

TATE’S HELL - WOMACK CREEK MITIGATION SITE
Annual Monitoring Report, Year 4
January 12, 2012

PROJECT OVERVIEW

Impacts: I-10 Little River Bridge, Gadsden Co.
US 319 at Curtis Mill Creek, Wakulla Co.
US 319 at Little Tide Creek, Wakulla Co.
Roberts Landing Road at Silver Lake Creek, Wakulla Co.

USACE Permit No.: SAJ-2002-05672 NW-JWS, issued 5/2/2003
SAJ-2002-05045 NW-JWS, issued 2/6/2003
SAJ-2002-00233 NW-JWS, issued 2/6/2003
SAJ-2002-05047 NW-JWS, issued 2/6/2003

Mitigation: Tate’s Hell – Womack Creek, Liberty County

Permittee/Consultant: FDOT

Responsible Party for Monitoring: Northwest Florida Water Management District (NFWFMD)
81 Water Management Dr.
Havana, FL 32333

Date of Inspection: November 9, 2011

Inspectors: Leigh Brooks, Graham Lewis

Purpose of the Approved Project

The Womack Creek mitigation project seeks to restore/enhance wetlands to compensate for loss of 1.0 acres of wetlands associated with the above four FDOT bridge repair and construction projects; all sites are proximate and within the Ochlockonee River watershed. The project area is part of the 200,000-acre (>300 miles²) Tate’s Hell State Forest. Tate’s Hell Swamp is low-lying, poorly drained land between the Apalachicola and Ochlockonee rivers. 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 silvicultural use during the 1960s and 1970s, diminishing the natural attributes of the swamp. Since 1993, the NFWFMD, working with Florida Forest Service (FFS), has improved hydrology and habitat in localized portions of Tate’s Hell State Forest.

Location and Directions

The Womack Creek/Tate’s Hell wetland restoration site is located on the west side of the Ochlockonee River, east of State Road 67 in Tate’s Hell Swamp, Liberty County, Florida ([Figures 1 and 2](#)) at approximately 30°1.5’N and 84°35’W in Section 2, Township 6S, Range 4W.

Project Summary

A contingency plan is being implemented in the Womack Creek drainage of Tate’s Hell Swamp for wetland restoration and long-term ecological management. Initially, a 70-acre tract directly adjacent to the Ochlockonee River was selected. It consisted of approximately 50 acres initially

thought to be historic hydric pine and 20 acres of existing forested hardwood wetlands. The 50 acres had been logged prior to public ownership, left fallow, and was overgrown with pioneer tree species. The original mitigation plan called for mechanical reduction of the vegetation followed by a site burn and planting of wiregrass on 20 acres of the parcel. After unsuccessful efforts to establish wet flatwoods (see Mitigation Activities section below) and a re-evaluation of the historical vegetation on the site, the target natural community was modified to a more appropriate bottomland hardwood forest. The Interagency Review Team (IRT) concurred, as documented in the IRT Quarterly Meeting Minutes from August 11, 2009.

MITIGATION ACTIVITIES

Description of Management Activities

The project was divided into two phases with all site preparation activities (mechanical reduction and burning) included in phase one and vegetation planting in phase two. Mechanical reduction was initiated in May 2005 with a walk down of the woody shrubs on about 50 acres of the site. All vegetation less than about 6-8 inches in diameter was pushed; larger hardwoods and scattered pines were left standing. Walk down was followed by roller chopping most of the site after 2-3 months. Due to the vagaries of the weather no burning was carried out in the area until fall 2007 when an unsuccessful partial burn was attempted. Additional mechanical reduction was completed with a gyrotrack in December 2007 followed shortly by a second burn. Only partial success was noted with both burns because of the limited amount of fuel on site.

Phase two was initiated in early 2008 with a total of 96,075 wiregrass (*Aristida stricta*) tubelings planted on 3-ft centers on 18 January 2008 over approximately 20 acres of the site. After the following annual monitoring indicated that planted wiregrass survival was only about 40-45% likely resulting from poor site conditions for that species, the mitigation plan was re-examined. Re-evaluation of historical aeriels and vegetation suggested that the site was, in fact, a transitional bottomland hardwood community. The mitigation plan was revised, and authorized by the IRT, to include a new bottomland hardwood community target.

A new but partially overlapping area of 20 acres immediately south of the initial site was mapped for bottomland hardwood restoration ([Figures 3 and 4](#)). Planting of three tree species – swamp chesnut oak (*Quercus michauxii*), black gum (*Nyssa biflora*), and spruce pine (*Pinus glabra*) – was conducted on 16 December 2010. Bare-root seedlings were planted on 12 foot centers over 20 acres. Two thousand trees of each species (6,000 trees total) were planted, yielding a density of about 300 trees per acre.

Herbicide treatment of nuisance exotic cogongrass (*Imperata cylindrical*) was conducted in Spring 2010 and May 2011. Subsequent observation shortly after the most recent treatment indicated browning of grass but apparently eradication was not fully successful (see Monitoring Observations below).

Anticipated Work Schedule for 2012

- Herbicide treatment of cogongrass and climbing fern
- Continued annual site inspection with photo-documentation
- No replanting necessary at this time

MONITORING REQUIREMENTS

- Annual site inspection to determine planting and community goal success
- Photo-documentation of site
- Annual report describing condition of vegetation submitted to the Corps for four years or until wetland impacts have been adequately compensated.

SUMMARY OF MONITORING ACTIVITIES

Monitoring Observations

The current monitoring was carried out on November 9, 2011, and consisted of a meandering pedestrian survey throughout the site with photographs taken at a variety of points ([Figures 3 and 4](#)). Field sheets are attached documenting [site conditions](#) and [observed species](#). Several new plant species were found during the 2011 inspection. To date, 120 species have been observed within the site with significant regrowth and colonization of appropriate species for the revised target community (i.e., bottomland hardwoods).

The mitigation area ground surface was dry on the day of this site visit due to extended drought conditions. The open areas that had previously been subject to mechanical shrub reduction and fire displayed diverse and dense native groundcover ([Photos 1-3](#)), with many plants in seed. Density of the herbs and shrubs was evidenced by difficulty walking, having to push down vegetation that was often thick and overhead. Several species were early successional and abundant including dog fennel (*Eupatorium capillifolium*), beautyberry (*Callicarpa americana*), and sweetgum (*Liquidambar styraciflua*). There were also more persistent wetland species such as netted chain fern (*Woodwardia areolata*), arrowwood (*Viburnum dentatum*), and numerous overcup oak (*Quercus lyrata*) saplings ([Photo 4](#)). Spruce pine saplings were also common; it could not be determined if they were planted or natural as there were many mature trees on site that could be parent trees. Red maple (*Acer rubrum*) saplings were common. Very few of the planted swamp chestnut oaks ([Photo 5](#)) were found and no planted black gums were observed.

Most of the plants listed in the prior year monitoring report vegetation species list were observed. Additional species seen were false foxglove (*Agalinis sp.*), swamp sunflower (*Helianthus angustifolius*), cogongrass (*Imperata cylindrica*), nailwort (*Paronychia sp.*), overcup oak (*Quercus lyrata*), saw palmetto (*Serenoa repens*), bagpod (*Sesbania vesicaria*), foxtail grass (*Setaria sp.*), and American wisteria (*Wisteria frutescens*).

One large patch of cogongrass ([Photo 6](#)) was found (see location in Figure 3). There were numerous occurrences of Japanese climbing fern yet none covered more than a very small area. Overall cover of nuisance exotic species was less than five percent. The cogongrass patch was noted in previous monitoring and was treated unsuccessfully in both 2010 and 2011; further treatment is necessary.

Numerous wildlife and wildlife signs were observed during the monitoring. A site that appeared to be frequented by black bear was found under a tree (east of photo point 3, Figure 3) where vegetation was matted down and there were several large scats.

Success Criteria

The following success criteria, taken from the specific Mitigation Plans attached to each permit, were evaluated in previous annual inspections but are re-iterated here. Because the wiregrass survival criterion was not met, a re-evaluation of the mitigation plan was undertaken in consultation with the IRT and the Florida Forest Service. A revised plan was developed that included a modification of the targeted restoration community to bottomland hardwoods and a revised planting plan. This plan was implemented with the planting of more appropriate species as described in the Management Activities section above. Monitoring of recent hardwood plantings will continue.

	Performance Standard	Condition Met
Mititation Plan SC1	Mechanical reduction and burn	Yes
Mititation Plan SC2	Planting of 10 acres +supplemental 10 acres of wiregrass	Yes
Mititation Plan SC3	Survival of the planted wiregrass shall be 85%.	No*
Mititation Plan SC4	Nuisance exotic species shall be less than 5% of the total vegetative cover.	Yes

*see discussion in Description of Management Activities section and above

The following performance standards, taken from the Northwest Florida Umbrella, Watershed-based, Regional Mitigation Plan (NFWFMD July 2006, revised March 2009) were also evaluated during the recent site inspection; all success criteria were met.

	Restoration Success Criteria	Condition Met
RC1	Desired species showing evidence of increasing coverage.	Yes
RC2	Invasive exotic species cover ≤ 1% and nuisance native and non-invasive exotic species cover ≤ 5% of sites.	Yes
RC3	Increase in appropriate herbaceous, shrub and/or tree species.	Yes
RC4	Kind and total coverage of herbaceous species appropriate for management goals and target natural community.	Yes
RC5	Kind and total coverage of shrub species appropriate for management goals and target natural community.	Yes
RC6	Kind and total coverage of tree species appropriate for management goals and target natural community.	Yes
RC7	Maintain the ecological conditions so that the mitigation UMAM scores are met for each of the specified community types.	Yes

CONCLUSIONS

All success criteria were met with the exception of wiregrass survival. Since the revised contingency plan for this site calls for restoration to a bottomland forest, wiregrass is not naturally a component of the habitat. Thus, a low survival of wiregrass should not be an

indicator of unsuccessful restoration. Care is required in the original designation of target communities for mitigation activities such that chances for successful completion are enhanced. However, when either target communities are incorrectly identified or specific restoration plans do not meet their performance standards, adjusting management plans in an adaptive manner is warranted. Flexibility is needed to achieve the desired mitigation objectives.

Given the recent observations, there is a strong likelihood of progress toward project goals if tree species are allowed to regenerate and re-establish the closed canopy that is natural for a bottomland forest community. Further augmentation of hardwood species, despite the low survival of recent planting, is not warranted at this time but will be evaluated during future monitoring. It should be noted that fire is not a significant factor in the maintenance and development of a bottomland forest community. Continued spot treatments of cogongrass and Japanese climbing fern will prevent further infestation and displacement of native, desirable species.

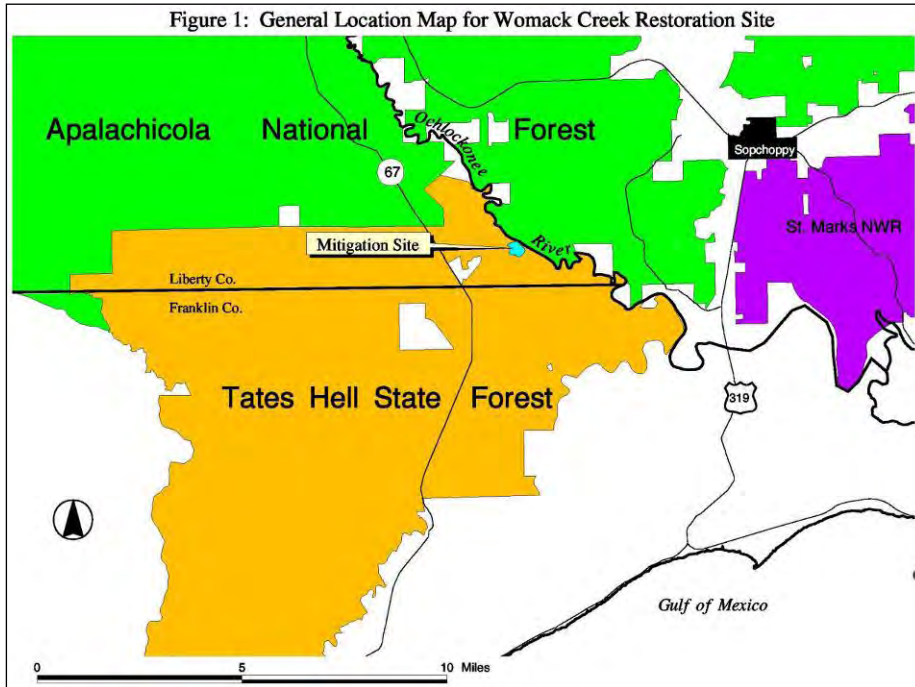


Figure 1. General location for the Womack Creek mitigation site in northeastern Tates Hell State Forest.

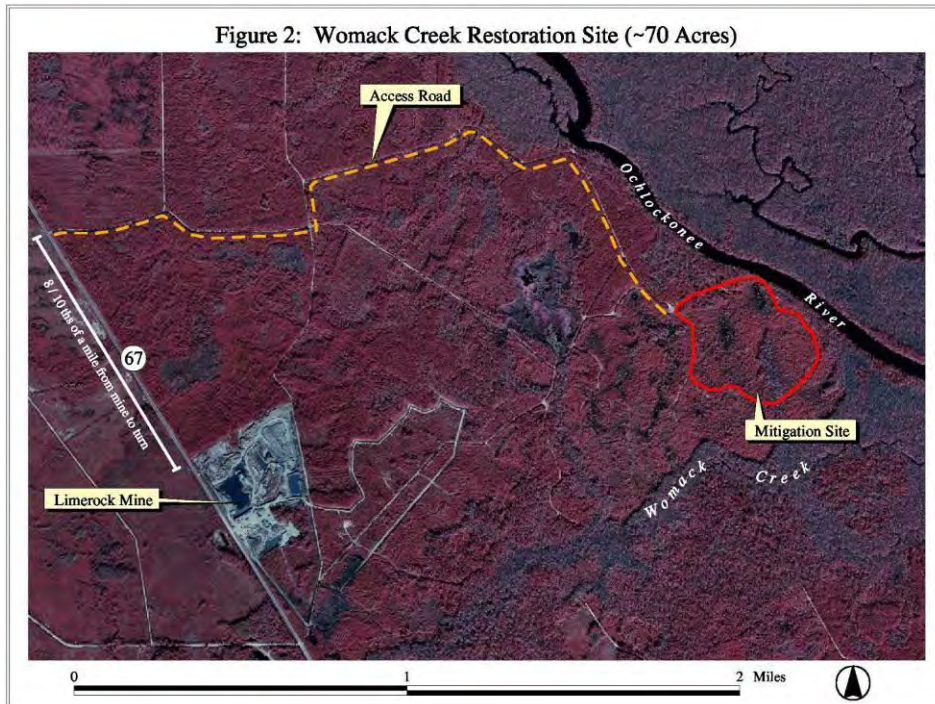


Figure 2. Location map for the Womack Creek mitigation site.

[RTN](#)

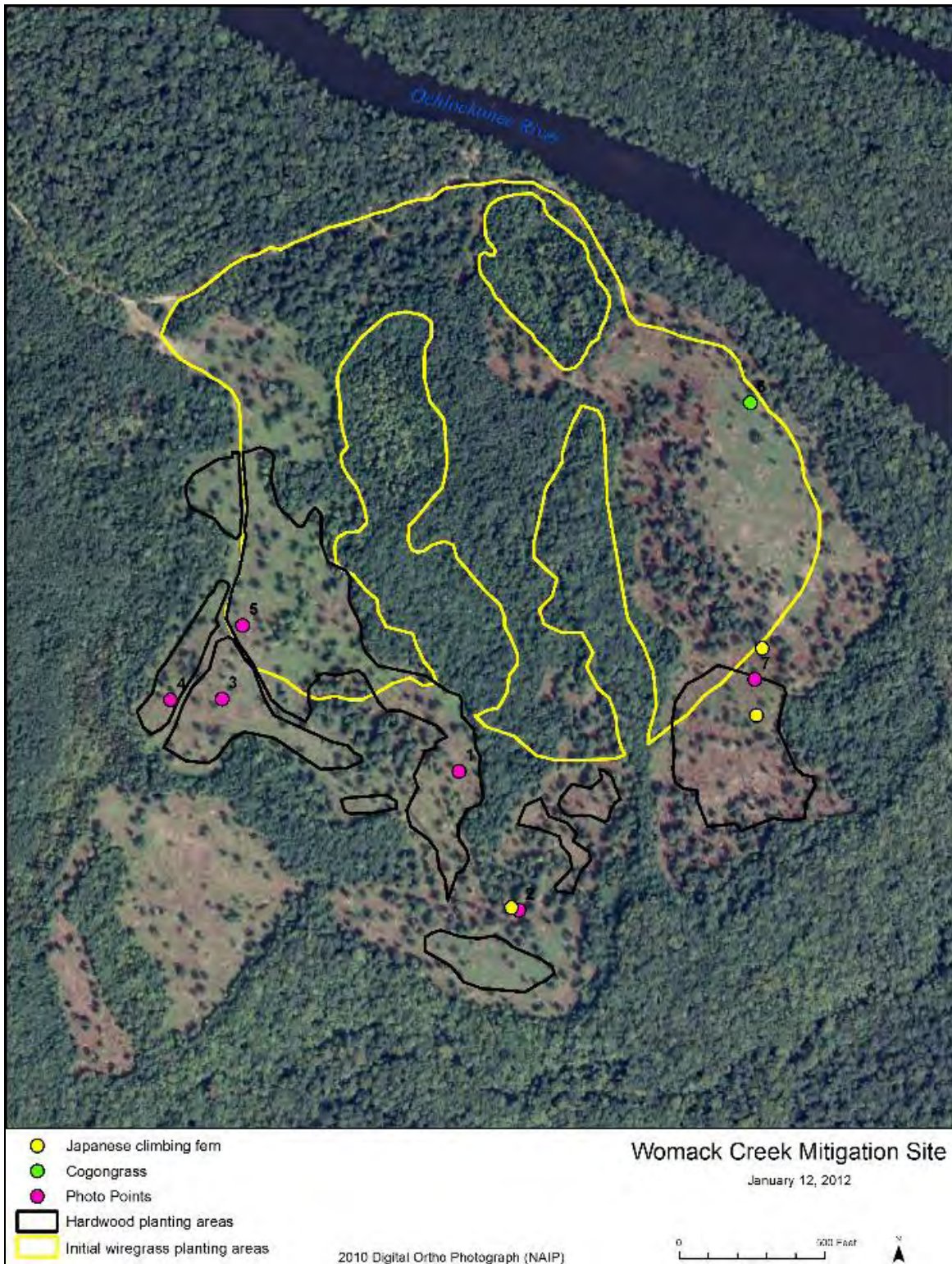


Figure 3. 2010 aerial image of mitigation site with original and current project boundaries shown. Also indicated are locations of the new hardwood planting areas and recent photo points. [RTN](#)

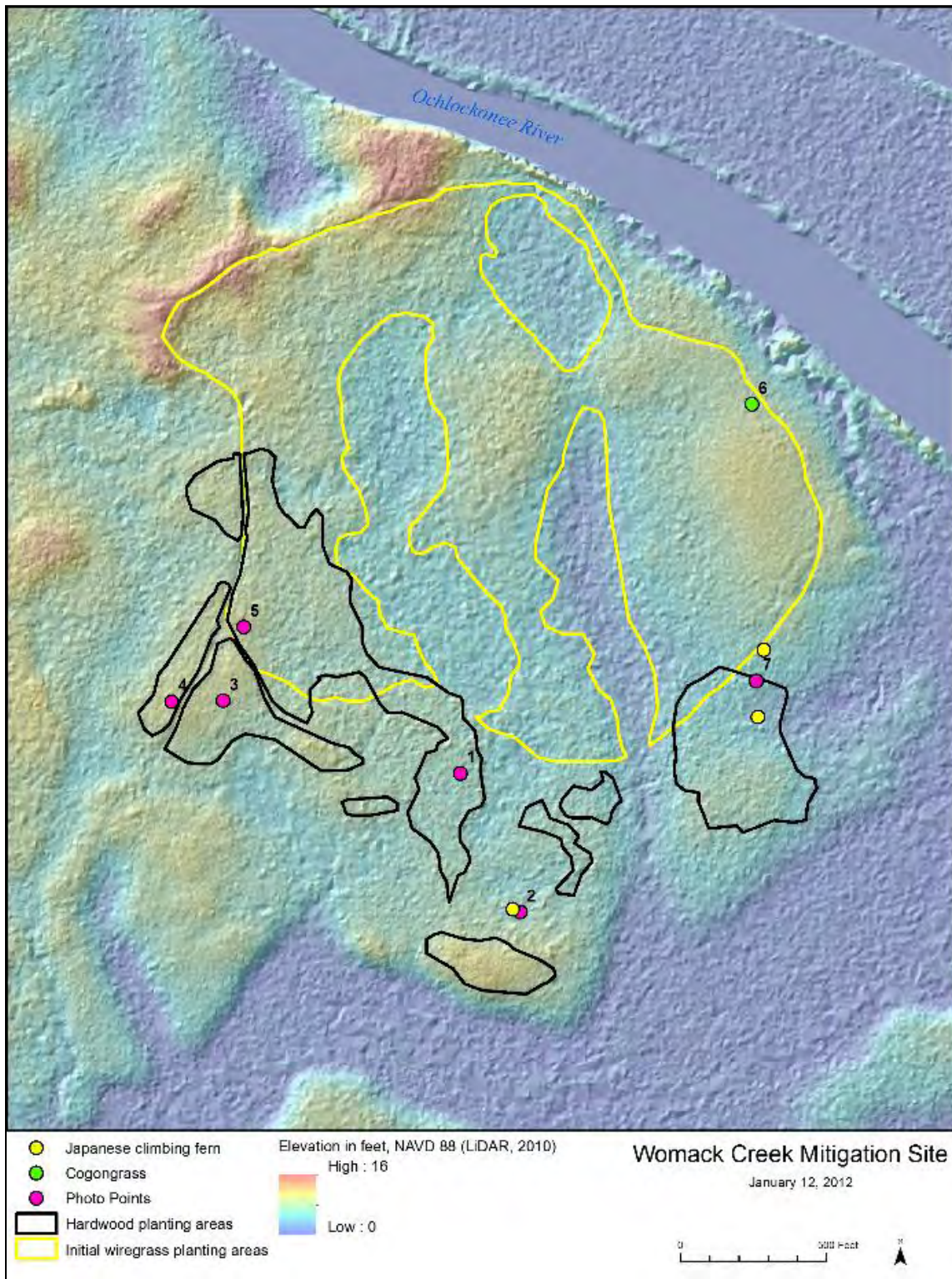


Figure 4. Topography of the mitigation site taken from LiDAR imagery (2006).

[RTN](#)



Photo 1. Representative photograph of natural diversity amidst abundant dog fennel. Photo Point 4, looking southwest. 11/09/2011. [RTN](#)



Photo 2. Representative photograph of natural diversity amidst abundant dog fennel. Photo point 5, looking northeast. 11/09/2011. [RTN](#)



Photo 3. Representative photograph of natural diversity amidst abundant dog fennel. Photo point 5, looking northeast. 11/09/2011. [RTN](#)



Photo 4. Overcup oak (*Quercus lyrata*) natural regeneration. 11/09/2011. [RTN](#)



Photo 5. Swamp chestnut oak (*Quercus michauxii*) planted seedling. 11/09/2011.

[RTN](#)



Photo 6. Cogongrass (*Imperata cylindrica*) patch on east side of site. Photo point 6. 11/09/2011.

[RTN](#)

Site Inspection Field Form	
Project: Womack Creek – Bates Hell	Date: November 9, 2011
Name(s) of Data Collectors: Leigh Brooks, Graham Lewis	Weather: sunny, wind light (<5mph)
Environmental Description: bottomland hardwood forest	
GPS Location: 30°1.5'N, 84°35'W Time: 3:00 pm	
<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:</p> <p>The site is not blocked from public access as it is part of the Bates Hell State Forest; access is allowed. Site is not fenced.</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:</p> <p>Public access is not restricted. Despite continued access, no signs of dumping and only minor littering were noted. Numerous observances of climbing fern through the site but very limited in spatial coverage. Small patch of cogongrass noted on eastern side of site along internal road.</p>	
<p>C: All construction areas for stabilization and re-vegetation, structure, operation, and integrity:</p> <p>N/A</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>-fuel load relatively low on site as area has had several recent burns of varying success. -some exotic/invasives noted on site but coverage is less than 5% -planted hardwood survival is low yet site has ample and appropriate species colonization -native hardwood species are recolonizing the site with numerous species reproducing and expanding coverage.</p>	

Vegetation Assessment Field Form Qualitative Assessment	
Project: Womack Creek – Tates Hell	Date: November 9, 2011
Name(s) of Data Collectors: Leigh Brooks, Graham Lewis	Weather: sunny, wind light (<5mph)
Environmental Description: bottomland hardwood forest	
Polygon: GPS Location: 30°1.5'N, 84°35'W	
Nuisance Species: cogongrass and Japanese climbing fern <5%	
Wildlife Observations: numerous avifauna, bear scat and signs of bedding	
Water depth:N/A	
Is the community observed along the walk path representative of the community being measured? Yes	
To what degree is the restoration in this area trending towards success? With high natural recruitment rates and supplemental planting, the site is trending toward the revised target of a bottomland hardwood forest	
Potential Problems and solutions: some exotic invasives were noted that will require further treatment for eradication	

Scientific Name	Common Name	2008 ¹	2009 ¹	2010 ¹	2011 ²	Dominant
<i>Acer floridanum</i>	Florida maple			X		
<i>Acer rubrum</i>	Red maple			X		
<i>Agalinis sp.</i>	False foxglove				X	
<i>Andropogon glomeratus</i>	Bushy bluestem			X		
<i>Andropogon virginicus</i>	Broom sedge	X	X	X		X
<i>Ampelopsis arborea</i>	Peppervine			X		
<i>Aristida stricta</i>	Wire grass	X	X	X		
<i>Baccharis halmifolia</i>	Groundsel tree		X	X		
<i>Bidens mitis</i>	Spanish needles			X		
<i>Boehmeria cylindrica</i>	False nettle			X		
<i>Callicarpa americana</i>	Beauty berry	X	X	X		X
<i>Carex sp.</i>	Caric sedge	X	X	X		
<i>Carpinus caroliniana</i>	Ironwood			X		
<i>Carya glabra</i>	Pignut hickory			X		
<i>Centella asiatica</i>	Centella	X		X		
<i>Chasmanthium laxum</i>	Slender woodoats			X		
<i>Cliftonia monophylla</i>	Black titi	X		X		X
<i>Cornus foemina</i>	Swamp dogwood			X		
<i>Conyza canadensis</i>	Horseweed			X		
<i>Crataegus marshallii</i>	Parsley hawthorn			X		
<i>Cyperus odoratus</i>	Fragrant flatsedge			X		
<i>Cyperus spp.</i>	Sedge	X		X		
<i>Cyrilla racemiflora</i>	Titi			X		
<i>Dicanthelium spp.</i>	Witch grass	X		X		
<i>Dichantherium aciculare</i>	Needleleaf witchgrass	X	X	X		
<i>Diodia virginiana</i>	Virginia buttonweed			X		
<i>Diospyros virginiana</i>	Persimmon	X		X		
<i>Elephantopus carolinianus</i>	Carolina elephantsfoot			X		
<i>Eragrostis elliottii</i>	Elliott lovegrass	X		X		
<i>Erechtites hieracifolius</i>	Fireweed			X		
<i>Eupatorium capillifolium</i>	Dog fennel	X	X	X		X
<i>Eupatorium compositifolium</i>	Yankeeweed			X		
<i>Euthamia caroliniana</i>	Flat-topped goldenrod	X		X		
<i>Fraxinus caroliniana</i>	Carolina ash			X		
<i>Fuirena squarrosa</i>	Lake-rush	X		X		
<i>Hammamelis virginiana</i>	Witchhazel			X		
<i>Helianthus angustifolius</i>	Swamp sunflower				X	

Scientific Name	Common Name	2008 ¹	2009 ¹	2010 ¹	2011 ²	Dominant
<i>Heterotheca subaxillaris</i>	Camphorweed			X		
<i>Hypericum gentianoides</i>	Orange grass	X	X	X		
<i>Hypericum hypericoides</i>	St. Andrew's cross		X	X		
<i>Hyptis alata</i>	Musk mint	X		X		
<i>Ilex cassine</i>	Dahoon			X		
<i>Ilex coriacea</i>	Tall gall berry	X		X		
<i>Ilex glabra</i>	Gall berry	X		X		
<i>Ilex opaca</i>	American holly	X		X		
<i>Ilex vomitoria</i>	Yaupon	X		X		
<i>Imperata cylindrica</i>	Cogongrass				X	
<i>Gelsemium rankii</i>	Swamp jessamine			X		
<i>Gelsemium sempervirens</i>	Jessamine		X	X		
<i>Jacquemontia tamnifolia</i>	Hairy clustervine			X		
<i>Juncus effusus</i>	Soft rush	X		X		
<i>Juncus marginatus</i>	Shore rush			X		
<i>Juncus megacephalus</i>	Large headed rush	X		X		
<i>Juncus</i> sp.	Rush		X	X		
<i>Juncus repens</i>	Lesser creeping rush			X		
<i>Liquidambar styraciflua</i>	Sweet gum	X	X	X		X
<i>Ludwigia</i> sp.	Seedbox	X	X	X		
<i>Lycopodium aloperuroides</i>	Fox clubmoss	X				
* <i>Lygodium japonicum</i>	Japanese climbing fern			X		
<i>Lyonia ligustrina</i> var. <i>foliosiflora</i>	Maleberry			X		
<i>Lyonia lucida</i>	Fetterbush			X		
<i>Magnolia grandiflora</i>	Southern magnolia	X	X	X		
<i>Magnolia virginiana</i>	Silver bay	X	X	X		
** <i>Matelea</i> sp.	Spinypod			X		
<i>Myrica cerifera</i>	Wax myrtle	X	X	X		
<i>Nyssa sylvatica</i> var. <i>biflora</i>	Swamp tupelo			X		X
<i>Nyssa ogeche</i>	Ogeechee tupelo			X		X
<i>Osmunda cinnamomea</i>	Cinnamon fern	X	X	X		
<i>Panicum verrucosum</i>	Warty panicum			X		
<i>Paronychia</i> sp.	Nailwort				X	
<i>Paspalum</i> sp.	Paspalum			X		
<i>Paspalum setaceum</i>	Slender paspalum			X		
<i>Paspalum urvillei</i>	Vaseygrass			X		
<i>Passiflora incarnata</i>	Passionflower			X		
<i>Persea palustris</i>	Swampbay			X		X
<i>Pinus glabra</i>	Spruce pine	X	X	X		X
<i>Pinus taeda</i>	Loblolly pine			X		X
<i>Pluchea foetida</i>	Camphor weed	X	X	X		
<i>Polygonum punctatum</i>	Smartweed		X	X		
<i>Polypremum procumbens</i>	Rustweed	X	X	X		
<i>Pteridium aquilinum</i>	Bracken fern	X	X	X		X
<i>Quercus hemisphaerica</i>	Diamond oak	X	X	X		
<i>Quercus lyrata</i>	Overcup oak				X	
<i>Quercus nigra</i>	Water oak			X		
<i>Quercus michauxii</i>	Swamp chestnut oak			X		
<i>Rhaphidophyllum hystrix</i>	Needle palm	X	X	X		X
<i>Rhexia mariana</i>	Pale meadow beauty	X		X		
<i>Rubus argutus</i>	Black berry	X	X	X		
<i>Rubus trivialis</i>	Dew berry	X		X		
<i>Sabal minor</i>	Bluestem palm	X	X	X		
<i>Sabal palmetto</i>	Sabal palm	X	X	X		
<i>Saururus cernuus</i>	Lizard's tail	X		X		
<i>Scirpus cyperinus</i>	Wool-grass	X		X		
<i>Scleria triglomerata</i>	Nut sedge	X	X	X		

Scientific Name	Common Name	2008 ¹	2009 ¹	2010 ¹	2011 ²	Dominant
<i>Scoparia dulcis</i>	Sweetbroom			X		
<i>Serenoa repens</i>	Saw palmetto				X	
<i>Sesbania vesicaria</i>	Bagpod				X	
<i>Setaria sp.</i>	Foxtail grass				X	
<i>Smilax bona-nox</i>	Greenbriar			X		
<i>Smilax glauca</i>	Greenbriar		X	X		
<i>Smilax laurifolia</i>	Greenbriar	X	X	X		
<i>Solidago fistulosa</i>	Pine barrens goldenrod	X	X	X		X
<i>Sporobolus indicus</i>	Smutgrass			X		
<i>Symplocos tinctoria</i>	Horse sugar			X		
<i>Taxodium distichum</i>	Bald cypress			X		
<i>Thelypteris sp.</i>	Maidenfern			X		
<i>Tillandsia usneoides</i>	Spanish moss			X		
<i>Toxicodendron radicans</i>	Poison ivy			X		
<i>Trichostema dichotomum</i>	Forked bluecurls			X		
<i>Vaccinium arboreum</i>	Sparkleberry			X		
<i>Vaccinium corymbosum</i>	Highbush blueberry	X	X	X		
<i>Vaccinium elliotii</i>	Elliott's blueberry			X		
<i>Viburnum dentatum</i>	Arrowwood	X		X		
<i>Viola lanceolata</i>	Bog white violet	X				
<i>Vitis rotundifolia</i>	Muscadine grape	X	X	X		
<i>Vitis sp.</i>	Grape			X		
<i>Wisteria frutescens</i>	American wisteria				X	
<i>Woodwardia areolata</i>	Netted chain fern	X	X	X		
<i>Woodwardia virginica</i>	Virginia chain fern			X		
<i>Xyris sp.</i>	Yellow-eyed grass	X		X		

¹ 2008-10 species were taken from the previous annual report.

² 2011 species are only those new species not previously observed and reported in annual reports.

[RTN](#)