

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.

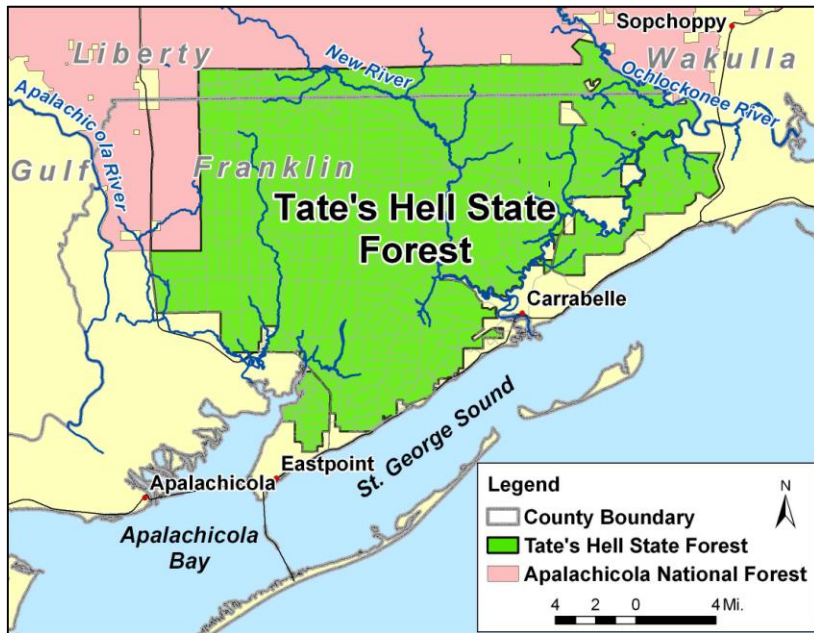


Figure 1. Tate's Hell State Forest

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.nfwmdwetlands.com/index.php?Page=30>.

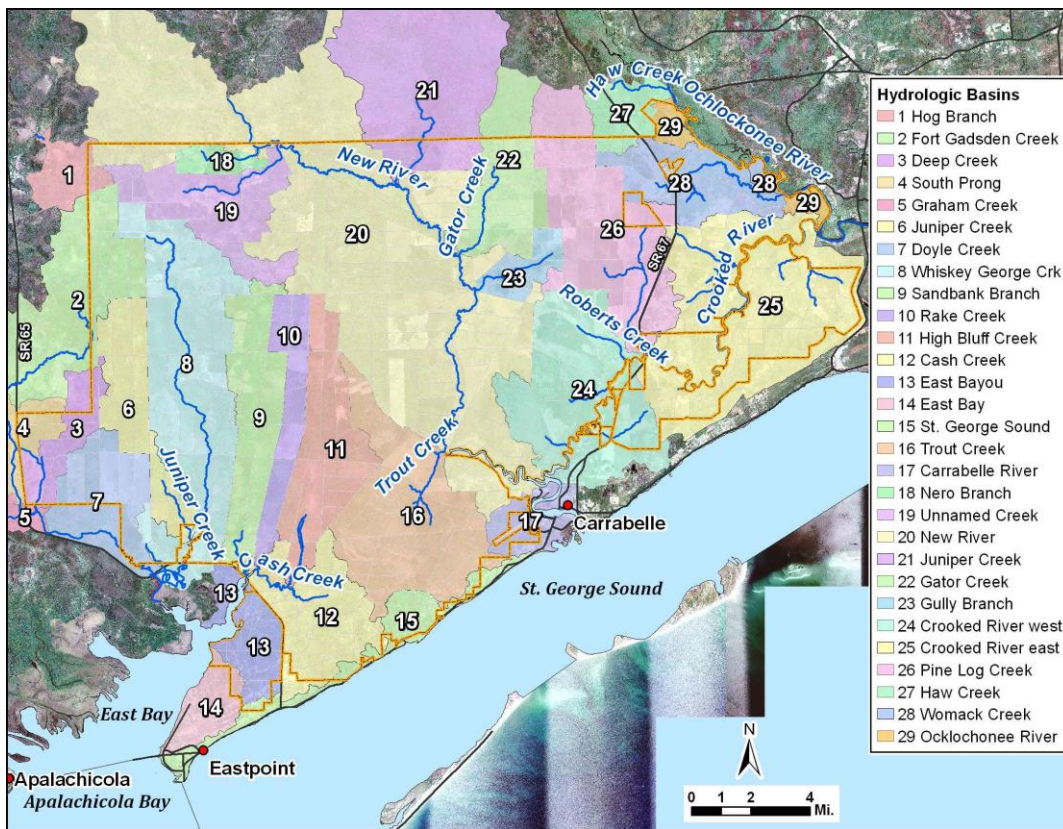


Figure 2. Surface Water Basins Within Tate's Hell State Forest

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



Figure 3. Low Water Crossing

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.

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

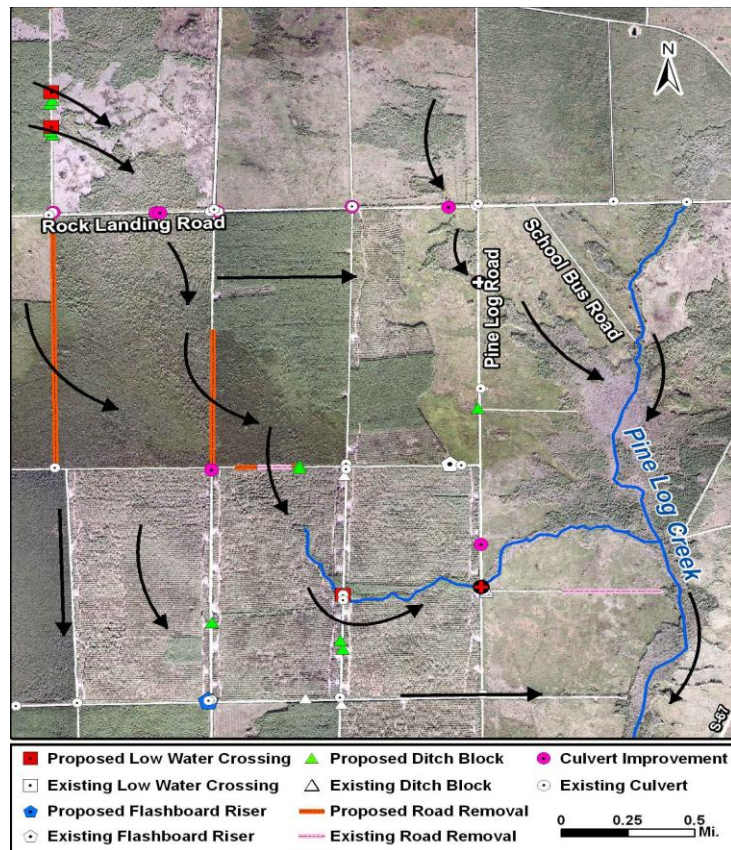


Figure 4. Example Restoration Plan Showing Proposed Hydrologic Improvements and Post-Restoration Drainage Patterns in the Pine Log Creek Basin

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.