PERDIDO RIVER WMA – PHASE II MITIGATION SECOND ANNUAL MONITORING REPORT

Impact: US 90 Perdido River Bridge, US 90 Escambia County, SAJ-2007-5634 IP-AWP Issued 09/19/08

Mitigation: Perdido River WMA-Phase II
Monitoring Date: October 29, 2010

SCOPE

Replacement of the Perdido River Bridge off US 90 will result in the loss of 3.69 acres of moderate quality bottomland hardwood forested wetlands. The impacts will occur at the Florida/Alabama state lines.

MITIGATION PROJECT

To compensate for the loss of wetland function associated with the US 90 bridge replacement, forested wetland restoration will occur within the adjacent Perdido River WMA. The restoration plan was reviewed and approved by the Interagency Review Team (IRT). It was determined that restoring 67 acres within the adjacent Perdido River WMA would more than generate the 11.72 UMAM credits needed to offset the wetland impacts associated with the bridge replacement.

Background:

In 2006, the NWFWMD acquired (fee-simple) 5,456 acres from the International Paper Company (IP) to form the Perdido River Water Management Area (WMA; Figure 1). These lands consist of a mosaic of forested wetlands and upland buffers, with extensive cover of loblolly and slash pine plantation. Harvesting rights for merchantable timber stands have been reserved by IP through 2011; the purchase price for this acquisition was ~$12,000,000. Most of the funding came from the Florida Forever program, although $480,000 of FDOT mitigation funding was used for acquisition of 220 acres of the IP lands to offset impacts associated with construction of the US 90 Escambia Co. Weigh Station.

Phase II Mitigation:

This project has implemented the restoration and enhancement ~67acres (Figure 2) of mostly 6-year old bedded pine plantation (loblolly pine planted 2002) to a mixture of ~38 acres of Forested Mixed Wetlands (FLUCCS 630), ~16 acres of Hydric Pine Flatwoods (FLUCCS 625), and ~13 acres of Mesic Pine Flatwoods (FLUCCS 411).

WORK SCHEDULE

- Removal of extensive windrows, that may be altering the historic hydrology: **Completed in 2009**
- Thinning of pine trees in the flatwoods area to less than 150 trees per acre: **Completed in 2009**
- Single or double drum roller chop of wet flatwoods and upland flatwoods to reduce shrub cover**: Completed in 2009**
- Herbicide treatment of nuisance native shrubs to assist in shrub reduction: **Completed in 2009**
- Annual monitoring (photo-documentation and inspection of mitigation site by a qualified biologist or wetland scientist to estimate survival of planted vegetation and percent cover of any

exotic/invasive plant species), if required, for five years after shoreline restoration or duration of permit: **Third (2010) annual monitoring complete.**

- Re-introduction of fire through cool season burn: **Burn was to be implemented in winter 09/10.**
- Re-planting of hardwood species in bottomland hardwood areas and wire grass in wet flatwood areas: **Wiregrass plantings completed Winter 09, survival in wettest areas is low but is doing well in upland areas. Bottomland hardwood species have not been planted as of October 2010.**
- Additional herbicide treatment of shrubs: **Ongoing, as needed**

SUCCESS CRITERIA

The project's success criteria are:

-Desired species showing evidence of increasing coverage: **Yes, in most areas cover is stable if not increasing. Wiregrass is stable in "upland" units but is showing poor survivorship in the lower areas (i.e. Area IV)**
-No more than 1% coverage of invasive exotic and 5% nuisance native and non invasive exotic species unless otherwise specified in a management plan: **Individual invasive exotic plants are present but do not comprise more than 1% cover and treatment is ongoing. Presence of non-native nuisance species cover is less than 5%, in some areas early successional herbaceous cover is high; however, this is a natural stage in the restoration process. With appropriate management (e.g. fire) the cover of these species will be reduced and cover of more desirable species will increase. Shrub cover is appropriate in the restoration areas.**
-Increase in appropriate herbaceous, shrub and/or tree species: **Cover of appropriate species is stable at this time, the planted wiregrass was not reproductive during the survey.**
-Kind and total coverage of species appropriate for management goals and target natural community: **Yes.**
-Kind and total coverage of tree species appropriate for management goals and target natural community: **Yes, planting of bottomland hardwood species will take place in the future, pine cover is appropriate.**

CONCLUSIONS

Overall, the conditions of the communities in the restoration areas appear to be appropriate for the stage of restoration and restoration targets. In the forested areas the "upland" thinned pine communities are exhibiting acceptable pine cover with a native early-successional shrub and herbaceous understory. Areas II and VI are trending towards wet prairie type communities, which appears to be the natural state based on hydrology and current species composition. Area III was not disturbed and is maintaining the appropriate species composition and cover for a bottomland forest community. The wiregrass plantings are showing good survivorship in Areas IV and V, but Area VI is showing poor wiregrass survivorship. Otherwise, the areas are trending towards success in that native vegetation has re-colonized the areas that are being restored and with further management (e.g. fire) cover of desirable species will increase.

Poor survivorship of wiregrass in Area VI may be due to the hydrologic regime and should be addressed, including an assessment as to whether the correct wiregrass ecotype was planted. Areas within this unit that retain wet prairie species should be managed for these species rather than managed/restored as a bottomland forest community. In order to prevent their spread, exotic species infestations (e.g. *Sapium sebiferum* and *Lygodium japonicum*) should continue to be treated. The monitoring completed on October 29, 2010 indicates compliance with all success criteria. The appended field form provides a listing of the observed species and general site observations related to the success criteria.

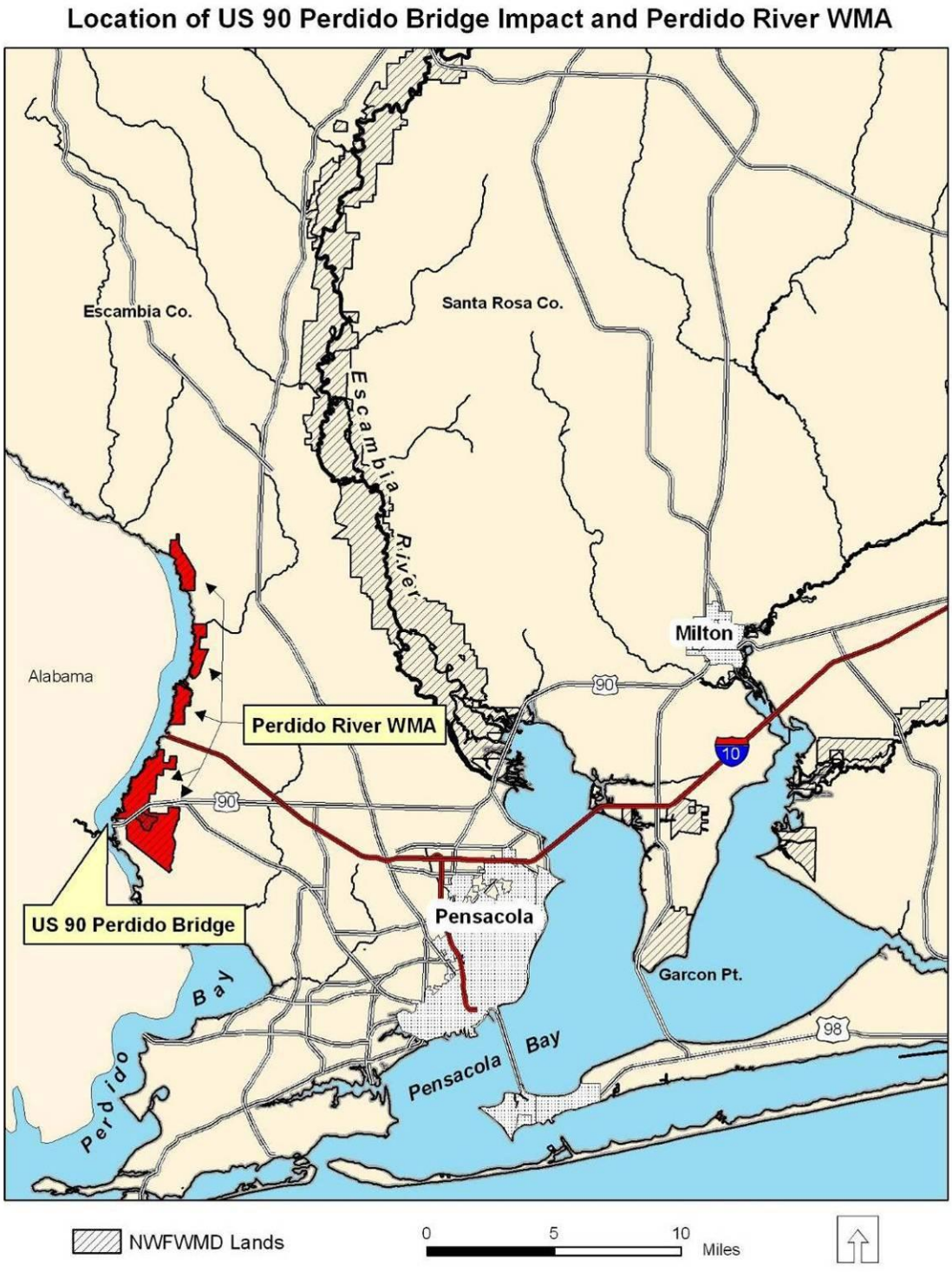

Figure 1: Location of Perdido River WMA and Impact

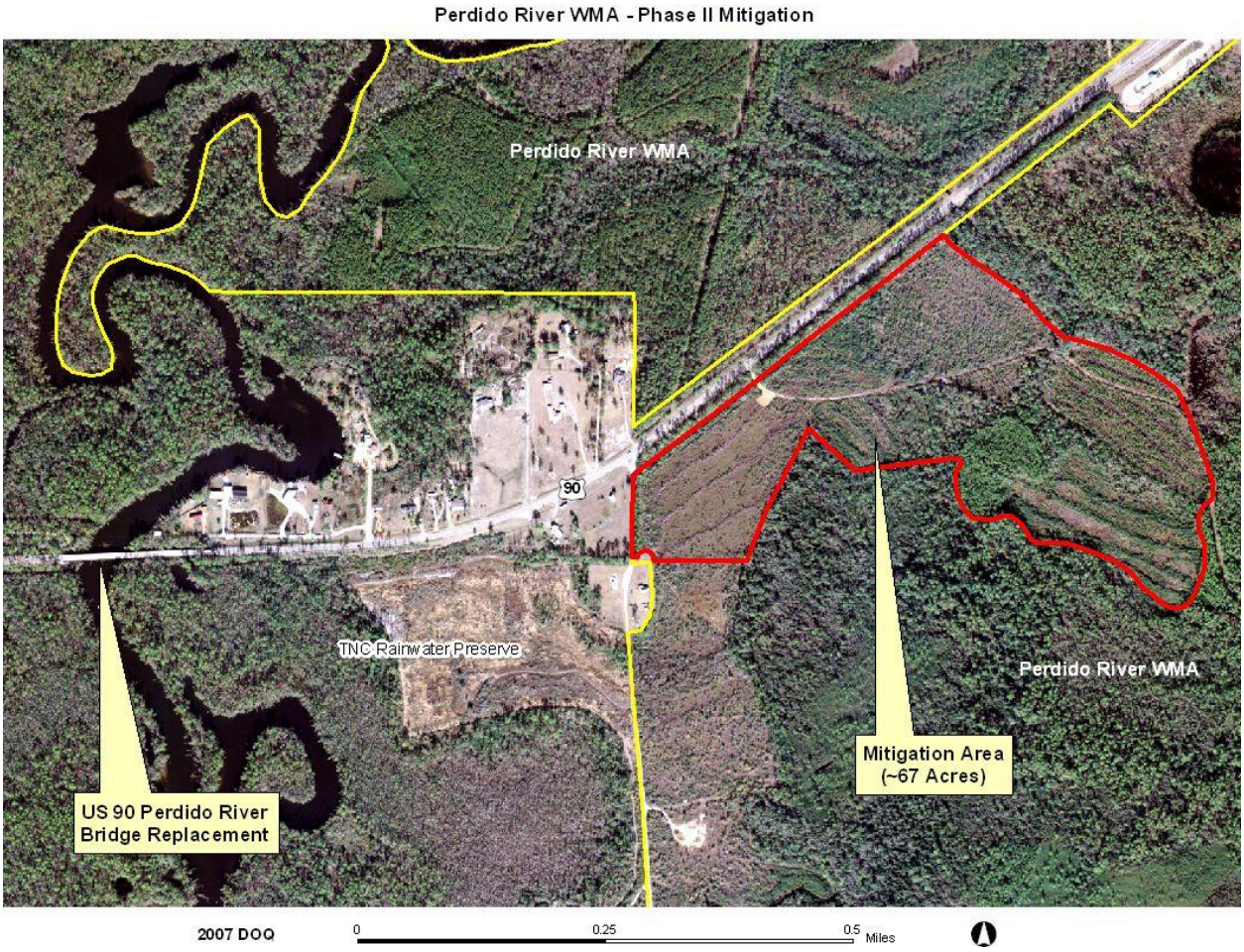

Figure 2: Impact Site and Mitigation Site

Figure 3: Area IV, Forested Mixed Wetlands Restoration Area

Figure 4: Area II, Forested Mixed Wetlands Restoration Area (wet prairie species composition)

Figure 5: Area II, Forested Mixed Wetlands Restoration Area

Figure 6: Area II, Hydric Pine Flatwoods Restoration Area

Figure 7: Area V, Mesic Pine Flatwoods Restoration Area

Figure 8: Area III, Forested Mixed Wetlands Enhancement Area

Figure 9: Area III, Forested Mixed Wetlands Enhancement Area

Figure 10: Area III Forested Mixed Wetlands Enhancement Area; stream bed.

Figure 11: *Sarracenia rosea* in Area III, Forested Mixed Wetlands Enhancement

Site Inspection Field Form	
Project: Perdido River	Date: 10/29/10
Name(s) of Data Collectors: Caitlin Elam, Alex Barth	Weather: 70's overcast and intermittently raining
Environmental Description: Photo #'s	
Polygon: GPS Location: Time: 12 pm	

Qualitative Assessment
(Enhancement Success Criteria)
√ - EC1 – Desired species showing evidence of increasing coverage
√ - EC2 – No more than 1% coverage of invasive exotic and 5% nuisance native and non invasive exotic species unless otherwise specified in a management plan
√ - EC3 – Increase in appropriate species diversity
√ - EC4 – Kind and total coverage of species appropriate for management goals and target natural community
√ - EC5 – Kind and total coverage of herbaceous species appropriate for management goals and target natural community
√ - EC6 – Kind and total coverage of tree species appropriate for management goals and target natural community
√ - EC7 – Maintain the ecological conditions so that the mitigation UMAM scores are met for each of the specified community types
(Restoration Success Criteria)
√ - RC1 – Desired species showing evidence of increasing coverage
√ - RC2 – No more than 1% coverage of invasive exotic and 5% nuisance native and non invasive exotic species unless otherwise specified in a management plan
√ - RC3 – Increase in appropriate herbaceous, shrub and / or tree species
√ - RC4 – Kind and total coverage of species appropriate for management goals and target natural community
√ - RC5 – Kind and total coverage of herbaceous species appropriate for management goals and target natural community
√ - RC6 – Kind and total coverage of tree species appropriate for management goals and target natural community
√ - RC7 – Maintain the ecological conditions so that the mitigation UMAM scores are met for each of the specified community types

On at least a yearly basis, the site will be inspected as follows:
A: Perimeter for signs of trespassing, fencing and signage integrity and infestation by exotic or nuisance vegetation;

Outer gate is broken. Inner gate is intact and closed with working lock. No signs of vandalism.

B: Internal Roads (Both public and maintenance) for signs of dumping or trespassing, erosion, bridges and road integrity, and exotic or nuisance species infestations;

Internal roads are intact and well maintained; road/firebreak along old pine plantation at the southeastern boundary of the property is fairly overgrown.

C: All construction areas for stabilization and re-vegetation, structure, operation, and integrity;

All areas where clearing and/or planting occurred have been re-vegetated with a mixture of typical early successional, native species, soils are stabilized.

D: Representative polygons for each UMAM community for fuel load, exotic or nuisance species, planted material survival, groundcover, and shrub condition.

Lygodium japonicum was observed in Area IV; *Sapium sebiferum* has been a recurring problem in Area VI and is regularly being pulled.

Area I: maintains herb-dominated community, wiry *Rhynchospora*.

Area II: Lots of woody debris from clearing and fire; early successional, native herbaceous species are dominant.

Area III: not inundated, streams not active due to recent dry period; large *Taxodium ascendens* scattered throughout with other appropriate wetland shrubs. This area is currently maintaining appropriate species composition and cover except in a small non-delineated included parcel of flatwoods (pine canopy) with an overgrown (6-12 foot) understory of *Cyrilla racemiflora*.

Area IV: trending to success; canopy is moderate which is appropriate for the flatwoods community; wiregrass plugs are exhibiting high survival rates; eventually needs fire to keep fuel load low and reduce early successional species cover (i.e. *Eupatorium capillifolium*).

Area V: trending to success; canopy is moderate which is appropriate for the flatwoods community; wiregrass plugs are exhibiting high survival rates; eventually needs fire to keep fuel load low and reduce early successional, species cover (i.e. *Eupatorium capillifolium*).

Vegetation Assessment Field Form Qualitative Assessment-Perdido River

Project: Date: 10/29/10

Name(s) of Data Collectors: Caitlin Elam and Alex Barth Weather: overcast, raining

Environmental Description: Photo #'s

Polygon: GPS Location: Time: afternoon

Nuisance Species: *Lygodium japonicum* and *Sapium sebiferum*

Fuel Load: Appropriate, not too heavy, medium sized woody debris in some areas.

- Wildlife Observations: Hawk.
- Water depth: Area was fairly dry at the time of the survey; the soil is saturated in the lowest sections (i.e. Area VI, Area I, and Area III). Area VI is known to have up to 3 feet of water above the soil surface at times.
- Is the community observed along the walk path representative of the community being measured? Yes, in the forested areas, the "upland" thinned areas are beginning to look like the appropriate community, with further fire and management they will support characteristic species and cover. Area VI and Area II are trending towards a wet prairie type community, which appears to be the natural state, based on hydrology and current species composition. Area III was not disturbed and is maintaining the appropriate species composition and cover for a bottomland forest community.
- To what degree is the restoration in this area trending towards success? The wiregrass plantings are showing good survivorship in Areas IV and V, but Area VI is showing poor wiregrass survivorship. Otherwise, the areas are trending towards success in that native vegetation has re-colonized the areas that are being restored and with further management (e.g. fire) cover of desirable species will increase.
- Potential Problems and solutions: Poor survivorship of wiregrass in Area VI may be due to the hydrologic regime and should be addressed, also areas within this unit that retain wet prairie species should be managed for these species rather than managed/restored as a bottomland forest community. Invasive exotic species infestations (e.g. *Sapium sebiferum* and *Lygodium japonicum*) should be, and are being, treated to prevent spread.

Scientific Name	**Common Name**	**Polygon I: 630**	**Polygon II: 630**	**Polygon III: 630**	**Polygon IV: 625 (WF)**	**Polygon V: 411 (MF)**
Acer rubrum	Red maple	X	X	X	X	
Andropogon virginicus	Broomsedge bluestem		X	X		
Andropogon virginicus var. *glaucus*	Chalky bluestem	X	X			X
Andropogon glomeratus	Bushy bluestem	X	X	X	X	X
Aster dumosus	Rice button aster		X			
Bidens mitis	Smallfruit beggarticks	X	X	X	X	X
Carex longii	Long's sedge		X			
Carex tenax	Caric sedge	X	X	X	X	
Cephalanthus occidentalis	Buttonbush			X		
Clethra alinfolia	Sweet pepper bush	X	X	X		
Cliftonia monoplylla	Black titi	X	X	X	X	X
Cyperus croceus	Baldwin's flatsedge		X			
Cyperus polystachyos	Manyspike flatsedge		X			
Cyperus retrorsus	Pine barren flatsedge		X			
Cyrilla racemiflora	Red titi	X	X	X	X	
Dicanthelium spp.	Panic grass	X	X	X		
Drosera brevifolia	Small sundew	X	X	X	X	
Eleocharis sp. (possibly *E. obtusa*)	Spikerush	X				
Eleocharis vivipara	Viparous spikerush			X		
Eriocaulon decangulare	Tenangle pipewort		X	X		
Eupatorium album	White thoroughwort			X	X	
Eupatorium capillifolium	Yankee weed		X		X	X
Eupatorium sp.	Thoroughwort	X	X		X	X
Euthamia caroliniana	Slender goldentop		X			

Scientific Name	Common Name	Polygon I: 630	Polygon II: 630	Polygon III: 630	Polygon IV: 625 (WF)	Polygon V: 411 (MF)
Fimbristylis autumnalis	Slender fimbry		X			
Gaylussacia frondosa var. *tomentosa*	Blue huckleberry	X	X	X		
Gaylussacia mosieri	Wooly huckleberry		X	X		
Hydrocotyle sp.	Marshpennywort	X				
Hypericum brachyphyllum	Coastal plain St. Johns-wort			X	X	
Hypericum cistifolium	Roundpod St. Johns-wort		X	X	X	
Hypericum tetrapetalum	Fourpetal St. Johns-wort		X			
Hypericum crux-andreae	St. Andrew's cross				X	X
Hypericum exile	Florida sands St. Johns Wort	X	X	X	X	
Hyptis alata	Musky mint		X	X		
Ilex coriacea	Large gallberry	X	X	X	X	
Ilex glabra	Gall berry	X	X	X	X	X
Ilex myrtifolia	Myrtle-leaved holly	X	X	X	X	
Ilex vomitoria	Yaupon			X	X	X
Itea virginica	Sweetspire			X		
Juncus repens	Lesser creeping rush			X	X	
Juncus marginatus	Grassleaf rush		X			
Lachnanthes caroliana	Carolina redroot	X	X	X	?	
Lachnocaulon anceps	White-headed bog buttons	X	X	X	X	X
*Listera australis forma viridis**	Southern tway blade orchid			X		
Lophiola aurea	Golden crest		X			
Ludwigia sp.	Seedbox					
Lycopodiella appressa	Southern club-moss	X	X	X	X	
Lycopodiella caroliniana	Slender club-moss	X	X	X	X	
Lyonia lucida	Fetter bush	X	X	X	X	
Magnolia grandiflora	Bull bay	X	X	X		X
Magnolia virginiana	Silver bay	X	X	X	X	X
Myrica cerifera	Wax myrtle		X	X	X	
Myrica inodorata	Odorless wax myrtle	X	X	X	X	X
Nyssa sylvatica var. *biflora*	Swamp tupelo			X		
Osmunda cinnamomea	Cinnamon fern		X	X	X	
Osmunda regalis	Royal fern				X	
Panicum longifolium	Panic grass			X		
Panicum verrucosum	Warty panic grass	X	X		X	X
Panicum virgatum	Switchgrass			X	X	
Persea borbonia	Silk bay		X	X	X	X
Persea palustris	Red bay	X	X	X	X	
Photinia pyrifolia	Red chokeberry		X	X		
Phytolacca americana	Pokeweed		X			
Pinus elliottii	Slash pine	X	X	X	X	X
Pinus taeda	Loblolly pine			X	X	
Pluchea sp.	Pluchea	X	X	X	X	
Pteridium aquilinum var. *pseudocaudatum*	Western brackenfern		X			
Quercus hemisphaerica	Diamond oak	X	X	X	X	X
Quercus laurifolia	Diamond oak			X		
Quercus nigra	Water oak			X		
Rhexia mariana	Maryland meadowbeauty			X	X	
Rhexia sp.	Meadowbeauty	X			X	X
Rhexia sp. 2	Meadowbeauty		X		X	
Rhexia mariana	Pale meadow beauty				X	X
Rhexia nashii	Maid Marion meadow beauty	X	X	X	X	
Rhus sp.	Sumac					X

Scientific Name	Common Name	Polygon I: 630	Polygon II: 630	Polygon III: 630	Polygon IV: 625 (WF)	Polygon V: 411 (MF)
Rhynchospora cephalantha	Bunched beaksedge	X	X	X		
Rhynchospora chapmanii	Wiry beaksedge	X	X			X
Rhynchospora corniculata	Large fruited beaksedge			X		
Rhynchospora fascicularis	Fascicled beaksedge	X	X			
Rhynchospora nudata	Naked beaksedge	X				
Rhynchospora sp.	Beaksedge			X	X	
Rubus argutus	Blackberry	X		X	X	
Saccharum giganteum	Giant plume grass				X	
Sagittaria graminea	Grassy arrowhead	X				
Sarracenia rosea	Gulf purple pitcherplant		X			
Scleria sp.	Scleria	X	X	X	X	
Serenoa repens	Saw palmetto	X	X	X	X	X
Smilax bona-nox	Saw toothed greenbriar			X		
Smilax laurifolia	Catbriar	X	X	X	X	X
Solidago fistulosa	Pine barrens goldenrod	X	X	X	X	X
Sphagnum sp.	Sphagnum	X	X	X	X	X
Taxodium ascendens	Pond cypress			X		
Unknown green ground moss	Unknown green ground moss	X	X		X	X
Vaccinium elliottii	Elliott's blueberry			X	X	
Vaccinium corymbosum	High bush blueberry	X	X	X	X	X
Viola primulifolia	Primrose leaf violet	X	X	X	X	X
Vitis rotundifolia	Muscadine grape	X	X	X	X	X
Woodwardia areolata	Netted chain fern			X	X	
Woodwardia virginica	Virginia chain fern	X	X	X	X	X
Xyris jupacai	Yellow eyed grass	X	X	X	X	X

Species observed during transects (most recent date seen):
X: March 2008
X: December 2009
X: October 2010