

TATE’S HELL - DOYLE CREEK MITIGATION SITE
Annual Monitoring Report, 2011
February 8, 2012

PROJECT OVERVIEW

Impacts: SR 65, Franklin County
USACE Permit No.: SAJ-2004-706 (NW-TLZ), issued 4/26/2004
Mitigation: Tate’s Hell – Doyle Creek, Franklin 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 16, 2011
Inspectors: Leigh Brooks, Graham Lewis

Purpose of the Approved Project

The Doyle Creek project is mitigation for impacts to 2.27 acres of wetlands associated with repaving and shoulder improvement to State Road (SR) 65 in Franklin County from US 98 north to the Liberty County line. The wetlands impacted were low quality wet flatwoods. 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 Doyle Creek/Tate’s Hell wetlands restoration site is located in the western portion of the forest along the eastern side of Tower Road, north of SR 65 in Tate’s 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.

Project Summary

The approved mitigation plan ([Figure 2](#)) is to restore wetlands on 25 acres in the Doyle Creek drainage within a 2,000-acre tract of cutover pine plantation that was historically wet pine flatwoods, open savanna, and cypress flats. Wetland restoration entailed eliminating 18,000 feet of logging roads and associated ditches 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 sp.*). Additionally, three hardened low-water crossings were installed downstream of the mitigation site to enhance hydrologic flows. Long-

term ecological management of the mitigation site is to be carried forth by FFS, to include the appropriate fire regime.

MITIGATION ACTIVITIES

Work Schedule

- Construction phase: completed July 2006
- Re-vegetation of road footprint (~25 acres): initial wiregrass and cypress planting completed January 2008, wiregrass re-planting fall 2009.
- Monitoring: Annual monitoring has been conducted from 2006 through 2011.

Description of management activities

The project was divided into two phases with all construction activities 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. Three hardened low water crossings were installed ([Figure 2](#)). In January 2008, 68,075 wiregrass tubelings were planted on 4-foot centers throughout the roadbed footprint and partially replanted in Fall 2009. Concurrently in January 2008, 2,725 cypress seedlings were planted along the edges of each road removal. Some torpedo grass (*Panicum repens*) had been noted in the recontoured roadways during previous annual surveys and was treated in May 2011.

MONITORING REQUIREMENTS

- Annual photo documentation of restoration at permanent photo points for five years.
- Annual report submitted to the Corps for five years, initially 2004 – 2009. The monitoring period has expired.

SUMMARY OF MONITORING ACTIVITIES

Monitoring Observations

The current monitoring was carried out on November 16, 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 and are discussed below bringing the total number of species observed to 120. Inspectors walked both ends of the two road removals ([Photos 1-6](#)). The ground was dry except for numerous shallow depressions where there was not available soil to re-grade to natural elevation or where portions of ditches remained ([Photo 3](#)). There were some areas where ditches were prominent on both sides and where the road crown was still visible ([Photo 4](#)), and this likely has localized effects on hydrology and habitat. Native groundcover appropriate for a savanna or wet flatwoods was generally establishing nicely where the grade was tied in well with the neighboring area ([Photos 1, 2, 5 and 6](#)). There were some large bare ground patches showing little colonization of vegetation, possibly due to compaction of the soil or shallow depressions with different hydrologic characteristics. Wiregrass had established well in some areas but not in others, although absence of wiregrass may not be a concern where abundant grasses and sedges have filled in. Small patches of torpedo grass, noted in previous surveys, were treated in May 2011 and were not observed at the time of this survey.

Survival of cypress was generally high. They were most robust at the southeast road segment ([Photo 1](#)); survival was not as good on the western segment and poor in the northeast. Young planted trees appeared to be bald cypress (*T. distichum*) and not pond cypress, as intended. The method of planting is readily apparent now that the trees are older; they were planted in straight lines down the old ditches. Some areas showed natural recruitment of pond cypress. Pine trees were also recruiting to some areas ([Photo 2](#)). Titi (*Cyrilla racemiflora*) was becoming established between Photo Points 1 and 2 on the east road segment (see [Figure 3](#)).

Plant species observed that were not listed on the previous year’s monitoring report were thistle (*Cirsium sp.*), pinewoods fingergrass (*Eustachys petraea*), slender club moss (*Lycopodiella caroliniana*), sweetbay (*Magnolia virginiana*), northern bayberry (*Myrica caroliniensis*), southern bayberry/wax myrtle (*Myrica cerifera*), odorless wax myrtle (*Myrica inodora*), beaked panicum (*Panicum anceps*), sand live oak (*Quercus geminata*), willow (*Salix sp.*), yellow hatpins (*Syngonanthus flavidulus*), bald cypress (*Taxodium distichum*) (planted), Virginia chain fern (*Woodwardia virginica*) as well as sphagnum and an unidentified moss. Invasive exotic torpedo grass (*Panicum repens*) was seen on the southeast segment, near photo point 3.

Wildlife signs observed were deer tracks, raccoon tracks, crayfish burrows and chimneys, small sand piles from a burrowing animal, and mammal scat with intact berries. Very small frogs were seen at the mouths of burrows, and a snipe or rail was flushed from shrubs.

Success Criteria

The following success criteria, taken from the specific Mitigation Plan attached to USACE permit, were evaluated in previous annual inspections but are re-iterated here. During the most recent site inspection, not all performance standards were found to be met but are trending in the right direction.

Success Criteria (from mitigation plan)	Condition Met
Soils on road footprint stabilized to prevent offsite discharges of turbid flows.	Yes
BMP’s (e.g., silt fences/curtains, hay bales) installed during all construction phases.	Yes
Minimum 80% native groundcover dominated by wiregrass within five years of restoration.	No*
No more than 1% coverage of invasive or exotic plant species.	Yes
80% survival of planted cypress within five years of restoration.	Yes

*see discussion in Monitoring Observations section and below

While an excellent coverage of native species has recolonized most of the old roadbed areas, wiregrass dominance was not observed throughout the site. While the dominance by wiregrass has not been met, native species recruitment has been good, meeting the intent of the success criterion.

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 but one of the success criteria were met. As

discussed previously, bald cypress was planted rather than pond cypress which is present on site currently and recolonizing the site along with groundcover species.

Restoration Success Criteria (from UWRMP)		Condition Met
RC-1	Desired species showing evidence of increasing coverage	Yes
RC-2	No more than 1% coverage of invasive exotic and 5% nuisance native and non-invasive exotic species unless otherwise specified in a management plan	Yes
RC-3	Increase in appropriate herbaceous, shrub and / or tree species	Yes
RC-4	Kind and total coverage of shrub species appropriate for management goals and target natural community	Yes
RC-5	Kind and total coverage of herbaceous species appropriate for management goals and target natural community	Yes
RC-6	Kind and total coverage of tree species appropriate for management goals and target natural community	No*
RC-7	Maintain the ecological conditions so that the mitigation UMAM scores are met for each of the specified community types.	Yes

*see discussion in Monitoring Observations section

CONCLUSIONS

The road removals have greatly improved localized hydrologic conditions, allowing for natural recovery of habitat and use by wildlife. While certain areas did not achieve the desired ground surface re-contouring, scattered small depressions and ponds are viewed as an asset that provides additional habitat diversity. It is very difficult to restore ground elevation and pre-disturbance hydrology. The appropriate plant species will colonize if hydrologic conditions are suitable.

Extensive linear patches of bare ground or wet depressions can impede the carry of fire across the landscape. FFS will need to take that into account when conducting prescribed burns and plan a firing strategy accordingly. It is hoped that re-graded areas will not be used as fire breaks, scraping vegetation to bare ground. These areas need fire to stimulate continued colonization. A possible benefit could come, however, if fire lines are plowed that improve the natural grade, smoothing out differences between elevated old roadways and incompletely filled ditches.

The cypress that was planted appears to be bald cypress (*T. distichum*) even though pond cypress (*T. ascendens*) is the more appropriate species for the target natural community. It is unclear what effect the planted bald cypress may have on restoration success or landscape function. Additionally, the trees have begun to look as if they were planted to line a canopy road, lending an unnatural appearance. In hindsight, augmenting natural recruitment of cypress was not necessary given the abundance of naturally occurring individuals and their ability to colonize the bare roadbeds.

Having a success criterion that wiregrass be the dominant groundcover may not be consistent with the natural diversity characteristic of the wet prairie community, and imposes a forcing factor that may not be economically justified given the imperfection of the re-graded topography.

A more meaningful success criterion should have been re-grading to natural contour with subsequent recolonization with 85-90% coverage of “natural groundcover”.

While performance standards have not all been met, ecological and hydrologic functions have been much improved compared to the pre-project road and ditch conditions. As the monitoring period stated in the permit has expired, it is time to evaluate if this project can be released from the annual monitoring requirement.

Location Map - Doyle Creek Mitigation Area

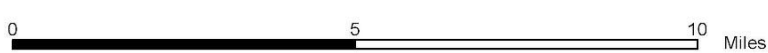
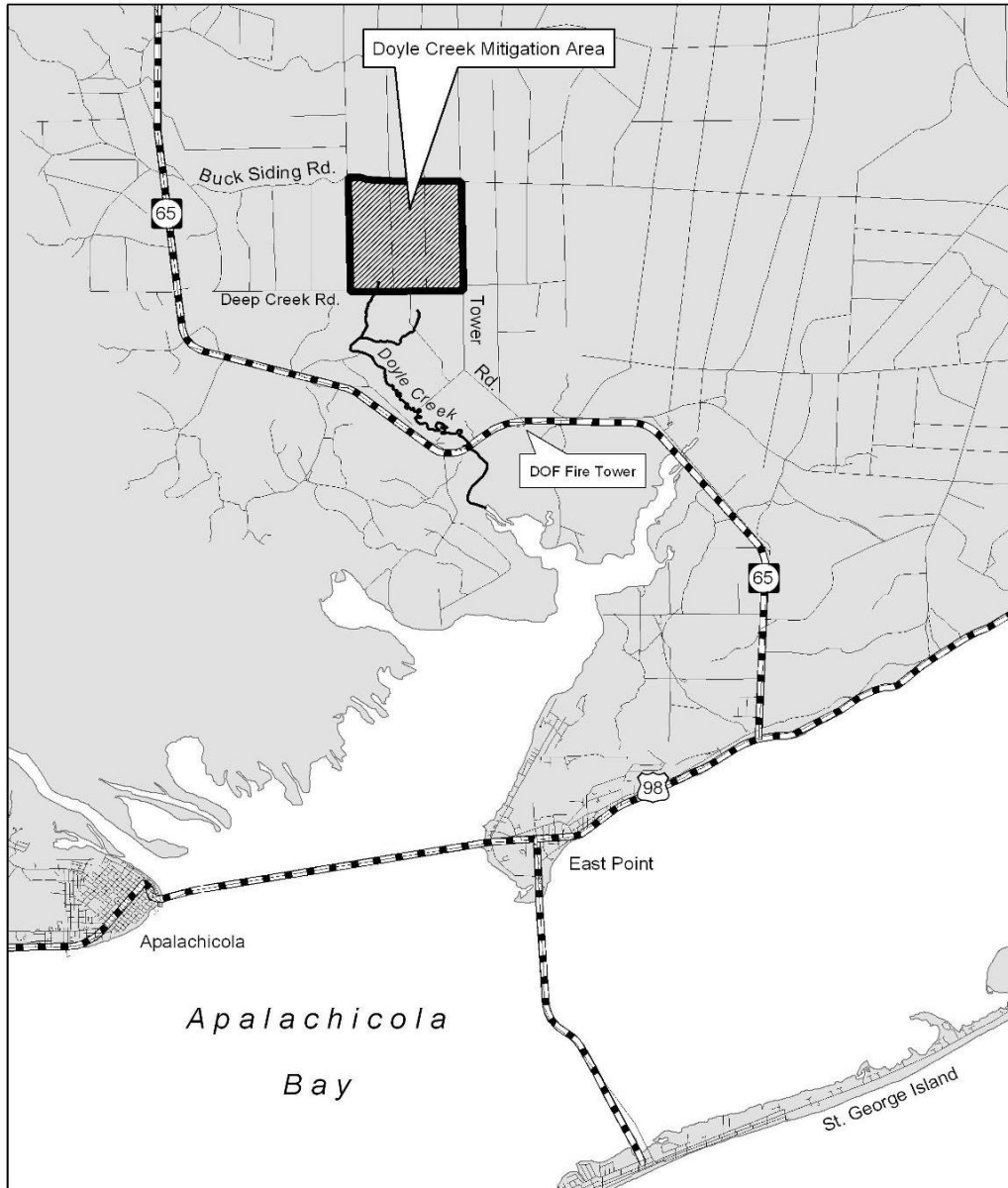
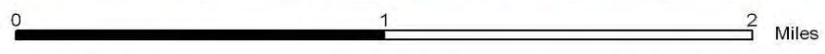
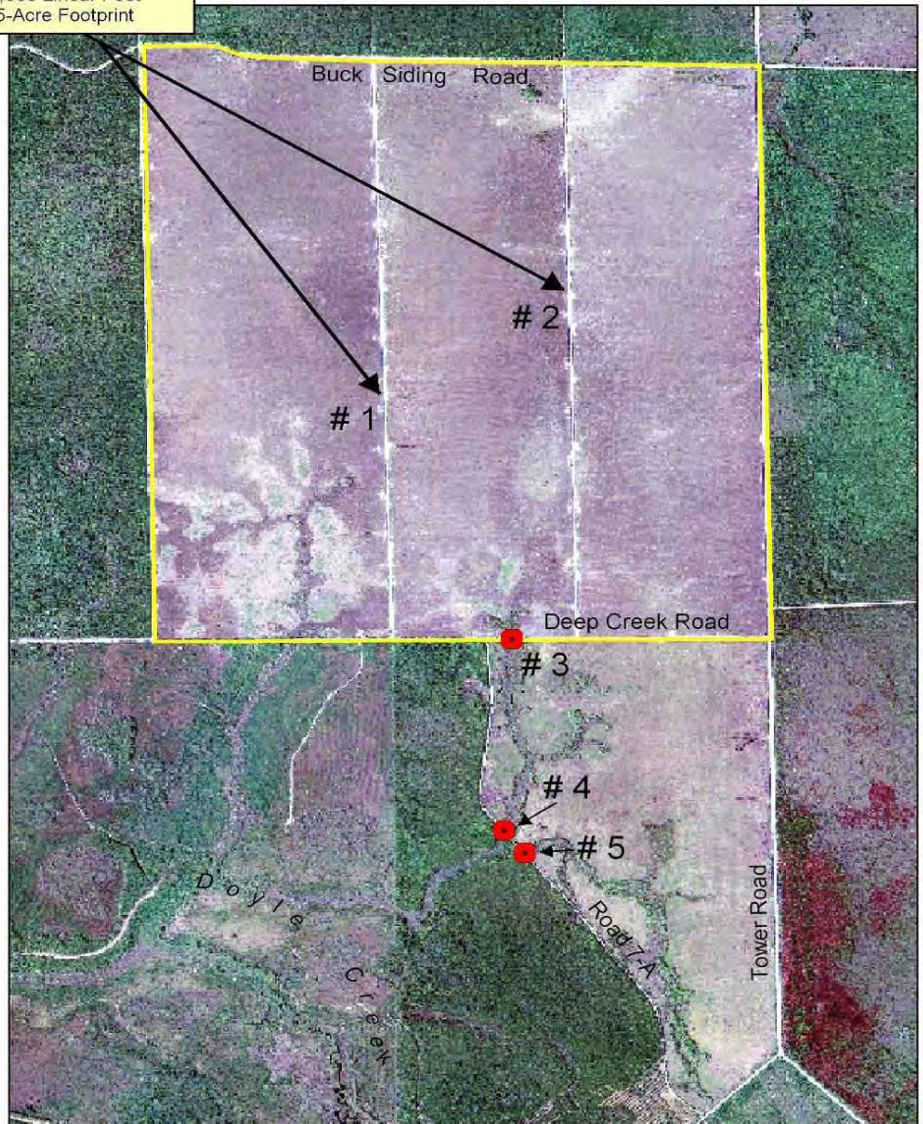


Figure 1. General location of the Doyle Creek mitigation site.

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Doyle Creek Mitigation Area

Removal of Road Fill / Ditches
and Revegetation of Footprint
~18,000 Linear Feet
~25-Acre Footprint



 Low Water Crossing 2004 DOQ 1:24,000 

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. [RTN](#)

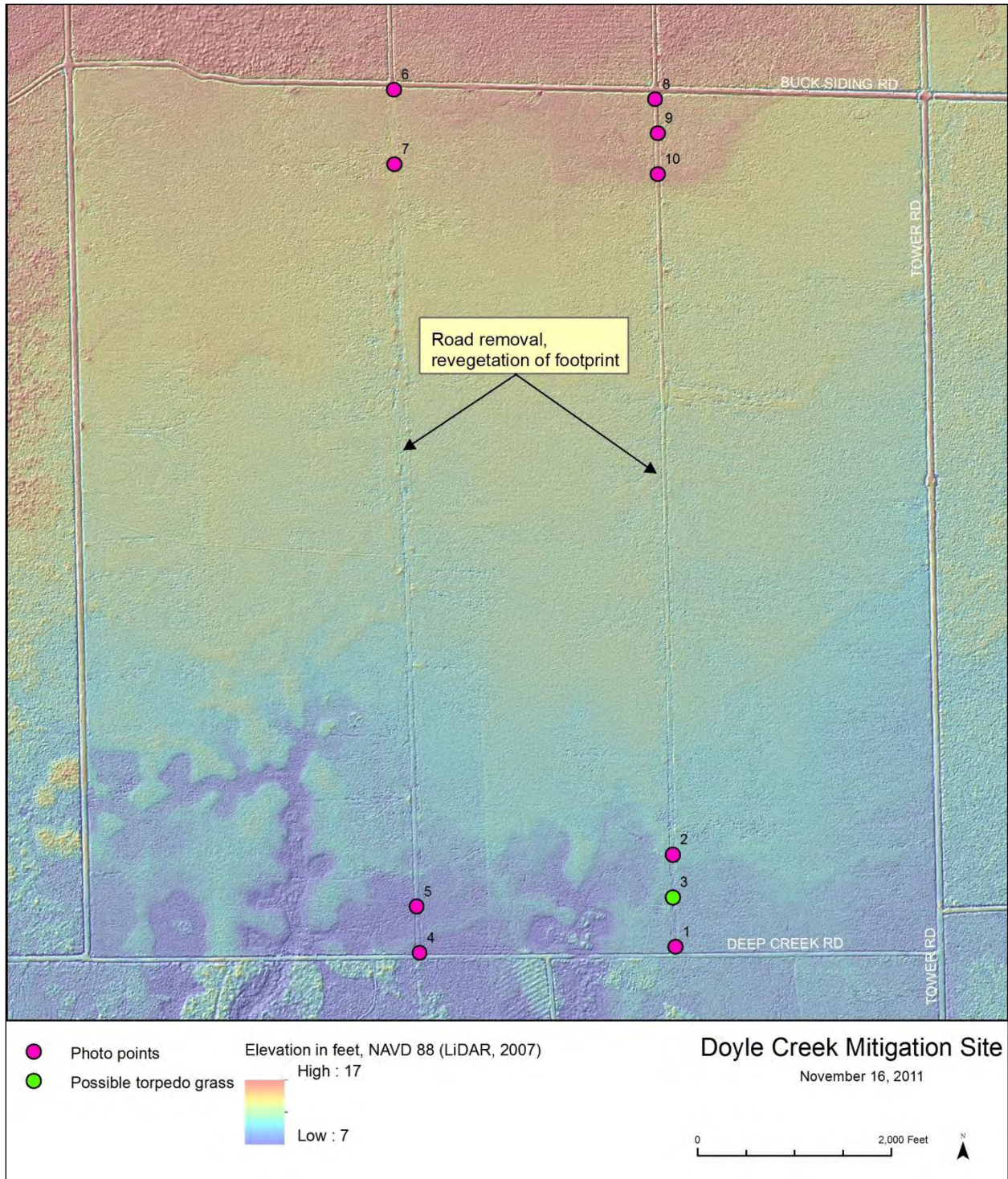


Figure 3. Topography after construction to regrade roads and ditches. Areas of uneven terrain are evident.

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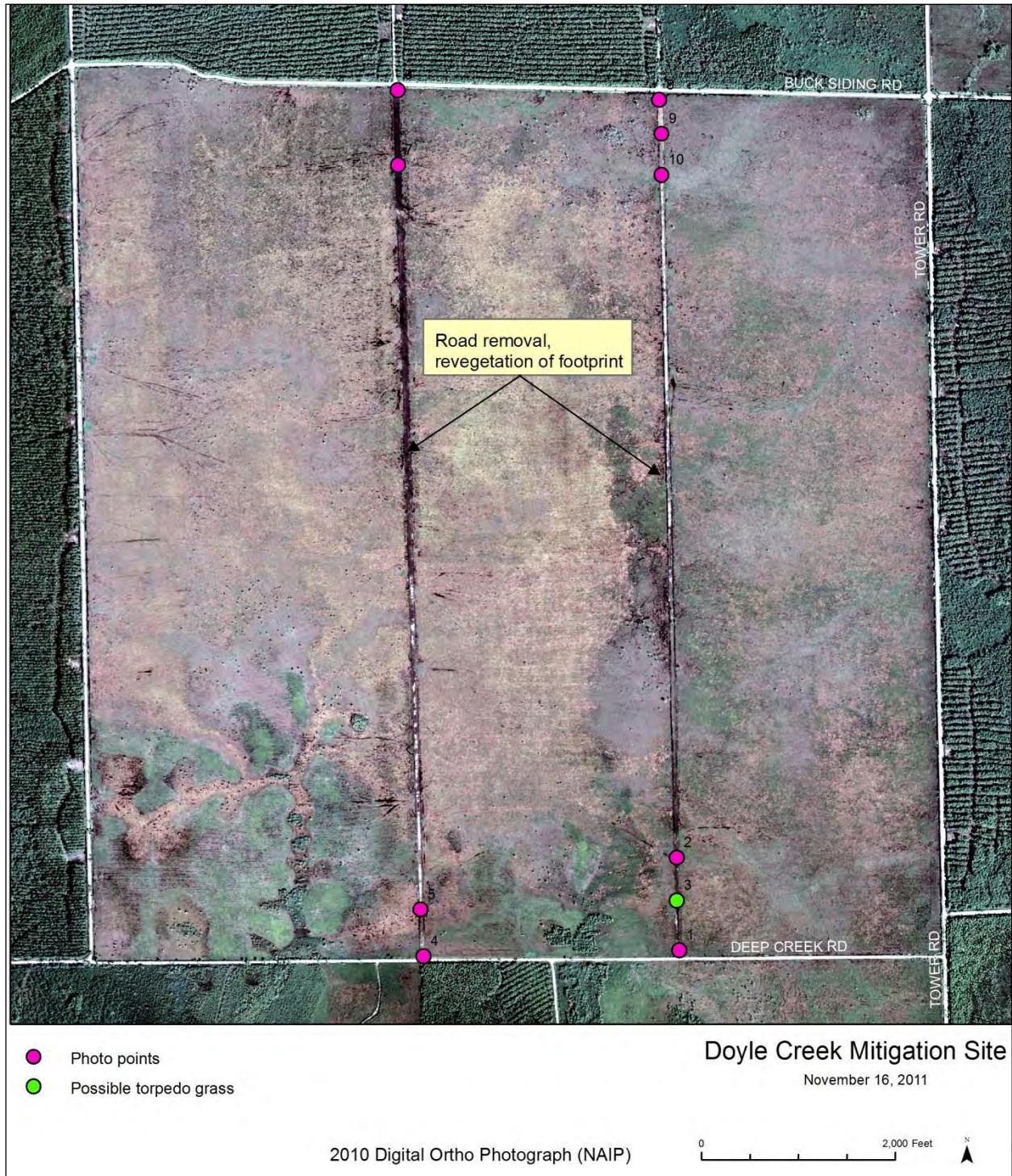


Figure 4. Aerial photograph after construction to regrade roads and ditches and revegetate. Areas of mostly bare ground appear white, areas of standing water appear dark. This photograph was likely taken after a rainy period. This amount of water was not standing during the current inspection. [RTN](#)



Photo 1. Road removal; roadway edges lined with planted cypress showing fall color. Photo Point 1, looking north. 11/16/2011



Photo 2. Road removal with natural pine recruitment. Photo Point 4, looking north. 11/16/2011. [RTN](#)



Photo 3. Road removal; *Eriocaulon decangulare* next to remnant ditch between Photo Points 4 and 5. 11/16/2011. [RTN](#)



Photo 4. Road removal with bare patches. Photo Point 5, looking north. 11/16/2011. [RTN](#)



Photo 5. Road removal. Photo Point 6, looking south.11/16/2011.



Photo 6. Road removal with remnant ditches evident. Photo Point 8, looking south.11/16/2011.

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Site Inspection Field Form	
Project: Tate's Hell – Doyle Creek	Date: November 16, 2011
Name(s) of Data Collectors: Leigh Brooks, Graham Lewis	
Environmental Description: Savanna, wet flatwoods, cypress flats	
Polygon: Doyle Creek	GPS Location: 29°52'N, 84°55'W
Time: 11:00 a.m.	
On at least a yearly basis, the site will be inspected as follows:	
<p>A: Perimeter for signs of trespassing, fencing and signage integrity and infestation by exotic or nuisance vegetation;</p> <p>N/A. Project area is interior to the managed area boundary.</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>No dumping was found. One small area of torpedo grass (<i>Panicum repens</i>) was seen.</p>	
<p>C: All construction areas for stabilization and re-vegetation, structure, operation, and integrity;</p> <p>Not all low water crossings were visited during visit but have been inspected within the last 3 months; all are intact with little to no erosion. Road removal areas have stabilized and generally exhibit comparable vegetative cover to the adjacent natural areas. Some extensive bare ground patches are present and some extensive ditching remains.</p>	
<p>D: Representative polygons for each UMAM community for fuel load, exotic or nuisance species, planted material survival, groundcover, and shrub condition.</p> <ul style="list-style-type: none"> • fuel load low on road removal sites, low to moderate on adjacent land. • invasive exotic species found on one road removal site in a limited area. • wiregrass and cypress survival mixed. • groundcover is recruiting well where there is good tie in of re-graded surface topography with adjoining areas. • titi is moving into some road removal areas. 	

Vegetation Assessment Field Form Qualitative Assessment	
Project: Tate's Hell – Doyle Creek	Date: November 16, 2011
Name(s) of Data Collectors: Leigh Brooks, Graham Lewis	
Environmental Description: Savanna, wet flatwoods, cypress flats	
Polygon: Doyle Creek Time: 11:00 a.m.	GPS Location: 29°52'N, 84°55'W
Nuisance Species: <i>Panicum repens</i>	Fuel Load: Low
<p>Wildlife Observations: Very small frogs, a snipe or rail. Signs included deer and raccoon tracks, crayfish burrows and chimneys, small sand piles from a burrowing animal, and mammal scat with intact berries.</p> <p>Water depth: Varied from shallow puddles and depressions to ditches several feet deep.</p> <p>Is the community observed along the walk path representative of the community being measured? Yes</p> <p>To what degree is the restoration in this area trending towards success? Conditions are drastically improved and generally trending well except for areas where ditch ponds or roads remain and where ditch blocks are not functioning properly.</p> <p>Potential Problems and solutions:</p> <ul style="list-style-type: none"> • Treat <i>Panicum repens</i>. • Repair failed ditch blocks. • Re-contour areas where ditching or road crowns remain. • Replace bald cypress planted in lines with pond cypress planted in random fashion, or remove bald cypress and allow pond cypress to recruit naturally. 	

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Vegetation Species list¹

Scientific Name	Common Name	2008	2009	2010	2011 ²
<i>Andropogon glomeratus</i>	Bushy bluestem	X	X	X	
<i>Andropogon virginicus</i>	Broom sedge	X	X	X	
<i>Aristida stricta</i>	Wiregrass	X	X	X	
<i>Aristida sp.</i>	Threeawn grass	-	-	X	
<i>Bartonia verna</i>	White screwstem	-	-	X	
<i>Bidens coronata</i>	Crowned beggarticks	-	X	X	
<i>Carex sp.</i>	Caric sedge	X	X	-	
<i>Centella asiatica</i>	Centella	X	X	X	
<i>Cirsium sp.</i>	Thistle				X
<i>Clethra alnifolia</i>	Coastal sweet pepperbush	-	X	X	
<i>Cliftonia monophylla</i>	Black titi	X	X	X	

Scientific Name	Common Name	2008	2009	2010	2011 ²
<i>Cyperus lecontei</i>	Leconte's flatsedge	-	X	X	
<i>Cyperus</i> sp.	Sedge	X	X	-	
<i>Cyrilla racemiflora</i>	Titi	-	X	X	
<i>Dicanthelium</i> spp.	Witch grass	X	-	X	
<i>Dichantheium aciculare</i>	Needleleaf witchgrass	X	-	-	
<i>Dichantheium scoparium</i>	Velvet witchgrass	-	-	X	
<i>Drosera brevifolia</i>	Dwarf sundew	-	-	X	
<i>Drosera capillaris</i>	Pink sundew	X	X	-	
<i>Echinochloa colonum</i>	Jungle grass	X	-	-	
<i>Eleocharis atropurpurea</i>	Annual spikegrass	X	X	-	
<i>Eleocharis tuberculosa</i>	Cone-cup spikerush	-	X	-	
<i>Eragrostis elliottii</i>	Elliott lovegrass	X	X	X	
<i>Eriocaulon decangulare</i>	Tenangle pipewort	-	X	X	
<i>Eupatorium album</i>	White thoroughwort	-	X	-	
<i>Eupatorium mohrii</i>	Mohr's thoroughwort	-	-	X	
<i>Eustachys petraea</i>	Pinewoods fingergrass				X
<i>Euthamia caroliniana</i>	Slender flattop goldenrod	X	X	X	
<i>Fimbristylis</i> sp.	Fringe rush	X	-	-	
<i>Fuirena breviseta</i>	Saltmarsh umbrellasedge	X	X	X	
<i>Fuirena pumila</i>	Dwarf umbrella grass	X	-	-	
<i>Fuirena squarrosa</i>	Lake-rush	X	-	X	
<i>Helianthus angustifolia</i>	Narrow leaved sunflower	-	-	X	
<i>Hydrocotyle</i> sp.	Marshpennywort	-	X	-	
<i>Hypericum brachyphyllum</i>	St. John's wort	X	X	X	
<i>Hypericum fasciculatum</i>	Fascicled St. John's wort	-	-	X	
<i>Hypericum gentianoides</i>	Orange grass	X	X	-	
<i>Hypericum microsepalum</i>	Flatwoods hypericum	-	-	X	
<i>Ilex glabra</i>	Gall berry	X	X	X	
<i>Ilex vomitoria</i>	Yaupon	X	X	X	
<i>Iva microcephala</i>	Piedmont marsh elder	-	X	X	
<i>Juncus megacephalus</i>	Large headed rush	X	X	X	
<i>Juncus pelocarpus</i>	Brownfruit rush	X	X	-	
<i>Juncus polycephalus</i>	Manyhead rush	X	X	-	
<i>Juncus repens</i>	Creeping rush	X	-	X	
<i>Juncus scirpoides</i>	Needlepod rush	-	-	X	
<i>Juncus tenuis</i>	Path rush	-	-	X	
<i>Juncus trigonocarpus</i>	Redpod rush	X	X	-	
<i>Lachnanthes caroliniana</i>	Redroot	X	X	X	
<i>Lachnocaulon anceps</i>	Bog button	-	-	X	
<i>Lachnocaulon minus</i>	Small's bog button	X	-	X	
<i>Leersia</i> sp.	Cut grass	X	X	-	
<i>Lophiola aurea</i>	Golden crest	-	-	X	
<i>Ludwigia arcuata</i>	Ludwigia	X	X	X	
<i>Ludwigia leptocarpa</i>	Anglestem primrosewillow	-	-	X	
<i>Ludwigia microcarpa</i>	Little seedbox	X	X	X	
<i>Ludwigia palustris</i>	Marsh seedbox	-	X	X	
<i>Ludwigia repens</i>	Creeping primrosewillow	-	X	X	

Scientific Name	Common Name	2008	2009	2010	2011 ²
<i>Ludwigia</i> sp.	Seedbox	-	X	-	
<i>Lycopodiella caroliniana</i>	Slender club moss				X
<i>Lycopodium aloperuroides</i>	Fox clubmoss	X	X	X	
<i>Lycopodium carolinana</i>	Prostrate clubmoss	X	-	-	
<i>Magnolia virginiana</i>	Sweetbay				X
<i>Mitreola petiolata</i>	Lax hornpod	-	-	X	
<i>Myrica caroliniensis</i>	Northern bayberry				X
<i>Myrica cerifera</i>	Southern bayberry/wax myrtle				X
<i>Myrica inodora</i>	Odorless wax myrtle				X
<i>Nymphaea odorata</i>	Fragrant water lily	X	X	X	
<i>Nyssa sylvatica</i> var. <i>biflora</i>	Swamp tupelo	X	X	X	
<i>Oldenlandia uniflora</i>	Clustered mille grains	-		X	
<i>Panicum anceps</i>	Beaked panicum				X
<i>Panicum repens</i>	Torpedo grass	-	X	X	
<i>Panicum rigidulum</i>	Redtop panicgrass	-	X	-	
<i>Panicum verrucosum</i>	Warty panicgrass	-	X	X	
<i>Panicum virgatum</i>	Switchgrass	-	X	-	
<i>Persea palustris</i>	Swamp bay	-	X	X	
<i>Photinia pyrifolia</i>	Red chokeberry	-	-	X	
<i>Pinus elliotii</i>	Slash pine	-	X	X	
<i>Pluchea rosea</i>	Rosy camphor weed			X	
<i>Pluchea foetida</i>	Camphor weed	X	X	X	
<i>Polypremum procumbens</i>	Rustweed or Juniperleaf	X	X	X	
<i>Proserpinaca pectinata</i>	Combleaf mermaidweed	-	X	X	
<i>Quercus geminata</i>	Sand live oak				X
<i>Rhexia mariana</i>	Pale meadowbeauty	-	X	X	
<i>Rhexia</i> sp.	Meadowbeauty	X	-	-	
<i>Rhexia virginica</i>	Handsome harry	-	X	-	
<i>Rhynchospora cephalantha</i>	Bunched beaksedge	-	X	X	
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge	-	X	X	
<i>Rhynchospora corniculata</i>	Short bristle beakrush	X	-	X	
<i>Rhynchospora fasciculata</i>	Fascicled beakrush	-		X	
<i>Rhynchospora intermixa</i>	Tufted beakrush	X	-	-	
<i>Rhynchospora inundata</i>	Horned beakrush	X	-	X	
<i>Rhynchospora microcephala</i>	Bunched beaksedge	-	-	X	
<i>Rhynchospora nitens</i>	Shortbeak beaksedge	-	-	X	
<i>Rhynchospora pusilla</i>	Fairy rhynchospora	-	-	X	
<i>Rhynchospora wrightiana</i>	Wright's beaksedge	-	X	-	
<i>Rubus</i> sp.	Blackberry	-	X	-	
<i>Saccharum alopecuroides</i>	Silver plume grass	-		X	
<i>Sagittaria graminea</i>	Grassy arrowhead	X	X	X	
<i>Salix</i> sp.	Willow				X
<i>Scirpus cyperinus</i>	Wool-grass	-	-	X	
<i>Scoparia dulcis</i>	Sweetbroom or Licoriceweed	-	X	-	
<i>Serenoa repens</i>	Saw palmetto	-	-	X	
<i>Smilax laurifolia</i>	Greenbriar	X	X	X	
<i>Solidago fistulosa</i>	Pinebarren goldenrod	-	X	X	

Scientific Name	Common Name	2008	2009	2010	2011 ²
<i>Stillingia aquatica</i>	Corkwood	X	X	X	
<i>Syngonanthus flavidulus</i>	Yellow hatpins				X
<i>Taxodium ascendens</i>	Pond-cypress	X	X	X	
<i>Taxodium distichum</i>	Bald cypress				X
<i>Utricularia juncea</i>	Southern bladderwort	-	-	X	
<i>Utricularia purpurea</i>	Eastern purple bladderwort	-	X	-	
<i>Utricularia subulata</i>	Zig-zag bladderwort	X	X	X	
<i>Viola lanceolata</i>	Bog white violet	X	X	X	
<i>Woodwardia areolata</i>	Netted chain fern	X	-	-	
<i>Woodwardia virginica</i>	Virginia chain fern				X
<i>Xyris ambigua</i>	Coastal Plain yellow-eyed grass	-	-	X	
<i>Xyris brevifolia</i>	Short-leaved yellow-eyed grass	-	-	X	
<i>Xyris difformis</i> var. <i>curtissii</i>	Curtiss' yellow-eyed grass	X	X	X	
<i>Xyris flabelliformis</i>	Yellow-eyed grass	X	-	X	
<i>Xyris</i> sp.	Yellow-eyed grass	X	X	-	

¹List was derived from prior year's monitoring report.

²Only species not previously reported are indicated.

[RTN](#)