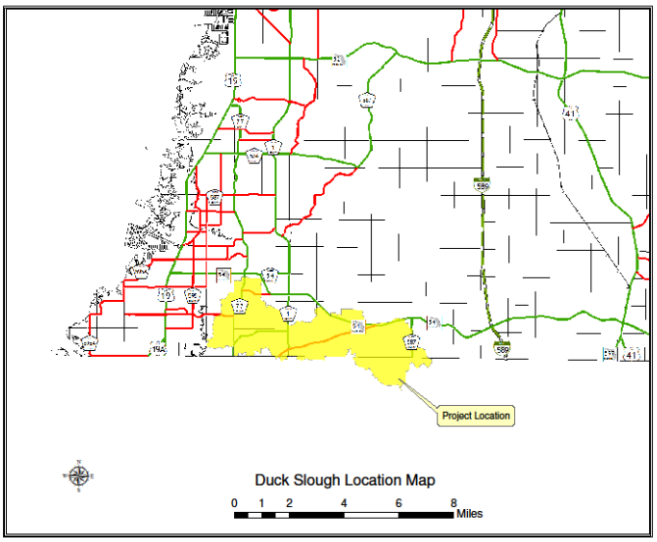
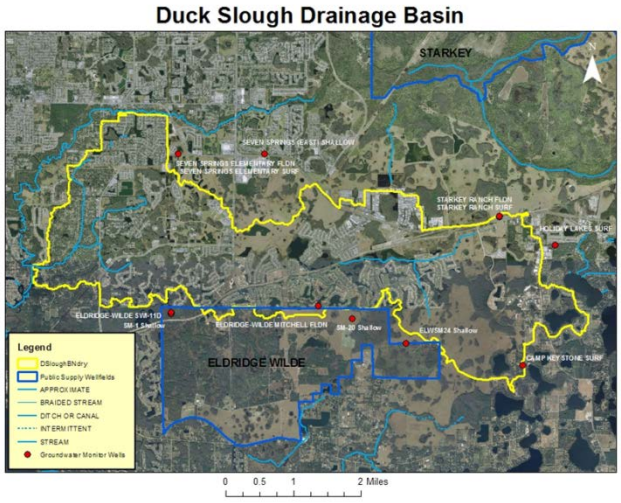
Overview of the Duck Slough Watershed

(October 29, 2015)

The Duck Slough Watershed is 14.1 square miles in size with 10.1 square miles that flows through the communities of Trinity, Thousand Oaks, Trinity Oaks, Wyndgate, Wyndtree and Chelsea Place then under Mitchell Boulevard to Seven Springs Boulevard and then crossing to flow to the Anclote River and ultimately to the Gulf of Mexico. The historic drainage flow is from East to West.





The Oakridge, Chelsea Place, Wyndgate, Wyndtree, Trinity Oaks and Thousand Oaks developments are located in the southwestern portion of the watershed.

The Trinity Oaks development was permitted in the late 1980s under the Southwest Florida Water Management District rules that charged an engineer with doing no harm. Thousand Oaks was permitted in 1994 under the same rules. The drainage system that was designed and permitted by the SWFWMD and subsequently built was to rehydrate the wetlands as they had been impacted by well field pumping and drought conditions.

The Thousand Oaks and Trinity Oaks area has experienced flooding during the 2003/2004 El Nino event when the roads were flooded for an extended period of time causing extensive road damage. The roads were repaired using a Federal Disaster Declaration Public Assistance Grant.

In 2005, the County and the SWFWMD cooperatively funded an engineering study to analyze the situation and then recommended solutions. The cost of the study was $500,000. While the engineering study recognized that the ponds did not drain because the wetlands were higher than the ponds, the study recommended that operable structures for flood control be installed as they were the only permittable option.

In 2007/2008, a firm was selected and completed the design/permitting of the operable structures at a cost of $360,000. In 2010, the operable structures were constructed at a cost of $1,000,000.

In 2011, with the flood control structures in place the County began the long process of obtaining approvals to re-establish the historic flow way that existed in the wetlands to the west of Kinsmere Drive (Trinity Oaks) in order to make the ponds function as designed.

The County had felt that evidence of apparent substantial historical dredging existed as there is evidence of existing spoil piles.

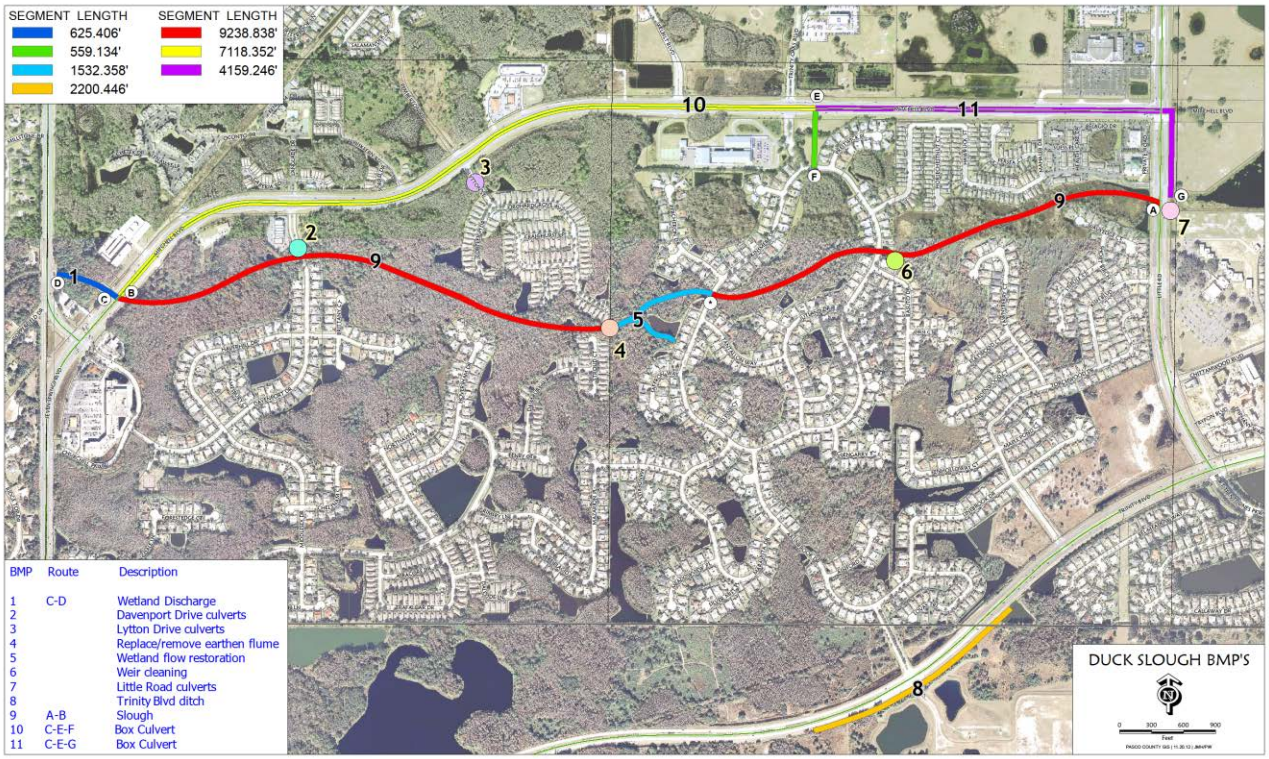
Based on the existing spoil piles, the County prepared plans to re-establish what we felt was a pre-existing canal in the wetlands and applied for a maintenance exemption. As the historic evidence exceeded the area of the spoil piles the exemption from SWFWMD could not be granted. It should be noted that even if a SWFWMD maintenance exemption was allowed to be granted, a permit from the Army Corps of Engineers (ACOE) would still have been required.

The County then began the longer process of permitting on re-establishing a flow way through the wetlands.

On June 24, 2012 rains from Tropical Storm Debby and then subsequent rains inundated the area and once again flooded the Thousand Oaks and Trinity Oaks developments. However, the rain did not just flood the streets, it has now flooded residences.

On August 9th, a community meeting was held with County staff, County Commissioners, other elected officials, agency officials, and residents from both communities. The residents were understandably upset and were advised that the County cannot take any remedial action until we can obtain the requisite permits from the applicable regulatory agencies. A neighborhood task force was also formed which consists of the community leaders, County and Regulatory staff and consultants hired by the County to review the problem and design and permit the solutions. These meetings are held on a regular schedule.

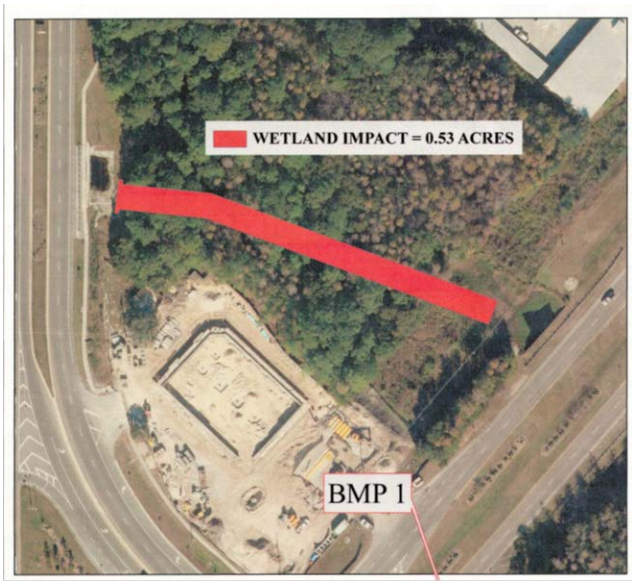
As part of the Task Force, eleven possible solutions were identified and the analysis began.

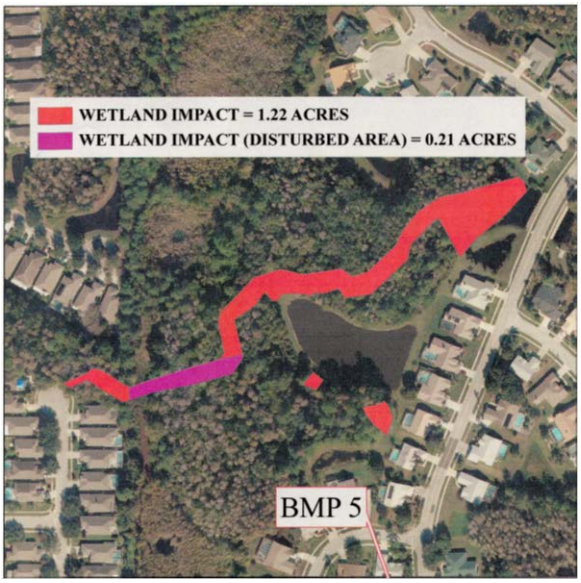

SEGMENT LENGTH
625.406'
559.134'
1532.358'
2200.446'
SEGMENT LENGTH
9238.838'
7118.352'
4159.246'
BMP Route Description
1 C-D Wetland Discharge
2 Davenport Drive culverts
3 Lytton Drive culverts
4 Replace/remove earthen flume
5 Wetland flow restoration
6 Weir cleaning
7 Little Road culverts
8 Trinity Blvd ditch
9 A-B Slough
10 C-E-F Box Culvert
11 C-E-G Box Culvert
DUCK SLOUGH BMP'S
0 300 600 900
Feet

BMP Nos. 1A, 5A and Mitigation

(SWFWMD Permit No. 43034034.004 dated January 27, 2015 & ACOE Permit No. SAJ-2011-02395)

On March 15, 2013, the County submitted a joint permit application to the Southwest Florida Water Management District (Application No. 678767) and to the Army Corp of Engineers (Application No. SAJ-2011-02395). The permit application is known as BMP 1A, 5A and Mitigation. BMP 1A is located at the downstream portion of the project, northeast of the intersection of Seven Springs Blvd and Mitchell Blvd. This element of the project entails construction of culverts with operable gates to allow for the temporary draw-down of water levels upstream prior to storm events. BMP 1A in conjunction with BMP No. 5A will help to improve the storage capacity and conveyance of stormwater flows from the upstream portion of the project. The operational schedule of the gates will assure that any effects on wetland water levels will be temporary, tailored to reduce elevated stormwater levels while preserving the natural hydroperiod of the wetland. BMP No. 5A which is located to the west of Kinsmere Drive is to provide for the recovery of the drainage pond within Trinity Oaks from the effects of daily back to back storm events. For storms that exceed what is known as a mean daily storm of 2.3 inches of water there can still be stormwater that will be within the roadways but it will now be able to flow from the area.





The estimated cost of BMP 1A, 5A and the mitigation necessary to offset the impacts to the wetlands totals just less than $1 million. The County was provided with an out of cycle SWFMWD cooperative funding agreement for the evaluation, design and permitting of the solution(s). Comments on the proposed contract have been provided to the SWFWMD and the County is awaiting a revised contract to review. The County also applied for and was approved to receive additional funds for design, permitting and construction for any additional BMPs in the 2014 Cooperative Funding Cycle.

The County was very fortunate to have Representatives Fasano & Corcoran place $1 Million to be distributed to the Southwest Florida Water Management District for Duck Slough/Thousand Oaks flood mitigation in the recent State Budget (SB 1502) provided to the Governor.

The permit applications for BMPs 1 and 5 were filed with SWFWMD and Army Corp of Engineers (ACOE) on March 15, 2013. The following is the history of the permit application comments and responses:

SWFWMD:

Comments from SWFWMD	Response to SWFWMD
April 12, 2013	July 4, 2013
August 2, 2013	August 10, 2013
August 23, 2013	September 30, 2013

Permit received on December 13, 2013.

ACOE:

Comments from ACOE	Response to ACOE
June 5, 2013	July 5, 2013
August 19, 2013	October 2, 2013
December 12, 2013	December 24, 2013

Draft permit received on December 26, 2013.

Permit proffered on January 17, 2014.

Signature page of proffered permit returned on February 3, 2014 and permit issued by ACOE.

The construction of BMP 1A was substantial complete in December 2014.

BMP 1A.

The construction of BMP 5A was substantial complete in early July 2015.

BMP 5A Construction Status

Purpose: Improve conveyance in Duck Slough

In addition to responding to BMPs 1A and 5A and the associated mitigation, the reviews of additional upstream solutions were and continue to be evaluated.

BMP No. 6

As part of the entire development project, BMP 6 was analyzed to determine if lowering the weir to create upstream storage capacity within the wetlands between Trinity Oaks and Little Road is a feasible project. The consultant investigated alternatives for drainage improvements associated with BMP No. 6 within the Thousand Oaks/Trinity Oaks project area, specifically drainage improvements associated with the weir and wetland system extending from the east side of Kinsmere Drive continuing in an easterly direction to Little Road. This task was to investigate alternatives to improve hydroperiod conditions within the upstream wetland, create additional available surface storage prior to the onset of some rain events, and contribute to some improvement in the system's response to storm event rainfall, particularly for smaller magnitude, frequent rainfall events.

This Task Order was approved by the BCC on May 21, 2013 and was completed on November 17, 2013.

Modification of the existing weir by cutting a 1-foot in height section from 2 of the bays was proposed as an interim solution. In the event that the structure cannot be safely modified (pending review of the structural engineer report), other short-term options such as installing a single 24-inch diameter temporary bypass culvert with type "C" inlet or equivalent set 1' below existing weir crest will be evaluated. These options are to achieve a quick effect coming out of this current dry season. The Interim Solution was permitted by the SWFWMD under Permit No. 43034034.002 on June 11, 2014. The interim solution has not been constructed as BMP 5A construction has been delayed due to weather.

A structural evaluation of the existing weir was conducted on December 17, 2013.

Long term options (for construction during the following dry season) will require geotechnical, structural and perhaps ecological input, and will consist of either **1)** re-construct similar weir structure at the existing location or **2)** abandon existing weir structure and construct a hydraulically equivalent structure immediately upstream of (closer to) the existing culverts at Kinsmere.

To assist with the design, permitting and construction of BMP 6A, the County made application and was able to secure funding assistance from both the State of Florida and SWFWMD. The total estimated project cost is $600,000.00 of which the State contribution will be $200,000,00; SWFWMD $150,000.00 and the County $250,000.00.

The County has executed the agreement with the State and the SWFWMD and has issued a task order to Land & Water, Inc. for the design and permitting BMP 6A.

In anticipation of the 2015 rainy season, the Public Works Department has installed the Interim BMP 6A solution that was permitted by the SWFWMD in 2014. This will assist with the drawdown of the wetlands upstream from Kinsmere Drive (eastern side).

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BMP No. 7

The consultant was asked to investigate alternatives for drainage improvements associated with BMP No. 7 within the Thousand Oaks/Trinity Oaks project area, specifically drainage improvements associated with the weir structure located upstream (east) of Little Road and the potential for impoundment of stormwater on lands upstream of that facility.

This Task Order was approved by the BCC on May 21, 2013 for a total cost of $25,000.00, and was completed on November 17, 2013.

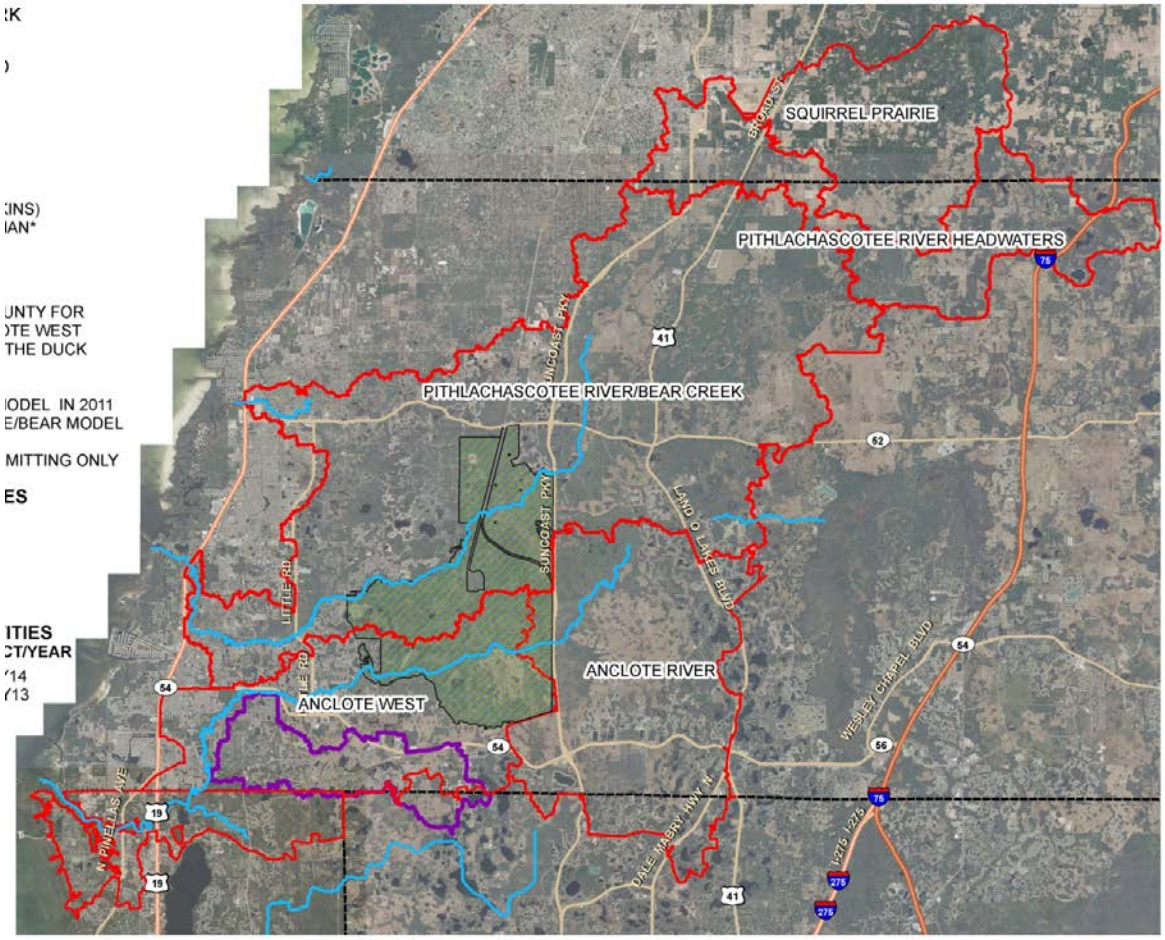
The current Duck Slough watershed model was used to evaluate performance of various alternatives for raising the existing weir. The goal is to reduce flow at Little Road into Thousand Oaks, sufficient to eliminate flooding of homes, while not adversely affecting adjacent properties.

The watershed model was used to estimate the volume of stormwater that would need to be removed during a 100-Year event in order to substantially reduce or eliminate flooding risk of residential structures.

The modeling showed that over 1,182 acre-feet of additional storage would be needed to remove all but one residence from the 100-year flood risk. To envision this storage, each acre-foot of water would be 1-foot in depth over one-acre of land. Due to the shallow depth of the seasonal high water table limitations exist as to how deep a storage pond could be dug.

Pithlachascotee/Anclote Conservation Effort (PACE)

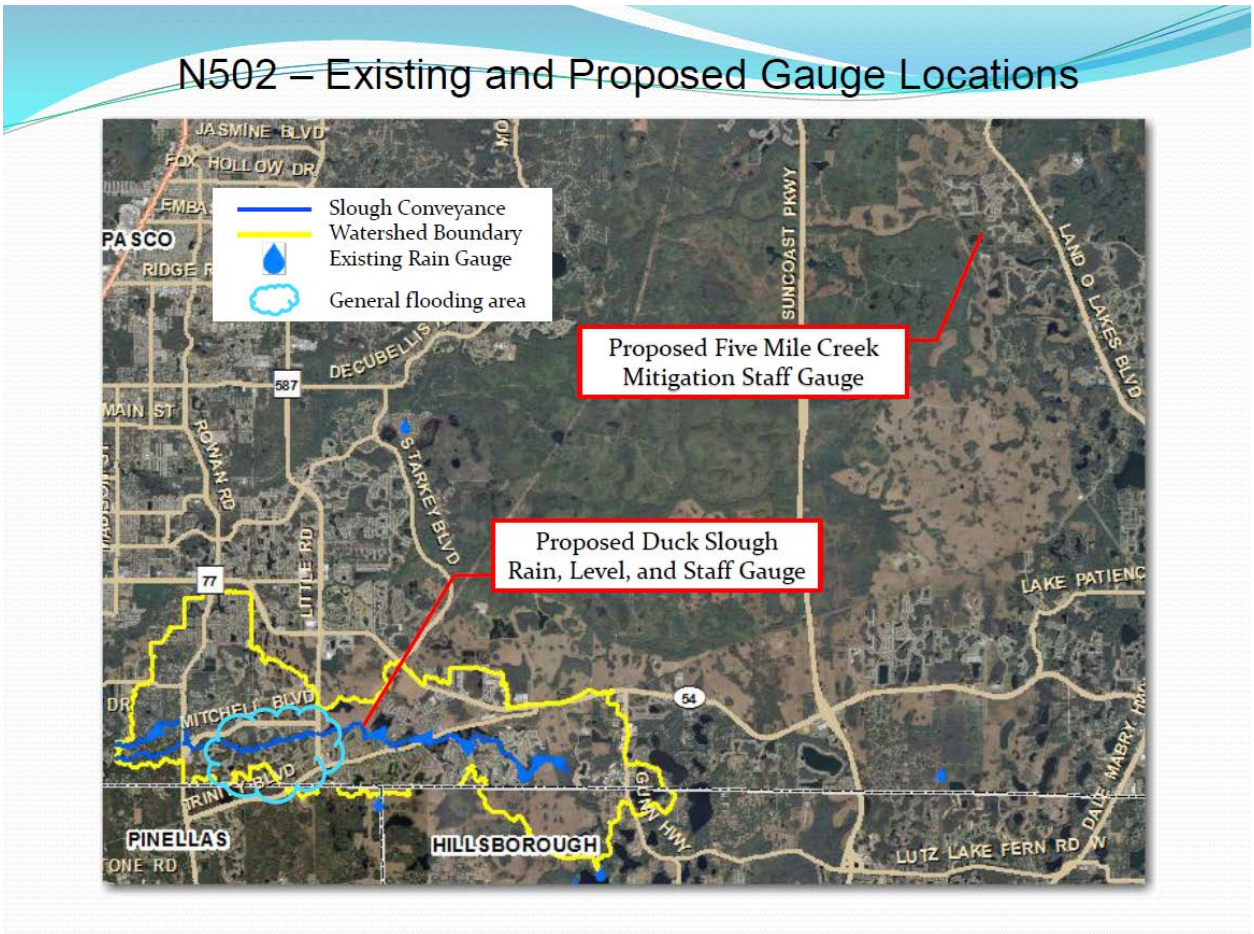
This is a multi-year funded project which consists of supplementing the watershed management plan for the Pithlachascotee-Anclote River Watersheds in Pasco County by updating critical portions of the watershed model and assessing the feasibility of diverting excess flows onto the Starkey Wilderness Preserve to better manage the water resources. This includes updating critical portions of the watershed model and for BMP alternative analysis. This is a multi-year funded project to perform the Watershed Evaluation, and Watershed Management Plan elements of the District's Watershed Management Program (WMP). The two watersheds cover a total area of approximately 200 square miles and are located in Pasco County, This project consists of assessing the feasibility of diverting excess flows from the Pithlachascotee and Anclote Rivers onto the Starkey Wilderness Preserve in order to better manage the water resources, i.e., flood protection, water quality, water supply, and natural systems. The quantity of water as well as the timing and distribution of diversions will be addressed in the BMP alternative analysis phase of the project. Conceptual designs will be prepared, the ability to permit implementation of these BMPs will be assessed, and probable construction costs will be developed. The total funding currently proposed for this project is $2.5 million.



Rain Gauges

The County and SWFWMD are in the process of installing a rain gauge within the Duck Slough. The County will provide survey work and the SWFWMD staff will install the rain gauges.

The rain gauges will be installed at the following sites:



The Duck Slough survey, easement and access license paperwork is being reviewed. After paperwork is in place then the survey will be conducted and as long as the site is accessible the rain, level and staff gauge will be installed.

The Five Mile Creek Mitigation area staff gauges will be installed after the site mitigation construction is complete.

To date the following funds have been expended/committed for the Duck Slough:

CFI	YEAR	Project	Status	Actual Expenditures	Appropriated	SWFWMD Share	County Share	Other Source Share
L350	2007	Duck Slough Analysis	Completed	$ 501,151	$ 501,151	$ 251,613	$ 249,538	
L429	2009	Duck Slough Structures	Completed	$ 2,697,004	$ 2,825,350	$ 825,350	$ 1,000,000	$ 1,000,000
N502	2013	Duck Slough BMPs	Active	$ 944,641	$ 2,750,000	$ 875,000	$ 875,000	$ 1,000,000
N540	2013	Duck Slough BMP 6A**	Active		$ 600,000	$ 150,000	$ 250,000	$ 200,000
	2013	Interim Design BMP 6A**	Completed	$ 60,000	$ 60,000		$ 60,000	
	2013	Pumping	Completed	$ 631,428	$ 631,428		$ 631,428	
		Total		**$ 4,834,224**	**$ 7,367,929**	**$ 2,101,963**	**$ 3,065,966**	**$ 2,200,000**

$2.5 Million has been committed to the PACE project.

The items remaining on the “To Do” list:

1. BMP 5A is functional with some plantings that are needed. In addition SWFWMD has requested that we add rip-rap to the spillway area(s) at the weir at BMP 5 to decrease the chance of erosion.

2. The permanent solution for BMP 6A had the design and permitting awarded to Land & Water in April. The permit from ACOE was received and the SWFWMD permit is under review. This is the replacement weir which will lower upstream wetland and replace the interim BMP 6A.

3. Once we have BMP 1A and 5A complete and BMP 6A Permanent, permitted, we anticipate that we will begin the review of the gate operation and submit the necessary SWFWMD permit modification.

4. County staff is working with Applied Science to restructure the SCADA bid package so we can build in stages. The stages all use different contractor types. Last time we put out as all or nothing and got 1 bid at twice the estimate

5. Last, the long term analysis is a project called PACE (Pithlachascotee-Anclote Conservation Effort) that is being managed by SWFWMD. This will explore the impounding of waters upstream in an effort to reduce the rate/volume of the waters traveling through the Duck Slough. Upon completion of this analysis we will be able to further review the feasibility and permitability of other BMPs, such as BMP 8.