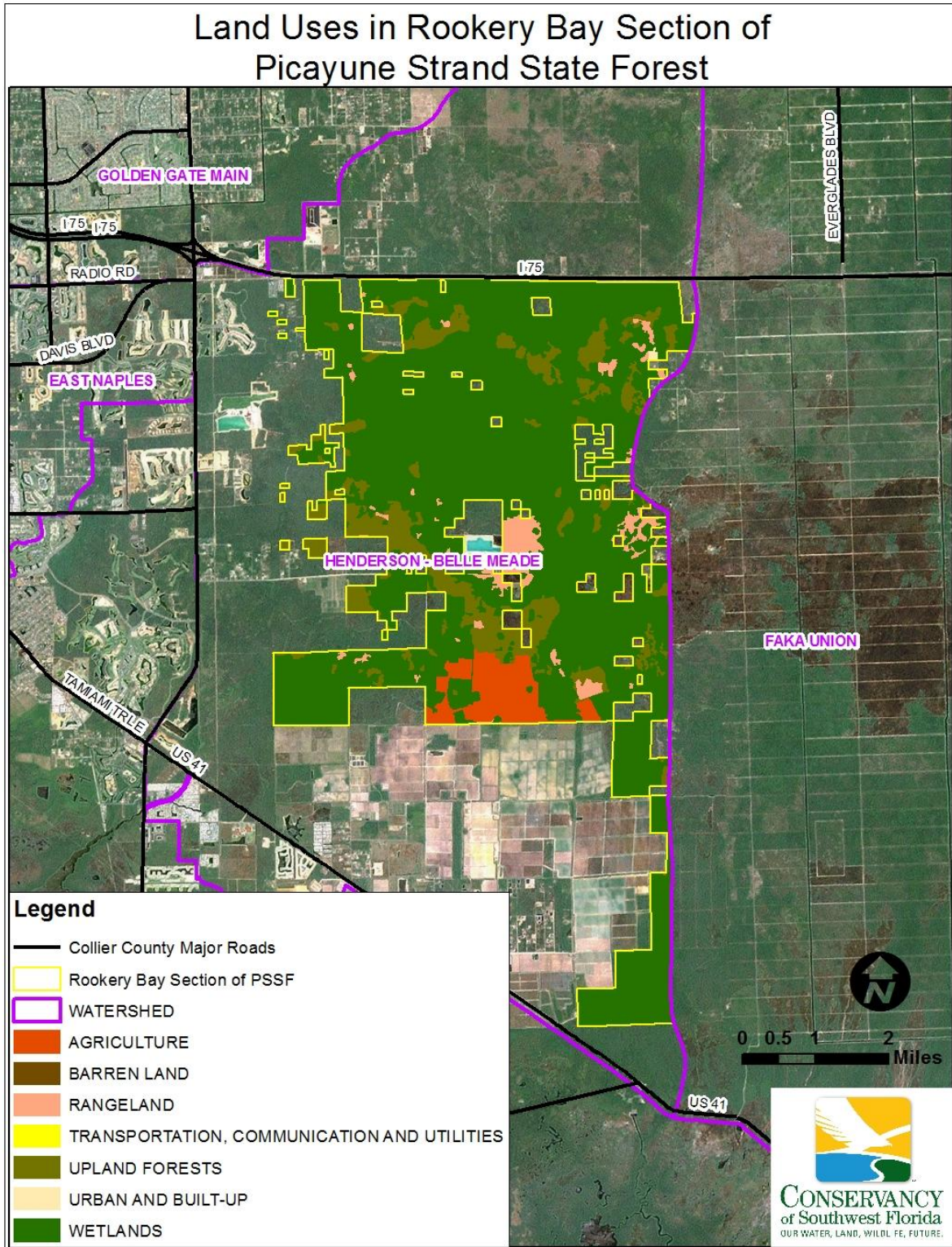
Attachment 3: Ecosystem Service Values Supported by South I-75 Canal Spreader Swale

2008 Land Use	Costanza Biome	Costanza Value (\$ ha ⁻¹ yr ⁻¹)	Approximate Acres	Approximate Hectares	Adapted Ecosystem Services Values
AGRICULTURE	Cropland	\$92	717	287	\$26,392
RANGELAND	Grass/Rangeland	\$232	573	229	\$53,155
TRANSPORTATION, COMMUNICATION AND UTILITIES	Urban	\$0	7	3	\$0
UPLAND FORESTS	Temperate/boreal Forest	\$302	2,112	845	\$255,156
URBAN AND BUILT-UP	Urban	\$0	14	5	\$0
WETLANDS	Swamps/floodplains	\$19,580	13,742	5,497	\$107,629,849
Total		\$20,206	17,165	6,866	\$107,964,551

Sources - **Economic values:** Costanza, R., et. Al. (1997). "The value of the world's ecosystem services and natural capital". Nature 387:253-260.

Land Use Values: 2008 FLUCCS data from South Florida Water Management District <www.fgdl.org>

Attachment 4: Land Uses Utilized in Determining Ecosystem Service Values



Attachment 5: Overall Project Area for the Belle Meade Flowway

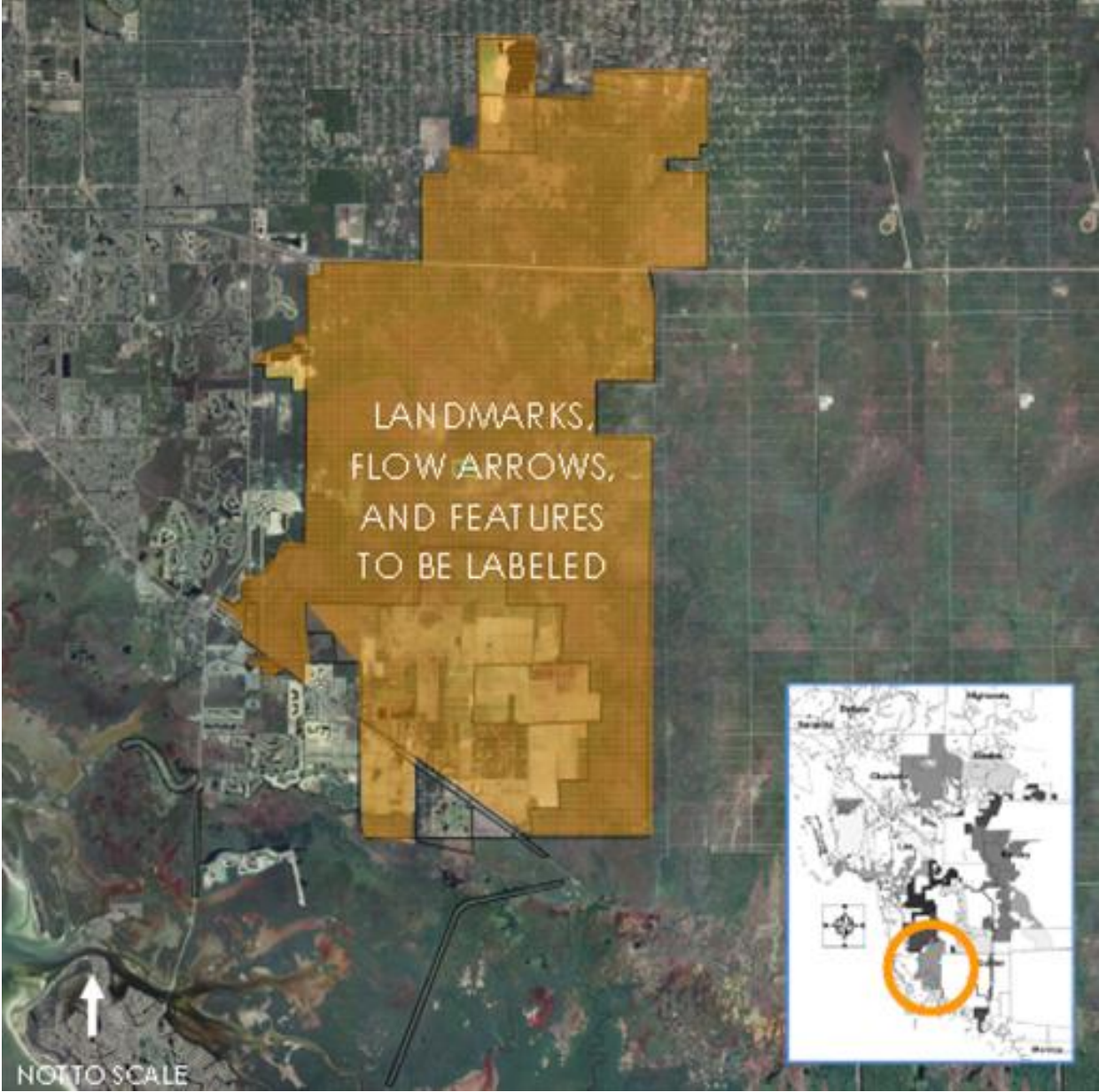


Image courtesy: Jim Beaver