Tates Hell
(NWFWMD ILF Program Mitigation Project Site)

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Tates Hell State Forest Hydrologic Restoration Plan Executive Summary

Executive Summary

Tate's Hell State Forest encompasses 202,400 acres of low-lying, poorly drained land located between the Apalachicola and Ochlockonee rivers. The forest occupies approximately 52% of the land area of Franklin County and a small portion of southern Liberty County (Figure 1). The present day forest was once a wetland-dominated landscape referred to as Tate's Hell Swamp. Tate's Hell Swamp encompassed at least 12 ecological community types including pine flatwoods, wet savannas, dwarf cypress swamps, and sand pine scrub.

The forest has experienced a long history of silvicultural activities. During the 1950s through 1970s, thousands of acres of pine flatwoods and the drier portions of many wetland ecosystems were converted to slash pine plantation. More than 800 miles of roads were constructed and drainage ditches were constructed along most roads to provide road fill and drain nearby wetlands. Many pine stands were bedded and planted at high tree densities, and some were fertilized with nitrogen and phosphorus. Fire was typically suppressed. These large-scale habitat alterations significantly impacted historical ecological communities and altered the magnitude, timing, and quality of surface water runoff discharged from Tate's Hell Swamp to Apalachicola Bay, East Bay, and surrounding waters.

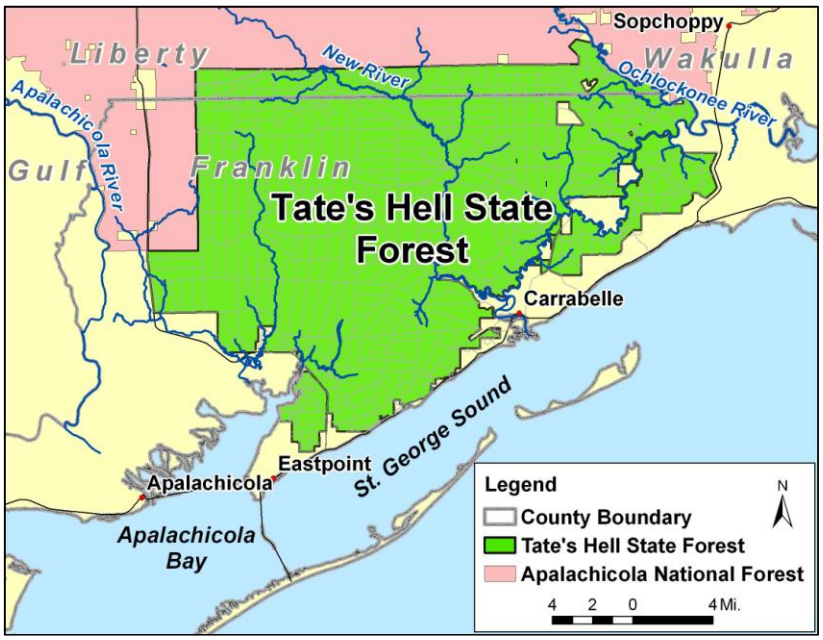


Figure 1. Tate's Hell State Forest

The Apalachicola River and Bay system contains one of the most diverse, productive, and economically important estuaries in the United States. The river and bay system have been designated as Outstanding Florida Waters and Apalachicola Bay has been designated as an Aquatic Preserve. East Bay, which receives surface water runoff from the Tate's Hell area, serves as a major nursery for ecologically and commercially important finfish, shellfish and other aquatic organisms. The Apalachicola River and Bay system are a high priority for the Surface Water Improvement and Management (SWIM) Program, which was established by the State of Florida in 1987 to reduce watershed degradation and protect natural resources.

In 1994, the state began acquiring land for Tate's Hell State Forest with the goal of restoring historical surface water drainage patterns and ecological communities to improve the timing, magnitude and quality of surface waters discharged from the area to the Apalachicola Bay system. The Northwest Florida Water Management District initiated the land acquisition process with the $3.5 million purchase of the Glawson tract in 1994. Due to the ecological importance of the East Bay estuary, the acquisition and restoration of Tate's Hell was identified as a priority under the State of Florida's Conservation and Recreation Lands Program.

To date, the land acquired for Tate's Hell State Forest totals approximately 202,400 acres. It is the second largest State Forest and the largest contiguous State Forest in Florida. Tate's Hell is managed as a multi-use area by the Florida Division of Forestry with cooperation from the Florida Fish and Wildlife Conservation Commission. The overall management goal is to restore, protect, and manage Tate's Hell ecosystems and maintain biological diversity, while integrating public use. The forest is a designated Wildlife Management Area, with opportunities for hunting, camping, fishing, canoeing, hiking, and off-highway vehicle use. The Division of Forestry continues to manage a large portion of the property for timber production. Pine management activities provide an economic benefit and are aimed at improving forest health.

During the past ten years, a number of hydrologic restoration projects have been implemented at Tate's Hell State Forest by the District, the Florida Division of Forestry, the Florida Fish and Wildlife Conservation Commission, and other public and private entities. Hydrologic restoration within Tate's Hell State Forest is cost-effective because the land is state-owned, eliminating expensive land acquisition, and the Division of Forestry performs many of the ongoing management activities such as prescribed burning, exotic species control and long-term roadway and drainage maintenance. The hydrologic restoration activities planned within Tate's Hell State Forest are one of the most significant contributions to the Apalachicola Bay System that can be made in the Florida portion of the Apalachicola-Chattahoochee-Flint River basin.

Recognizing the need for a long-term plan to guide future restoration efforts, the District and the Division of Forestry began discussing hydrologic restoration goals, sharing data, and working on the development of a Hydrologic Restoration Plan. Hydrologic restoration goals shared by the District and Division of Forestry include:

(1) Improving the water quality of surface water flows and runoff discharged to East Bay, Apalachicola Bay, and surrounding waters
(2) Restoring surface water drainage patterns to more natural conditions
(3) Enhancing wetland hydrology and function
(4) Restoring a mix of native ecological communities

The Hydrologic Restoration Plan is comprised of two volumes. Volume I describes the conditions at Tate's Hell State Forest, prioritizes areas for hydrologic restoration, and provides guidelines for environmental monitoring and habitat management of restoration areas. Volume II presents hydrologic restoration plans for the 29 surface water drainage basins identified within Tate's Hell State Forest (Figure 2), provides estimated construction costs associated with the proposed hydrologic improvements, and discusses aspects of project implementation. Both volumes were developed through a cooperative effort with the Division of Forestry. The plan fulfills Division of Forestry objectives outlined in the Ten-Year Management Plan for Tate's Hell State Forest (DOF 2007, pp. 5 and 14). Volumes I and II of the Hydrologic Restoration Plan may be found online at: http://www.nwfwmdwetlands.com/index.php?Page=30.

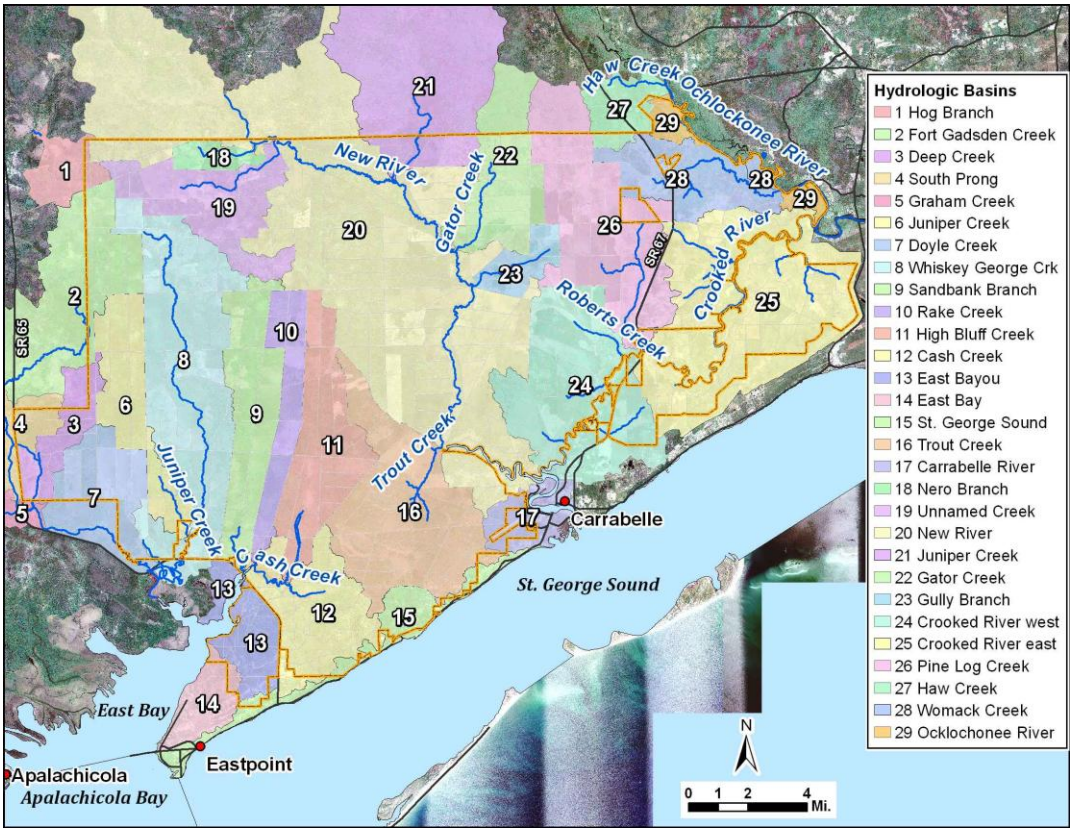


Figure 2. Surface Water Basins Within Tate's Hell State Forest

Areas within Tate's Hell State Forest were prioritized for restoration based on potential water quality benefits to Apalachicola Bay and surrounding waters, the feasibility of restoration, and the distribution of habitats of species of conservation concern. Approximately 25 listed plant and animal species occur within Tate's Hell State Forest including the Red-cockaded Woodpecker and Eastern indigo snake. The highest priority areas for restoration are generally located west of the New River and most discharge surface water to the Apalachicola Bay system.

The development of a hydrologic restoration plan for each surface water drainage basin was based on an extensive review of site data including forest stand attributes, historical and present-day aerial photography, LiDAR elevation data, road and culvert attributes, recreational facilities, and maps of historical ecological communities. Restoration plans include proposed locations for hydrologic improvements such as low water crossings, ditch blocks, flashboard risers, and culvert modifications (Figures 3 and 4). Habitat management activities such as shrub removal and prescribed burning are also recommended in many areas.

Figure 3. Low Water Crossing

To accompany the Hydrologic Restoration Plan, a set of GIS (Geographic Information Systems) mapping files have been prepared for use by the District and the Division of Forestry. These GIS files show the locations and attributes of the proposed low water crossings, culvert modifications, flashboard risers, ditch blocks and road removals. It is envisioned that the GIS files will be updated annually by the District and the Division of Forestry as new field data become available.

In all, the 29 basin restoration plans include more than 200 low water crossings, 690 ditch blocks, 300 culvert improvements, 80 flashboard risers and nearly 20 miles of road removals. The estimated construction costs for the proposed hydrologic improvements total nearly $8 million. Costs for habitat improvements (e.g. prescribed burning, replanting, and shrub reduction) and post-construction monitoring have not been included and will depend on field conditions and permitting requirements encountered when individual projects are implemented. Some habitat

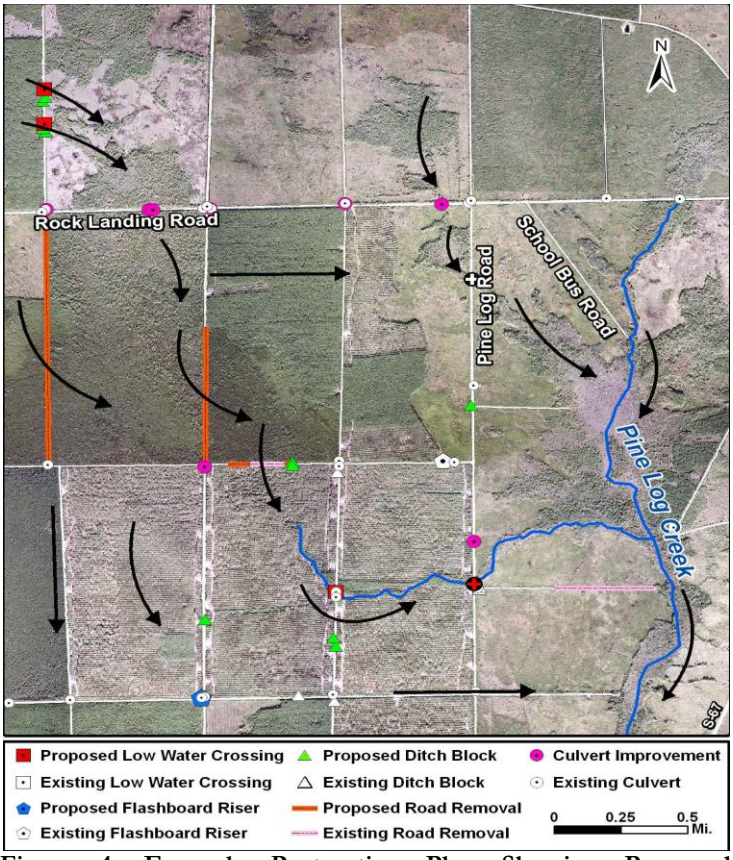


Figure 4. Example Restoration Plan Showing Proposed Hydrologic Improvements and Post-Restoration Drainage Patterns in the Pine Log Creek Basin

management activities, such as prescribed burning, will continue to be performed by the Division of Forestry.

Due to the large area encompassed by Tate's Hell State Forest and the extensive degree of hydrologic impacts, restoration is anticipated to be a gradual process with cumulative benefits accruing as hydrologic restoration and habitat management activities are implemented during the next 5 to 20 years or longer. Restoration projects are anticipated to be implemented by the District, Division of Forestry, and other public and private entities. Potential funding sources include agency budgets, FDOT mitigation funds, and state and federal grants. For projects that are implemented using FDOT mitigation funds, the District would essentially bank credits developed through its regional mitigation plan (found at: nwfwmdwetlands.com). The Division of Forestry would be required to refrain from using wetland mitigation areas solely for long-term timber production and would closely adhere to prescribed wetland mitigation requirements.

Table 1. Summary of proposed hydrologic improvements and estimated construction costs for Tate's Hell State Forest.

Structure	Unit cost	Total Number	Total Cost
Culvert modifications	$5,000	320	$1,313,350
Box culverts / weirs	$40,000	6	$240,000
Bridges	$100,000	8	$800,000
Ditch block	$2,550	691	$1,762,050
Flashboard riser	$6,000	80	$480,000
Low water crossing	$15,000	200	$3,000,000
Road removal	$17,000	19.84	$337,195
			$7,932,595

The implementation of specific restoration projects will typically involve additional field reviews, final design and permitting, construction activities, and habitat modifications, followed by post-restoration monitoring. Prior to finalizing the design for a particular project, a comprehensive field review should be performed to assess current site conditions and to confirm the suitability of restoration goals and design details associated with the proposed hydrologic improvements. Prior to applying for state and federal permits, project details will be reviewed with Division of Forestry to confirm that the proposed hydrologic restoration activities do not pose a conflict with other land management activities.

An adaptive management approach will be used for restoration activities whereby post construction monitoring will be performed to confirm that ecosystem conditions and hydrologic restoration goals are being achieved. If ecosystem conditions are not exhibiting a trend towards desired conditions, restoration projects will be re-evaluated and restoration plans or activities will be revised as needed. It is anticipated that the Hydrologic Restoration Plan will be updated and refined over time based on the result of ongoing monitoring activities.

Summary of Twelve Components of the Compensatory Mitigation Plan

(Pine Log Creek Unit)

Northwest Florida Water Management District
In-Lieu Fee Program

Tates Hell (Pine Log Creek Unit) Mitigation Area

(Summary of 12 Elements Required by § 332.4(c) of the 2008 EPA/USACE Final Compensatory Mitigation Rule for All In-Lieu Fee Program Project Plans; See Attached Pine Log Creek Mitigation Documents for Additional Explanation and Detail)

22 September 2014

1—Objectives

The Tates Hell (Pine Log Creek Unit) Mitigation Area is part of Tates Hell State Forest, a 202,436-acre property owned and managed by the Florida Forest Service. Historically a mosaic of hydric pine flatwoods and savanna, cypress sloughs, and other wetland types, much of the area was converted to pine plantation during the 1960s – 1980s. Silvicultural operations during this period drastically altered natural hydrologic conditions via construction of over 800 miles of logging roads and associated ditches. In 2010, the NWFWMD and the Florida Forest Service cooperatively developed a long-term, comprehensive hydrologic restoration plan for Tates Hell State Forest. The Tates Hell (Pine Log Creek Unit) Mitigation Area is a component of this hydrologic restoration plan.

The goal of this project is to restore site hydrology and promote vegetation recovery within the Pine Log Creek basin. Restoration will consist of:

- Road Removal (3.02 Miles)
- Ditch Elimination (6.04 Miles)
- Low-Water-Crossings (11)
- Culvert Modifications (21)
- Ditch Plugs and Culvert Riser (31)
- Bridge (1)

140 acres of palustrine wetlands will be directly enhanced or restored, with the larger Pine Log Creek basin benefiting from enhanced hydrologic flows. 16.68 UMAM palustrine wetland credits will be generated.

2—Site Selection Criteria

Much of the present day Tates Hell State Forest was once a mosaic of wet prairies, hydric pine flatwoods, cypress sloughs, and other vegetative communities. However, intensive silvicultural operations have altered the natural landscape. Between the 1950s and 1980s, extensive areas were converted to slash pine (*Pinus elliottii*) plantation, with many pine stands being bedded and fertilized. Fire was often suppressed. More than 800 miles of roads were constructed to support logging operations and ditches were excavated along most roads to provide road-fill material and

drain adjacent wetlands. These silvicultural activities have adversely impacted the hydrology and ecology of historic vegetative communities and have affected the magnitude, timing, and quality of surface water runoff discharged to the Apalachicola Bay system and surrounding waters.

In 1994, the State of Florida began purchasing the property from timber companies with the goal of restoring natural vegetative communities, re-establishing historic surface water drainage patterns, and improving and protecting the quality of surface water runoff discharged from the area to the Apalachicola Bay system and surrounding waters. The Northwest Florida Water Management initiated the land acquisition process with the $3.5 million purchase of the Glawson tract in 1994. To date, the land acquired for Tates Hell State Forest totals nearly 205,000 acres. Tates Hell State Forest is managed by the Florida Forest Service.

3—Site Protection Instrument

The NWFWD will be responsible for the perpetual management of the Pine Log Creek mitigation project implemented within Tates Hell State Forest. The NWFWMD works cooperatively with the Florida Forest Service to coordinate management activities such as shrub reduction, revegetation, thinning of trees, and prescribed burning in restoration areas. The NWFWMD, in cooperation with the Florida Forest Service, has developed a comprehensive hydrologic restoration plan for the entire Tates Hell State Forest, which prioritizes future restoration activities, provides specifications for site maintenance and environmental monitoring, and clarifies agency roles and responsibilities.

As a component of Tates Hell State Forest, Pine Log Creek is managed in accordance with the State of Florida land management policies. The Tates Hell lands and natural resources are managed using a stewardship ethic that assures these resources will be available for the benefit and enjoyment of all people of the state, both present and future. All management strategies, where feasible and consistent with the goals of protection and conservation of natural resources, shall:

- Restore, maintain, and protect in perpetuity all native ecosystems, insuring the long-term viability of populations and species considered rare, endangered, threatened, or of special concern.
- Integrate human use through a multiple-use concept, not emphasizing any particular use over the others.
- Protect known archeological and historical resources.
- Practice sustainable forest management utilizing sound silvicultural techniques.

4—Baseline Information

See “Tates Hell State Forest Hydrologic Restoration Plan”

5—Determination of Credits

Mitigation credits were determined by the Uniform Mitigation Assessment Method (UMAM). The UMAM credit determination of 16.68 was approved and released by the USACE, in consultation with a mitigation review team, after all mitigation activities were implemented.

6—Detailed Work Plan

Road Removal:

- 6 Sites
- 11.73-Acre Footprint (3.02 Miles x Average Width of 32 FT)
- UMAM Credit = 6.713
- Road-fill will be excavated to natural grade, with fill material used to eliminate adjacent ditches. The road footprint will then be mechanically harrowed to break up the ground and facilitate natural recruitment of wetland vegetation. (There will be no planting of vegetation.) For UMAM assessment, the existing conditions (Landscape, Water, Vegetation) are all scored as zero, with proposed post-restoration scores of 8, 9, 9 respectively. A 6-10 year time lag (1.25) was used to calculate the proposed UMAM credit of 6.713. Elimination of these road segments will help reestablish natural hydrologic flows within the Pine Log Creek basin, and will directly restore 11.73 acres of wetlands that have been destroyed by road construction.

Ditch Elimination:

- 6 Sites
- 8.8-Acre Footprint (6.02 Miles of Ditches x Average Width of 12 FT). Depth typically 2-4 FT.
- UMAM Credit = 1.405
- The amount of road-fill material available from elimination of the road segments is believed to be insufficient to fill the entire length of all ditches. Thus, the road-fill material available will instead be used to fill ditches in a series of broad plugs and pools. Broad plugs will be filled to natural grade (or slightly higher to accommodate for any anticipated settling). The ratio of broad plugs to shallow pools will be dependent upon the amount of fill material available from the removal of roads. This approach will ensure that all ditches are effectively eliminated without the possibility of reforming.

Low-Water-Crossings:

- 11 Sites
- 71.39-Acre Footprint (Based on an assumption that each low-water-crossing will enhance 6.49 acres, i.e., a 300’ radial distance from the center of the LWC)
- UMAM Credit = 5.711

Culvert Modifications:

- 21 Sites
  - New Culverts (11)

    - Culvert Removals (2)
    - Culvert Replacements (8)
  - 34.02-Acre Footprint(Based on an assumption that each culvert will influence 1.62 acres, i.e., a 150' radial distance from the center of the culvert)
  - UMAM Credit = 0.454

Ditch Plugs and Riser:

  - 31 Sites
    - Ditch Plugs (30)
    - Flashboard Riser (1)
  - 12.71-Acres Footprint (Based on an assumption that each ditch plug and flashboard riser will influence 0.41 acres, i.e., a 75' radial distance from the center of the plug or riser)
  - UMAM Credit = 0.847

Bridge (1 Site):

  - 6.49-Acre Footprint (Based on an assumption that this bridge will influence a 300' radial distance from the center)
  - UMAM Credit = 0.346

7—Maintenance Plan

This site is actively maintained by the NWFWMD and the Florida Forest Service as part of Tates Hell State Forest. Maintenance will consist of maintaining hydrologic improvements, and may include prescribed fire and exotics management where necessary or appropriate. This site is expected to be largely self-sustaining.

8—Performance Standards

- Nuisance vegetation ≤ 5% cover of site.
- Exotic vegetation ≤ 1% cover of site.
- No observable decline in vegetation community health
- Native groundcover and shrub layer species appropriate for natural community type trending toward increase in diversity and coverage.

9—Monitoring

Monitoring protocols necessary to ensure effective preservation, enhancement, restoration and management will be conducted annually for a minimum of five years from the start of mitigation activities or as required by USACE permit conditions. Monitoring will be performed by NWFWMD staff or qualified consulting firms. Annual reports will be generated and posted at www.NWFWMDwetlands.com (or any successor website). Specific monitoring for this site will include annual panoramic photos at established points.

10—Long-term Management

The hydrologic restoration plan developed cooperatively between the NWFWMD and the Florida Forest Service includes specific guidelines for long-term site maintenance and management activities that are based on the broader objective of restoring a mosaic of historic vegetative community types across the Tates Hell State Forest.

The NWFWMD is responsible for ensuring the perpetual management of mitigation lands. The NWFWMD will continue to coordinate with the Florida Forest Service regarding land management activities. Site inspections will be performed annually to ensure performance criteria are being achieved and to confirm that ditch plugs, low water crossings, and culverts are functioning properly to meet restoration goals.

11—Adaptive Management Plan

If changes in the implementation of this mitigation plan become necessary due to the stochastic nature of ecological processes, the NWFWMD will first obtain approvals from the USACE.

12—Financial Assurances

The NWFWMD is a governmental entity created by the Florida Water Resources Act of 1972 with the mission of protecting water resources protection and ecosystem integrity. Funds are specifically earmarked to implement and maintain mitigation.

As of July, 2014, the NWFWMD had greater than $15,000,000 available in a dedicated mitigation fund. This fund was established to receive payment from sales of mitigation credits and to ensure adequate funding for the implementation and long-term management of mitigation sites, in accordance with 62-342.850 FAC.

Detailed Mitigation Plan (Pine Log Creek Unit)

Pine Log Creek Basin (Tates Hell State Forest)
Hydrologic Enhancements
9/10/10

SUMMARY

Restoration/Enhancement Activities:

- Road Removal (3.09 Miles)
- Ditch Elimination (6.18 Miles)
- Low-Water-Crossings (8)
- Culvert Modifications (21)
- Ditch Plugs and Culvert Riser (27)
- Bridge (1)

Estimated UMAM Credits = 15.34

DETAILS

Road Removal:

- 7 Sites
- 11.98-Acre Footprint (3.09 Miles x Average Width of 32 FT)
- Proposed UMAM Credit = 8.306
- Road-fill will be excavated to natural grade, with fill material used to eliminate adjacent ditches. The road footprint will then be mechanically harrowed to break up the ground and facilitate natural recruitment of wetland vegetation. (There will be no planting of vegetation.) For UMAM assessment, the existing conditions (Landscape, Water, Vegetation) are all scored as zero, with proposed post-restoration scores of 8, 9, 9 respectively. A 6-10 year time lag (1.25) was used to calculate the proposed UMAM credit of 8.306. Elimination of these road segments will help reestablish natural hydrologic flows within the Pine Log Creek basin, and will directly restore 11.98 acres of wetlands that have been destroyed by road construction.

Ditch Elimination:

- 7 Sites
- 8.99-Acre Footprint (6.18 Miles of Ditches x Average Width of 12 FT). Depth typically 2-4 FT.
- Proposed UMAM Credit = 2.877
- The amount of road-fill material available from elimination of the road segments is believed to be insufficient to fill the entire length of all ditches. Thus, the road-fill

material available will instead be used to fill ditches in a series of broad plugs and pools. Broad plugs will be filled to natural grade (or slightly higher to accommodate for any anticipated settling). The ratio of broad plugs to shallow pools will be dependent upon the amount of fill material available from the removal of roads. This approach will ensure that all ditches are effectively eliminated without the possibility of reforming.

Low-Water-Crossings:

- 8 Sites
- 51.92-Acre Footprint (Based on an assumption that each low-water-crossing will enhance 6.49 acres, i.e., a 300' radial distance from the center of the LWC)
- Proposed UMAM Credit = 2.769 (~0.36 Credit per LWC)

Culvert Modifications:

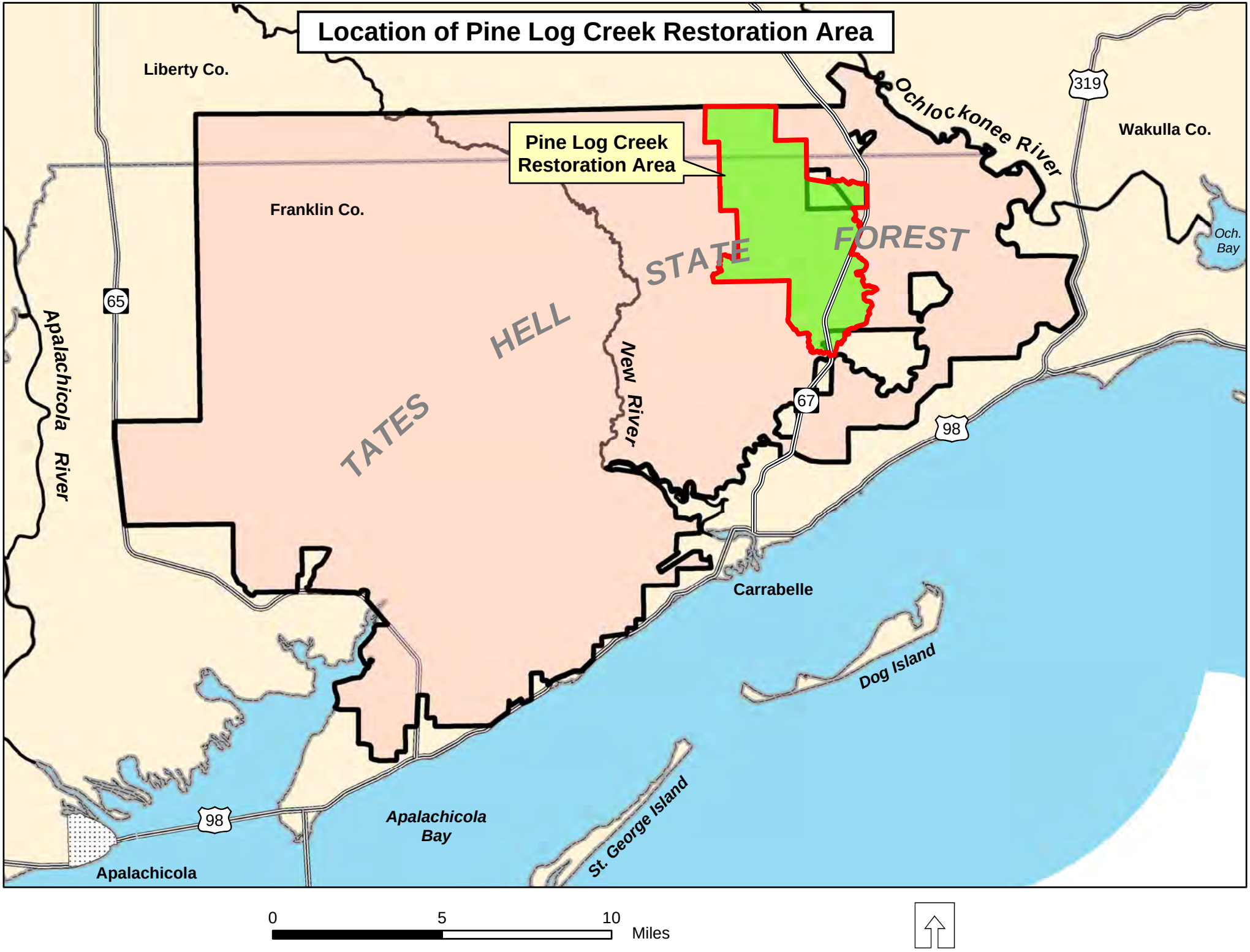
- 21 Sites
  - New Culverts (11)
  - Culvert Removals (2)
  - Culvert Replacements (8)
- 34.02-Acre Footprint(Based on an assumption that each culvert will influence 1.62 acres, i.e., a 150' radial distance from the center of the culvert)
- Proposed UMAM Credit = 0.454 (~0.02 Credit per Culvert)

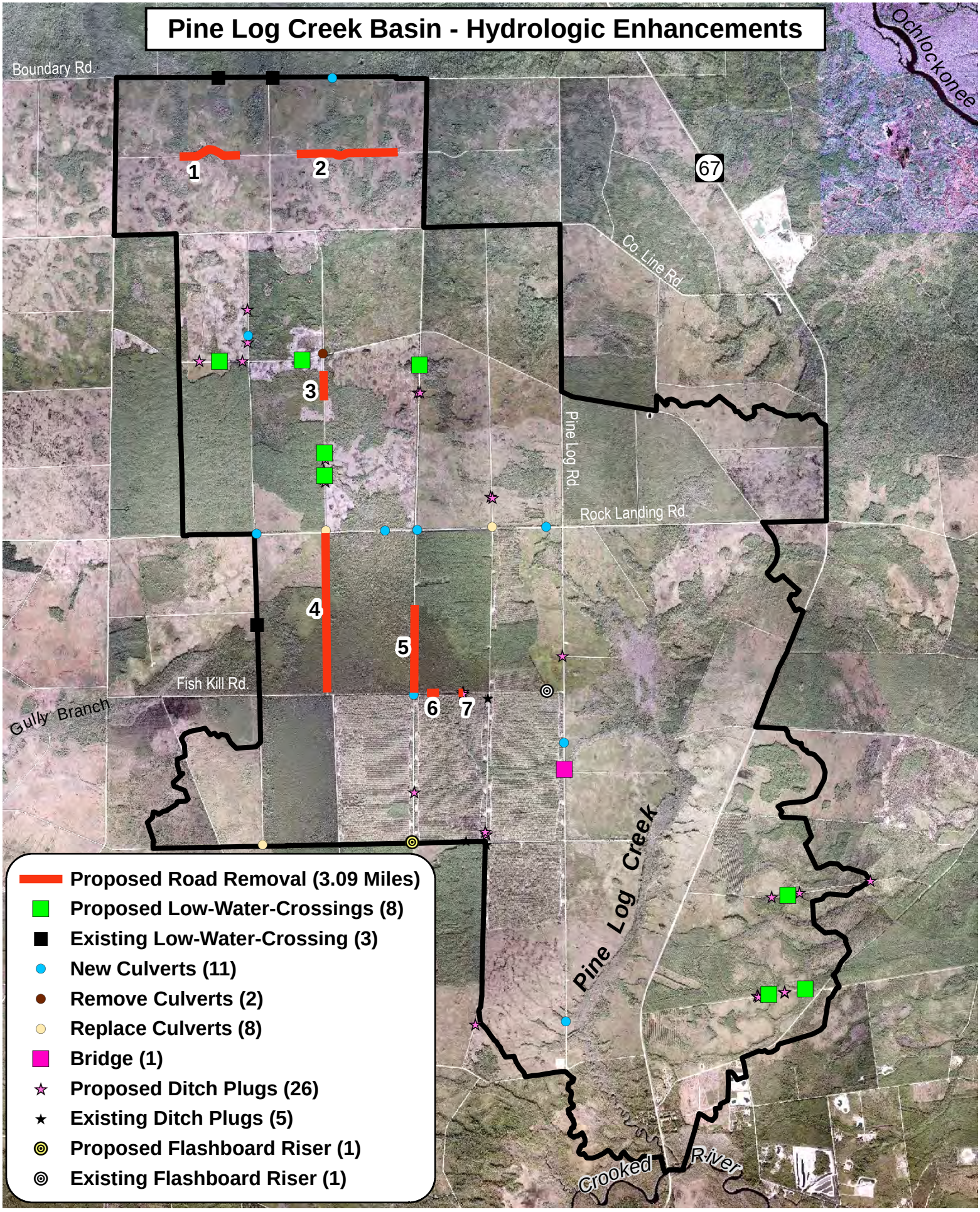
Ditch Plugs and Riser:

- 27 Sites
  - Ditch Plugs (26)
  - Flashboard Riser (1)
- 11.07-Acres Footprint (Based on an assumption that each ditch plug and flashboard riser will influence 0.41 acres, i.e., a 75' radial distance from the center of the plug or riser)
- Proposed UMAM Credit = 0.59 (~0.02 Credit per Plug or Riser)

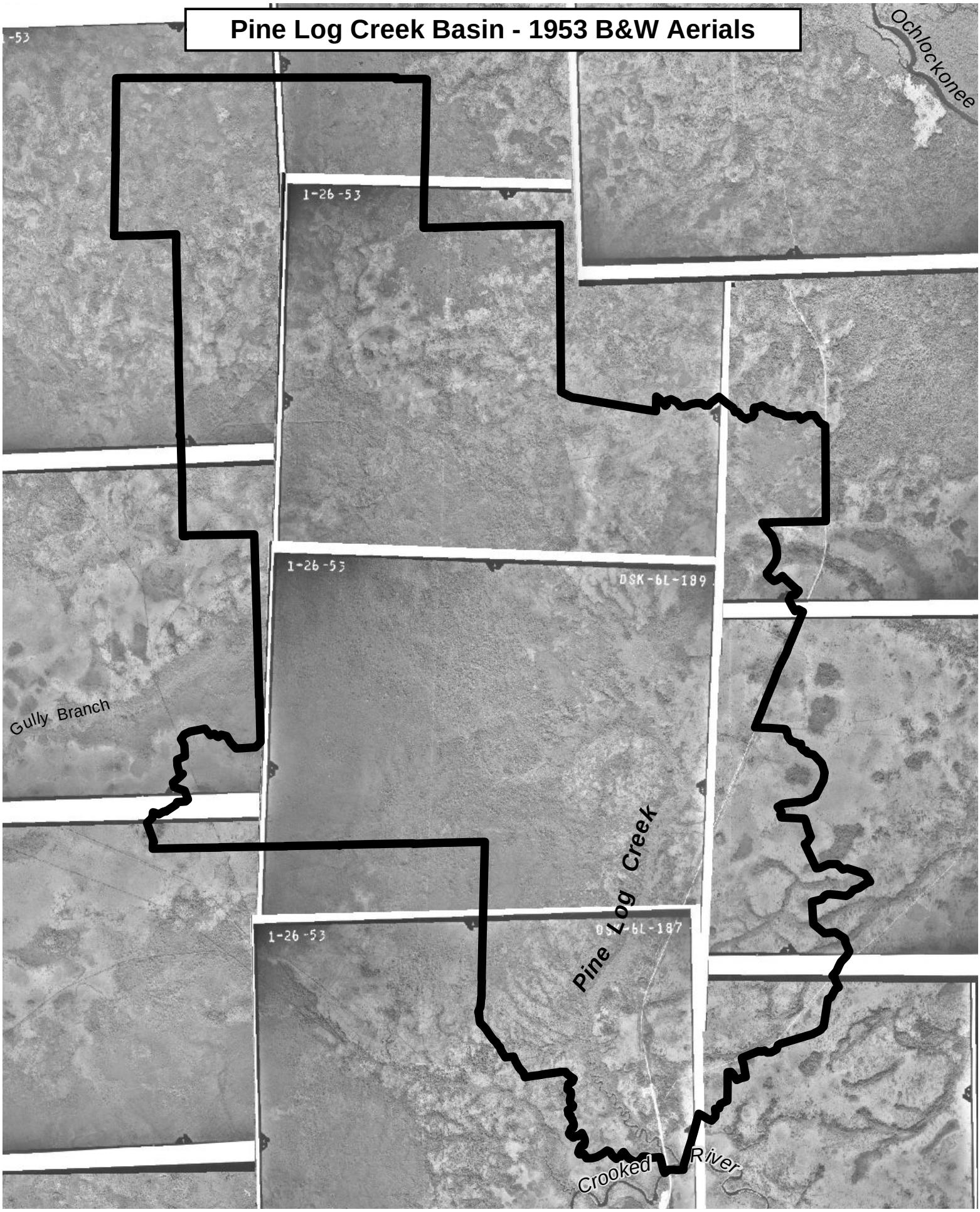
Bridge (1 Site):

- 6.49-Acre Footprint (Based on an assumption that this bridge will influence a 300' radial distance from the center)
- Proposed UMAM Credit = 0.346

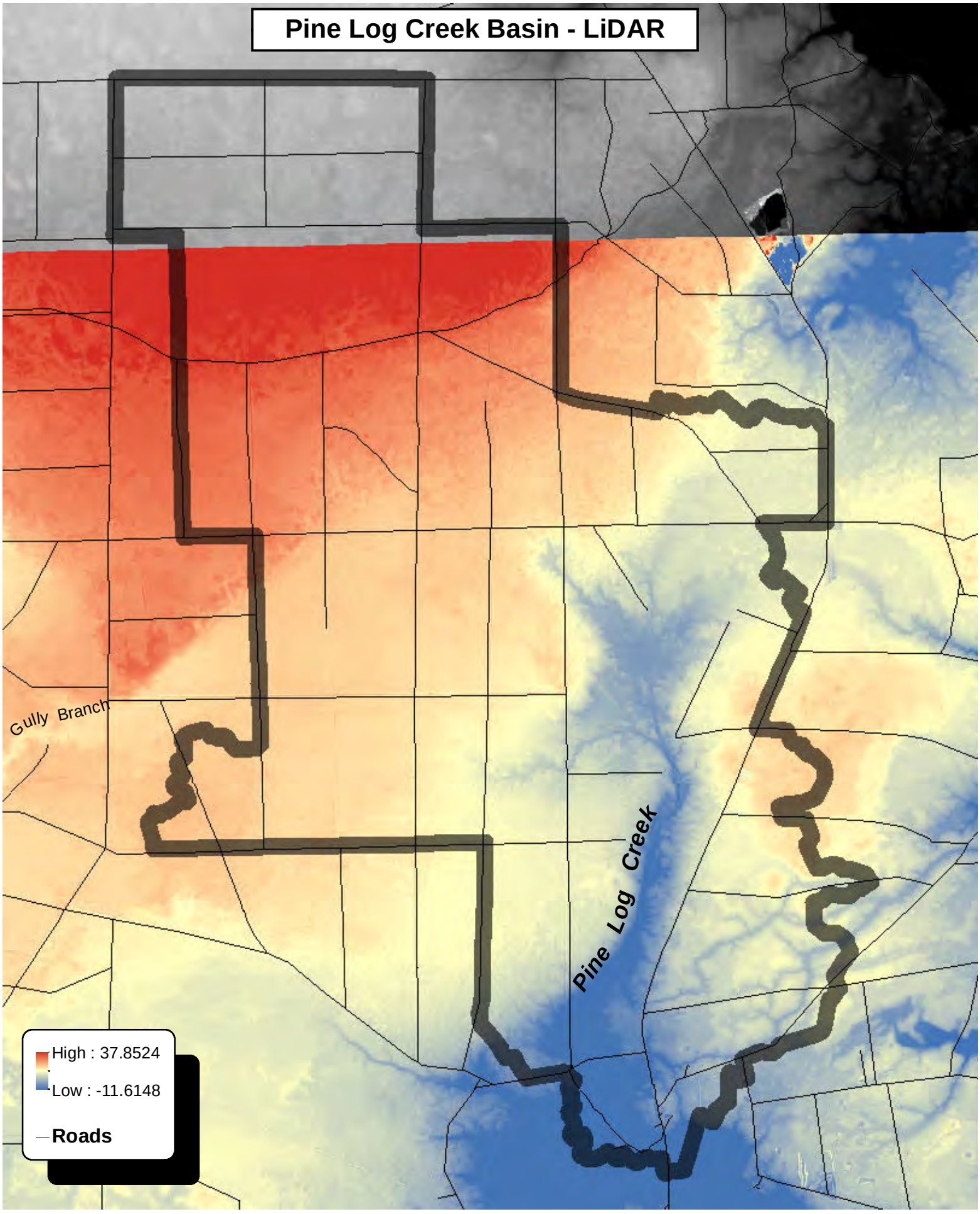

Location of Pine Log Creek Restoration Area
Liberty Co.
Pine Log Creek Restoration Area
Franklin Co.
Ochlockonee River
319
Wakulla Co.
Och. Bay
STATE
FOREST
TATES
HELL
New River
65
67
98
Apalachicola River
Carrabelle
Dog Island
Apalachicola Bay
St. George Island
98
Apalachicola
0
5
10
Miles

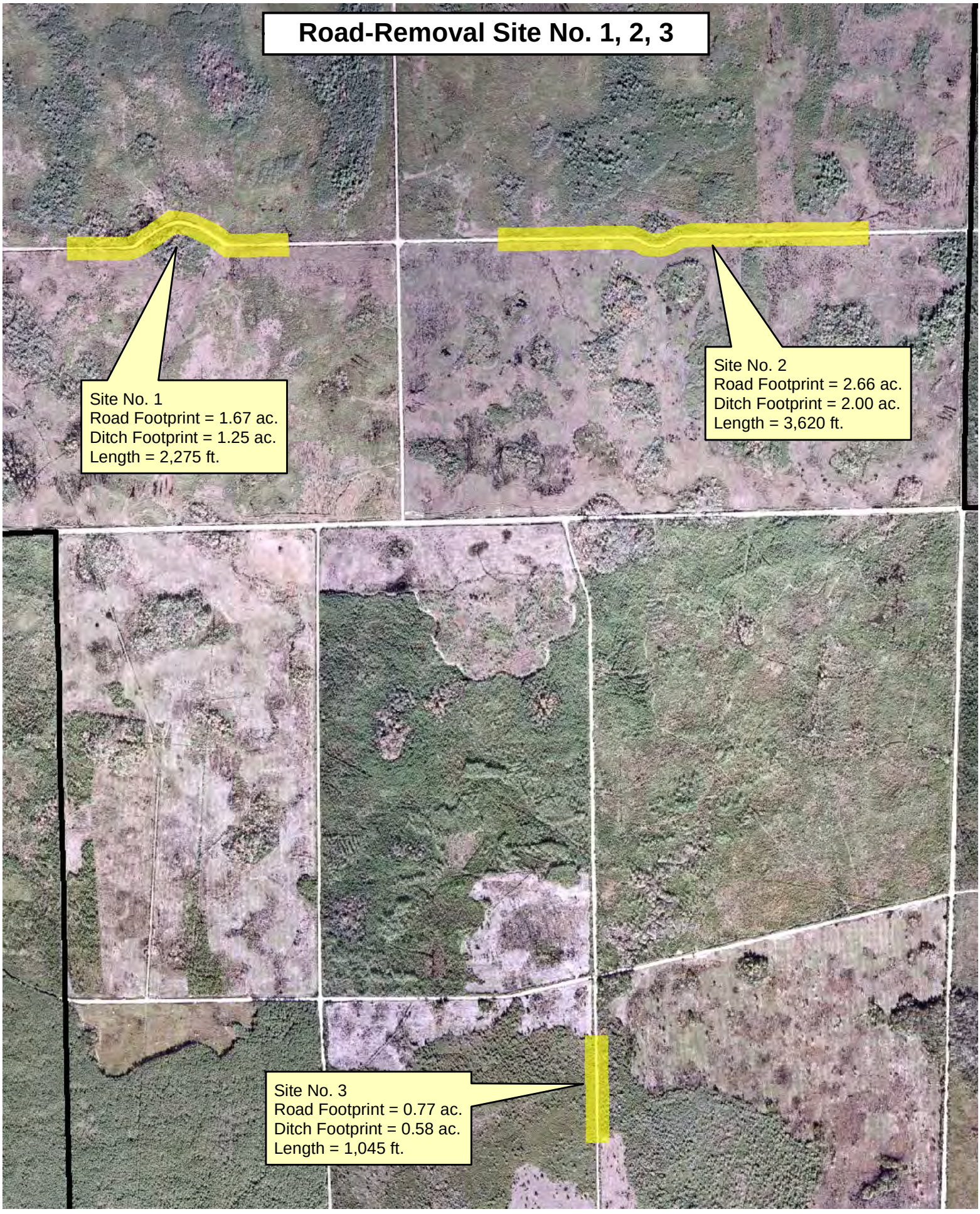

Pine Log Creek Basin - Hydrologic Enhancements
Boundary Rd.
Ochlocknee
67
Co. Line Rd.
Pine Log Rd.
Rock Landing Rd.
Fish Kill Rd.
Gully Branch
Pine Log Creek
Crooked River
1
2
3
4
5
6
7
Proposed Road Removal (3.09 Miles)
Proposed Low-Water-Crossings (8)
Existing Low-Water-Crossing (3)
New Culverts (11)
Remove Culverts (2)
Replace Culverts (8)
Bridge (1)
Proposed Ditch Plugs (26)
Existing Ditch Plugs (5)
Proposed Flashboard Riser (1)
Existing Flashboard Riser (1)
0
2.5
5
Miles

Pine Log Creek Basin - 1953 B&W Aerials



0 2.5 5 Miles


Pine Log Creek Basin - LiDAR
Gully Branch
Pine Log Creek
High : 37.8524
Low : -11.6148
Roads
0
2.5
5
Miles


Road-Removal Site No. 1, 2, 3
Site No. 1
Road Footprint = 1.67 ac.
Ditch Footprint = 1.25 ac.
Length = 2,275 ft.
Site No. 2
Road Footprint = 2.66 ac.
Ditch Footprint = 2.00 ac.
Length = 3,620 ft.
Site No. 3
Road Footprint = 0.77 ac.
Ditch Footprint = 0.58 ac.
Length = 1,045 ft.
0
0.5
1
Miles


Road-Removal Site No. 4, 5, 6, 7
Site No. 4
Road Footprint = 4.16 ac.
Ditch Footprint = 3.12 ac.
Length = 5,660 ft.
Site No. 5
Road Footprint = 2.29 ac.
Ditch Footprint = 1.72 ac.
Length = 3,115 ft.
Site No. 6
Road Footprint = 0.32 ac.
Ditch Footprint = 0.24 ac.
Length = 430 ft.
Site No. 7
Road Footprint = 0.12 ac.
Ditch Footprint = 0.09 ac.
Length = 165 ft.
0
0.5
1
Miles

(Excerpt from "Tate's Hell State Forest Hydrologic Restoration Plan" developed by the NWFWMD in cooperation with the Florida Forest Service.)

Pine Log Creek Basin

Restoration Priority: Medium

Basin Area: 15,300 acres

Description: The Pine Log Creek drainage basin comprises 15,300 acres on the east side of Tate's Hell State Forest. Pine Log Creek flows south and discharges to the Crooked River. Although most of the basin is located west of Highway 67, a portion of the basin is located east of Highway 67 and west of Jeff Sanders Road.

The 1953 black and white aerial photography shows that the central portion of the basin, located between Rock Landing and Gully Branch roads, was once a vast, low-lying basin swamp (Figures 90 and 93). The construction of dirt logging roads and conversion of the basin swamp to pine plantation has significantly altered the landscape and surface water drainage patterns. Today, surface water runoff flows into large ditches on County Line Road, Road 152 (immediately south of County Line Rd), and Pine Log Road before flowing through bridges and culverts and eventually discharging to Pine Log Creek.

The only previous hydrologic restoration effort was the Pine Log Lakes project, which was implemented by a private entity to fulfill wetland mitigation requirements associated with offsite activities. The project involved removing a short section of Fish Kill Road, installing a flashboard riser and several ditch blocks and culverts (see existing structures Figure 92). Unfortunately, the flashboard riser is not effective because the large volume of flow in the ditch has created a new channel that bypasses the riser and flows into the ditch on the eastern side. The road removal, which was intended to enable water to surface water runoff to flow south towards Pine Log Creek, is of limited effectiveness because the ditch on the northern side of the road segment was left intact and therefore water continues to flow east in the ditch. Additionally, the planted pines south of the road removal area appear to have been bedded and the topography modified. Rather than flowing south across the road removal area as intended, surface water runoff flows continues to flow east in the ditch and then flows south through a culvert near the intersection with Pine Log Road.

2010 – 2020 Hydrologic Restoration Plan: The objectives of the hydrologic restoration activities are to restore portions of the former basin swamp, reduce surface water flow in roadside ditches, and increase the flow through natural wetland systems towards Pine Log Creek.

Two segments of road totaling 1.1 miles are proposed to be removed to reconnect former wetland habitats and facilitate sheet flow north of County Line Road (Figures 90, 91, and 92). Further south, three north-south oriented road segments totaling 1.9 miles are proposed for removal as part of the restoration of the former large basin swamp. The timing of the road removals will depend on when the Division of Forestry is able to harvest the remaining timber in the adjacent areas. Additional short segments of Fish Kill Road are proposed for removal on either side of the

existing section of road removed as part of the Pine Log Lakes mitigation project. The proposed ditch blocks at the eastern end of the Fish Kill Road removal segment will prevent the easterly flow of water in the roadside ditches and facilitate natural drainage to the south towards Pine Log Creek. The low water crossings proposed north of Fish Kill Road are wetland crossings rather than stream crossings and may only contain water intermittently. Culverts are proposed to reconnect contributing drainage areas along Rock Landing Road, Pine Log Road, and several smaller roads.

A new bridge is proposed to replace two existing large culverts where Pine Log Creek crosses Pine Log Load (Figures 90, 91, and 92). The road is eroding at this location and the new bridge will increase the conveyance capacity and allow a more natural stream channel to become reestablished. West of the bridge along the creek, a long low water crossing is proposed to replace a series of three small culverts. These culverts were installed as part of the Pine Log Lakes mitigation project; however a low water crossing would facilitate a more natural flow regime at this location. The remnant Pine Log Creek stream channel is shallow wide, and braided in the vicinity of these three culverts.

In the southeastern portion of the Pine Log Creek basin, three low water crossings and associated ditch blocks are proposed in lieu of the existing culverts to increase conveyance capacity and facilitate the restoration of natural channel morphometry in these interconnected basin swamps (Figures 94, 95, and 96). An additional culvert is proposed in the southern portion of the basin on the western side of Pine Log Creek. A flashboard riser and a culvert removal are proposed to reduce ditch flow across the basin boundary.

In all, the proposed hydrologic improvements encompass the removal of three miles of dirt logging roads and adjacent ditches and the installation of nine low water crossings, one flashboard riser, 19 culverts, and 23 ditch blocks.

Estimated Construction Cost for Hydrologic Improvements: $ 425,000

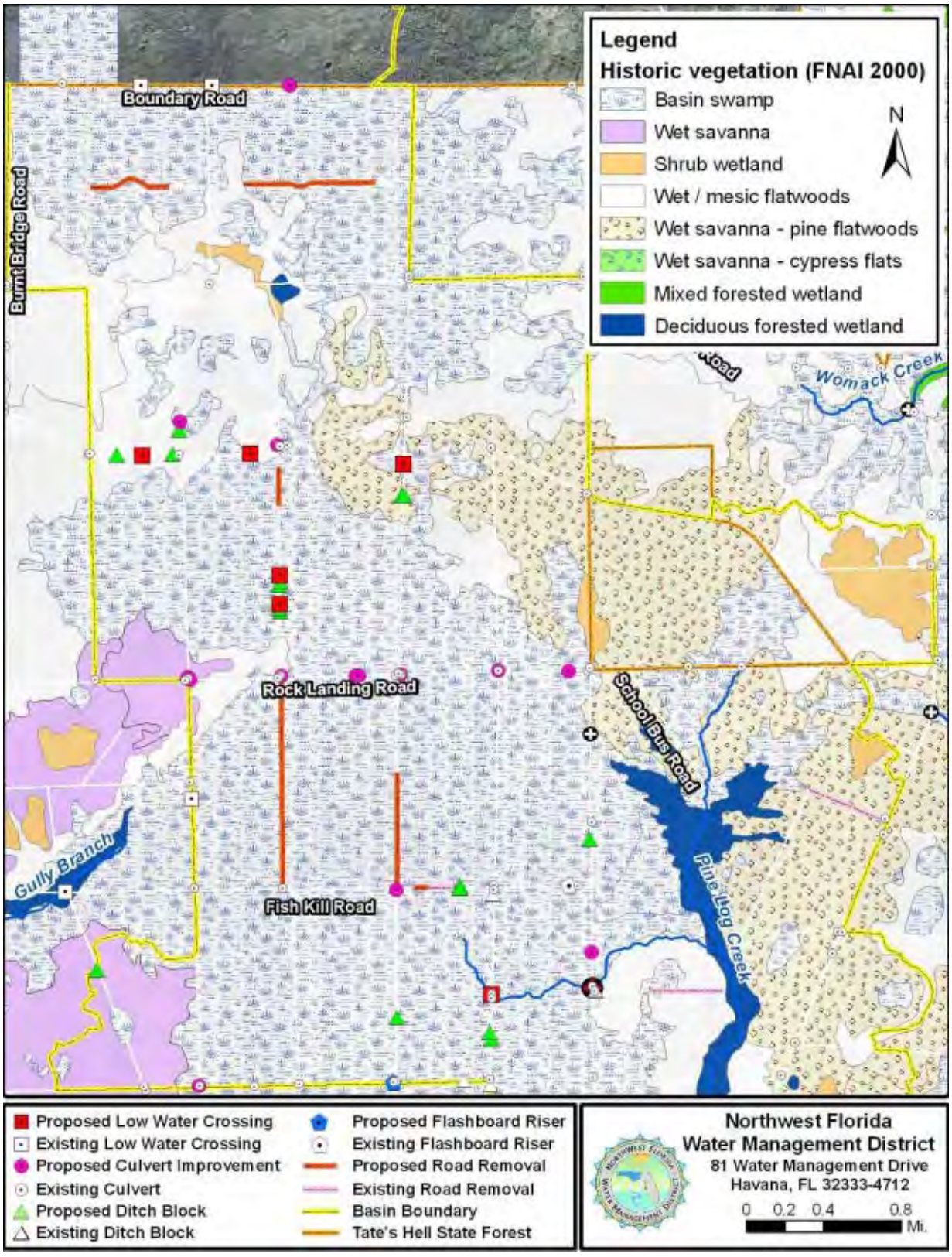


Figure 90. Historical ecological communities and proposed hydrologic improvements in the northern portion of the Pine Log Creek basin.

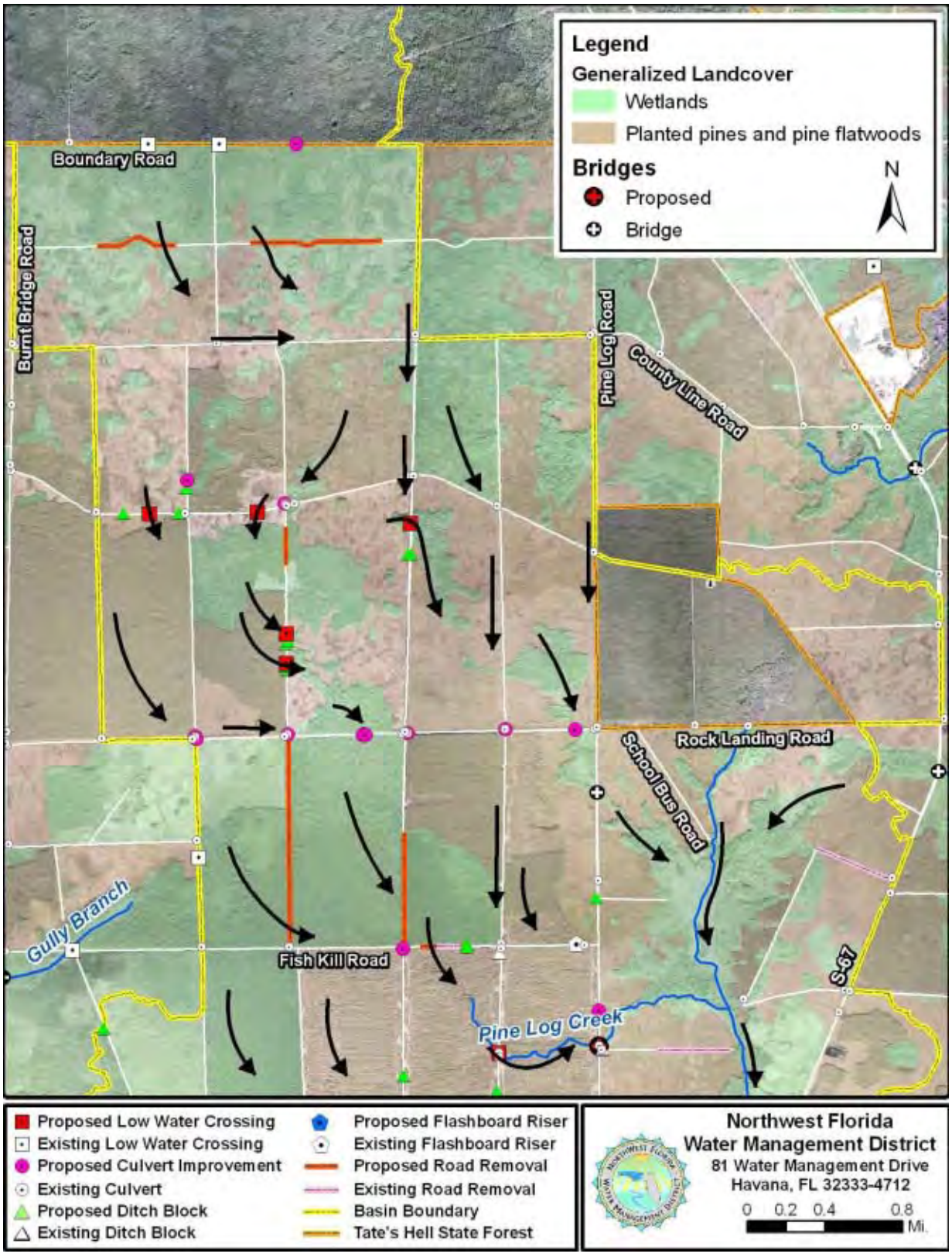


Figure 91. Proposed hydrologic improvements and post-restoration drainage patterns in the northern portion of the Pine Log Creek basin.

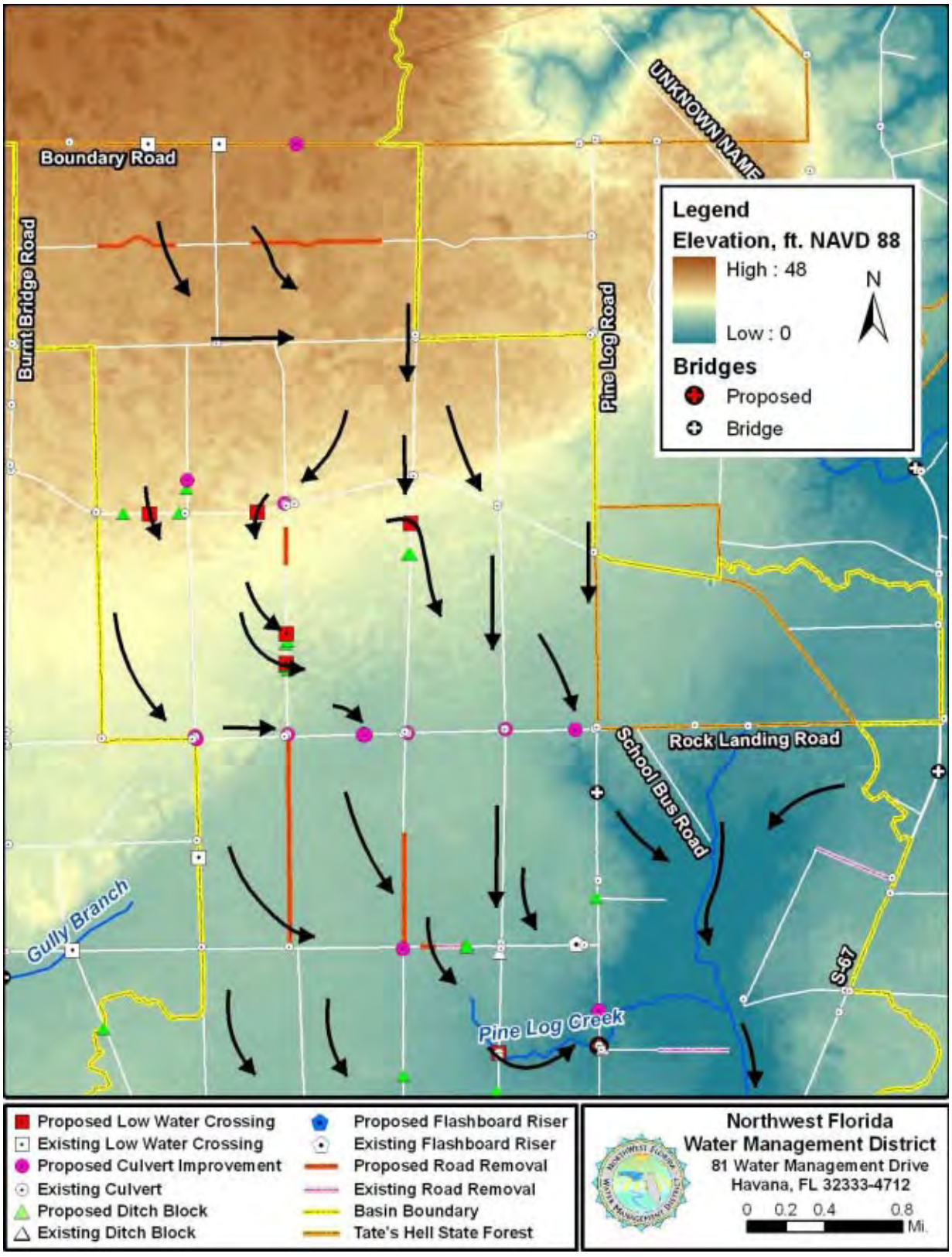


Figure 92. LiDAR elevation data, proposed hydrologic improvements and post-restoration drainage patterns in the northern portion of the Pine Log Creek basin.

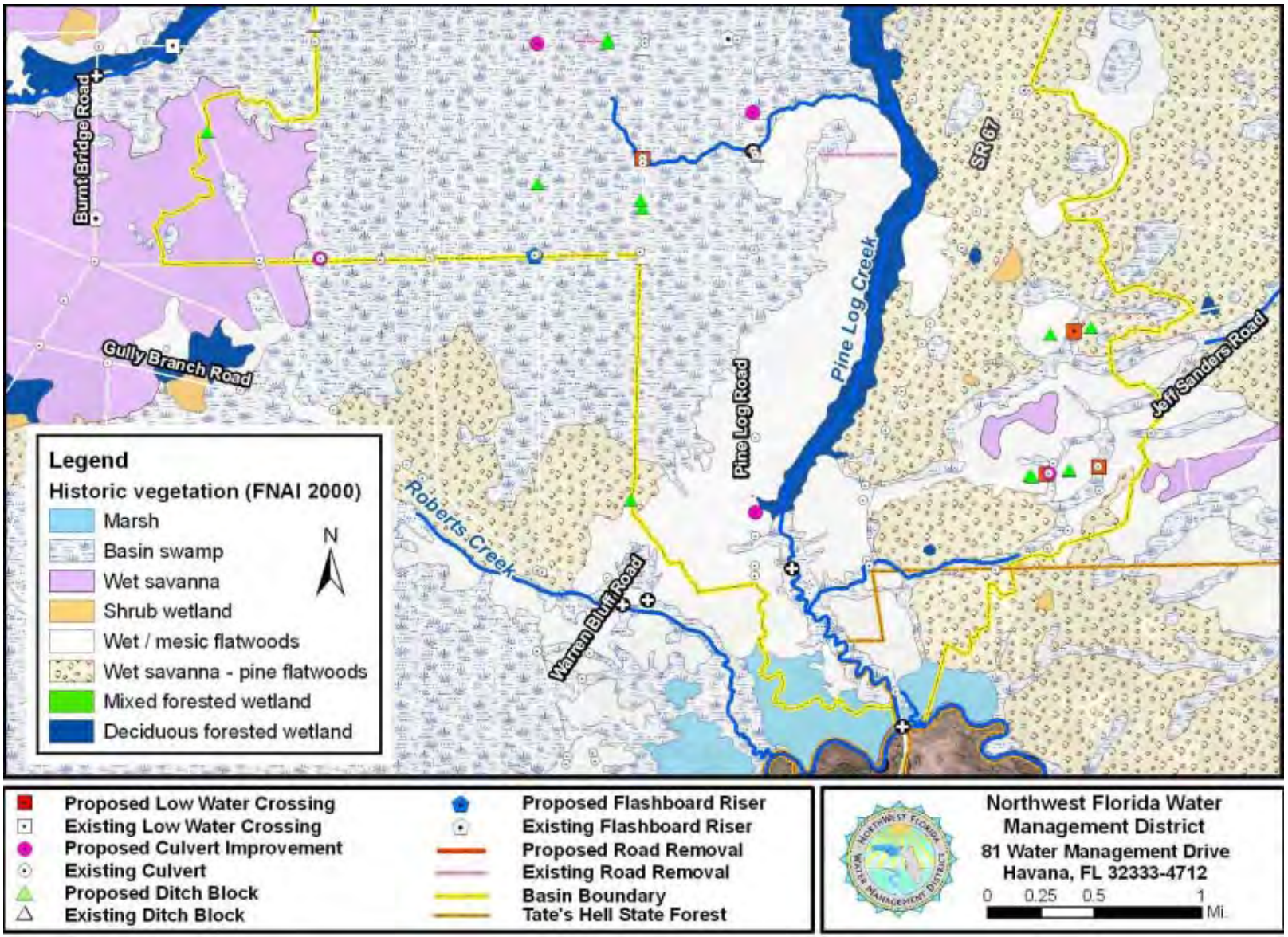


Figure 93. Historical ecological communities and proposed hydrologic improvements in the southern portion of the Pine Log Creek basin.

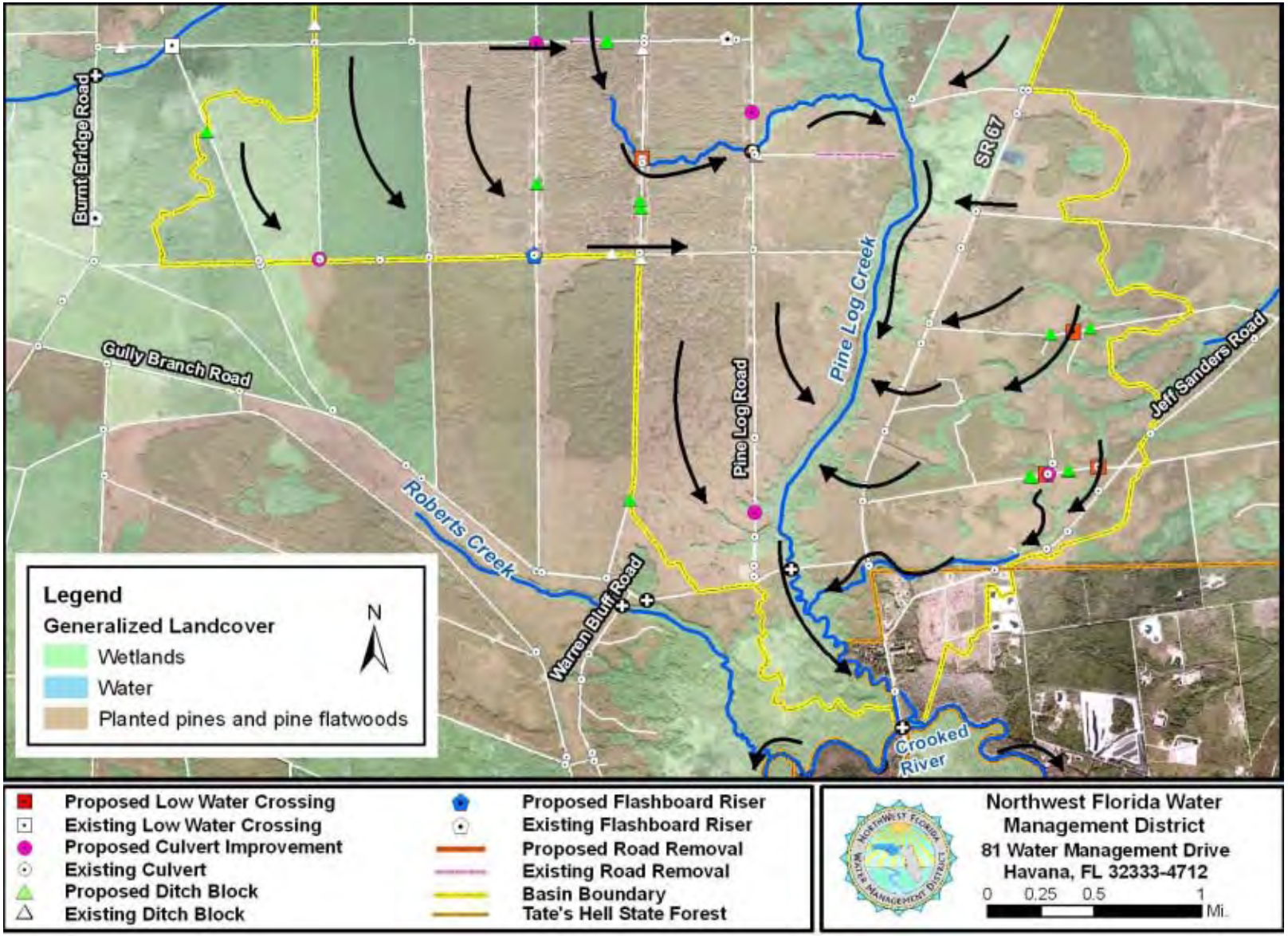


Figure 94. Proposed hydrologic improvements and post-restoration drainage patterns in the southern portion of the Pine Log Creek basin.

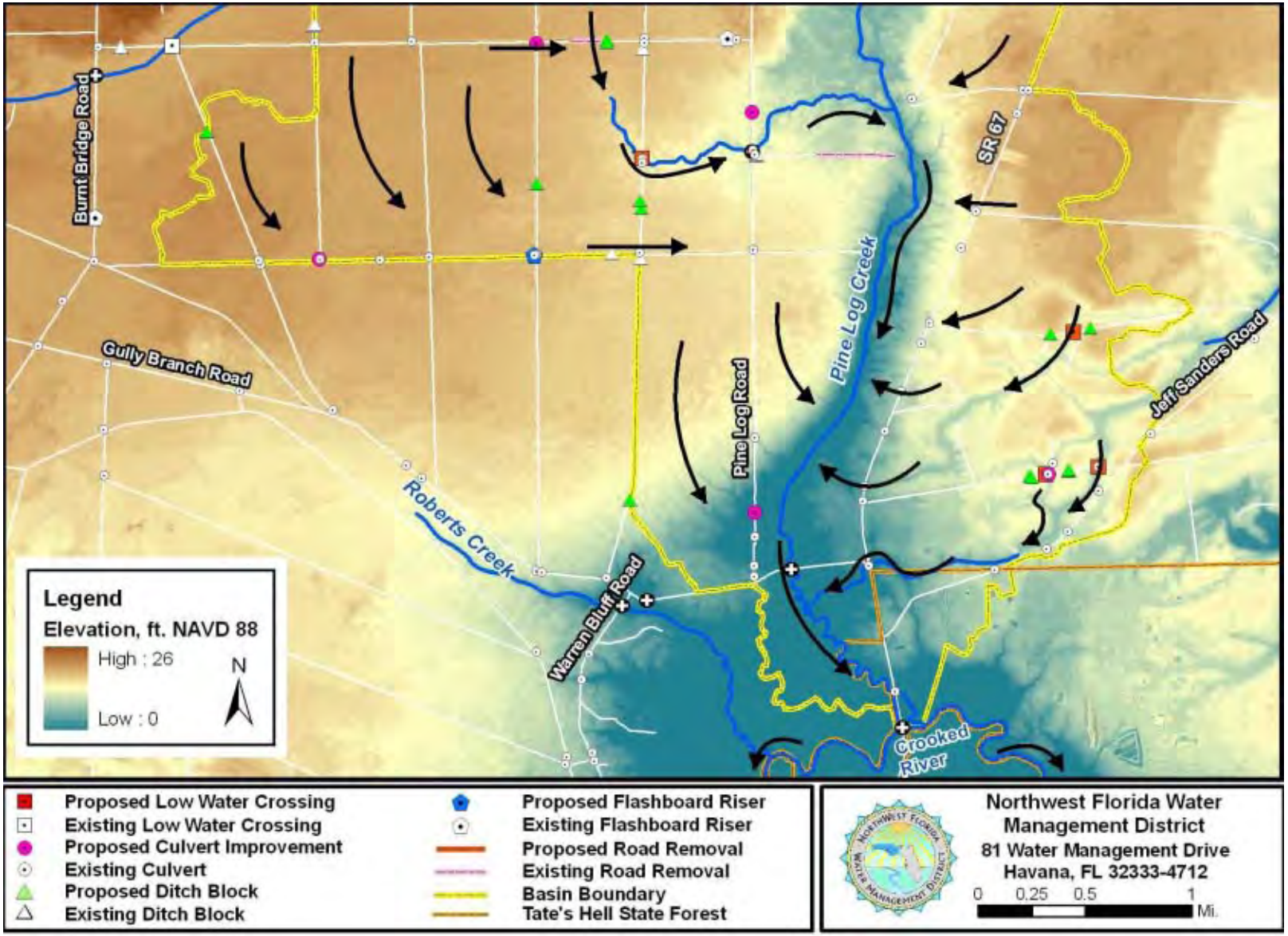


Figure 95. LiDAR elevation data, proposed hydrologic improvements and post-restoration drainage patterns in the southern portion of the Pine Log Creek basin.

Pine Log Creek Hydrologic Enhancements
(Estimated UMAM Credits)

15 September 2010 (IRT Consensus)

Polygon	Acres	L1	L2	W1	W1	C1	C2	W/Out Score	With Score	Raw Delta	Time Lag	PF Factor	Risk	Adjusted Delta	UMAM Credits
Polygon A (Road Removal Site 1, 3, 6, 7)	5.28	0	9	0	8	0	9	0.00	0.87	0.87	1.25	1	1.25	0.55	2.929
Polygon A (Road Removal Site 4 & 5)	6.45	0	8	0	8	0	6	0.00	0.73	0.73	1.25	1	1.00	0.59	3.784
Polygon B (Ditches - Site 1, 3, 6, 7)	3.96	7	9	6	8	4	9	0.57	0.87	0.30	1.25	1	1.25	0.19	0.760
Polygon B (Ditches - Site 4 & 5)	4.84	7	8	6	8	4	6	0.57	0.73	0.17	1.25	1	1.00	0.13	0.645
Polygon C (10 Low-Water-Crossings)	71.39	7	8	7	8	7	8	0.70	0.80	0.10	1.25	1	1.00	0.08	5.711
Polygon D (21 Culvert Modifications)	34.02	7	7	7	8	7	7	0.70	0.73	0.03	1	1	1.00	0.03	1.134
Polygon E (31 Ditch Plugs / Riser)	12.71	7	7	7	9	7	7	0.70	0.77	0.07	1	1	1.00	0.07	0.847
Polygon F (1 Bridge)	6.49	7	8	7	9	7	8	0.70	0.83	0.13	1	1	1.00	0.13	0.865
	145.14														**16.68**

L1/L2 - Location and Landscape Support (L1 = Without Mitigation / L2 = W/Mitigation)

W1/ W2 - Water Environment (W1 = Without Mitigation / W2 = With Mitigation)

C1/C2 - Community Structure (C1 = Without Mitigation / C2 = With Mitigation)

Raw Delta = w/Mitigation Score - Without Mitigation Score

P = Preservation Factor (0 to 1; value is less than 1 ONLY for preservation-only mitigation)

Time Lag (T) = 1 (none) to 3.91 (>55 years)

Risk (R) = 1 (minimal) to 3 (high)

Adjusted Delta = (Raw Delta * PF) / (Time Lag * Risk)

UMAM Functional Gain = * Adjusted Delta * Acres

(Note: Site 2 Road-Removal Dropped)

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon A (Road Removal - Site 1, 3, 6, 7)**

FLUCCS code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
640 (Vegetated Non-Forested)	**---**	**Mitigation**	**5.28 Acres**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Apalachicola	**III**	**---**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Component of Tates Hell Swamp with myriad connections to other wetlands and surface waters. However, hydrologic connections have been extensively modified by a network of logging roads and ditches.

Assessment area description

Road-fill (i.e., logging road) in historic wetland.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Tates Hell State Forest	**Not unique.**

Functions	Mitigation for previous permit/other historic use
Water storage; water quality; floral and faunal habitat.	**None**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
---	**---**

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.)

Additional relevant factors

Assessment conducted by	Assessment date(s)
IRT Consensus	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon A (Road Removal Site 1, 3, 6, 7)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/out mit	w/mit	
.500(6)(a) Location and Landscape Support	0	9	**Without Mitigation** - Not a wetland (continued use as a forest access road). **With Mitigation** - Removal of road; natural regeneration of native wetland vegetation; improved connectivity between adjacent wetlands; restoration of natural hydrologic flows.
.500(6)(b)Water Environment (N/A for Uplands)	0	8	**Without Mitigation** - Not a wetland (continued existence of forest road and disruption of natural hydrologic flows). **With Mitigation** - Restoration of wetland hydrology.
.500(6)(c)Community structure Vegetation and/or Benthic Community	0	9	**Without Mitigation** - Not a wetland (continued existence as a forest road). **With Mitigation** - Reestablishment of native wetland vegetation via natural recruitment from adjacent wetlands.

Score = sum of above scores/30 (if uplands, divide by 20)	w/out mit	w/mit
	0.00	0.87

Raw Delta = [w/mit - w/out mit]
0.87

Preservation Adjustment Factor (PF) =	**1**
Time Lag Factor (6-10 Years) =	**1.25**
Risk Factor =	**1.25**
Adjusted Delta [(Raw Delta * PF) / (T * R)] =	**0.55**

UMAM Functional Assessment	
Polygon Acreage =	**5.28**
Functional Gain w/Mitigation (Adjusted Delta * Acres) =	**2.93**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon B (Ditches - Site 1, 3, 6, 7)**

FLUCCS code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
640 (Vegetated Non-Forested)	**---**	**Mitigation**	**3.96 Acres**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Apalachicola	**III**	**---**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Wetlands adjacent and contiguous to Shoal River. Generally surrounded by natural buffers in need of ecological management.

Assessment area description

Ditch adjacent to logging road.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Tates Hell State Forest	**Not unique.**

Functions	Mitigation for previous permit/other historic use
Water storage; water quality; floral and faunal habitat.	**None**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.)

Additional relevant factors

Assessment conducted by	Assessment date(s)
IRT Consensus	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon B (Ditches - Site 1, 3, 6, 7)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/out mit	w/mit	
.500(6)(a) Location and Landscape Support	7	9	**Without Mitigation** - Continued roadside ditch wetlands. **With Mitigation** - Elimination of ditches and adjacent road, restoration of native vegetation, and more natural hydrologic flows.
.500(6)(b)Water Environment (N/A for Uplands)	6	8	**Without Mitigation** - Rapid, unnatural drainage from continued existence of roadside ditches. **With Mitigation** - Restoration of more natural hydrologic flows.
.500(6)(c)Community structure Vegetation and/or Benthic Community	4	9	**Without Mitigation** - Roadside ditches. **With Mitigation** - Restoration of native vegeation via natural recruitment.

Score = sum of above scores/30 (if uplands, divide by 20)	w/out mit	w/mit
	0.57	0.87

Raw Delta = [w/mit - w/out mit]
0.30

Preservation Adjustment Factor (PF) =	**1**
Time Lag Factor (6-10 Years) =	**1.25**
Risk Factor =	**1.25**
Adjusted Delta [(Raw Delta * PF) / (T * R)] =	**0.19**

UMAM Functional Assessment	
Polygon Acreage =	**3.96**
Functional Gain w/Mitigation (Adjusted Delta * Acres) =	**0.76**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon A (Road Removal - Site 4 & 5)**

FLUCCS code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
640 (Vegetated Non-Forested)	**---**	**Mitigation**	**6.45 Acres**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Apalachicola	**III**	**---**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Component of Tates Hell Swamp with myriad connections to other wetlands and surface waters. However, hydrologic connections have been extensively modified by a network of logging roads and ditches.

Assessment area description

Road-fill (i.e., logging road) in historic wetland.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Tates Hell State Forest	**Not unique.**

Functions	Mitigation for previous permit/other historic use
Water storage; water quality; floral and faunal habitat.	**None**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
---	**---**

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.)

Additional relevant factors

Assessment conducted by	Assessment date(s)
IRT Consensus	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon A (Road Removal Site 4 & 5)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/out mit	w/mit	
.500(6)(a) Location and Landscape Support	0	8	**Without Mitigation** - Not a wetland (continued use as a forest access road). **With Mitigation** - Removal of road; natural regeneration of native wetland vegetation; improved connectivity between adjacent wetlands; restoration of natural hydrologic flows.
.500(6)(b)Water Environment (N/A for Uplands)	0	8	**Without Mitigation** - Not a wetland (continued existence of forest road and disruption of natural hydrologic flows). **With Mitigation** - Restoration of wetland hydrology.
.500(6)(c)Community structure Vegetation and/or Benthic Community	0	6	**Without Mitigation** - Not a wetland (continued existence as a forest road). **With Mitigation** - Reestablishment of native wetland vegetation via natural recruitment from adjacent wetlands.

Score = sum of above scores/30 (if uplands, divide by 20)	w/out mit	w/mit
	0.00	0.73

Raw Delta = [w/mit - w/out mit]
0.73

Preservation Adjustment Factor (PF) =	**1**
Time Lag Factor (6-10 Years) =	**1.25**
Risk Factor =	**1**
Adjusted Delta [(Raw Delta * PF) / (T * R)] =	**0.59**

UMAM Functional Assessment	
Polygon Acreage =	**6.45**
Functional Gain w/Mitigation (Adjusted Delta * Acres) =	**3.78**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon B (Ditches - Site 4 & 5)**

FLUCCS code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
640 (Vegetated Non-Forested)	**---**	**Mitigation**	**4.84 Acres**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Apalachicola	**III**	**---**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Wetlands adjacent and contiguous to Shoal River. Generally surrounded by natural buffers in need of ecological management.

Assessment area description

Ditch adjacent to logging road.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Tates Hell State Forest	**Not unique.**

Functions	Mitigation for previous permit/other historic use
Water storage; water quality; floral and faunal habitat.	**None**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.)

Additional relevant factors

Assessment conducted by	Assessment date(s)
IRT Consensus	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon B (Ditches - Site 4 & 5)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/out mit	w/mit	
.500(6)(a) Location and Landscape Support	7	8	**Without Mitigation** - Continued roadside ditch wetlands. **With Mitigation** - Elimination of ditches and adjacent road, restoration of native vegetation, and more natural hydrologic flows.
.500(6)(b)Water Environment (N/A for Uplands)	6	8	**Without Mitigation** - Rapid, unnatural drainage from continued existence of roadside ditches. **With Mitigation** - Restoration of more natural hydrologic flows.
.500(6)(c)Community structure Vegetation and/or Benthic Community	4	6	**Without Mitigation** - Roadside ditches. **With Mitigation** - Restoration of native vegeation via natural recruitment.

Score = sum of above scores/30 (if uplands, divide by 20)	w/out mit	w/mit
	0.57	0.73

Raw Delta = [w/mit - w/out mit]
0.17

Preservation Adjustment Factor (PF) =	**1**
Time Lag Factor (6-10 Years) =	**1.25**
Risk Factor =	**1**
Adjusted Delta [(Raw Delta * PF) / (T * R)] =	**0.13**

UMAM Functional Assessment	
Polygon Acreage =	**4.84**
Functional Gain w/Mitigation (Adjusted Delta * Acres) =	**0.65**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon C (Low-Water-Crossings)**

FLUCCS code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
621 / 625 / 626 / 627 / 630	**---**	**Mitigation**	**11 x 6.49ac (600' Dia) = 64.90 Acres**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Apalachicola	**III**	**---**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Component of Tates Hell Swamp with myriad connections to other wetlands and surface waters. However, hydrologic connections have been extensively modified by a network of logging roads and ditches.

Assessment area description

Low-Water-Crossing Site.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Tates Hell State Forest	**Not unique.**

Functions	Mitigation for previous permit/other historic use
Water storage; water quality; floral and faunal habitat.	**None**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
---	**---**

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.)

Additional relevant factors

Assessment conducted by	Assessment date(s)
IRT Consensus	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon C (10 Low-Water-Crossings)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/out mit	w/mit	
.500(6)(a) Location and Landscape Support	7	8	**Without Mitigation** - Continued blockage of flows. **With Mitigation** - Low-water-crossing installed.
.500(6)(b)Water Environment (N/A for Uplands)	7	8	**Without Mitigation** - Continued blockage of flows. **With Mitigation** - Enhancement of hydrologic flows.
.500(6)(c)Community structure Vegetation and/or Benthic Community	7	8	**Without Mitigation** - Continued blockage of flows. **With Mitigation** - Low-water-crossing installed.

Score = sum of above scores/30 (if uplands, divide by 20)	w/out mit	w/mit
	0.70	0.80

Raw Delta = [w/mit - w/out mit]
0.10

Preservation Adjustment Factor (PF) =	**1**
Time Lag Factor =	**1.25**
Risk Factor =	**1**
Adjusted Delta [(Raw Delta * PF) / (T * R)] =	**0.08**

UMAM Functional Assessment	
Polygon Acreage =	**71.39**
Functional Gain w/Mitigation (Adjusted Delta * Acres) =	**5.71**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon D (Culverts)**

FLUCCS code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
621 / 625 / 626 / 627 / 630	**---**	**Mitigation**	**21 x 1.62ac (300' Dia) = 34.02 Acres**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Apalachicola	**III**	**---**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Component of Tates Hell Swamp with myriad connections to other wetlands and surface waters. However, hydrologic connections have been extensively modified by a network of logging roads and ditches.

Assessment area description

Culvert modification site (either new culvert, replacement, or removal).

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Tates Hell State Forest	**Not unique.**

Functions	Mitigation for previous permit/other historic use
Water storage; water quality; floral and faunal habitat.	**None**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
---	**---**

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.)

Additional relevant factors

Assessment conducted by	Assessment date(s)
IRT Consensus	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon D (21 Culvert Modifications)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/out mit	w/mit	
.500(6)(a) Location and Landscape Support	7	7	**Without Mitigation** - Continued hydrologic alteration. **With Mitigation** - Culvert modification.
.500(6)(b)Water Environment (N/A for Uplands)	7	8	**Without Mitigation** - Continued hydrologic alteration. **With Mitigation** - Enhancement of hydrologic flows.
.500(6)(c)Community structure Vegetation and/or Benthic Community	7	7	**Without Mitigation** - Continued hydrologic alteration. **With Mitigation** - Enhancement of hydrologic flows.

Score = sum of above scores/30 (if uplands, divide by 20)	w/out mit	w/mit
	0.70	0.73

Raw Delta = [w/mit - w/out mit]
0.03

Preservation Adjustment Factor (PF) =	**1**
Time Lag Factor =	**1**
Risk Factor =	**1**
Adjusted Delta [(Raw Delta * PF) / (T * R)] =	**0.03**

UMAM Functional Assessment	
Polygon Acreage =	**34.02**
Functional Gain w/Mitigation (Adjusted Delta * Acres) =	**1.13**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon E (Ditch Plugs / Risers)**

FLUCCS code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
621 / 625 / 626 / 627 / 630	**---**	**Mitigation**	**31 x 0.41ac (150' Dia) = 12.71 Acres**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Apalachicola	**III**	**---**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Component of Tates Hell Swamp with myriad connections to other wetlands and surface waters. However, hydrologic connections have been extensively modified by a network of logging roads and ditches.

Assessment area description

Ditch plug or culvert riser site.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Tates Hell State Forest	**Not unique.**

Functions	Mitigation for previous permit/other historic use
Water storage; water quality; floral and faunal habitat.	**None**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
---	**---**

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.)

Additional relevant factors

Assessment conducted by	Assessment date(s)
IRT Consensus	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon E (31 Ditch Plugs / Riser)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/out mit	w/mit	
.500(6)(a) Location and Landscape Support	7	7	**Without Mitigation** - Continued hydrologic alteration. **With Mitigation** - Enhancement of hydrologic flows.
.500(6)(b)Water Environment (N/A for Uplands)	7	9	**Without Mitigation** - Continued hydrologic alteration. **With Mitigation** - Enhancement of hydrologic flows.
.500(6)(c)Community structure Vegetation and/or Benthic Community	7	7	**Without Mitigation** - Continued hydrologic alteration. **With Mitigation** - Enhancement of hydrologic flows.

Score = sum of above scores/30 (if uplands, divide by 20)	w/out mit	w/mit
	0.70	0.77

Raw Delta = [w/mit - w/out mit]
0.07

Preservation Adjustment Factor (PF) =	**1**
Time Lag Factor =	**1**
Risk Factor =	**1**
Adjusted Delta [(Raw Delta * PF) / (T * R)] =	**0.07**

UMAM Functional Assessment	
Polygon Acreage =	**12.71**
Functional Gain w/Mitigation (Adjusted Delta * Acres) =	**0.85**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon F (Bridge)**

FLUCCS code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
621 / 625 / 626 / 627 / 630	**---**	**Mitigation**	**1 x 6.49ac (600' Dia) = 6.49 Acres**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Apalachicola	**III**	**---**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Component of Tates Hell Swamp with myriad connections to other wetlands and surface waters. However, hydrologic connections have been extensively modified by a network of logging roads and ditches.

Assessment area description

Bridge site.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Tates Hell State Forest	**Not unique.**

Functions	Mitigation for previous permit/other historic use
Water storage; water quality; floral and faunal habitat.	**None**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
---	**---**

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.)

Additional relevant factors

Assessment conducted by	Assessment date(s)
IRT Consensus	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Pine Log Creek Basin (Tates Hell)	**Not Applicable**	**Polygon F (1 Bridge)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

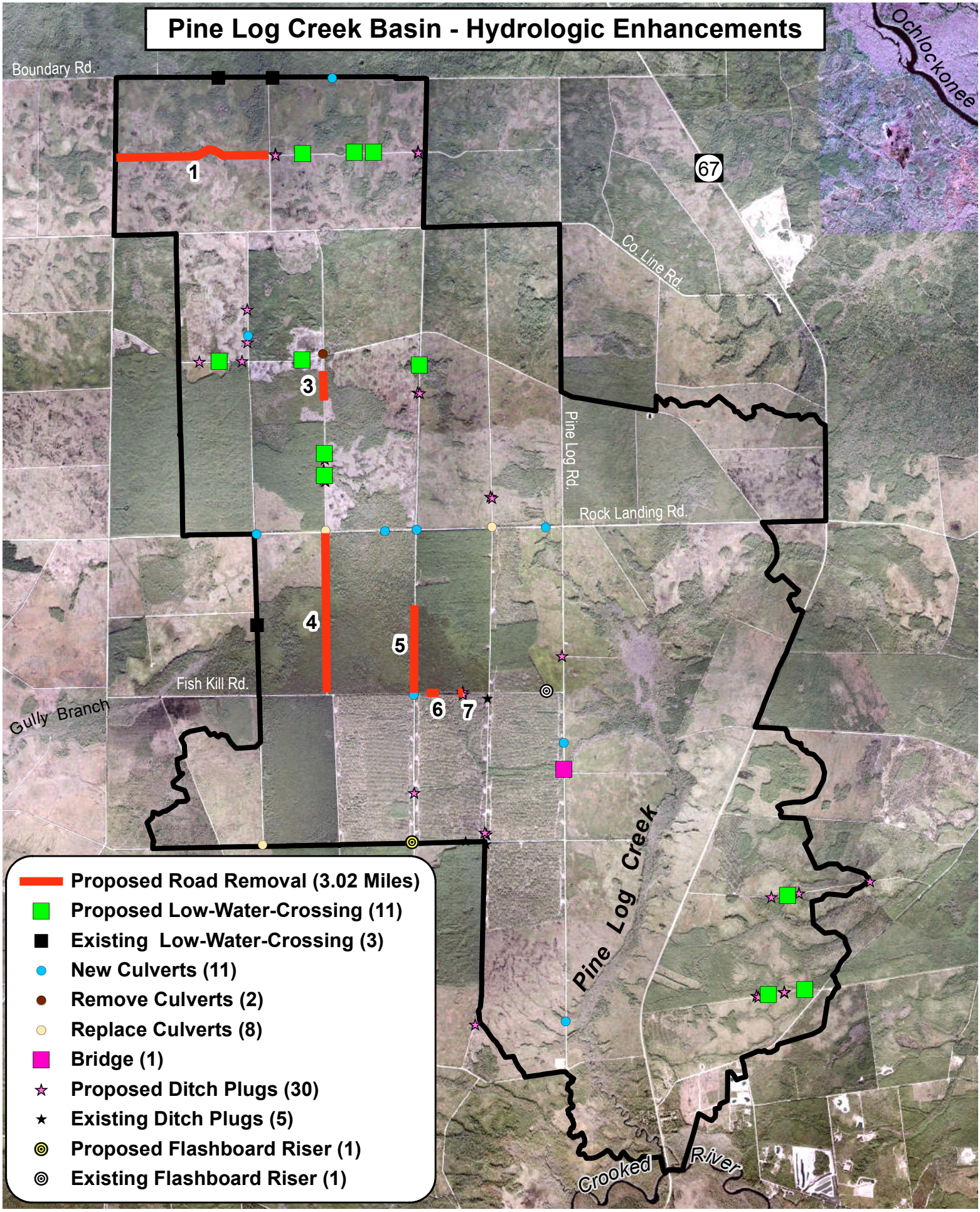
	w/out mit	w/mit	
.500(6)(a) Location and Landscape Support	7	8	**Without Mitigation** - Not a wetland (continued use as a forest access road). **With Mitigation** - Removal of road; natural regeneration of native wetland vegetation; improved connectivity between adjacent wetlands; restoration of natural hydrologic flows.
.500(6)(b)Water Environment (N/A for Uplands)	7	9	**Without Mitigation** - Not a wetland (continued existence of forest road and disruption of natural hydrologic flows). **With Mitigation** - Restoration of wetland hydrology.
.500(6)(c)Community structure Vegetation and/or Benthic Community	7	8	**Without Mitigation** - Not a wetland (continued existence as a forest road). **With Mitigation** - Reestablishment of native wetland vegetation via natural recruitment from adjacent wetlands.

Score = sum of above scores/30 (if uplands, divide by 20)	w/out mit	w/mit
	0.70	0.83

Raw Delta = [w/mit - w/out mit]
0.13

Preservation Adjustment Factor (PF) =	**1**
Time Lag Factor =	**1**
Risk Factor =	**1**
Adjusted Delta [(Raw Delta * PF) / (T * R)] =	**0.13**

UMAM Functional Assessment	
Polygon Acreage =	**6.49**
Functional Gain w/Mitigation (Adjusted Delta * Acres) =	**0.87**


Pine Log Creek Basin - Hydrologic Enhancements
Boundary Rd.
Ochlocknee
67
Co. Line Rd.
Pine Log Rd.
Rock Landing Rd.
Fish Kill Rd.
Gully Branch
Pine Log Creek
Crooked River
1
3
4
5
6
7
Proposed Road Removal (3.02 Miles)
Proposed Low-Water-Crossing (11)
Existing Low-Water-Crossing (3)
New Culverts (11)
Remove Culverts (2)
Replace Culverts (8)
Bridge (1)
Proposed Ditch Plugs (30)
Existing Ditch Plugs (5)
Proposed Flashboard Riser (1)
Existing Flashboard Riser (1)
0
2.5
5
Miles

Summary of Twelve Components of the Compensatory Mitigation Plan

(Whiskey George / Sumatra Unit)

Northwest Florida Water Management District
In-Lieu Fee Program

Tates Hell (Whiskey George/Sumatra Units) Mitigation Area

(Summary of 12 Elements Required by § 332.4(c) of the 2008 EPA/USACE Final Compensatory Mitigation Rule for All In-Lieu Fee Program Project Plans; See Attached Whiskey George / Sumatra Property Mitigation Documents for Additional Explanation and Detail)

January 2009 (Minor updates September 2014)

1—Objectives

The primary objectives of the Whiskey George / Sumatra project are to restore historic surface water drainage patterns and wetland vegetative communities to enhance the quality and timing of surface water runoff flowing from the Whiskey George Creek watershed to East Bay. East Bay is a productive estuarine system that serves as the primary nursery area for many commercial fish species and other marine organisms within the Apalachicola Bay system. The Apalachicola River and Bay system has been recognized as a resource of state, national, and international importance. The bay has been designated an Outstanding Florida Water, a State Aquatic Preserve, and an International Biosphere Reserve. In recognition of the Bay's importance and the need to protect and enhance this watershed, the Apalachicola Bay system is designated as the highest priority watershed within the NWFWMD Surface Water Improvement and Management (SWIM) Program.

2—Site Selection Criteria

Much of the present day Tates Hell State Forest was once a mosaic of wet prairies, hydric pine flatwoods, cypress sloughs, and other vegetative communities. However, intensive silvicultural operations have altered the natural landscape. Between the 1950s and 1980s, extensive areas were converted to slash pine (*Pinus elliottii*) plantation, with many pine stands being bedded and fertilized. Fire was often suppressed. More than 800 miles of roads were constructed to support logging operations and ditches were excavated along most roads to provide road-fill material and drain adjacent wetlands. These silvicultural activities have adversely impacted the hydrology and ecology of historic vegetative communities and have affected the magnitude, timing, and quality of surface water runoff discharged to the Apalachicola Bay system and surrounding waters.

In 1994, the State of Florida began purchasing the property from timber companies with the goal of restoring natural vegetative communities, re-establishing historic surface water drainage patterns, and improving and protecting the quality of surface water runoff discharged from the area to the Apalachicola Bay system and surrounding waters. The Northwest Florida Water Management initiated the land acquisition process with the $3.5 million purchase of the Glawson tract in 1994. To date, the land acquired for Tates Hell State Forest totals nearly 205,000 acres. Tates Hell State Forest is managed by the Florida Forest Service.

3—Site Protection Instrument

The NWFWD will be responsible for the perpetual management of the Whiskey George / Sumatra mitigation project implemented within Tates Hell State Forest. The NWFWMD works cooperatively with the Florida Forest Service to coordinate management activities such as shrub reduction, revegetation, thinning of trees, and prescribed burning in restoration areas. The

NWFWMD has developed a comprehensive, hydrologic restoration plan for the entire Tates Hell State Forest, which prioritizes future restoration activities, provides specifications for site maintenance and environmental monitoring, and clarifies agency roles and responsibilities.

As a component of Tates Hell State Forest, Whiskey George / Sumatra is managed in accordance with the State of Florida land management policies. The Tates Hell lands and natural resources are managed using a stewardship ethic that assures these resources will be available for the benefit and enjoyment of all people of the state, both present and future. All management strategies, where feasible and consistent with the goals of protection and conservation of natural resources, shall:

- Restore, maintain, and protect in perpetuity all native ecosystems, insuring the long-term viability of populations and species considered rare, endangered, threatened, or of special concern
- Integrate human use through a multiple-use concept, not emphasizing any particular use over the others
- Protect known archeological and historical resources
- Practice sustainable forest management utilizing sound silvicultural techniques

4—Baseline Information
See "Tates Hell State Forest Hydrologic Restoration Plan"

Maps (see attached figures)

- Map of Tates Hell State Forest
- Location of restoration areas within the Whiskey George Creek watershed
- 1953 B&W aerials
- 2004 and 2007 DOQs
- Historic vegetative communities delineated by FNAI
- LiDAR digital elevation model (DEM)
- Soils (NRCS)
- Existing habitat cover (FLUCCS)
- Target habitat cover (FLUCCS)
- UMAM mitigation polygons

5—Determination of Credits
Mitigation credits were determined by the Uniform Mitigation Assessment Method (UMAM). The UMAM credit determination of 21.84 was approved by USACE. Release of mitigation credits will be determined by the USACE in consultation with a mitigation review team.

6—Detailed Work Plan
This project includes two separate restoration areas within the Whiskey George Creek watershed: the Sumatra Savannas area and the Whiskey George Savannas area. See the attached Whiskey George Creek Basin plan for detailed work plans.

7—Maintenance Plan
This site will be actively maintained by NWFWMD and the Florida Forest Service. The District will be responsible for revegetation, brush reduction, site inspections, environmental monitoring, and maintenance of low water crossings and ditch plugs. Following the establishment of the vegetation planted in the former road and ditch footprints, the Florida Forest Service will resume

periodic prescribed burns. The District will coordinate with the Florida Forest Service to ensure that appropriate fire regimes are maintained in the Sumatra Savanna and Whiskey George Savanna areas. With an appropriate fire regime, both project areas are expected to be largely or fully self-sustaining. However, manual brush reduction will be implemented as needed to manage invasive titi.

8—Performance Standards

- Nuisance vegetation ≤ 5% cover of site.
- Exotic vegetation ≤ 1% cover of site.
- No observable decline in vegetation community health
- Native groundcover and shrub layer species appropriate for natural community type trending toward increase in diversity and coverage.

9—Monitoring

Monitoring protocols necessary to ensure effective preservation, enhancement, restoration and management will be conducted annually for a minimum of five years from the start of mitigation activities or as required by USACE permit conditions. Monitoring will be performed by NWFWMD staff or qualified consulting firms. Annual reports will be generated and posted at www.NWFWMDwetlands.com (or any successor website). Specific monitoring for this site will include annual panoramic photos at established points.

10—Long-term Management

The Hydrologic Restoration Plan includes specific guidelines for long-term site maintenance and management activities that are based on the broader objective of restoring a mosaic of historic vegetative community types across the Tates Hell State Forest.

The NWFWMD is responsible for ensuring the perpetual management of mitigation lands. The NWFWMD will continue to coordinate with the Florida Forest Service regarding land management activities (e.g. prescribing burning, control of titi). Site inspections will be performed annually to ensure performance criteria are being achieved and to confirm that ditch plugs, low water crossings, and culverts are functioning properly to meet restoration goals.

11—Adaptive Management Plan

If changes in the implementation of this mitigation plan become necessary due to the stochastic nature of ecological processes, the NWFWMD will first obtain approvals from the USACE.

12—Financial Assurances

The NWFWMD is a governmental entity created by the Florida Water Resources Act of 1972 with the mission of protecting water resources protection and ecosystem integrity. Funds are specifically earmarked to implement and maintain mitigation.

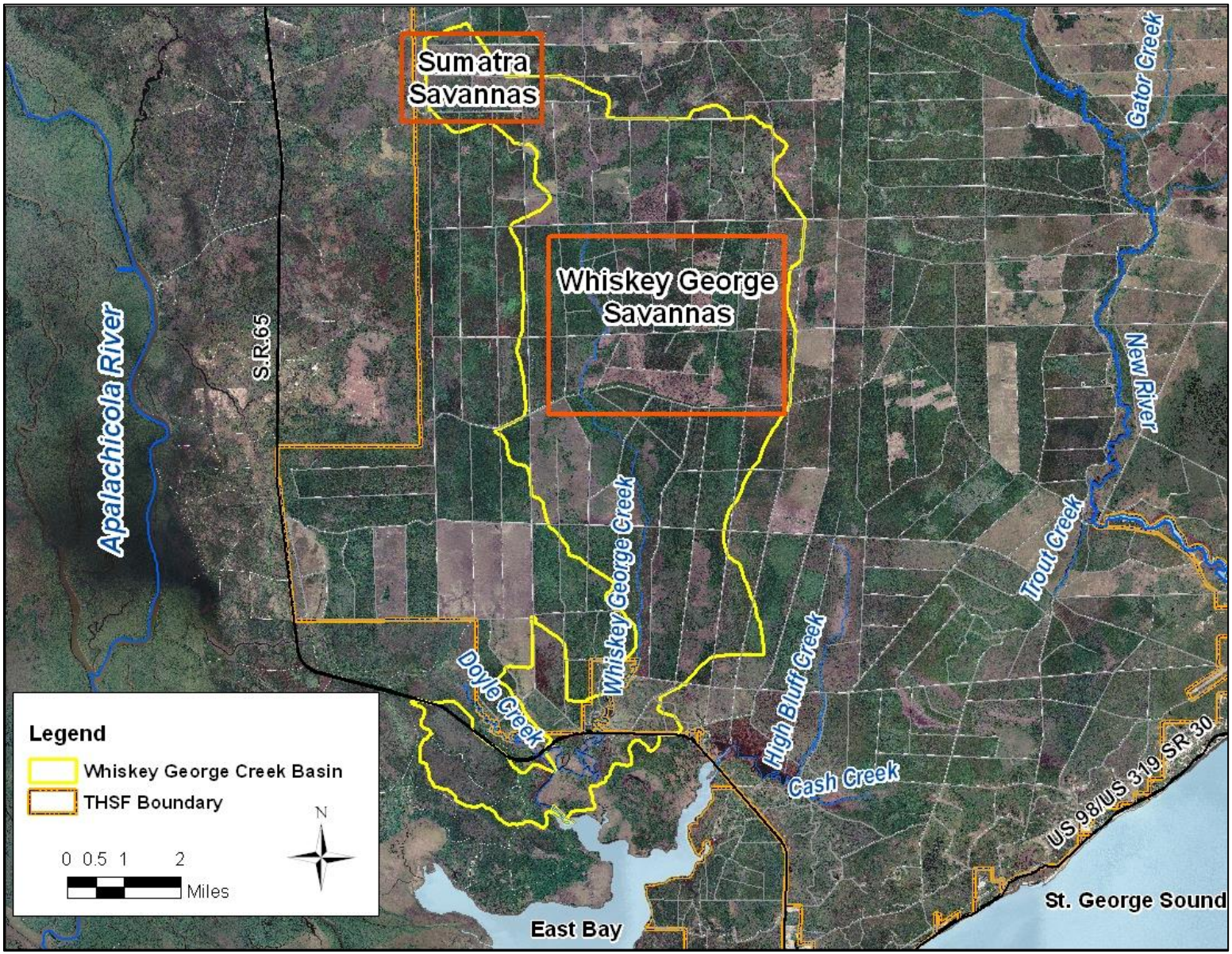
As of July, 2014, the NWFWMD had greater than $15,000,000 available in a dedicated mitigation fund. This fund was established to receive payment from sales of mitigation credits and to ensure adequate funding for the implementation and long-term management of mitigation sites, in accordance with 62-342.850 FAC.

Other Information

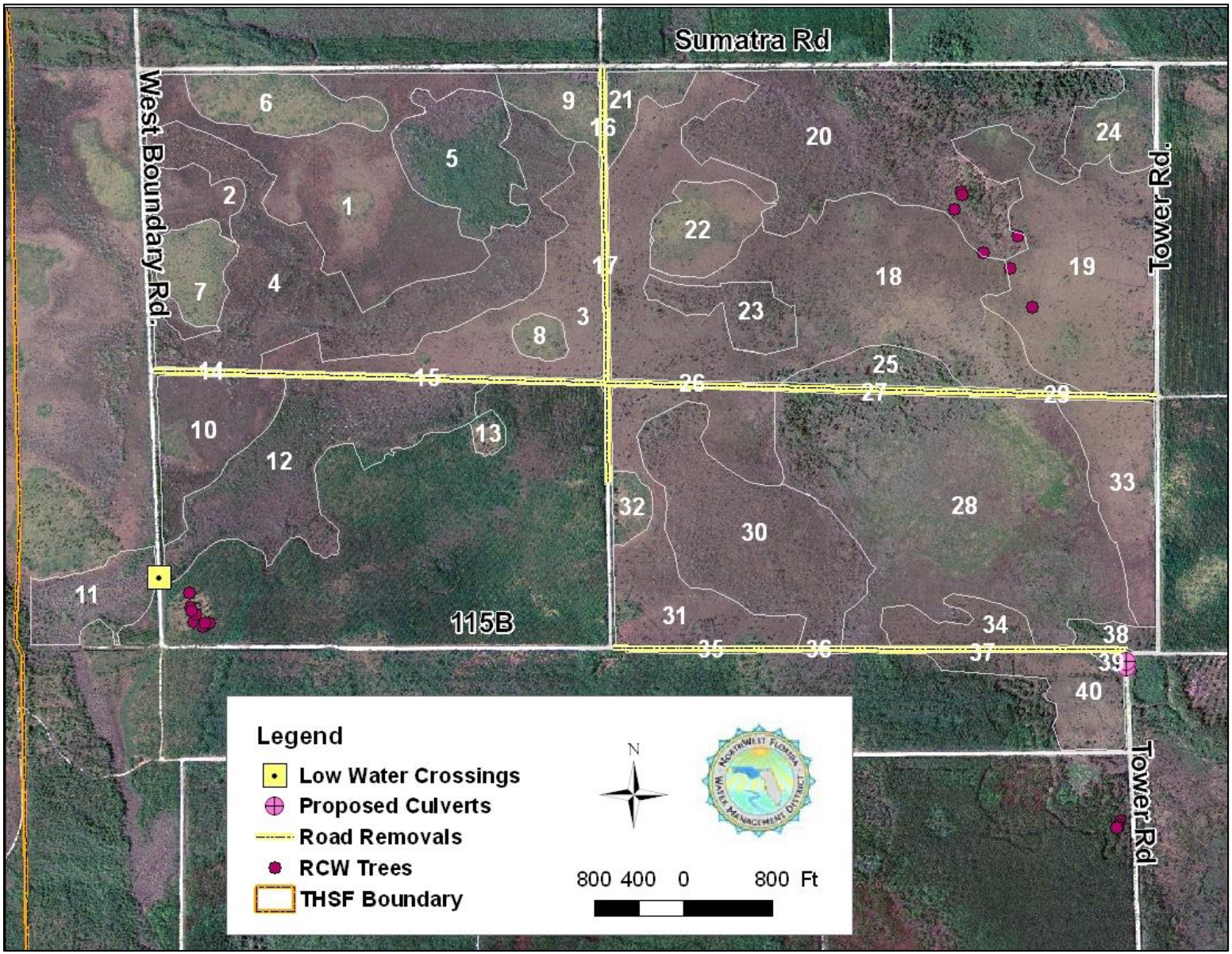
Any additional information requested by the USACE to determine the appropriateness, feasibility, and practicability of this compensatory mitigation project will be provided.

Tates Hell State Forest Location Map

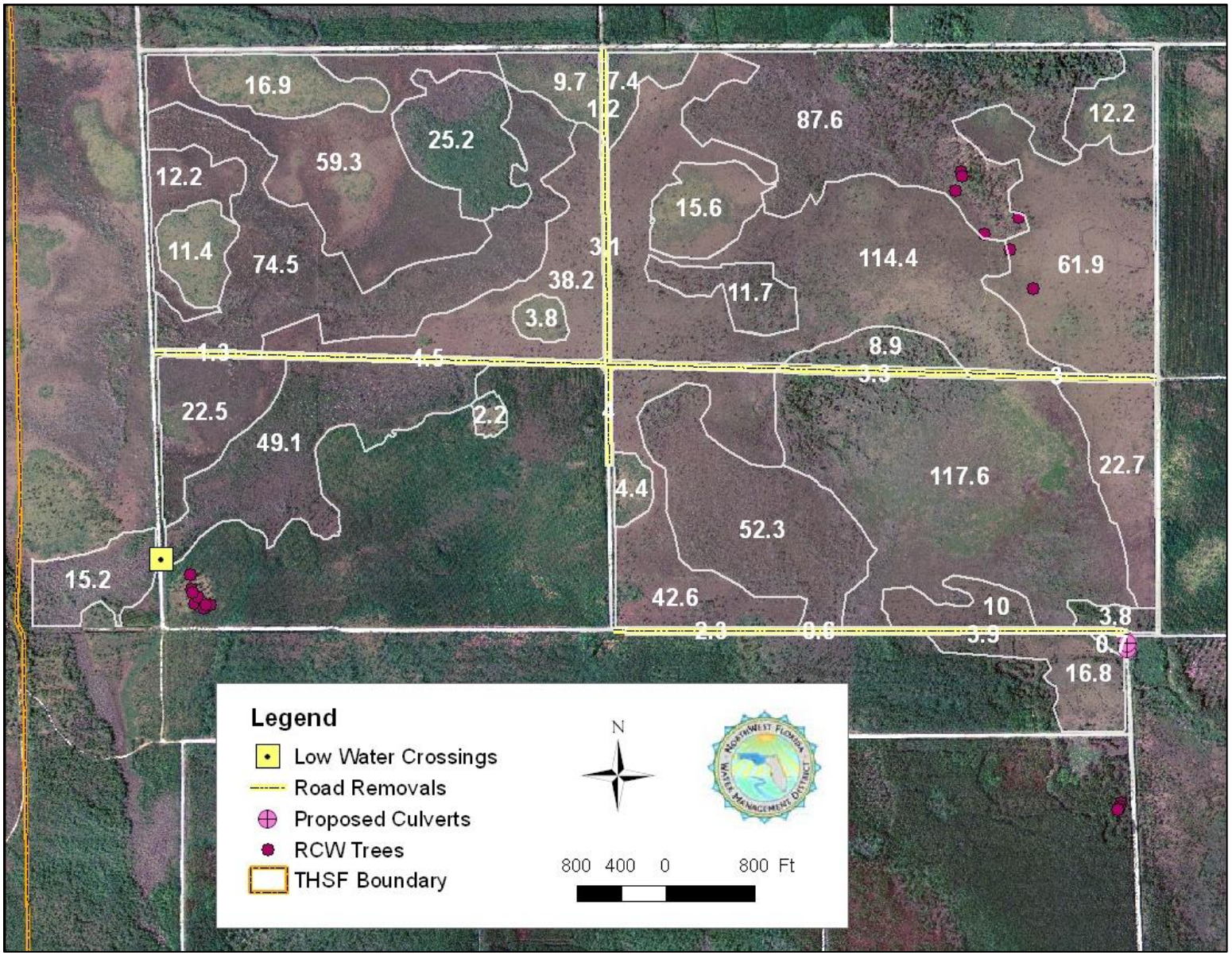
Location of Sumatra Savannas and Whiskey George Savannas Areas



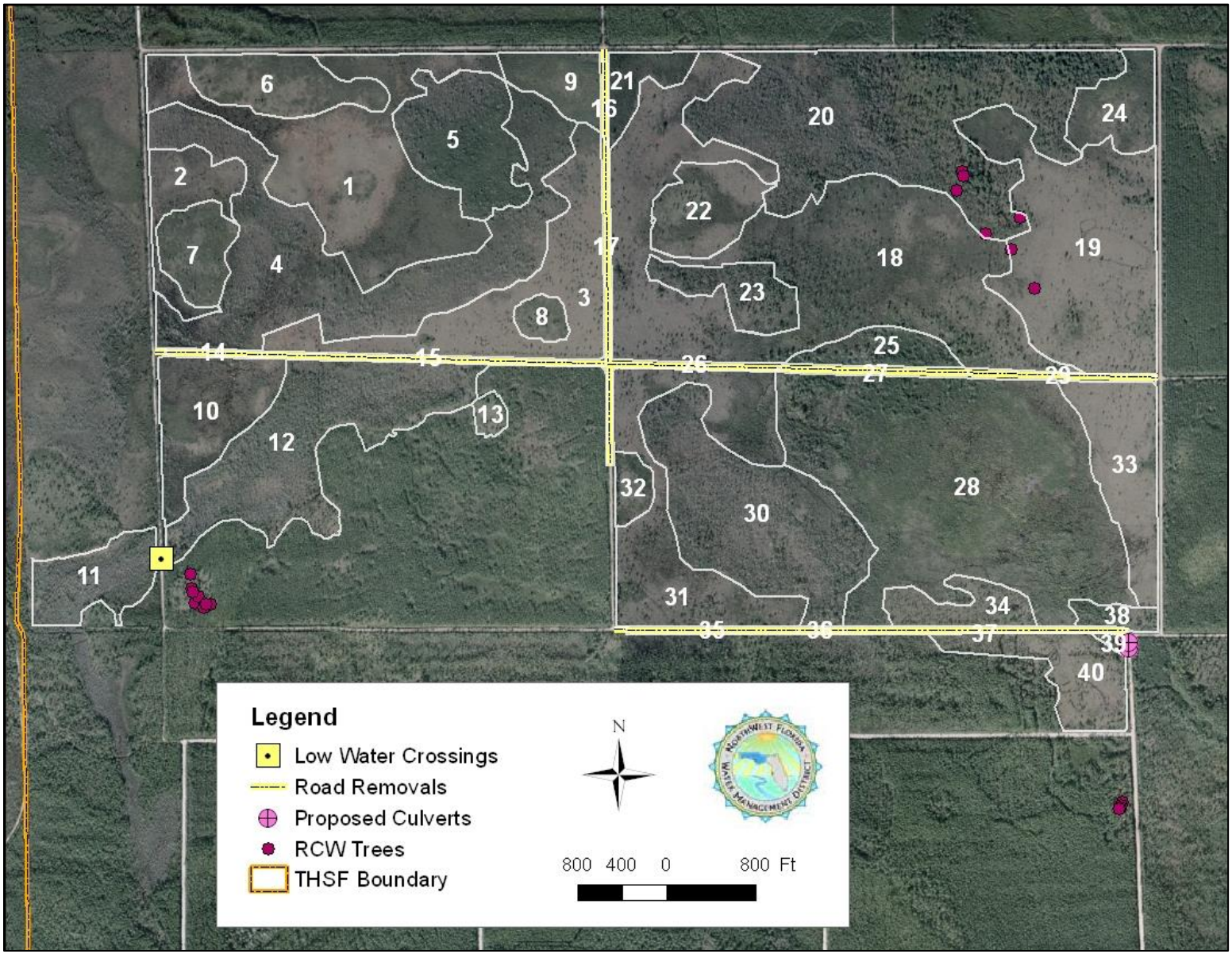
Mitigation Polygons in Sumatra Savannas Area (2004 Aerial Photography)



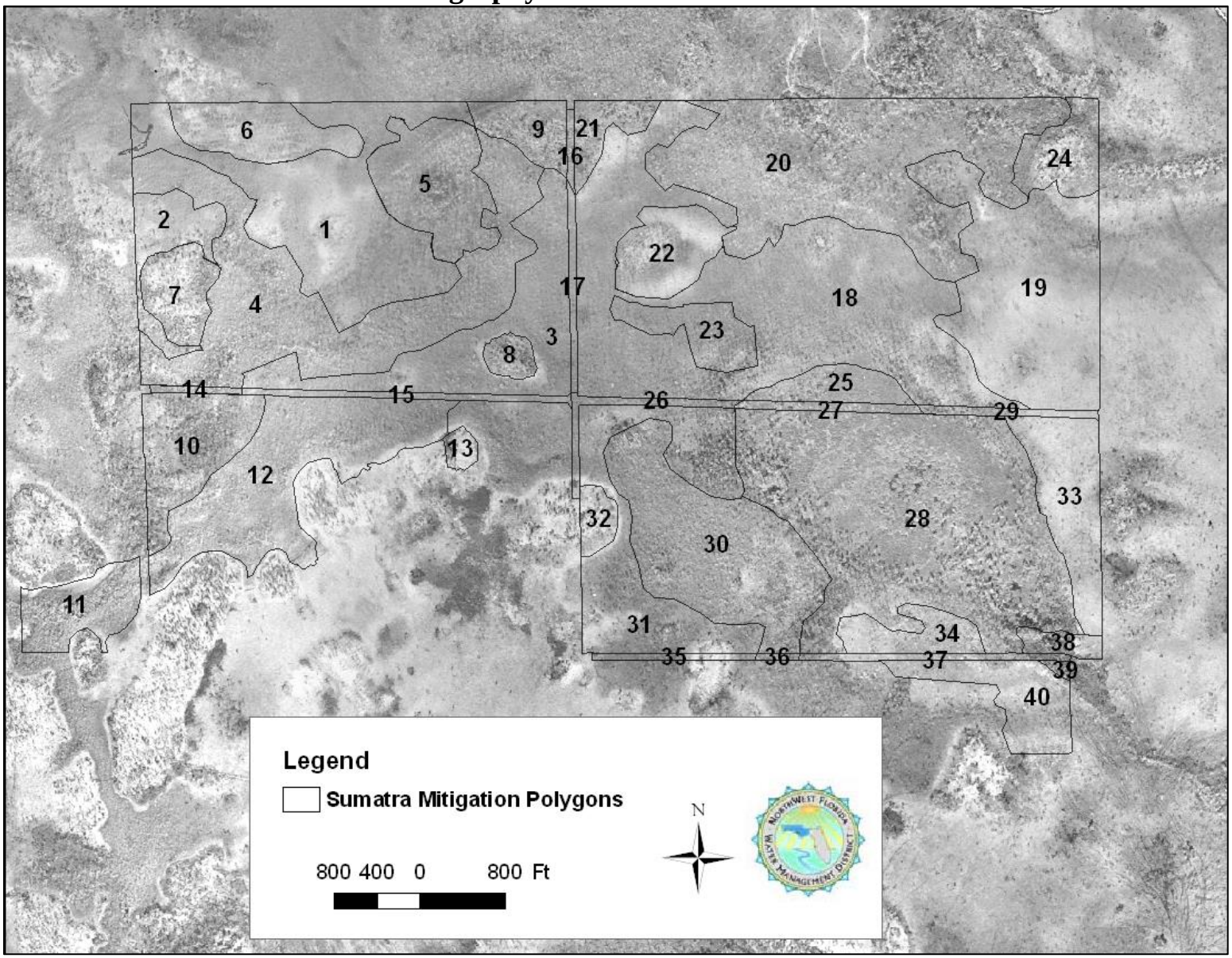
Acreages of Mitigation Polygons in Sumatra Savannas Area (2004 Aerial Photography)



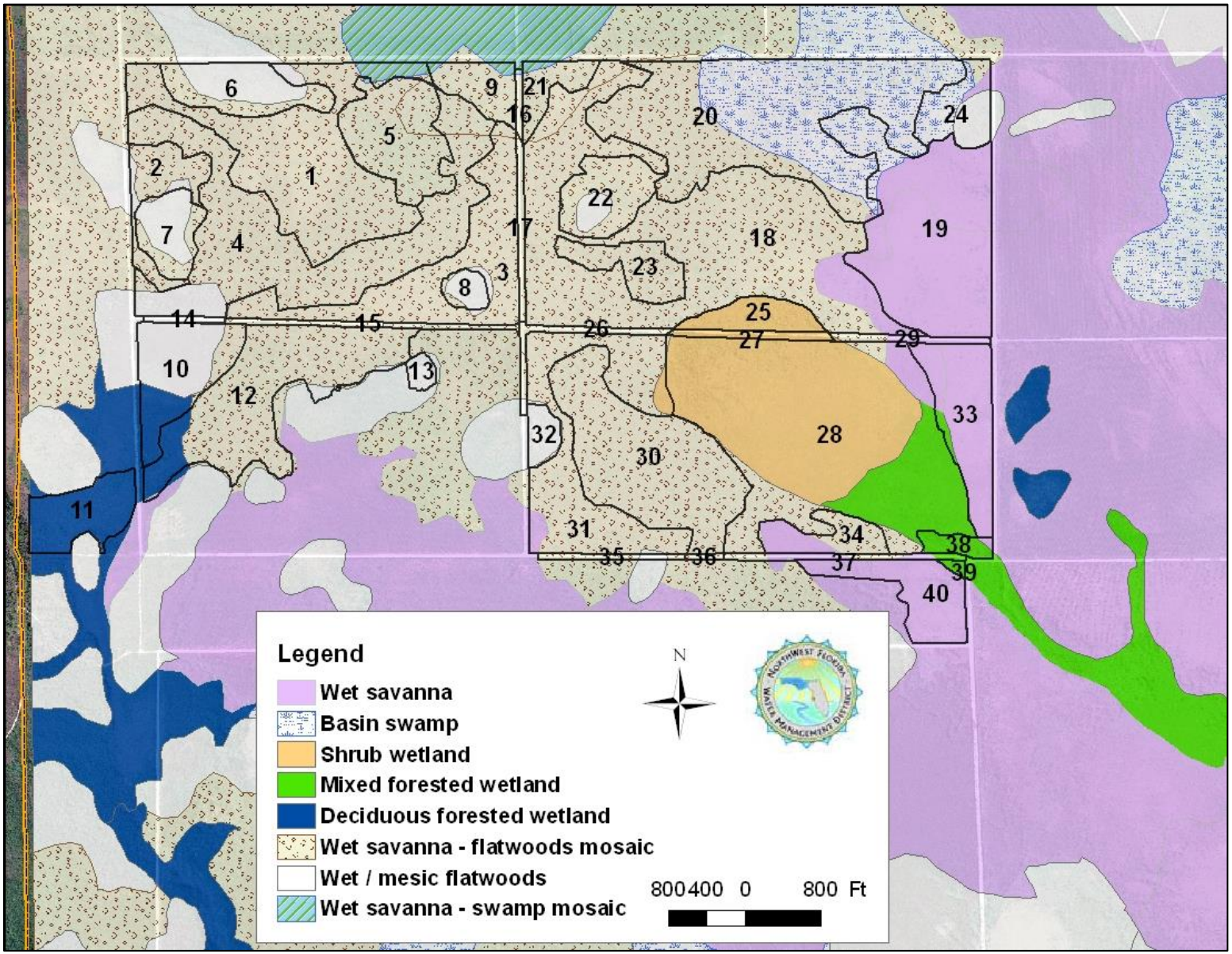
Mitigation Polygons in Sumatra Savannas Area (2007 Aerial Photography)



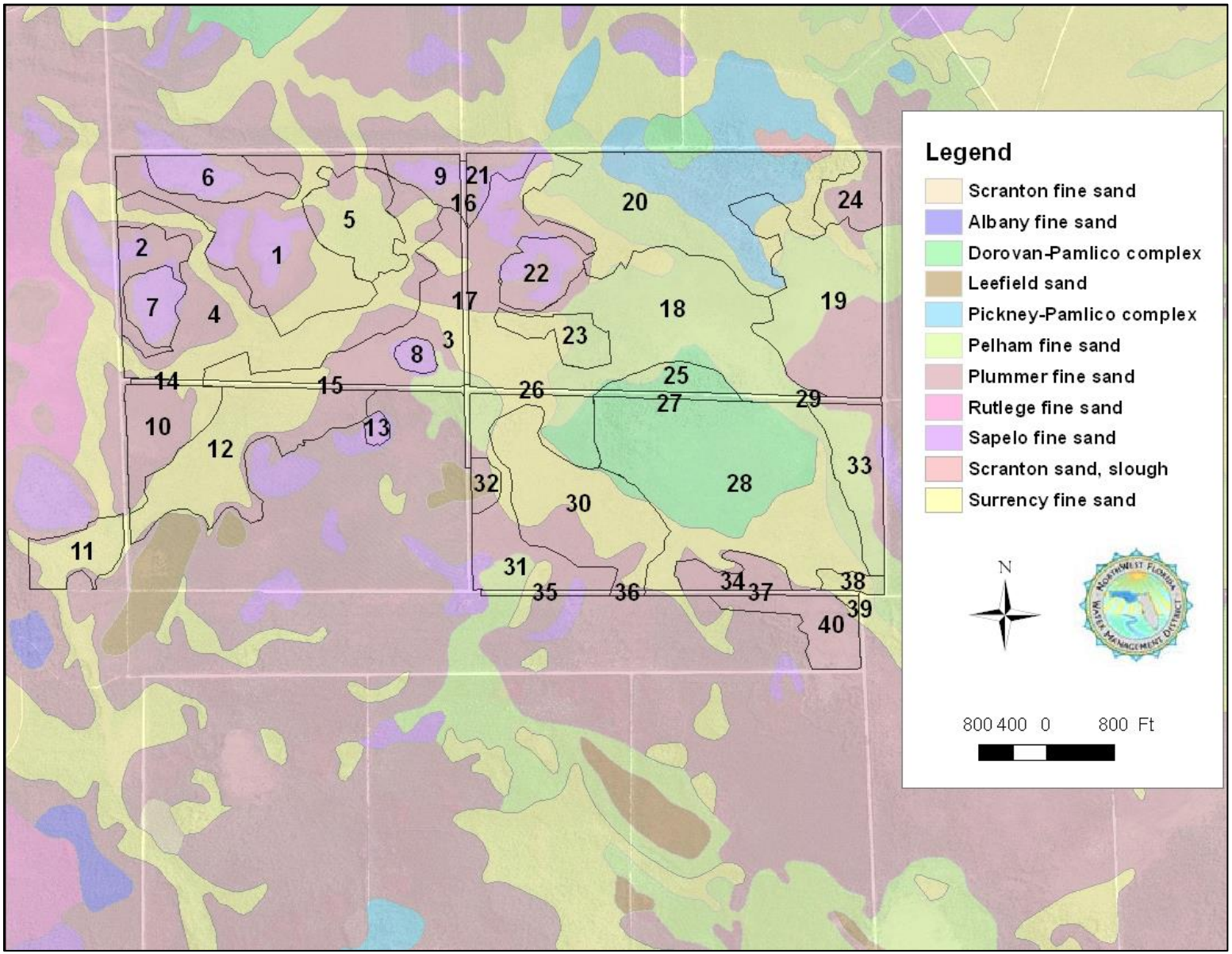
1953 Black and White Aerial Photography for the Sumatra Savannas Area



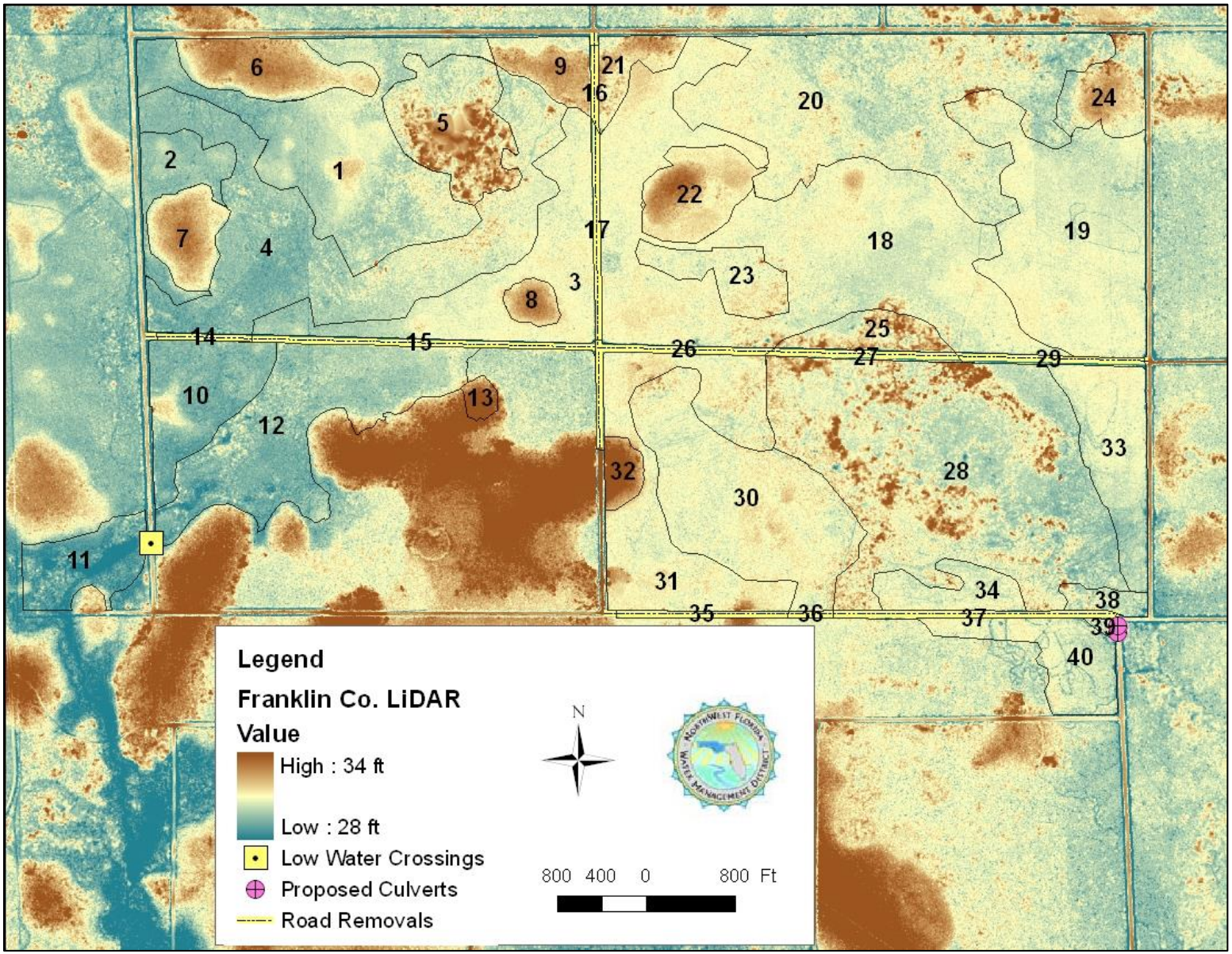
Historic Vegetation in Sumatra Savannas Area with Mitigation Polygons Overlay (FNAI 2000)



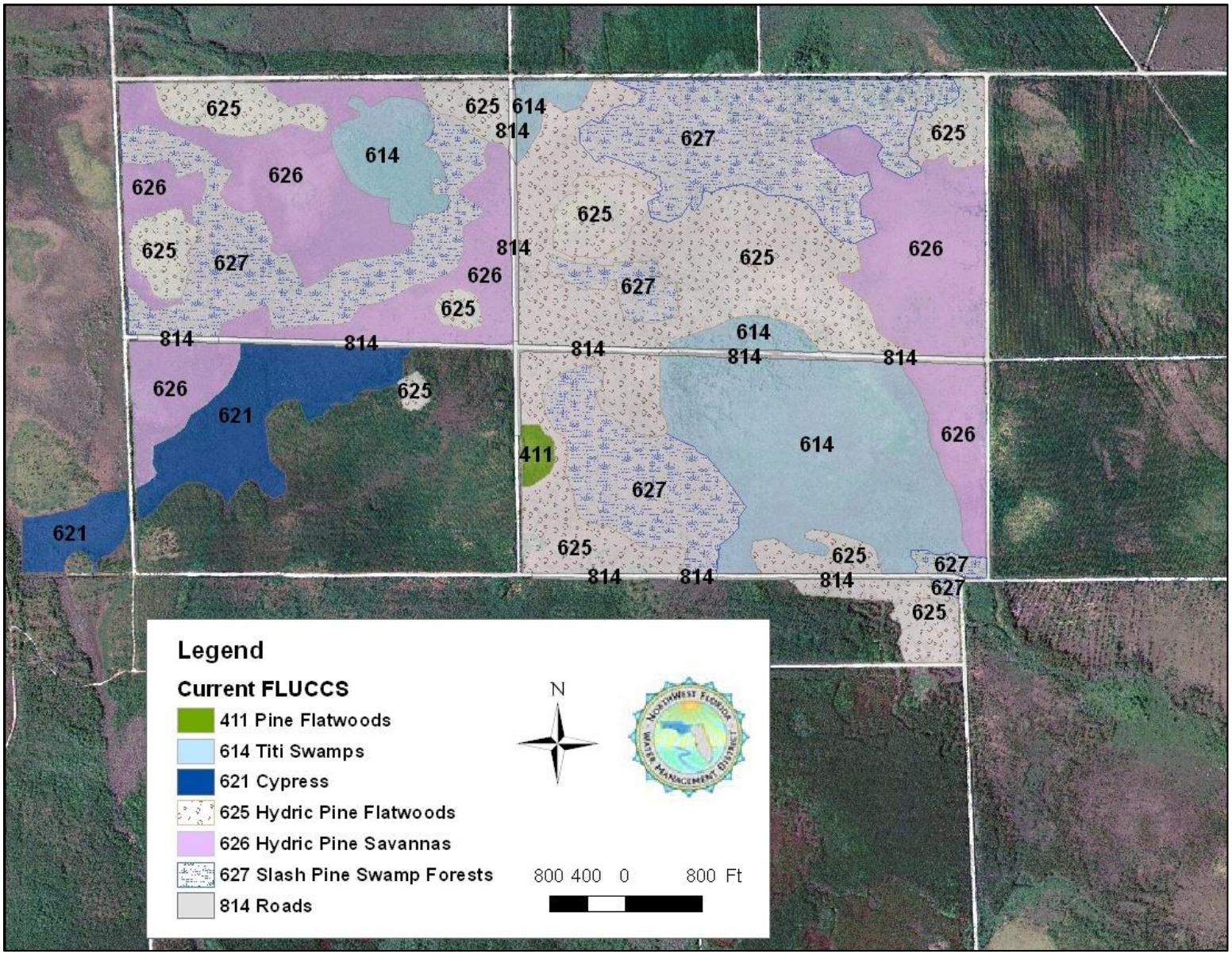
Soils in the Sumatra Savannas Area



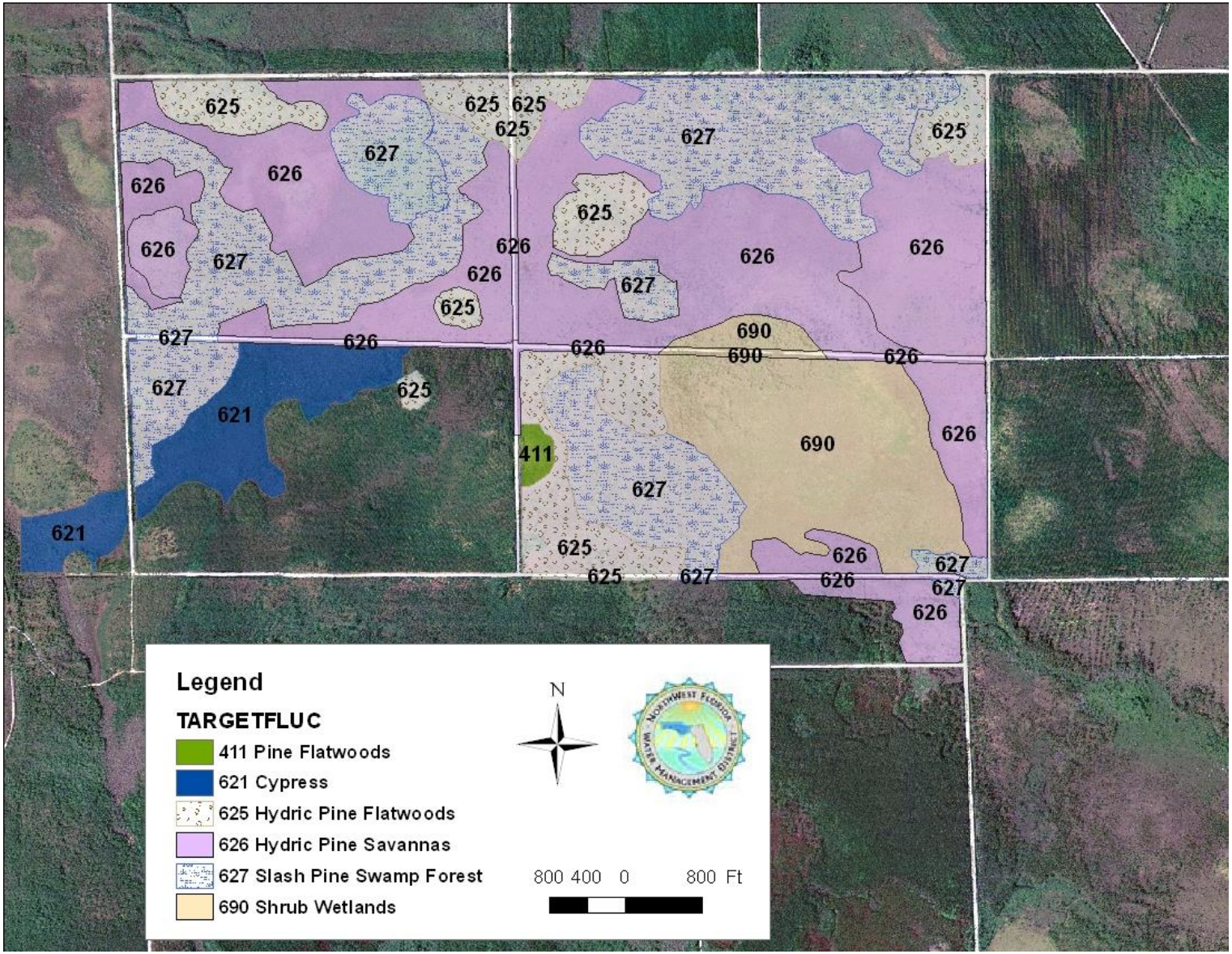
Digital Elevation Map for the Sumatra Savannas Area



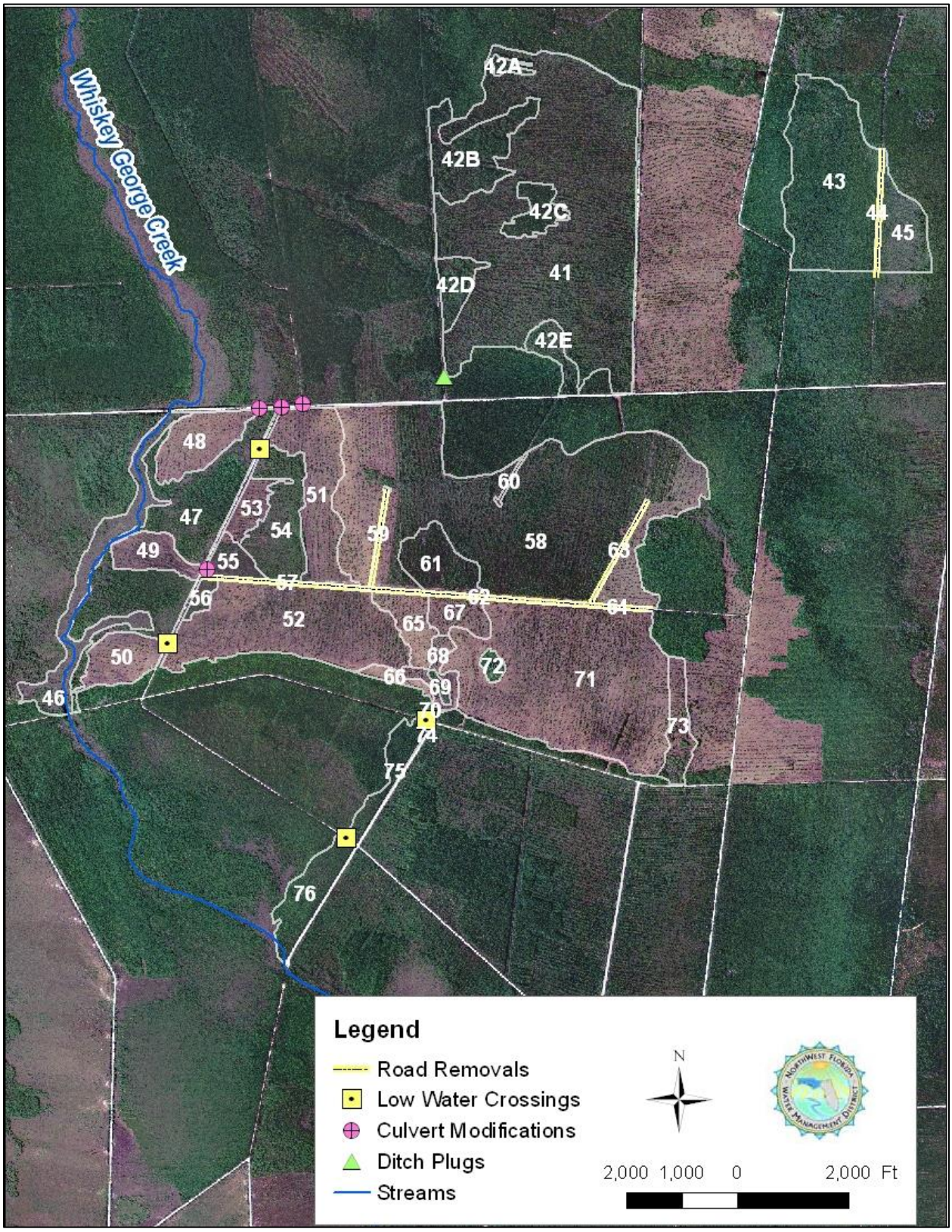
Current Habitat Types (FLUCCS) in the Sumatra Savannas Area



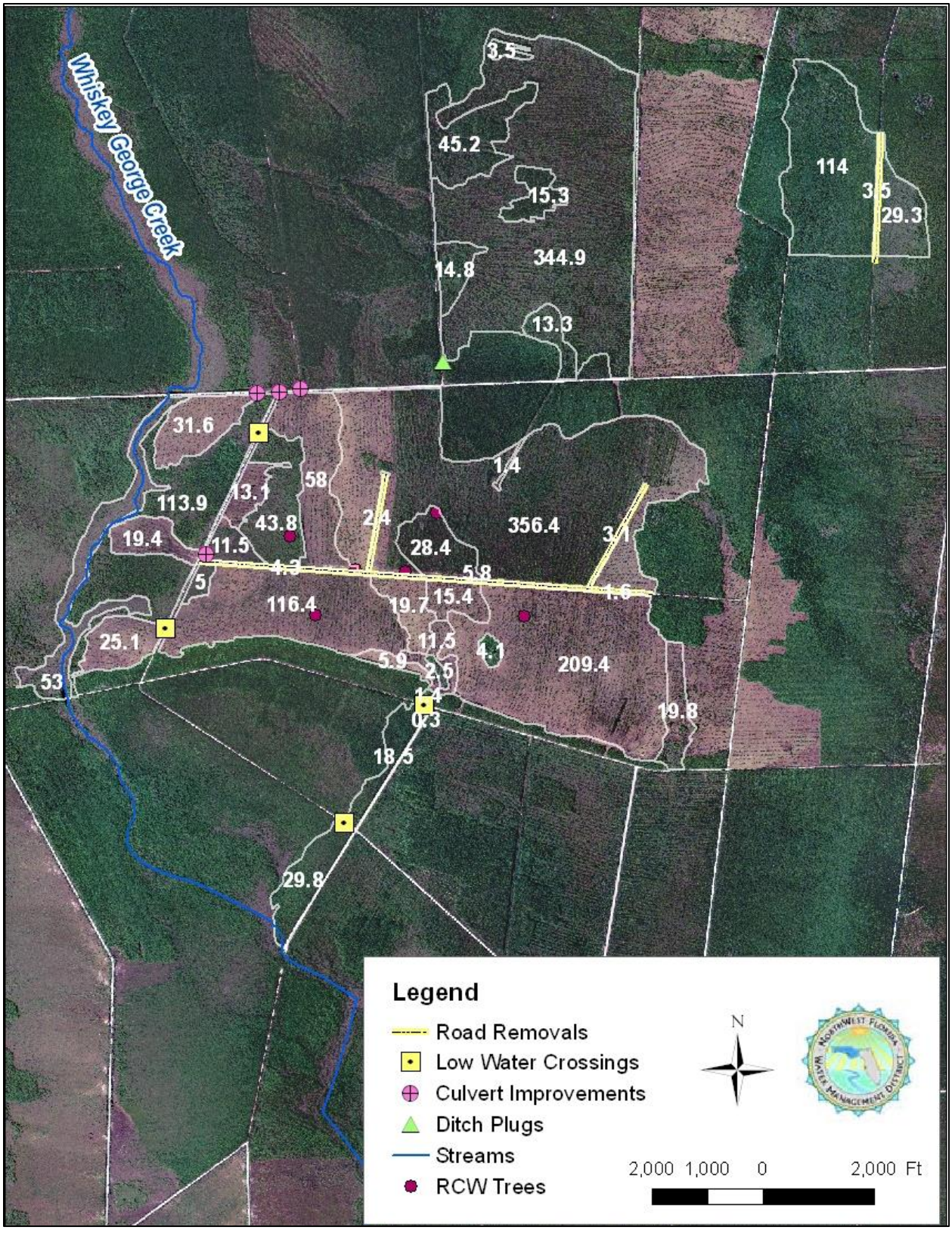
Target Habitat Types (FLUCCS) in the Sumatra Savannas Area



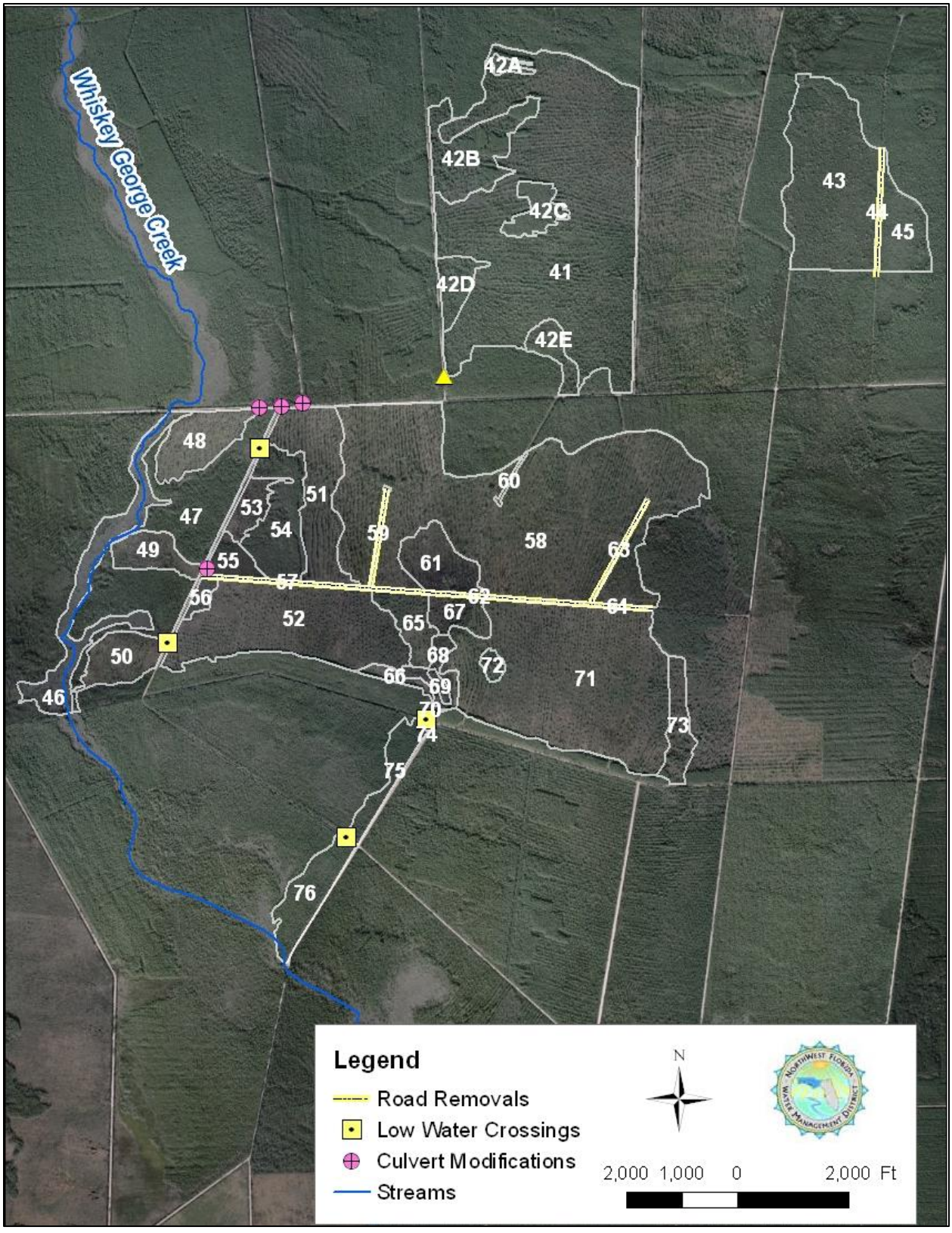
Mitigation Polygons in Whiskey George Savannas Area (2004 Aerial Photography)



Acreages of Mitigation Polygons in Whiskey George Savannas Area



Mitigation Polygons in Whiskey George Savannas Area (2007 Aerial Photography)


Whiskey George Creek
42A
42B
42C
42D
42E
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44
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59
58
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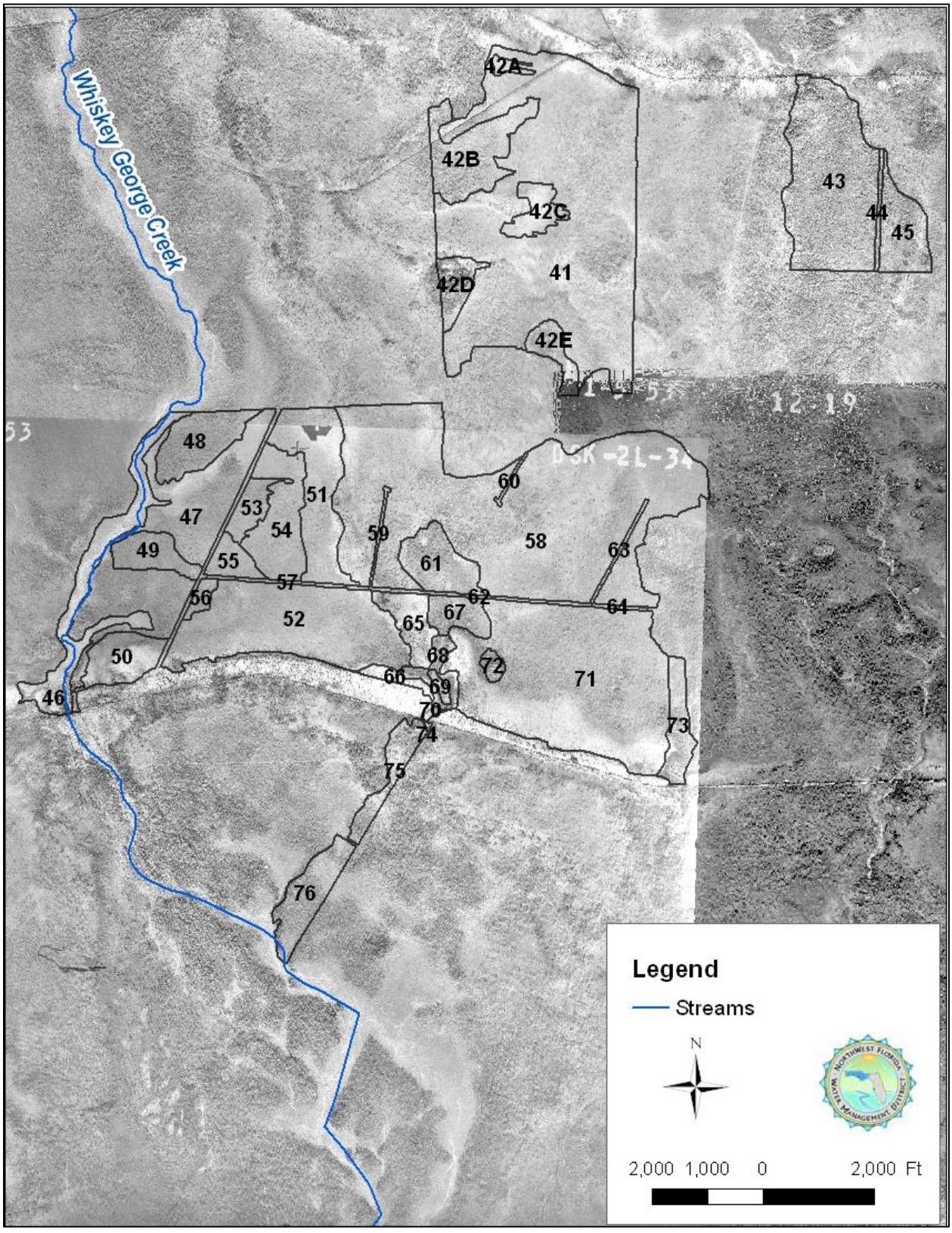
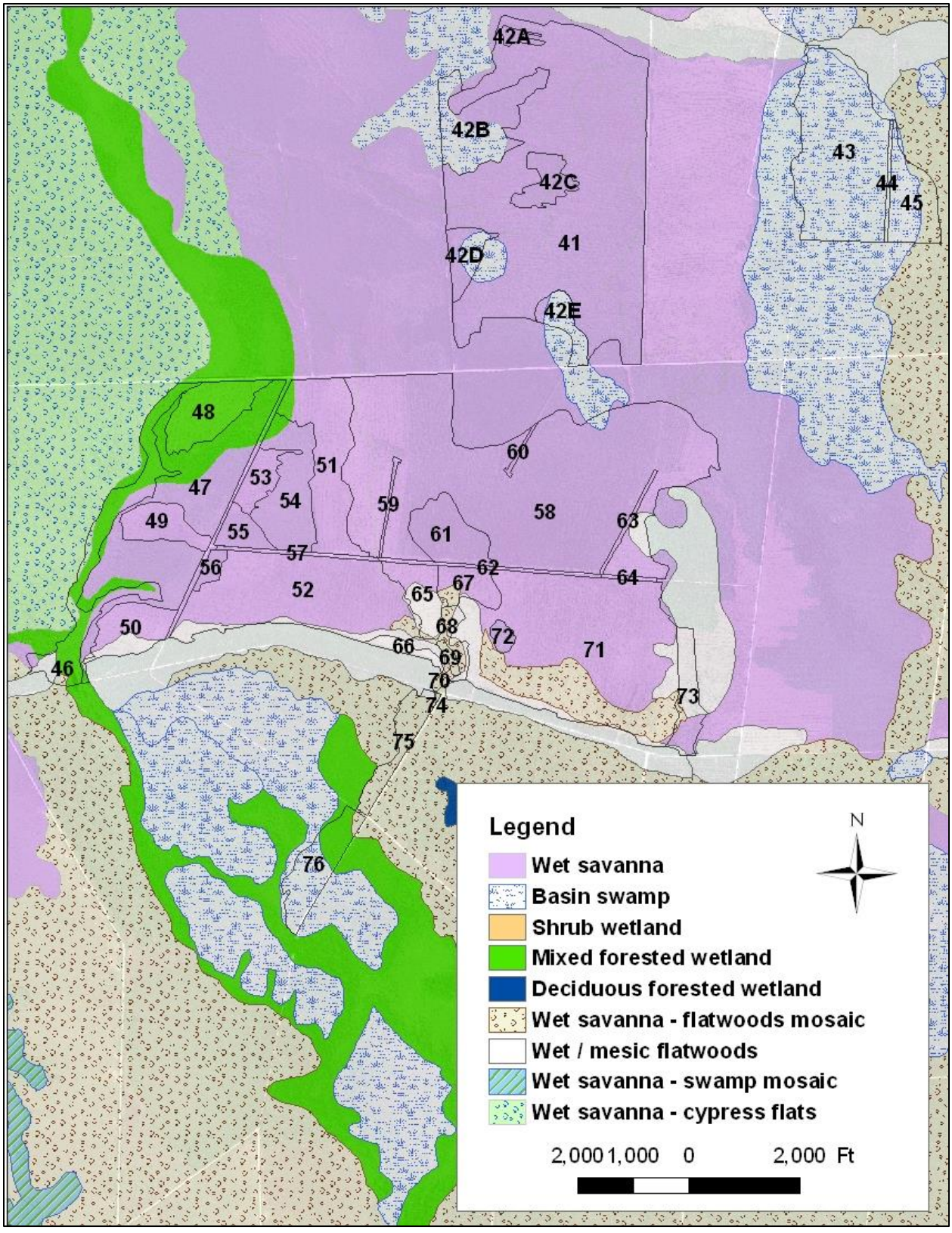
69
46
70
73
74
75
76
Legend
Road Removals
Low Water Crossings
Culvert Modifications
Streams
N
2,000 1,000 0 2,000 Ft

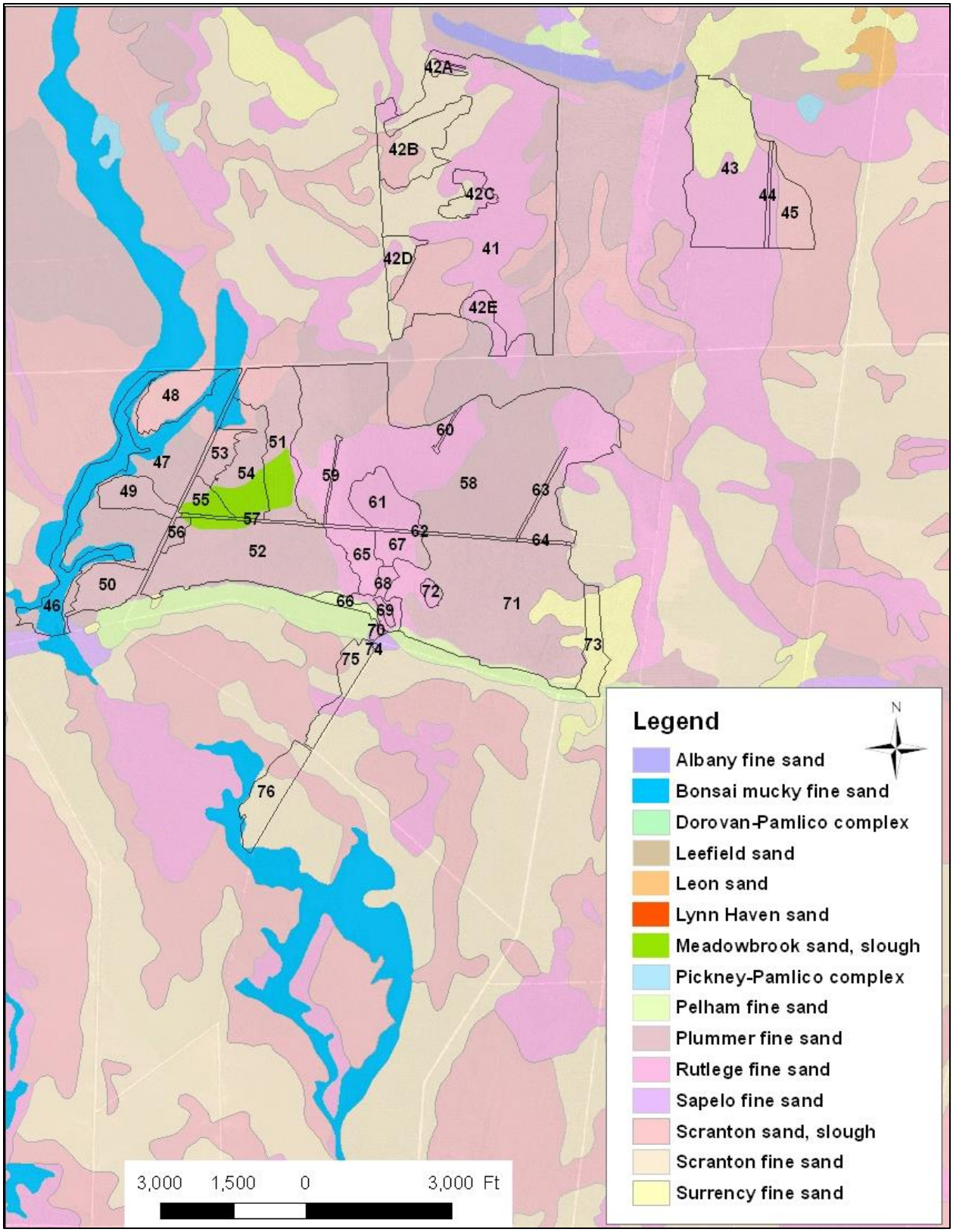
1953 Black and White Aerial Photography for the Whiskey George Savannas



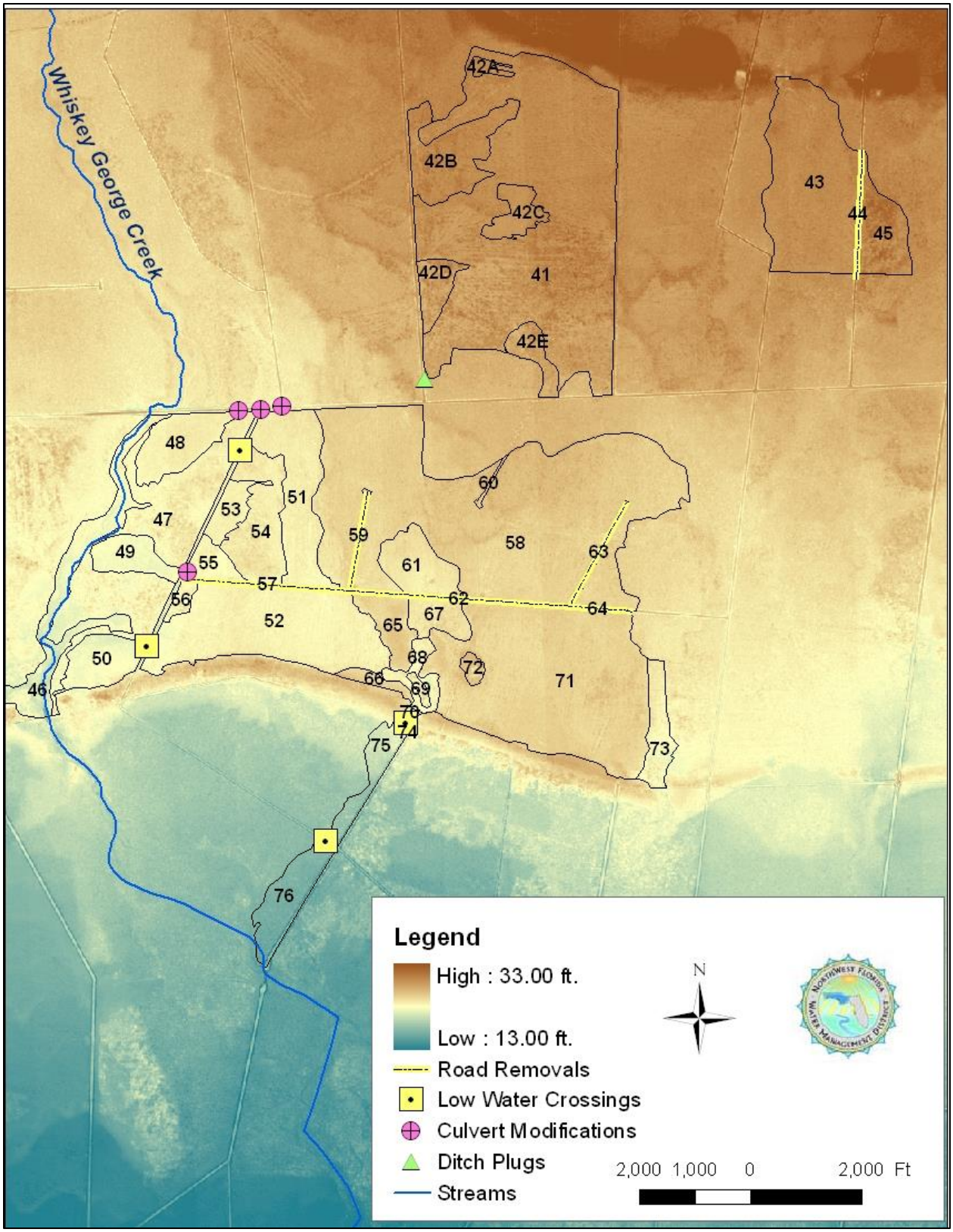
Historic Vegetation in Whiskey George Savannas Area (FNAI 2000)



Soils in the Whiskey George Savannas Area



Digital Elevation Map for the Whiskey George Savannas Area


Whiskey George Creek
42A
42B
42C
42D
42E
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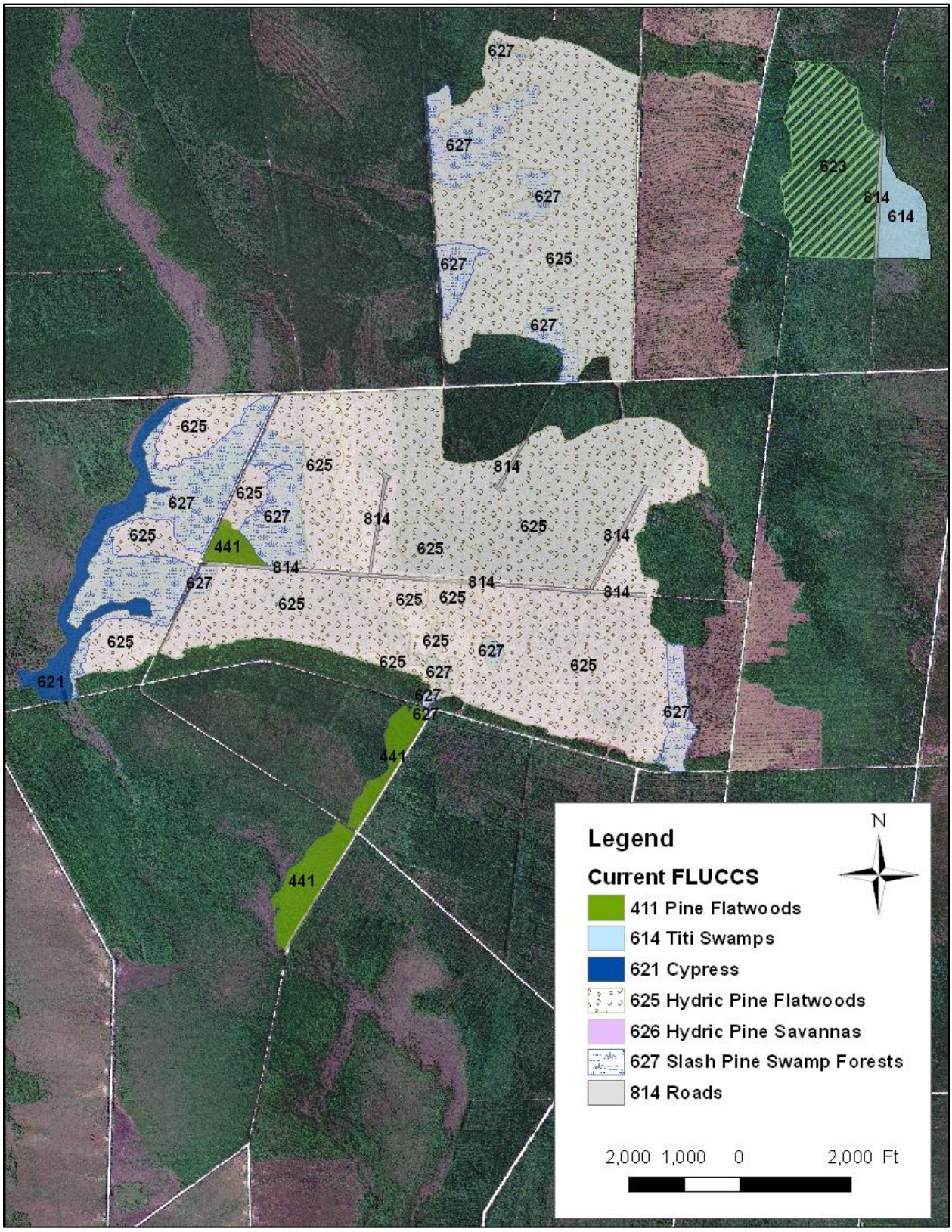
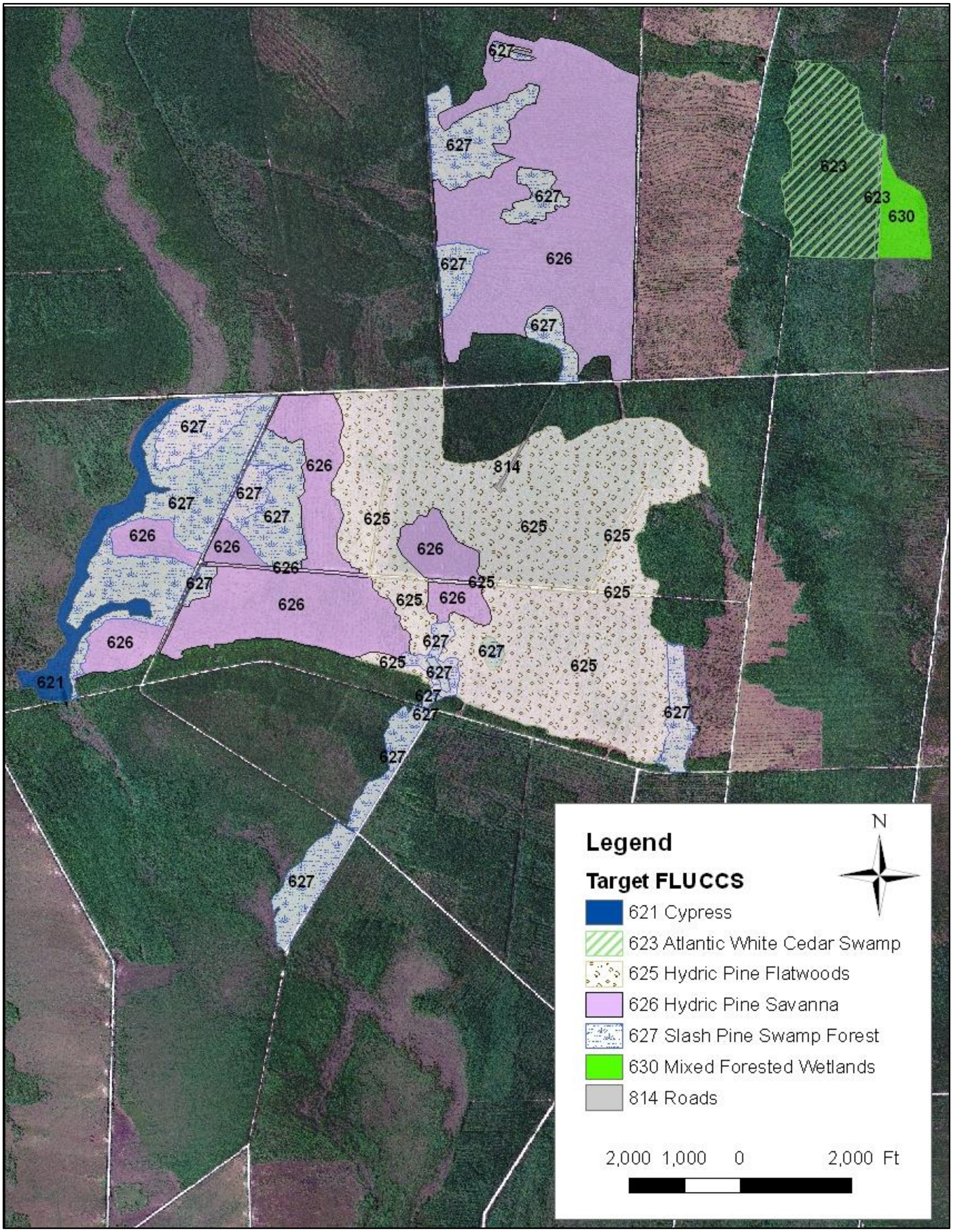
69
72
71
70
74
75
73
76
Legend
High : 33.00 ft.
Low : 13.00 ft.
Road Removals
Low Water Crossings
Culvert Modifications
Ditch Plugs
Streams
N
2,000 1,000 0 2,000 Ft

Current Habitat Types (FLUCCS) in the Whiskey George Savannas Area



Target Habitat Types (FLUCCS) in the Whiskey George Savannas Area


627
627
627
626
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623
623
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814
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621
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627
627
627
Legend
Target FLUCCS
621 Cypress
623 Atlantic White Cedar Swamp
625 Hydric Pine Flatwoods
626 Hydric Pine Savanna
627 Slash Pine Swamp Forest
630 Mixed Forested Wetlands
814 Roads
2,000 1,000 0 2,000 Ft
N

Detailed Mitigation Plan (Whiskey George / Sumatra Unit)

Whiskey George Creek Basin

(Excerpt from "Tates' Hell State Forest Hydrologic Restoration Plan" developed by the NWFWMD in cooperation with the Florida Forest Service.)

Restoration Priority: High

Basin Area: 19,900 acres

Description: Whiskey George Creek is one of the longest streams in the Tate's Hell State Forest with a total length of nearly 22 miles. Whiskey George Creek flows south, merges with Juniper Creek, Doyle Creek, and another small tributary and then discharges into the West Bayou of East Bay. Because East Bay serves as the primary nursery area for the Apalachicola Bay system, Whiskey George Creek and its tributary basins are a high priority for hydrologic restoration.

Historically, Whiskey George Creek was fed by local surface water runoff that flowed through wet savannas and basin swamps before discharging toward the stream. The stream corridor was comprised of cypress sloughs and mixed forested wetlands (Figures 24 and 25). The network of roads and ditches constructed during the 1960s and 1970s severed wetland connections, altered surface water drainage patterns, and impacted wetland functions. Many historical wet savannas were converted to slash pine plantation. The amount of remnant wetland vegetation remaining under the planted pines varies. Some planted pines have been bedded and fertilized and these soil alternations have further impacted drainage patterns and native plant communities.

Today, much of the surface water runoff discharges to Whiskey George Creek via large drainage ditches located along Tower Road, Gully Branch Road, West Double Bridge Road, Buck Siding Road, and Dry Bridge Road. A primary goal of restoration activities is to reduce the flow of water in these roadside drainage ditches and increase natural sheet flow through existing and remnant wetland systems.

Several hydrologic restoration projects have been implemented in the Whiskey George Creek basin. The Big Slough Restoration Project was implemented by the NWFWMD in 1998. The project, located north of Gully Branch Road, involved reconnecting a large cypress slough system to the creek by removing road segments and installing several low water crossings and ditch blocks. In 2009, the NWFWMD implemented the Whiskey George Savannas Restoration Project which involved two separate project areas. In the northernmost part of the basin, the large shrub wetland that once comprised the headwaters of Whiskey George Creek was reconnected to the stream by removing nearly three miles of dirt logging roads and installing two new culverts and a low water crossing (Figures 24 and 27). South of West Double Bridge Road, historical surface water drainage patterns in a wet savanna – pine flatwoods mosaic were restored by removing an additional three miles of logging roads and installing four low water crossings, several ditch blocks, and three culverts (Figures 25 and 28). Post-construction monitoring conducting during the spring of 2010 indicates the low water crossings are conveying surface water flows and that wetland vegetation has begun recolonizing the road removal areas. The ditch blocks are functioning well but some additional fill will be needed to repair minor erosion of ditch block side slopes.

An additional low water stream crossing and associated ditch blocks were constructed south of Buck Siding Road as part of a separate wetland mitigation project implemented by Superholdings LLC (Figures 26 and 29). To date, restoration activities in the Whiskey George Creek basin have involved the installation of 10 low water crossings, the removal of more than six miles of dirt logging roads and adjacent ditches, and the installation of numerous ditch blocks and culverts. To improve habitat conditions, the Division of Forestry is reducing pine densities in historical wetland habitats and is conducting prescribed burns to maintain appropriate fire frequencies.

2010 – 2020 Hydrologic Restoration Plan: Although a significant amount of hydrologic restoration has been accomplished in the Whiskey George Creek basin, many additional opportunities remain. Future hydrologic improvements will build and expand on previous efforts. Proposed improvements include 12 low water crossings, two flashboard risers, approximately 23 ditch blocks, 20 culvert modifications, and two segments of road removal (Figures 24 through 32). The proposed low water crossings are wetland crossings rather than stream crossings and will likely only contain water intermittently. Some of the proposed low water crossing locations will reconnect former wetlands that are currently planted in pines. As a result, surface water flow paths may not be readily visible on the aerial photography. However, flow paths can generally be discerned from either the LiDAR elevation data or the 1953 black-and-white aerial photography. Water has been observed flowing across the road at several of the proposed low water crossing locations.

The proposed ditch blocks will reduce the flow in roadside ditches or reroute ditch flow towards low water crossings or culverts. Ditch blocks will also restore local topographic features and prevent surface water flow across hydrologic basin divides. Two flashboard risers are proposed to be installed in the northern portion of the basin in the large drainage ditch adjacent to Tower Road. Flashboard risers, rather than permanent ditch blocks, have been proposed because the Division of Forestry needs to maintain the ability to convey surface water flows in these ditches under extremely wet conditions or in advance of pine harvesting operations.

Culvert modifications located throughout the Whiskey George Creek basin include seven new culverts, three culvert removals, and four culvert replacements. Culverts have been proposed in lieu of low water crossings on primary roads such as Tower Road and Buck Siding Road where year-round vehicle access is needed. The new culverts will reconnect contributing drainage areas and increase the conveyance capacity. Additional road fill will be needed in some areas to achieve sufficient cover depths (18") over the culvert pipes.

There are two road segments proposed for removal that total approximately 0.6 miles. However, the pines adjacent to these road segments must be first thinned or harvested. Accordingly, these road segments will not likely be removed until after 2015.

Recommended habitat improvements include shrub (titi) reduction north of Gully Branch Road and in the area between Tower Road and Whiskey George Creek and south of Evans Lake Tram Road. Pine thinning is needed in many areas. Areas suitable for long-term timber production

consist primarily of mesic flatwoods located in the northern part of the basin and the drier portions of pine flatwood mosaics located in the southern part of the basin.

Estimated Construction Cost for Hydrologic Improvements: $ 320,000

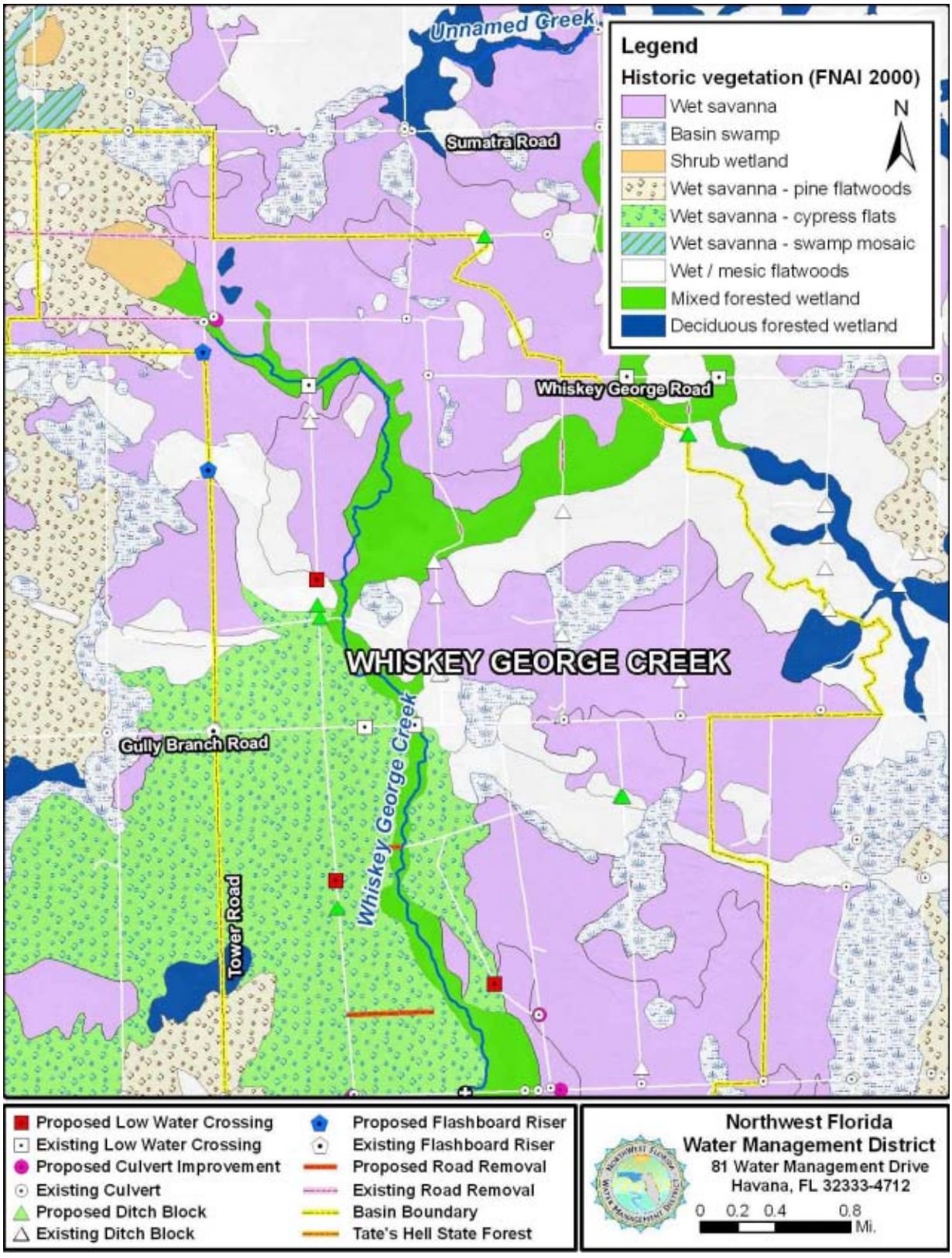


Figure 24. Historical ecological communities and proposed hydrologic improvements in the northern portion of the Whiskey George Creek basin

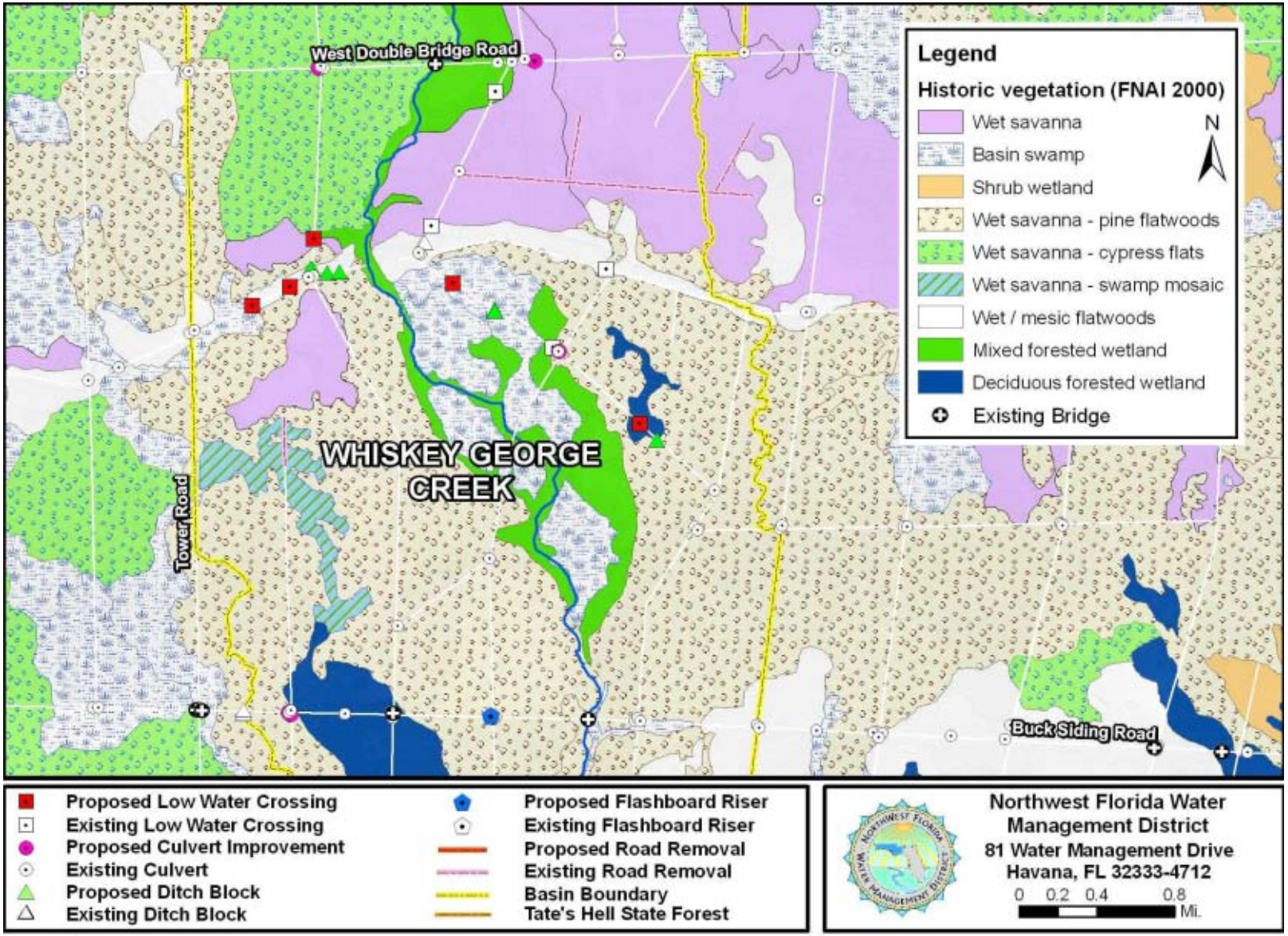


Figure 25. Historical ecological communities and proposed hydrologic improvements in the central portion of the Whiskey George Creek basin

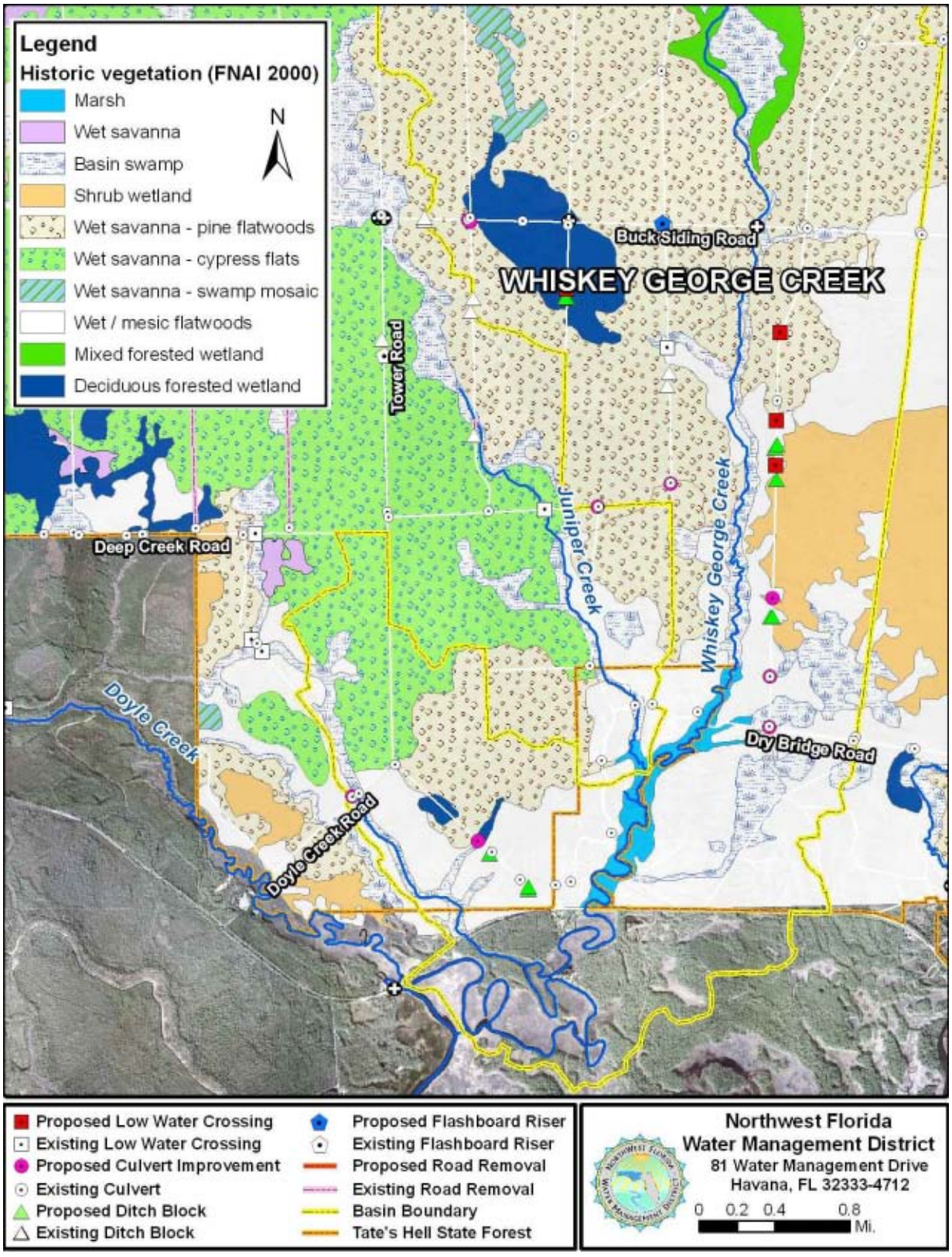


Figure 26. Historical ecological communities and proposed hydrologic improvements in the southern portion of the Whiskey George Creek basin

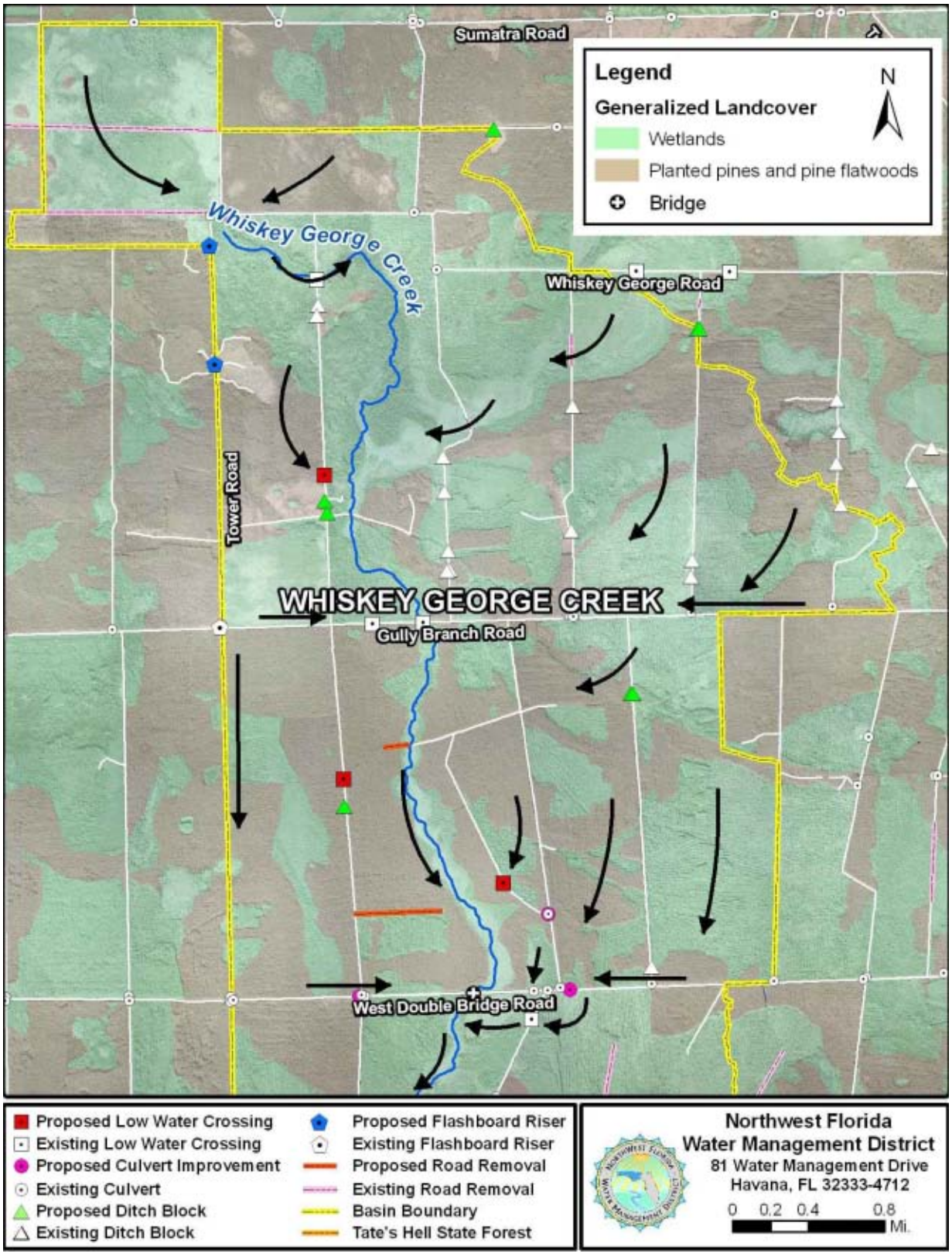


Figure 27. Proposed hydrologic improvements and post-restoration drainage patterns in the northern portion of the Whiskey George Creek basin

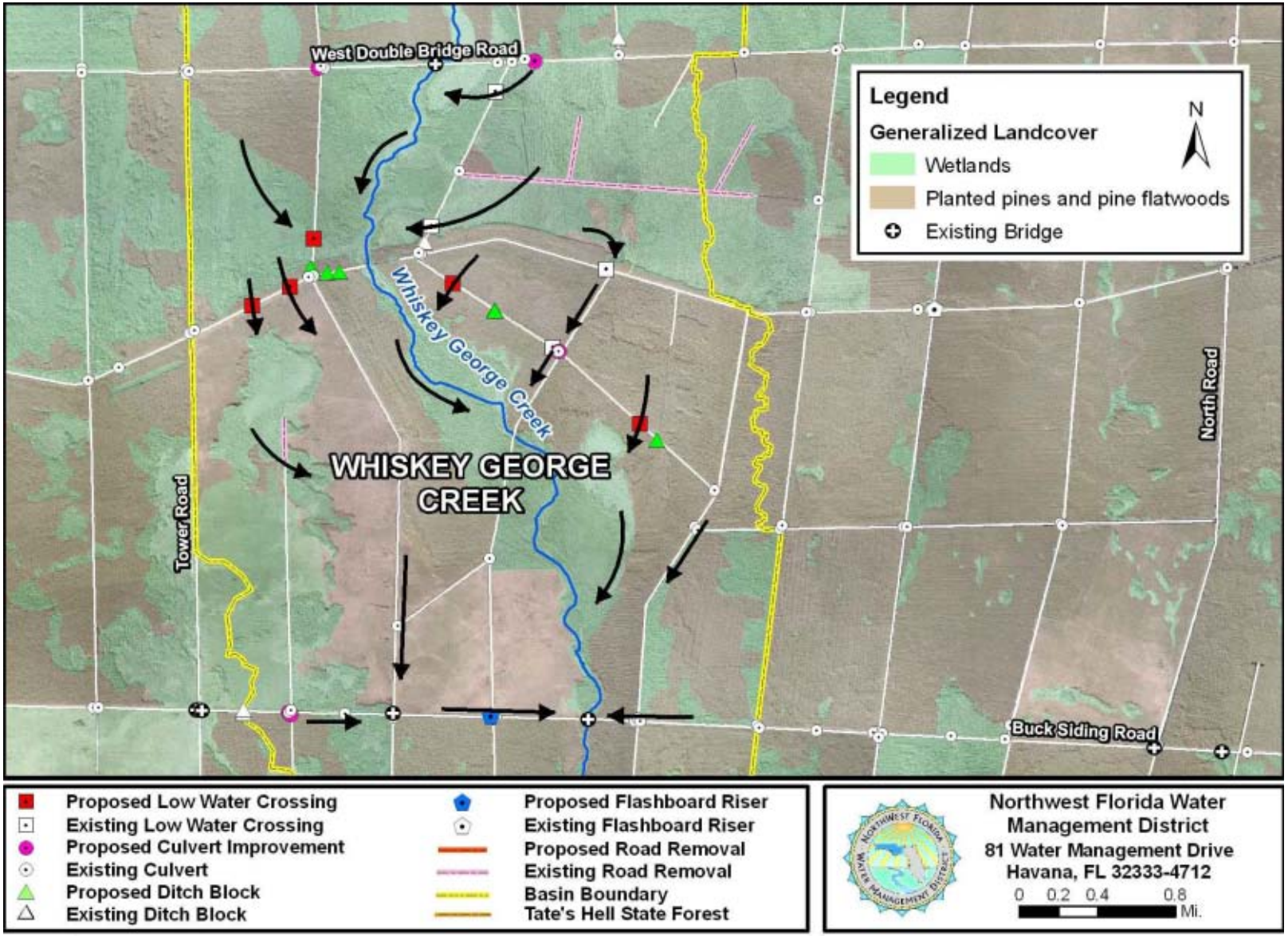


Figure 28. Proposed hydrologic improvements and post-restoration drainage patterns in the central portion of the Whiskey George Creek basin

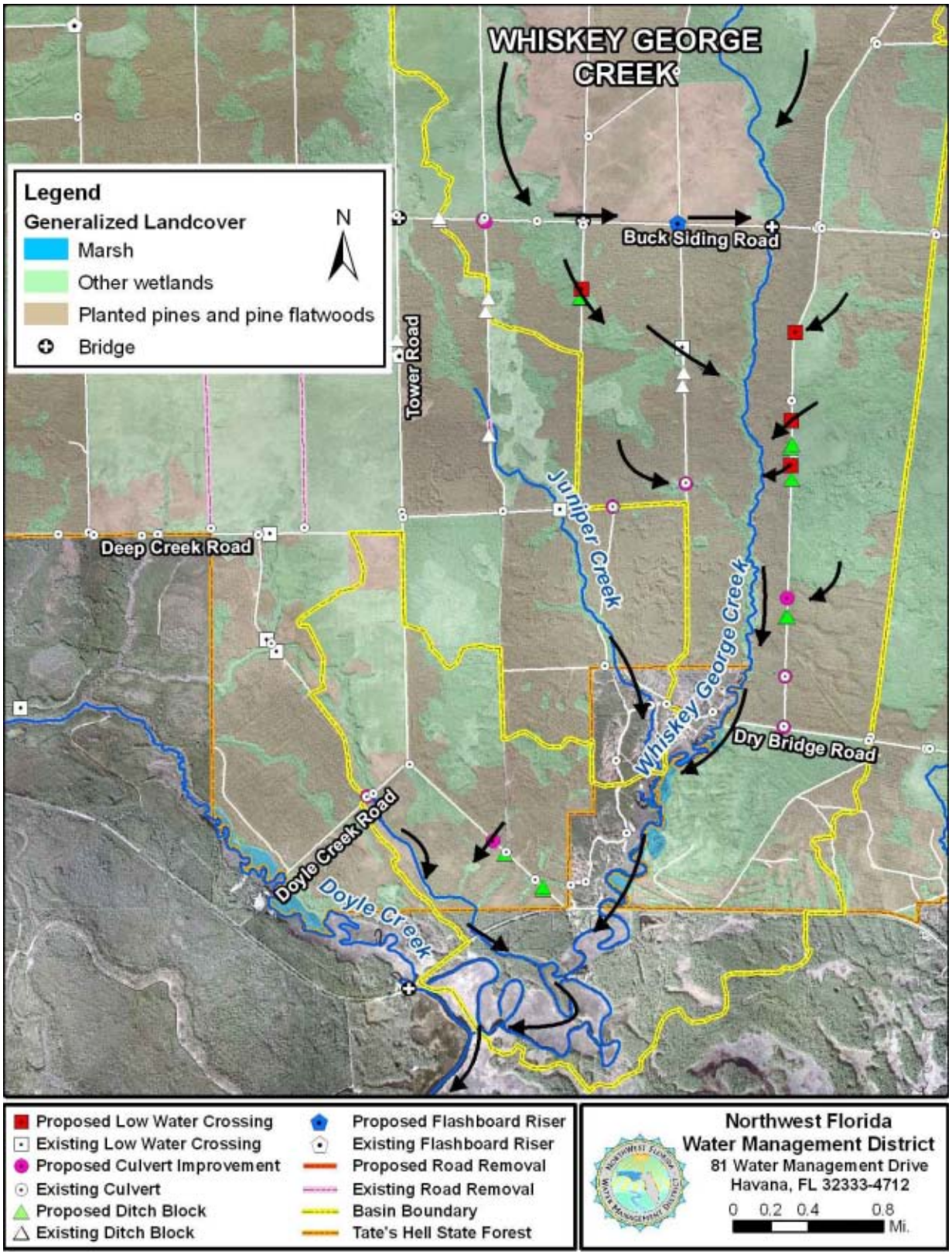


Figure 29. Proposed hydrologic improvements and post-restoration drainage patterns in the southern portion of the Whiskey George Creek basin

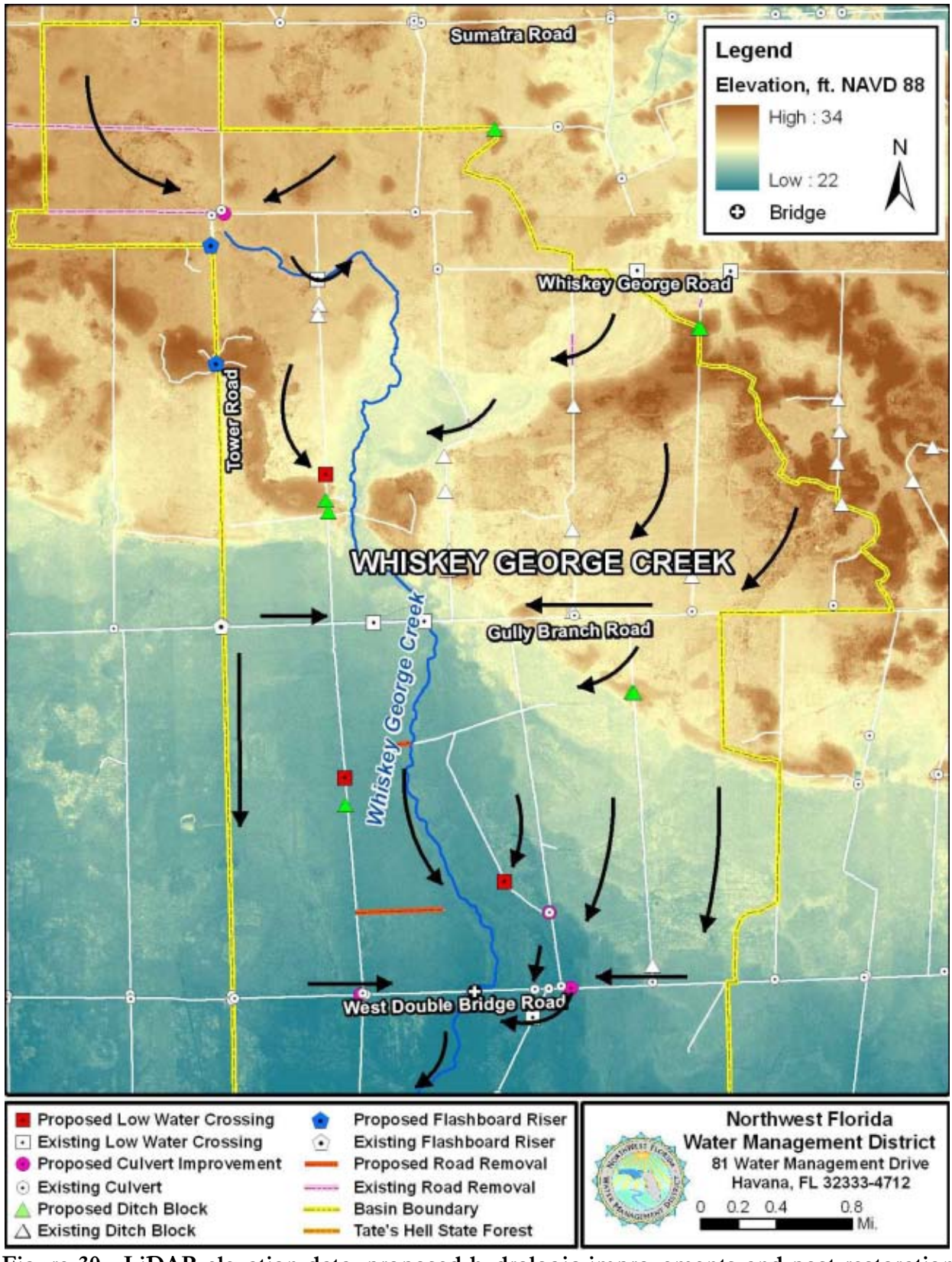


Figure 30. LiDAR elevation data, proposed hydrologic improvements and post-restoration drainage patterns in the northern portion of the Whiskey George Creek basin.

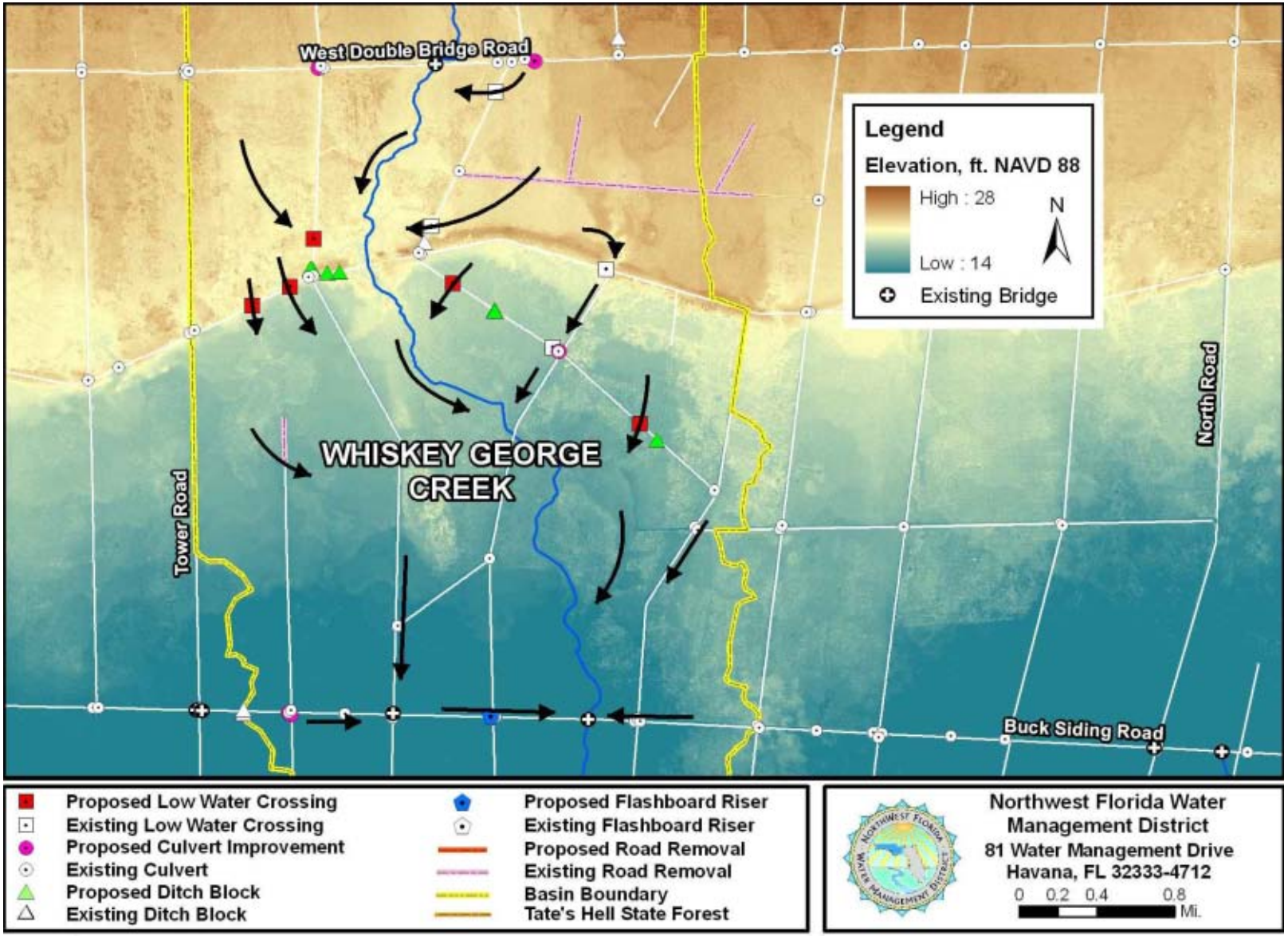


Figure 31. LiDAR elevation data, proposed hydrologic improvements and post-restoration drainage patterns in the central portion of the Whiskey George Creek basin.

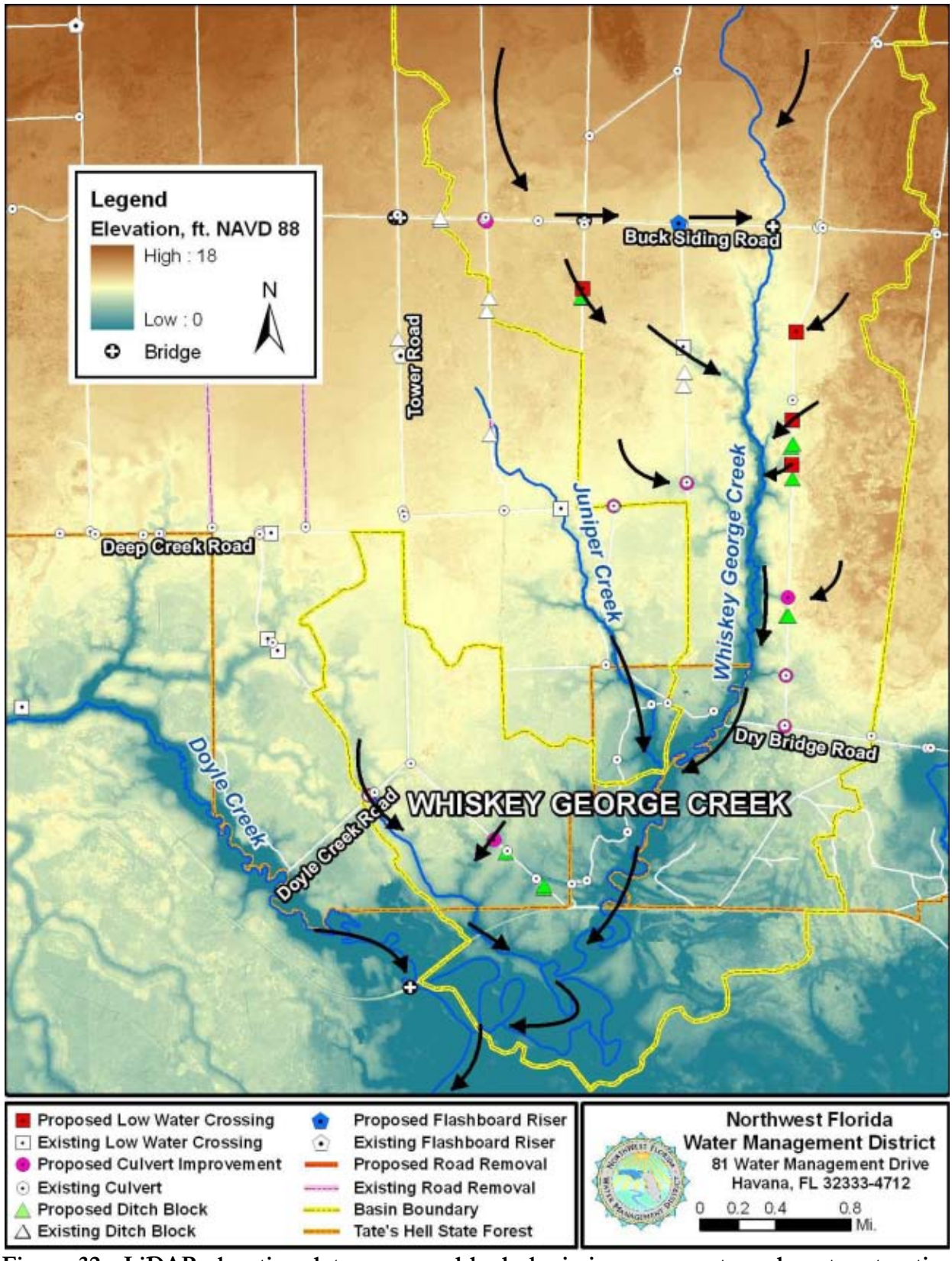


Figure 32. LiDAR elevation data, proposed hydrologic improvements and post-restoration drainage patterns in the southern portion of the Whiskey George Creek basin.

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**1a (Road removals - road area)**

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
814 (Current)	**Future FLUCCS (640 Successional to 620 and 630)**	**Mitigation**	**12.42 Acres (road footprint only)**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Apalachicola	**III**	**OFW (Apalachicola Bay)**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

The roads were historically wet savanna and pine flatwoods habitats.

Assessment area description

These areas consist of dirt logging roads, ranging from approximately 30 - 35' in width. The road footprint of 12.42 acres is based on 16,900 linear feet of road removal multiplied by an average roadway width (shoulder to shoulder) of 32 feet.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Apalachicola National Forest, Whiskey George Creek	**None**

Functions	Mitigation for previous permit/other historic use
Roads provide no wetland or habitat function.	**None Known**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
None	**None**

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
IRT	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**1 (Road removals - road area)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	**9/15/2010**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	w/out mit: 0	with mit: 9	**Without Mitigation** - These roads bisect historic wetland habitats and constrain the habitat and hydrologic connectivity of surrounding areas. **With Mitigation** - The removal of the roads will restore local habitat and hydrologic connectivity.
.500(6)(b)Water Environment (N/A for Uplands)	w/out mit: 0	with mit: 8	**Without Mitigation** - The roads inhibit natural drainage patterns and have reduced the surface water flow to Whiskey George Creek **With Mitigation** - Removing the roads will restore historic surface water drainage patterns and improve the timing, magnitude, and quality of surface water runoff discharge into Whiskey George Creek.
.500(6)(c)Community structure Vegetation and/or Benthic Community	w/out mit: 0	with mit: 9	**Without Mitigation** - The existing dirt roads provide no wetland functions. **With Mitigation** - Removing the road and replanting the former road footprints will restore this area to wetland habitat and create an appropriate vegetative community.

Score = sum of above scores/30 (if uplands, divide by 20)	
w/out mit: 0.00	with mit: 0.87

Delta = [with - w/out]
0.87

If preservation as mitigation
Preservation adjustment factor = N/A
Adjusted mitigation delta = N/A

If mitigation / restoration	
Time Lag Factor (6- 10 years) =	**1.25**
Risk factor =	**1**

For impact assessment areas
N/A

lygon Acreage = **12.42**

For mitigation assessment areas	
Mitigation Credits [(Delta / (Time Lag * Risk)) * Acres] =	**8.61**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**1b (Road removals - ditches)**

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
814	**Future FLUCCS (640 Successional to 620 and 630)**	**Mitigation**	**9.26 Acres**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Whiskey George Crk / East Bay / Apalachicola Bay	**III**	**OFW (Apalachicola Bay)**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

The roadside ditches were historically wet savanna and flatwoods habitats. The ditches within the Sumatra Savanna area are hydrologically isolated with no culverts or hydrologic connections to other upstream or downstream areas.

Assessment area description

The ditch dimensions vary but average 12 ft in width and 3 ft in depth in this area. Because there are no culverts, the water is generally stagant. The ditches support some aquatic vegetation, small fishes and other aquatic organisms. The assessment area includes the ditch footprint (16,900 LF of road x 2 ditches x 12 ft width)

Significant nearby features	Uniqueness (considering the relative rarity in relation to the
Apalachicola National Forest, Whiskey George Creek	**None**

Functions	Mitigation for previous permit/other historic use
Drainage ditches provide water storage and minimal floral and faunal habitat.	**None Known**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the
Herpetofauna that may be found in the ditches primary consist of frogs and water-associated snakes such as cottonmouths. Small fishes may also occur.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
IRT	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**1 (Road removals - ditch areas)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	**9/15/2010**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/out mit	with mit	
.500(6)(a) Location and Landscape Support	7	9	**Without Mitigation** - These ditches bisect historic wetland habitats. There is no hydrologic connection between these ditches and any upstream or downstream waters. **With Mitigation** - The removal of the ditches will restore wetland habitat connectivity.
.500(6)(b)Water Environment (N/A for Uplands)	6	8	**Without Mitigation** - The ditches inhibit natural drainage patterns and have reduced the surface water flow to Whiskey George Creek **With Mitigation** - Removing the ditches will restore historic surface water drainage patterns and improve the timing, magnitude, and quality of surface water runoff discharge into Whiskey George Creek.
.500(6)(c)Community structure Vegetation and/or Benthic Community	6	9	**Without Mitigation** - Although the ditches do provide aquatic habitat, these features are unnatural and have displaced historic wetlands. **With Mitigation** - Removing the ditches and restoring these areas to wetland habitats will create an appropriate vegetative and benthic community.

Score = sum of above scores/30 (if uplands, divide by 20)	
w/out mit	with mit
0.63	0.87

Delta = [with - w/out]
0.23

If preservation as mitigation
Preservation adjustment factor = N/A
Adjusted mitigation delta = N/A

If mitigation / restoration	
Time Lag Factor (6- 10 years) =	**1.25**
Risk factor =	**1**

For impact assessment areas
N/A

lygon Acreage = **9.26**	
For mitigation assessment areas	
Mitigation Credits [(Delta / (Time Lag * Risk)) * Acres] =	**1.73**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**2 (Low Water Crossing)**

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
621 - Cypress	**---**	**Mitigation**	**6.49 Acres (based on 300' radial buffer)**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Fort Gadsden Creek	**Ft. Gadsden Crk / Apalachicola Bay**	**OFW (Apalachicola Bay System)**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

This cypress wetland, which is bisected by West Boundary Road, was historically part of a large cypress slough that discharges south toward Fort Gadsden Creek. Currently there is no hydrologic connection between the east and west sides of the road.

Assessment area description

The wetland area on the west side of the road has a cypress canopy but the area east of the road has a mixed canopy of cypress and titi. This wetland is bordered by planted pines on the southeast.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Fort Gadsden Creek, Apalachicola National Forest	**Typical Habitat**

Functions	Mitigation for previous permit/other historic use
Water quality; water storage; floral and faunal habitat.	**None Known**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Mammal species include white-tailed deer, racoon, oppossum, bobcat, black bear, and small rodents. Herpetofauna include various snake, frog, and salamandar species. Small fish and benthic organism may also be found occur within this habitat.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
IRT	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**2 (Low Water Crossing)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	**9/15/2010**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	w/out mit: 7	with mit: 9	**Without Mitigation** - West Boundary Road bisects this cypress slough habitat. **With Mitigation** - The installation of a low water crossing will provide minor improvements to habitat connectivity.
.500(6)(b)Water Environment (N/A for Uplands)	w/out mit: 7	with mit: 8	**Without Mitigation** - West Boundary Road bisects this cypress wetland and impacts the wetland hydrology and surface water flows. Surface water runoff into the wetland is blocked by the existing forest road to the north. **With Mitigation** - The removal of the road to the north and the installation of a low water crossing on West Boundary Road will restore surface water drainage patterns, reconnect this cypress slough, and enhance wetland hydroperiods and surface water flows to Fort Gadsden Creek.
.500(6)(c)Community structure Vegetation and/or Benthic Community	w/out mit: 7	with mit: 8	**Without Mitigation** - The eastern portion of this wetland has a dense titi understory and canopy of scattered small cypress. **With Mitigation** - Hydrologic improvements and the maintenance of an appropriate fire regime will provide some improvements to community structure.

Score = sum of above scores/30 (if uplands, divide by 20)	
w/out mit	with mit
0.70	0.83

Delta = [with - w/out]
0.13

If preservation as mitigation
Preservation adjustment factor = N/A
Adjusted mitigation delta = N/A

If mitigation / restoration	
Time Lag Factor (6- 10 years) =	**1.25**
Risk factor =	**1**

For impact assessment areas
N/A

lygon Acreage = **6.49**

For mitigation assessment areas	
Mitigation Credits [(Delta / (Time Lag * Risk)) * Acres] =	**0.69**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**3 (Culvert improvements)**

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
627 - Slash Pine Swamp Forest	**---**	**Mitigation**	**1.6 Acres (based on 150' radial buffer from culverts)**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Whiskey George Crk / East Bay / Apalachicola Bay	**III**	**OFW (Apalachicola Bay)**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Prior to the construction of forest roads, this was a mixed forested wetland in the upper Whiskey George Creek corridor. This remnant wetland is currently bisected by roads and ditches, with no habitat or hydrologic connectivity to Whiskey George Creek.

Assessment area description

This slash pine swamp forest was a former mixed forested wetland that has been bisected and impacted by logging roads and ditches.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Apalachicola National Forest, Whiskey George Creek	**Typical Habitat**

Functions	Mitigation for previous permit/other historic use
Water quality; water storage; floral and faunal habitat.	**None Known**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Mammal species include white-tailed deer, racoon, oppossum, bobcat, black bear, and small rodents. Herpetofauna include various snake, frog, and salamandar species. Various wintering and resident bird species also occur within this habitat.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
IRT	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**3 (Culvert improvements)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	**9/15/2010**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

		w/out mit	with mit
.500(6)(a) Location and Landscape Support	**Without Mitigation -** No change. **With Mitigation** - No change.	7	7
.500(6)(b)Water Environment (N/A for Uplands)	**Without Mitigation** - This upper corridor of the Whiskey George Creek is bisected by roads and drainage ditches which have severed the hydrologic connection to the headwaters wetlands. **With Mitigation -** The installation of two 30" culverts across Tower Rd, together with the removal of the roads and ditches, will restore hydrologic connectivity within the upper Whiskey George Creek corridor.	6	8
.500(6)(c)Community structure Vegetation and/or Benthic Community	**Without Mitigation** - The forested wetland immediately downstream of the culvert no longer receives surface water runoff from the north and the reduced hydroperiod has likely altered the vegetative community. **With Mitigation** - The removal of the road and ditches will restore natural topography and improve the hydrology and vegetative community of the wetland immediately downstream of the culvert.	7	8

Score = sum of above scores/30 (if uplands, divide by 20)		
	w/out mit	with mit
	0.67	0.77

Delta = [with - w/out]
0.10

If preservation as mitigation
Preservation adjustment factor = N/A
Adjusted mitigation delta = N/A

If mitigation / restoration	
Time Lag Factor (6 to 10 yr) =	**1.25**
Risk factor =	**1**

For impact assessment areas
N/A

lygon Acreage = **1.6**

For mitigation assessment areas	
Mitigation Credits [(Delta / (Time Lag * Risk)) * Acres] =	**0.13**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**4a (Road removals - road area)**

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
814	**Future FLUCCS (640 Successional to 620 and 630)**	**Mitigation**	**10.39 Acres (road footprint only)**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Whiskey George Crk / East Bay / Apalachicola Bay	**III**	**OFW (Apalachicola Bay)**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

The roads were historically wet savanna and pine flatwoods habitats.

Assessment area description

These areas consist of dirt logging roads, ranging from approximately 30 - 35' in width. The road footprint of 10.39 acres is based on 14,150 linear feet of road removal multiplied by an average roadway width (shoulder to shoulder) of 32 feet.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Apalachicola National Forest, Whiskey George Creek	**Typical Habitat**

Functions	Mitigation for previous permit/other historic use
Roads provide no wetland or habitat function.	**None Known**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
None	**None**

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
IRT	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**4a (Road removals - road area)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	**9/15/2010**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	w/out mit: 0	with mit: 9	**Without Mitigation** - These roads bisect historic wetland habitats and constrain the habitat and hydrologic connectivity of surrounding areas. **With Mitigation** - The removal of the roads will restore local habitat and hydrologic connectivity.
.500(6)(b)Water Environment (N/A for Uplands)	w/out mit: 0	with mit: 7	**Without Mitigation** - The roads inhibit natural drainage patterns and have reduced the surface water flow to Whiskey George Creek **With Mitigation** - Removing the roads will restore historic surface water drainage patterns and improve the timing, magnitude, and quality of surface water runoff discharge into Whiskey George Creek.
.500(6)(c)Community structure Vegetation and/or Benthic Community	w/out mit: 0	with mit: 7	**Without Mitigation** - The existing dirt roads provide no wetland functions. **With Mitigation** - Removing the road and replanting the former road footprints will restore this area to wetland habitat and create an appropriate vegetative community.

Score = sum of above scores/30 (if uplands, divide by 20)	w/out mit	with mit
	0.00	0.77

Delta = [with - w/out]
0.77

If preservation as mitigation
Preservation adjustment factor = N/A
Adjusted mitigation delta = N/A

If mitigation / restoration	
Time Lag Factor (6- 10 years) =	**1.25**
Risk factor =	**1**

For impact assessment areas
N/A

lygon Acreage = **10.39**

For mitigation assessment areas	
Mitigation Credits [(Delta / (Time Lag * Risk)) * Acres] =	**6.37**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**4b (Road removals - ditches)**

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
814	**Future FLUCCS (640 Successional to 620 and 630)**	**Mitigation**	**7.75 Acres**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Whiskey George Crk / East Bay / Apalachicola Bay	**III**	**OFW (Apalachicola Bay)**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

The roadside ditches were historically wet savanna and flatwoods habitats. The ditches within this area generally drain west toward Whiskey George Creek.

Assessment area description

The ditch dimensions vary but average 8 ft in width and 2.5 ft in depth in this area. The ditches support some aquatic vegetation, small fishes and other aquatic organisms. The assessment area includes the ditch footprint (14,150 LF of road x 2 ditches x 8 ft width).

Significant nearby features	Uniqueness (considering the relative rarity in relation to the
Apalachicola National Forest, Whiskey George Creek	**None**

Functions	Mitigation for previous permit/other historic use
Drainage ditches provide water storage and minimal floral and faunal habitat.	**None Known**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the
Herpetofauna that may be found in the ditches primary consist of frogs and water-associated snakes such as cottonmouths. Small fishes may also occur.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
IRT	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**4b (Road removals - ditch areas)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	**9/15/2010**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/out mit	with mit	
.500(6)(a) Location and Landscape Support	7	9	**Without Mitigation** - These ditches bisect historic wetland habitats. There is no hydrologic connection between these ditches and any upstream or downstream waters. **With Mitigation** - The removal of the ditches will restore wetland habitat connectivity.
.500(6)(b)Water Environment (N/A for Uplands)	6	7	**Without Mitigation** - The ditches inhibit natural drainage patterns and have reduced the surface water flow to Whiskey George Creek **With Mitigation** - Removing the ditches will restore historic surface water drainage patterns and improve the timing, magnitude, and quality of surface water runoff discharge into Whiskey George Creek.
.500(6)(c)Community structure Vegetation and/or Benthic Community	6	7	**Without Mitigation** - Although the ditches do provide aquatic habitat, these features are unnatural and have displaced historic wetlands. **With Mitigation** - Removing the ditches and restoring these areas to wetland habitats will create an appropriate vegetative and benthic community.

Score = sum of above scores/30 (if uplands, divide by 20)	w/out mit	with mit
	0.63	0.77

Delta = [with - w/out]
0.13

If preservation as mitigation
Preservation adjustment factor = N/A
Adjusted mitigation delta = N/A

If mitigation / restoration	
Time Lag Factor (6- 10 years) =	**1.25**
Risk factor =	**1**

For impact assessment areas
N/A

lygon Acreage = **7.75**	
For mitigation assessment areas	
Mitigation Credits [(Delta / (Time Lag * Risk)) * Acres] =	**0.83**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**5 (Four Low Water Crossings)**

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
627 (Slash Pine Swamp Forest) and 626 (Hydric Pine Savanna)	**---**	**Mitigation**	**25.96 Acres (total) (4 LWCx X 300 ft radial buffer for**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Whiskey George Crk / East Bay / Apalachicola Bay	**Whiskey George Crk / Apalachicola Bay**	**OFW (Apalachicola Bay System)**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

The existing road and ditch network has altered surface water drainage patterns, reduced hydrologic and habitat connectivity, and affectly the timing and magnitude of flows to Whiskey George Creek.

Assessment area description

Habitats within the immediate vicinity of the low water crossings are variable (see maps) but generally consist of either slash pine swamp forest (FLUCCS 627) or hydric pine savanna (FLUCCS 626). All areas were historically wetlands that were converted to pine plantation. The pines have been thinned to low to moderate densities (< 100 TPA).

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Whiskey Georg Creek, Apalachicola National Forest	**Typical Habitat**

Functions	Mitigation for previous permit/other historic use
Water quality; water storage; floral and faunal habitat.	**None Known**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Mammal species include white-tailed deer, racoon, oppossum, bobcat, black bear, and small rodents. Herpetofauna include various snake, frog, and salamandar species. Small fish and benthic organism may also be found occur within this habitat.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
IRT	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**5 (Four Low Water Crossings)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	**9/15/2010**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	w/out mit: 7	with mit: 9	**Without Mitigation** - Various roads and ditches bisect the historic wetland habitats **With Mitigation** - The installation of these four low water crossing will provide minor improvements to habitat connectivity.
.500(6)(b)Water Environment (N/A for Uplands)	w/out mit: 7	with mit: 8	**Without Mitigation** - The existing road and ditch network has altered surface water drainage patterns, reduced hydrologic connectivity, and affectly the timing and magnitude of flows to Whiskey George Creek. **With Mitigation** - The installation of the these four low water crossings will restore natural surface water drainage patterns and enhance wetland hydroperiods and the timining and magnitude of surface water discharge to Whiskey George Creek.
.500(6)(c)Community structure Vegetation and/or Benthic Community	w/out mit: 7	with mit: 8	**Without Mitigation** - The habitat areas immediately downstream of the proposed low water crossings have diminished hydroperiods due to the existing road and ditch system. **With Mitigation** - The enhance of wetland hydroperiods will improve the vegetative community.

Score = sum of above scores/30 (if uplands, divide by 20)	
w/out mit	with mit
0.70	0.83

Delta = [with - w/out]
0.13

If preservation as mitigation
Preservation adjustment factor = N/A
Adjusted mitigation delta = N/A

If mitigation / restoration	
Time Lag Factor (6 to 10 years) =	**1.25**
Risk factor =	**1**

For impact assessment areas
N/A

lygon Acreage = **25.96**

For mitigation assessment areas	
Mitigation Credits [(Delta / (Time Lag * Risk)) * Acres] =	**2.77**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**7 (Ditch plug)**

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
625 - Hydric Pine Flatwoods	**---**	**Mitigation**	**0.8 Acres (based on 150' radial buffer on east side only)**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Whiskey George Crk / East Bay / Apalachicola Bay	**III**	**OFW (Apalachicola Bay)**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

The habitat to the east of the proposed ditch plug is bordered by roads and ditches to the east, west, and south, which have altered natural surface water drainage patterns. The natural flow direction is to the south and west.

Assessment area description

The habitat to the east of the proposed ditch plug was delineated by FNAI as a hydric pine savanna. The area was converted to pine planation and the pines were subsequently thinned, resulting in vegetative community that resembles hydric pine flatwoods. There are also several large inclusions of cypress wetlands.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Apalachicola National Forest, Whiskey George Creek	**Typical Habitat**

Functions	Mitigation for previous permit/other historic use
Water quality; floral and faunal habitat.	**None Known**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Mammal species include white-tailed deer, racoon, oppossum, bobcat, and small rodents. Herpetofauna include various snake, frog, and salamandar species. Several wintering and year-round bird species also occur within this habitat.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
IRT	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**7 (Ditch plug)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	**9/15/2010**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	**Without Mitigation** - No change **With Mitigation** - No change.	w/out mit: 8 / with mit: 8
.500(6)(b)Water Environment (N/A for Uplands)	**Without Mitigation** - During periods of high rainfall and water table elevations, surface water runoff is discharged from this area to the roadside ditches on the south and west. **With Mitigation -** The ditch block will help retain surface water runoff in this former hydric pine savanna.	w/out mit: 7 / with mit: 8
.500(6)(c)Community structure Vegetation and/or Benthic Community	**Without Mitigation** - Historic wetland hydroperiods have likely been altered by the roads and ditch network. **With Mitigation** - Retaining surface water runoff in this area will enhance wetland hydroperiods and vegetation.	w/out mit: 7 / with mit: 7

Score = sum of above scores/30 (if uplands, divide by 20)	
w/out mit	with mit
0.73	0.77

Delta = [with - w/out]
0.03

If preservation as mitigation
Preservation adjustment factor = N/A
Adjusted mitigation delta = N/A

If mitigation / restoration	
Time Lag Factor (6- 10 years) =	**1.25**
Risk factor =	**1**

For impact assessment areas
N/A

lygon Acreage = **0.8**	
For mitigation assessment areas	
Mitigation Credits [(Delta / (Time Lag * Risk)) * Acres] =	**0.02**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**8 (Low Water Crossing)**

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
627 - Slash Pine Swamp Forest	**---**	**Mitigation**	**6.49 Acres (based on 300' radial buffer)**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Whiskey George Creek / East Bay / Apalachicola Bay	**III**	**OFW (Apalachicola Bay)**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Prior to the construction of forest roads, this was a mixed forested wetland in the upper Whiskey George Creek corridor. The roads that bisects the wetland has removed the hydrologic connection between upstream and downstream.

Assessment area description

This slash pine swamp forest was a former mixed forested wetland that has been bisected and impacted by logging roads and ditches.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Apalachicola National Forest, Whiskey George Creek	**Typical Habitat**

Functions	Mitigation for previous permit/other historic use
Water quality; water storage; floral and faunal habitat.	**None Known**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Mammal species include white-tailed deer, racoon, oppossum, bobcat, black bear, and small rodents. Herpetofauna include various snake, frog, and salamandar species. Various wintering and resident bird species also occur within this habitat.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
IRT	**9/15/2010**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Whiskey George / Sumatra	**Not Applicable**	**8 (Low Water Crossing)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**NWFWMD Staff**	**9/15/2010**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

		w/out mit	with mit
.500(6)(a) Location and Landscape Support	**Without Mitigation** - The northern portion of this shrub wetland is bisected by a road and a road borders the wetland to the south. **With Mitigation** - The removal of the roads to the north and south will restore connectivity with adjacent habitats	7	9
.500(6)(b)Water Environment (N/A for Uplands)	**Without Mitigation -** This upper corridor of the Whiskey George Creek is bisected by roads and drainage ditches which have severed the hydrologic connections along the forested stream corridor. **With Mitigation -** The installation of this low water crossing will restore hydrologic connectivity.	7	8
.500(6)(c)Community structure Vegetation and/or Benthic Community	**Without Mitigation** - The downstream forested wetland may have an altered vegetative community resulting from the altered hydrology. **With Mitigation** - The installation of the low water crossing will enhance the hydrology and vegeation in is forested wetland.	7	8

Score = sum of above scores/30 (if uplands, divide by 20)	w/out mit	with mit
	0.70	0.83

Delta = [with - w/out]
0.13

If preservation as mitigation
Preservation adjustment factor = N/A
Adjusted mitigation delta = N/A

If mitigation / restoration	
Time Lag Factor (6- 10 years) =	**1.25**
Risk factor =	**1**

For impact assessment areas
N/A

lygon Acreage = **6.49**

For mitigation assessment areas	
Mitigation Credits [(Delta / (Time Lag * Risk)) * Acres] =	**0.69**

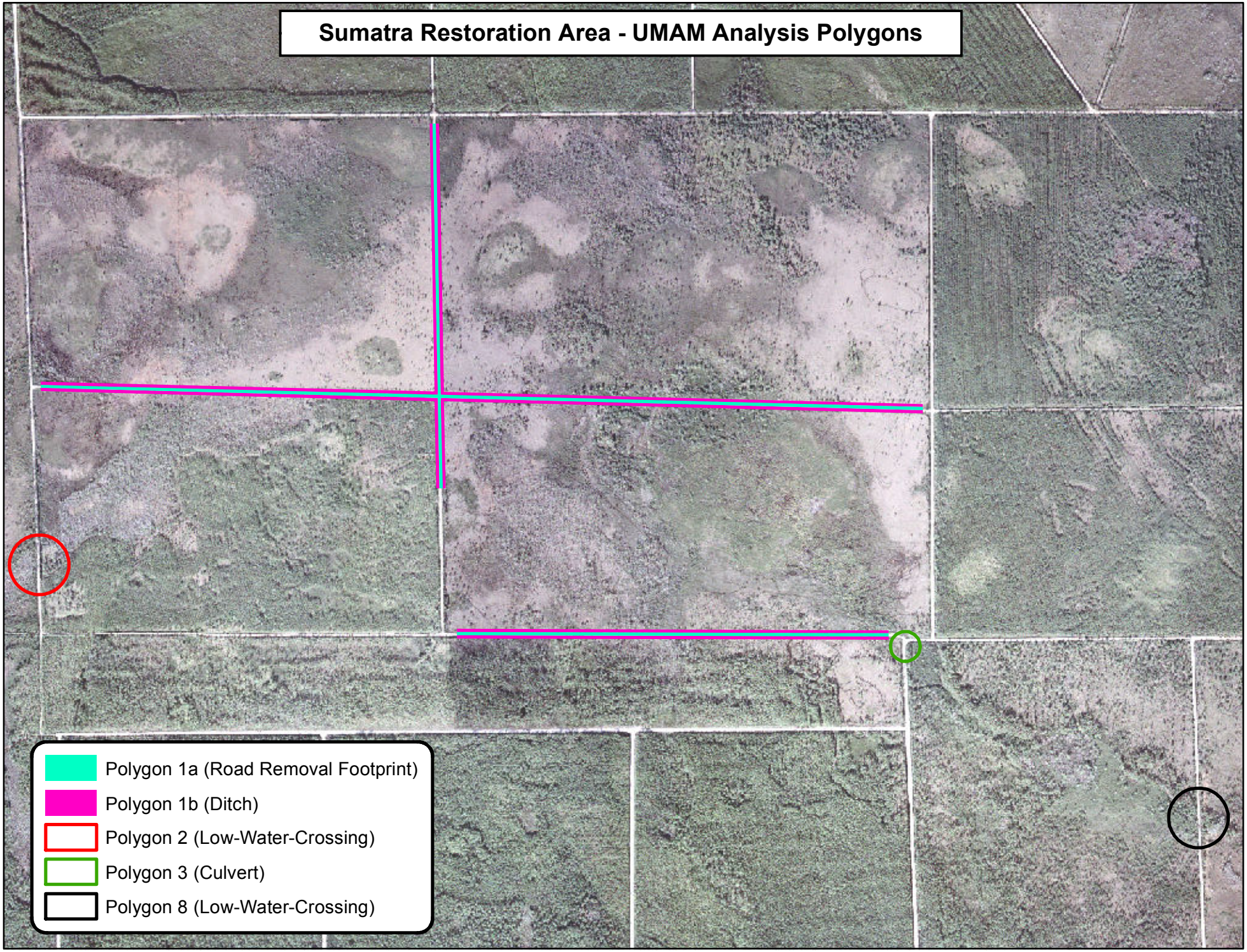
Whiskey George / Sumatra
IRT UMAM Credit Assessment - 9/15/10

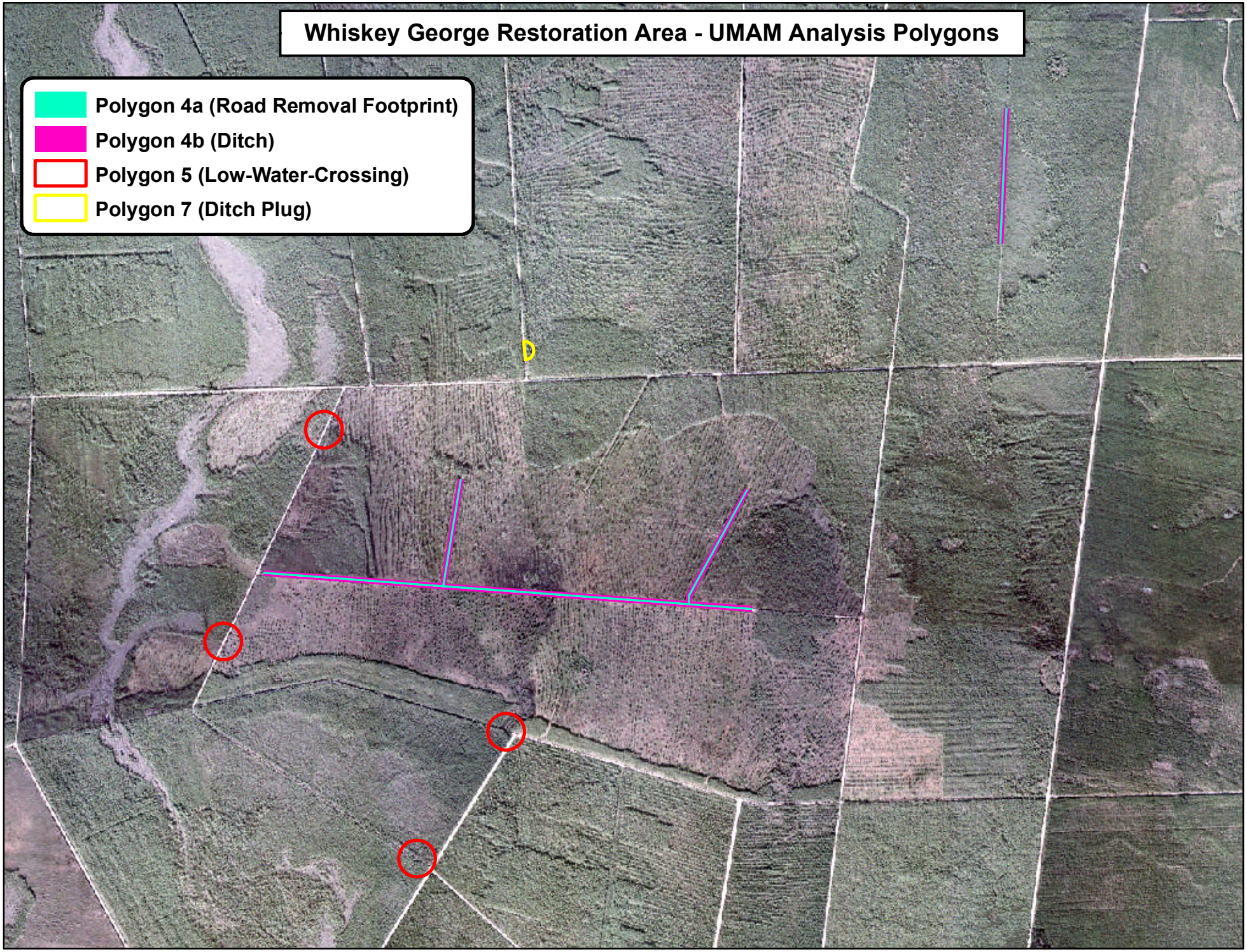
DO NOT ENTER DATA ON THIS PAGE
ENTER SCORES ONLY ON INDIVIDUAL POLYGON PAGES

Polygon	Acres	L1	L2	W1	W1	C1	C2	W/Out Score	With Score	Raw Delta	Time Lag	P Factor	Risk	Adjusted Delta	UMAM Credits	Description
1a	12.42	0	9	0	8	0	9	0.00	0.87	0.87	1.25	N/A	1	0.69	8.61	Road removal: road footprint (Sumatra)
1b	9.26	7	9	6	8	6	9	0.63	0.87	0.23	1.25	N/A	1	0.19	1.73	Road removal: ditch (Sumatra)
2	6.49	7	9	7	8	7	8	0.70	0.83	0.13	1.25	N/A	1	0.11	0.69	One Low water crossing on West Boundary Road (Sumatra)
3	1.60	7	7	6	8	7	8	0.67	0.77	0.10	1.25	N/A	1	0.08	0.13	New two 30-inch culverts (Sumatra areas)
4a	10.39	0	9	0	7	0	7	0.00	0.77	0.77	1.25	N/A	1	0.61	6.37	Road removal: road footprint (Whiskey George)
4b	7.75	7	9	6	7	6	7	0.63	0.77	0.13	1.25	N/A	1	0.11	0.83	Road removal: ditch (Whiskey George)
5	25.96	7	9	7	8	7	8	0.70	0.83	0.13	1.25	N/A	1	0.11	2.77	Four Low water crossings (Whiskey George)
7	0.80	8	8	7	8	7	7	0.73	0.77	0.03	1.25	N/A	1	0.03	0.02	Ditch Plug (Whiskey George)
8	6.49	7	9	7	8	7	8	0.70	0.83	0.13	1.25	N/A	1	0.11	0.69	One Low water crossing on Road 21 (Sumatra)
	---														---	
	81.16														21.84	

L1 = Location and Landscape Support - Without Mitigation
L2 = Location and Landscape Support - With Mitigation
W1 = Water Environment - Without Mitigation
W2 = Water Environment - With Mitigation
C1 = Community Structure - Without Mitigation
C2 = Community Structure - With Mitigation

Raw Delta = w/mit score - without mitigation score
Adjusted Delta = Raw Delta / (Time Lag * Risk)
UMAM Credits = Acres * Adjusted Delta


Sumatra Restoration Area - UMAM Analysis Polygons
Polygon 1a (Road Removal Footprint)
Polygon 1b (Ditch)
Polygon 2 (Low-Water-Crossing)
Polygon 3 (Culvert)
Polygon 8 (Low-Water-Crossing)

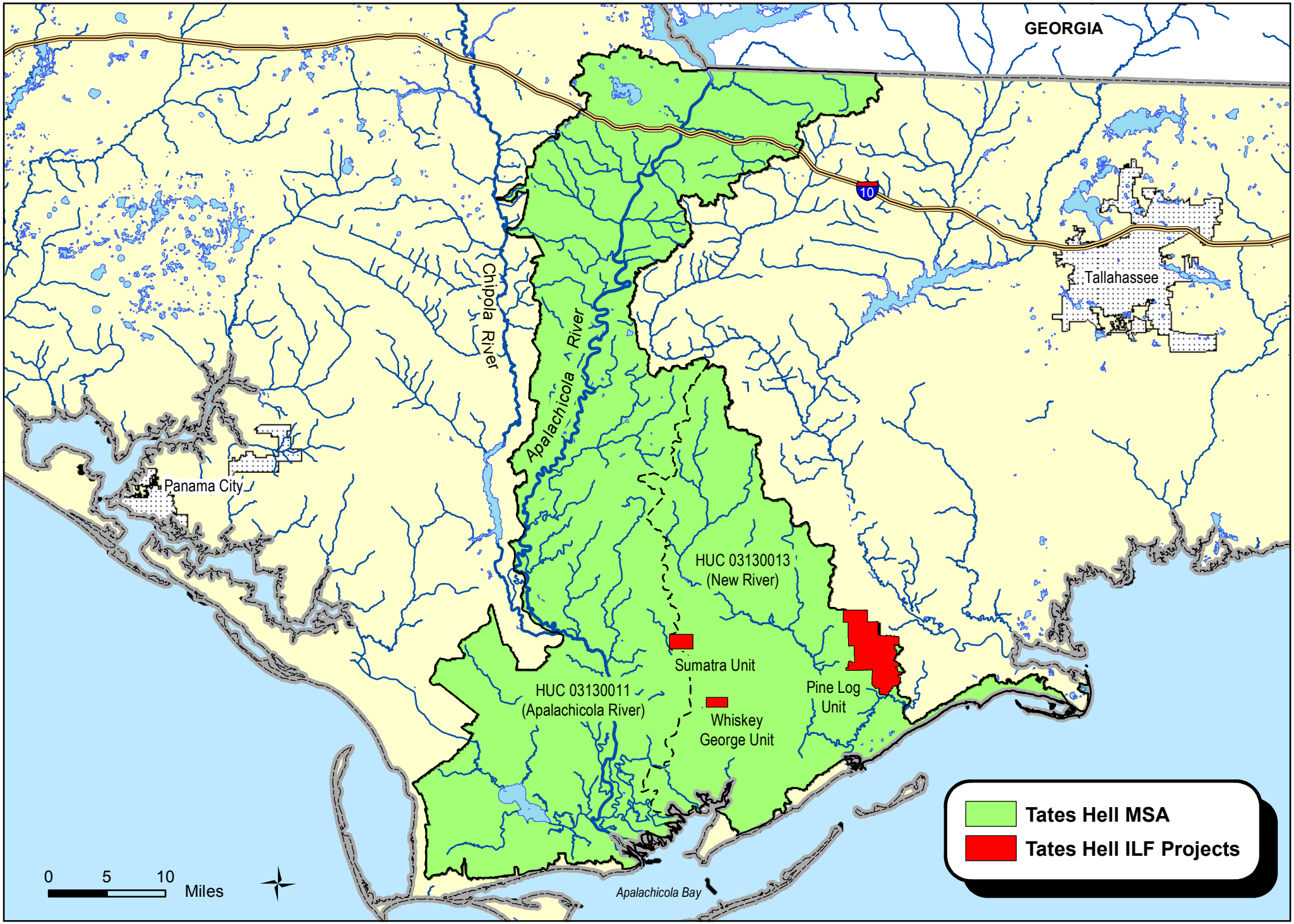

Whiskey George Restoration Area - UMAM Analysis Polygons
Polygon 4a (Road Removal Footprint)
Polygon 4b (Ditch)
Polygon 5 (Low-Water-Crossing)
Polygon 7 (Ditch Plug)

Mitigation Service Area

The Tates Hell Mitigation Service Area (MSA) covers approximately 1,075 mi^2, and consists of two 8-digit Hydrologic Unit Code (HUC) basins; HUC 03130013—New River, and HUC 03130011—Apalachicola River (excluding the approximately 4% of the basin that occurs in Georgia).

Three separate mitigation sites comprise the Tate Hell ILF project: the Pine Log Creek Unit (located within the New River HUC basin), the Whiskey George Unit (also located within the New River HUC basin), and the Sumatra Unit (which straddles the watershed divide between the New River and Apalachicola HUC basins). Similar wetland habitats (e.g., hydric pine flatwoods and savanna, cypress, bay swamp, etc.) occur in both HUC basins. Because of similar wetland habitats, the largely rural nature of the Apalachicola / New River watershed, and to ensure the economic viability to the Tates Hell ILF project (over 90% of the New River HUC basin is part of either the Tates Hell State Forest or the Apalachicola National Forest), it is appropriate for the MSA to consist of these two 8-digit HUC basins.

Tates Hell Mitigation Service Area



Schedule of Credit Release
Tates Hell (Pine Log Creek) Mitigation Area

Total Potential Credits = 16.68

Task No.	Performance-based Milestone	% Credit Release	Number of Credits
	CREDITS RELEASED AS OF JUNE 12, 2013	100%	16.68
	Totals:	100%	16.68

Schedule of Credit Release
Tates Hell (Whiskey George / Sumatra Unit) Mitigation Area

Total Potential Credits = 21.84

Task No.	Performance-based Milestone	% Credit Release	Number of Credits
	CREDITS RELEASED AS OF JUNE 12, 2013	89%	19.48
1	**Final Release Criteria** - Installed hydrologic improvements (i.e., ditch plugs, culverts, low-water-crossings) are functioning and in stable condition; vegetation on footprint of road removal areas trending toward natural, appropriate communities.	11%	2.36
	Totals:	100%	21.84