

Doyle Creek/Tates Hell Wetlands Restoration Annual Monitoring Report (2008)
Nationwide Permit – SAJ-2004-706 (NW-TLZ) issued 4/26/2004

Impact: SR 65 in Franklin County, 2.27 acres of low quality wet flatwoods

Mitigation: Doyle Creek/Tates Hell

Monitoring date: 11/11/08

Mitigation Site

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. 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.

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

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, reestablishing natural grade, and revegetating the road footprint (approximately 25 acres) with wiregrass (*Aristida stricta*) and cypress (*Taxodium spp.*). 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. Comparative photographs of the road removals are shown for site #1 (Figures 3 and 4) as an example; the set of photos shows the sites immediately after construction and again after about 16 months. Hardened low water crossings were installed at sites #3 - #5. Stream reconnection was observed with water flowing over the structures during and after several recent rain events. Best management practices were implemented during both road removal and construction of low water crossings. No turbid runoff was observed at either road removal or low water crossing sites during or after construction. Guard rails and water elevation staff gages were installed at each of the crossings as a safety precaution.

Prior to planting the roadbed sites were surveyed for existing vegetation on December 10, 2007 (see Figure 4). A 15-minute pedestrian survey was taken at each site; thirty-seven plant species were observed. Native groundcover covered about 30-40% of both sites and no invasive or exotic species were observed.

On 14-15 January 2008, 68,075 wiregrass tubelings were planted on 4-foot centers throughout the roadbed footprint (Figure 5). In addition, 2,725 cypress seedlings were planted in appropriate areas of the footprint.

Annual monitoring of the restoration site was carried out on 11 November 2008. About 60-65% coverage of native groundcover has been established after two years (Figure 6); however, planted wiregrass survival was poor (<25%). Cypress survival was high with greater than 80% of the planted individuals present and growing well. Less than 1% coverage of exotic species was noted throughout the site. Wiregrass will be replanted in 2009 to meet the required dominance specifications. Fifteen-minute pedestrian surveys were taken at each site noting vegetation present. Forty-five species were observed (Table 1) with eight new species noted from the pre-

planting monitoring. Evidence of wildlife usage (e.g., tracks, scat) at the sites is given in Table 2.

Work Schedule

- Coordination with Florida Division of Forestry (Tates Hell State Forest): initial coordination completed prior to construction (12/15/05); communication ongoing
- Removal of 18,000 feet of logging roads and associated ditches: completed 7/11/06
- Installation of low-water crossings: completed 7/11/06
- Re-vegetation of road footprint (~25 acres): initial planting completed 1/15/08

Success Criteria

- Soils on road footprint stabilized to prevent offsite discharges of turbid flows: this was accomplished by mulching road footprint with hay and brown top millet grass seed immediately after completion of road removal.
- BMP's installed during all construction phases: hay bales were installed prior to construction of low-water crossings to prevent offsite movement of turbid waters; no turbidity increases were noted.
- 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%). Replanting of wiregrass is scheduled for Fall 2009.
- No more than 1% coverage of invasive or exotic plant species: no invasive or exotic species were noted in the annual surveys.
- 80% survival of planted cypress within five years of restoration: at least 80% survival of planted cypress was noted during the annual monitoring.
- Annual photo documentation of restoration at permanent photo points for five years: photo documentation was taken during annual monitoring.

Location Map - Doyle Creek Mitigation Area

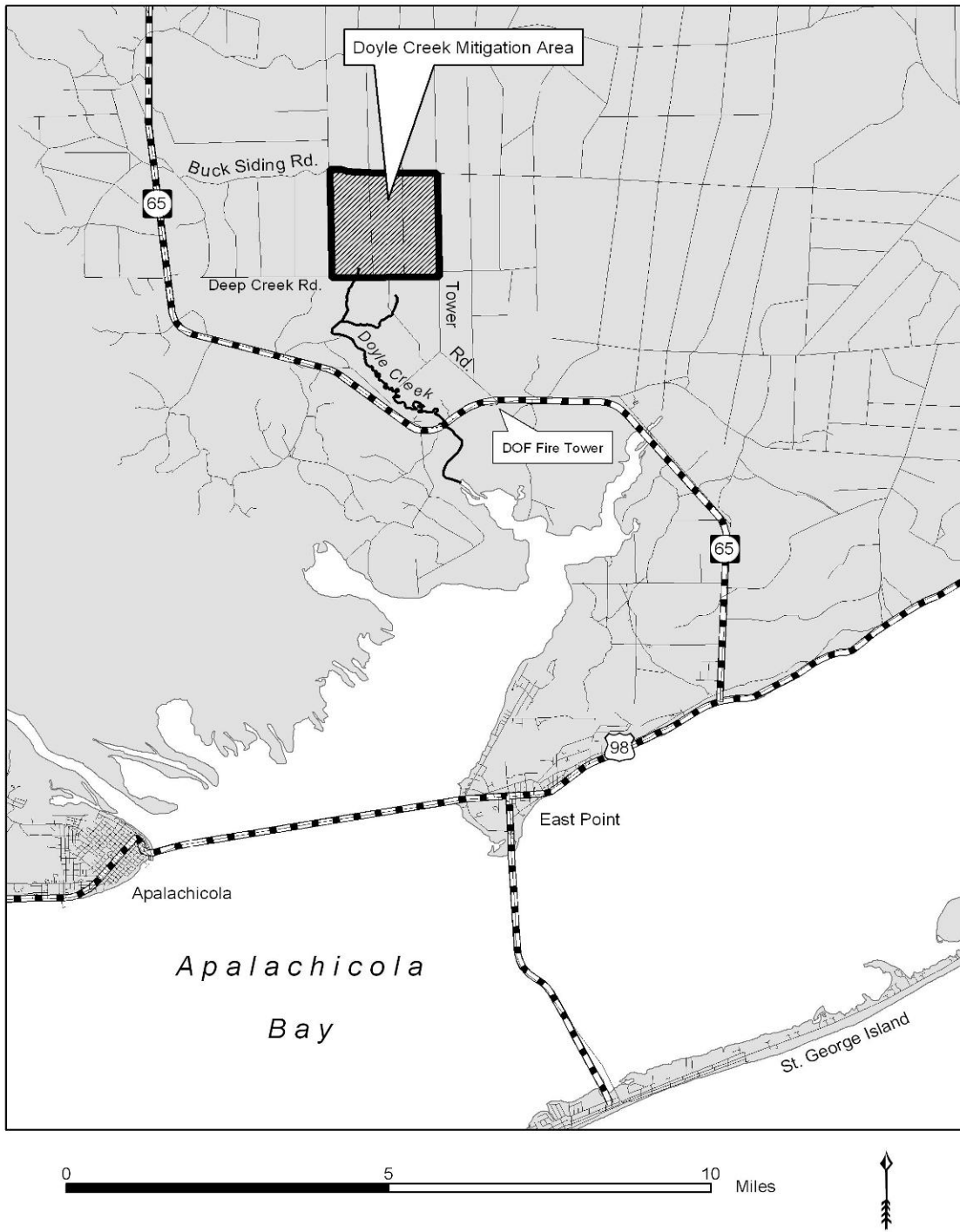
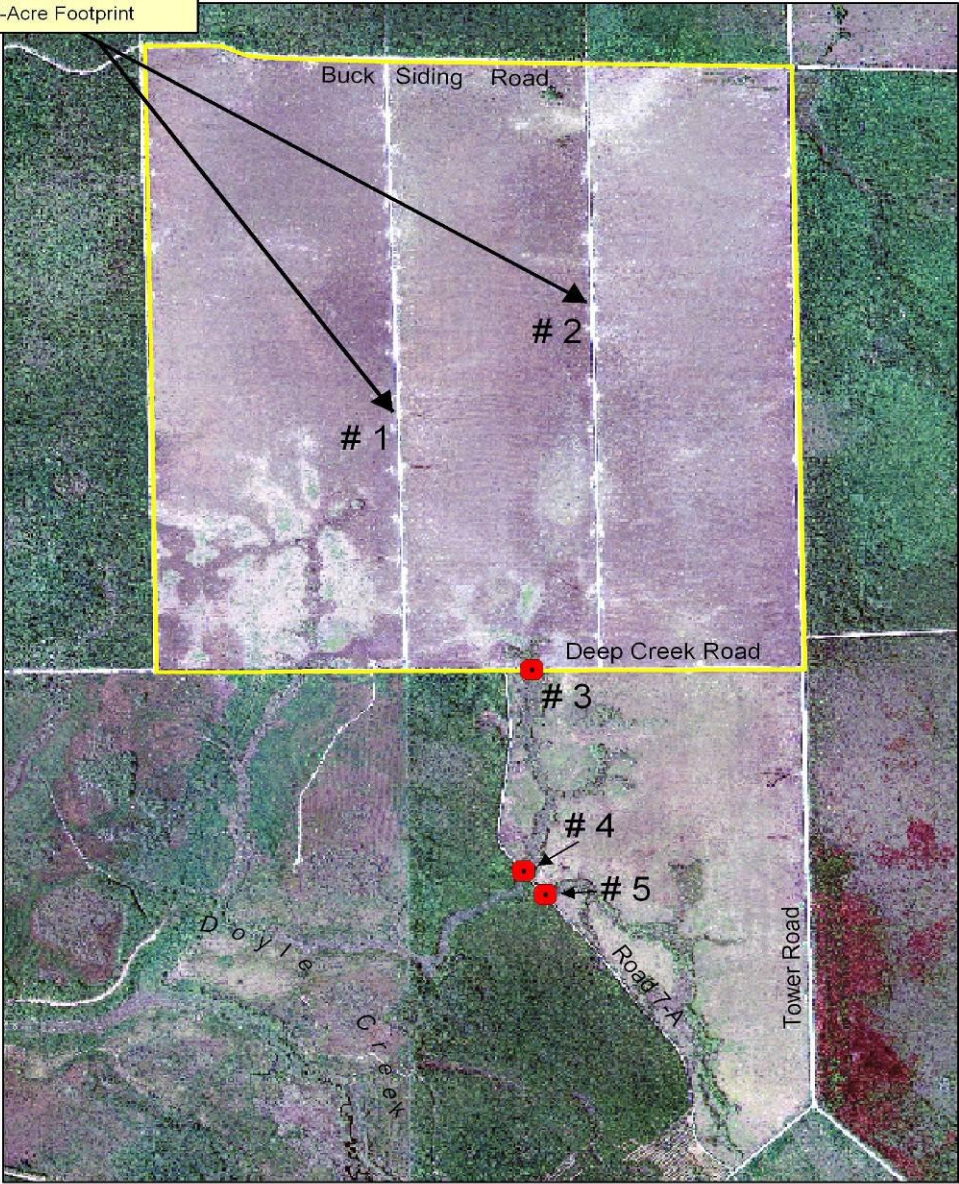


Figure 1. General location of the Doyle Creek mitigation site.

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.



Figure 3. Road removal site #1 (westernmost road) after roadbed material was pushed into adjacent ditches and contoured to existing adjacent natural grade.



Figure 4. Road removal site #1 (westernmost road) after natural recolonization of vegetation. Photograph was taken about 16 months after completion of construction and can be compared with that in Figure 3.



Figure 5. Planting of wiregrass plugs and cypress tubelings on road removal site. Planting was done on 14-15 January 2008.



Figure 6. Vegetation coverage during annual monitoring on 11 November 2008. Cover is estimated to be 60-65% native groundcover with less than 25% wiregrass survival. Wiregrass replanting is scheduled for Fall 2009.

Table 1. Species list recolonizing road removal sites at Doyle Creek (2008 monitoring). New species observed in recent monitoring effort are highlighted in blue.

Scientific Name	Common Name	Tree	Shrub	Vine	Herb
<i>Andropogon glomeratus</i>	Bushy bluestem				X
<i>Andropogon virginicus</i>	Broom sedge				X
<i>Carex sp.</i>	Caric sedge				X
<i>Centella asiatica</i>	Centella				X
<i>Cliftonia monophylla</i>	Black ti ti		X		
<i>Cyperus sp.</i>	Sedge				X
<i>Dichanthelium aciculare</i>	Needleleaf witchgrass				X
<i>Dicanthelium spp.</i>	Witch grass				X
<i>Echinochloa colonum</i>	Jungle grass				X
<i>Eleocharis atropurpurea</i>	Annual spikegrass				X
<i>Eragrostis elliotii</i>	Elliott lovegrass				X
<i>Euthamia caroliniana</i>	Flat-topped goldenrod				X
<i>Fimbristylis sp.</i>	Fringe rush				X
<i>Fuirena pumila</i>	Dwarf umbrella grass				X
<i>Fuirena squarrosa</i>	Lake-rush				X
<i>Juncus megacephalus</i>	Large headed rush				X
<i>Juncus repens</i>	Creeping rush				X
<i>Hypericum brachyphyllum</i>	St. John's wort				X
<i>Hypericum gentianoides</i>	Orange grass				X
<i>Ilex glabra</i>	Gall berry		X		
<i>Ilex vomitoria</i>	Yaupon		X		
<i>Leersia sp.</i>	Cut grass				X
<i>Lachnanthes caroliniana</i>	Redroot				X
<i>Lachnocaulon minus</i>	Small's bog button				X
<i>Ludwigia arcuata</i>	Ludwigia				X
<i>Ludwigia microcarpa</i>	Little seedbox				X
<i>Ludwigia sp.</i>	Seedbox				X
<i>Lycopodium aloperuroides</i>	Fox clubmoss				X
<i>Lycopodium carolinianum</i>	Prostrate clubmoss				X
<i>Nymphaea odorata</i>	Fragrant water lily				X
<i>Polypremum procumbens</i>	Rustweed				X
<i>Pluchea foetida</i>	Camphor weed				X
<i>Rhexia sp.</i>	Meadow beauty				X
<i>Rynchospora corniculata</i>	Short-bristle beakrush				X
<i>Rynchospora intermixa</i>	Tufted beakrush				X
<i>Rynchospora inundata</i>	Horned beakrush				X
<i>Sagittaria graminea</i>	Grassy arrowhead				X
<i>Scirpus cyperinus</i>	Wool-grass				X
<i>Smilax laurifolia</i>	Greenbriar			X	
<i>Stillingia aquatica</i>	Corkwood		X		
<i>Utricularia subulata</i>	Zig-zag bladderwort				X
<i>Viola lanceolata</i>	Bog white violet				X
<i>Woodwardia areolata</i>	Netted chain fern				X
<i>Xyris flabelliformis</i>	Yellow-eyed grass				X
<i>Xyris sp.</i>	Yellow-eyed grass				X

Table 2. Wildlife observations at Doyle Creek road removal sites.

Deer (tracks)
Raccoon (tracks and scat)
Oak toad
Crayfish chimney
Armadillo (tracks)
Rabbit (tracks and scat)
Mourning dove
Snipe