

DOYLE CREEK/TATES HELL WETLANDS RESTORATION ANNUAL MONITORING REPORT (2010)
Franklin County

Impact: SR 65 in Franklin County, 2.27 acres of low quality wet flatwoods; **Nationwide Permit – SAJ-2004-706 (NW-TLZ) issued 4/26/2004**

Mitigation: Doyle Creek/Tates Hell Swamp

Monitoring date: October 30, 2010

SCOPE

Repaving and shoulder improvement of SR 65 in Franklin County for US 98 north to the Liberty County line will impact 2.27 acres of wetlands (wet flatwoods per FDOT Inventory). To plan for sufficient mitigation, it was assumed that the wetlands being impacted were of the highest quality and would be completely destroyed. In actuality, the impact wetlands were lower quality roadside areas diminished by right-of-way maintenance, runoff, and altered hydrology from ditches and berms.

PROPOSED MITIGATION

Background

The Doyle Creek/Tates Hell wetlands restoration site is located along the eastern side of Tower Road, north of State Road (SR) 65 in Tates Hell Swamp, Franklin County, Florida (Figure 1) at approximately 29°52'N and 84°55'W in Sections 10, 11, 14, 15, Township 7S, Range 7W. The Tates Hell Swamp covers some 200,000 acres (>300 mi²) of low-lying, poorly drained land between the Apalachicola and Ochlockonee rivers in the Florida Panhandle. Although this area historically was dominated by a variety of wetland types including wet savanna, wet flatwoods, cypress strands and hardwood swamps, much of the swamp was converted to slash pine (*Pinus elliotii*) plantation during the 1960s and 1970s. Degradation of Tates Hell from silvicultural operations included the construction of over 800 miles of logging roads and drainage ditches, and the establishment of bedded pine stands. These actions disrupted natural flow patterns and caused a lowering of the water table across large sections of the swamp and ponding of some specific locations due to road construction. With the replacement of much of the natural vegetation with stands of bedded pine, the natural functions and biotic diversity (flora and fauna) of the swamp also were severely impacted.

The ecological health of the Apalachicola Bay is strongly influenced by freshwater flows from Tates Hell. In the early 1990s, the Northwest Florida Water Management District (NFWFMD) and the State of Florida began acquiring portions of Tates Hell Swamp for wetland habitat preservation and to forestall further water quality declines. Public acquisitions now total some 205,000 acres and are managed by the Florida Division of Forestry (DOF) as Tates Hell State Forest. Since 1993, the NFWFMD, working with DOF, has conducted restoration of portions of Tates Hell Swamp. A long-term vision is eventual restoration of the natural communities of the entire swamp. This mitigation project complements these ongoing efforts by focusing on an area not previously slated for restoration activities.

Mitigation Project

To mitigate for a 2.27-acre wetland impact associated with the repaving and shoulder improvements to SR65 in Franklin County, a 25 acre wetland restoration site was selected within a 2,000-acre tract of cutover pine plantation. DOF clear cut the area in Fall 1998, roller chopped in Spring 2004 and burned in Spring 2005 and 2007. The approved mitigation plan (Figure 2) incorporates the elimination of 18,000 feet of logging roads and associated ditching by pushing the road-fill into the adjacent ditches, re-establishing natural grade, and revegetating the road footprint (approximately 25 acres) with wiregrass (*Aristida stricta*) and cypress (*Taxodium ascendens*). Additionally, three hardened low-water crossings (HLWC) were installed downstream of the mitigation site to enhance hydrologic flows.

Restoration Activities

The project was divided into two phases with all construction activities (road removal and construction of HLWCs) included in phase one and vegetation planting in phase two. Construction began on February 10, 2006 and was completed by July 11, 2006. Nearly 18,000 feet of roadbed was pushed into the adjacent ditches (Figure 2). The roadbed footprint was contoured and graded to approximate adjacent land elevations and seeded with brown topped millet as an erosion control measure. Hardened low water crossings were installed at sites #3 - #5 (Figure 2). Best management practices were implemented during both road removal and construction of low water crossings.

On January 2008, 68,075 wiregrass tubelings were planted on 4-foot centers throughout the roadbed footprint and partially replanted in fall 2009. In addition, 2,725 cypress seedlings were planted in appropriate areas of the footprint.

Annual monitoring of the restoration site was carried out on October 30 2010. Coverage of native groundcover ranges from 40-100%, with an average of 65-70% since project completion. The initial wiregrass plantings still show poor survival (<25%) despite being replanted in fall 2009. In some areas of the west road, wiregrass survival is high and many large healthy clumps are present. No wiregrass was seen on the east road. Low wiregrass survival on the east road could be due to the slightly longer hydroperiod of this section of the mitigation area as made evident by the prevalence of plant species that typically occupy lower areas than those in which wiregrass thrive (e.g. *Stillingia aquatica*, *Sagittaria graminea*, and *Juncus repens*). Cypress survival was high with greater than 80% of the planted individuals present. These trees are 4-6 feet tall and appear healthy though they are too young to be reproductive. Less than 1% coverage of exotic species was noted throughout the site. However, a moderate infestation (5-10 meters²) of *Panicum repens* was found on the east road and this issue should be dealt with before more native species are displaced. The road bed sites were walked in their entirety noting species that were present. **Number of plant species observed has increased from 51 in 2008 to 81 in 2009 to 107 in 2010.** Evidence of wildlife usage (e.g., tracks, scat) at the sites is provided at the end of the plant species observed table. Representative photos are appended to this report.

WORK SCHEDULE

Construction phase: completed July 2006

Re-vegetation of road footprint (~25 acres): initial planting completed January 2008, wiregrass re-planting fall 2009

Monitoring: Annually

SUCCESS CRITERIA

The project's success criteria are:

- Soils on road footprint stabilized to prevent offsite discharges of turbid flows. **Completed.**
- BMP's installed during all construction phases. **Completed.**
- Minimum 80% native groundcover dominated by wiregrass within five years of restoration: only about 60-65% native groundcover has been established after two years with poor survival of planted wiregrass (<25%). **Survival of wiregrass in the west road appears to meet the success criteria, survival of wiregrass in the east road is minimal and does not meet the success criteria. However, there is excellent native species recruitment in the ground cover, meeting the intent of this success criterion.**
- No more than 1% coverage of invasive or exotic plant species. **A moderate *Panicum repens* infestation was seen in the eastern roadbed.**
- 80% survival of planted cypress within five years of restoration. **Met.**
- Annual photo documentation of restoration at permanent photo points for five years. **Completed.**

The monitoring completed on October 30, 2010 indicates compliance with most success criteria. The low survival of wiregrass may be a function of the natural hydrology in the east road and, the fact that the restoration areas support a species composition and cover that is typical of the surrounding plant community should carry more weight from an ecological restoration perspective than the survival of planted wiregrass. The appended field form provides a listing of the observed species and general site observations related to the success criteria. Number of plant species observed has increased from 51 in 2008 to 81 in 2009 to 107 in 2010.

Figure 1. General location of the Doyle Creek mitigation site.

Location Map - Doyle Creek Mitigation Area

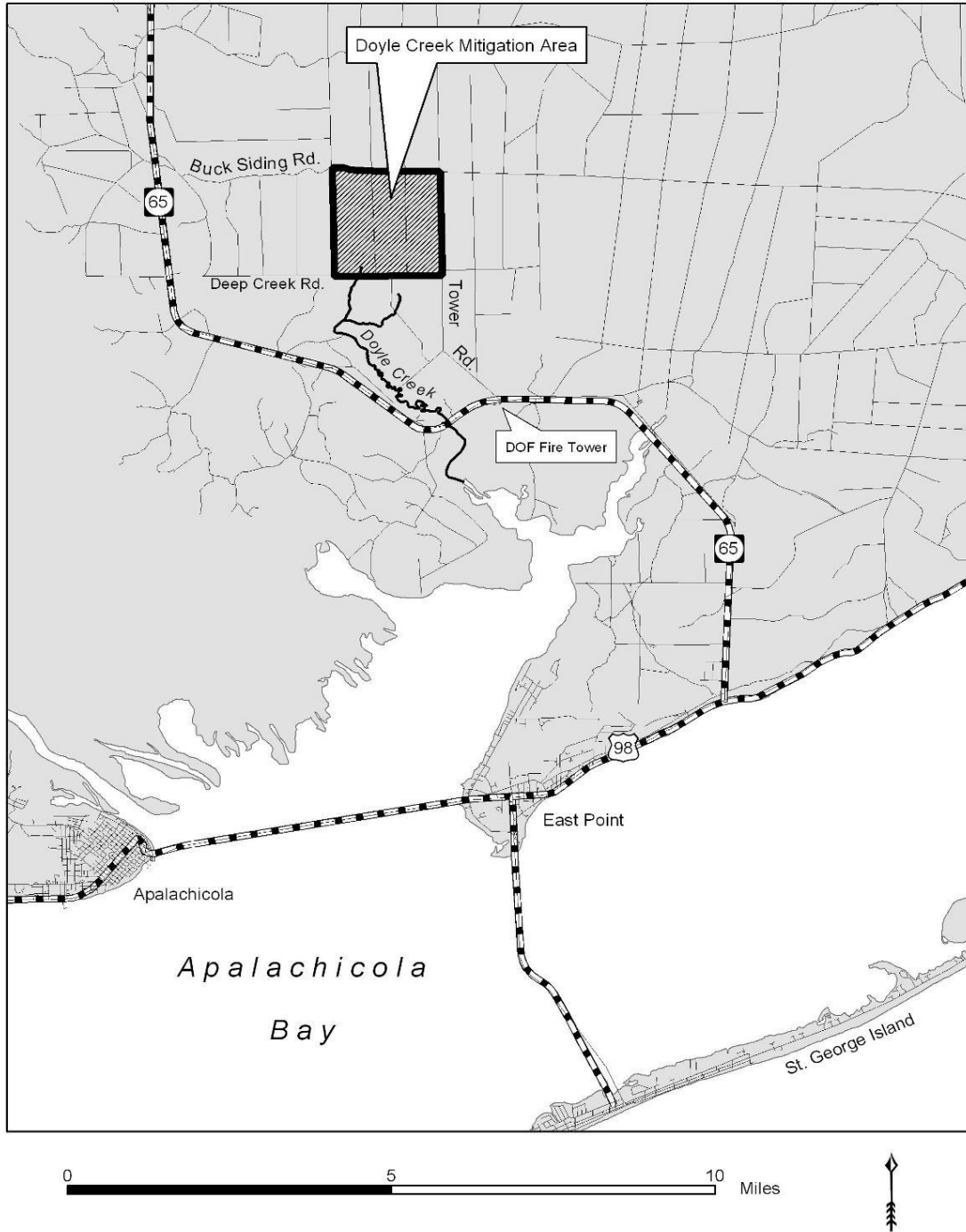


Figure 2. Doyle Creek mitigation site with location of each construction activity. Sites #1-2 are road removals; sites #3-5 are hardened low-water crossings.

Doyle Creek Mitigation Area

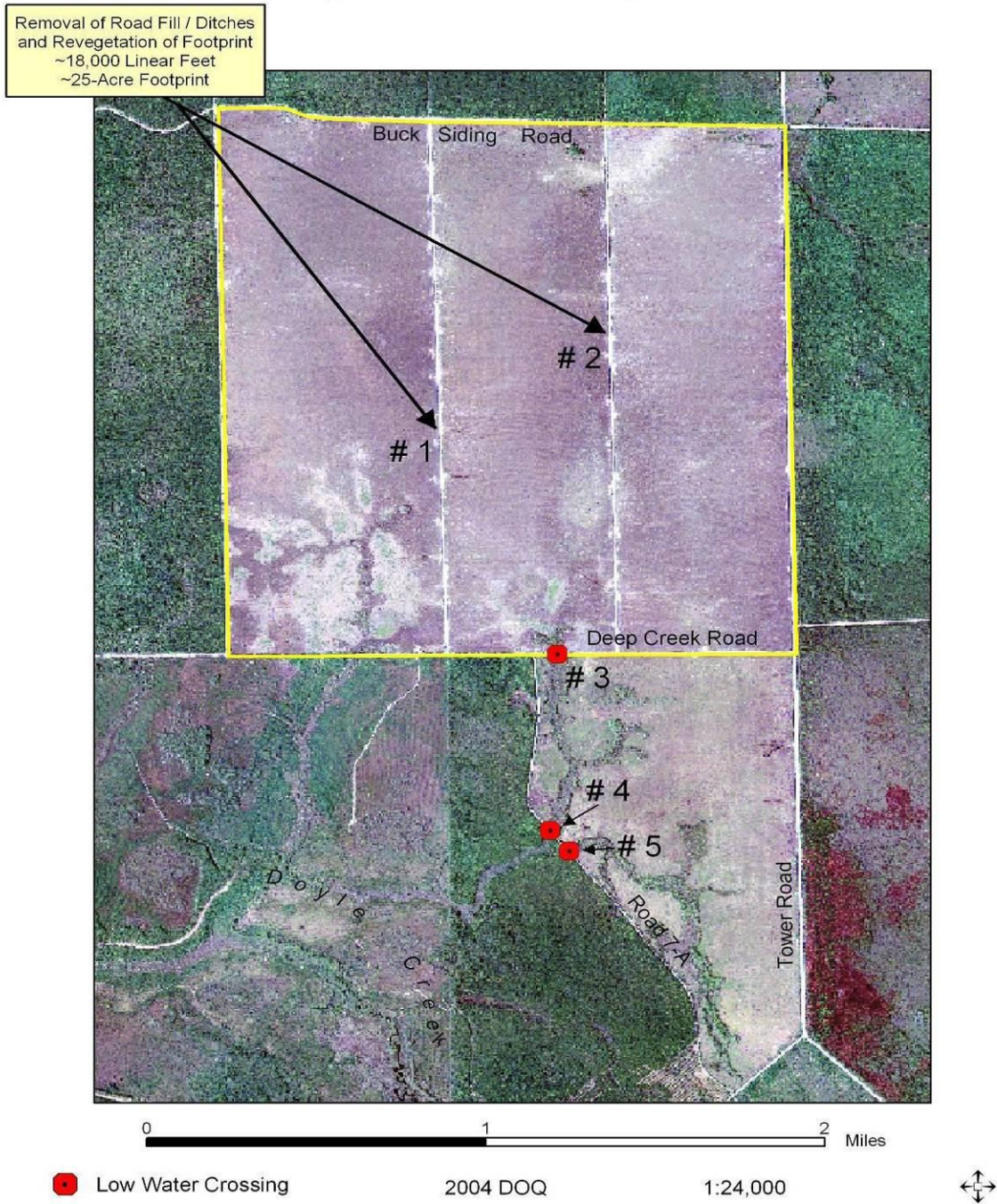


Figure 3. Road removal Site #1 (West); photo facing north.



Figure 4. Wiregrass survival in road #1.



Figure 5. Cypress survival in road removal site #2 (East).



Figure 6. Road removal site #2 (East), facing north.



Site Inspection Field Form	
Project: Doyle Creek	Date: October 30, 2010
Name(s) of Data Collectors: Caitlin Elam, Alex Barth	Weather: Partly cloudy, mid 70's
Environmental Description: Photo #'s	
Polygon: GPS Location: Time: 9 AM – 1 PM	
<p>Qualitative Evaluation: Success criteria</p> <ol style="list-style-type: none"> 1. Soils on road footprint stabilized to prevent offsite discharges of turbid flows: <u>Done.</u> 2. BMP's installed during all construction phases: <u>Done.</u> 3. Minimum 80% native groundcover dominated by wiregrass within five years of restoration: <u>only about 40-75% native groundcover (depending on the location) has been established after three years with poor survival of planted wiregrass (<25%). No wiregrass was seen on the east road, many healthy clumps were evident on the west road. Other native wetland species have colonized the sites and, aside from and infestation of <i>Panicum repens</i> on the west road, mimic the surrounding species composition with slightly lower cover. As other native wetland species colonize the site, the need for wiregrass cover declines.</u> 4. No more than 1% coverage of invasive or exotic plant species: <u>no invasive or exotic species were noted in the annual surveys. There is a 5-10 m² area where <i>Panicum repens</i> is the dominant species is still present on the east road in the southern portion of the site. Treatment of this infestation is advisable before it continues to expand into the restoration area and the surrounding plant community.</u> 5. 80% survival of planted cypress within five years of restoration: <u>Cypress survival appeared to be at least 80% along the restored roads. Trees were 4-6 feet in height and appeared healthy.</u> 6. Annual photo documentation of restoration at permanent photo points for five years: <u>photo documentation was taken during annual monitoring.</u> 	
<p>On at least a yearly basis, the site will be inspected as follows:</p> <p>A: Perimeter for signs of trespassing, fencing and signage integrity and infestation by exotic or nuisance vegetation. <u>Area of <i>Panicum repens</i> on eastern road as noted above.</u></p>	
<p>B: Internal Roads (Both public and maintenance) for signs of dumping or trespassing, erosion, bridges and road integrity, and exotic or nuisance species infestations. <u>NA</u></p>	
<p>C: All construction areas for stabilization and re-vegetation, structure, operation, and integrity.</p> <p><u>All areas have stabilized and exhibit the same plant species composition as the surrounding area. Most areas also have comparable vegetative cover to the adjacent natural areas, but occasional barren areas are present on the east road.</u></p>	
<p>D: Representative polygons for each UMAM community for fuel load, exotic or nuisance species, planted material survival, groundcover, and shrub condition.</p> <p><u>The single UMAM community that is on site shows increasing cover of native and locally appropriate wetland species, which is made evident by appropriate aerial cover and evidence of seedling recruitment and/or plant reproduction. Aside from small barren areas on the east road the presence of fine fuel is similar to the adjacent community. Medium fuel is very low and there are no heavy fuel sources present.</u></p>	

Vegetation Assessment Field Form Qualitative Assessment: Doyle Creek	
Project: Date: October 30, 2010	
Name(s) of Data Collectors: Caitlin Elam, Alex Barth	Weather: Partly cloudy, mid 70's
Environmental Description: Photo #'s	
Polygon: GPS Location: Time: 9 AM – 1 PM	
Nuisance Species: <u>Panicum repens, east road.</u> Fuel Load: <u>In most areas the fuel load is comparable to the surrounding plant community both in density and fuel size.</u>	
<ul style="list-style-type: none"> • Wildlife Observations: <u>listed at bottom of lists.</u> • Water depth: <u>No standing water was present during the survey; soil in some areas was saturated at the surface.</u> • Is the community observed along the walk path representative of the community being measured? <u>Yes.</u> • To what degree is the restoration in this area trending towards success? <u>Clearly trending to success as made evident by species composition, cover, and reproduction. Wiregrass survival is good on the west road.</u> • Potential Problems and solutions. <u>A moderate infestation of Panicum repens should be addressed on eastern road before treatment becomes more costly and native species are displaced.</u> 	

Scientific Name	Common Name	2008	2009	2010	Natural Recruitment	Form
<i>Andropogon glomeratus</i>	Bushy bluestem	X	X	X	Yes	Herb
<i>Andropogon virginicus</i>	Broom sedge	X	X	X	Yes	Herb
<i>Aristida stricta</i>	Wiregrass	X	X	X	No	Herb
<i>Aristida sp.</i>	Threeawn grass	-	-	X	Yes	Herb
<i>Bartonia verna</i>	White screwstem	-	-	X	Yes	Herb
<i>Bidens coronata</i>	Crowned beggarticks	-	X	X	Yes	Herb
<i>Carex sp.</i>	Caric sedge	X	X	-	Yes	Herb
<i>Centella asiatica</i>	Centella	X	X	X	Yes	Herb
<i>Clethra alnifolia</i>	Coastal sweet pepperbush	-	X	X	Yes	Shrub
<i>Cliftonia monophylla</i>	Black titi	X	X	X	Yes	Shrub
<i>Cyperus lecontei</i>	Leconte's flatsedge	-	X	X	Yes	Herb
<i>Cyperus sp.</i>	Sedge	X	X	-	Yes	Herb
<i>Cyrilla racemiflora</i>	Titi	-	X	X	Yes	Shrub
<i>Dicanthelium spp.</i>	Witch grass	X	-	X	Yes	Herb
<i>Dichantherium aciculare</i>	Needleleaf witchgrass	X	-	-	Yes	Herb
<i>Dichantherium scoparium</i>	Velvet witchgrass	-	-	X	Yes	Herb
<i>Drosera brevifolia</i>	Dwarf sundew	-	-	X	Yes	Herb
<i>Drosera capillaris</i>	Pink sundew	X	X	-	Yes	Herb
<i>Echinochloa colonum</i>	Jungle grass	X	-	-	Yes	Herb
<i>Eleocharis atropurpurea</i>	Annual spikegrass	X	X	-	Yes	Herb
<i>Eleocharis tuberculosa</i>	Cone-cup spikerush	-	X	-	Yes	Herb
<i>Eragrostis elliotii</i>	Elliott lovegrass	X	X	X	Yes	Herb
<i>Eriocaulon decangulare</i>	Tenangle pipewort	-	X	X	Yes	Herb
<i>Eupatorium album</i>	White thoroughwort	-	X	-	Yes	Herb
<i>Eupatorium mohrii</i>	Mohr's thoroughwort	-	-	X	Yes	Herb
<i>Euthamia caroliniana</i>	Slender flattop goldenrod	X	X	X	Yes	Herb

Scientific Name	Common Name	2008	2009	2010	Natural Recruitment	Form
<i>Fimbristylis</i> sp.	Fringe rush	X	-	-	Yes	Herb
<i>Fuirena breviseta</i>	Saltmarsh umbrellasedge	X	X	X	Yes	Herb
<i>Fuirena pumila</i>	Dwarf umbrella grass	X	-	-	Yes	Herb
<i>Fuirena squarrosa</i>	Lake-rush	X	-	X	Yes	Herb
<i>Helianthus angustifolia</i>	Narrow leaved sunflower	-	-	X	Yes	Herb
<i>Hydrocotyle</i> sp.	Marshpennywort	-	X	-	Yes	Herb
<i>Hypericum brachyphyllum</i>	St. John's wort	X	X	X	Yes	Shrub
<i>Hypericum fasciculatum</i>	Fascicled St. John's wort	-	-	X	Yes	Shrub
<i>Hypericum gentianoides</i>	Orange grass	X	X	-	Yes	Herb
<i>Hypericum microsepalum</i>	Flatwoods hypericum	-	-	X	Yes	Shrub
<i>Ilex glabra</i>	Gall berry	X	X	X	Yes	Shrub
<i>Ilex vomitoria</i>	Yaupon	X	X	X	Yes	Shrub
<i>Iva microcephala</i>	Piedmont marsh elder	-	X	X	Yes	Herb
<i>Juncus megacephalus</i>	Large headed rush	X	X	X	Yes	Herb
<i>Juncus pelocarpus</i>	Brownfruit rush	X	X	-	Yes	Herb
<i>Juncus polycephalos</i>	Manyhead rush	X	X	-	Yes	Herb
<i>Juncus repens</i>	Creeping rush	X	-	X	Yes	Herb
<i>Juncus scirpoides</i>	Needlepod rush	-	-	X	Yes	Herb
<i>Juncus tenuis</i>	Path rush	-	-	X	Yes	Herb
<i>Juncus trigonocarpus</i>	Redpod rush	X	X	-	Yes	Herb
<i>Lachnanthes caroliniana</i>	Redroot	X	X	X	Yes	Herb
<i>Lachnocaulon anceps</i>	Bog button	-	-	X	Yes	Herb
<i>Lachnocaulon minus</i>	Small's bog button	X	-	X	Yes	Herb
<i>Leersia</i> sp.	Cut grass	X	X	-	Yes	Herb
<i>Lophiola aurea</i>	Golden crest	-	-	X	Yes	Herb
<i>Ludwigia arcuata</i>	Ludwigia	X	X	X	Yes	Herb
<i>Ludwigia leptocarpa</i>	Anglestem primrosewillow	-	-	X	Yes	Herb
<i>Ludwigia microcarpa</i>	Little seedbox	X	X	X	Yes	Herb
<i>Ludwigia palustris</i>	Marsh seedbox	-	X	X	Yes	Herb
<i>Ludwigia repens</i>	Creeping primrosewillow	-	X	X	Yes	Herb
<i>Ludwigia</i> sp.	Seedbox	-	X	-	Yes	Herb
<i>Lycopodium aloperuroides</i>	Fox clubmoss	X	X	X	Yes	Herb
<i>Lycopodium carolinana</i>	Prostrate clubmoss	X	-	-	Yes	Herb
<i>Mitreola petiolata</i>	Lax hornpod	-	-	X	Yes	Herb
<i>Nymphaea odorata</i>	Fragrant water lily	X	X	X	Yes	Herb
<i>Nyssa sylvatica</i> var. <i>biflora</i>	Swamp tupelo	X	X	X	Yes	Tree
<i>Oldenlandia uniflora</i>	Clustered mille grains	-	-	X	Yes	Herb
<i>Panicum repens</i>	Torpedo grass	-	X	X	Yes	Herb
<i>Panicum rigidulum</i>	Redtop panicgrass	-	X	-	Yes	Herb
<i>Panicum verrucosum</i>	Warty panicgrass	-	X	X	Yes	Herb
<i>Panicum virgatum</i>	Switchgrass	-	X	-	Yes	Herb
<i>Persea palustris</i>	Swamp bay	-	X	X	Yes	Tree, sapling
<i>Photinia pyrifolia</i>	Red chokeberry	-	-	X	Yes	Shrub

Scientific Name	Common Name	2008	2009	2010	Natural Recruitment	Form
<i>Pinus elliotii</i>	Slash pine	-	X	X	Yes	Tree, 18-36 inches
<i>Pluchea rosea</i>	Rosy camphor weed			X	Yes	Herb
<i>Pluchea foetida</i>	Camphor weed	X	X	X	Yes	Herb
<i>Polypremum procumbens</i>	Rustweed or Juniperleaf	X	X	X	Yes	Herb
<i>Proserpinaca pectinata</i>	Combleaf mermaidweed	-	X	X	Yes	Herb
<i>Rhexia mariana</i>	Pale meadowbeauty	-	X	X	Yes	Herb
<i>Rhexia sp.</i>	Meadowbeauty	X	-	-	Yes	Herb
<i>Rhexia virginica</i>	Handsome harry	-	X	-	Yes	Herb
<i>Rhynchospora cephalantha</i>	Bunched beaksedge	-	X	X	Yes	Herb
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge	-	X	X	Yes	Herb
<i>Rhynchospora corniculata</i>	Short bristle beakrush	X	-	X	Yes	Herb
<i>Rhynchospora fasciculata</i>	Fascicled beakrush	-		X	Yes	Herb
<i>Rhynchospora intermixa</i>	Tufted beakrush	X	-	-	Yes	Herb
<i>Rhynchospora inundata</i>	Horned beakrush	X	-	X	Yes	Herb
<i>Rhynchospora microcephala</i>	Bunched beaksedge	-	-	X	Yes	Herb
<i>Rhynchospora nitens</i>	Shortbeak beaksedge	-	-	X	Yes	Herb
<i>Rhynchospora pusilla</i>	Fairy rhynchospora	-	-	X	Yes	Herb
<i>Rhynchospora wrightiana</i>	Wright's beaksedge	-	X	-	Yes	Herb
<i>Rubus sp.</i>	Blackberry	-	X	-	Yes	Vine
<i>Saccharum alopecuroides</i>	Silver plume grass	-		X	Yes	Herb
<i>Sagittaria graminea</i>	Grassy arrowhead	X	X	X	Yes	Herb
<i>Scirpus cyperinus</i>	Wool-grass	-	-	X	Yes	Herb
<i>Scoparia dulcis</i>	Sweetbroom or Licoriceweed	-	X	-	Yes	Herb
<i>Serenoa repens</i>	Saw palmetto	-	-	X	Yes	Shrub
<i>Smilax laurifolia</i>	Greenbriar	X	X	X	Yes	Vine
<i>Solidago fistulosa</i>	Pinebarren goldenrod	-	X	X	Yes	Herb
<i>Stillingia aquatica</i>	Corkwood	X	X	X	Yes	Shrub
<i>Taxodium ascendens</i>	Pond-cypress	X	X	X	No	Tree
<i>Utricularia juncea</i>	Southern bladderwort	-	-	X	Yes	Herb
<i>Utricularia purpurea</i>	Eastern purple bladderwort	-	X	-	Yes	Herb
<i>Utricularia subulata</i>	Zig-zag bladderwort	X	X	X	Yes	Herb
<i>Viola lanceolata</i>	Bog white violet	X	X	X	Yes	Herb
<i>Woodwardia areolata</i>	Netted chain fern	X	-	-	Yes	Herb
<i>Xyris ambigua</i>	Coastal Plain yellow-eyed grass	-	-	X	Yes	Herb
<i>Xyris brevifolia</i>	Short-leaved yellow-eyed grass	-	-	X	Yes	Herb
<i>Xyris difformisvar.curtissii</i>	Curtiss' yellow-eyed grass	X	X	X	Yes	Herb
<i>Xyris flabelliformis</i>	Yellow-eyed grass	X	-	X	Yes	Herb
<i>Xyris sp.</i>	Yellow-eyed grass	X	X	-	Yes	Herb

Wildlife observations:

Deer (tracks)

Raccoon (tracks)

Crayfish chimney