TATE'S HELL - PINE LOG CREEK MITIGATION SITE
Annual Monitoring Report, Year 1 of 5
February 21, 2012

PROJECT OVERVIEW

Impact:	NA
USACE Permit No.:	NA
Mitigation:	Tate's Hell – Pine Log Creek Hydrologic Restoration Project, Franklin County
Permittee/Consultant:	NA
Responsible Party for Monitoring:	Northwest Florida Water Management District (NWFWMD) 81 Water Management Dr. Havana, FL 32333
Date of Inspection:	January 18, 2012
Inspectors:	Graham Lewis, Kim Branciforte, Linda Chaisson

Purpose of the Approved Project

The Pine Log Creek Hydrologic Restoration Project seeks to restore historic surface water drainage patterns and wetland vegetation communities to enhance the quality and timing of surface water runoff flowing into the Crooked River and eventually empting into St. George Sound, part of the Apalachicola Bay system. The project area is part of the 202,000-acre (>300 miles^2) Tate's Hell State Forest (THSF) (Figure 1). 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 NWFWMD, working with Florida Forest Service (FFS), has improved hydrology and habitat in localized portions of Tate's Hell State Forest.

This project is part of the larger Tate's Hell State Forest Hydrological Restoration Plan (http://www.nwfwmdwetlands.com/index.php?Page=30) developed by the NWFWMD and FFS, and has been incorporated into the Northwest Florida Umbrella, Watershed-based, Regional Mitigation Plan (UWRMP 5.5.12 http://www.nwfwmdwetlands.com/Site.php?site_id=190 ; NWFWMD July 2006, revised March 2009).

Location and Directions

The Pine Log Creek - Tate's Hell wetlands restoration site is located in the eastern portion of THSF, Franklin County, Florida (Figure 2) at approximately 29°59.4'N and 84°38.6'W. The basin includes portions of Sections 19, 20, 28-35, Township 5S, Range 4W and Sections 2-5, 7-11, 14-16, 21-23, 27, Township 6S, Range 4W. State Road 67 runs along portions of the eastern boundary of the watershed, with a small part of the basin lying east of the highway.

The project area is reached by taking either County Line Road or Gully Branch Road west from SR 67 to Pine Log Road; the former enters the northern portion of the site while the latter enters to the south. The project area is roughly bounded by Burnt Bridge Road on the west, Gully Branch Road on the south, Boundary Road to the north and SR 67 on the east. Rock Landing Road runs east/west roughly through the middle of the site.

Project Summary

Hydrologic improvements are detailed in both the Tate's Hell State Forest Hydrological Restoration Plan and the UWRMP 5.5.12 and consisted of the removal and re-contouring of 2.9 miles of logging roads and adjacent ditches and the installation of 11 low-water crossings, 30 ditch plugs, 21 culvert improvements, 1 flashboard riser and 1 bridge (Figures 3-5). The goal of these activities is to improve the hydrological function within the basin by reconnecting and rerouting water flow to its historical flow pathways. Prescribed burns appropriate to maintaining savannas, sloughs and other wetland habitats will be conducted by the THSF fire program every two to five years.

MITIGATION ACTIVITIES

Work Schedule

- Bridge construction: initiated October 2010; completed April 2011.
- Hydrologic improvements: initiated March 2011; completed December 2011.
- Annual monitoring: conducted in mid-winter 2012.

Description of management activities

Approximately 15,410 linear feet (2.9 miles) of dirt logging roads and associated ditches were re-graded as closely to the original natural elevation as possible, allowing for 20.5 acres of wetlands restoration. Eleven hardened low-water crossings, 21 culvert improvements (including replacement, removal and new), one flashboard riser, 30 earthen ditch plugs and one Bailey bridge were installed to assist with hydrological enhancements throughout the watershed. Detailed project construction activities are shown in Figures 3-5. Hydrological improvements are labeled and numbered in these figures for reference throughout the report.

MONITORING REQUIREMENTS (from UWRMP):

- Annual or more frequent site inspection
    - Internal roads (both public and maintenance) for signs of dumping or trespassing, erosion, road integrity, exotic vegetation and nuisance vegetation and fauna;
    - All construction areas for stabilization and re-vegetation, structure operation and integrity.
- Qualitative monitoring, as appropriate.
    - Pedestrian survey - Notes on general health and reproductive status of vegetation, dominant species, recruitment of new species, the presence or spread of nuisance/exotic species, and the hydrologic condition will be recorded on field data sheets. Potential problems and appropriate solutions will be identified.
    - Permanent photographic stations.
    - Best available digital ortho photography for aerial monitoring.
    - Wildlife utilization - direct sightings, scat, tracks, vocalizations.
- Annual reports posted at www.NWFWMDwetlands.com for duration of monitoring.

SUMMARY OF MONITORING ACTIVITIES

Monitoring Observations

The current monitoring was carried out on January 18, 2012, and consisted of a meandering pedestrian survey through various road removal segments along with an inspection of all hydrological improvement structures. Photographs were taken at a variety of points and are representative of areas and structures visited (Figures 6 and 7). Field sheets are attached documenting site conditions; numerous wetland groundcover species including a variety of grasses, rushes, sedges and small shrubs were observed within the old road footprints. The site was moderately wet during this year's survey and showed signs of recent ponding of water in some areas. The restoration areas showed mixed success attributable primarily to differing surface elevations and the brief time lag for recruitment. Recolonization with native vegetation is expected to continue as recruitment occurs in bare areas.

Overall, vegetative communities appear healthy with respect to diversity and absence of nuisance/exotic species. Due to the relatively short recruitment period since construction, recolonization of the road removal areas is just beginning yet is trending in a positive direction. Some segments have developed thick groundcover (>75%) while others have bare patches of varying size. All are expected to revegetate over the next year. The following summarizes conditions in the various road removal segments.

- Segment 1: Remnant roadside ditches were present at several locations but were more evident along the western portion of this segment (Photo 1) than at the eastern end (Photo 2). Bare areas varied in size throughout the segment with cover ranging only up to 35-40%. The eastern portion of the site appeared wetter than the western side with standing water observed to the south of the old road within the adjacent block (Photo 3). The guard rail at the eastern end of the segment has been removed and needs replacement. The ditch block at the western end, southern side of road, has been breached and it appears that vehicle traffic has entered the site bypassing the guard rail (Photo 4) at this end.
- Segment 2: Road recontouring was very effective throughout this segment and achieved a grade similar to the adjacent natural elevations. Vegetative cover ranged from 50-75% along the segment and consisted of a variety of early successional species of rushes, sedges and wetland grasses (Photo 5); several juvenile sweet bays were found sprouting in the southern portion of the segment.
- Segment 3: Similar to segment 2, recontouring of this segment appeared to result in a good match to adjacent natural grade. Vegetation recolonization is proceeding well but patchy. Southern portions of the segment had up to 80% cover (Photo 6); northern sections were more heterogeneous, ranging from 25-75% (Photo 7). Here, as elsewhere, colonization by early successional species of wetland grasses and rushes was evident.
- Segment 4: Road and ditch recontouring in this segment matched well with existing natural grade; no remnant ditches were found. Vegetative recolonization was proceeding well also with groundcover ranging between 65-75% (Photo 8). A variety of wetland grasses, appropriate to the area, were recruiting to the site.
- Segment 5: Road removal at this segment was canceled due to hydrological problems routing water into the adjacent natural blocks; elevations in the adjacent blocks were too high for water to flow south through the removal area into the apparent historical natural community. Removal of this section of the road was eliminated from the plan.

- Segment 6: A small section of road was removed abutting an existing removal section from a previous project (Photo 9). Ditching remains on north side of removal and water flows to the east in these ditches rather than south through the natural community. It is likely that this rerouting of water will not be successful until further recontouring can take place within the adjacent block to the south.

All other structures (i.e., low-water crossings, culvert improvements, flashboard riser, ditch blocks) were inspected and found to be functioning properly. Minor erosion was noted around some of the new culvert installations (e.g., C10; Photo 10) but was not excessive; sediment deposition was not accumulating in any of the adjacent ditches. All of the ditch plugs were intact and holding water; most had revegetated well (e.g., D11; Photo 11). One low-water crossing (L10) needs a staff gage, as water depth is relatively deep. A guard rail is missing at the east end of road removal Segment 1and should be replaced.

A 3-span Bailey bridge replaced inadequately sized culverts to improve flows under Pine Log Road (Photo 12). Bridge construction was completed in April 2011 prior to completion of the remaining hydrological improvements. The bridge was constructed by FFS staff and has received DOT inspection and approval.

Success Criteria

The following performance standards, taken from the Northwest Florida Umbrella, Watershed-based, Regional Mitigation Plan (NWFWMD July 2006, revised March 2009), were evaluated during the recent site inspection. Restoration criteria apply within the footprint of the road/ditch removal while enhancement criteria apply to the remaining portions of the site. Natural recolonization and recruitment within the road and ditch removal areas have lagged somewhat over the last year since completion of construction activities; revegetation is occurring but bare areas remain. Appropriate groundcover species have established in many areas but may take additional time to fill in unvegetated parts of the sites; total coverages lag behind that observed in adjacent natural areas. Thus, while not all performance standards were found to be met at this time, the general trend is toward the target natural communities. It is anticipated that this recolonization trajectory with continue over the next few years as new recruits from the adjacent areas come into the site.

Restoration Success Criteria		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	No*
RC-5	Kind and total coverage of herbaceous species appropriate for management goals and target natural community	No*
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 and above

Enhancement success criteria are based primarily on providing improved hydrology within the sites through the repair of severed flow pathways (e.g., low-water crossings, culvert improvements, ditch blocks) and continued introduction of fire. All construction activities are complete and based on site surveys the interior portions of the sites are being well rehydrated; this is especially evident in the headwaters of the creek (Road Removal Segment 1). Burning is being coordinated with the FFS staff. All enhancement criteria are being met.

Enhancement Success Criteria		Condition Met
EC-1	Desired species showing evidence of increasing coverage	Yes
EC-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
EC-3	Increase in appropriate species diversity	Yes
EC-4	Kind and total coverage of shrub species appropriate for management goals and target natural community	Yes
EC-5	Kind and total coverage of herbaceous species appropriate for management goals and target natural community	Yes
EC-6	Kind and total coverage of tree species appropriate for management goals and target natural community	Yes
EC-8	Maintain the ecological conditions so that the mitigation UMAM scores are met for each of the specified community types.	Yes

CONCLUSIONS

The road removals have improved localized hydrologic conditions, allowing for natural recovery of habitat and use by wildlife. While some areas did not achieve the desired ground surface re-contouring, most of the removal segments in this basin were a close match to adjacent natural grades. As noted in other similar projects, it is difficult to recontour the roadbed and ditch

elevations to match adjacent natural grade. In many instances, soil has been lost over the years due to erosion and cannot be brought in to replace the material lost. For those areas with slight elevation differences, having scattered small depressions and ponds may be viewed as an asset that provides additional habitat diversity to the landscape.

Revegetation of the sites has been relatively rapid with a good diversity of early successional stage wetland grasses, rushes and sedges; sprouts of several small trees (i.e., sweet bay) were observed in one area. Overall, the general trend is toward the target natural communities. It is anticipated that this recolonization trajectory with continue over the next few years as new recruits from the adjacent areas come into the site.

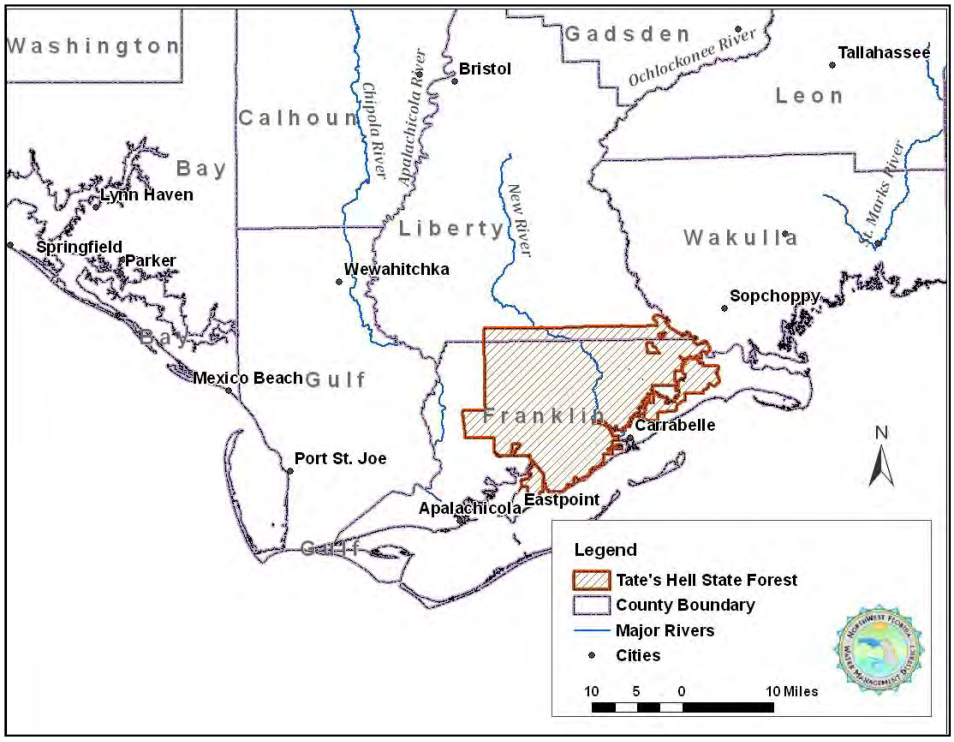

Figure 1. General location map for Tate's Hell State Forest. RTN

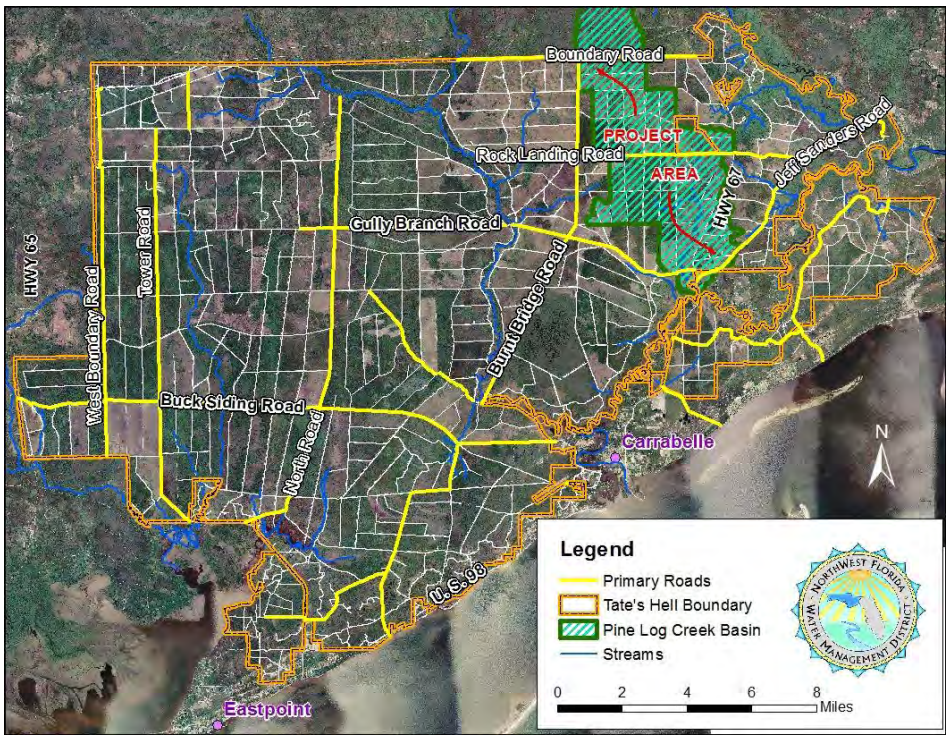

Figure 2. Location of the Pine Log Creek project area in relationship to Tate's Hell State Forest. RTN

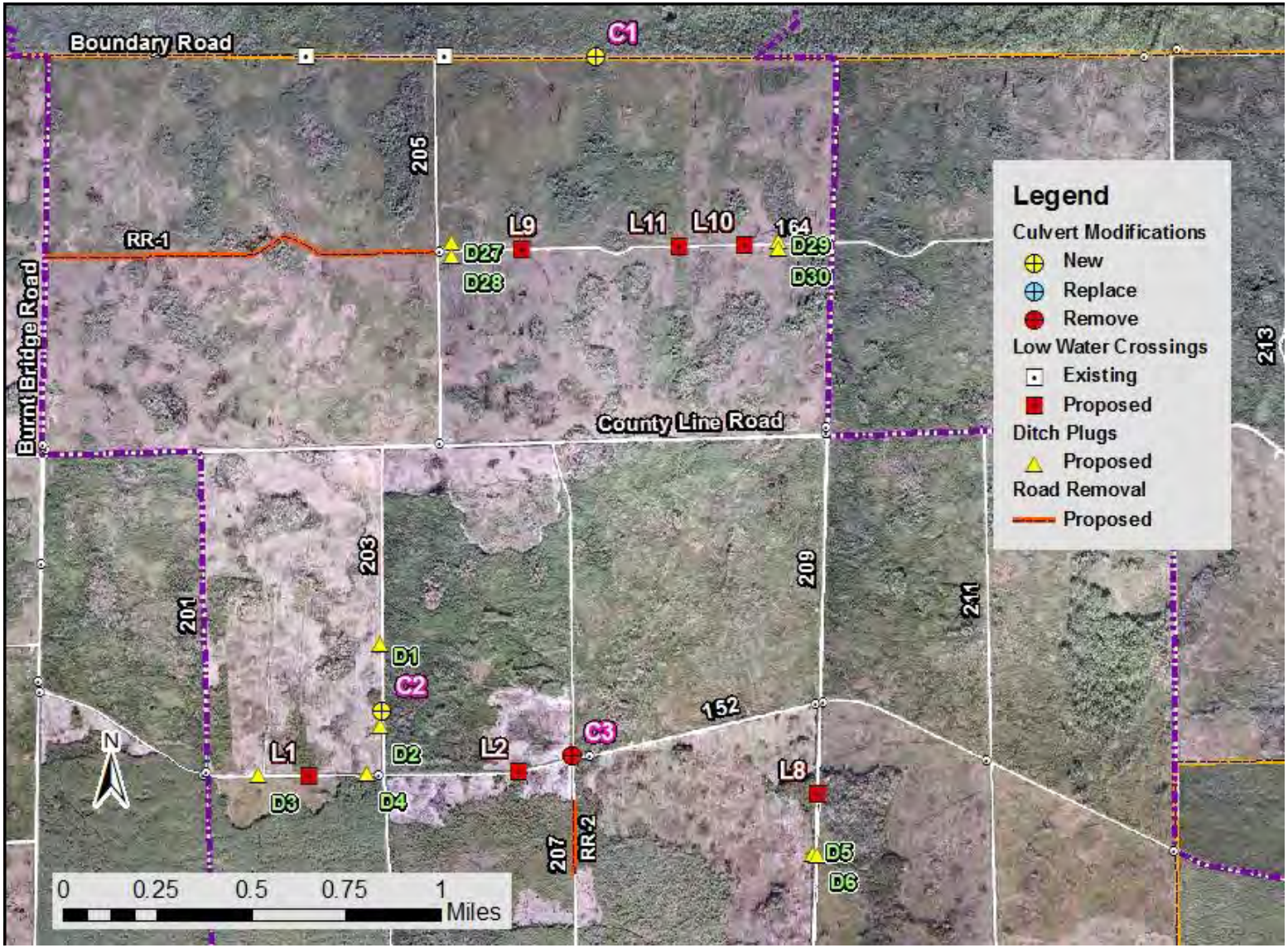

Figure 3. Hydrological restoration activities in the northern portion of the Pine Log Creek basin. Improvements are labeled as road removal (RR), low-water crossing (L), ditch plug (D), culvert (C), flashboard riser (F) and numbered for reference in text. RTN

Figure 4. Hydrological restoration activities in the central portion of the Pine Log Creek basin. Improvements are labeled as road removal (RR), low-water crossing (L), ditch plug (D), culvert (C), flashboard riser (F) and numbered for reference in text. RTN

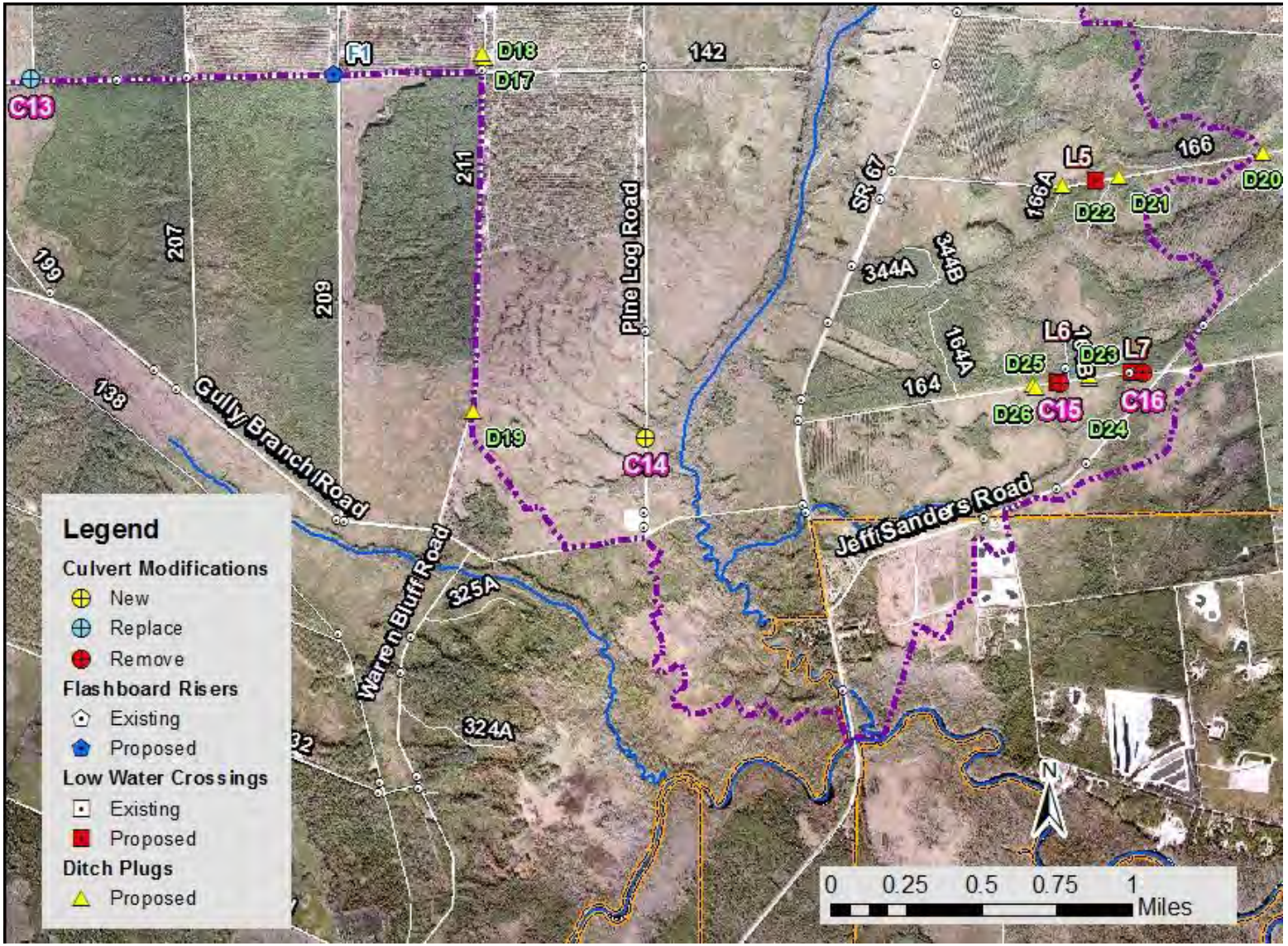

Figure 5. Hydrological restoration activities in the southern portion of the Pine Log Creek basin. Improvements are labeled as road removal (RR), low-water crossing (L), ditch plug (D), culvert (C), flashboard riser (F) and numbered for reference in text. RTN

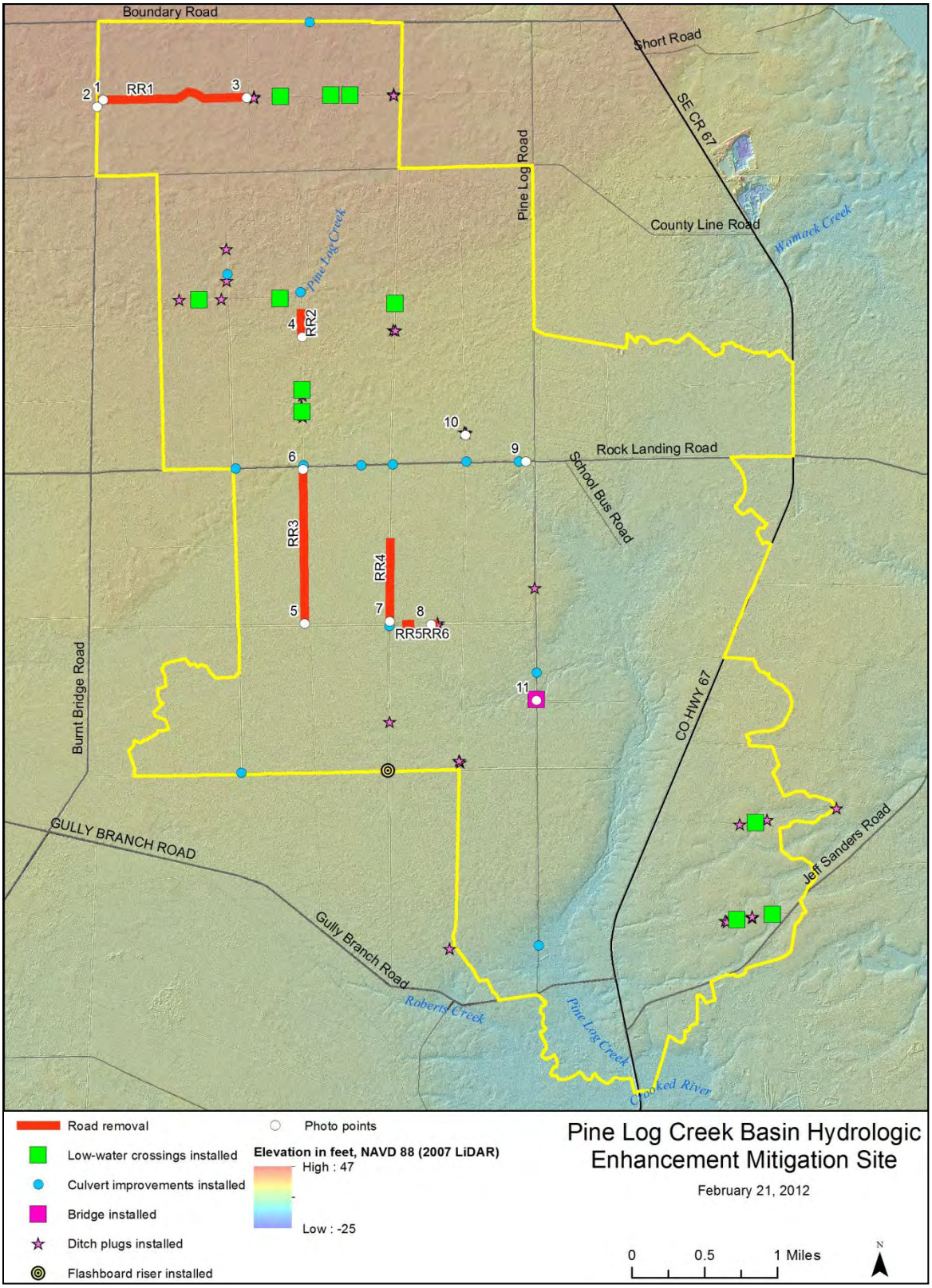

Figure 6. Topography of the Pine Log Creek mitigation site taken from LiDAR imagery (2006). Photo points are indicated as 1-11. RTN

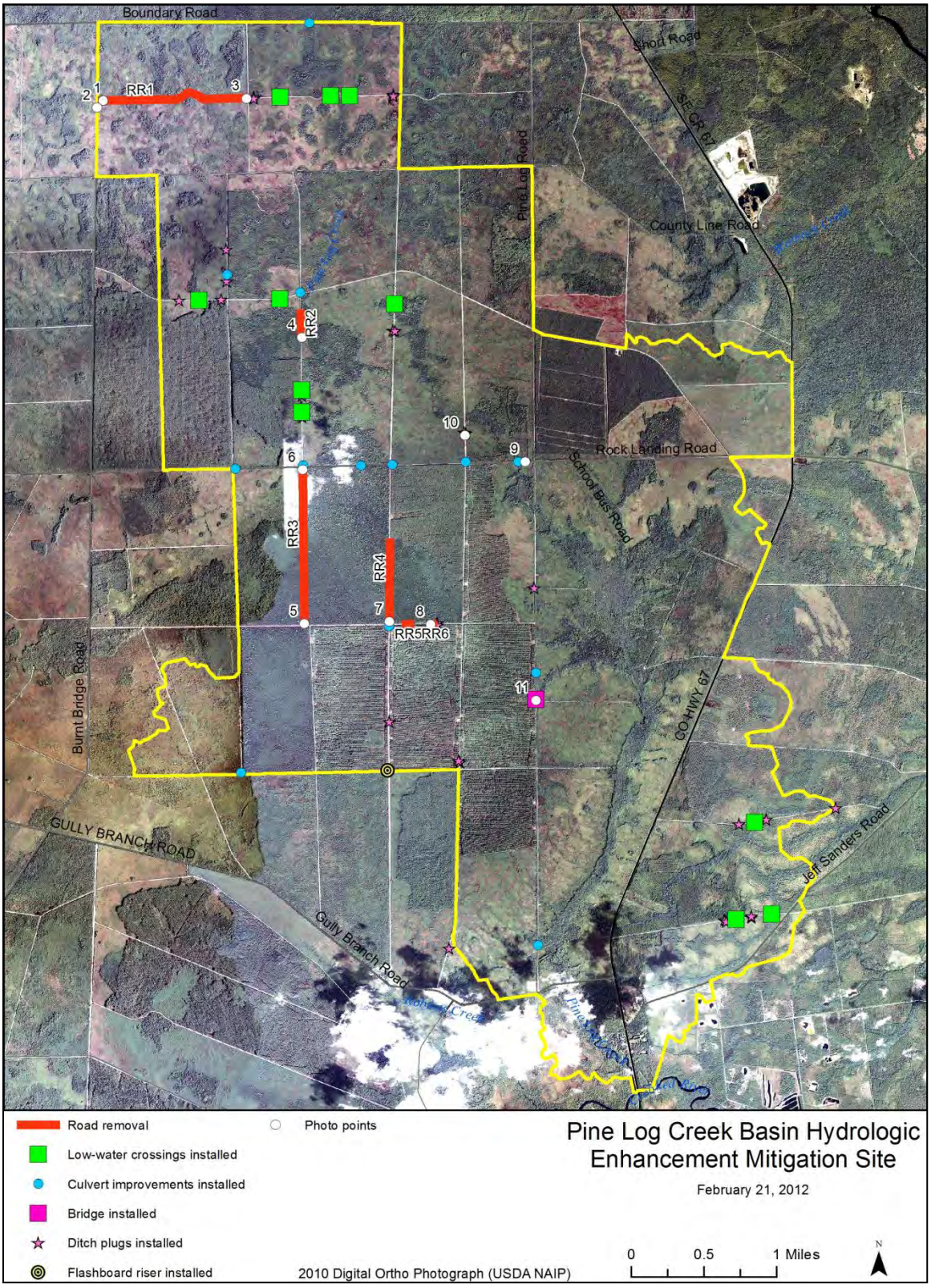

Figure 7. Aerial photography of the Pine Log Creek mitigation site. Photo points are indicated as 1-11. RTN

Photo 1. Western end of road removal Segment 1; taken at photo point 1 looking east, 1/18/12.

Photo 2. Eastern end of road removal Segment 1; taken at photo point 3 looking west, 1/18/12. RTN

Photo 3. Standing water in adjacent block to the south of road removal Segment 1-eastern end; taken at photo point 3 looking south, 1/18/12. RTN

Photo 4. Western end of road removal Segment 1 indicating loss of ditch plug and possible vehicle tracks bypassing the guard rail and entering the site; taken at photo point 2 looking SE, 1/18/12. RTN

Photo 5. Southern end of road removal Segment 2, note sprouting sweet bay just left of center; taken at photo point 4 looking north, 1/18/12. RTN

Photo 6. Southern end of road removal Segment 3; taken at photo point 5 looking north, 1/18/12. RTN

Photo 7. Northern end of road removal Segment 3; taken at photo point 6 looking south, 1/18/12. RTN

Photo 8. Southern end of road removal Segment 4; taken at photo point 7 looking north, 1/18/12. RTN

Photo 9. Western end of road removal Segment 6; taken at photo point 8, 1/18/12. RTN

Photo 10. Minor erosion around side of newly installed culvert (e.g., C10); taken at photo point 9, 1/18/12. RTN

Photo 11. Typical ditch plug (e.g., D11) indicating relatively rapid revegetation; taken at photo point 10, 1/18/12. RTN

Photo 12. Three-span Bailey bridge over a tributary of Pine Log Creek; taken at photo point 11, 6/11/11. RTN

Site Inspection Field Form

Project: Tate's Hell – Pine Log Creek Date: January 18, 2012

Name(s) of Data Collectors: Kim Branciforte, Linda Chaisson, Graham Lewis

Environmental Description: Savanna, wet flatwoods, shrub wetlands, basin swamp

Polygon: Pine Log Creek GPS Location: centered on 29°59.4'N, 84°38.6'W
Time: 11:00 am

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;

N/A. Project areas are interior to the managed area boundary.

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

No dumping was observed. The area is open to the public as a State Forest. Minor erosion near the installation of some of the new culverts found but not problematic. No nuisance exotic species noted; some titi observed in adjacent areas with encroachment into old road footprint.

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

Road removal areas have stabilized with no sedimentation into adjacent areas. While not all ditches were filled, enough were such that offsite ditch flow has been stopped except for one area near road removal area 7. Here water has bypassed the end of road block and has drained across the site, eventually discharging via a ditch to the east. Some bare ground patches are present and some ditching remains. Recolonizing community is trending toward that in adjacent off-roadway areas.

Ditch blocks were generally found to be holding up well with varying degrees of revegetation. Minor erosion along sides of some culvert installations.

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

- fuel load low on road removal sites, low to moderate on adjacent land.
- invasive exotic species not observed.
- there have been no plantings in either project area.
- 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 but on a limited basis.

Vegetation Assessment Field Form	**Qualitative Assessment**
Project: Tate's Hell – Pine Log Creek	Date: January 18, 2012
Name(s) of Data Collectors: Kim Branciforte, Linda Chaisson, Graham Lewis	
Environmental Description: Savanna, wet flatwoods, shrub wetlands, basin swamp	
Polygon: Pine Log Creek Time: 11:00 am	GPS Location: centered on 29°59.4'N, 84°38.6'W
Nuisance Species: None observed	Fuel Load: Low

Wildlife Observations:

Water depth: Varied from shallow puddles and depressions to remnant ditch segments several feet deep.

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?
Conditions are drastically improved and generally trending positively except for areas where ditches or ponds remain and where ditch blocks are not functioning properly.

Potential Problems and solutions: Several problems were noted during the annual survey.

- Ditch block at western end of road removal segment 1 appears to have breached allowing vehicle access to old road. Ditch block should be restored.
- Guard rail at eastern end of road removal segment 1 has been removed; rail should be replaced.
- Slight erosion around several culvert replacements is evident and should be watched and repaired as necessary.
- Water flowing across road and back into ditch at road removal segment 6 due to high ground elevation in block south of road. There has been a discussion about recontouring the higher grade but it cannot be done at this time because the planted pines within the block are not ready for harvest. Suggest recontouring area after pine harvest and reshaping road removal to allow for flow to the south.

RTN