

Dutex (NFWFMD ILF Program Mitigation Project Site)

Contents:

- Summary of Twelve Components of the Compensatory Mitigation Plan
- Detailed Mitigation Plan
- Joint Application for Works in Waters of Florida
- USACE Jurisdictional Determination (JD Form)
- Mitigation Service Area

Summary of Twelve Components of the Compensatory Mitigation Plan

Northwest Florida Water Management District
In-Lieu Fee Program

Dutex 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 Dutex Mitigation Documents for Additional Explanation and Detail)

22 September 2014

1—Objectives

Located in the Perdido River and Bay watershed (an area not served by any private mitigation bank), the Dutex Mitigation Area (809.85± acres) was acquired June 12, 2009 specifically for use as mitigation for current and future FDOT impacts. Mitigation will consist of preservation, enhancement, and restoration of hydrology and natural vegetation communities. Restoration and enhancement activities may include, yet are not limited to, mechanical reduction of understory brush layers, prescribed fire, herbicide treatments of exotic and/or invasive plant species, and hydrologic improvements (e.g., low-water-crossings, ditch plugs). Specific mitigation targets, by vegetation community, are as follows:

- Restoration of ~125.13 acres of (FLUCCS 625) Hydric Pine Flatwoods
- Restoration of ~190.42 acres of (FLUCCS 626) Hydric Pine Savanna
- Enhancement of ~3.79 acres of (FLUCCS 510 and 510d) Stream and Waterways
- Enhancement of ~2.31 acres of (FLUCCS 524 Lake (less than 10 acres)
- Enhancement of ~74.38 acres of (FLUCCS 611) Bay Swamp
- Enhancement of ~36.28 acres of (FLUCCS 613) Gum Swamp
- Enhancement of ~61.87 acres of (FLUCCS 614) Titi Swamp
- Enhancement of ~9.46 acres of (FLUCCS 627) Hydric Pine Swamp Forest
- Enhancement of ~79.13 acres of (FLUCCS 630) Wetland Forested Mix
- Enhancement of ~5.16 acres of (FLUCCS 631) Wetland Shrub
- Enhancement of ~77.99 acres of (FLUCCS 641) Freshwater Marsh
- Enhancement of ~104.56 acres of (FLUCCS 642) Saltwater Marsh
- Enhancement of ~35.84 acres of (FLUCCS 411) Mesic Pine Flatwoods
- Enhancement of ~9.89 acres of (FLUCCS 434) Hardwood-Conifer Mix
- Preservation of ~4.31 acres of (FLUCCS 710) Beach

2—Site Selection Criteria

Perdido River and Bay watershed, occurring on the border of Florida and Alabama, drains about 1,200 mi². Approximately 350 mi² (30%) is within Florida, with the remainder being in Alabama. Land cover in the Florida portion of the basin is primarily urban and forest; substantial urbanization occurs west of Pensacola.

Acquisition of this mitigation site complements existing NFWMD land ownership within the Perdido River and Bay watershed, is part of a larger, legislative mandate to restore and protect aquatic resources in northwest Florida, and fills a gap in mitigation options for FDOT impacts in

this watershed. Prior to acquisition, the Dutex site and conceptual mitigation plan was reviewed and inspected in the field by the USACE and a Review Team (composed of representatives from USFWS, NMFS, FWC, FDOT, and NFWFMD), which deemed it appropriate as a compensatory wetland mitigation project. A detailed restoration plan was developed, and the USACE, in consultation with the Review Team, approved a potential of 107.16 Uniform Mitigation Assessment Method (UMAM) credits. After mitigation is implemented and success criteria fully met, this site is expected to be largely ecologically self-sustaining (long-term management is expected to consist of periodic prescribed fire and management of exotic and/or invasive plant species as needed).

3—Site Protection Instrument

The NFWFMD, a governmental entity created by the Florida Water Resources Act of 1972, given taxing authority by a Florida constitutional amendment in 1973, with jurisdictional boundaries covering 16 counties established in Florida Statutes 373.069, manages over 200,000 acres in the Florida Panhandle for water resources protection and ecosystem integrity. Florida Statutes 373.1391 mandates ecological management of NFWFMD lands, although allowing for multiple uses such as hunting and passive recreation when such uses do not conflict with ecological management goals. It is the policy of the NFWFMD Governing Board to prioritize the conservation, protection and restoration of water resources and natural ecosystems over other uses such as public access.

In accordance with the site protection clauses of the USACE/EPA compensatory mitigation Final Rule, title to the Dutex Mitigation Area (acquired fee-simple) will be held in perpetuity by the NFWFMD and managed as conservation/mitigation lands.

4—Baseline Information

(See “DUTEX PROPERTY CONCEPTUAL MITIGATION PLAN” June 24, 2010 for detailed baseline information and the maps referenced below)

- Location Map (Figure 1)
- USGS Quadrangle (Figure 2)
- Current FLUCCS Map Tract A (Figure 3A)
- Current FLUCCS Map Tract B (Figure 3B)
- Historical Aerial 1951 (Figure 4)
- NRCS Soils Map (Figure 5)
- Proposed FLUCCS Map Tract A (Figure 6A)
- Proposed FLUCCS Map Tract B (Figure 6B)
- Mitigation Activity Tract A (Figure 7A)
- Mitigation Activity Tract B (Figure 7B)
- UMAM Assessment Area Tract A (Figure 8A)
- UMAM Assessment Area Tract B (Figure 8B)

5—Determination of Credits

Mitigation credits were determined by the Uniform Mitigation Assessment Method (UMAM). The UMAM credit determination of 107.16 was approved by the USACE. Release of mitigation

credits will be determined by the USACE in consultation with an Interagency Review Team. Detailed information on the determination of credits is contained within the “DUTEX PROPERTY CONCEPTUAL MITIGATION PLAN” of June 24, 2010.

6—Detailed Work Plan

Detailed information on the mitigation work plan is contained within the “DUTEX PROPERTY CONCEPTUAL MITIGATION PLAN” of June 24, 2010. Restoration goals will be achieved via extensive mechanical thinning/removal of shrubs (e.g., Gyro-trac or similar methods), hydrologic improvements (e.g., low-water-crossings, ditch plugs, breaching or removal of beaver dam, removal of beaver), supplemental plantings, forest thinning, herbicide treatments of exotic and/or invasive vegetation, and prescribed fire. Techniques employed may be modified as on-the-ground conditions warrant.

Prescribed Fire, Fire Intrusion

Frequent fire is necessary to re-establish and maintain the historic limits and plant assemblages of grasslands and herbaceous pinelands. A great deal of the existing dense woody vegetation is likely attributable to fire suppression, especially within the mesic and hydric pine flatwoods and hydric pine savanna lands. The longer the period of time since the last fire, the more developed the understory shrubs will be. If the understory is allowed to grow for too long, the accumulation of needle drape and the height of flammable understory shrubs will increase the probability of a catastrophic canopy fire. Due to the long absence of fire throughout many of communities within the Dutex Property, cool season or dormant season burns may be required to reduce the fuel load prior to warm season burns. Mechanical removal of dense titi stands should also be implemented to reduce the vertical fuel load to reduce the likelihood of a canopy fire. Fires should be allowed to burn into deeper wetland systems. Existing firebreaks should be used where present. No firelines will be used to prevent fire from intruding into forested or shrub dominated wetlands unless experiencing drought conditions or there is concern with smoke management. When a fireline is necessary, heavy equipment can be used only to mow or “lay down” vegetation by driving equipment over the area of concern with attention to avoiding wet, mucky areas. If the previous two methods are unsatisfactory, and the situation is considered a serious threat, careful planning and consideration for a lightly harrowed line as determined by agency staff is acceptable. Growing season burning will be used whenever possible to mimic natural fires. Firelines will avoid ecotones and prescribed fires will be encouraged to burn into wetland ecotones when sufficient hydration exists. The protocol for fire in wetlands is to allow fires to reduce woody plants on the wetland edges and within the ecotone.

Gyrotrac, Thinning

A Gyro-Track, set off-grade, should be used in areas containing dense, mature brush and small trees. Gyro-Tracking should be conducted in manner that does not disturb the soil.

Road/Beaver Dam Removal and Low Water Crossings

The beaver dam and associated road should be breached and/or removed. Fill generated should be spread into adjacent ditches, used as ditch blocks, or otherwise disposed of in appropriate upland areas. Beavers should be trapped and removed from the property. Six hardened low-water-crossings have been sited on a road that will be maintained for management access where wetland drains or water conveyances were historically present. Following beaver dam removal and subsequent draining of inundated wetlands, historically forested wetlands will be allowed to re-vegetate naturally. Supplemental plantings are not proposed as native soil and

adjacent lands should provide an ample seed source and root stock for proper re-establishment of the native vegetative community.

Vegetation Control

Chemical treatment may be utilized to remove and retard growth both of native, woody vegetation following initial shrub reduction, and nuisance/exotic species. Herbicide applications will be applied by a Florida-licensed Restricted Use Pesticide (RUP) applicator that is familiar with the indigenous plant populations. Herbicides are often the most effective and efficient means of controlling woody plants or plants with running rhizomes. There are several application techniques that can be used to control trees and other woody plants, and not all woody plant species are equally susceptible to herbicides. Therefore, relative to size and species, results may vary for any of these application methods. Hand-applied foliar spray may be utilized where risk to non-target species is minimal. Treatments using this method will be conducted such that over-application, spray run-off, and spray drift are minimized. Additionally, a tracer dye may be used with the spray solution to avoid over-application or omitting some plants entirely. This treatment technique is most effective during the growing season. All treatments will be conducted during appropriate vegetative growing stage, weather conditions, and season to increase effectiveness.

Supplemental Planting

Supplemental planting within the western tract of the Dutex site, if any, would only occur within areas of beaver dam removal. Supplemental plantings within the eastern tract may occur in areas currently containing dense pine stands. Throughout both western and eastern tracts supplemental wiregrass plantings and additional regional herbaceous groundcover flatwoods species may occur if herbaceous groundcover within mesic flatwoods, hydric pine flatwoods, or hydric pine savannas is deemed insufficient following the initial clearing/thinning effort. Supplemental plantings will consist of seedlings and wiregrass plugs installed at varying densities dependent upon existing/regenerating plant densities. Planting densities within bay swamps will depend on vegetative structure/density following mitigation activities.

7—Maintenance Plan

After implementation of mitigation and meeting of all success criteria, this site will be actively maintained by NFWFMD lands management personnel as part of extensive holdings in the Perdido River and Bay watershed. Maintenance may include ensuring that the breaches in the beaver dam remain open (e.g., beaver management), prescribed fire where appropriate, and exotics management. This site is expected to be largely self-sustaining.

8—Performance Standards

- Nuisance vegetation \leq 5% cover per acre.
- Exotic vegetation \leq 1% cover per acre.
- In hydric pine flatwoods restoration areas, an average of no more than 200 trees per acre.
- In hydric pine savanna restoration areas, an average of no more than 120 trees per acre
- No more than an average of 200 pine trees per acre in any upland areas.
- 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.

Performance standards may be modified, with approvals by the USACE in consultation with an Interagency Review Team, if on-the-ground conditions warrant.

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 NFWFMD staff or qualified consulting firms. Annual reports will be generated and posted at www.NFWFMDwetlands.com (or any successor website).

UMAM Analysis

A UMAM reassessment may be conducted approximately 5 years and 10 years after initiation of restoration activities.

Exotic and/or Invasive Vegetation

The target is for invasive exotic species to cover less than 1% cover in any one acre and for nuisance native species to cover less than 5% in any one acre. Surveys for exotic and nuisance native vegetation will occur annually and percent cover will be recorded and included in the annual report. If observed, exotic vegetation will be eradicated manually or chemically to ensure that the exotic species cover is below desired cover requirements.

Quantitative Monitoring

Quantitative monitoring will be conducted annually at the end of the growing season. Percent vegetation cover will be monitored at permanent transect locations established for each site and community. The presence of any threatened or endangered species will be recorded and noted in the annual monitoring report, and GPS locations recorded. Vegetation species coverage statistics will be generated.

Qualitative Monitoring: Materials and Methods

Qualitative vegetation monitoring will include direct observation of habitat health and a record of all species occurring within a given community at the time of the site visit. Pedestrian surveys increase site coverage and include meandering walk-paths intended to provide information useful in management and to determination the success of management activities. Each walk path will traverse as much habitat as possible. Plant species will be recorded along the pedestrian walk-path. Representative photos and a community description and health will be included for each walk-path. Fuel load for each habitat was determined and the presence of any threatened or

endangered species will be recorded and highlighted in the annual report. Wildlife observations may also be recorded and included in the annual report.

Photographic Documentation

Site Photos:

In conjunction with the pedestrian surveys, quantitative sampling, or other site visits, representative photos will be taken of each restoration community.

Panoramic photos:

Panoramic 360 degree photographs will be taken from permanently established stations.

Oblique aerials:

Periodic acquisition of oblique aerials for the site may be considered.

Wildlife Monitoring

During the vegetation monitoring and pedestrian surveys, wildlife observations will be recorded. These observations will consist of direct sightings, scat, tracks, or vocalizations. The presence of any listed species or unique wildlife observation such as a gopher tortoise burrow or wading bird colony will be noted and GPS location recorded.

Fuel loads and prescribed fires within pyrogenic communities

Annual status reports will detail the condition of the communities relative to the need and potential for a burn, the conditions required for the next desirable burn, and the anticipated timeframe for the next burn.

10—Long-term Management

Long-term management, including exotics control and prescribed fire, will be implemented by the NFWFMD. The NFWFMD is responsible for ensuring the perpetual management of mitigation lands. Florida Statutes sections 373.1391(1)(a) and 373.59(3) mandate the ecological management and restoration, to the extent practicable, of lands owned by the NFWFMD. Mitigation lands owned by the NFWFMD will be managed in perpetuity for ecological integrity.

11—Adaptive Management Plan

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

12—Financial Assurances

The NFWFMD 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 NFWFMD had greater than \$15,000,000 available in a dedicated mitigation fund. This fund was established to receive payments from FDOT (and potentially other entities) for providing mitigation 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.

Detailed Mitigation Plan

**DUTEX PROPERTY
UMBRELLA REGIONAL MITIGATION PLANS
FOR FLORIDA DEPARTMENT OF TRANSPORTATION PROJECTS
CONCEPTUAL MITIGATION PLAN
ESCAMBIA COUNTY, FLORIDA**

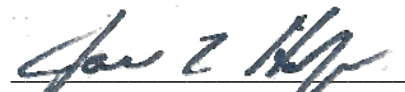
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June 24, 2010

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Appendix D.	UMAM Assessment Area Tract A (western lands)
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1.0 PROJECT OVERVIEW AND GOALS

ENTRIX, Inc. (ENTRIX) has prepared the following conceptual wetland restoration plan of the Dutex Property (Dutex) for the Northwest Florida Water Management District (NFWFMD). The majority of wetlands within Dutex are degraded due to historical land management practices, primarily fire suppression. The restoration plan was developed together with NFWFMD.

Dutex is comprised of western and eastern tracts, 481.58 and 338.85 acres respectively. For the purposes of this report the western lands will be referred to as Tract A and the eastern lands as Tract B. The majority of the property exists as wetlands that have been identified by NFWFMD as suitable wetland mitigation lands. The wetland mitigation limits were established by NFWFMD following review of historic aerials. To the greatest extent possible, proposed mitigation lands are intended to approximate the sites historic (pre-impact) wetlands limits and community structure. The property's uplands and wetlands will be restored and managed in perpetuity for ecological integrity by NFWFMD.

The following wetland report provides a cursory review of current and historic site conditions as well as a conceptual mitigation plan for all lands slated for mitigation. This review included utilizing aerial interpretation of current and historic aerials, soils mapping and associated community prescription, and ground-truthing of these interpolated features to determine the sites restoration potential. The assessment of historic conditions at the site underscores the extent to which native site conditions have been significantly altered through fire suppression. The prescribed restoration plan is based on the evaluation of these conditions.

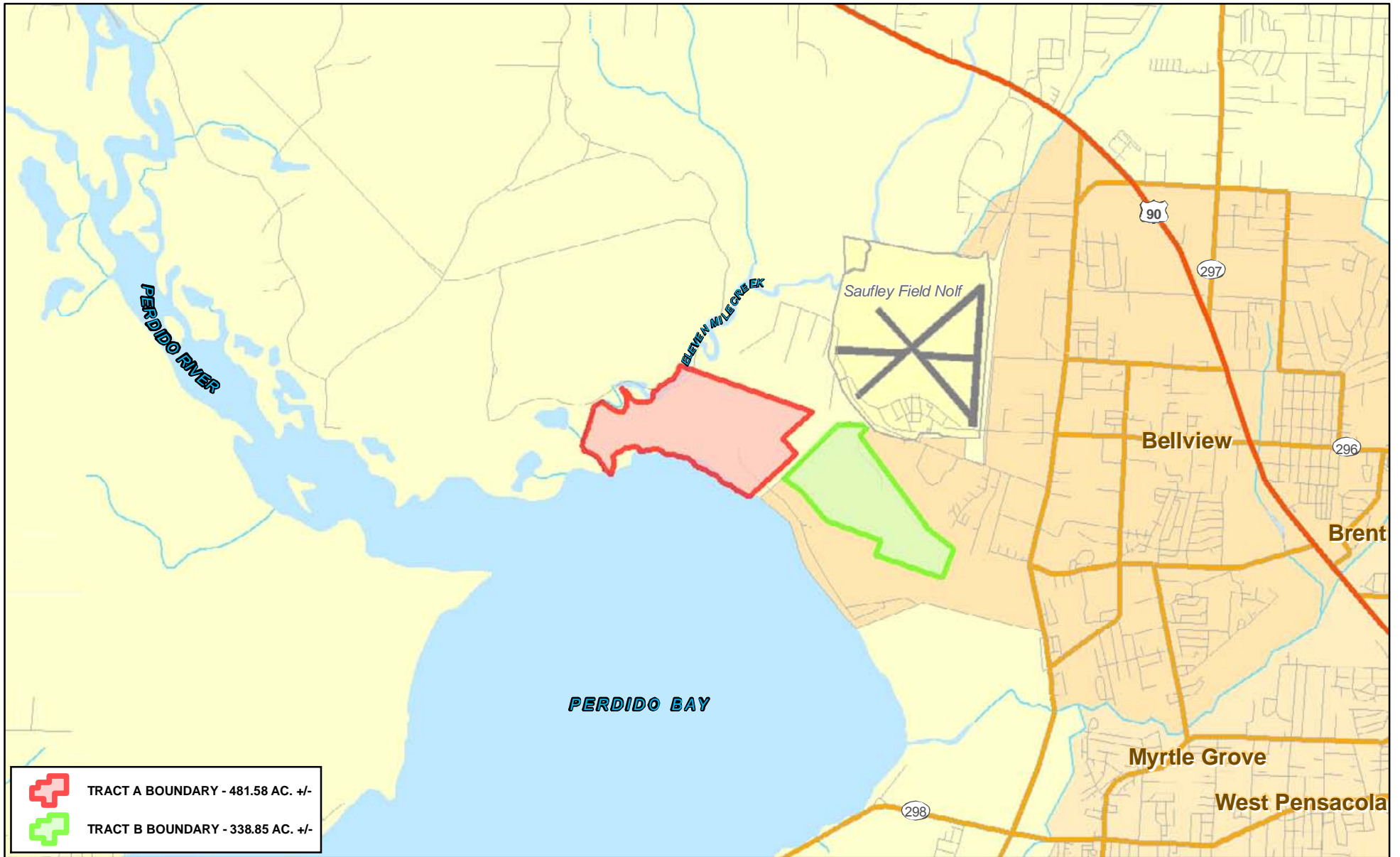
Both common and scientific botanical names follow Wunderlin and Hansen (2003) and Andre Clewell (1985); see references in **Section 11.0**. The authorship of scientific names can be obtained in either of these references, and therefore, have been excluded from this report.



2.0 LOCATION AND LANDSCAPE

Dutex (Section 36, Township 2S, Range 31W) is approximately 820 acres located in the Perdido watershed between Perdido Bay and Saufley Field (part of the Pensacola Naval Air Station facilities), Escambia County, Florida; see **Figure 1**. The property lies north of Perdido Bay (a Class III water body), bordered by Eleven Mile Creek to the west and Saufley Field, a naval training facility, to the north. Topographic changes within Dutex are detailed on a United States Geological Survey (USGS) Quadrangle map as **Figure 2**.

The Dutex property is entirely undeveloped. A federally constructed and maintained drainage easement associated with the naval air field runs through the middle of the property separating Tracts A and B. Maintained access roads lie along either side of the drainage easement. Tract A contains various dirt roads and ditches. Numerous areas of trash dumping were evident throughout the western portion of the property, as was evidence of previous silviculture activity.

The Department of State, Division of Historic Resources, was contacted concerning possible archaeological sites. They have no record of any archaeological sites and no evidence of any archaeological resources was found during the inspection on this property as reported by The Phoenix Environmental Group (Otto-Allender, 1995).



-  TRACT A BOUNDARY - 481.58 AC. +/-
-  TRACT B BOUNDARY - 338.85 AC. +/-

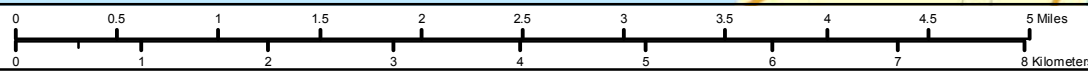



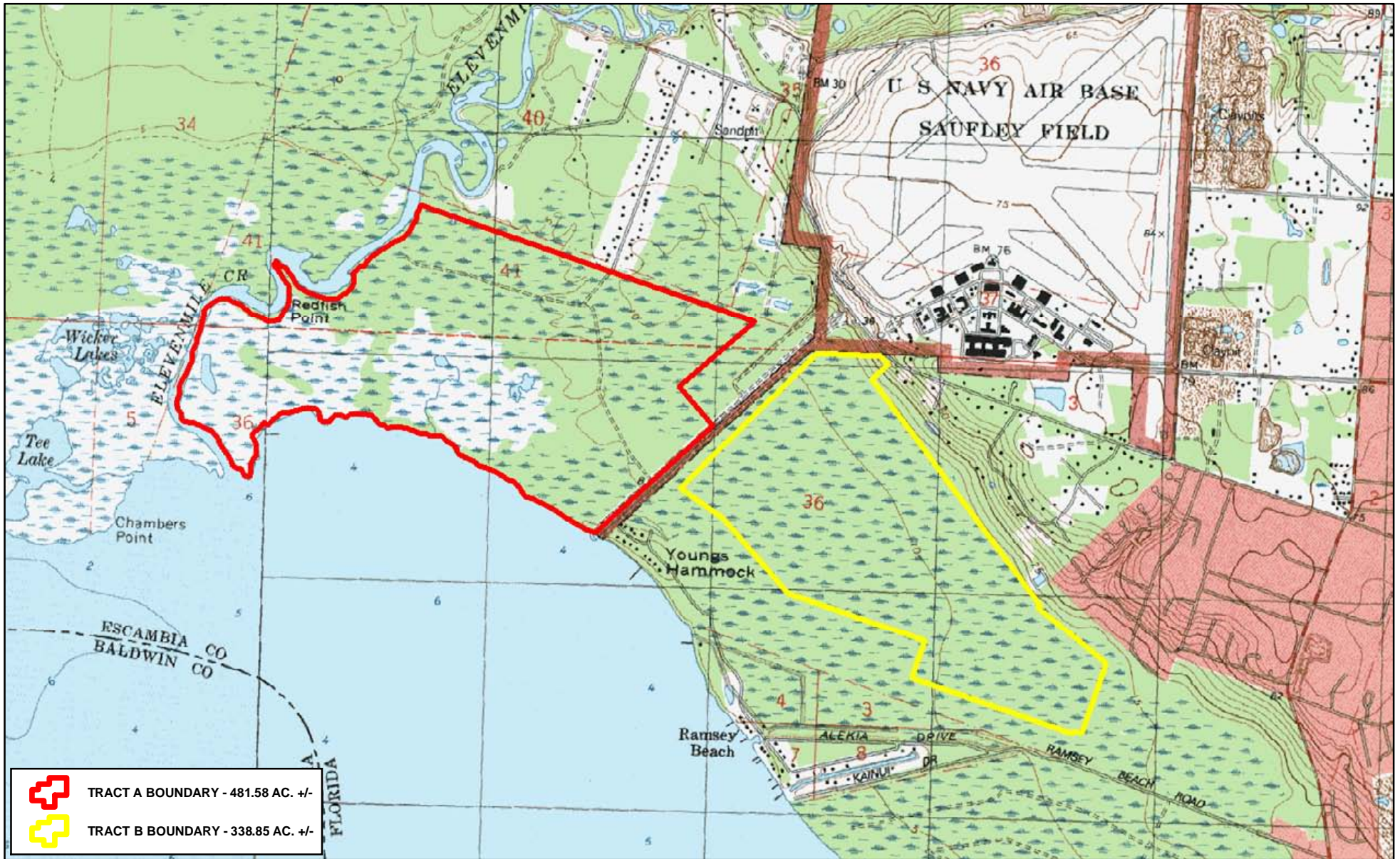
Figure 1 - Location Map
Dutex
Escambia County, Florida

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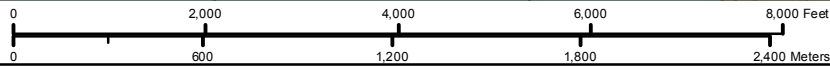
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TRACT A BOUNDARY - 481.58 AC. +/-



TRACT B BOUNDARY - 338.85 AC. +/-



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Figure 2 - USGS Quadrangle Map

Dutex
Escambia County, Florida



Image: USGS Quadrangle
WEST PENSACOLA

Sec 041
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Sec 036
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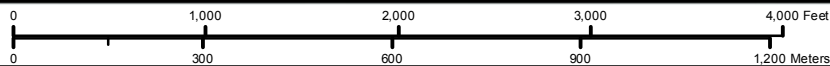
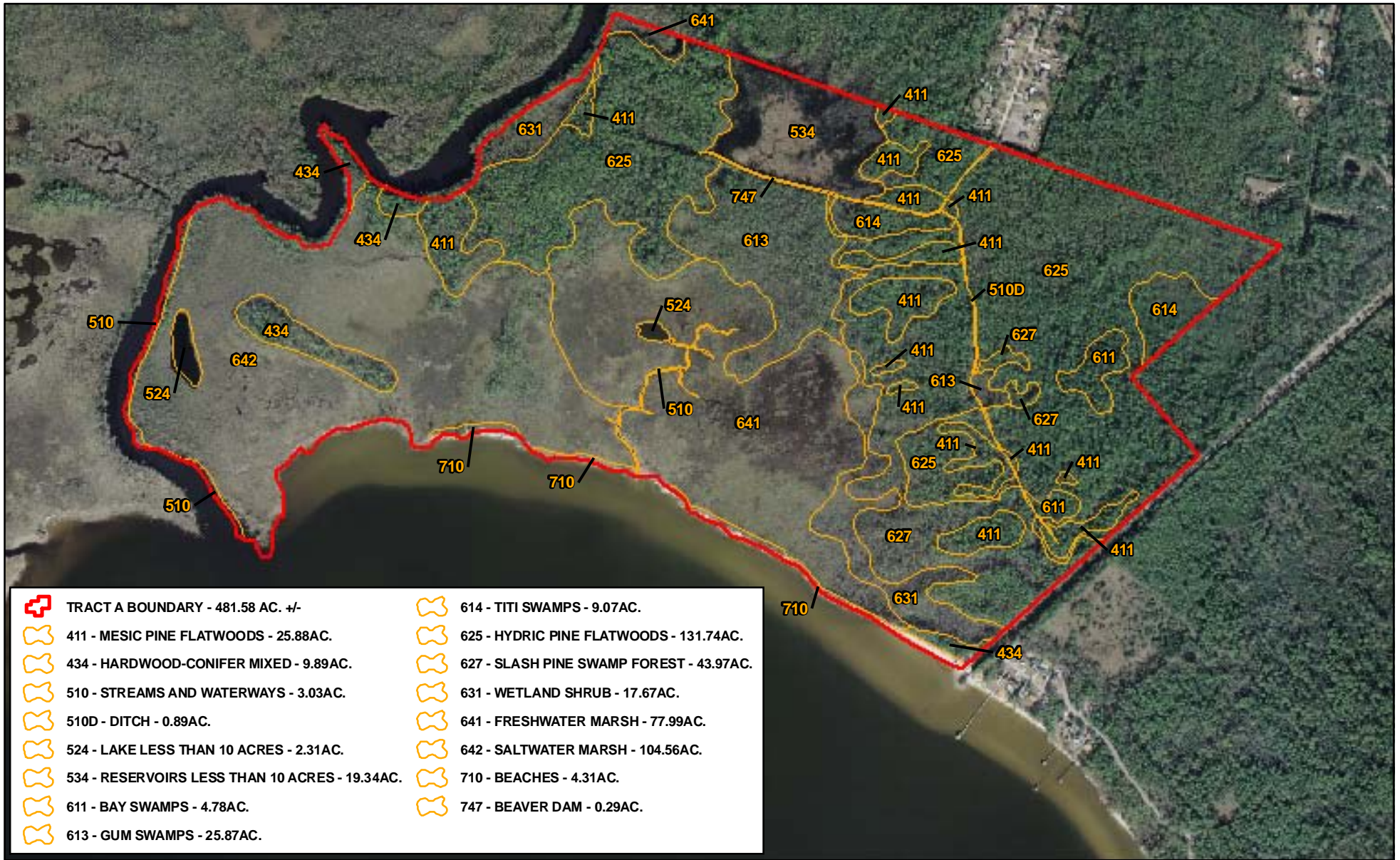
3.0 CURRENT AND RECENT HISTORICAL CONDITIONS

Historically both subject tracts were subjected to limited silvicultural practices. These included harvest of cypress, slash (*Pinus elliottii*), and longleaf pine (*P. palustris*) followed by site preparation burns and planting of slash pine. Neither tract contains evidence of mechanical soil disturbance, however, due to the absence of fire the understory community diversity and density has been greatly reduced and partially replaced by a thick duff layer in the hydric pine communities. Some signs of historic fire was observed, but limited to the older canopy trees. More recently the property has been impacted by adjacent upstream development and associated stormwater runoff, encroachment of exotic/invasive vegetative species, fire suppression, and beaver activity. These impacts have caused shifts in the overall vegetative community structures and limits of unique plant community assemblages.

The *Florida Land Use, Cover and Forms Classification System* (FLUCCS) was utilized to identify and map the site’s ecological communities. The FLUCCS method was designed by the Florida Department of Transportation (FDOT) as a way to develop a unified land use classification system for all land cover and plant communities found throughout Florida. ENTRIX conducted a reconnaissance of Tracts A and B in order to aerially delineate the current limits of the various wetland and upland vegetative communities and land uses. The limits of these communities are detailed on **Figures 3A** and **3B**. Specifically, ENTRIX used high-resolution infrared photography, historic black and white photographs, soils maps, and ground-truthing techniques to determine the community limits. For the purposes of this report vegetative communities estimated at less than one acre in size were typically not mapped. A summary of observed vegetative communities by tract are detailed in **Table 1**. A description of the vegetative assemblages found within each community is provided. A complete list of observed plant and wildlife species is provided in **Appendix A** and **B**. A series of site photos is provided as **Appendix C**.

Table 1. Summary of Current On-site Vegetative Communities on the Dutex Property.

FLUCCS Code	FLUCCS Community	Wetland	Acreage
Tract A			
411	Mesic Pine Flatwoods	No	25.88
434	Hardwood Conifer Mixed	No	9.89
510	Stream and Waterways	Yes	3.03
510D	Road/Ditch	Yes	0.89
524	Lakes <10 Acres	Yes	2.31
534	Beaver Pond	Yes	19.34
611	Bay Swamp	Yes	4.78
613	Gum Swamp	Yes	25.87
614	Titi Swamp	Yes	9.07
625	Hydric Pine Flatwoods	Yes	131.74
627	Slash Pine Swamp Forest	Yes	43.97
631	Wetland Shrub	Yes	17.67
641	Freshwater Marsh	Yes	77.99
642	Saltwater Marsh	Yes	104.56
710	Beaches	No	4.31
747	Beaver Dam	No	0.29
Tract B			
441	Pine Plantation	No	8.58
611	Bay Swamp	Yes	36.09
614	Titi Swamp	Yes	56.54
627	Slash Pine Swamp Forest	Yes	167.69
630	Wetland Forested Mixed	Yes	69.94
TOTAL WETLAND ACREAGE			771.48
TOTAL UPLAND ACREAGE			48.95



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Figure 3A - Current FLUCCS Map Tract A

Dutex
Escambia County, Florida



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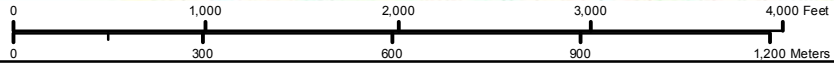
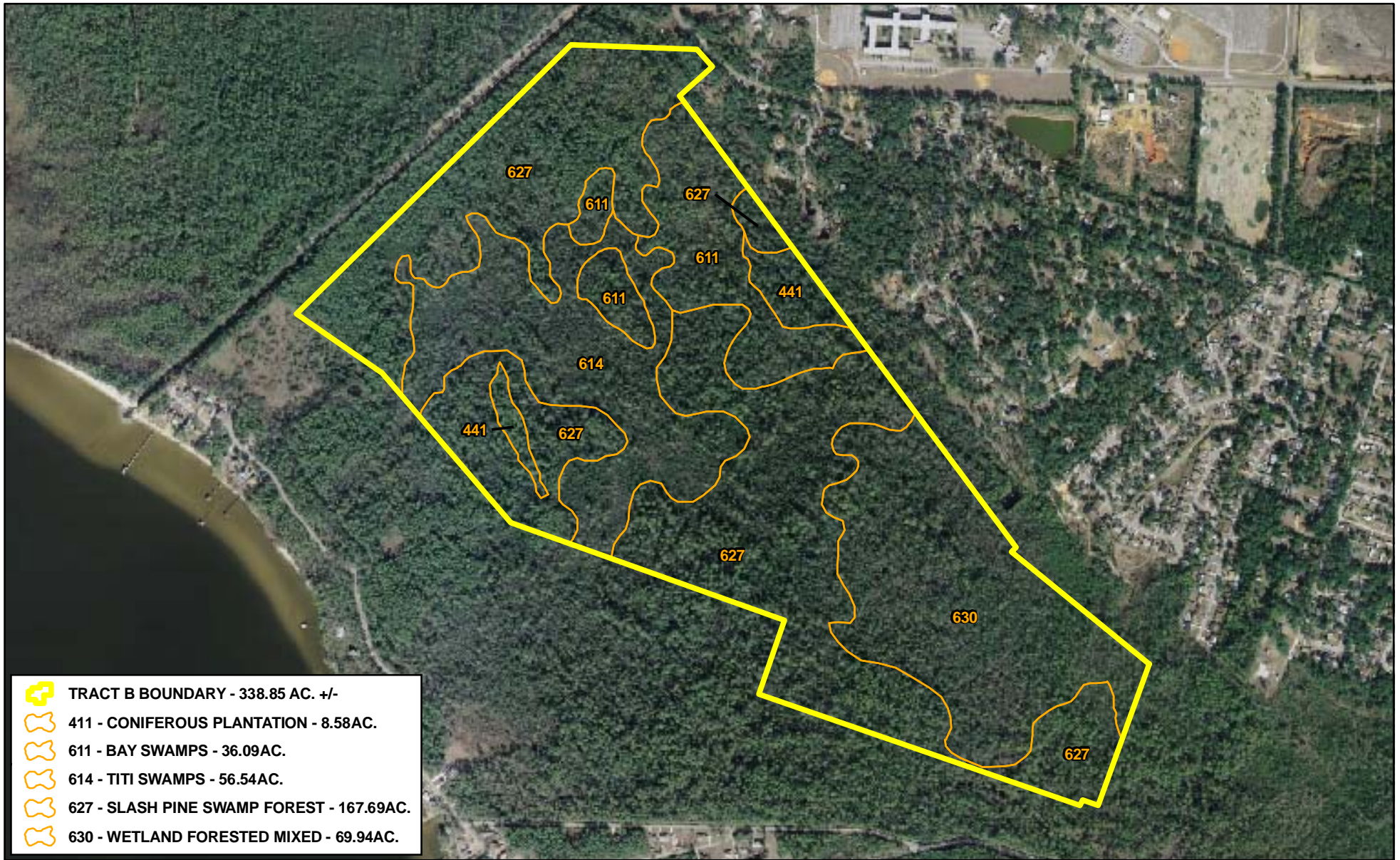
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Figure 3B - Current FLUCCS Map Tract B

**Dutex
Escambia County, Florida**



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Mesic Pine Flatwoods (FLUCCS 411), 34.46 Acres

This community contains an open-to-dense canopy dominated by slash pine. Understory and shrub layer are overgrown and dense. Black titi (*Cyrilla racemiflora*) was often present in large dense stands. Shrub and low growing woody species observed included dwarf live oak (*Quercus minima*), wax myrtle (*Myrica cerifera*), saw palmetto (*Serenoa repens*), coastal sweet pepperbush (*Clethra alnifolia*), horse sugar (*Symplocos tinctoria*), largeleaf gallberry (*Ilex coriacea*), wooly huckleberry (*Gaylussacia mosieri*), Elliott's blueberry (*Vaccinium elliotii*), shiny blueberry (*V. myrsinites*), Darrow's blueberry (*V. darrowii*), and hairy wicky (*Kalmia hirsuta*).

The duff layer throughout this designation was typically deep and ground cover minimal. Occasional canopy openings often contained relict flatwoods herbaceous species including wiregrass (*Aristida stricta*), downy milkpea (*Galactia volubilis*), Carolina yelloweyed grass (*Xyris caroliniana*), and pale meadowbeauty (*Rhexia mariana*).

Hardwood Conifer Mixed (FLUCCS 434), 9.89 Acres

This designation included two narrow, linear, upland vegetative communities adjacent to Eleven Mile Creek on the westernmost edge as well as a small area at the southeasternmost corner of Tract A. Areas adjacent to Eleven Mile Creek appear to be stream terraces associated with flood events or shifts in the river channel. This community contains large, mature southern magnolia, slash pine, and red cedar. Understory and shrub species observed include overstory recruits, laurel oak (*Quercus hemisphaerica*), sand live oak (*Q. geminata*), red bay (*Persea borbonia*), yaupon (*Ilex vomitoria*), and sparkleberry (*Vaccinium arboreum*). Groundcover species included muscadine grape (*Vitis rotundifolia*), saw palmetto (*Serenoa repens*), tall elephants foot (*Elephantopus elatus*), bracken fern (*Pteridium aquilinum*), highbush blackberry (*Rubus argutus*), and laurel greenbrier (*Smilax laurifolia*). This community contains a fairly open understory, a deep layer of pine duff, and low percent coverage of ground cover.

Stream (FLUCCS 510), 3.03 Acres and Lakes <10 Acres (FLUCCS 523), 3.03 Acres

One small unnamed tidal stream and two small lakes occur within the freshwater marsh in the south-central portion of Tract A. These habitat features are typical of marsh systems in northwestern Florida. Daily water level fluctuates according to lunar, as well as windblown forces. In addition to the main tributary creek, and upstream pool, a vast network of small rivulets exists most of which drain freshwater runoff from nearby uplands. Salinities within this system range from freshwater to near saline (30 ppt) dependent on local rainfall and tide cycle. The edges of the marsh creek and rivulets offer essential habitat for a variety of brackish fish species such as killifishes (*Fundulus* spp.), silversides (*Menidia* sp.), mullet (*Mugil* sp.), and pinfish (*Lagodon* sp.). The marsh system also serves as important nursery grounds for commercially important species such as blue crabs (*Callinectes sapidus*), oysters (*Crassostrea* sp.), and Penaeidae. The upstream pools serve as refugia during low tide periods. This designation also includes portions of Eleven Mile Creek on the western edge of Tract A. One small patch of wild taro (*Colocasia esculenta*) was observed growing within Eleven Mile Creek.

Ditches and Roads (FLUCCS 510D), 0.89 Acre

A system of primarily wetland cut ditches and associated roads occur across Tract A. These ditches are associated with either an existing or historic fill road. These ditches were likely created as a result of fill road construction and not for the sole purpose of wetland drainage. Commonly observed ditch vegetation includes southern umbrellasedge (*Fuirena sciroides*), manyhead rush (*Juncus polycephalus*), fringed beaksedge (*Rhynchospora ciliaris*), needlepod rush (*Juncus scirpoides*), fascicled beaksedge (*Rhynchospora fascicularis*), torpedograss (*Panicum repens*), and common water-hyacinth (*Eichhornia*

crassipes). Roads/trails not slated for removal as proposed by this restoration plan were not located and are not depicted on any figures in this report.

Beaver Pond (FLUCCS 534), 19.34 Acres

This feature was created through the flooding of a gum swamp. Downstream wetlands appear sufficiently hydrated and vegetative structure appropriate. Remnant tree stumps and standing dead cypress trees are present throughout this community. The center of this community designation contains a large area of floating and emergent herbaceous vegetation. Herbaceous vegetation is also rooted on persisting hummocks and cypress buttresses. Deeper inundated lands are dominated by fragrant water lily (*Nymphaea odorata*). Vegetation observed included white-topped pitcherplant (*Sarracenia leucophylla*), southern umbrellasedge (*Fuirena scirpoidea*), saltmarsh umbrellasedge (*F. breviseta*), wooly witchgrass (*Dichanthelium scabriusculum*), acid swamp yelloweyed grass (*Xyris serotina*), purple love grass (*Eragrostis refracta*), hairy primrosewillow (*Ludwigia pilosa*), slender beaksedge (*Rhynchospora gracilentata*), bunched beaksedge (*Rhynchospora cephalantha*), and switch grass (*Panicum virgatum*).

Bay Swamp (FLUCCS 611), 40.87 Acres

This community is limited to the northwestern corner of Tract B. This vegetative assemblage occupies both historic forested wetland and hydric pine savanna. This community likely expanded into hydric savannas and hydric pine flatwoods due to a reduction in the fire return interval. The near complete canopy closure and shading reduced the mid and understory cover. Several small creek systems were present and became more defined closer to the bay.

This community designation is dominated by sweetbay. Additional canopy species observed include tulip popular (*Liriodendron tulipifera*), swamp bay (*Persea palustris*) and red maple (*Acer rubrum*). Slash pines were occasionally present as canopy trees. Although no cypress species were observed within this community, several small cypress stumps were present. Herbaceous groundcover was dominated by sensitive fern. Additional species observed included poison ivy, evergreen bayberry (*Myrica carolinensis*), Virginia chain fern, and littlehead nutrush (*Scleria oligantha*), common boneset (*Eupatorium perfoliatum*), water cowbane (*Oxypolis filiformis*), mild waterpepper (*Polygonum* cf. *hydropiperoides*), possumhaw (*Viburnum nudum*), fringed yelloweyed grass (*Xyris fimbriata*), hairy maiden fern (*Thelypteris hispidula*), lax hornpod (*Mitreola petiolata*), irisleaf yelloweyed grass (*Xyris laxifolia* var. *iridifolia*) and marsh fern (*Thelypteris palustris*). A large amount of Chinese privet (*Ligustrum sinense*) is present throughout the northern half of this community.

Gum Swamp (FLUCCS 613), 25.87 Acres

This system occurs immediately south of the beaver dam and grades into the freshwater marsh. Very few large tree specimens were observed within this community, and were primarily limited to a few pond cypress and slash pine. Shrub growth was primarily limited to rooting on hummocks. Some cypress cut stumps were observed. Pond cypress recruitment was also present.

This community is typified by an open canopy comprised of swamp tupelo (*Nyssa sylvatica* var. *biflora*), sweetbay, red maple, swamp bay, as well as occasional slash pine and pond cypress (*Taxodium ascendens*). Understory trees and shrubs included overstory recruits, red chokeberry (*Photinia pyrifolia*), fetterbush, highbush blueberry (*Vaccinium corymbosum*), dahoon (*Ilex cassine*), Virginia willow (*Itea virginica*), and wax myrtle. Herbaceous species observed include royal fern (*Osmunda regalis* var. *spectabilis*), threeway sedge (*Dulichium arundinaceum*), Virginia marsh St. John's-wort (*Triadenum virginicum*), Virginia chain fern (*Woodwardia virginica*), cinnamon fern (*Osmunda cinnamomea*), clustered sedge (*Carex glaucescens*), and string-lily (*Crinum americanum*).

One small isolated polygon, immediately north of a fill road within the eastern-central portion of Tract A, historically appeared to be part of a larger bay swamp (FLUCCS 611). This community's current state may be attributed to lengthened hydroperiod due to pooling of water resultant from the installation of the fill road.

Titi Swamp (FLUCCS 614), 65.61 Acres

This vegetative community occurs on the northeastern corner of Tract A. Vegetation is dominated by pure stands of very dense 15-20 foot tall black titi (*Cliftonia monophylla*). The few canopy trees present are limited to 40-60-foot tall slash pine. No slash pine recruitment was observed. Additional shrub species were a minor component of this community and included fetter bush and gallberry. No herbaceous groundcover vegetation was observed.

Hydric Pine Flatwoods (FLUCCS 625), 131.74 Acres

This forested wetland community covers the majority of Tract A and encompasses the majority of lands historically occupied by hydric flatwoods and hydric savannas. Canopy trees within this community are dominated by slash pine. Pine height on average appeared to be 50-60 feet, and throughout slash pine recruitment was low. Few large, flat-topped slash pines were observed. The understory throughout was typically dense containing sweetbay, myrtle leafed holly (*Ilex cassine* var. *myrtifolia*), large gallberry (*I. coriacea*), red bay, Elliott's blueberry (*Vaccinium elliotii*), highbush blueberry, Virginia willow, swamp tupelo, gallberry, red maple, and black titi.

The duff layer throughout this designation was typically deep, replacing most of the ground cover vegetation. Occasional canopy openings often contained relict hydric flatwoods herbaceous species including wiregrass, Carolina yellow-eyed grass (*Xyris caroliniana*), hairy wicky, bracken fern, foxtail club moss (*Lycopodiella alopecuroides*), whitehead bogbutton (*Lachnocaulon anceps*), redroot (*Lachnanthes caroliniana*), yellow hatpins (*Syngonanthus flavidulus*), slender beaksedge (*Rhynchospora gracilentia*), narrowfruit horned beaksedge (*Rhynchospora* cf. *inundata*), Camphorweed (*Pluchea* sp.), woolly witchgrass (*Dichantherium scabriusculum*), switchgrass (*Panicum virgatum*), loosehead beaksedge (*Rhynchospora chalarocephala*), irisleaf yelloweyed grass (*Xyris laxifolia* var. *iridifolia*), Elliott's yelloweyed grass (*Xyris elliotii*), manyspike flatsedge (*Cyperus polystachyos*), oneflower honeycombhead (*Balduina uniflora*), pale meadowbeauty, savanna meadowbeauty (*R. alifanus*), maid marian (*R. nashii*), blue maidencane (*Amphicarpum muhlenbergianum*), tapered witchgrass (*Dichantherium acuminatum*), pineland yelloweyed grass (*Xyris stricta*), and Chapman's beaksedge (*Rhynchospora chapmanii*).

Slash Pine Swamp Forest (FLUCCS 627), 211.66 Acres

This community designation includes forested wetlands in which slash pine dominates the canopy. Historically these areas were occupied by pine flatwoods, hydric flatwoods, hydric savannas, and bay swamps. Due to fire exclusion, and possible off-site changes in hydrology, slash pine has been able to encroach into these systems. Vegetative assemblages and structure are comprised of a combination of the plant communities historically present. Numerous large "cat faced" slash and several longleaf pines are present on the southeasternmost corner of Tract B. Longleaf pine was not observed anywhere else within the Dutex property. Understory vegetation was sparse due to canopy cover, and wire grass was absent from these areas.

Wetland Forested Mixed (FLUCCS 630), 69.94 Acres

This community occurs on the southeastern corner of Tract B. This designation represents mixed wetland forest communities in which neither hardwoods nor conifers achieve dominance of the crown canopy

composition. Vegetative assemblages and structure are comprised of a combination of the plant communities historically present.

Wetland Shrub (FLUCCS 6312), 17.67 Acres

Canopy trees are essentially absent from this community. Several trees species, predominately slash pine, are occasionally present throughout. Shrub density typically exceeds ten feet in height. Characteristic shrubs observed included titi (*Cyrilla racemiflora*), black titi (*Cliftonia monophylla*), fetterbush (*Lyonia lucida*), large gallberry (*Ilex coriacea*), gallberry (*I. glabra*), wax myrtle (*Myrica cerifera*), and sweet pepperbush (*Clethra alnifolia*), and shrubs are often laced together with laurel greenbrier. Herbs are sparse, patchy, and confined to sunny openings.

Freshwater Marsh (FLUCCS 641), 77.99 Acres

A freshwater marsh dominates the southeastern half of Tract A. Additionally, two small disjunct freshwater marshes occur within the northwestern corner of Tract A. The northernmost of these marshes is an oxbow of Eleven Mile Creek. Tree species were occasionally observed and with the exception of slash pine, typically small in stature. Herbaceous vegetation occurs as a mosaic of nearly pure stands of saw grass (*Cladium jamaicense*) to areas containing combinations of saw grass, wool-grass bulrush (*Scirpus cyperinus*), Leconte's flatsedge (*Cyperus lecontei*), wand loosestrife (*Lythrum lineare*), , bighead rush (*Juncus megacephalus*), fragrant flatsedge (*Cyperus odoratus*), herb-of-grace (*Bacopa monnieri*), torpedograss (*Panicum repens*), switchgrass (*Panicum virgatum*), rough barnyard grass (*Echinochloa muricata*), conecup spikerush (*Eleocharis tuberculosa*), comfort root (*Hibiscus aculeatus*), water cowbane (*Oxypolis filiformis*), and dotted smartweed (*Polygonum punctatum*).

Saltwater Marsh (FLUCCS 642), 104.56

A salt marsh dominates the southwestern half of Tract A. Salt marshes are intertidal areas colonized by grasses and other salt-tolerant plants (halophytes). Two vegetation zones are often observed, a low marsh that is subject to daily tidal flooding and a high marsh that is flooded less often. Due to a small beach area and extensive coastal erosion, the low marsh was limited to a patchy fringe dominated by smooth cordgrass (*Spartina alterniflora*). The majority of the site was dominated by a high marsh dominated by an extensive expanse of black needlerush (*Juncus roemerianus*) with a few associated species. Additionally observed species included marshay cordgrass (*Spartina patens*), rattlebox (*Sesbania punicea*), smallflower thoroughwort (*Eupatorium semiserratum*), wand loosestrife (*Lythrum lineare*), common reed (*Phragmites australis*), torpedograss (*Panicum repens*), coastal groundcherry (*Physalis angustifolia*), switchgrass (*Panicum virgatum*), saltmarsh morning glory (*Ipomoea sagittata*), seaside goldenrod (*Solidago sempervirens*), seashore mallow (*Kosteletzkya virginica*), and salt marsh aster (*Aster tenuifolius*).

Beaches (FLUCCS 710), 4.31 Acres

This community occurs between Perdido Bay and the freshwater and saltwater marsh on Tract A. The shoreline exhibits evidence of being subjected to high energy wave/wind action. Shoreline erosion is evident by stumps 15-20 feet out in the bay. This shoreline is primarily bare mineral soil with occasional vegetative encroachment from the immediately adjacent freshwater and saltwater marsh. Several exotic species including Chinese tallow and rattlebox (*Sesbania punicea*) were occasionally present.

Beaver Dam (FLUCCS 747), 0.29 Acre

One large earthen beaver dam occurs on the north central portion of Tract A. The dam is approximately 1,283 feet in length, upwards of 6 feet in height and potentially 15-20 feet wide at the base. Wetlands downstream of the dam appear sufficiently hydrated and vegetative structure appropriate.

4.0 LISTED SPECIES

All incidental listed wildlife and botanical observations were recorded. Surveys were conducted concurrently with habitat mapping and overall site assessments. Prior to initiating site-specific surveys, ENTRIX obtained information from the Florida Natural Areas Inventory (FNAI) and Florida Fish and Wildlife Conservation Commission (FFWCC) databases of known listed and rare species occurrences within the project vicinity. Focus was given on identification of these species as well as other species known to occur locally.

Site-specific surveys were initiated to determine the presence/absence of the saltmarsh topminnow (*Fundulus jenkinsi*). Wildlife species are listed under the *Endangered Species Act* of 1973, and Chapter 39.27 *Florida Administrative Code* (FAC). On August 18, 2008, ENTRIX ecologists sampled for the species within an unnamed bayou located approximately one-half mile east of the mouth of Eleven Mile Creek.

The saltmarsh topminnow occupies tidal streams, bayous, and rivulets along the Gulf of Mexico coast ranging from Galveston, Texas to Pensacola, Florida (Boschung and Mayden 2004). This species prefers *Spartina* habitat with low to moderate salinity and has been historically recorded within the lower Eleven Mile Creek drainage (*pers. comm.* Dr. Mark Peterson). The saltmarsh topminnow is considered a ‘Species of Special Concern’ by the State of Florida and was listed by the Federal Register in 1997 as a candidate species for federal protection (Vol.62: 134).

Six Breder traps were deployed at strategic locations throughout the bayou; see **Table 2**. Traps were positioned along the banks using PVC-pipe harnesses so that the apertures faced into the freshwater marsh; see photo in **Appendix B**. This method, as described by Peterson *et al.* (2003), is considered the most appropriate and practical mode of capture for the species.

Table 2. Breder Trap Locations.

Station	Longitude	Latitude
1	30° 27' 33.31" N	87° 22' 03.26" W
2	30° 27' 34.27" N	87° 22' 03.80" W
3	30° 27' 35.64" N	87° 22' 01.65" W
4	30° 27' 38.33" N	87° 22' 00.42" W
5	30° 27' 38.27" N	87° 21' 58.70" W
6	30° 27' 39.78" N	87° 21' 58.11" W

Salinities at the time of deployment ranged from 10.4 ppt at Station 1 (downstream) to 7.5 ppt at Station 6 (upstream). Water temperature and dissolved oxygen at these stations measured 28.4 and 27.3, and 6.3 and 4.5, respectively. Traps were allowed an approximately four-hour soak period timed to occur during ebb tide. Tidal fluctuations during the sampling period were minimal (<0.6 inches) as is common in northern Perdido Bay. No individuals were captured during the August 2008 sampling event. However, based on available habitat and historical records we conclude that presence of *F. jenkinsi* is probable and should not be confirmed or denied without additional sampling.

Listed vegetative species observed included Water sundew (*Drosera intermedia*), white topped pitcher plant (*Sarracenia leucophylla*), and yellow fringed orchid (*Platanthera ciliaris*) were observed during site visits. Water sundew and white topped pitcher plant are common throughout the beaver pond (FLUCCS 534). A single specimen of yellow fringed orchid was observed in the bay swamp (FLUCCS 611) in the northwestern corner of Tract B. No listed wildlife species were observed.

5.0 EXOTIC SPECIES

Invasive plants affect forest health, productivity, and limit species diversity of native forests. These plants replace native plant species and often form exotic monocultures. In many cases these stands of exotic plants are not beneficial to native wildlife which has evolved to depend on native plants for food and shelter, and who in turn distributes of native plants by seed dispersal. When exotic plants replace too much of our native plants, those wildlife dependent on native plants will move away or become extirpated. Exotic invasive plant species also reduce or eliminate resources, *i. e.*, food, cover, nesting sites, used by native wildlife and can promote populations of invasive non-native wildlife by providing them with resources otherwise unavailable in the area. Several exotic and invasive non-native plant species were observed within the project limits during site survey events. A summary of exotic species observed, location and approximate population size is provided in **Table 3**.

Table 3. Summary of Invasive Botanical Species Observed within the Dutex Property.

<i>Scientific Name</i>	Common Name	Observation Point	Population/Distribution
<i>Colocasia esculenta</i>	wild taro	Eleven Mile Creek; western edge of Tract A	small/single point
<i>Eichhornia crassipes</i>	common water-hyacinth	Throughout ditch adjacent to beaver dam; Tract A	medium
<i>Ligustrum sinense</i>	Chinese privet	Northern edge of Tract B	large/wide spread
<i>Lygodium japonicum</i>	Japanese climbing fern	Northern edge of Tract B	small/rare
<i>Panicum repens</i>	Torpedo grass	Ditch adjacent to beaver dam, beach, freshwater marsh; Tract A	medium/wide spread
<i>Sapium sebiferum</i>	Chinese tallow tree	Beach; Tract A: Northern edge of Tract B	small/sparse
<i>Sesbania punicea</i>	rattlebox	Beach; Tract A	small/sparse

To retain the natural biological components of the Dutex property, management of non-native invasive plants should utilize an integrated management approach, incorporating a combination of mechanical and chemical techniques. Proposed exotic species management is described **Section 9.3**.

6.0 HISTORIC CONDITIONS

Black-and-white 1940 and 1951 historical aerial photographs were evaluated to provide the most complete illustration and highest resolution images available, and were, therefore, selected as the best representation of historic vegetative communities and distribution patterns. Historic aerials suggest that pre-impact communities within mitigation lands were comprised primarily of hydric savannas, hydric flatwoods, wetland shrub, fresh/saltwater marsh and hardwood sloughs. A historic aerial is provided as **Figure 4**. Due to the complete aerial coverage of the 1951 aerials, these were georeferenced and tiled to create an image depicting the historic site conditions of the Dutex property.

7.0 SOILS

The Natural Resources Conservation Service (NRCS) soils manual was utilized to determine the approximate extent of the different soil units known to exist within the project site. Additionally, the *Hydric Soils of Florida Handbook*, Fourth Edition, was utilized to evaluate the potential presence of hydric soils. The locations and limit of individual soil units within the each tract are depicted on **Figure 5**. According to the NRCS soil survey for Escambia County, Florida (USDA, 1996) ten soil units are present within the subject tracts. **Table 4** as well as listing the soils types also lists the type of plant community/landform that typically occupies each soil type in the undisturbed condition.

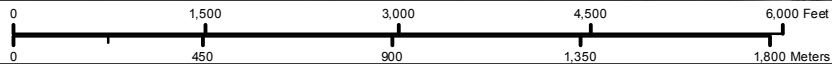
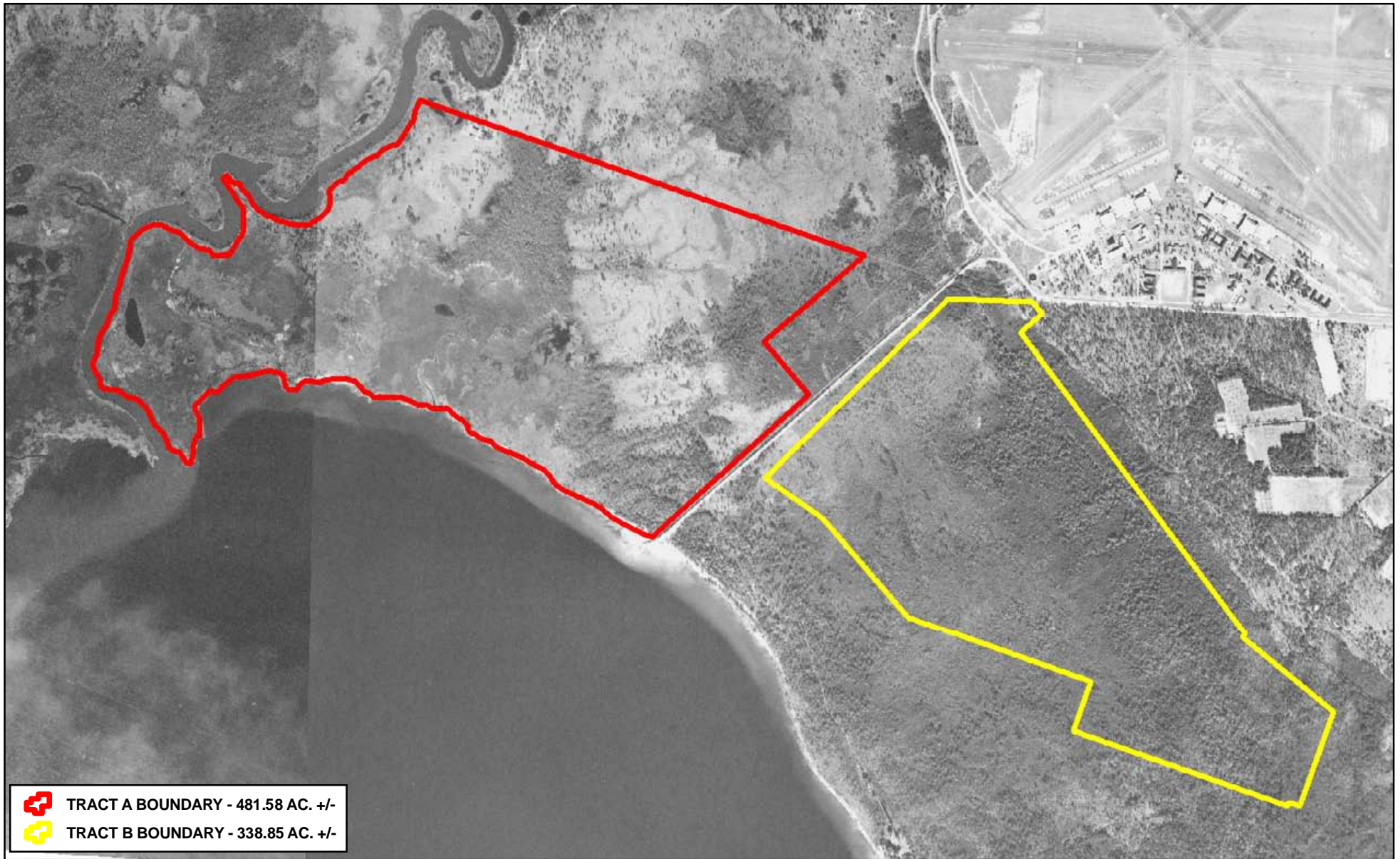


Figure 4 - Historic Aerial 1951

**Dutex
Escambia County, Florida**

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Image: 1951

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Sec 036
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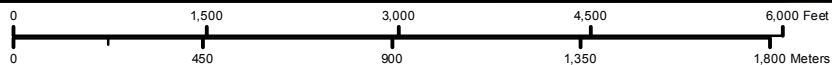
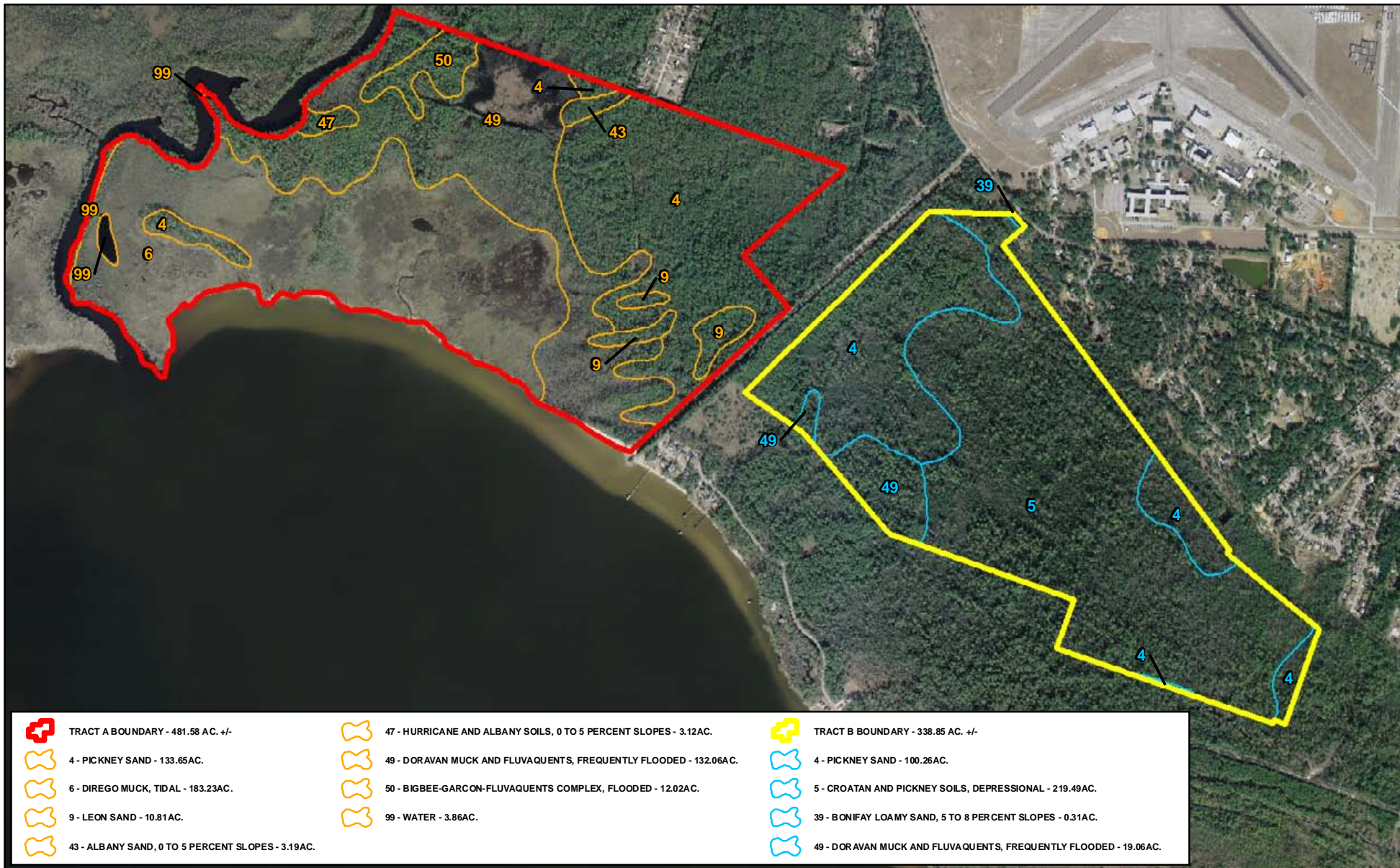


Figure 5 - NRCS Soils Map

Dutex
Escambia County, Florida



Image: 2007 NC

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Table 4. USDA NRCS Soil Types on the Dutex Property.

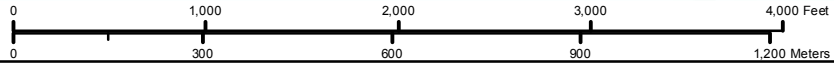
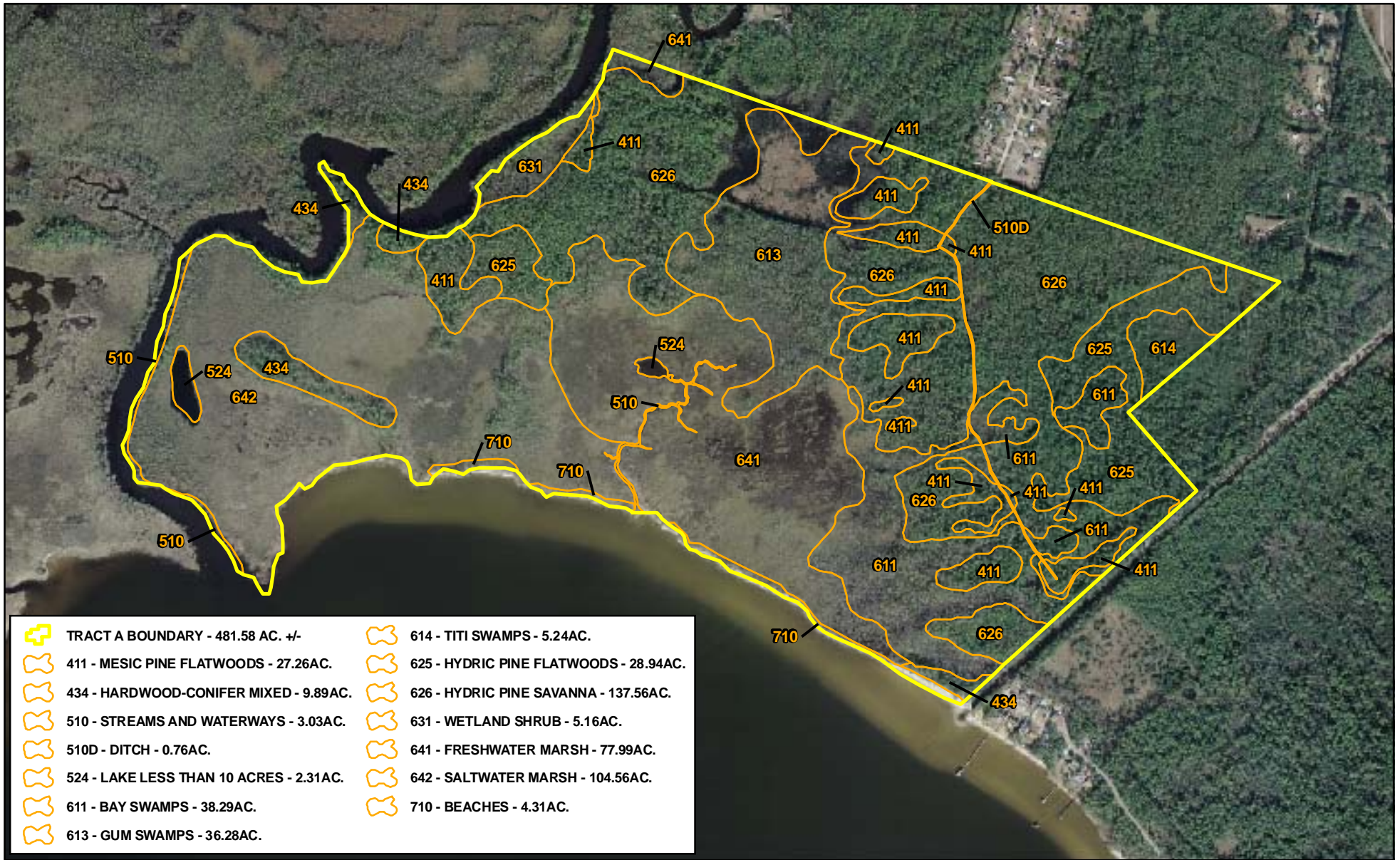
Soil Number	Soil Type	Acreage	Percent Hydric	Typical Landform
Tract A				
4	Pickney Sand	133.65	100	Hydric Flatwoods
6	Dirego Muck, Tidal	183.23	100	Tidal Marshes
9	Leon Sand	10.81	10	Flatwoods
43	Albany Sand, 0 to 5 Percent Slopes	3.19	5	Ridges/Rises
47	Hurricane and Albany Soils, 0 to 5 Percent Slopes, Occasionally Flooded	3.12	5	Stream Terrace
49	Doravan Muck and Flavaquents, Frequently Flooded	132.06	100	Floodplain
50	Bigbee-Garcon-Flavaquents Complex, Flooded	12.02	35	Stream Terrace/Floodplain
99	Water	3.86	100	Water
Tract B				
4	Pickney Sand	100.26	100	Hydric Flatwoods
5	Crotan and Pickney Soils, Depressional	219.49	100	Depression
39	Bonifay Loamy Sand, 5 to 8 Percent Slopes	0.31	0	Ridges
49	Doravan Muck and Flavaquents, Frequently Flooded	19.06	100	Floodplain

8.0 PROPOSED CONDITIONS

Historic and current vegetative communities were compared to identify changes in community structure or community limits. Large shifts were observed in both the overall position of vegetative communities within the landscape and community coverage. The greatest shifts in community limits occurred with the conversions of sparsely canopied hydric pine flatwoods and hydric savannas to densely forested wetland systems containing often dense understory of black titi and titi.

The mitigation goals are to re-establish historic vegetative assemblages and community limits within each tract to the greatest extent possible. This goal will be achieved through hydrologic improvements, supplemental planting, forest thinning, and prescribed burns. The vegetative community limits and designations within the tract were identified following field investigations and review of historic and current aerial photography.

A total of fourteen community types have been identified as historically occurring throughout the Dutex property. Target communities include primarily hydric flatwoods as well as forested and herbaceous wetlands. Additional restoration activities are also proposed within upland mesic flatwoods and hardwood-conifer mixed communities. Target conditions, with appropriate continued management, will be similar to historical native structure and vegetative assemblages as shown in **Figures 6A** and **6B** and as further described. Target community types and acreages are approximated based on aerial interpretation of 1944 and 1951 historical aerials. A summary of the target vegetative community assemblages/land uses within both Tracts A and B following restoration and/or enhancement activities are detailed in **Table 5**. Descriptions typifying the historic/target communities, as described by FNAI and FLUCCS handbook are also provided.



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Figure 6A - Proposed FLUCCS Map Tract A

Dutex
Escambia County, Florida



Image: 2007 NC

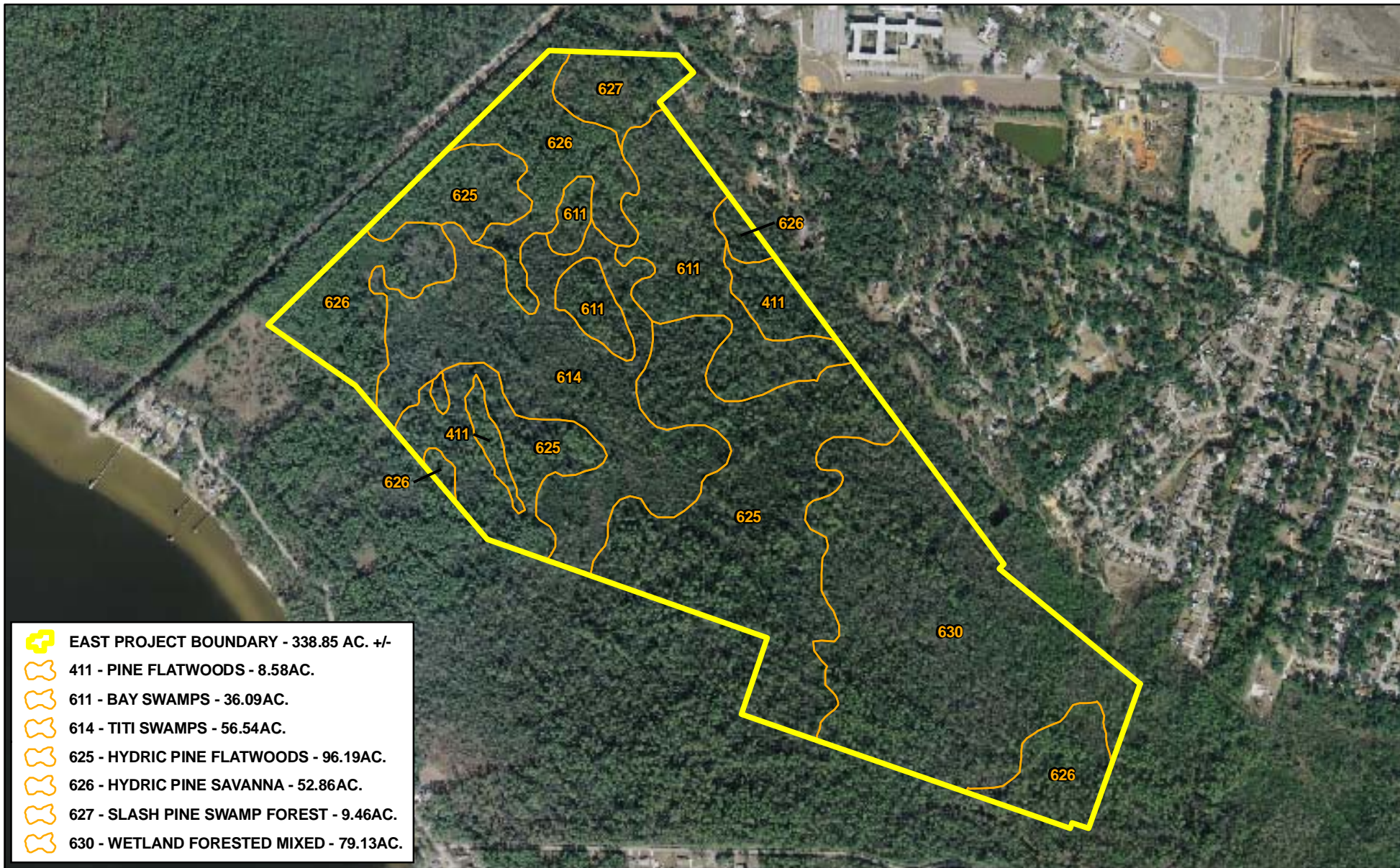
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Figure 6B - Proposed FLUCCS Map Tract B

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Escambia County, Florida



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Table 5. Summary of Historic/Proposed Vegetative Communities on the Dutex Property.

FLUCCS Code	FLUCCS Community	Wetland	Acreage
Tract A			
411	Mesic Pine Flatwoods	No	27.26
434	Hardwood-Conifer Mix	No	9.89
510	Stream and Waterways	Yes	3.03
510D	Ditch	Yes	0.76
524	Lake (less than 10 acres)	Yes	2.31
611	Bay Swamp	Yes	38.29
613	Gum Swamp	Yes	36.28
614	Titi Swamp	Yes	5.24
625	Hydric Pine Flatwoods	Yes	28.94
626	Hydric Pine Savanna	Yes	137.56
631	Wetland Shrub	Yes	5.16
641	Freshwater Marsh	Yes	77.99
642	Saltwater Marsh	Yes	104.56
710	Beach	No	4.31
Tract B			
411	Mesic Pine Flatwoods	No	8.58
611	Bay Swamp	Yes	36.09
614	Titi Swamp	Yes	56.54
625	Hydric Pine Flatwoods	Yes	96.19
626	Hydric Pine Savanna	Yes	52.86
627	Hydric Pine Swamp Forest	Yes	9.46
630	Wetland Forested Mix	Yes	79.13
TOTAL WETLAND ACREAGE			770.39
TOTAL UPLAND ACREAGE			50.04

Mesic Pine Flatwoods (FLUCCS 411), 35.84 Acres

This upland community is typified by an overstory dominated by either slash pine, longleaf pine or both. Common flatwoods understory species include wire grass (*Aristida stricta*) and a variety of other grasses and forbs, saw palmetto (*Serenoa repens*), wax myrtle (*Myrica cerifera*), gallberry (*Ilex glabra*), and a wide variety of herbs and brush. Originally longleaf pines were common on drier sites while slash pines, which are less fire-resistant, were confined to moister sites; wildfire was the contributing factor in this distribution. However, fire control and artificial reforestation have extended the range of slash pine into former longleaf sites

Initially this upland canopy will be dominated by slash pine but adequate numbers of recruiting longleaf pine seedlings may ultimately replace the slash in dominance provided fire returns at a 2-4 year interval. Mesic flatwoods will be restored to an open landscape with a species-rich groundcover dominated by wiregrass and other fire-dependent grasses and forbs, as well as with shrubs maintained as coppice. Longleaf pine may ultimately be the principal canopy tree within this community. Following mitigation activities, lands slated for conversion to pine flatwoods are anticipated to succeed back to historic vegetative conditions.

Hardwood-Conifer Mixed (FLUCCS 434), 9.89 Acres

No significant changes in vegetative assemblages or structure are anticipated to occur within this community.

Streams and Waterways (FLUCCS 510), 3.03 Acres

No significant changes are anticipated to occur within this community.

Ditch (FLUCCS 510D), 0.76 Acres

No significant changes are anticipated to occur within this community.

Lake (less than 10 acres; FLUCCS 524), 2.31 Acres

No significant changes are anticipated to occur within this community.

Bay Swamp (FLUCCS 611), 74.38 Acres

Bay swamp is an evergreen forested wetland of bay species situated at the base of a slope or in a depression. Loblolly bay (*Gordonia lasianthus*), sweetbay (*Magnolia virginiana*), and/or swamp bay (*Persea palustris*) form an open-to-dense tree canopy and are also dominant in the understory along with fetterbush (*Lyonia lucida*), large gallberry (*Ilex coriacea*), dahoon (*I. cassine*), myrtle dahoon (*I. cassine* var. *myrtifolia*), titi (*Cyrilla racemiflora*), black titi (*Cliftonia monophylla*), wax myrtle (*Myrica cerifera*), coastal doghobble (*Leucothoe axillaris*), swamp doghobble (*L. racemosa*), red maple (*Acer rubrum*), and/or Virginia willow (*Itea virginica*). Composition of the understory varies regionally; black titi is a dominant component of baygall in the Florida Panhandle, but is uncommon in other areas. Loblolly pine (*Pinus taeda*), slash pine (*P. elliottii*), and/or pond pine (*P. serotina*) are occasionally found in the canopy, as well as sweetgum (*Liquidambar styraciflua*), and in the Panhandle, Atlantic white cedar (*Chamaecyparis thoides*). Wetter bay swamps may also contain swamp tupelo (*Nyssa sylvatica* var. *biflora*) and/or pond cypress (*Taxodium ascendens*).

The canopy and understory do not generally form distinct strata but may appear as a dense, tall thicket (Clewell 1986). Vines, especially laurel greenbrier (*Smilax laurifolia*), coral greenbrier (*S. walteri*), and muscadine (*Vitis rotundifolia*), may be abundant and contribute to the often impenetrable nature of the understory. Herbs are absent or few, and typically consist of ferns such as cinnamon fern (*Osmunda cinnamomea*), netted chain fern (*Woodwardia areolata*), and Virginia chain fern (*W. virginica*). Sphagnum mosses (*Sphagnum* spp.) are common. Following mitigation activities, lands slated for conversion to pine flatwoods are anticipated to succeed back to historic vegetative conditions.

Gum Swamp (FLUCCS 613), 36.28 Acres

No significant changes in vegetative assemblages or structure are anticipated to occur within existing gum swamps. Following removal of the beaver dam, currently inundated lands are anticipated to revegetate naturally and succeed back to historic vegetative conditions.

Titi Swamp (FLUCCS 614), 61.78 Acres

Approximately 84 acres of titi swamp will be restored to the historic condition or hydric pine flatwoods or hydric pine savannah. These areas will be restored to an open landscape with a species-rich groundcover dominated by wiregrass and other fire-dependent grasses and forbs, as well as with shrubs maintained as coppice sprouts. Slash pine will be targeted as the principal canopy tree within this community with limited long leaf pine cover. In other areas the titi swamp will remain. The titi swamp was a component of the historic condition along historic drains and will be preserved. A reduction in vines and woody vegetation along shrub-flatwoods interfaces is likely following fire.

Hydric Pine Flatwoods (FLUCCS 625), 125.13 Acres

This community will become an open pine forest with a sparse or absent midstory and a dense groundcover of wire grass (*Aristida stricta*) and other hydrophytic grasses, herbs, and low shrubs. The pine canopy typically consists of slash and longleaf pine. The subcanopy, where present, consists of scattered sweetbay (*Magnolia virginiana*), swamp bay, loblolly bay (*Gordonia lasianthus*), pond cypress (*Taxodium ascendens*), dahoon (*Ilex cassine*), titi (*Cyrilla racemiflora*), and/or wax myrtle (*Myrica cerifera*). Shrubs include large gallberry (*Ilex coriacea*), fetterbush (*Lyonia lucida*), titi, black titi (*Cliftonia monophylla*), sweet pepperbush (*Clethra alnifolia*), red chokeberry (*Photinia pyrifolia*), and azaleas (*Rhododendron canescens*, *R. viscosum*), Saw palmetto (*Serenoa repens*), and gallberry (*I. glabra*). Herbs include wiregrass, blue maidencane (*Amphicarpum muhlenbergianum*), and/or hydrophytic species such as toothache grass (*Ctenium aromaticum*), coastalplain

yellow-eyed grass (*Xyris ambigua*), Carolina redroot (*Lachnanthes caroliniana*), beaksedges (*Rhynchospora chapmanii*, *R. latifolia*, and *R. compressa*), and pitcherplants (*Sarracenia* spp.).

These areas are typically present on wet prairie/seepage slopes and contain an herbaceous community found on continuously wet, but not inundated, soils and subjected to frequent fires. Savanna communities are usually dominated by dense wiregrass which, in the wetter portions, may occur with, or be replaced by, species in the sedge family. This nearly treeless community would have a similar diverse groundcover, dominated by beak rushes, wiregrass, as well as other grasses and forbs, that carries fire. If trees are present, the canopy will consist of cypress, longleaf pine, and slash pine. Shrubs, a minor component of this landscape, are maintained as coppice shrubs and often include titi. The restored groundcover will contain a diverse assemblage of wetland herbs as well as unusual and endemic insectivorous species. Following mitigation activities, lands slated for conversion to hydric pine flatwoods are anticipated to succeed back to historic vegetative conditions.

Hydric Pine Savanna (FLUCCS 626), 190.42 Acres

Historically, hydric pine savanna dominated the northern and eastern portions of Tract A. This community is an open forest of slash pine with a dense herbaceous understory found on continuously wet, but not inundated, soils and subjected to frequent fires. It is usually dominated by dense wiregrass which, in the wetter portions, may occur with or be replaced by species in the sedge family: plumed beaksedge (*Rhynchospora plumosa*); featherbristle beaksedge (*R. oligantha*); Baldwin's nutrush (*Scleria baldwinii*); or slenderfruit nutrush (*S. georgiana*). In the Panhandle and northern Florida pitcherplants (*Sarracenia* spp.) are concentrated in the wetter portions. Characteristic species throughout its range include longleaved threeawn (*Aristida palustris*), pineland rayless goldenrod (*Bigelovia nudata*), toothache grass (*Ctenium aromaticum*), flattened pipewort (*Eriocaulon compressum*), water cowbane (*Oxypolis filifolia*), and coastalplain yellow-eyed grass (*Xyris ambigua*).

Slash Pine Swamp Forest (FLUCCS 627), 9.46 Acres

This community is typically a domed swamp or strand dominated by slash pine, pond cypress, swamp black gum, loblolly bay, sweet bay, and swamp bay. These systems are typically found in systems transitioning from a pine flatwoods to hardwood forest. Due to the dense canopy, shrub and understory vegetation is sparse and may be dominated by wax myrtle, fetterbush, black titi, big gall berry, netted chain fern, Virginia chain fern and sphagnum moss.

Wetland Forested Mixed (FLUCCS 630), 79.13 Acres

This community is vegetated with hydrophytic trees and shrubs that can withstand an extended hydroperiod. While mixed species canopies are common, the dominant trees are pond cypress (*Taxodium ascendens*) and swamp tupelo (*Nyssa sylvatica* var. *biflora*). Other typical canopy and subcanopy trees include slash pine (*Pinus elliotii*), red maple (*Acer rubrum*), dahoon (*Ilex cassine*), swamp bay (*Persea palustris*), sweetbay (*Magnolia virginiana*), loblolly bay (*Gordonia lasianthus*), swamp laurel oak (*Quercus laurifolia*), sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), green ash (*Fraxinus pennsylvanica*), American hornbeam (*Carpinus caroliniana*), and American elm (*Ulmus americana*).

Depending on hydrology and fire history, shrubs may be found throughout a basin swamp or they may be concentrated around the perimeter. Common species include Virginia willow (*Itea virginica*), swamp dogwood (*Cornus foemina*), swamp doghobble (*Leucothoe racemosa*), coastal sweetpepperbush (*Clethra alnifolia*), myrtle dahoon (*Ilex cassine* var. *myrtifolia*), fetterbush (*Lyonia lucida*), wax myrtle (*Myrica cerifera*), titi (*Cyrilla racemiflora*), black titi (*Cliftonia monophylla*), and common buttonbush (*Cephalanthus occidentalis*). The herbaceous layer is also variable and includes a wide array of species including maidencane (*Panicum hemitomon*), Virginia chain fern (*Woodwardia virginica*), arrowheads (*Sagittaria* spp.), lizard's tail (*Saururus*

cernuus), false nettle (*Boehmeria cylindrica*), beaksedges (*Rhynchospora* spp.), bladderworts (*Utricularia* spp.), and royal fern (*Osmunda regalis* var. *spectabilis*). Following mitigation activities, lands slated for conversion to wetland forested mixed are anticipated to succeed back to historic vegetative conditions.

Wetland Shrub (FLUCCS 631), 5.16 Acres

No significant changes in vegetative assemblages or structure are anticipated to occur within this community. A reduction in vines and woody vegetation along shrub-flatwoods interfaces is likely following fire.

Freshwater Marsh (FLUCCS 641), 77.99 Acres and Saltwater Marsh (FLUCCS 642), 104.56

No significant changes in vegetative assemblages or structure are anticipated to occur within this community. A reduction in woody vegetation within the marsh and along the landward limits is likely following fire.

Beaches (FLUCCS 710), 4.31 Acres

No significant changes in vegetative assemblages or structure are anticipated to occur within this community.

9.0 RESTORATION PLAN

The following restoration recommendations are proposed to aid in the development of the management plans and land management activities implemented by NFWFMD. To the greatest extent possible, this plan will attempt to re-establish pre-silvicultural vegetative assemblages and distribution patterns on the Dutex property.

The mitigation restoration scenario was developed to provide a framework to facilitate a mitigation cost/ecological lift analysis. ENTRIX completed a Unified Mitigation Assessment Methodology (UMAM) analysis. The mitigation plan was developed in coordination with NFWFMD utilizing site-specific field surveys and target field conditions. The mitigation plan and associated UMAM analysis are described further in this section. This report does not provide specific mitigation cost analysis.

The conversion of specific types of current communities to their target community types, and potential acreages, is described in **Table 6**. Proposed activities include installation of culverts, low water crossings, pine thinning, supplemental planting, prescribed fire, as well as mechanical and chemical treatments to control woody vegetation. Specific details are described in **Sections 9.1** and **9.2**.

Table 6. Matrix of Current to Target Vegetative Communities and Land Uses with Acreages on the Dutex Property.

Proposed Community		Proposed Community															
FLUCCS Code	Description	411	434	510	510D	524	611	613	614	625	626	627	630	631	641	642	710
Tract A																	
411	Mesic Pine Flatwoods	X															
434	Hardwood Conifer Mixed		X														
510	Stream and Waterways			X													
510D	Road/Ditch	X			X												
524	Lakes <10 Ac.					X											
534	Beaver Pond	X						X			X						
611	Bay Swamp						X										
613	Gum Swamp						X	X									
614	Titi Swamp								X		X						
625	Hydric Pine Flatwoods									X	X						
627	Slash Pine Swamp Forest						X				X						
631	Wetland Shrub						X							X			

Proposed Community		Proposed Community															
FLUCCS Code	Description	411	434	510	510D	524	611	613	614	625	626	627	630	631	641	642	710
641	Freshwater Marsh														X		
642	Saltwater Marsh															X	
710	Beaches																X
747	Beaver Dam	X						X			X						
Tract B																	
411	Mesic Pine Flatwoods	X															
611	Bay Swamp						X										
614	Titi Swamp								X								
627	Slash Pine Swamp Forest									X	X	X	X				
630	Wetland Forested Mixed												X				

9.1 MITIGATION EFFORT

Figures 7A and 7B depict the proposed mitigation plan for Tract A and B respectively. The proposed planting schedule is provided in Section 9.3. Table 7 provides a summary of the proposed mitigation activities for Tracts A and B.

Table 7. Proposed Restoration Technique per Community Conversion Type within the Dutex Property.

Current Community	Target Community	UMAM Polygon	Restoration Technique							
			Thinning	Gyrotrac	Herbicide	Planting	Fire	Preserve/Fire Intrusion	Removal/Fill	Exotic Removal
Tract A										
411	411	2-2						X		
411	411	3-3	X		X			X		
434	434	1-6							X	
510	510	4-6							X	
510D	411	5-5								X
510D	510D	6-6							X	
524	524	8-6							X	
534	411	9-6							X	
534	613	10-6							X	
534	626	11-6							X	
611	611	12-4		X	X			X		
613	611	13-4		X	X			X		
613	613	14-6							X	
614	614	15-6							X	
614	626	3-3	X		X			X		
625	625	16-2						X		
625	625	18-4		X	X			X		
625	625	17-3	X		X			X		
625	626	19-2						X		
625	626	20-3	X		X			X		
625	626	21-4		X	X			X		
627	626	23-3	X		X			X		
627	611	22-4		X	X			X		
627	626	20-3	X		X			X		
631	611	24-6							X	
631	631	25-6							X	
641	641	27-6							X	
710	710	28-2						X		
747	411	29-1					X			X
747	613	30-1					X			X
747	626	31-1					X			X
Tract B										
411	411	3B	X		X	X	X			

Current Community	Target Community	UMAM Polygon	Restoration Technique							
			Thinning	Gyrotrac	Herbicide	Planting	Fire	Preserve/Fire Intrusion	Removal/Fill	Exotic Removal
411	411	4C		X	X	X	X			
411	411	4ERC		X	X	X	X			X
611	611	4ERB		X	X	X	X			X
611	611	4B		X	X		X			
611	611	6						X		
611	611	6ER						X		X
614	614	4B		X	X		X			
614	614	6						X		
627	625	3A	X		X	X	X			
627	626	3A	X		X	X	X			
627	625	4ERA		X	X	X	X			X
627	626	4ERA		X	X	X	X			X
627	625	4A		X	X	X	X			
627	626	4A		X	X	X	X			
627	630	4B		X	X		X			
627	627	6						X		
627	627	6ER						X		X
630	630	6						X		
630	630	6ER						X		X

9.2 RESTORATION TECHNIQUES

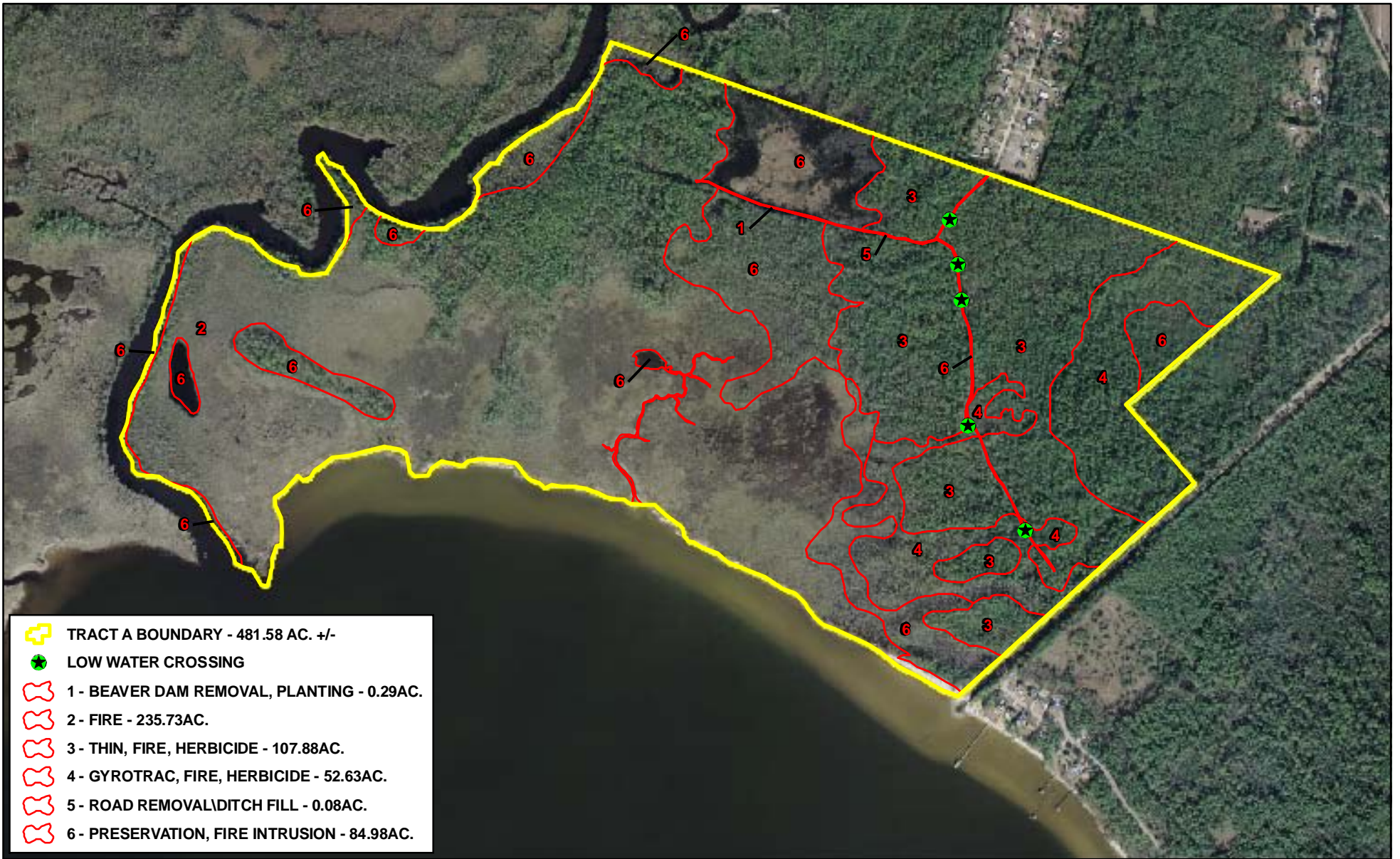
Low impact machinery should be utilized where possible. Vehicles should be equipped with tracks to avoid rutting in both uplands and wetlands. Tracked vehicles are in contact with a larger surface area than would generally be the case with a wheeled vehicle, and as a result exert a much lower force per unit area on the ground being traversed than a conventional wheeled vehicle of the same weight. This makes them suitable for use on soft, low friction, and uneven ground. Existing access roads, where available, should be utilized to enter and exit mitigation. Further, restoration activities should not occur following periods of extended rainfall.









Prescribed Fire, Fire Intrusion

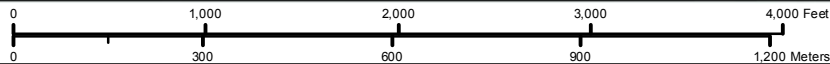
Frequent fire is necessary to re-establish and maintain the historic limits and plant assemblages of grasslands and herbaceous pinelands. A great deal of the existing dense woody vegetation is likely attributable to fire suppression, especially within the mesic and hydric flatwoods and savanna lands. The longer the period of time since the last fire, the more developed the understory shrubs will be. If the understory is allowed to grow for too long, the accumulation of needle drape and the height of flammable understory shrubs will increase the probability of a catastrophic canopy fire. Due to the long absence of fire throughout many of communities within the Dutex Property, cool season or dormant season burns may be required to reduce the fuel load prior to warm season burns.

Falling dense titi stands should also be implemented to reduce the vertical fuel load to reduce the likelihood of a canopy fire. Fires should be allowed to burn into deeper wetland systems. Existing firebreaks should be used where present. No firelines will be used to prevent fire from intruding into forested or shrub dominated wetlands unless experiencing drought conditions or there is concern with smoke management. When a fireline is necessary, heavy equipment can be used only to mow or “lay down” vegetation by driving equipment over the area of concern with attention to avoiding wet, mucky areas. If the previous two methods are unsatisfactory, and the situation is considered a serious threat, careful planning and consideration for a lightly harrowed line as determined by agency staff is acceptable.

Growing season burning will be used whenever possible to mimic natural fires. Firelines will avoid ecotones and prescribed fires will be encouraged to burn into wetland ecotones when sufficient hydration exists. The protocol for fire in wetlands is to allow fires to reduce woody plants on the wetland edges and within the ecotone.



-  TRACT A BOUNDARY - 481.58 AC. +/-
-  LOW WATER CROSSING
-  1 - BEAVER DAM REMOVAL, PLANTING - 0.29AC.
-  2 - FIRE - 235.73AC.
-  3 - THIN, FIRE, HERBICIDE - 107.88AC.
-  4 - GYROTRAC, FIRE, HERBICIDE - 52.63AC.
-  5 - ROAD REMOVAL\DITCH FILL - 0.08AC.
-  6 - PRESERVATION, FIRE INTRUSION - 84.98AC.



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Figure 7A - Mitigation Activity Tract A

Dutex
Escambia County, Florida



Image: 2007 NC

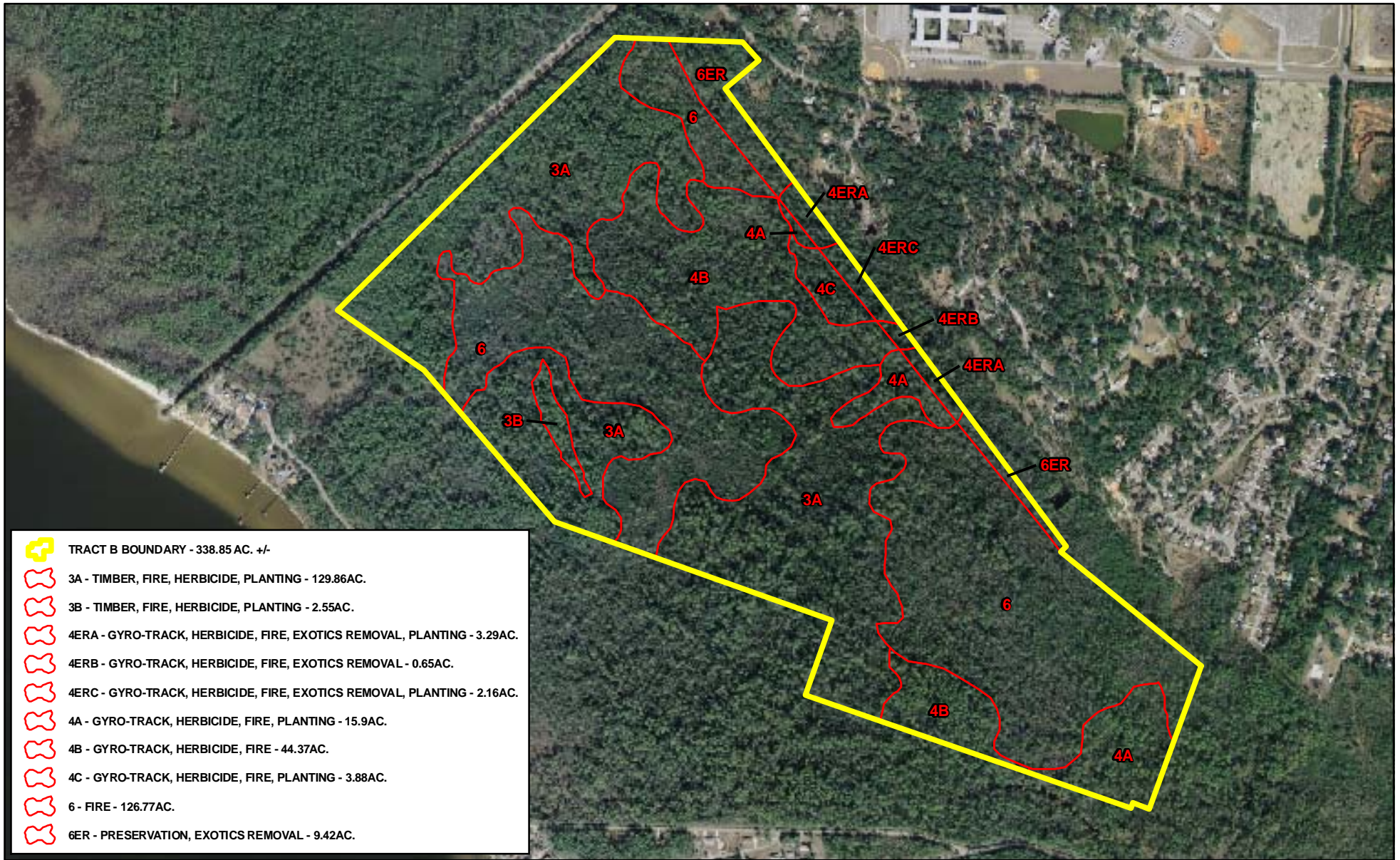
Sec 041
Twp 01 S
Rng 31 W
Sec 036
Twp 02 S
Rng 31 W














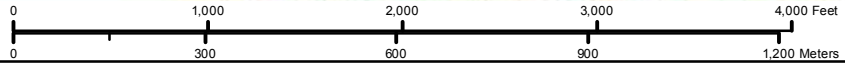
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Tallahassee, FL 32312 fx. (850) 681-9741

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Coordinate System: NAD 83 FSTPLN FEET



-  TRACT B BOUNDARY - 338.85 AC. +/-
-  3A - TIMBER, FIRE, HERBICIDE, PLANTING - 129.86AC.
-  3B - TIMBER, FIRE, HERBICIDE, PLANTING - 2.55AC.
-  4ERA - GYRO-TRACK, HERBICIDE, FIRE, EXOTICS REMOVAL, PLANTING - 3.29AC.
-  4ERB - GYRO-TRACK, HERBICIDE, FIRE, EXOTICS REMOVAL - 0.65AC.
-  4ERC - GYRO-TRACK, HERBICIDE, FIRE, EXOTICS REMOVAL, PLANTING - 2.16AC.
-  4A - GYRO-TRACK, HERBICIDE, FIRE, PLANTING - 15.9AC.
-  4B - GYRO-TRACK, HERBICIDE, FIRE - 44.37AC.
-  4C - GYRO-TRACK, HERBICIDE, FIRE, PLANTING - 3.88AC.
-  6 - FIRE - 126.77AC.
-  6ER - PRESERVATION, EXOTICS REMOVAL - 9.42AC.



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Figure 7B - Mitigation Activity Tract B

Dutex
Escambia County, Florida



Image: 2007 NC

Sec 041
Twp 01 S
Rng 31 W
Sec 036
Twp 02 S
Rng 31 W



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Coordinate System: NAD 83 FSTPLN FEET

The reduction of shrub density through repeated prescribed burns will allow relict graminoid and herbaceous groundcover species, currently present at reduced numbers, the opportunity to colonize areas previously occupied by woody vegetation. The woody species will persist, but will remain as part of the ground cover stratum as the herbaceous component recovers. Plants currently identified as absent within unburned lands should emerge, as many herbaceous species are known to become dormant with increasing competition from shrubs, surviving as rootstocks until released by fire and increased exposure to light and air. A summary of the target fire return interval for each target community is provided as **Table 9**.

Table 9. Summary of Fire Return Interval within the Dutex Property.

FLUCCS Code	FLUCCS Community	Fire Return Interval
Tract A		
411	Mesic Pine Flatwoods	2-4 yrs.
434	Hardwood-Conifer Mix	variable, 2-20 yrs
510	Stream and Waterways	NA
524	Lake (less than 10 acres)	NA
611	Bay Swamp	occasional, rare
613	Gum Swamp	occasional, rare
614	Titi Swamp	variable, periodic
625	Hydric Pine Flatwoods	2-4 yrs.
626	Hydric Pine Savanna	2-4 yrs.
631	Wetland Shrub	2-3 yrs
641	Freshwater Marsh	5-10 yrs.
642	Saltwater Marsh	5-10 yrs.
710	Beach	3-10 yrs.
Tract B		
411	Mesic Pine Flatwoods	2-4 yrs.
611	Bay Swamp	occasional, rare
614	Titi Swamp	variable, periodic
625	Hydric Pine Flatwoods	2-4 yrs
626	Hydric Pine Savanna	2-4 yrs
630	Wetland Forested Mix	occasional, rare

Silvicultural Activities (Gyrotrac, Thinning, Drop/Fall)

Where possible, pine within flatwoods should be thinned and converted to uneven-aged management. Preferably, thinning will result in a random spatial pattern of trees. In all cases enough canopy trees should be left to provide sufficient needle cast to carry fires. When groundcover fuels have recovered enough to carry fire on their own, canopy trees should be further harvested, felled, or girdled to restore historic densities. If harvested, specialized equipment, including chainsaws, may be required to prevent rutting in some areas.

A Gyro-Track, set off-grade, should be used in areas containing dense, mature brush and small trees. Gyro-Tracking should be conducted in manner that does not disturb the soil. A summary of the longterm target tree density per proposed vegetative community is provided in **Table 10**. Actual tree densities during implementation phase of mitigation activities are likely to be higher than the longterm target densities.

Table 10. Summary of Target Trees per Acre.

FLUCCS Code	FLUCCS Community	Target Trees/Acre	Forest Age Structure
411	Pine Flatwoods	25-40	Uneven
434	Hardwood-Conifer Mix	150-250	Uneven
510	Stream and Waterways	NA	NA
524	Lake (less than 10 acres)	NA	NA
611	Bay Swamp	200-400	Uneven
613	Gum Swamp	200-400	Uneven

FLUCCS Code	FLUCCS Community	Target Trees/Acre	Forest Age Structure
614	Titi Swamp	NA	NA
625	Hydric Pine Flatwoods	15-30	Uneven
626	Hydric Pine Savanna	0-15	Uneven
630	Wetland Forested Mix	200-400	Uneven
631	Wetland Shrub	NA	NA
641	Freshwater Marsh	NA	NA
642	Saltwater Marsh	NA	NA
710	Beach	NA	NA

The initial thin for each system, would be 100-200 trees per acre, for mesic pine flatwoods, hydric pine flatwoods, and pine encroachment areas until the understory has developed. This initial target density should provide sufficient needle cast to sufficiently carry fire across the landscape as the understory is developing. After the understory can carry a fire, tree densities can be further reduced toward the target levels.

Road/Beaver Dam Removal/Low Water Crossings

The beaver dam and all wetland roads should be removed where feasible. Fill generated should be placed in adjacent ditches and graded back into the drained pond. Beavers should be trapped and removed from the property. Roads and beaver dam should be graded to the same elevation as the adjacent vegetative community. Ditch filling should re-establish hydroperiods within drained and immediately adjacent lands. Ditch plugs should be installed where fill generated from road removals is insufficient to fully fill ditches. Where roads are not slated for removal, five low-water crossings have been sited where wetland drains or water conveyances were historically present. Consideration should be given to the utilization of granite in lieu of lime rock as a low-water crossing base so as not to affect natural water and soil chemistry. Further hydrologic evaluation of the study site and adjacent lands is needed to fully understand how existing culverts, and the respective siting of, affect re-establishment of historic flow paths.

Following beaver dam removal and subsequent draining of inundated lands, historically forested wetlands will be allowed to revegetate naturally. Supplemental plantings are not proposed as native soil and adjacent lands should provide an ample seed source and root stock for proper re-establishment of the native vegetative community. Annual monitoring will be required to ensure new dams are not constructed. Dam removal is also anticipated to decrease the flooding frequency on immediately adjacent developed lands to the north.

Herbicide Treatment

Chemical treatment will be utilized to remove and retard growth both of native, woody vegetation, and nuisance/exotic species. Herbicide applications will be applied by a Florida-licensed Restricted Use Pesticide (RUP) applicator that is familiar with the indigenous plant populations.

Herbicides are often the most effective and efficient means of controlling woody plants or plants with running rhizomes. There are several application techniques that can be used to control trees and other woody plants, and not all woody plant species are equally susceptible to herbicides. Therefore, relative to size and species, results may vary for any of these application methods.

Hand-applied foliar spray will be utilized where risk to non-target species is minimal. Treatments using this method will be conducted such that over-application, spray run-off, and spray drift are minimized. Additionally, a tracer dye will be used with the spray solution to avoid over-application or omitting some plants entirely. This treatment technique is most effective during the growing season. All treatments will be conducted during appropriate vegetative growing stage, weather conditions, and season to increase effectiveness.

Supplemental Planting

Supplemental planting within Tract A is slated to occur only within areas of beaver dam removal. Supplemental plantings within Tract B will occur throughout most areas currently containing dense pine stands (e.g. 411 and 627). Throughout both Tracts A and B supplemental wiregrass plantings and seventeen additional regional herbaceous groundcover flatwoods species will occur if herbaceous groundcover within mesic flatwoods, hydric flatwoods, or hydric savannas is deemed insufficient following the initial clearing/thinning effort. Supplemental plantings will consist of bareroot trees and wiregrass plugs installed at varying densities dependent upon existing/regenerating plant densities. Planting densities within bay swamps will depend on vegetative structure/density following mitigation activities. The proposed and potential mitigation effort planting schedule is provided in **Table 11**.

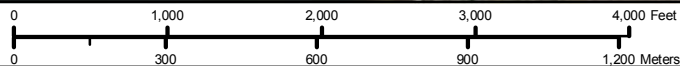
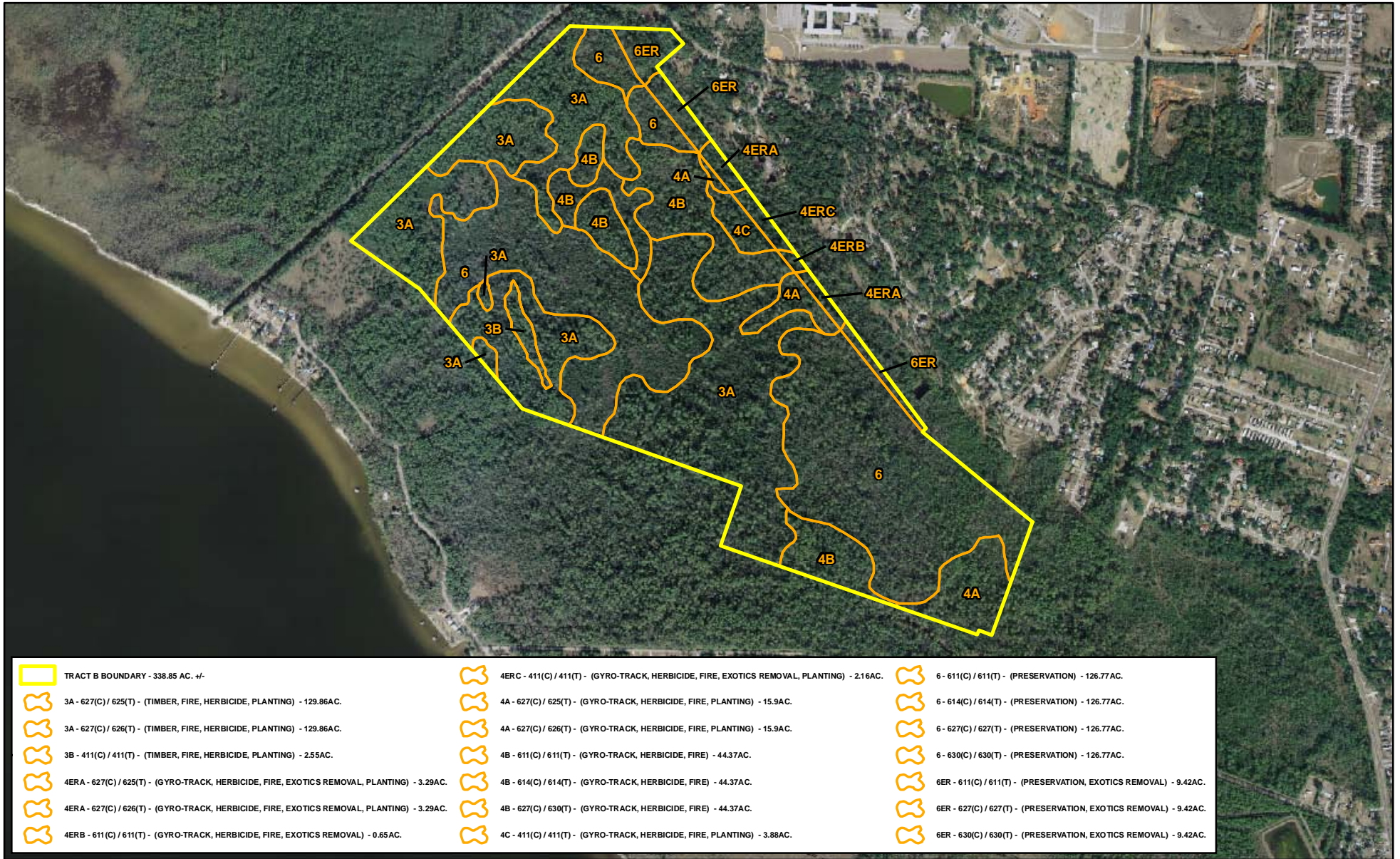
Table 11. Mitigation Effort Planting Summary for Dutex Property.

Scientific Name	Common Name	Spacing (ft. on-center)	FLUCCS Code		Mitigation Activity Code	Size (Acre)	Quantity
			Current	Target			
Tract A							
<i>Pinus palustris</i>	longleaf pine	10	747	411	2	0.05	22
<i>Aristida stricta</i>	wire grass	3					242
<i>Nyssa sylvatica</i> var. <i>biflora</i>	swamp tupelo	6	747	613	1	0.19	115
<i>Taxodium ascendens</i>	pond cypress	6					115
<i>Pinus elliotii</i>	slash pine	10	747	626	2	0.05	22
<i>Aristida stricta</i>	wire grass	4					136
NA	17 herb. spp.	4					136
Tract B							
<i>Aristida stricta</i>	wire grass	4	627	625, 626	3a	129.85	351,267
NA	17 herb. spp.	4					351,267
<i>Pinus elliotii</i>	slash pine	10	411	411	3b	2.55	12,337
<i>Aristida stricta</i>	wire grass	3					
<i>Aristida stricta</i>	wire grass	4	627	625, 626	4ERa	3.29	8,964
NA	17 herb. spp.	4					8,964
<i>Pinus palustris</i>	longleaf pine	10	441	411	4ERc	2.16	939
<i>Aristida stricta</i>	wire grass	3					10,430
<i>Aristida stricta</i>	wire grass	4	627	625, 626	4a	15.90	43,253
<i>Pinus palustris</i>	longleaf pine	10	441	411	4c	3.881	1,691

The successful restoration of historic vegetative distribution patterns should be measured against the best available pre-silvicultural aerial photography. While near-total hydrologic restoration within the study areas is potentially possible, complete re-establishment of historic hydro patterns and historic vegetative limits may not be realized due to permanent hydrologic alterations within the study sites and on adjacent lands. Hydrological restoration of off-site lands is outside the scope of this report. Though comparison of restored target vegetative communities with those historically present is not possible due to the lack of pre-silvicultural vegetative data within the study areas, similar relatively unaltered plant assemblages present locally and should be used as reference sites. Reference site for this project have not yet been identified.

10.0 UMAM ANALYSIS

UMAM analysis was conducted for the mitigation plan. The results of UMAM analysis identify a potential overall functional lift of 107.16 credits following implementation of the proposed mitigation activities. A UMAM assessment area polygon map is provided as **Figure 8A** for Tract A and **Figure 8B** for Tract B. UMAM polygons were delineated based on both current and historic/target vegetative community structure and function as well as the proposed mitigation schedule. A summary of the mitigation effort UMAM scoring is provided in **Appendix D** for Tract A and **Appendix E** for Tract B.



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Figure 8B - UMAM Assessment Area Tract B

Dutex
Escambia County, Florida



Image: 2007 NC

Sec 041
Twp 01 S
Rng 31 W
Sec 036
Twp 02 S
Rng 31 W



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Coordinate System: NAD 83 FSTPLN FEET

10.1 IMPLEMENTATION ISSUES

- Use of prescribed fire would need to be coordinated with Saufley Field and adjacent landowners.
- Initial dormant-season fuel reduction fires should be followed by implementation of growing-season burns, subject to on-the-ground conditions, on 2-to-5-year cycles.

10.2 PERFORMANCE CRITERIA

The plant community structure targeted in the post-enhancement condition will be that which existed prior to the fire exclusion, subsequent increase in woody vegetation and beaver dam construction, as listed in **Table 5** and illustrated on **Figures 6A** and **6B**.

10.3 LONG-TERM MANAGEMENT

NFWFMD will be responsible for ensuring the perpetual management of mitigation lands. NFWFMD will manage the property for restoration and mitigation purposes, as necessary, and in accordance with the conservation easement. Long-term management is described in *Umbrella, Watershed-Based, Regional Mitigation Plan* (UWRMP) Section 11.7.

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APPENDIX

A

Appendix A—Observed Plant Species.

<i>Scientific Name</i>	<i>Common Name</i>
<i>Acalypha gracilens</i>	three seeded mercury
<i>Acer rubrum</i>	red maple
<i>Alternanathera philoxeroides</i>	alligatorweed
<i>Ambrosia artemisiifolia</i>	common ragweed
<i>Ammannia</i> sp.	redstem
<i>Amphicarpum muhlenbergianum</i>	blue maidencane
<i>Andropogon virginicus</i> var. <i>virginicus</i>	broomsedge bluestem
<i>Andropogon virginicus</i> var. <i>glaucus</i>	chalky bluestem
<i>Aristida stricta</i>	wiregrass
<i>Aronia arbutifolia</i>	red chokeberry
<i>Arundinaria gigantea</i>	switchcane
<i>Aster tenuifolius</i>	salt marsh aster
<i>Baccharis halimifolia</i>	sea myrtle
<i>Bacopa monnieri</i>	herb-of-grace
<i>Balduina uniflora</i>	oneflower honeycombhead
<i>Bidens mitis</i>	smallfruit beggarticks
<i>Bignonia capreolata</i>	crossvine
<i>Bolboschoenus robustus</i>	sturdy bulrush
<i>Callicarpa americana</i>	beautyberry
<i>Carex glaucescens</i>	clustered sedge
<i>Carex stipate</i>	owlfruit sedge
<i>Carya glabra</i>	pignut hickory
<i>Centella asiatica</i>	spadeleaf
<i>Chamaecyparis thyoides</i>	atlantic white cedar
<i>Chasmanthium</i> sp.	woodoats
<i>Chrysopsis subulata</i>	golden aster
<i>Cladium jamaicense</i>	jamaica swamp sawgrass
<i>Clethra alnifolia</i>	sweet pepper bush
<i>Cliftonia monophylla</i>	black titi
<i>Colocasia esculenta</i>	wild taro
<i>Commelina diffusa</i>	dayflower
<i>Conradina canescens</i>	false rosemary
<i>Crinum americana</i>	southern swamp lily
<i>Cyperus lecontei</i>	Leconte's flatsedge
<i>Cyperus odoratus</i>	fragrant flatsedge
<i>Cyperus polystachyos</i>	manyspike flatsedge
<i>Cyrilla racemiflora</i>	red titi
<i>Dicanthelium</i> sp.	panic grass
<i>Dichantherium aciculare</i>	needleleaf witchgrass
<i>Dichantherium acuminatum</i>	tapered witchgrass
<i>Dichantherium commutatum</i>	variable witchgrass
<i>Dichantherium scabriusculum</i>	woolly witchgrass
<i>Diodia virginiana</i>	Virginia buttonweed
<i>Drosera brevifolia</i>	dward sundew
<i>Drosera intermedia</i>	water sundew; spoonleaf sundew
<i>Drosera capillaris</i>	pink sundew
<i>Dulichium arundinaceum</i>	threeway sedge; sheathed galingale
<i>Echinochloa muricata</i>	rough barnyardgrass
<i>Eichhornia crassipes</i>	common water-hyacinth
<i>Eleocharis tuberculosa</i>	conecup spikerush
<i>Elephantopus elatus</i>	florida elephant's-foot
<i>Eragrostis refracta</i>	coastal lovegrass
<i>Eriocaulon decangulare</i>	pipewort
<i>Eupatorium compositifolium</i>	dog fennel
<i>Eupatorium mikanioides</i>	semaphore thoroughwort
<i>Eupatorium morhii</i>	Mohr's thoroughwort

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<i>Scientific Name</i>	Common Name
<i>Eupatorium perfoliatum</i>	common boneset
<i>Eupatorium rotundifolium</i>	false hoarhound
<i>Eupatorium semiserratum</i>	smallflower thoroughwort
<i>Eupatorium serotinum</i>	boneset
<i>Euthamia graminifolia</i>	grass-leaved goldenrod
<i>Euthamia minor</i>	slender flattop goldenrod
<i>Fuirena brevisetaa</i>	saltmarsh umbrellasedge
<i>Fuirena sciroides</i>	southern umbrellasedge
<i>Fuirena scirpoidea</i>	southern umbrellasedge
<i>Fuirena</i> sp.	umbrellasedge
<i>Galactia volubilis</i>	downy milkpea
<i>Gaylussacia mosieri</i>	woolly huckleberry
<i>Gelsemium sempervirens</i>	Florida jessamine
<i>Habenaria repens</i>	water-spider orchid
<i>Hamamelis virginiana</i>	American witchhazel
<i>Helenium amarum</i>	Spanish daisy; bitterweed
<i>Hibiscus aculeatus</i>	comfortroot
<i>Hibiscus grandiflorus</i>	swamp rosemallow
<i>Hydrocotyle</i> sp.	marshpennywort
<i>Hypericum brachyphyllum</i>	coastalplain St. John's-wort
<i>Hypericum cistifolium</i>	roundpod St. John's-wort
<i>Hypericum denticulatum</i>	coppery St. John's-wort
<i>Hypericum gentianoides</i>	Pineweeds; Orangegrass
<i>Hypericum hypericoides</i>	St. Andrew's-cross
<i>Hypericum mutilum</i>	dwarf St. John's-wort
<i>Hypericum tetrapetalum</i>	fourpetal St. John's-wort
<i>Ilex cassine</i>	dahoon
<i>Ilex coriacea</i>	large gallberry
<i>Ilex glabra</i>	gallberry
<i>Ilex myrtifolia</i>	myrtle leaf holly
<i>Ilex vomitoria</i>	yaupon
<i>Ipomoea sagittata</i>	salt marsh morning glory
<i>Itea virginica</i>	Virginia willow; Virginia sweetspire
<i>Iva frutescens</i>	bigleaf sumpweed
<i>Juncus cf. scirpoides</i>	needlepod rush
<i>Juncus elliotii</i>	bog rush; elliot's rush
<i>Juncus megacephalus</i>	bighead rush
<i>Juncus polycephalus</i>	manyhead rush
<i>Juncus scirpoides</i>	needlepod rish
<i>Juncus roemerianus</i>	black needle rush
<i>Juniperus virginiana</i>	red cedar
<i>Justicia</i> sp.	waterwillow
<i>Kalmia hirsuta</i>	hairy wicky
<i>Kosteletzkya virginica</i>	seashore mallow
<i>Lachnanthes caroliniana</i>	redroot
<i>Lachnocaulon anceps</i>	whitehead bogbutton
<i>Liatris</i> sp.	shooting star
<i>Ligustrum sinense</i>	chinese privet
<i>Liriodendron tulipifera</i>	tuliptree; yellow poplar
<i>Ludwigia pilosa</i>	hairy primrosewillow
<i>Ludwigia</i> sp.	rattlebox
<i>Lycopodiella alopecuroides</i>	foxtail clubmoss
<i>Lycopus</i> sp.	waterhorehound
<i>Lygodium japonicum</i>	Japanese climbing fern
<i>Lyonia lucida</i>	fetterbush
<i>Lythrum lineare</i>	wand loosestrife
<i>Magnolia grandiflora</i>	southern magnolia
<i>Magnolia virginiana</i>	sweetbay
<i>Melanthium virginicum</i>	Virginia bunchflower

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<i>Scientific Name</i>	Common Name
<i>Mikania scandens</i>	milk vine
<i>Mitreola petiolata</i>	lax hornpod
<i>Myrica cerifera</i>	wax myrtle
<i>Myrica heterophylla</i>	evergreen bayberry; northern bayberry
<i>Nymphaea odorata</i>	fragrant water lily
<i>Nyssa sylvatica</i> var. <i>biflora</i>	tupelo
<i>Onoclea sensibilis</i>	sensitive fern
<i>Osmunda regalis</i>	royal fern
<i>Osmunda cinnamomea</i>	cinnamon fern
<i>Oxypolis filiformis</i>	water cowbane
<i>Panicum commutatum</i>	variable witchgrass
<i>Panicum repens</i>	torpedograss
<i>Panicum virgatum</i>	switchgrass
<i>Paspalum</i> sp.	crowgrass
<i>Peltandra sagittifolia</i>	spoon flower
<i>Persea borbonia</i>	red bay
<i>Persea palustris</i>	silk bay
<i>Phragmites australis</i>	common reed
<i>Phyla nodiflora</i>	frogs- fruit
<i>Physalis angustifolia</i>	coastal groundcherry
<i>Pinus elliotii</i>	slash pine
<i>Platanthera ciliaris</i>	yellow fringed orchid
<i>Platanus occidentalis</i>	American sycamore; American planetree
<i>Pluchea odorata</i>	cure-for-all
<i>Pluchea purpurescens</i>	annual salt marsh fleabane
<i>Pluchea rosea</i>	rosy camphorweed
<i>Pluchea</i> sp.	camphorweed
<i>Polygala cruciata</i>	drumheads
<i>Polygala cymosa</i>	tall pinebarren milkwort
<i>Polygala hookeri</i>	hooker's milkwort
<i>Polygala lutea</i>	orange milkwort
<i>Polygala nana</i>	candyroot
<i>Polygala ramosa</i>	low pinebarren milkwort
<i>Polygonum</i> cf. <i>hydropiperoides</i>	mild waterpepper; swamp smartweed
<i>Polygonum hydropiperoides</i>	mild waterpepper; swamp smartweed
<i>Polygonum punctatum</i>	dotted smartweed
<i>Proserpinaca pectinata</i>	combleaf mermaidweed
<i>Pteridium aquilinum</i> var. <i>pseudocaudatum</i>	tailed bracken
<i>Pterocaulon pycnostachyum</i>	blackroot
<i>Quercus geminata</i>	sand live oak
<i>Quercus hemispherica</i>	laurel oak; diamond oak
<i>Quercus laurifolia</i>	laurel oak; diamond oak
<i>Quercus minima</i>	dwarf live oak
<i>Quercus pumila</i>	running oak
<i>Quercus virginiana</i>	live oak
<i>Rhexia alifanus</i>	savannah meadow beauty
<i>Rhexia mariana</i>	pale meadowbeauty; Maryland meadowbeauty
<i>Rhexia nashii</i>	maid marian
<i>Rhus copalinum</i>	winged sumac
<i>Rhynchospora cephalantha</i>	bunched beaksedge
<i>Rhynchospora</i> cf. <i>inundata</i>	narrowfruit horned beaksedge
<i>Rhynchospora chalarocephala</i>	loosehead beaksedge
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge
<i>Rhynchospora ciliaris</i>	fringed beaksedge
<i>Rhynchospora fascicularis</i>	fascicled beaksedge
<i>Rhynchospora gracilentia</i>	slender beaksedge
<i>Rhynchospora</i> sp.	beakrush
<i>Rubus argutus</i>	sawtooth blackberry
<i>Rubus cuneifolius</i>	sand blackberry

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<i>Scientific Name</i>	Common Name
<i>Rubus trivialis</i>	southern dewberry
<i>Rhynchospora corniculata</i>	shortbristle horned beaksedge
<i>Sabal minor</i>	dwarf palmetto; bluestem palm
<i>Sabal palmetto</i>	sabal palm
<i>Sabatia brevifolia</i>	narrow-leaved sabatia
<i>Sabatia macrophylla</i>	largeleaf rosegentian
<i>Sagittaria latifolia</i>	broadleaf arrowhead; common arrowhead; duck potato
<i>Sagittaria lancifolia</i>	bulltongue arrowhead
<i>Salix caroliniana</i>	Carolina willow; coastalplain willow
<i>Sambucus canadensis</i>	American elder; elderberry
<i>Sapium sebiferum</i>	popcorn tree
<i>Sarracenia leucophylla</i>	white top pitcher plant
<i>Scleria oligantha</i>	littlehead nutrush
<i>Scirpus cyperinus</i>	wool-grass bulrush
<i>Serenoa repens</i>	saw-palmetto
<i>Sesbania punicea</i>	rattlebox
<i>Smilax bona-nox</i>	saw greenbrier
<i>Smilax laurifolia</i>	laurel greenbrier; bamboo vine
<i>Smilax pumila</i>	sarsaparilla vine
<i>Smilax sp.</i>	greenbrierr
<i>Solidago sempervirens</i>	seaside goldenrod
<i>Spartina patens</i>	marshhay cordgrass; saltmeadow cordgrass
<i>Sphagnum sp.</i>	peat moss
<i>Stillingia aquatica</i>	water toothleaf; corkwood
<i>Symplocos tinctoria</i>	common sweetleaf; horse sugar
<i>Syngonanthus flavidulus</i>	yellow hatpins
<i>Taxodium ascendens</i>	pond cypress
<i>Thelypteris hispida</i>	hairy maiden fern
<i>Thelypteris palustris</i>	marsh fern
<i>Toxicodendron radicans</i>	poison ivy
<i>Triadenum virginicum</i>	Virginia marsh St. John's-wort
<i>Typha latifolia</i>	cattail
<i>Utricularia sp.</i>	bladderwort
<i>Vaccinium arboreum</i>	sparkleberry; farkleberry
<i>Vaccinium corymbosum</i>	highbush blueberry
<i>Vaccinium elliotii</i>	highbush blueberry
<i>Vaccinium myrsinites</i>	shiny blueberry
<i>Viburnum nudum</i>	possumhaw
<i>Vitis rotundifolia</i>	muscadine grape
<i>Woodwardia areolata</i>	netted chain fern
<i>Woodwardia virginica</i>	Virginia chain fern
<i>Xyris sp.</i>	yelloweyed grass
<i>Xyris caroliniana</i>	Carolina yelloweyed grass
<i>Xyris elliotii</i>	Elliott's yelloweyed grass
<i>Xyris fimbriata</i>	fringed yelloweyed grass
<i>Xyris laxifolia</i> var. <i>iridifolia</i>	irisleaf yelloweyed grass
<i>Xyris platylepis</i>	tall yelloweyed grass
<i>Xyris serotina</i>	acidswamp yelloweyed grass
<i>Xyris stricta</i>	pineland yelloweyed grass

APPENDIX

B

Appendix B—Observed and Target Wildlife Species on the Dutex Property

AMPHIBIANS

Scientific Name	Common Name
<i>Acris gryllus</i>	cricket frog
<i>Acris gryllus</i>	southern cricket frog
<i>Agkistrodon piscivorus</i>	cottonmouth
<i>Alligator mississippiensis</i>	alligator
<i>Ambystoma cingulatum</i>	flatwoods salamander
<i>Ambystoma talpoideum</i>	mole salamander
<i>Ambystoma tigrinum</i>	tiger salamander
<i>Amphiuma means</i>	two-toed amphiuma
<i>Anolis carolinensis</i>	green anole
<i>Bufo quercicus</i>	oak toad
<i>Chelydra serpentina</i>	snapping turtle
<i>Cnemidophorus sexlineatus</i>	six-lined racerunner
<i>Coluber constrictor</i>	black racer
<i>Crotalus adamanteus</i>	eastern diamondback rattlesnake
<i>Crotalus</i> spp.	diamondback rattlesnake
<i>Deirochelys reticularia</i>	chicken turtle
<i>Desmognathus auriculatus</i>	southern dusky salamander
<i>Diadophis punctatus</i>	ringneck snake
<i>Elaphe guttata</i>	red rat snake
<i>Elaphe obsoleta quadrivittata</i>	yellow rat snake
<i>Elaphe obsoleta spiloides</i>	gray rat snake
<i>Eumeces laticeps</i>	broadhead skink
<i>Eurycea quadradigitata</i>	dwarf salamander
<i>Farancia abacura</i>	eastern mud snake
<i>Gastrophryne carolinensis</i>	narrowmouth toad
<i>Gopherus polyphemus</i>	gopher tortoise
<i>Heterodon simus</i>	southern hognose snake
<i>Hyla chrysoscelis</i>	Cope's gray treefrog
<i>Hyla cinerea</i>	green treefrog
<i>Hyla femoralis</i>	pinewoods treefrog
<i>Hyla gratiosa</i>	barking treefrog
<i>Hyla squirella</i>	squirrel treefrog
<i>Kinosternon baurii</i>	striped mud turtle
<i>Kinosternon subrubrum steindachneri</i>	mud turtle
<i>Lampropeltis elapsoides</i>	scarlet kingsnake
<i>Masticophis flagellum</i>	coachwhip snake
<i>Micrurus fulvius</i>	coral snake
<i>Nerodia fasciata</i>	banded water snake
<i>Nerodia floridana</i>	green water snake
<i>Notophthalmus perstriatus</i>	striped newt
<i>Opheodrys aestivus</i>	rough green snake
<i>Ophisaurus ventralis</i>	eastern glass lizard
<i>Plethodon glutinosus</i>	slimy salamander
<i>Pseudacris nigrata</i>	southern chorus frog
<i>Pseudacris ocularis</i>	little grass frog
<i>Pseudacris ornata</i>	ornate chorus frog
<i>Pseudacris</i> spp.	chorus frog
<i>Rana capito</i>	gopher frog
<i>Rana catesbeiana</i>	bull frog
<i>Rana clamitans clamitans</i>	bronze frog
<i>Rana grylio</i>	pig frog
<i>Rana sphenoccephala</i>	leopard frog
<i>Regina alleni</i>	striped swamp snake
<i>Regina rigida</i>	crayfish snake
<i>Scaphiopus holbrookii</i>	eastern spadefoot toad
<i>Sceloporus undulatus</i>	eastern fence lizard
<i>Scincella lateralis</i>	ground skink
<i>Seminatrix pygaea</i>	black swamp snake
<i>Siren intermedia</i>	lesser siren
<i>Siren lacertina</i>	greater siren
<i>Sistrurus miliarius</i>	pygmy rattlesnake
<i>Storeria occipitomaculata</i>	red-bellied snake
<i>Terrapene carolina</i>	box turtle

BIRDS

Scientific Name	Common Name
<i>Accipitriformes spp.</i>	hawks
<i>Aix sponsa</i>	wood duck
<i>Ardea alba</i>	great egret
<i>Ardea herodias</i>	great blue heron
<i>Baeolophus bicolor</i>	tufted titmouse
<i>Bubo virginianus</i>	great horned owl
<i>Buteo lineatus</i>	red-shouldered hawk
<i>Circus cyaneus</i>	northern harrier
<i>Coccyzus americanus</i>	yellowbellied cuckoo
<i>Colinus virginianus</i>	bobwhite
<i>Compothlypis americana</i>	parula warbler
<i>Corvus brachyrhynchos</i>	common crow
<i>Cyanocitta cristata</i>	blue jay
<i>Dendroica pinus</i>	pine warbler
<i>Dryocopus pileatus</i>	pileated woodpecker
<i>Dumetella carolinensis</i>	catbird
<i>Egretta caerulea</i>	little blue heron
<i>Egretta thula</i>	snowy egret
<i>Egretta tricolor</i>	tricolored heron
<i>Elanoides forficatus</i>	swallow-tailed kite
<i>Eudocimus albus</i>	white ibis
<i>Euphagus carolinus</i>	rusty blackbird
<i>Falco sparverius</i>	southeastern kestrel
<i>Grus canadensis</i>	sandhill crane
<i>Haliaeetus leucocephalus</i>	bald eagle
<i>Melanerpes carolinus</i>	red-bellied woodpecker
<i>Meleagris spp.</i>	turkey
<i>Mimus polyglottos</i>	mocking brid
<i>Mycteria americana</i>	woodstork
<i>Myiarchus crinitus</i>	great-crested flycatcher
<i>Pandion haliaetus</i>	osprey
<i>Passeriformes spp.</i>	songbirds
<i>Poliopitila caerulea</i>	blue gray gnatcatcher
<i>Protonotaria citrea</i>	prothonotary warbler
<i>Scolopax minor</i>	woodcock
<i>Sitta pusilla</i>	brown-headed nuthatch
<i>Strix varia</i>	barred owl
<i>Thryothorus ludovicianus</i>	Carolina wren
<i>Vireo griseus</i>	white-eyed vireo
<i>Vireo olivaceus</i>	red-eyed vireo
<i>Zenaida macroura</i>	mourning dove

MAMMALS

Scientific Name	Common Name
<i>Didelphis virginiana</i>	opossum
<i>Felis rufus</i>	bobcat
<i>Lontra canadensis</i>	river otter
<i>Mephitis mephitis</i>	striped skunk
<i>Neotoma floridana</i>	woodrat
<i>Neovison vison</i>	mink
<i>Odocoileus virginianus</i>	white-tailed deer
<i>Peromyscus gossypinus</i>	cotton mouse
<i>Peromyscus polionotus</i>	beach mouse
<i>Procyon lotor</i>	raccoon
<i>Scalopus aquaticus</i>	eastern mole
<i>Sciurus carolinensis</i>	gray squirrel
<i>Sciurus niger</i>	fox squirrel
<i>Sigmodon hispidus</i>	cotton rat
<i>Soricidae spp.</i>	shrews
<i>Sylvilagus floridanus</i>	cottontail rabbit
<i>Urocyon cinereoargenteus</i>	gray fox
<i>Ursus americanus</i>	black bear

INVERTEBRATES

Scientific Name	Common Name
<i>Neritina spp.</i>	olive nerites
<i>Uca spp.</i>	fiddler crabs

APPENDIX

C



Wetland Forested Mixed (FLUCCS 630)



Wetland Forested Mixed (FLUCCS 630)



South of beaver pond (Gum Swamp; FLUCCS 613)



Ditch (FLUCCS 510)



Canopy opening in Pine Flatwoods (FLUCCS 411)



Pine Flatwoods (FLUCCS 411)



Titi Swamp (FLUCCS 614)



Titi Swamp (FLUCCS 614)



Bay Swamp with Privet (FLUCCS 611)



Beaver Pond (FLUCCS 534)



Beaver Dam (FLUCCS 747)



Titi Swamp (FLUCCS 614)



Beaches (FLUCCS 713)



Lakes <10 Acres (FLUCCS 524)



Slash Pine Swamp Forest (FLUCCS 627)



Hardwood Conifer Mixed (FLUCCS 434)



Stream and Waterways (FLUCCS 510)



Ditch (FLUCCS 510)



Hardwood Conifer Mixed/Stream and Waterways (Eleven Mile
Creek; FLUCCS 434/510)



Hydric Pine Flatwoods (FLUCCS 625)



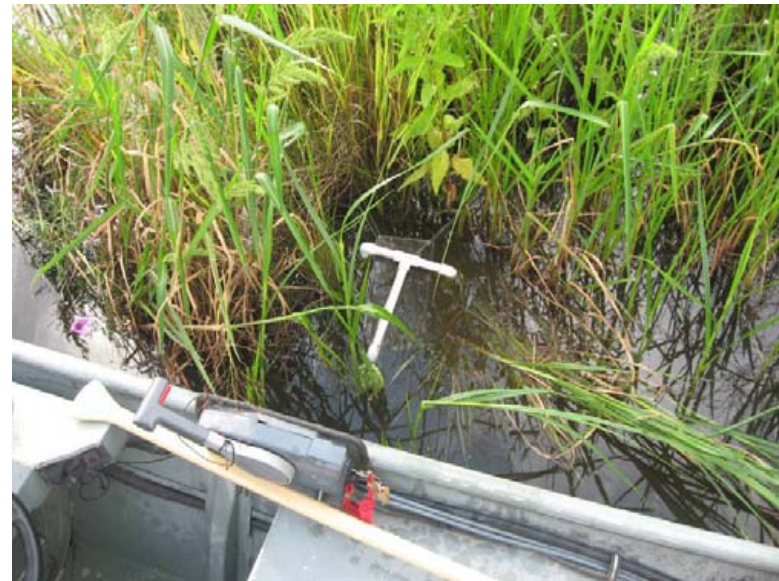
Stream and Waterways (FLUCCS 510) with Wild Taro (*Colocasia esculenta*)



Beaches/Freshwater Marsh (FLUCCS 710/641)



Freshwater Marsh (FLUCCS 641)



Breder Trap Deployment



Common water hyacinth (*Eichhornia crassipes*)

APPENDIX

D

Dutex Property
Umbrella Regional Mitigation Plans for
Florida Department of Transportation Projects
June 24, 2010



FLUCCS Code		MIT ACT CODE	UMAM Polygon	Ac	SCORE						UMAM W/OUT MIT.	UMAM WITH MIT.	DELTA	TIME LAG	P FACT	RISK	RFG	LIFT	
					LOCATION AND LANDSCAPE		WATER ENVIRONMENT		COMMUNITY STRUCTURE										
CURRENT	TARGET				W/OUT or CUR.	WITH MIT.	W/OUT or CUR.	WITH MIT.	W/OUT or CUR.	WITH MIT.									
434	434	6	1	9.89	0	0	0	0	0	0	0.00	0.00	0.00	NA	1	1.00	NA	NA	
441	411	2	2	6.82	0	0	0	0	0	0	0.00	0.00	0.00	1.68	1	1.75	0.00	0.00	
441	411	3	3	22.89	0	0	0	0	0	0	0.00	0.00	0.00	1.46	1	1.50	0.00	0.00	
510	510	6	4	3.03	0	0	0	0	0	0	0.00	0.00	0.00	NA	1	1.00	NA	NA	
510D	411	5	5	0.13	0	0	0	0	0	0	0.00	0.00	0.00	1.68	1	2.00	0.00	0.00	
510D	510D	6	6	0.76	0	0	0	0	0	0	0.00	0.00	0.00	NA	1	1.00	NA	NA	
510D	626	5	7	0.17	2	9	2	9	2	10	0.20	0.93	0.73	1.68	1	2.00	0.22	0.04	
524	524	6	8	2.31	0	0	0	0	0	0	0.00	0.00	0.00	NA	1	1.00	NA	NA	
534	411	6	9	1.21	0	0	0	0	0	0	0.00	0.00	0.00	NA	1	1.00	NA	NA	
534	613	6	10	11.28	7	9	4	9	3	9	0.47	0.90	0.43	1.16	1	1.00	0.37	4.21	
534	626	6	11	6.85	7	9	2	9	1	9	0.33	0.90	0.57	1.07	1	1.00	0.53	3.63	
611	611	4	12	4.78	7	9	8	9	7	10	0.73	0.93	0.20	1.03	1	1.25	0.16	0.74	
613	611	4	13	1.07	7	9	6	9	7	10	0.67	0.93	0.27	1.03	1	1.25	0.21	0.22	
613	613	6	14	24.80	7	9	8	9	9	10	0.80	0.93	0.13	1.00	1	1.00	0.13	3.31	
614	614	6	15	5.24	7	9	9	9	9	10	0.83	0.93	0.10	1.00	1	1.00	0.10	0.52	
625	625	2	16	5.41	7	9	8	9	6	9	0.70	0.90	0.20	1.03	1	1.00	0.19	1.05	
625	625	3	17	2.47	7	9	8	9	6	10	0.70	0.93	0.23	1.07	1	1.25	0.17	0.43	
625	625	4	18	21.06	7	9	8	9	6	10	0.70	0.93	0.23	1.07	1	1.25	0.17	3.67	
625	626	2	19	38.53	7	9	8	9	6	9	0.70	0.90	0.20	1.03	1	1.25	0.16	5.99	
625	626	3	20	77.59	7	9	8	9	6	10	0.70	0.93	0.23	1.07	1	1.25	0.17	13.54	
625	626	4	21	5.78	7	9	8	9	6	10	0.70	0.93	0.23	1.07	1	1.25	0.17	1.01	
627	611	4	22	19.93	7	9	8	9	8	10	0.77	0.93	0.17	1.07	1	1.25	0.12	2.48	
627	626	3	23	4.93	7	9	8	9	5	9	0.67	0.90	0.23	1.07	1	1.25	0.17	0.86	
631	611	2	24	12.51	7	9	8	9	9	9	0.80	0.90	0.10	1.16	1	1.00	0.09	1.08	
631	631	2	25	5.16	7	9	8	9	9	9	0.80	0.90	0.10	1.00	1	1.00	0.10	0.52	
641	641	2	26	180.67	7	9	8	9	9	9	0.80	0.90	0.10	1.03	1	1.00	0.10	17.54	
641	641	6	27	1.88	7	9	10	10	9	10	0.87	0.97	0.10	1.00	1	1.00	0.10	0.19	
710	710	2	28	4.31	0	0	0	0	0	0	0.00	0.00	0.00	1.07	1	1.00	0.00	0.00	
747	411	1	29	0.05	0	0	0	0	0	0	0.00	0.00	0.00	1.68	1	2.00	0.00	0.00	
747	613	1	30	0.19	7	9	0	9	0	10	0.23	0.93	0.70	1.16	1	1.00	0.60	0.11	
747	626	1	31	0.05	7	9	0	9	0	9	0.23	0.90	0.67	1.07	1	1.00	0.62	0.03	
West Totals:				481.75															61.17

APPENDIX

E

Dutex Property
Umbrella Regional Mitigation Plans for
Florida Department of Transportation Projects
June 24, 2010



FLUCCS Code		MIT ACT CODE	UMAM Polygon	Ac	SCORE						UMAM W/OUT MIT.	UMAM WITH MIT.	DELTA	TIME LAG	P FACT	RISK	RFG	LIFT
					LOCATION AND LANDSCAPE		WATER ENVIRONMENT		COMMUNITY STRUCTURE									
CURRENT	TARGET				W/OUT or CUR.	WITH MIT.	W/OUT or CUR.	WITH MIT.	W/OUT or CUR.	WITH MIT.								
627	625, 626	3a	3a	129.86	7	9	8	8	6	9	0.70	0.87	0.17	1.03	1	1.25	0.13	16.81
441	411	3b	3b	2.55	7	9	8	8	6	9	0.70	0.87	0.17	1.07	1	1.25	0.12	0.32
627	625, 626	4ERa	4ERa	3.29	7	9	8	8	4	9	0.63	0.87	0.23	1.07	1	1.25	0.17	0.57
611	611	4ERb	4ERb	0.65	7	9	8	8	4	9	0.63	0.87	0.23	1.07	1	1.25	0.17	0.11
441	411	4ERc	4ERc	2.16	7	9	8	8	4	9	0.63	0.87	0.23	1.07	1	1.25	0.17	0.38
627	625, 626	4a	4a	15.90	7	9	8	8	6	9	0.70	0.87	0.17	1.03	1	1.25	0.13	2.06
611, 614, 627, 630	611, 614, 627, 630	4b	4b	44.38	7	9	8	8	6	9	0.70	0.87	0.17	1.03	1	1.00	0.16	7.18
441	411	4c	4c	3.88	7	9	8	8	6	9	0.70	0.87	0.17	1.03	1	1.25	0.13	0.50
614, 627, 630	614, 627, 630	6	6	126.78	7	9	8	8	7	9	0.73	0.87	0.13	1.03	1	1.00	0.13	16.41
611, 627, 630	611, 627, 630	6ER	6ER	9.42	7	9	8	8	4	9	0.63	0.87	0.23	1.07	1	1.25	0.17	1.64
East Totals:				338.85														45.99
West and East Combined Total:				820.60														107.16

Joint Application for Works in Waters of Florida

**Joint Application
for Works in Waters of Florida**

Dutex Tract Restoration

**Submitted by:
Northwest Florida Water Management District
(January 14, 2011)**

Joint Application for Works in Waters of Florida Dutex Tract Restoration

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Joint Application for Works in the Waters of Florida Form

Department of the Army (Corps/Florida Department of Environmental Protection (DEP)/
 Water Management District (WMD))

Corps Application Number (official use only)	DEP Application Number (official use only)
--	--

Type or Print Legibly

<p>1. Applicant's Name and Address</p> <p>Name <u>Northwest Florida Water Management District</u> <small>Last Name, First Name (if individual); Corporate Name; Name of Govt. Agency</small></p> <p>Street <u>81 Water Management Drive</u></p> <p>City <u>Havana</u> State: <u>FL</u> Zip: <u>32333-4712</u></p> <p>Telephone <u>(850) 539-5999</u> (Day) <u>n/a</u> (Night)</p>
<p>2. Name, Address, Zip Code, Telephone Number and Title of Applicant's Authorized Agent</p> <p>Name <u>Bartel, Ron (Director, Resource Management Division)</u> <small>Last Name, First Name</small></p> <p>Corporate Name; Name of Govt. Agency <u>Northwest Florida Water Management District</u></p> <p>Street <u>81 Water Management Drive</u></p> <p>City <u>Havana</u> State <u>FL</u> Zip <u>32333-4712</u></p> <p>Telephone <u>(850) 539-5999</u> (Day) <u> </u> (Night)</p>
<p>3. Name of Waterway at Work Site: <u>Eleven Mile Creek / Perdido Bay</u></p>
<p>4. Street, Road or Other Location of Work <u>NWFWMD Lands (Dutex Tract) Southwest of Saufley Field NAS</u></p> <p>Incorporated City or Town <u>None</u></p> <p>Section <u>36</u> Township - <u>2S</u> Range <u>31W</u></p> <p>Section <u>41</u> Township - <u>1S</u> Range <u>31W</u></p> <p>County(ies) <u>Escambia</u></p> <p>Coordinates in Center of Project: Federal Projects Only: <u> </u> x <u> </u> y</p> <p>Latitude <u>30</u> ° <u>27</u> ' <u>36</u> " Longitude <u>87</u> ° <u>21</u> ' <u>28</u> "</p> <p>Lot <u> </u> Block <u> </u> Subd <u> </u> Plat Bk <u> </u> Pg</p> <p>Directions to Locale/Site: <u>From Pensacola, head west on US 90. Left (west) onto Bellview Road. Left (south) onto Blue Angel Pkwy. Right (west) onto Saufley Pines Road. Left (south) onto Wyndotte Road. Principal access is at end of Wyndotte Road.</u></p>
<p>5. Names, Addresses, and Zip Codes of Adjacent Property Owners Whose Property Also Adjoins the Water (Excluding Applicant). <small>Show Numbers or Names of These Owners on Plan Views. If More Than Six (6) Owners Adjoin the Project, You May Be Required to Publish a Public Notice for the DEP.</small></p> <p>1. 2.</p> <p>3. 4. (See Attached)</p> <p>5. 6.</p>

6. Proposed Use (Check one or more as applicable) Private: Single Family Multi-Family
Public Commercial New Work Alteration of Existing Works Maintenance Other (Explain):

7. Desired Permit Duration (see Fee Schedule): 5 Yr. 10 Yr Other (Specify)

8. General Permit or Exemption Requested:

DEP General Permit FAC Rule 17-312. DEP Exemption FAC Rule 17-312. Section 403. FS.

9. Total Extent of Work in Jurisdictional Open Waters or Wetlands: (Use additional sheets and provide complete breakdown of each category if more space is needed.)

a. Within Corps Jurisdiction:

Fill: 2765 Sq. Ft. 0.07 Acres 161 Cu. Yds.

Excavation: 6585 Sq. Ft. 0.15 Acres 472 Cu. Yds.

b. Within DEP Jurisdiction:

Fill: x Sq. Ft. x Acres x Cu. Yds.

Excavation: x Sq. Ft. x Acres x Cu. Yds.

Excavation Waterward of MHW 0 cu. yds (information needed for DEP)

c. DEP Jurisdictional Area Severed (Area Landward of Fill Structures which will be Severed):

0 Sq. Ft. 0 Acres

d. DEP Jurisdictional Area Created (New Excavation from Uplands, Exclusive of Mitigation):

0 Sq. Ft. 0 Acres

e. Docks, Piers, and Over Water Structures:

Total Number of Slips: Total Number of Mooring Pilings:

Length Width Height above MHW

Length Width Height above MHW

Number of Finger Piers Length Width Height

Number of Finger Piers Length Width Height

Total area of structure over waters & wetlands sq. ft.

Use of structure

Will the docking facility provide:

Live-aboard Slips – No

Fueling Facilities – No

Sewage Pump-out Facilities – No

Other Supplies or Services Required for Boating – None

(Excluding refreshments, bait and tackle)

f. Seawall length: ft. Seawall material:

Riprap revetment length: ft. Slope H: V: Toe width

Riprap at toe of seawall length ft. Slope H: V: Toe width

Size of riprap:

Type of riprap or seawall material:

g. Other (See item 10).

10. Description of Work (be specific; use additional sheets as necessary).

(See attached Project Description)

11. Turbidity, Erosion, and Sedimentation Controls Proposed:

(See attached Turbidity, Erosion, and Sediment Control Measures)

12. Date Activity is Proposed to Commence: 2011 to be Completed: 2011
Total Time Required to Construct: 6 months, depending on weather and site conditions

13. Previous Applications for this Project have been: no previous applications DEP No.: Corps No.:

A. Denied (date):

B. issued (date):

C Other (please explain):

Differentiate between existing work and proposed work on the drawings.

14. Certification. Application is hereby made for a permit or permits to authorize the activities described herein.

A. I Certify That: (Please check appropriate space)

1. I am the record owner ; lessee , or the record easement holder of the property on which the proposed project is to be undertaken, as described in the attached legal document.

2. I am not the record owner, lessee or record easement holder of the property on which the proposed project is to be undertaken, as described in the attached legal document, but I will have, before undertaking the proposed work the requisite property interest. (Please explain what the interest will be and how it will be acquired.)

Attach legal description of property or copy of deed to the property on which project is to occur (must be provided).

B. I understand I may have to provide any additional information/data that may be necessary to provide reasonable assurance or evidence that the proposed project will comply with the applicable State Water Quality Standards or other environmental standards both before construction and after the project is completed.

C. In addition, I agree to provide entry to the project site for inspectors with proper identification or documents as required by law from the environmental agencies for the purpose of inspecting the site. Further, I agree to provide entry to the project site for such inspectors to monitor permitted work, if a permit is granted.

D. This is a Joint Application and is not a Joint Permit. I hereby acknowledge the obligation and responsibility for obtaining all of the required state federal or local permits before commencement of construction. I also understand that before commencement of this proposed project, I must be granted separate permits or authorizations from the U.S. Corps of Engineers, the U.S. Coast Guard, the Department of Environmental Protection and the Delegated Water Management District (where applicable), as necessary.

Project Description

Introduction

In 2009, the Northwest Florida Water Management District (NFWFMD) acquired the 809.85-acre± Dutex Tract for use as mitigation for wetland impacts associated with current and anticipated future Florida Department of Transportation (FDOT) projects. Approximately 95% of this site consists of jurisdictional wetlands. An effluent canal emanating from Saufley Field Naval Air Station divides the Dutex Tract into an eastern part (~335 acres) and a western part (~475 acres).

A variety of factors have degraded the ecological integrity of the wetlands located on the Dutex Tract including historic suppression of fire, encroachment of nuisance/exotic plant species, beaver activity including extensive damming in the northwest portion of the site, and a dirt road and associated ditch that trends northwest to southeast across the western tract. To enhance and restore degraded wetlands found on this property, the NFWFMD intends to use techniques that include, yet are not limited to, mechanical reduction of thick titi/shrub layers (i.e., Gyro-track), reintroduction of prescribed fire, management of nuisance/exotic plant species, thinning of pine, and hydrologic enhancements including control of beaver populations, beaver dam removal, and installation of low-water-crossings and culverts. Details of existing and target site conditions are described in the mitigation plan found in the appendix of this document (“Dutex Property, Umbrella Regional Mitigation Plans for Florida Department of Transportation Projects, Conceptual Mitigation Plan, Escambia County, Florida”, 6/24/2010, prepared by Entrix, Inc. for NFWFMD).

This Joint Application is for construction of six hardened low-water-crossings, installation of culverts at three locations, and the breaching / removal of 1,250 feet of a road and associated beaver dam that is artificially impounding water in the northwest portion of the site.

Hydrologic Restoration and Enhancement

The six (6) low-water-crossings (LWCs) will reconnect and restore hydrologic connectivity among wetlands, primarily hydric pine flatwoods and savanna (see Figures 8 – 11). Each LWC site is located in a low-energy hydraulic environment, will not be subject to significant scour potential, and will typically only contain water under wet weather conditions. Existing road fill at each LWC site will be excavated to natural grade (plus approaches at a maximum 4% grade), a geotextile woven fabric (conforming to FDOT Design Standards, Index 199, Class D-1 or D2) lain down with a minimum fabric overlap of 2 ft., and covered with a 12 inch thick coarse aggregate base consisting of limestone or granite 2-6 inches in diameter ($D_{50} = 4$ inches). A 12 inch thick rock apron consisting of 6-10 inch diameter material ($D_{50} = 8$ inches) will be placed on each side of the LWC. Road fill excavated from LWC construction will be disposed by spreading it on the existing management access road; it will not be placed into any wetland areas or upland areas in a natural

state.

Culverts will be placed in three (3) locations (see Figures 8-11) as part of maintaining management access. These culverts will be placed in existing ditches, covered with fill material, and will allow equipment access necessary for LWC construction, Gyro-track work, prescribed fire, etc. At each culvert site, a geotextile apron will be anchored on the top of the bank and the toe of the slope. Culverts will be set on a layer of compacted, clean bedding material (minimum 4 inches thick beneath bottom of each culvert), and covered with compacted, clean road-fill material to a minimum of 1 ½ feet above the top of each culvert. Two 30 inch diameter culverts will be used at both Site #1 and Site #2, whereas three 30 inch diameter culverts will be used at Site #3.

The majority of a 1,250-foot section of a relict dirt road, now in extremely poor condition with a beaver dam covering most of its length, (see Figures 8-11) will be eliminated by multiple breaches and removal. Material from removal of the road and beaver dam will be disposed by spreading it into a relict ditch adjacent to the dam. Road sections with large, mature trees growing in the road footprint will be left intact.

Cut and fill estimates are in Table 1. Low-water-crossing dimensions are in Table 2. Figures 1-4 show engineering drawings of the proposed low-water-crossings. Figures 5-6 show engineering drawings of the proposed culverts. A location map of the Dutex Tract is shown in Figure 7. A 2007 DOQ, with the locations of proposed low-water-crossings, culvert locations, and road removal is shown in Figure 8. LiDAR imagery of the site is shown in Figure 9. LiDAR with USGS quad sheet topography overlain is shown in Figure 10. Figure 11 shows the location of the proposed hydrologic improvements and post-restoration drainage patterns. Adjacent landowners are shown in Figure 12.

Construction Schedule

Construction activities are scheduled to begin in 2011 and are anticipated to be completed prior to 2012, depending on weather and site conditions. Construction will be performed primarily during dry weather and will be temporarily suspended during periods of heavy rainfall or high water levels. All applicable Best Management Practices (BMPs), including silt fences, will be implemented during all construction phases. Grading and excavation activities are anticipated to be performed using heavy equipment such as backhoes and small bulldozers or excavators. A description of the turbidity, sediment and erosion control measures follows.

Turbidity, Sediment and Erosion Control Measures

Best Management Practices (BMPs) for turbidity, sedimentation and erosion control will be implemented and maintained at all times during construction to prevent siltation and turbid discharges into waters of the state. Silt and sedimentation control measures will be installed and properly maintained at all points where runoff from disturbed areas could result in water quality violations of Chapter 62-302, F.A.C.

1. Staging of Construction Activities

The excavation and moving of soil materials will be scheduled in stages to minimize the size of areas disturbed and unprotected from erosion for the shortest reasonable time.

2. Protection of Desirable Vegetation

Stockpiling, vehicular parking and excessive foot or vehicular traffic will not be allowed within wetland areas. Material storage, fueling and servicing equipment, undertaking equipment maintenance, and cleaning will not be performed in or immediately adjacent to wetland areas. Erosion and sediment controls, such as silt fences, may be needed around the perimeter of stockpiles to prevent the transportation of soils from the area.

3. Best Management Practices

Erosion control measures which will minimize impacts to wetlands and wetland vegetation will be used during construction activities. This can be accomplished by the use of floating turbidity barriers, floating silt screen/curtains, sediment basins, earthen berms, and straw, geotextile or similar bale or log barriers which are free of exotic or noxious weed species. The use of staked silt fences is not recommended except to contain stockpiles in areas such as roadbeds that are outside wetland areas.

Erosion controls where flowing water may be present, such as low water crossings, will require best management practices appropriate for the field conditions. Straw or similar bales or logs may not be appropriate where flowing water is present. Floating turbidity barriers or silt screen/curtains and temporary earthen berms are best management practices that may be used to prevent the transport of sediment in ditches, streams, and wetland waterways.

4. Stabilization of Disturbed Areas

Prompt stabilization of all disturbed areas will be undertaken during and after completion of the project. All disturbed areas will be stabilized within two weeks of disturbance. Suitable methods for stabilization are grading, establishment of a vegetative cover by mulching and/or seeding, and the use of geo-textiles. When seeding and mulching, Brown Top Millet seed (free of exotic or noxious weed species) will be applied to disturbed areas and covered with approximately one (1) inch thick organic mulch of wheat straw (free of exotic or noxious weed species). Steep slopes are more susceptible to erosion than flatter slopes, so temporary mulching and quick establishment of vegetation are extremely important. Jute mats, or similar devices, may be used on steep slopes until the vegetation has become established to prevent erosion.

5. Suspension of Work During Inclement Weather

Construction will be carried out during dry weather conditions to the extent practical and erosion and sedimentation control measures will be implemented. Excavations and other construction activities will be suspended during periods of inclement weather or high water levels if there is potential for environmental damage.

6. Inspection and Maintenance of Erosion and Sedimentation Control

Routine inspection and maintenance of erosion and sedimentation control features will be provided until the project is complete. Barriers will be regularly maintained to insure their effectiveness. Sediments will be cleaned out periodically and before major predicted rainfall events.

7. Removal of Sediment and Erosion Control Measures

Any temporary measure of erosion control, whether temporary sediment basin, silt fence, straw bales, or other measures, will be removed following the successful establishment of vegetation.

Table 1. Fill and Excavation Estimates

Structure Type	Wetland Fill				Wetland Excavation			
	Total Fill Area (ft ²)	Total Fill Area (ac)	Total Fill Volume (ft ³)	Total Fill Volume (CY)	Total Excavated Area (ft ²)	Total Excavated Area (ac)	Total Excavated Volume (ft ³)	Total Excavated Volume (CY)
Low water crossings	2405	0.06	2405	89	6585	0.15	12738	472
Beaver Dam Removal	24000	0.55	72000	2667	0	0.00	0	0
Culverts	360	0.01	1940	72	0	0.00	0	0
TOTALS	26765	0.62	76345	2828	6585	0.15	12738	472

Structure Type	Non-wetland Fill				Non-wetland Excavation			
	Total Fill Area (ft ²)	Total Fill Area (ac)	Total Fill Volume (ft ³)	Total Fill Volume (CY)	Total Excavated Area (ft ²)	Total Excavated Area (ac)	Total Excavated Volume (ft ³)	Total Excavated Volume (CY)
Low water crossings	4600	0.11	4600	170	4600	0.11	4600	170
Beaver Dam Removal	0	0.00	0	0	24000	0.55	72000	2667
Culverts	0	0.00	0	0	0	0	0	0
TOTALS	4600	0.11	4600	170	28600	0.66	76600	2837

Table 2. Low-Water-Crossing Locations and Approximate Dimensions

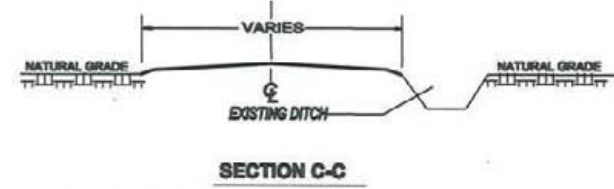
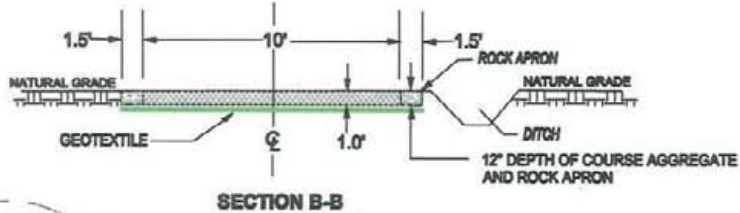
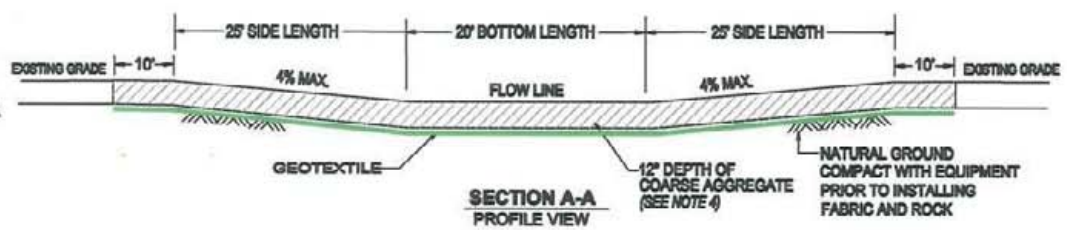
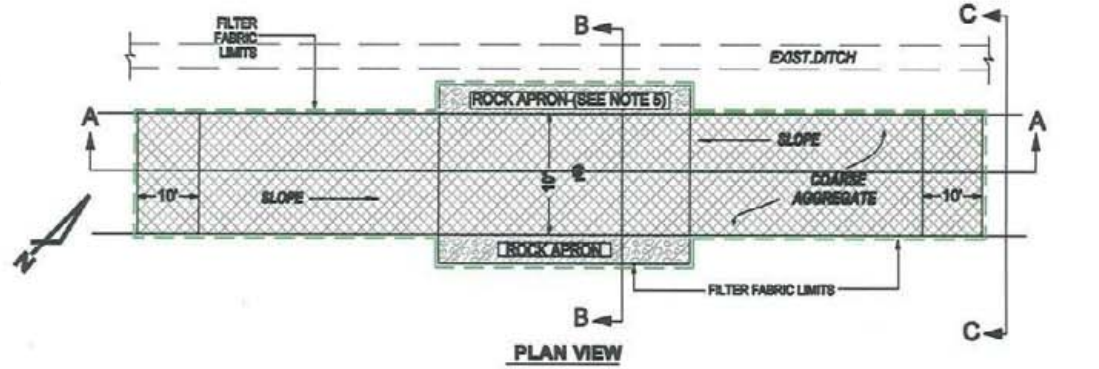
Map ID	Lat	Long	Total Crossing Length (ft)	Min. Length of Each Side (4% slope) (ft)	Bottom Length (ft)	Length of Two 10-ft Tie-ins (ft)	Road Width (ft)
1	30.4646	-87.3598	90	25	20	20	10
2	30.4634	-87.3598	95	25	25	20	10
3	30.4627	-87.3597	95	25	25	20	10
4	30.4602	-87.3593	135	35	45	20	10
5	30.4599	-87.3592	95	25	25	20	10
6	30.4582	-87.3582	135	35	45	20	10

Table 3. Culvert Locations

Map ID	Lat	Long
1	30.4654	-87.3591
2	30.4652	-87.3593
3	30.4639	-87.3603

NOTES:

1. GEOTEXTILE SHALL BE A WOVEN FABRIC FOR STABILIZATION THAT CONFORMS TO FDOT DESIGN STANDARDS, INDEX 199, CLASS D-1 OR D-2.
2. MINIMUM FABRIC OVERLAP SHALL BE 2 FT. ON EACH EDGE. ROCK SHALL BE PLACED ON LAP PRIOR TO PLACING ROCK ON SINGLE LAYERS OF FABRIC TO PREVENT LATERAL MOVEMENT.
3. LIMEROCK SHALL BE TRUCK DUMPED AND MACHINE SPREAD OVER THE FABRIC FOLLOWING PLACEMENT OF FABRIC.
4. COARSE AGGREGATE BASE SHALL BE 12" THICK AND CONSIST OF LIMESTONE OR GRANITE, 2 TO 6 INCHES IN DIAMETER, ($D_{50} = 4$ INCHES), WITH A MAXIMUM L. A. ABRASION LOSS OF 35%.
5. ROCK APRON SHALL CONSIST OF BEDDING STONE, RUBBLE OR COBBLES IN THE RANGE OF 6"-10" WITH A D_{50} OF 8 INCHES AND MAXIMUM L.A. ABRASION LOSS OF 35%. THE THICKNESS OF THE ROCK APRON SHALL BE A MINIMUM OF 12 INCHES.
6. ALL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.



HARDENED LOW WATER CROSSING #1 DETAIL

Lisa D. Chan SIGNED
 1/13/11 DATE
 51357 LICENSE NO.

**DUTEX TRACT
 HYDROLOGIC RESTORATION**

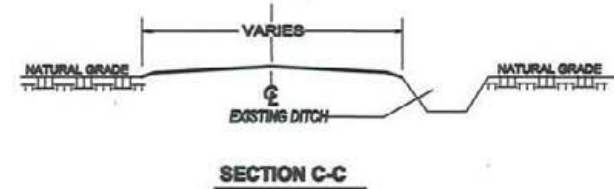
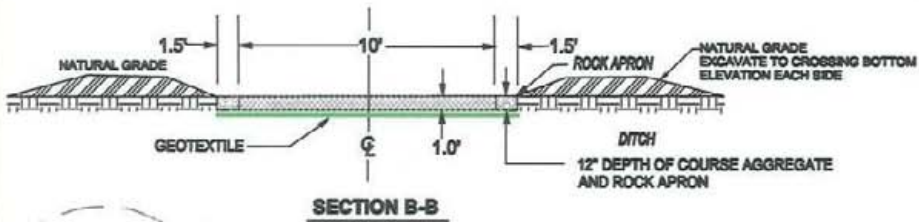
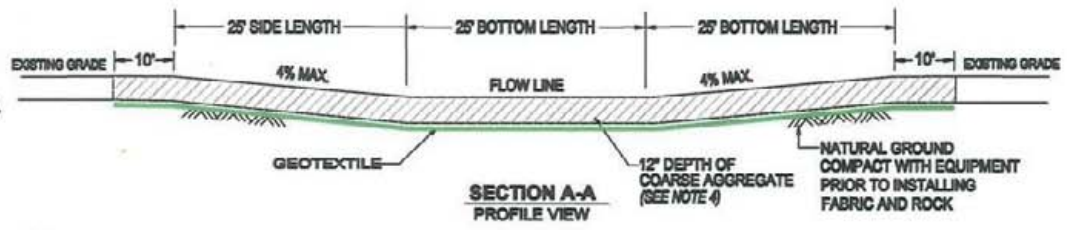
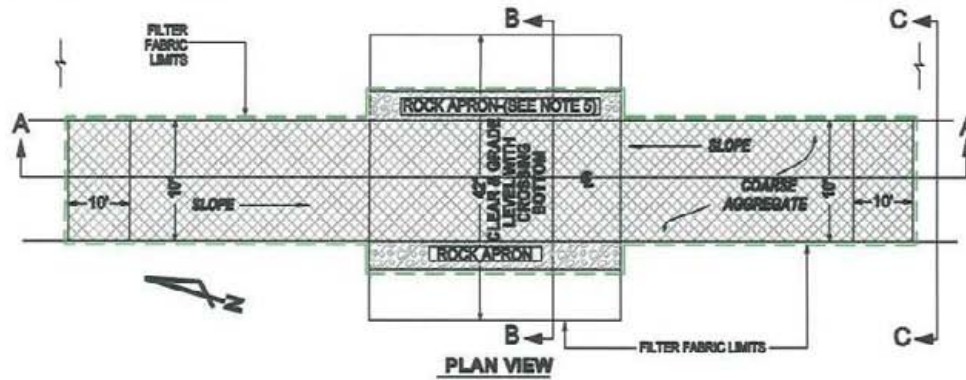
DATE : JUNE 2010 NOT TO SCALE
 PROJECT: 55-5 SHEET 1 OF 5

**Northwest Florida Water
 Management District**
 81 Water Management Drive
 Havana, FL 32333-4712
 (850) 539-5999
 www.nwfwmd.state.fl.us

Figure 1. Low-Water-Crossing #1

NOTES:

1. GEOTEXTILE SHALL BE A WOVEN FABRIC FOR STABILIZATION THAT CONFORMS TO FDOT DESIGN STANDARDS, INDEX 199, CLASS D-1 OR D-2.
2. MINIMUM FABRIC OVERLAP SHALL BE 2 FT. ON EACH EDGE. ROCK SHALL BE PLACED ON LAP PRIOR TO PLACING ROCK ON SINGLE LAYERS OF FABRIC TO PREVENT LATERAL MOVEMENT.
3. LIMEROCK SHALL BE TRUCK DUMPED AND MACHINE SPREAD OVER THE FABRIC FOLLOWING PLACEMENT OF FABRIC.
4. COARSE AGGREGATE BASE SHALL BE 12" THICK AND CONSIST OF LIMESTONE OR GRANITE, 2 to 8 INCHES IN DIAMETER, ($D_{50} = 4$ INCHES), WITH A MAXIMUM L. A. ABRASION LOSS OF 35%.
5. ROCK APRON SHALL CONSIST OF BEDDING STONE, RUBBLE OR COBBLES IN THE RANGE OF 6"-10" WITH A D_{50} OF 8 INCHES AND MAXIMUM L.A. ABRASION LOSS OF 35%. THE THICKNESS OF THE ROCK APRON SHALL BE A MINIMUM OF 12 INCHES.
6. ALL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.



HARDENED LOW WATER CROSSINGS #2 & #3 DETAIL

Richard D. Chason SIGNED
 6/13/11 DATE
 51357 LICENSE NO.

**DUTEX TRACT
 HYDROLOGIC RESTORATION**

DATE : JUNE 2010	NOT TO SCALE
PROJECT: 55-5	SHEET 1 OF 5

**Northwest Florida Water
 Management District**
 81 Water Management Drive
 Havana, FL 32333-4712
 (850) 539-5999
 www.nwfwmd.state.fl.us

Figure 2. Low-Water-Crossing #2 & #3

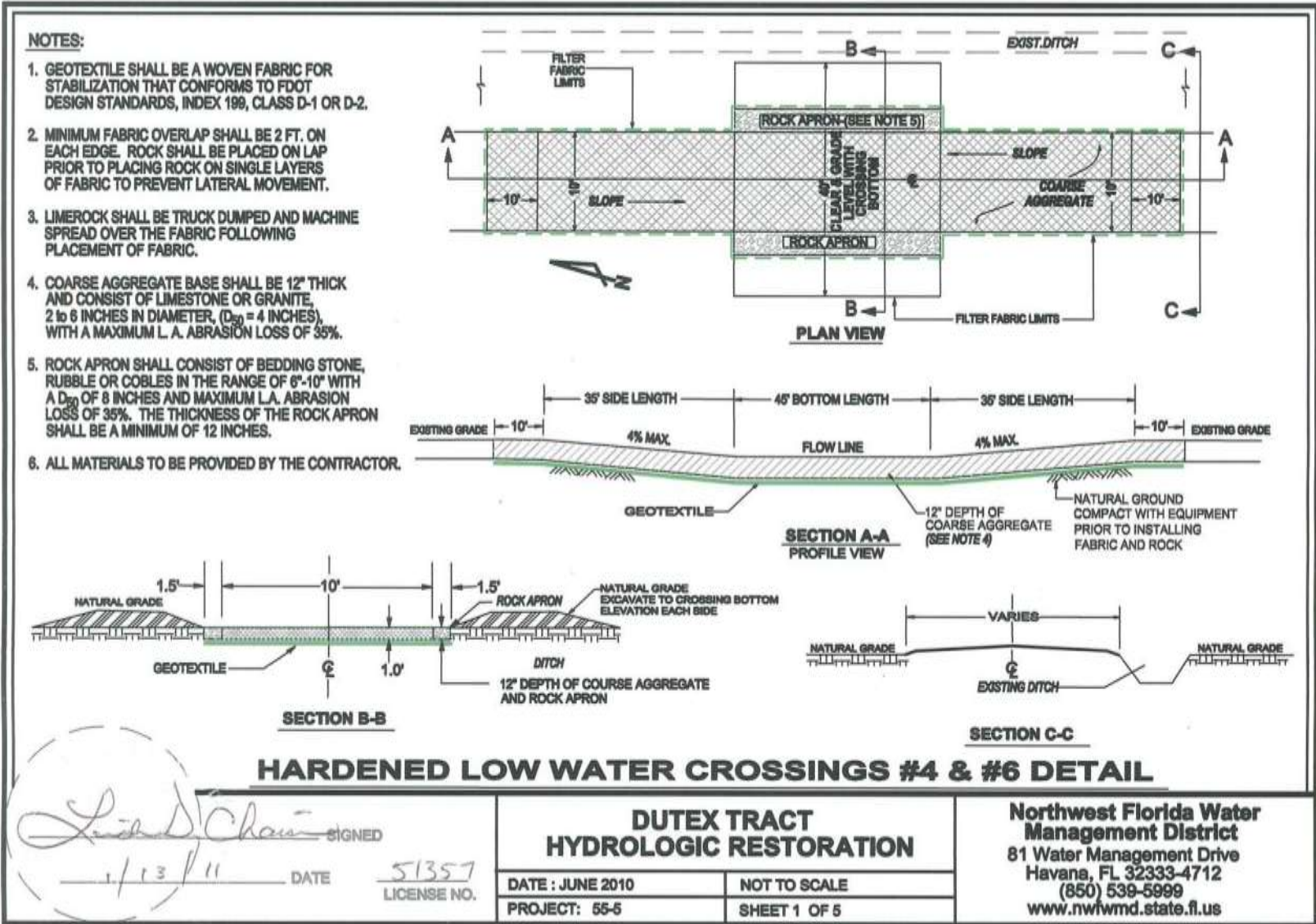


Figure 3. Low-Water-Crossing #4 & #6

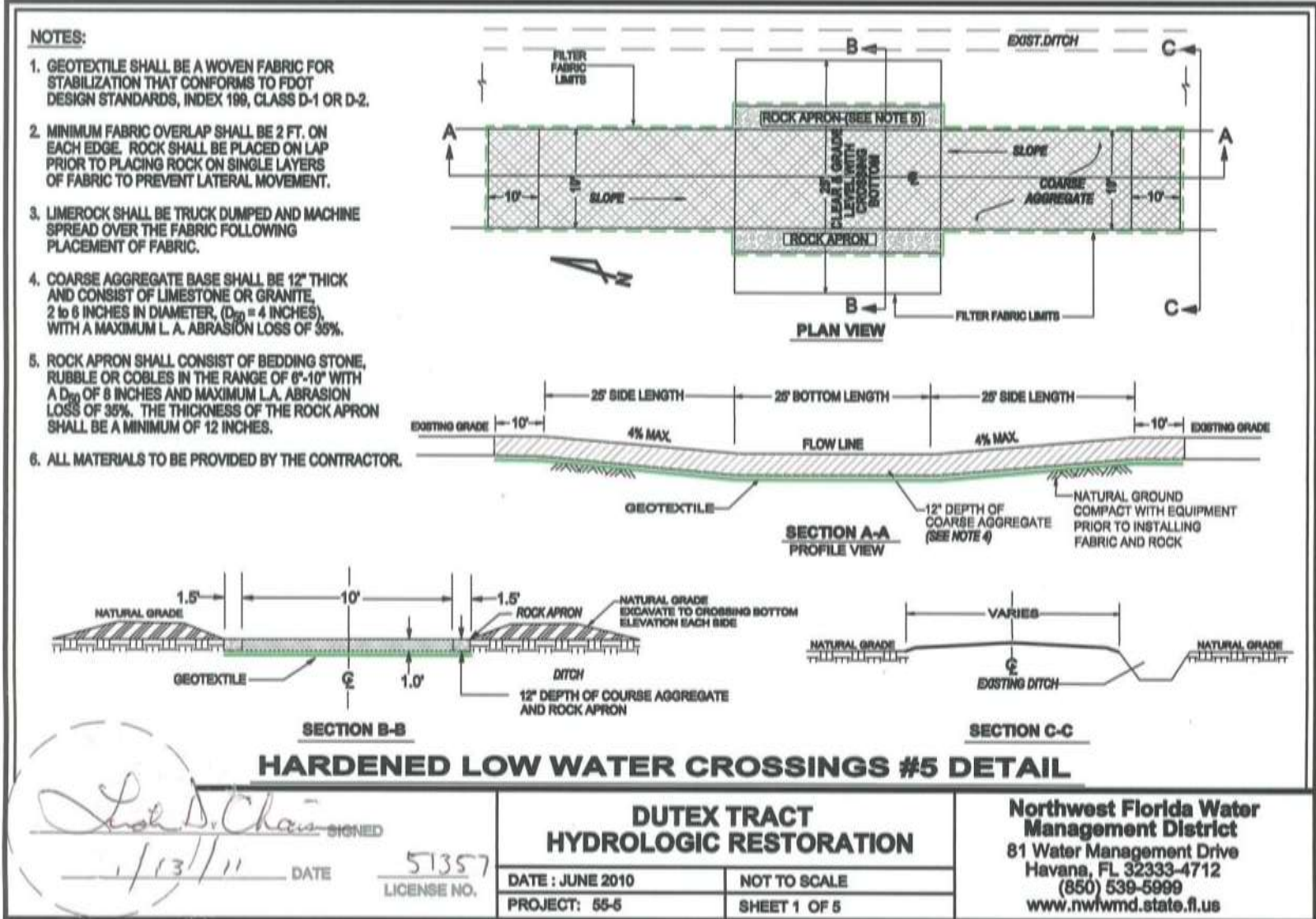


Figure 4. Low-Water-Crossing #5

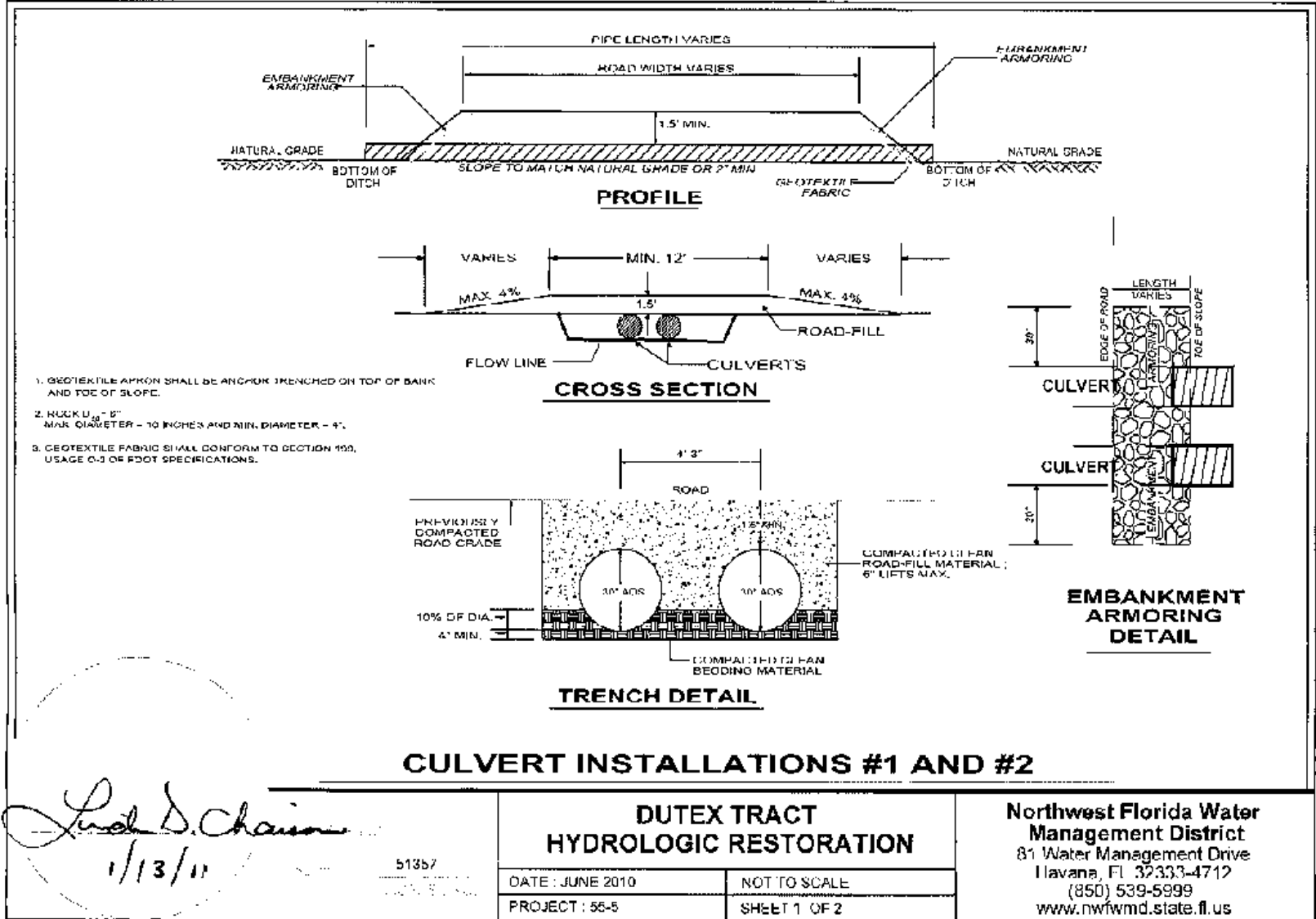


Figure 5. Culvert Installation #1 & #2

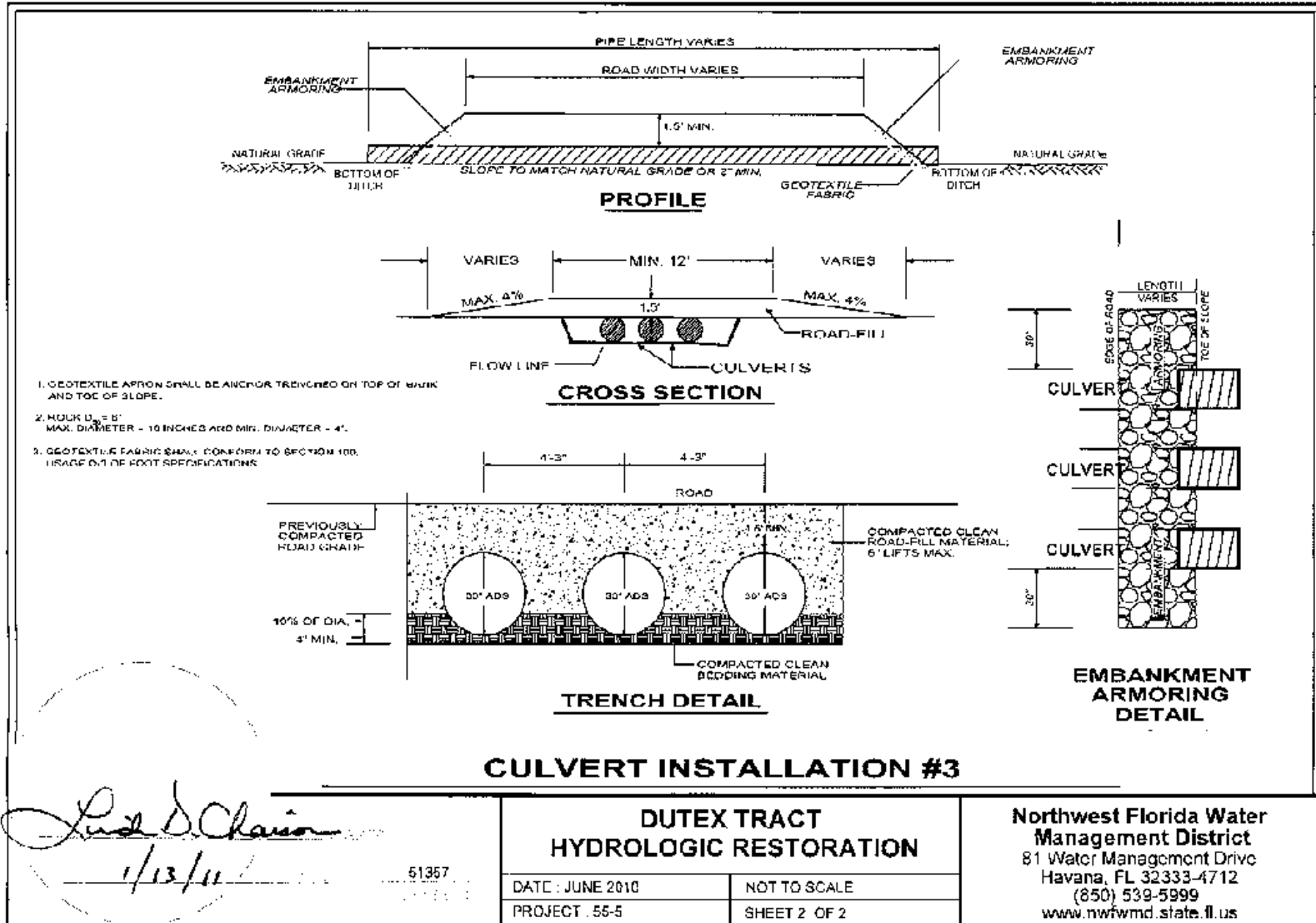


Figure 6. Culvert Installation #3

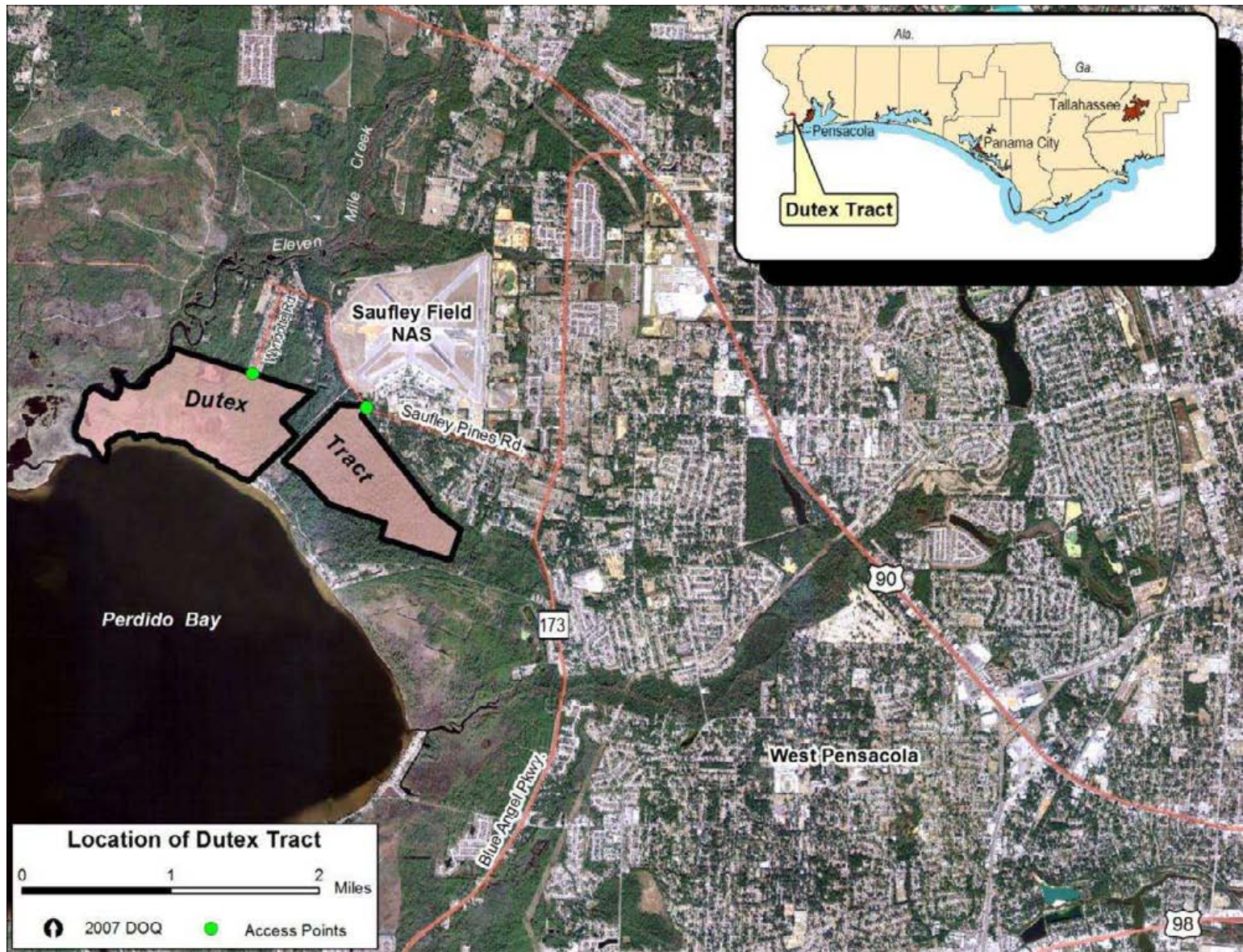


Figure 7. Location Map of Dutex Tract



Figure 8. DOQ of Hydrologic Enhancements

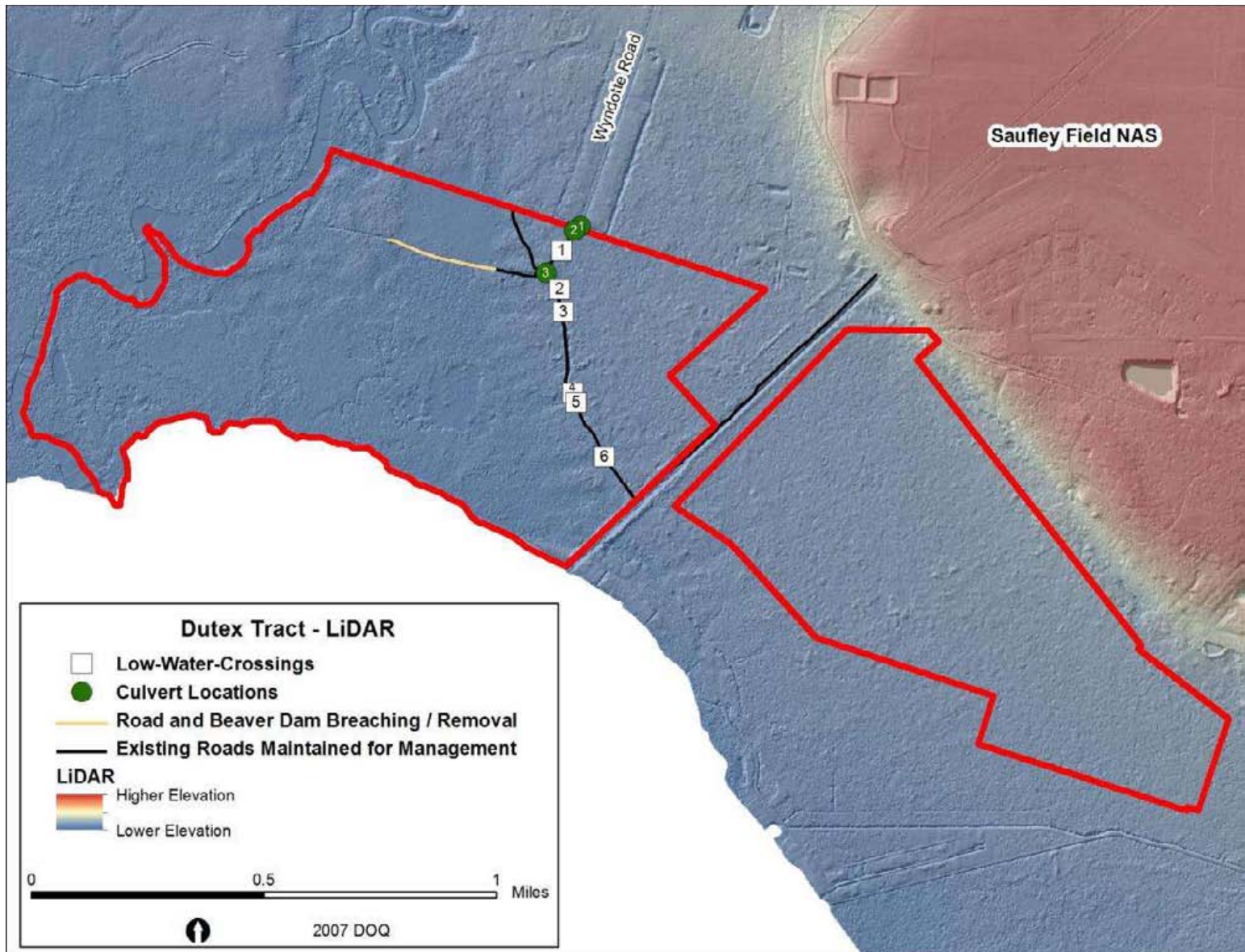


Figure 9. LiDAR Map

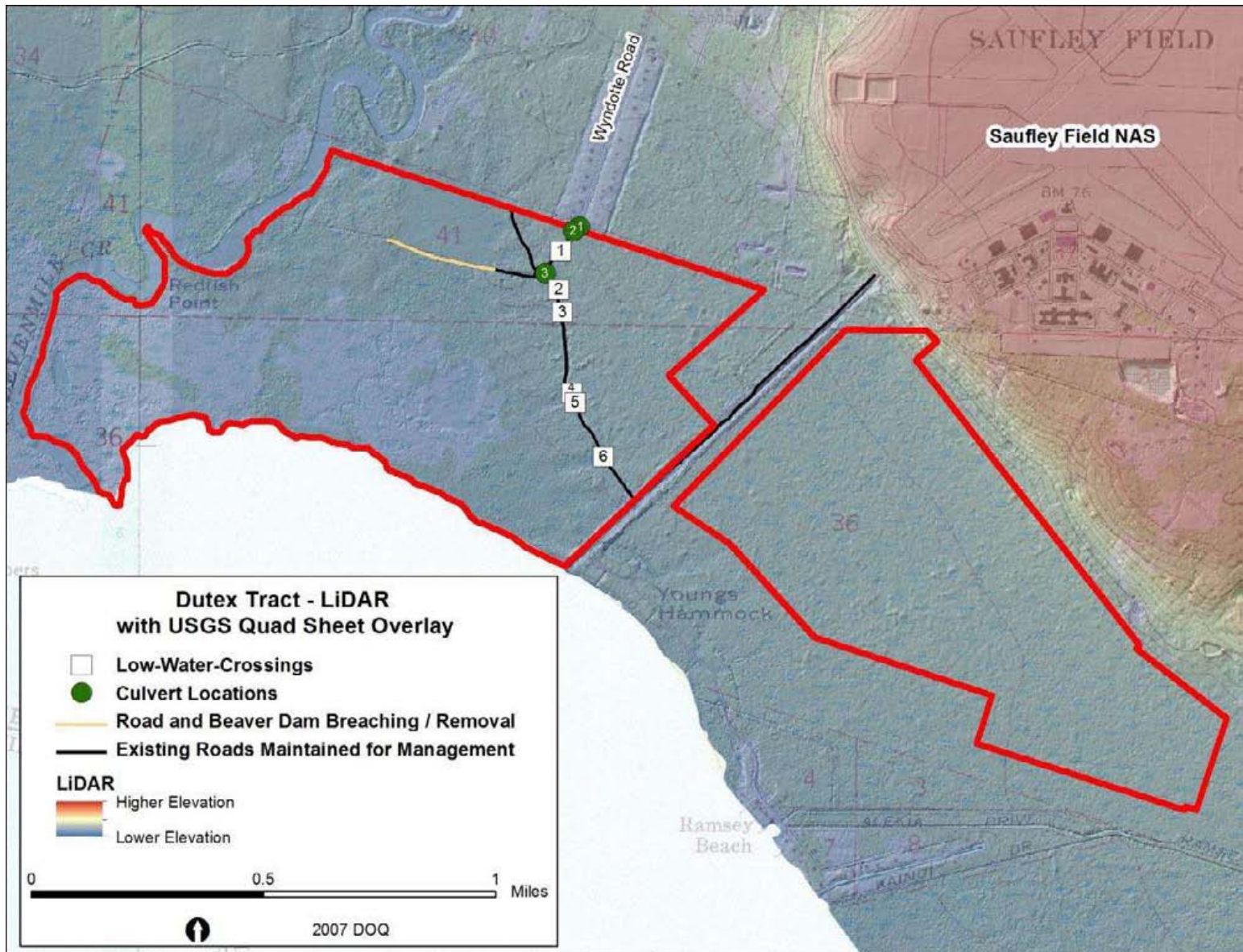


Figure 10. LiDAR w/USGS Quad Sheet Overlay

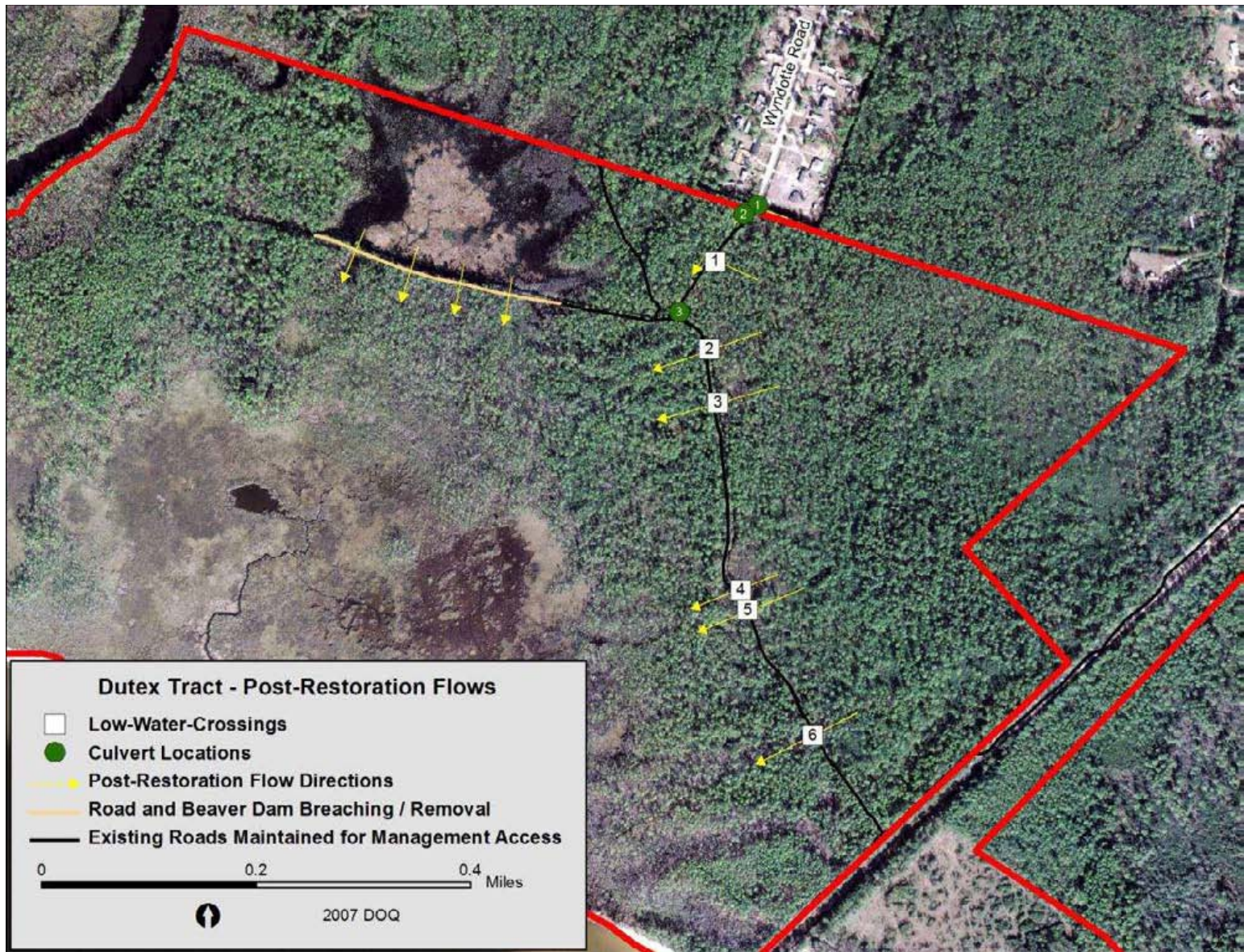


Figure 11. Map of Post Hydrologic Restoration Flow Directions

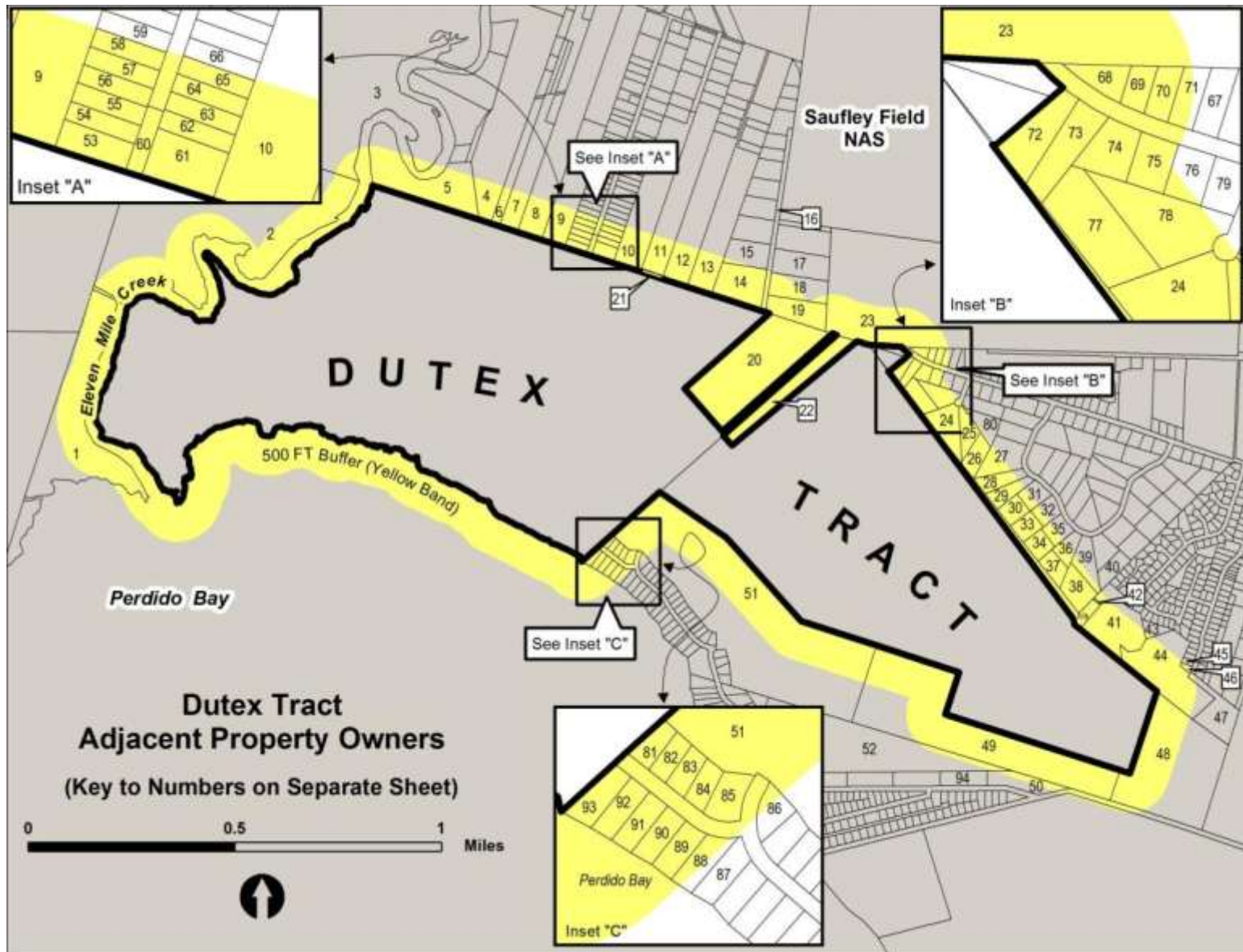


Figure 12. Map of Adjacent Property Owners

Dutex Tract
Adjacent Property Owners¹

1) Parcel ID: 362S312000000000
Account: 101358000
Owners: INTERNATIONAL PAPER COMPANY
Mail: ATTN NETA LATHAM
6400 POPLAR AVE
MEMPHIS, TN 38197

2) Parcel ID: 362S312000000000
Account: 101358000
Owners: INTERNATIONAL PAPER COMPANY
Mail: ATTN NETA LATHAM
6400 POPLAR AVE
MEMPHIS, TN 38197

3) Parcel ID: 401S312103000000
Account: 092023000
Owners: INTERNATIONAL PAPER COMPANY
Mail: ATTN NETA LATHAM
6400 POPLAR AVE
MEMPHIS, TN 38197

4) Parcel ID: 401S312103000000
Account: 092023000
Owners: INTERNATIONAL PAPER COMPANY
Mail: ATTN NETA LATHAM
6400 POPLAR AVE
MEMPHIS, TN 38197

5) Parcel ID: 401S312103000001
Account: 092024000
Owners: WILLIS WILLIAM B SR & MARY LOUISE
Mail: 1602 NORTH Z ST
PENSACOLA, FL 32505

6) Parcel ID: 401S311107001001
Account: 092021600
Owners: MEACHAM RALPH W & VERA
Mail: 8963 PENSACOLA BLVD
PENSACOLA, FL 32534

¹ Information derived from Escambia County Property Appraiser website (<http://www.escpa.org>).

7) Parcel ID: 401S311107000001
Account: 092021500
Owners: HEEKE ROBERT D & CHERYL A
Mail: 8041 ALONZO RD
PENSACOLA, FL 32526

8) Parcel ID: 401S311106000001
Account: 092020000
Owners: INTERNATIONAL PAPER COMPANY
Mail: ATTN NETA LATHAM
6400 POPLAR AVE
MEMPHIS, TN 38197

9) Parcel ID: 401S311105000030
Account: 092019130
Owners: STONE WILLIAM IRA JR
Mail: 6933 SAUFLEY PINES RD
PENSACOLA, FL 32526

10) Parcel ID: 401S311103000300
Account: 092017290
Owners: BERLING TERRANCE & BERLING DANIEL B
Mail: 6440 BERLING RD
PENSACOLA, FL 32526

11) Parcel ID: 401S311103000040
Account: 092017040
Owners: BERLING RALPH L & IRENE L
Mail: 6440 BERLING RD
PENSACOLA, FL 32526

12) Parcel ID: 401S311102000000
Account: 092014000
Owners: MATTHEWS RUTH
Mail: 6551 MATTHEWS JUNCTION
PENSACOLA, FL 32526

13) Parcel ID: 401S311102000002
Account: 092015000
Owners: MATTHEWS BLANCHE B
Mail: 6540 MATTHEWS JUNCTION
PENSACOLA, FL 32526

14) Parcel ID: 351S312100000009
Account: 091704100
Owners: PHILLIPS CHARLES E
Mail: 6500 SHILSTON BRANCH RD
PENSACOLA, FL 32526

15) Parcel ID: 351S312100001006
Account: 091704041
Owners: WALDERS EDWARD C JR
Mail: 7325 VELMA ST
PENSACOLA, FL 32526

16) Parcel ID: 351S312100000000
Account: 091704000
Owners: SHILSTON DANIEL G & SUSAN R
Mail: 6575 SAUFLEY PINES RD
PENSACOLA, FL 32526

17) Parcel ID: 351S312100000002
Account: 091704020
Owners: BUSH ANNA S
Mail: 6545 SAUFLEY PINES RD
PENSACOLA, FL 32526

18) Parcel ID: 351S312100000003
Account: 091704025
Owners: HUMPHREY LINDA K & BOSACK DEBRA A
Mail: 6450 SHILSTON BRANCH RD
PENSACOLA, FL 32526

19) Parcel ID: 351S312100000004
Account: 091704030
Owners: HUMPHREY LINDA & BOSACK DEBRA
Mail: 6450 SHILSTON BRANCH RD
PENSACOLA, FL 32526

20) Parcel ID: 362S311014006001
Account: 101356625
Owners: ESCAMBIA COUNTY
Mail: 221 PALAFOX PL STE 420
PENSACOLA, FL 32502

21) Parcel ID: 401S311103000000
Account: 092017000
Owners: JESSE RAYMOND E & ALICE M
Mail: PO BOX 12407
PENSACOLA, FL 32591-2407

22) Parcel ID: 362S311014005001
Account: 101356620
Owners: ESCAMBIA COUNTY
Mail: 221 PALAFOX PL STE 420
PENSACOLA, FL 32502

23) Parcel ID: 371S311100000000
Account: 091706000
Owners: UNITED STATES GOVERNMENT
Mail: DEPT OF NAVY-PENTAGON
WASHINGTON, DC 20301

24) Parcel ID: 362S310200310001
Account: 101291155
Owners: TOMLINSON DAN C & MARCIA R
Mail: 6253 SPANISH OAK CT
PENSACOLA, FL 32526

25) Parcel ID: 362S310200300001
Account: 101291150
Owners: DOUGHERTY JAMES F & ROXANNE D J
Mail: 6247 SPANISH OAK CT
PENSACOLA, FL 32526

26) Parcel ID: 362S310200290001
Account: 101291145
Owners: ISOSAARI ROBERT M & JANICE M
Mail: 6249 SPANISH OAK CT
PENSACOLA, FL 32526

27) Parcel ID: 362S310200250001
Account: 101291125
Owners: KNECHTEL GLENN K & SANDRA N
Mail: 5810 ROBLE LOMA DR
PENSACOLA, FL 32526

- 28) Parcel ID: 362S310200240001
Account: 101291120
Owners: BELL HONOR M & CAFFEY H
Mail: 6073 SPANISH OAK DR
PENSACOLA, FL 32526
- 29) Parcel ID: 362S310200230001
Account: 101291115
Owners: SIMKINS KENNETH R & CAROLYN L
Mail: 6071 SPANISH OAK DR
PENSACOLA, FL 32526-3727
- 30) Parcel ID: 362S310200220001
Account: 101291110
Owners: PRIDGEN HAROLD & MARY D
Mail: 25 E NINE MILE RD
PENSACOLA, FL 32534
- 31) Parcel ID: 362S310200210001
Account: 101291105
Owners: ROSCHEL GEORGE A JR & LILLIAN B
Mail: 6067 SPANISH OAK DR
PENSACOLA, FL 32526
- 32) Parcel ID: 362S310200190001
Account: 101291095
Owners: ENFINGER RHONDS J
Mail: 6065 SPANISH OAK DR
PENSACOLA, FL 32526
- 33) Parcel ID: 362S310200200001
Account: 101291100
Owners: PRIDGEN HAROLD & MARY D
Mail: 25 E NINE MILE RD
PENSACOLA, FL 32534
- 34) Parcel ID: 362S310200180001
Account: 101291090
Owners: PRIDGEN HAROLD & MARY D
Mail: 25 E NINE MILE RD
PENSACOLA, FL 32534

- 35) Parcel ID: 362S310200170001
Account: 101291085
Owners: COLEMAN DAVID L & MARY LOU
Mail: 6061 SPANISH OAK DR
PENSACOLA, FL 32526
- 36) Parcel ID: 362S310200150001
Account: 101291075
Owners: JANSEN RONALD W & JANSEN TERESA T
Mail: 6057 SPANISH OAK DR
PENSACOLA, FL 32526
- 37) Parcel ID: 362S310200160001
Account: 101291080
Owners: PRIDGEN HAROLD & MARY D
Mail: 25 E NINE MILE RD
PENSACOLA, FL 32534
- 38) Parcel ID: 362S310200140001
Account: 101291070
Owners: PRIDGEN HAROLD & MARY D
Mail: 25 E NINE MILE RD
PENSACOLA, FL 32534
- 39) Parcel ID: 362S310200130001
Account: 101291065
Owners: GAETZ CHARLES T & REBECCA L WESTBROOK
Mail: 6051 SPANISH OAK DR
PENSACOLA, FL 32526
- 40) Parcel ID: 362S310200120001
Account: 101291060
Owners: WALLS ROBERT C & WALLS MARY ANN
Mail: 6049 SPANISH OAK DR
PENSACOLA, FL 32526
- 41) Parcel ID: 362S311015000000
Account: 101356800
Owners: HALL CHARLES
Mail: 509 WARRINGTON RD
PENSACOLA, FL 32506

42) Parcel ID: 362S311012001001
Account: 101354510
Owners: COOK NELL W
Mail: 117 ST JOHN ST
PENSACOLA, FL 32503

43) Parcel ID: 362S310300090004
Account: 101292548
Owners: ESCAMBIA COUNTY
Mail: 221 PALAFOX PL STE 420
PENSACOLA, FL 32502

44) Parcel ID: 362S310300100004
Account: 101292550
Owners: COOK BROWN ENTERPRISES INC
Mail: PO BOX 6006
PENSACOLA, FL 32503

45) Parcel ID: 362S311600011004
Account: 101357729
Owners: CAPPO PETER & DEBORAH A
Mail: 5707 PRINCETON DR
PENSACOLA, FL 32526

46) Parcel ID: 362S311600012004
Account: 101357731
Owners: WITHERSPOON MARK R
Mail: 5701 PRINCETON DR
PENSACOLA, FL 32526

47) Parcel ID: 362S311014000001
Account: 101356500
Owners: TEACHEY HOWARD & NIELSEN CHRIS
Mail: 2144 W KINGSFIELD RD
CANTONMENT, FL 32533

48) Parcel ID: 362S311014001001
Account: 101356600
Owners: GRESKOVICH FRANK J JR 87 64/100 % &
BALCOM JAMES H 12 36/100 %
Mail: 4320 MONTALVO DR
PENSACOLA, FL 32504

49) Parcel ID: 362S311014002001
Account: 101356605
Owners: GRESKOVICH FRANK J JR 87 64/100 % &
BALCOM JAMES H 12 36/100 %
Mail: 4320 MONTALVO DR
PENSACOLA, FL 32504

50) Parcel ID: 082S311013000000
Account: 092934200
Owners: TANCHI PETER L & DEONNA H
Mail: C/O CANDY MCCOMB
190 BELFONT CIR
SACRAMENTO, CA 95835

51) Parcel ID: 362S311014001001
Account: 101356600
Owners: GRESKOVICH FRANK J JR 87 64/100 % &
BALCOM JAMES H 12 36/100 %
Mail: 4320 MONTALVO DR
PENSACOLA, FL 32504

52) Parcel ID: 032S311002000000
Account: 092811000
Owners: MOODY FRANK C & COBB EDWARD E
Mail: 40 RIVERIEW RD
PANACEA, FL 323462531

53) Parcel ID: 401S311104003210
Account: 092018273
Owners: BARBANO MARLENE
Mail: 6203 WYNDOTTE RD
PENSACOLA, FL 32526

54) Parcel ID: 401S311104002210
Account: 092018272
Owners: BOMMARITO MARY ANN
Mail: PO BOX 3643
PENSACOLA, FL 325163643

55) Parcel ID: 401S311104001210
Account: 092018271
Owners: SCOTT CONNIE MORAN
Mail: 6207 WYNDOTTE RD
PENSACOLA, FL 32526

56) Parcel ID: 401S311000000014
Account: 092012075
Owners: KOONTZ RAY E & DELORES JEAN
Mail: 1630 TAR HILL RD
DYERSBURG, TN 38024

57) Parcel ID: 401S311000001013
Account: 092012072
Owners: BENSON MICHAEL J & TERESA ANN
Mail: 6211 WYNDOTTE RD
PENSACOLA, FL 32526

58) Parcel ID: 401S311000002013
Account: 092012073
Owners: SHOEMAKE LARRY G
Mail: 6213 WYNDOTTE RD
PENSACOLA, FL 32526

59) Parcel ID: 401S311000002012
Account: 092012070
Owners: TARKUS ANNIE & WILLIAMS SANDRA
Mail: 6215 WYNDOTTE RD
PENSACOLA, FL 32526

60) Parcel ID: 401S311104000210
Owner: NFWFMD
Mail: 81 WATER MANAGEMENT DR
HAVANA, FL 32333

61) Parcel ID: 401S311104004210
Account: 092018274
Owners: GISSENDANNER CHARLES W & DELORIS J
Mail: 6204 WYNDOTTE RD
PENSACOLA, FL 32526

62) Parcel ID: 401S311000000015
Account: 092012080
Owners: COLE DANNY R & HERRINGTON ASHLEY D
Mail: 6206 WYNDOTTE RD
PENSACOLA, FL 32526

63) Parcel ID: 401S311000001015
Account: 092012081
Owners: DYLE RUTH
Mail: 6208 WYNDOTTE RD
PENSACOLA, FL 32526

64) Parcel ID: 401S311000003015
Account: 092012085
Owners: PADLEY LORRIE A & EMMONS MABLE A
Mail: 6210 WYNDOTTE RD
PENSACOLA, FL 32526

65) Parcel ID: 401S311000001016
Account: 092012087
Owners: LEGGETT MICHAEL G & MALANIE SUE
Mail: 6212 WYNDOTTE RD
PENSACOLA, FL 32526

66) Parcel ID: 401S311000000017
Account: 092012090
Owners: FREDERICK MICHELLE L
Mail: 6214 WYNDOTTE DR
PENSACOLA, FL 32526

67) Parcel ID: 032S311010000022
Account: 092811205
Owners: HEATON CHARLES W & HEATON WILBUR J
Mail: PO BOX 6
CANTONMENT, FL 32533-0006

68) Parcel ID: 032S311010000026
Account: 092811225
Owners: HEATON CHARLES W & HEATON WILBUR J
Mail: PO BOX 6
CANTONMENT, FL 32533-0006

69) Parcel ID: 032S311010000025
Account: 092811220
Owners: DEHART RICHARD S & CHARLENE MARIE
Mail: 6276 SAUFLEY PINES RD
PENSACOLA, FL 32526

70) Parcel ID: 032S311010000024
Account: 092811215
Owners: DEHART RICHARD S & CHARLENE M
Mail: 6276 SAUFLEY PINES RD
PENSACOLA, FL 32526

71) Parcel ID: 032S311010000023
Account: 092811210
Owners: HEATON CHARLES W & HEATON WILBUR J
Mail: PO BOX 6
CANTONMENT, FL 32533-0006

72) Parcel ID: 362S311013000000
Account: 101355000
Owners: BRIGHT HARRY R JR & LAUREL CHRISTINE
Mail: 6285 SAUFLEY PINES RD
PENSACOLA, FL 32526

73) Parcel ID: 362S311013380001
Account: 101355370
Owners: WAGENER JANE A
Mail: 6281 SAUFLEY PINES RD
PENSACOLA, FL 32526

74) Parcel ID: 362S311013310001
Account: 101355310
Owners: PARMARTER SAMUEL N JR
Mail: 450 WYNFIELD CIR
ROCKLEDGE, FL 32955-5390

75) Parcel ID: 362S311013285001
Account: 101355285
Owners: DENNIS ROBERT L & REBECCA A
Mail: 6271 SAUFLEY PINES RD
PENSACOLA, FL 32526

76) Parcel ID: 362S311013280001
Account: 101355275
Owners: THOMPSON JIMMIE C
Mail: PO BOX 27853
PANAMA CITY, FL 32411-7853

77) Parcel ID: 362S310200320001
Account: 101291160
Owners: ISOSAARI ROBERT M
Mail: 6249 SPANISH OAK CT
PENSACOLA, FL 32526

78) Parcel ID: 362S310200330001
Account: 101291165
Owners: ISOSAARI ROBERT M & JANICE M
Mail: 6249 SPANISH OAK CT
PENSACOLA, FL 32526

79) Parcel ID: 362S311013270001
Account: 101355270
Owners: FORESTER ROBERT E III & SUE G
Mail: 6259 SPANISH OAK CT
PENSACOLA, FL 32526

80) Parcel ID: 362S310200280001
Account: 101291140
Owners: LANGSTON MARY W
Mail: 6245 SPANISH OAK CT
PENSACOLA, FL 32526

81) Parcel ID: 362S310100005003
Account: 101287258
Owners: PUGH JAMES R JR & PUGH JOYCE A TRUSTEES FOR
PUGH JAMES R JR & JOYCE A TRUST
Mail: 6531 MINT JULEP TRAIL
PENSACOLA, FL 32526

82) Parcel ID: 362S310100004003
Account: 101287256
Owners: COBB JAMES M
Mail: 767 HAYGOOD RD
EVERGREEN, AL 36401-7802

83) Parcel ID: 362S310100003003
Account: 101287254
Owners: MADDEN TIMOTHY J & REBECCA A
Mail: 5708 BAY FOREST DR
PENSACOLA, FL 32526

84) Parcel ID: 362S310100002003
Account: 101287252
Owners: HECKMAN JERRY L
Mail: 5706 BAY FOREST DR
PENSACOLA, FL 32526

85) Parcel ID: 362S310100001003
Account: 101287250
Owners: SCHUCKER LARRY E & NOLA F
Mail: 173 WEBB ST
HERTFORD, NC 27944-8026

86) Parcel ID: 362S310100017002
Account: 101287132
Owners: CULBERTSON M W ESTHER G GARGER JOHN & LAFAWN
Mail: 3533 PINE FOREST RD
CANTONMENT, FL 32533

87) Parcel ID: 362S310100014004
Account: 101287376
Owners: CULBERTSON BETTYE SUE
Mail: 6350 PENSACOLA BLVD
PENSACOLA, FL 32505

88) Parcel ID: 362S310100015004
Account: 101287378
Owners: HIGDON SHIRELY M & HIGDON CHARLES R IV & HIGDON
KENNETH R & MATHEW PEGGY HIGDON
Mail: 5701 BAY FOREST DR
PENSACOLA, FL 32526

89) Parcel ID: 362S310100016004
Account: 101287380
Owners: HARRIS RUTH M
Mail: 5705 BAY FOREST DR
PENSACOLA, FL 32526

90) Parcel ID: 362S310100017004
Account: 101287382
Owners: BARNHART PHILLIP H & SHARON S
Mail: 5709 BAY FOREST DR
PENSACOLA, FL 32526

91) Parcel ID: 362S310100018004
Account: 101287384
Owners: ZIMMERMAN BARBARA L
Mail: 5713 BAY FOREST DR
PENSACOLA, FL 32526

92) Parcel ID: 362S310100019004
Account: 101287386
Owners: HIGDON KENNETH R
Mail: 1029 S FAIRFIELD DR
PENSACOLA, FL 32506

93) Parcel ID: 362S310100020004
Account: 101287388
Owners: JOINER CHARLES P & STEFFIE CLEO
Mail: 250 STAFFORDSHIRE RD
WINSTON SALEM, NC 27104

94) Parcel ID: 082S311013000028
Account: 092934620
Owners: BRADLEY JAMES H
Mail: PO BOX 6165
PENSACOLA, FL 32503

USACE Jurisdictional Determination (JD Form)

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 20 February 2009

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CESAJ-RD-NC-Dutex Umbrella Mitigation Plan, SAT-2009-579

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Florida County/parish/borough: Escambia City: Pensacola
Center coordinates of site (lat/long in degree decimal format): Lat. 30.4538° N, Long. -87.3497° W.
Universal Transverse Mercator:

Name of nearest waterbody: Perdido Bay

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Perdido Bay

Name of watershed or Hydrologic Unit Code (HUC): 0340107 Perdido Watershed

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

Office (Desk) Determination. Date: 20 February 2009

Field Determination. Date(s): 23 October 2008

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are** "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

Waters subject to the ebb and flow of the tide.

Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

Explain: Perdido River may have been used to transport interstate commerce between Alabama and Florida.

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):¹

- TNWs, including territorial seas
- Wetlands adjacent to TNWs
- Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- Non-RPWs that flow directly or indirectly into TNWs
- Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- Impoundments of jurisdictional waters
- Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: linear feet: width (ft) and/or acres.

Wetlands: 2000 acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):³

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.

Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³ Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW: **Perdido Bay**.

Summarize rationale supporting determination: Perdido River is a navigable river with headwaters originating in Alabama and discharging in Florida. It is tidal influenced in Florida but not at the subject location. The river could have been used and may still be used for interstate commerce.

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent": Freshwater wetlands abut Perdido Bay at this location forming tributaries and adding to the composition of the Bay. The subject wetlands are located within the Perdido Bay Floodplain mapped by FEMA.

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: **Pick List**
Drainage area: **Pick List**
Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

- Tributary flows directly into TNW.
 Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Identify flow route to TNW⁵:
Tributary stream order, if known:

(b) **General Tributary Characteristics (check all that apply):**

Tributary is: Natural
 Artificial (man-made). Explain:
 Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):

Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):

<input type="checkbox"/> Silts	<input type="checkbox"/> Sands	<input type="checkbox"/> Concrete
<input type="checkbox"/> Cobbles	<input type="checkbox"/> Gravel	<input type="checkbox"/> Muck
<input type="checkbox"/> Bedrock	<input type="checkbox"/> Vegetation. Type/% cover:	
<input type="checkbox"/> Other. Explain:		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:

Presence of run/riffle/pool complexes. Explain:

Tributary geometry: Pick List

Tributary gradient (approximate average slope): %

(c) **Flow:**

Tributary provides for: Pick List

Estimate average number of flow events in review area/year: Pick List

Describe flow regime:

Other information on duration and volume:

Surface flow is: Pick List. Characteristics:

Subsurface flow: Pick List. Explain findings:

Dye (or other) test performed:

Tributary has (check all that apply):

<input type="checkbox"/> Bed and banks	
<input type="checkbox"/> OHWM ⁶ (check all indicators that apply):	
<input type="checkbox"/> clear, natural line impressed on the bank	<input type="checkbox"/> the presence of litter and debris
<input type="checkbox"/> changes in the character of soil	<input type="checkbox"/> destruction of terrestrial vegetation
<input type="checkbox"/> shelving	<input type="checkbox"/> the presence of wrack line
<input type="checkbox"/> vegetation matted down, bent, or absent	<input type="checkbox"/> sediment sorting
<input type="checkbox"/> leaf litter disturbed or washed away	<input type="checkbox"/> scour
<input type="checkbox"/> sediment deposition	<input type="checkbox"/> multiple observed or predicted flow events
<input type="checkbox"/> water staining	<input type="checkbox"/> abrupt change in plant community
<input type="checkbox"/> other (list):	

Discontinuous OHWM.⁷ Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

<input checked="" type="checkbox"/> High Tide Line indicated by:	<input checked="" type="checkbox"/> Mean High Water Mark indicated by:
<input type="checkbox"/> oil or scum line along shore objects	<input type="checkbox"/> survey to available datum;
<input type="checkbox"/> fine shell or debris deposits (foreshore)	<input type="checkbox"/> physical markings;
<input type="checkbox"/> physical markings/characteristics	<input type="checkbox"/> vegetation lines/changes in vegetation types.
<input type="checkbox"/> tidal gauges	
<input type="checkbox"/> other (list):	

(iii) **Chemical Characteristics:**

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain:

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

⁶ A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷Ibid.

Identify specific pollutants, if known: .

(iv) **Biological Characteristics. Channel supports (check all that apply):**

- Riparian corridor. Characteristics (type, average width):
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

2. **Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**

(i) **Physical Characteristics:**

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain:

Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain:

Surface flow is: **Pick List**

Characteristics:

Subsurface flow: **Pick List**. Explain findings:

Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

Directly abutting

Not directly abutting

Discrete wetland hydrologic connection. Explain:

Ecological connection. Explain:

Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Flow is from: **Pick List**.

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) **Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) **Biological Characteristics. Wetland supports (check all that apply):**

- Riparian buffer. Characteristics (type, average width):
- Vegetation type/percent cover. Explain:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

3. **Characteristics of all wetlands adjacent to the tributary (if any)**

All wetland(s) being considered in the cumulative analysis: **Pick List**

Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)

Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
 - TNWs: linear feet width (ft), Or, 2 acres.
 - Wetlands adjacent to TNWs: 2000 acres.
2. **RPWs that flow directly or indirectly into TNWs.**
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
 Other non-wetland waters: acres.
Identify type(s) of waters: .

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

- Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: linear feet width (ft).
 Other non-wetland waters: acres.
Identify type(s) of waters: .

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

- Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
 Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .
 Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

- Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

- Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.⁹

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- Demonstrate that impoundment was created from "waters of the U.S.," or
 Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

- which are or could be used by interstate or foreign travelers for recreational or other purposes.
 from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 which are or could be used for industrial purposes by industries in interstate commerce.
 Interstate isolated waters. Explain: .
 Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

⁸See Footnote # 3.

⁹To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres.
Identify type(s) of waters: .
- Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
- Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands: acres.

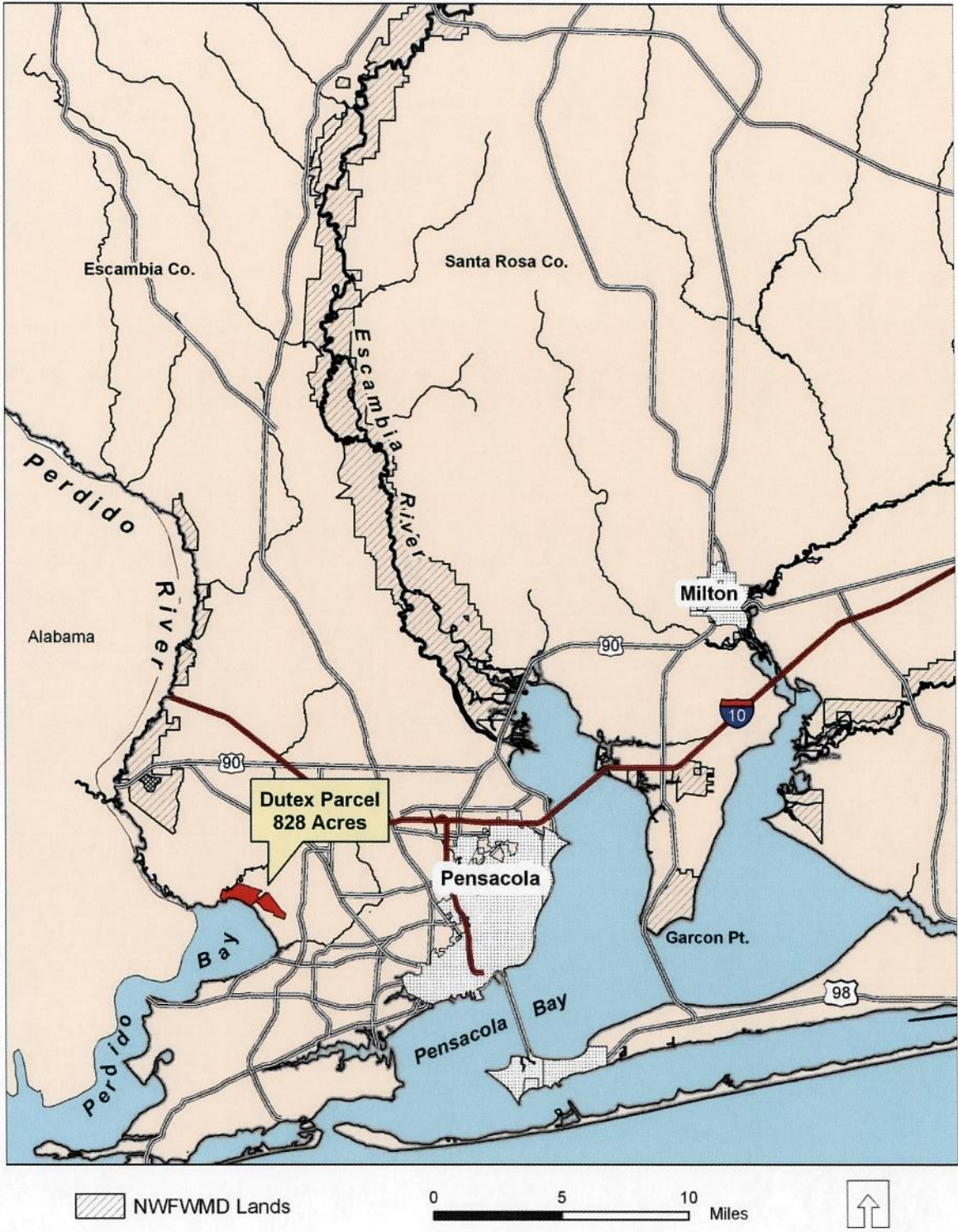
SECTION IV: DATA SOURCES.

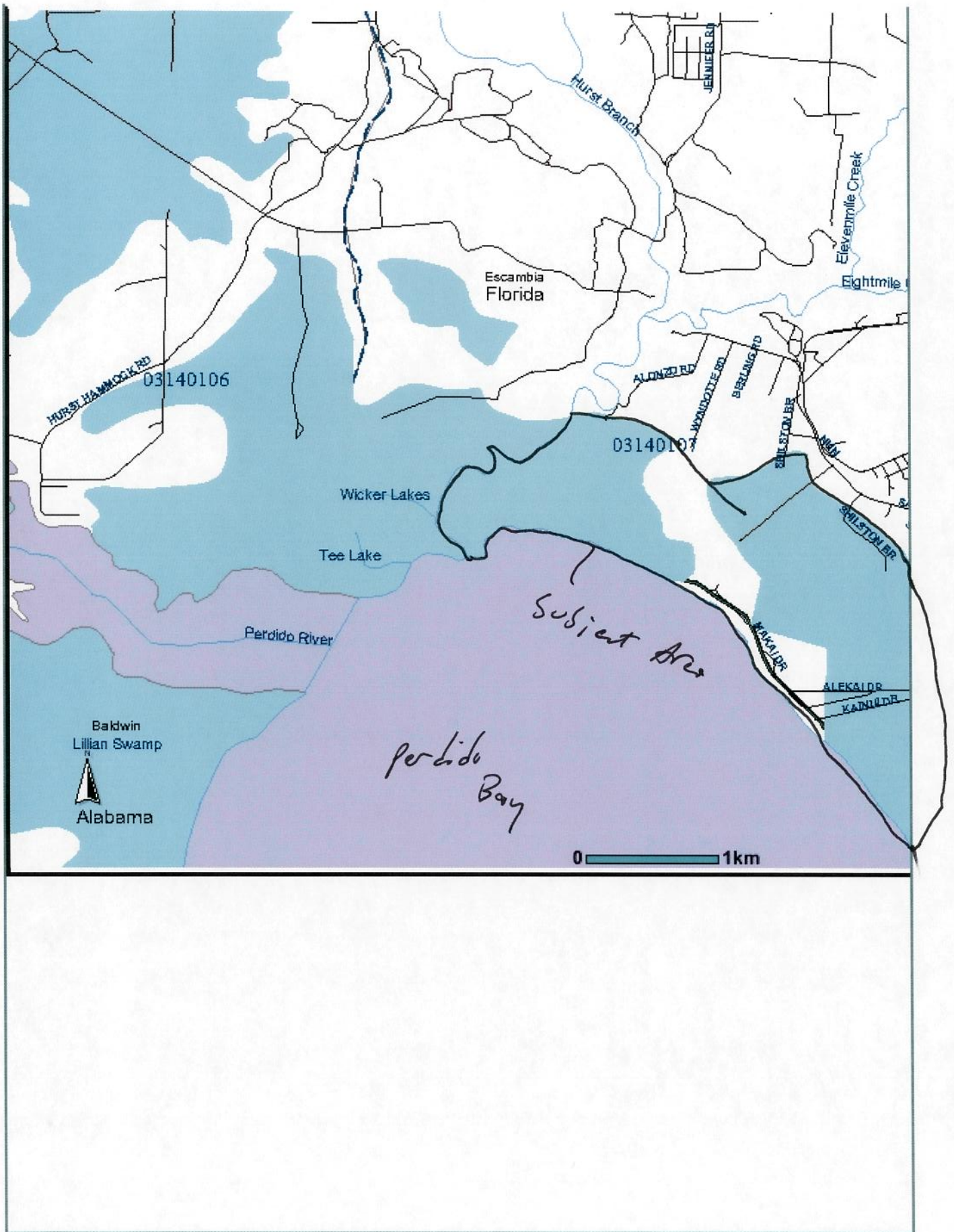
A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- Data sheets prepared by the Corps:
 - Corps navigable waters' study: .
- U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: West Pensacola and Lillian Quads.
- USDA Natural Resources Conservation Service Soil Survey. Citation: .
- National wetlands inventory map(s). Cite name: .
- State/Local wetland inventory map(s): .
- FEMA/FIRM maps: .
- 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- Photographs: Aerial (Name & Date): Google Earth Pro February 2009.
or Other (Name & Date): .
- Previous determination(s). File no. and date of response letter: .
- Applicable/supporting case law: .
- Applicable/supporting scientific literature: .
- Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD:

Location of Dutex Property





Dutex Property (828 Acres) - Wetland Types



A = FLUCCS 642 - Salt Marsh; 183.7 ac.
B = FLUCCS 630 - Wetland Forested Mixed; 625.8 ac.
C = FLUCCS 641 - Freshwater Marsh; 18.5 ac





Eleven
Mile
Creek

Dutex
Mitigation
Site

Review Area
and Relative
Reach

Perdido
Bay

Youngs Hammock

Ramsey Beach

Bayou Marcus

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© 2009 Tele Atlas
© 2009 LeadDog Consulting

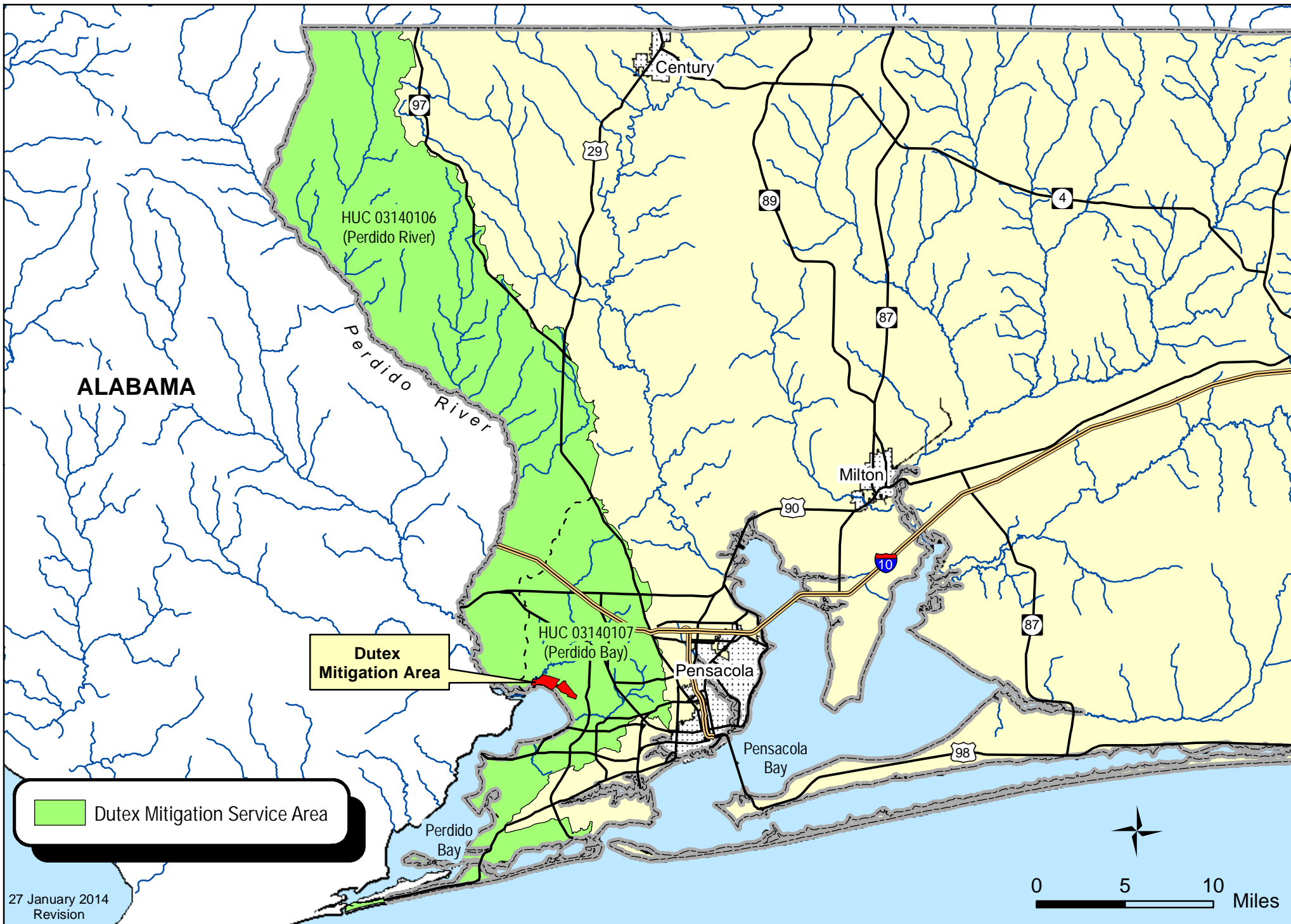
Pointer lat 30.453991° lon -87.346314° elev 55 ft Streaming 100% Eye alt 18249 ft

Mitigation Service Area

The Dutex Mitigation Service Area (MSA) covers approximately 350 mi², and consists of the portions of the Perdido River and Bay watershed that occur within Florida. It encompasses approximately 26% of the 8-digit Hydrologic Unit Code (HUC) basin for the the Perdido River (HUC 03140106), and approximately 36% of the Perdido Bay HUC basin (HUC 03140107).

A review of management and restoration plans, species lists and community descriptions developed for Tarklin Bayou Preserve State Park, Perdido I & II NFWFMD mitigation areas, and the Dutex Mitigation Site, coupled with NWI (National Wetland Inventory) mapping, the FNAI (Florida Natural Areas Inventory) T&E species database, and a draft NFWFMD “Perdido River and Bay Resource Characterization” study, indicate strong similarities between the Perdido River and Bay HUC basins. Because of these similarities, the largely rural nature of the Perdido River and Bay watershed, and to ensure the economic viability to the Dutex ILF project, it is appropriate for the MSA to consist of portions of two 8-digit HUC basins.

Dutex Mitigation Service Area



**Schedule of Credit Release
Dutex Tract Mitigation Area**

Total Potential Credits = 107.16

Task No.	Performance-based Milestone	% Credit Release	Number of Credits
	CREDITS RELEASED AS OF JUNE 12, 2013	59%	63.30
1	1st Interim Release Criteria - Invasive exotic vegetation cover <1% and nuisance native vegetation cover <5%; all hydrologic improvements (i.e., low-water-crossings, ditch plugs, culverts, beaver management and dam breaching) implemented; 1st prescribed fire in eastern and western tracts implemented; mechanical shrub reduction on 150 acres of hydric pine flatwoods and savannah using Gyro-Trac or similar techniques implemented.	11%	11.74
2	2nd Interim Release Criteria - Invasive exotic vegetation cover <1% and nuisance native vegetation cover <5%; fire adapted, native wet flatwoods/wet prairie herbaceous species increasing in cover; shrub cover in hydric pine flatwoods and savannah areas reduced to <40%; reduction of pine densities in hydric pine flatwoods and savannah areas to ≤200 trees per acre; wiregrass planted in areas not inundated within the hydric pine flatwood and savannah areas on 3' centers (4,840 plants per acre) (150 acres); Shrub reduction on an additional 100 acres, completion of 2nd prescribed fire for eastern and western tracts.	10%	10.70
3	Final release criteria - Invasive exotic vegetation cover <1% and nuisance native vegetation cover to <5%, in the hydric pine flatwoods and wet prairie restoration areas ≥60% cover by fire adapted, native herbaceous species; shrub cover of titi, gallberry, wax myrtle and other shrubs ≤10% average cover; reduction of pine densities in hydric pine flatwoods and savannah to ≤200 trees per acre; 3rd prescribed fire in eastern and western tracts completed; planted wiregrass averaging ≥ 1,000 plants per acre; all graded areas stabilized with no erosion; non-nuisance, native vegetation is healthy, reproducing naturally and exhibiting the cover and diversity typical of the surrounding landscape in all communities.	20%	21.42
Totals:		100%	107.16