

**THE RESERVE AT SWEETWATER ESTUARY
FRESHWATER WETLANDS MITIGATION PLAN**

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The Freshwater Wetlands Mitigation Plan describes proposed mitigation to off-set freshwater wetlands impacts (forested and herbaceous habitat) that will result from constructing the proposed *Reserve at Sweetwater Estuary* project located near Dekle Beach Road and CR 361 in Taylor County, FL. (Figure 7.1-1). Figure 7.1-2 depicts the Project Area with Habitat Types (FLUCCS). Avoidance measures have been implemented to reduce proposed impacts to wetlands on-site. Minimization efforts were incorporated into the project location and design including but not limited to site selection, wetland quality assessment, utilization of uplands, and downsizing the project footprint within the wetlands. The golf course impacts alone were reduced by 20.5 acres due to the relocation of 9-holes to an upland site east of County Road 361.

Mitigation for freshwater wetland impacts is proposed within the project area and adjacent areas owned by Secret Promise, LTD. Proposed mitigation includes: 1) forested wetland preservation, 2) creation of approximately 4.0 acres of freshwater wetland sites, and 3) the purchase of wetland mitigation bank credits.

Project Impacts and Mitigation Assessment

Commercial and residential waterfront development, an 18-hole golf course, passive recreation boardwalks, and a kayak launch facility are planned within the project area. Project impacts to freshwater forested and herbaceous wetlands will occur from placement of fill and excavation associated with the construction of roads, stormwater ponds, building fill pads, and golf course construction.

Project Impacts

Assessment of the project impacts and the extent of mitigation anticipated are based on the Uniform Mitigation Assessment Method (UMAM), Chapter 62-345, Florida Administrative Code (F.A.C.). The UMAM was conducted to evaluate the functional loss of wetlands by project construction and the functional gain to wetlands by the proposed mitigation.

A summary of the freshwater project impacts and a detailed discussion of proposed mitigation are provided below.

Table 7.1-1 Conceptual Site Plan Including Phase I Construction FRESHWATER WETLAND DIRECT IMPACT SUMMARY UMAM Chapter 62-345 F.A.C.				
LOCATION	FLUCCS/Habitat Type	IMPACT TYPE	IMPACT AREA (acres)	FL
Development	PFO - 617	DREDGE	1.04	0.45
Development	PFO - 617	FILL	17.29	13.31
Development	PEM - 641	DREDGE	0.45	0.150
Development	PEM - 641	FILL	3.02	2.33
Golf Course	PEM - 641	FILL	1.83	1.46
Golf Course	PFO - 617	FILL	13.76	10.59
Golf Course	PFO - 617	DREDGE	0.36	0.13
Golf Course	PEM - 641	DREDGE	0.21	0.07
Bridge over Sweetwater Creek	PFO - 617	BRIDGE	0.65	0.18
TOTAL WETLAND IMPACTS			38.61	28.67

Table 7.1-2 Conceptual Site Plan Including Phase I Construction FRESHWATER WETLAND SECONDARY IMPACT SUMMARY UMAM Chapter 62-345 F.A.C.				
LOCATION	FLUCCS/Habitat Type	IMPACT TYPE	SECONDARY IMPACT (acres)	FL
Golf course fly-over areas	PFO - 617	GOLF COURSE TREE CLEARING	4.24	0.72
Golf course wetland fragmentation	PFO - 617	WETLAND FRAGMENTATION	0.41	0.04
Golf course	PFO - 617	BOARDWALK	0.15	0.05
Boardwalks to and from spring	PFO - 617	BOARDWALKS	0.5	0.10
Golf course	PEM - 641	BOARDWALK	0.080	0.02
TOTAL WETLANDS SECONDARY IMPACTS			5.38	0.93

Table 7.1-3 Phase I Construction Site Plan Only FRESHWATER WETLANDS DIRECT IMPACT SUMMARY UMAM Chapter 62-345 F.A.C.				
LOCATION	FLUCCS/Habitat Type	IMPACT TYPE	IMPACT AREA (acres)	FL
Stormwater ponds Central Development	PFO - 617	DREDGE	0.96	0.51
Access road, roundabout, and Central Development	PFO - 617	FILL	13.80	11.04
Stormwater ponds Central Development	PEM - 641	DREDGE	0.37	0.085
Central and Southeast Development	PEM - 641	FILL	2.34	1.64
Bridge over Sweetwater Creek	PFO - 617	BRIDGE	0.65	0.18
TOTAL DIRECT WETLAND IMPACTS			18.12	13.46

Table 7.1-4 Phase I Construction Site Plan Only FRESHWATER WETLANDS SECONDARY IMPACT SUMMARY UMAM Chapter 62-345 F.A.C.				
LOCATION	FLUCCS/Habitat Type	IMPACT TYPE	SECONDARY IMPACT (acres)	FL
Boardwalks to and from spring	PFO - 617	BOARDWALKS	0.5	0.10
TOTAL SECONDARY WETLAND IMPACTS			0.5	0.10

Proposed Mitigation

Mitigation is proposed on-site to compensate for freshwater wetlands impacts associated with *The Reserve at Sweetwater Estuary* (Figure 7.1-3).

Proposed freshwater mitigation includes:

- 1) Preservation of a significant area of freshwater forested wetlands habitat;
- 2) Wetland creation within the golf course; and
- 3) Purchasing mitigation bank credits from San Pedro Bay Mitigation Bank

Refer to Tables 7.1-5 and 7.1-6 Freshwater Wetland Mitigation areas, both Conceptual and Phase I Construction, for proposed mitigation on the project site. The tables provide summaries of proposed freshwater wetlands mitigation, acreage, and the Relative Functional Gain (RFG) and Functional Gain (FG) based on assessment in accordance with the UMAM pursuant to Chapter 62-345, F.A.C.

Table 7.1-5 Conceptual Site Plan Including Phase I Construction FRESHWATER WETLAND MITIGATION UMAM Chapter 62-345 F.A.C.					
ASSESSMENT AREA	LOCATION	MITIGATION AREA (acres)	FLUCCS/Habitat Type	RFG	FG
FWM -Creation Areas	Golf Course	4.00	PEM - 641	0.36	1.44
FWM - Preservation Areas	From the spring run east	230.0	PFO - 617	0.18	41.40
FWM - Mitigation Bank Credits	San Pedro Bay Mitigation Bank	N/A	PFO - 617	N/A	3.00
TOTAL MITIGATION		234.0			45.84

Table 7.1-6 Phase I Construction Site Plan Only FRESHWATER WETLAND MITIGATION UMAM Chapter 62-345 F.A.C.					
ASSESSMENT AREA	LOCATION	MITIGATION AREA (acres)	FLUCCS/Habitat Type	RFG	FG
<i>Preservation/Management Area</i>					
FWM - Preservation Areas	From the spring run east	65.0	PFO - 617	0.18	11.7
FWM - Mitigation Bank Credits	San Pedro Bay Mitigation Bank	N/A	PFO - 617	N/A	2.00
TOTAL MITIGATION		65.0			13.7

A more detailed description of each proposed freshwater wetlands mitigation area is provided below.

Freshwater Wetlands Creation

The applicant will create freshwater wetlands at ten (10) locations (4.0 total acres) upon initiation of construction of the proposed golf course. Please see the following for a description of the mitigation proposed which will include the creation of freshwater wetlands in ten (10) upland areas on site. A detailed mitigation plan will be submitted prior to initiation of conceptual activities.

Proposed Creation Areas

The proposed creation areas are currently upland areas located on the eastern portion of the project assessment area. Three (3) of the proposed freshwater creation areas are north of the proposed access road to the proposed development west of CR 361, four (4) are proposed south of the access road, and three (3) are located east of CR 361. Refer to Figure 7.1-4, Proposed Creation Areas for locations of the proposed creation sites and Figure 7.1-5, Proposed Creation Areas - FLUCCS.

The upland areas selected for the construction of the freshwater wetlands can be described as dominated by herbaceous vegetation with minimal sub-canopy tree species. Photographs A & B display vegetative composition similar to that of the creation site. The FLUCCS map lists the habitats as Hardwood Conifer Mixed (FLUCCS 434). However, most of the pine canopy has been removed by harvesting, and the areas are between 70 percent and 90 percent open. Based on a recent reconnaissance survey, it was found that the dominant vegetation included chalky bluestem (*Andropogon virginicus*), sub-mature slash pine (*Pinus elliottii*), cabbage palm (*Sabal palmetto*), wiregrass (*Aristida stricta*), wax myrtle (*Myrica cerifera*), and various species of grasses. Other sub-mature tree species included laurel oak (*Quercus laurifolia*), live oak (*Quercus virginiana*), yaupon (*Ilex vomitoria*), and red cedar (*Juniperus virginiana*). Additional vegetation included bracken fern (*Pteridium aquilinum*) and bahiagrass (*Paspalum notatum*).



Photograph A. Freshwater creation site vegetative composition.



Photograph B. Notice the cleared area from previous logging/silvicultural activities.

The surficial soils and subsoils in this area have been subject to horizon inversions that have turned and mixed the natural layering of the substrates due to decades of silvicultural activities. The soil type in the majority of the uplands proposed for freshwater marsh creation is Leon (6 in the Soil Survey of Taylor County Watts et al., 2000), Leon soils are commonly found in flatwoods in the lower Coastal Plain and dominant uses are timber production and wildlife habitat. Leon soils can be defined as having a very dark gray fine sand surface layer with a grayish brown and light gray fine sand subsurface layer (Photograph C). This soil type is poorly drained and the depth to the Seasonal High Water Table is 6 to 18 inches. Slopes for Leon soils is 0 to 2 percent (Watts et al., 2000).

The sites are not currently utilized by protected species based on the Florida Natural Areas Inventory report dated August 29, 2007 and site inspections.



Photograph C. Leon soils at one of the freshwater wetland creation areas. Notice the sandy soils.

Creation Methods

The uplands will be cleared and graded to the appropriate elevation that is consistent with the onsite freshwater wetlands and provides adequate hydrology for planted vegetation to create areas of contiguous freshwater marsh. Survey elevations will be taken to relate elevation limits of the existing marsh to creation sites. Creation sites will have slopes of 1 to 3 percent to ensure adequate surface runoff.

Planting Plan

Herbaceous vegetation will be planted at the ten (10) freshwater wetland creation areas. Species will include only herbaceous vegetation and include smartweed, beak sedge, sand cordgrass, maidencane, and bushy broomsedge. Each species will be planted evenly (20 percent) with 3872 plants of each species to be spaced at a maximum of 90 centimeters or approximately 3 feet apart.

Bare root to four (4) inch liner sized plant species will be transplanted during the establishment period. The preferred planting range for the selected species falls between +0.3meters to 0.6meters National Geodetic Vertical Datum (NGVD) and will be planted accordingly (Lewis, 1990).

Other suitable species may be substituted or included in the planting plan depending on availability and cost. Please see table below for the Freshwater Wetland Creation Planting Plan.

**TABLE 7.1-8.
FRESHWATER WETLAND CREATION PLANTING PLAN**

COMMON NAME	SCIENTIFIC NAME	DEP STATUS	SPACING	TOTAL # OF PLANTS
MILD WATERPEPPER, SWAMP SMARTWEED	<i>Polygonum hydropiperoides</i>	OBL	3 foot centers	3872
BEAKSEDGE	<i>Rhynchospora sp.</i>	FACW	3 foot centers	3872
SAND CORDGRASS	<i>Spartina bakerii</i>	FACW	3 foot centers	3872
BUSHY BLUESTEM	<i>Andropogon glomerat us</i>	FACW	3 foot centers	3872
MAIDENCANE	<i>Panicum hemitomon</i>	OBL	3 foot centers	3872

Monitoring, Maintenance, and Management Creation Areas

Construction Schedule and Methods

Construction of the proposed freshwater marsh creation areas will occur concurrent with future phase development construction. Final grades achieved will mimic the natural elevation and contours of the adjacent wetland and provide appropriate elevations for freshwater marsh species. Detailed construction plans will be submitted with future phase construction permit applications. Plans will include design drawings, cross sections, construction methods, and construction schedules.

Monitoring Plan

All creation areas will be monitored by a qualified environmental scientist according to the following conditions:

1. A freshwater wetland creation completion report will be prepared and submitted to regulatory agencies following completion of construction and planting for the creation areas.
2. The monitoring program shall be initiated upon agency inspection and approval of the area(s) upon construction completion. The monitoring schedule includes semi-annual monitoring conducted for three (3) years; or until all applicable agencies have determined that the success criteria have been met. A monitoring report will be

submitted following each monitoring event. Success of freshwater wetland creation is proposed as the establishment and survival of 80 percent planted vegetation as documented through monitoring events. Invasive species will not exceed 5 percent.

3. The report shall provide documentation of maintenance inspections activities. Maintenance inspections will be conducted annually or as determined from monitoring efforts. The performance of maintenance inspections and/or maintenance activities may occur more frequently than the monitoring events if applicable.
4. The monitoring report will include the following:
 - a. Date of planting and number of plants installed;
 - b. Date and time of monitoring
 - c. Soil stabilization measures, if needed;
 - d. Percent of desirable species coverage for all planted and naturally recruited species;
 - e. Number of plants replanted by species, if necessary, to meet 85 percent desirable species coverage and date planted;
 - f. Depth of water at monitoring;
 - g. Wildlife observed;
 - h. Water quality observations;
 - i. Photographic documentation;
 - j. Problems encountered and corrective actions recommended
5. Nuisance species cover must not exceed 5 percent.
6. The source of the plant materials will be from a Florida certified nursery or other approved source.

Maintenance Plan and Schedule

Nuisance/Exotic species encroachment should be of little concern post construction because of the lack of nuisance species seed source in the surrounding environment. However, implementation of a maintenance plan will include the removal of nuisance or exotic species, should they occur, to avoid potential colonization.

The creation areas will be subject to the following maintenance regimen:

- a) Nuisance and exotic species are defined as those listed on the Florida Exotic Pest Plant Council (FLEPPC) Category I and II nuisance and exotic species list and will be maintained to less than 5 percent coverage in perpetuity.
- b) Maintenance will be performed annually or as determined from monitoring efforts in order to ensure the continued success of the creation areas.
- c) Maintenance will be performed by a qualified local contractor versed in agency requirements.
- d) Exotic and nuisance vegetation will be controlled using both manual methods and approved
- e) herbicides, as necessary. Herbicides may be used to control nuisance and exotic species, as necessary. Acceptable methods of application include cutting and treating stumps, wicking, and hand held or backpack sprayer. All applications are to be in

accordance with the product label and under appropriate weather conditions. A water soluble dye will be added to the herbicides to mark the areas of application.

Freshwater Wetlands Preservation

As part of the proposed freshwater mitigation plan for *The Reserve at Sweetwater Estuary*, approximately 140 acres of hardwood wetlands will be preserved (See Photographs D through G below) and managed in perpetuity. An additional approximately 90 acres will also be preserved. Refer to Figure 7.1-6 for the location of Freshwater Wetland Preservation Areas. The proposed preservation area contains significant areas of forested wetland habitat, several natural springs, and a spring run at Sweetwater Creek. Only passive recreation will be allowed in the preservation area.



Photograph D– Bay Swamp with cabbage palm under-story



Photograph E – Magnolia, cabbage palm, and tupelo



Photograph F – Forested Bay Swamp north of Corduroy Road



Photograph G – Braiding stream from spring outfall



Photograph H - Spring boil



Photograph I – Sweetwater Creek connection to Spring

By preserving this area, the land will remain unimpacted and in a natural state. Preservation of the land will ensure that potential disturbances resulting from silviculture activities or development will not affect the area in the future. Historic disturbances include palm tree harvesting, road construction, and alteration of hydrology. Silvicultural exemptions allow for the harvesting of hardwood species throughout the forested wetlands. While a “swamp harvest” of the hardwood species has not occurred to date, without preservation of the area, there is the potential for significant alteration of the natural forested wetlands habitat in the near future. The magnitude of the preservation area provides significant additional ecosystem benefits beyond the mitigation to offset project impacts.

The proposed preservation area contains a variety of land comprising both palustrine emergent and palustrine forested wetlands. The vegetation within the area is composed of a diverse group of forested and herbaceous species specifically adapted to thrive in the wet environment. Many of the trees within the area have Diameter Breast Heights (DBHs) greater than two (2) feet, with a small number of trees having DBHs reaching three (3) and four (4) feet. The preservation area will also create an uninhibited sanctuary for wildlife to breed and forage. Wetlands provide valuable functions for the environment helping to increase water quality, flood minimization, and sediment filtration. The preservation of a large area in close proximity to the Big Bend Seagrasses Preserve would be a positive step in ensuring the region as a whole continues to thrive as a healthy system.

The proposed preservation will also ensure the natural spring habitats remain undisturbed. The springs are hidden within the wetland forest, creating a natural waterway flowing south to the estuary and eventually the Gulf of Mexico. At the Sweetwater Creek springhead, three (3) separate outflows exist. The main spring creates a large pool which visibly discharges water from the underground fissure. Two (2) smaller springs also exist above the main outflow.

These springs are smaller in size and produce less flowing water; however, can still be observed by the minimal “boil” and flow into the main springhead. Along the southern waterway, a fourth spring has also been noted. The spring produces seeping water, which can be observed adjacent to the waterway.

The area around the spring contains dense forested wetlands consistent with the habitat observed throughout the preservation area. The water flow from the southern spring forms Sweetwater Creek and creates a natural waterway that can be utilized for passive recreation. Kayak travel up and down the waterway from the Gulf of Mexico up to the springhead is possible. Along the spring path many tributaries and flood zones occur off the main waterway. Large Elm, Cedar, Oak, and Bay trees were observed along the spring run or in close proximity to the spring site. The spring site is a significant feature which will be enhanced by placement of boardwalks to allow public viewing and educational outposts. Along the passive recreation boardwalks, signs will be posted providing information on the cultural resources and natural environment found in and around the area. Protection of springs is an important current initiative for the state of Florida. The preservation and management of this area will provide documentation and protection for these significant natural resources.

The preserve will be maintained in its natural state in perpetuity. The land will be protected via Conservation Easement or Fee Simple Transfer allowing for passive recreation and maintenance.

Mitigation Bank Credits

The applicant will purchase three (3) mitigation bank credits from San Pedro Bay Mitigation Bank (SPBMB) to supersede required mitigation necessary to offset unavoidable wetland impacts. Credits are available for purchase and have been reserved. Purchasing credits demonstrates the applicant’s willingness to cooperate with agencies in resolving mitigation requirements.

UMAM Summary

The UMAM calculation sheets have been prepared for impacts and mitigation. The project impact areas have been divided into three (3) separate assessment areas: 1) Phase I Construction (only), 2) Conceptual Development with Phase I construction, and 3) Golf Course (only). Within each assessment group the UMAM Impact sheets have also been divided by FLUCCS code (PEM-641, PFO-630). For each assessment group FLUCCS code a Part I Qualitative Description has been completed, as well as, the appropriate Part II Quantification of Assessments (type of impact) sheet. Please refer to Figure 6.4D and Tables 7.1-6 for impact and mitigation sites.

Each area can be viewed on the Figure and can be used to reference the appropriate site based on the UMAM sheet.

In order to appropriately assess the amount of mitigation required, based on project impacts, the following rule was applied (FAC 62-345.600 (3)d): $Functional\ Loss\ (FL) \leq Functional\ Gain\ (FG)$. The total FL resulting from Phase I construction project impacts is 13.56. The total FL resulting from all project impacts (Phase I construction, Conceptual Development, and Golf Course) is 29.56. The impact values include both direct and secondary impacts. In order meet or exceed the mitigation required a functional gain of 29.60 must be met.

The functional gain provided by the wetland creation sites is 1.44. An Additional three (3) credits will be purchased by the applicant from the San Pedro Bay Mitigation Bank. The remaining portion will be provided by preservation.

To supplement the required mitigation for the Phase I construction 2 mitigation bank credits will be purchased and 65 acres (11.7 FG) of preservation will be created. The mitigation will equal a FG of 13.7, sufficient to match the 13.56 FL credits resulting from Phase I construction.

In order to meet and/or exceed the 29.60 FL “credits” required by the entire project, the creation site (1.44 FG), one (1) additional mitigation bank credit (3 total FG credits), and 140 acres of forested wetland preservation is required, yielding 25.20 FG of mitigation “credits” will be proposed. The total FG resulting from creation, mitigation bank credit purchase, and preservation is 29.64. Therefore, the rule $FL \leq FG$ is satisfied.

In an effort to go beyond the minimum requirement for mitigation, the project applicant will provide an additional ~90 acres of land for preservation. The additional preservation will exceed the standard required mitigation.