APPENDIX C: DRAFT WETLAND AND T&E REPORT

Port Bienville Railroad

Hancock and Pearl River Counties, Mississippi

Project Number FRA-0023-00(003)/105494 101000-102000

DRAFT WETLANDS AND THREATENED AND ENDANGERED SPECIES REPORT

Prepared for:

Mississippi Department of Transportation
Federal Railroad Administration

Prepared by:

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EXECUTIVE SUMMARY

The Mississippi Department of Transportation (MDOT), the Federal Railroad Administration (FRA), and the Hancock County Port and Harbor Commission (HCPHC) are preparing an Environmental Impact Statement (EIS) to evaluate a proposed new freight rail line that would provide a direct connection between the Port Bienville Railroad (PBVR) and the Norfolk Southern (NS) rail line near Interstate 59 (I-59), north of National Aeronautics and Space Administration's (NASA's) John C. Stennis Space Center. This railroad would provide a second Class I rail connection to Port Bienville and the Port Bienville Industrial Park.

The project is approximately 24 miles in length and located in the southwestern part of the state of Mississippi. For the purpose of the wetland and Threatened and Endangered (T&E) species investigations detailed in this report, a 200-foot (ft) survey corridor that buffered the reasonable project (rail) alignment, as identified through the alternatives analysis, was used as the survey area. Throughout this document, "survey corridor" refers to this 200-ft wide area evaluated for wetlands and T&E. This survey corridor was evaluated in numbered segments (Chapter 4) of the reasonable alignment for existing wetlands and protected species.

It is anticipated that the proposed project will cross six (6) named streams within the project area. From North to South, these include: Alligator Branch (currently bridged), Second Alligator Branch, Indian Camp Branch, Turtleskin Creek, Wolf Branch, and Bayou LaCroix. An additional seven (7) unnamed streams were also identified throughout the study corridor. These include one perennial stream, 5 intermittent streams and one ephemeral stream. The proposed project will also cross additional jurisdictional features including Lower Devils Swamp and Mulatto Bayou located immediately north and south of Old Lower Bay Road, respectively.

A total of 83 wetland areas (343.02 acres total), 8 open waters (3.84 acres total) and 2 riverine areas (0.40 acres total) were identified within the approximately 575-acre survey corridor for the proposed rail line (See Appendix B). 13 (thirteen) streams cross the corridor for a total of approximately 4,065 linear feet (LF). Wetland habitats have been classified as emergent, bottomland hardwood, scrub-shrub, and pine savannah. Other waters were classified as either open waters or riverine. Streams were classified as ephemeral, intermittent and perennial. These wetlands and other waters are considered potentially jurisdictional (i.e., waters of the U.S.) until concurrence is given by a representative of the U.S. Army Corps of Engineers (USACE), Regulatory Branch, through the jurisdictional determination (JD) process.

Federally listed, state listed, and federal candidate species that may occur in or near the project area are listed in **Table 1**.

We recommend a determination of no effect for the following federally protected species because the proposed action will not affect these listed species or critical habitat: Alabama (=inflated) heelsplitter (*Potamilus inflatus*), pearl darter (*Percina aurora*), Atlantic sturgeon (*Acipenser oxyrinchus desotoi*), smalltooth sawfish (*Percina aurora*), gopher tortoise (*Gopherus polyphemus*), ringed map turtle (*Graptemys oculifera*), black pine snake (*Pituophis melanoleucus lodingi*), Kemp's ridley sea turtle (*Lepidochelys kempii*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), Hawksbill sea turtle (*Eretmochelys imbricate*), piping plover (*Charadrius melodus*), red knot

(*Calidris canutus ruga*), fin or finback whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), and West Indian manatee (*Trichechus manatus*).

Table 1. Federally/State-Listed/Candidate Species for Hancock and Pearl River Counties, Mississippi.

Common Name/ Scientific Name	Federal Status[1]	State Status[1]	Potential Habitat Present?	Recommended Determination[2] (Federally Listed Species Only)
Clams				
Alabama (=inflated) heelsplitter *Potamilus inflatus*	T	E	Yes	No effect
Fishes				
Crystal darter *Crystallaria asprella*	-	E	No	NA
Ironcolor shiner *Notropis chalybaeus*	-	E	Yes	NA
Pearl darter *Percina aurora*	C	E	No	No effect
Frecklebelly madtom *Notorus munitus*	-	E	No	NA
Atlantic sturgeon (Gulf subspecies) *Acipenser oxyrinchus desotoi*	T	E	No	No effect
Smalltooth sawfish *Pristis pectinata*	E	-	No	No effect
Ferns and Allies (Plants)				
Louisiana quillwort *Isoetes louisianensis*	E	-	Yes	May affect, not likely to adversely affect
Reptiles				
Eastern indigo snake *Drymarchon couperi*	T	E	Yes	May affect, not likely to adversely affect
Southern hognose snake *Heterodon simus*	-	E	No	NA
Black pine snake *Pituophis melanoleucus lodingi*	T	E	Yes	No effect
Rainbow snake *Farancia erytrogramma*	-	E	Yes	NA
Gopher tortoise *Gopherus polyphemus*	T	E	No	No effect
Ringed map turtle *Graptemys oculifera*	T	E	No	No effect
Kemp's ridley sea turtle *Lepidochelys kempii*	E	E	No	No effect
Leatherback sea turtle *Dermochelys coriacea*	E	E	No	No effect
Loggerhead sea turtle *Caretta caretta*	T	E	No	No effect
Hawksbill sea turtle *Eretmochelys imbricata*	E	E	No	No effect

Common Name/ Scientific Name	Federal Status[1]	State Status[1]	Potential Habitat Present?	Recommended Determination[2] (Federally Listed Species Only)
Birds				
Peregrine falcon *Falco peregrinus*	DL	E	No	NA
Piping plover *Charadrius melodus*	E[3], T[4]	E	No	No effect
Southeastern snowy plover *Charadrius nivosus*	-	E	No	NA
Red knot *Calidris canutus rufa*	T	-	No	No effect
Red-cockaded woodpecker *Picoides borealis*	E	E	Yes	May affect, not likely to adversely affect
Wood stork *Mycteria americana*	T	E	Yes	May affect, not likely to adversely affect
Brown pelican *Pelecanus occidentalis*	DL	E	No	NA
Mammals				
Louisiana black bear *Ursus americanus luteolus*	DL	E	Yes	NA
Florida panther *Concolor coryi*	E	E	Yes	May affect, not likely to adversely affect
Fin or finback whale *Balaenoptera physalus*	E	-	No	No effect
Humpback whale *Megaptera novaeangliae*	E	-	No	No effect
West Indian manatee *Trichechus manatus*	E	E	No	No effect

[1] E = Endangered; T = Threatened; C = Candidate species; DL = Delisted; - = not listed
[2] Federal species = No effect or May affect, not likely to adversely affect
[3] Only the population within the Great Lakes Watershed
[4] All populations except the Great Lakes Watershed
NA = Not applicable

For federally listed and candidate species, we recommend a determination of may affect, not likely to adversely affect the following species because the potential effects are small and extremely unlikely to occur: Louisiana quillwort (*Isoetes louisianensis*), eastern indigo snake (*Drymarchon couperi*), red-cockaded woodpecker (*Picoides borealis*), wood stork (*Mycteria americana*), and the Florida panther (*Puma concolor coryi*).

The project is not anticipated to negatively impact the following state listed species: crystal darter (*Crystallaria asprella*), ironcolor shiner (*Notropis chalybaeus*), frecklebelly madtom (*Notorus munitus*), southern hognose snake (*Heterodon simus*), peregrine falcon (*Falco peregrinus*), southeastern snowy plover (*Charadrius alexandrines tenuirostris*), and brown pelican (*Pelecanus occidentalis*). The project may adversely impact the state listed black bear (*Ursus americanus luteolus*) and rainbow snake (*Farancia erytrogramma*).

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Acronyms and Abbreviations

AOI	Area of Interest
ARS	Agricultural Research Service
ASL	Above Sea Level
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FRA	Federal Railroad Administration
GIS	Geographic Information Systems
GNSS	Global Navigation Satellite System
GPS	Global Positioning Systems
HCPHC	Hancock County Port and Harbor Commission
JD	Jurisdictional Determination
MDEQ	Mississippi Department of Environmental Quality
MDOT	Mississippi Department of Transportation
MDWFP	Mississippi Department of Wildlife, Fisheries, and Parks
MMPA	Marine Mammal Protection Act
MNHP	Mississippi Natural Heritage Program
NASA	National Aeronautics and Space Administration
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NS	Norfolk Southern
OHWM	Ordinary High Mater Mark
OWUS	Other Waters of the United States
PBVR	Port Bienville Railroad
RPW	Relatively Permanent Waters
TNW	Traditional Navigable Waters
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAAS	Wide Area Augmentation System

CHAPTER 1. INTRODUCTION

The purpose of this report for the proposed Port Bienville Railroad is to identify and describe the presence and approximate extent of jurisdictional wetlands and other waters of the U.S. as defined in Section 404 of the Clean Water Act, 33 U.S.C. 1251-1387 and/or Section 10 of the Rivers and Harbors Act of 1899.

The proposed project will involve the construction of a railroad track on a new location, as well as the restoration and rehabilitation of approximately 5.4 miles of existing railroad track. The purpose of the project is to construct a new railroad line to support the needs of the Port Bienville Industrial Park, its tenants, and other industries in the area. A new dual Class I railroad connection to serve the Port Bienville Industrial Park and surrounding area would:

- improve rail transport time and reliability;
- foster greater economic opportunities and attract new industries to Hancock and Pearl River Counties; and
- allow/increase/create flexibility in rail transportation options during storms and other emergencies.

The project is approximately 24 miles in length and located in the southwestern part of the state of Mississippi (**Figure 1**). For the purpose of the wetland and Threatened and Endangered species investigations detailed in this report, a 200-foot (ft) survey corridor that buffered the reasonable project (rail) alignment, as identified through the alternatives analysis, was used as the survey corridor (**Figure 2**). The rail line would require a 100-ft Right-Of-Way (ROW). Using a 200-ft corridor provides a 50-ft buffer on either side of the ROW limits, allowing for minor adjust if required. Throughout this document, "survey corridor" refers to this 200-ft wide area evaluated for wetlands and T&E. This survey corridor was evaluated in numbered segments (Chapter 4) of the preferred alignment for existing wetlands and protected species.

Resources having the potential to be jurisdictional were delineated in the survey corridor centered along the reasonable alignment, which begins at the existing Port Bienville Railroad and travels north approximately 24 miles to the Norfolk Southern railroad near U.S. Highway 11 and Jackson Landing Road (**Figures 1, 2,** and **3**). In addition to documenting wetland and water features, this report documents the findings of any potential occurrence and/or effect to any state or federally listed threatened or endangered species found within the wetlands and T&E survey corridors.

Figure 1. State and County Map

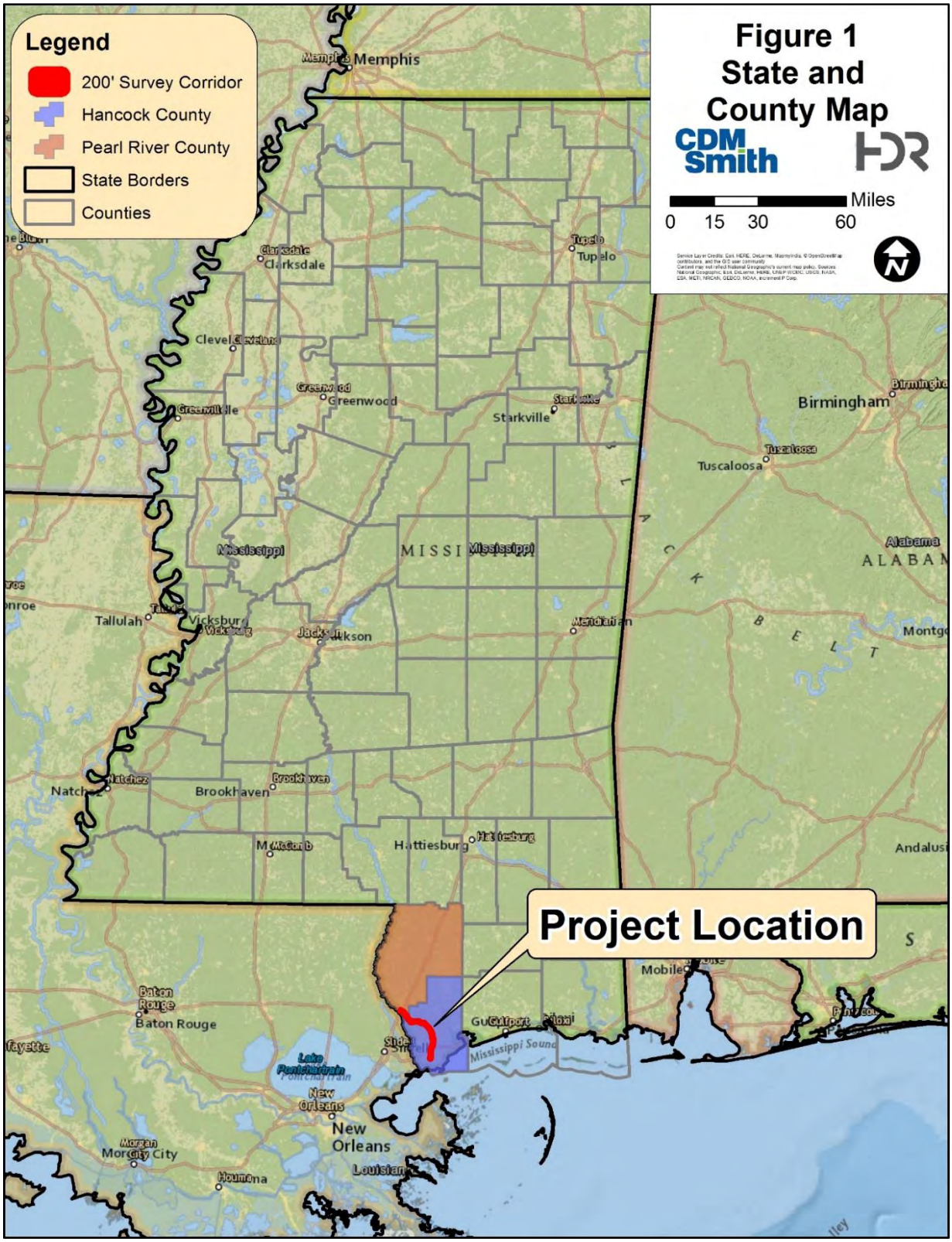


Figure 2. Aerial Photography

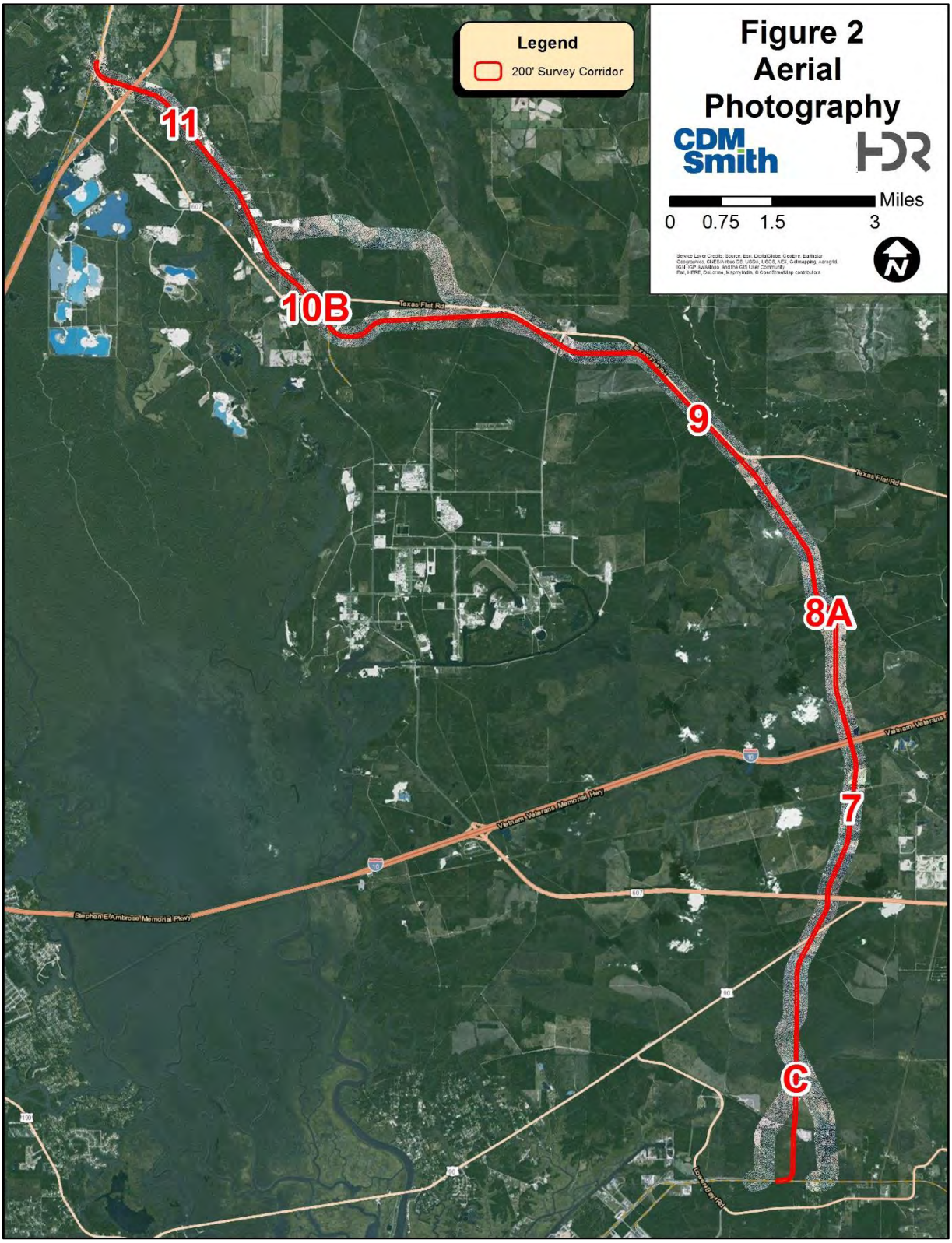
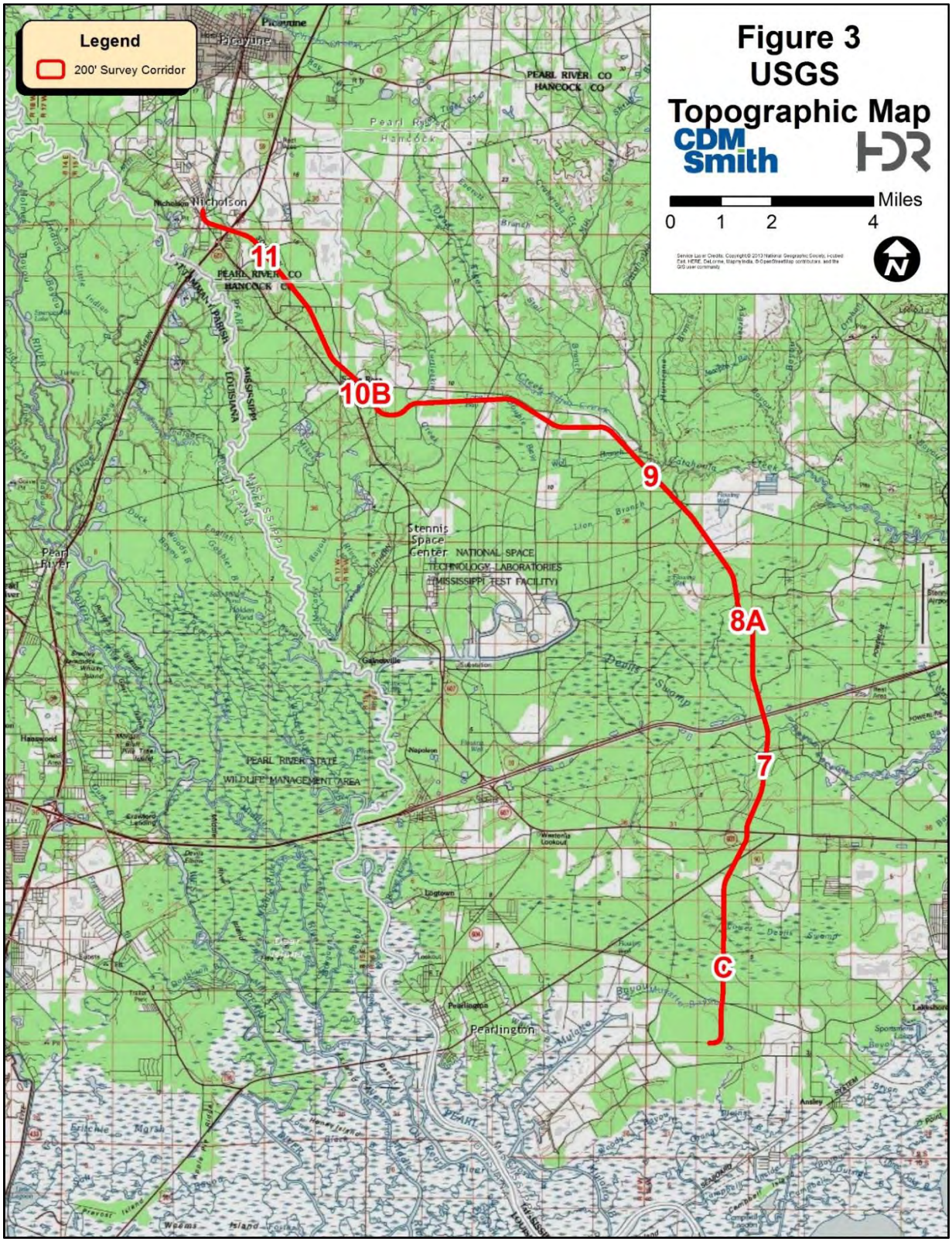


Figure 3. USGS Topographic Map



In the absence of a permit application and Jurisdictional Determination (JD) for the proposed project, a planning-level waters of the U.S. evaluation was developed by staff scientists in order to facilitate discussion of water resources within the survey corridor in the EIS, as well as potential impacts to water resources as a result of the proposed project and its alternatives. The planning-level data were first modeled using Geographic Information Systems (GIS). This dataset was then ground-truthed and refined by wetlands staff of CDM Smith and HDR, Engineering, Inc. (HDR) in March/April 2016 and in June 2016 to determine the accuracy of streams and wetlands identified by GIS. Streams and wetlands were identified in the field using the three-parameter approach as defined in the USACE 1987 Manual mentioned in Chapter 2. All wetland/upland boundaries found within the 200-ft wide survey corridor were mapped using Trimble Geo XH Differential Global Positioning Systems (GPS) technology with a Global Navigation Satellite System (GNSS), which reports to sub-meter accuracy. The GPS data were collected using ArcPad and Terrasync software and exported to shapefile format. The information gathered in the field was used to verify the presence of the predicted stream and wetland features, to add features not predicted, and to adjust boundaries of wetlands, open water, or streams. It is assumed that all wetlands within the survey corridor have the potential to be jurisdictional; however, their jurisdictional status has not been verified with the regulatory agencies.

CHAPTER 2. METHODS

An evaluation of the presence and approximate extent of jurisdictional wetlands and other waters of the U.S. as defined in Section 404 of the Clean Water Act was conducted for the Port Bienville Railroad project. The term "jurisdictional" refers to the legal authority assigned to the U.S. Army Corps of Engineers (USACE) to regulate wetlands and other waters. For the purposes of this report, the term "wetland" as defined by the USACE and the U.S. Environmental Project Agency (EPA) shall mean:

> *Those areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.*

For the purposes of this report, the term "other waters of the U.S. (OWUS)" as defined by the USACE shall mean:

> *All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, which the use, degradation or destruction of could affect interstate or foreign commerce including any such waters:*
>
> *i. which are or could be used by interstate or foreign travelers for recreational or other purposes; or*
> *ii. from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or*
> *iii. which are used or could be used for industrial purposes by industries in interstate commerce.*

The wetland delineation methods follow the procedures outlined in Part IV of the USACE Wetland Delineation Manual dated 1987 and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region dated 2010. A full list of the methods and tools used may be found in **Appendix A** at the end of this document. Other sources of information used in the wetland delineation include:

- "Soil Survey for Hancock County, MS," US Department of Agriculture Natural Resources Soil Conservation Service (NRCS), 1981 (U.S. Department of Agriculture [USDA] 1981);
- "Redoximorphic Features for Identifying Aquic Conditions," North Carolina Agricultural Research Service (ARS), Technical Bulletin 301 (N.C. ARS 1992);
- Field Indicators of Hydric Soils. Version 7. NRCS, 2010 (USDA 2010).
- English Lookout, Logtown, Dead Tiger Creek and Nicholson, Mississippi USGS Topographic Quadrangle maps, U.S. Geological Survey (USGS 2012);
- Onsite evaluation of soils, vegetation, and hydrology.

Streams and drains within the survey corridor were inspected on-site to determine if they should be considered OWUS. Current terminology for jurisdictional streams and drains is Traditional Navigable Waters (TNW) and Relatively Permanent Waters (RPW) (Rapanos 2008, USACE 2007a).

Perennial and intermittent streams addressed in this report are considered to be RPWs. Ephemeral streams (i.e., none identified with a significant nexus to a TNW) addressed in this report are considered to be non-RPW wet-weather conveyances through uplands. Final jurisdictional determinations of all streams are given only by a representative of the USACE.

The presence of an "ordinary high water mark" (OHWM) was used as a primary guide to determine potential jurisdictional limits for OWUS. In accordance with USACE (2005), this is indicated by the following flow characteristics: natural line impressed on the bank; the presence of litter and debris; changes in the character of soil; destruction of terrestrial vegetation; shelving; the presence of a wrack line; vegetation matted down, bent, or absent; sediment sorting; leaf litter disturbed or washed away; scour; sediment deposition; multiple observed or predicted flow events; water staining; and abrupt change in plant community. Three USACE documents were used as secondary guides to help determine jurisdictional status of potential OWUS:

- The Approved Jurisdictional Determination Form, "JD form", 30 May 2007 (USACE 2007a);
- Regulatory Guidance Letter (RGL) 07-01, 5 June 2007 (USACE 2007b); and
- RGL 05-05, 7 December 2005 (USACE 2005).

2.1 STREAM CLASSIFICATION

Jurisdictional boundaries for streams and open waters were delineated at the OHWM in the field. Methods used to determine the category of each stream (e.g., perennial, intermittent, or ephemeral) include characterizing the type of substrate, evidence of groundwater seepage, percentage of reaches with gain and loss, type of vegetation, and evidence of flow volume. Data was also collected on the apparent condition of each stream reach such as channel condition, riparian buffer vegetation, in-stream habitat, and hydrologic setting. Streams are classified based on potential navigability and flow regime, and include: TNWs, RPWs (perennial or seasonal), and non-RPWs (i.e., ephemeral streams).

The jurisdictional status of constructed ponds depends on whether they were constructed as an impoundment of a jurisdictional stream or if they were constructed in uplands, away from waters of the U.S. However, the jurisdictional status of constructed ponds also depends on whether they have a surface hydrological connection to a water of the U.S. under normal conditions. If a pond lacks a drainage pipe (or other means) that provides flow sufficient to establish an OHWM directly downstream to a water of the U.S., then it may be considered a non-jurisdictional aquatic feature.

Ditches (including roadside ditches) excavated wholly in and draining only uplands, that did not carry a relatively permanent flow of water, were omitted as tributaries and did not have a significant nexus to a TNW were not considered OWUS. Swales, ephemeral streams, and erosion features (e.g., gullies, small washes characterized by low volume, infrequent, and short duration flow) were, likewise, not considered jurisdictional if they were not tributaries and did not have a significant nexus to a TNW. Even when not OWUS, these geographic features (e.g., swales, ditches) could, however, still contribute to a surface hydrologic connection between an adjacent wetland and a TNW. Manmade ponds, sediment control basins, borrow pits, and other non-flowing open water areas were assumed to be OWUS.

A Wide Area Augmentation System (WAAS)-enabled GPS was used to determine the latitude and longitude of the areas where data were collected and where site photographs were taken. Accuracy of the positions shown is typically one to three feet depending on tree cover. GPS track data were collected and used as an aid to accurately depict wetland/non-wetland boundaries on maps used in this report.

Field surveys were conducted during March/April 2016 and June 2016. All wetlands, streams, and waterbody features found within the survey corridor were identified, described, and documented. After field work was completed, data was entered into GIS software (ESRI ArcMap 10.2.1), potentially jurisdictional areas were mapped, and areas and lengths of existing waters and wetlands within the survey corridor were calculated. Results from the GIS analysis can be found in Chapter 4 and **Appendix B**. All areas identified should be considered potentially jurisdictional until concurrence is given by a representative of the USACE, Regulatory Branch, through the JD process.

CHAPTER 3. EXISTING CONDITIONS

Based upon the field delineation, there were a total of **83 (eighty-three) wetland areas (343.02 acres), 8 (eight) open water areas (3.84 acres) and 2 (two) riverine areas (0.40 acres)**, identified within the survey corridor (See **Appendix B**). A total of thirteen streams were identified throughout the corridor for an approximate total of 4,065 linear feet. All potential jurisdictional areas should be considered preliminary prior to confirmation by the USACE Regulatory Branch. Findings for each segment are shown in Tables 4 through 13 in Chapter 4, as well a complete dataset in **Appendix C**.

3.1 TERRAIN

The majority of the survey corridor consists of prior-converted pine plantations of loblolly (*Pinus taeda*) and slash (*Pinus elliottii*) pines. The terrain is very flat with minor changes in elevations around drainages and bayous. The elevations for the survey corridor range from the high point at approximately 25 ft Above Sea Level (ASL) to the low point of approximately 8 ft ASL.

3.2 LANDSCAPE SETTING

The proposed project is located within the Southern Coastal Plain physiographic province (EPA Ecoregion Level III). This area extends from Virginia to Louisiana and Mississippi of the Coastal Plain Province of the Atlantic Plain. Longleaf pine flatwoods and savannas historically dominated the Southern Coastal Plain, but it now consists of a variety of other communities including slash pine (*Pinus eliotii*), pond pine (*Pinus serotina*), pond cypress (*Taxodium ascendens*), American beech (*Fagus grandifolia),* sweetgum (*Liquidambar styraciflua*), southern magnolia (*Magnolia grandiflora*), white oak (*Quercus alba*), and laurel oak (*Quercus laurifolia*) forests. Most of the floodplains consist of bald cypress (*Taxodium distichum*), pond cypress, water tupelo (*Nyssa aquatica*), bottomland oaks, sweetgum, green ash (*Fraxinus pennsylvanica*), and water hickory (*Carya aquatica*).

Defined further, the survey corridor lies primarily within the Gulf Coast Flatwoods (EPA Ecoregion Level IV), which is described as a narrow region of nearly level terraces and delta deposits composed of Quaternary sands and clays. The Gulf Coast Flatwoods consists of wet, sandy flats and broad depressions that are locally swampy and usually forested, while some of the better-drained land has been cleared for pasture or crops. The area includes bottomland hardwood forests, scrub-shrub wetlands, emergent wetlands, upland scrub-shrub, agriculture (rice farming), and residential properties.

3.3 LAND USES

The majority of the survey corridor runs through the approximately 125,000 acre Stennis Space Center acoustical buffer zone. The buffer zone surrounding Stennis was established by NASA to enable testing of large rocket engines, etc. The buffer zone is critical to NASA's missions and is considered a national asset. The United States government owns a perpetual easement restricting certain uses in, on, across and over the land in the buffer zone, and has the right to prohibit habitation or occupancy of dwellings and other buildings. The government also has the right to prohibit the construction of buildings allowing for, or susceptible to, habitation and reserves the right to remove structures in violation of this easement. The easement does permit other uses when those activities

do not interfere with or reduce the rights of the government. Examples of these other uses include hunting, fishing, or general silviculture practices.

The remaining area of the survey corridor that lies outside of the Stennis Space Center acoustical buffer zone is primarily rural, with a few residences north of Port Bienville. The area contains several rights of way for utility uses including gas pipelines and electric transmission lines.

3.4 HYDROLOGY

3.4.1 Watershed

The survey corridor is comprised of many bayous and unnamed tributaries of the Pearl River Basin. The Pearl River Basin is found in central and southern Mississippi and covers over 8,700 square miles. The basins' rivers and tributaries drains all or parts of 24 counties in Mississippi and three parishes in Louisiana. Over 16,000 miles of streams and rivers flow through the basin. Sub-watersheds of the Pearl River Basin include Fannegusha Creek, Mill Creek, the Strong River, Magees Creek, West Boley Creek, and Mike's River (MDEQ, 2007). The project's survey corridor falls within the Lower Pearl River watershed.

The natural hydrology has been heavily altered in the area due to silvicultural activities including ditching, rowing, and logging within the numerous pine plantations that account for most of the survey corridor. The saturated and flooded conditions in portions of the area can be attributed to riverine influences of the Pearl River through its bayous and tributaries, a high-water table, and geographic location within the 100-year floodplain. The 100-year floodplain is identified as those areas with the 1 percent annual chance flood (100-year flood). Also, known as the base flood, it is the flood that has a 1 percent chance of being equaled or exceeded in a given year. This Special Flood Hazard Area is the area subject to flooding by the annual 1 percent chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. Areas classified as Zone X include the area subject to 0.2 percent annual chance flood (500-year flood). Approximately 192 acres of the survey corridor falls within Zones A and AE (1 percent chance annual flood) and 327 acres falls in Zone X.

Flood data obtained from FEMA is detailed in **Table 2** and shown on exhibits in **Appendix D**.

Table 2. FEMA National Flood Hazard Panels for Port Bienville Proposed Rail Corridor

Panel No.	Effective Date	Flood Zones[1]
28045C0180D	10/16/2009	
28045C0185D	10/16/2009	X
28045C0195D	10/16/2009	A, X
28045C0215D	10/16/2009	A, X
28045C0220D	10/16/2009	A, AE, X
28045C0310D	10/16/2009	AE, X
28045C0320D	10/16/2009	AE, X
28045C0407D	10/16/2009	AE

(FEMA, July 2016)

3.4.2 Climate

Hancock County, Mississippi and Pearl River County, Mississippi receive 65 inches and 63 inches of rain per year, respectively, on average. The number of days with any measurable precipitation in Hancock County is 101 and 105 for Pearl River County (Sperling's Best Places 2016).

In the days prior to the first field survey, Louisiana and parts of Southwest Mississippi experienced record rainfall and flooding with totals of over 26 inches of rain between March 8 and March 11, 2016.[2] The project survey corridor is situated within the Pearl River Basin. Due to flooding, the Pearl River experienced its second highest crest in history of 20.35 ft on March 14, 2016, the day fieldwork began.[3] Flood stage for the Pearl River is 14 ft.[4] The recent heavy rainfall and flood stage of the Pearl River caused flooding throughout the extent of the area and conditions may have been wetter than normal. During a second field visit for the southern alignment in June 2016 under normal conditions, portions of the proposed corridor were still heavily saturated or ponded with standing water varying between 3 to 12 inches.

Although a defined surface hydrologic connection to the Pearl River is not clearly apparent in all areas, it is assumed that wetlands and streams in the survey corridor would be considered jurisdictional due to their location within the floodplain.

[1] **Zone A:** 1 percent annual chance flood. No Base Flood Elevations determined.

Zone AE: 1 percent annual chance flood. Base Flood Elevations Determined. Floodways, such as channels or streams plus any adjacent floodplain, must be kept free of encroachment so that the 1 percent annual chance flood can be carried without substantial increase in flood heights.

Zone X: Areas of 0.2 percent annual chance flood; areas of 1percent annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1 percent annual chance flood.

[2] https://weather.com/storms/severe/news/historic-south-flooding-march-2016, accessed 7/10/2016

[3] http://water.weather.gov/ahps2/hydrograph.php?wfo=lix&gage=perl1, accessed 7/10/2016

[4] http://water.weather.gov/ahps2/hydrograph.php?wfo=lix&gage=perl1, accessed 7/10/2016

3.5 VEGETATION

The survey corridor contains six general habitat types (**Table 3**). These are broadly determined from the dominant vegetation and may contain some overlap of species.

Table 3. Habitat Types

Dominant Vegetation Types	Wetland/Upland Classification
Pine Plantation	Upland
Early Succession Pine Plantation	Upland
Pine Savannah/Pine Flatwoods	Wetland
Bottomland Hardwoods	Wetland
Scrub-Shrub	Wetland
Emergent	Wetland

3.5.1 Pine Plantation – Upland

Areas of planted pine are very common throughout Mississippi. This major component of Mississippi's economic base covers approximately 19.6 million acres, or 65 percent of the state's total land area. This habitat was characterized by an overstory composed primarily of loblolly pine. These areas were intensively managed for silviculture with a first thinning occurring typically at ages 12 to 15 years, followed by a clearcut at typically 25 to 30 years old. These areas were bedded and extensively ditched. The survey corridor spanned multiple stands of pines, ranging from open thinned (60 to 80 Basal Area) stands to dense, pre-merchantable stands (120 to 140 Basal Area). As a result of recent clearcut harvests, some areas were devoid of overstory or midstory. In the thinned pine areas (60 to 80 BA), the midstory consisted of sweet gum and red maple (*Acer rubrum*) with approximately 10 to 25 percent cover. In the denser pine areas (120 to 140 BA) no midstory or shrub layer was present due to 90 to 100 percent overstory cover. In the open thinned pine stands the shrub layer consisted of wax myrtle (*Morella cerifera*), redbay, (*Magnolia virginiana*), fetterbush (*Lyonia lucida)*, and Vaccinium, with 10 to 30 percent cover. The herbaceous layer was also somewhat sparse, approximately 0 to 10 percent cover, and was composed primarily of dwarf palmetto (*Sabal minor*), longleaf woodoats (*Chasmanthium sessiliflorum)*, plumegrass (*Saccharum giganteum)*, giant cane (*Arundinaria gigantea*), Virginia chain fern (*Woodwardia virginiana*), cinnamon fern (*Osmundastrum cinnamomeum*), and netted chain fern (*Woodwardia areolata)*. These areas were bedded, ditched, and drained extensively.

3.5.2 Early Succession Pine Plantation - Upland

Early successional pine plantation habitat originates from the harvest and replanting of a mature upland pine plantation community that previously existed in the area. Soils and hydrology are characteristic of an upland pine plantation, including well-drained soils with no indication of saturation or presence of surface water. Regrowth in early successional habitats includes a sapling and scrub/shrub overstory interspersed with a grass and forb understory.

During the survey, these areas were identified among intermediate-aged and mature upland pine plantations. Dominant species observed during field surveys include loblolly pine saplings and gallberry, interspersed with broomsedge bluestem (*Andropogon virginicus*). Even after a rainfall of approximately 2 inches the day prior to the survey of these areas, no surface water or saturation was observed. This is due to the well-drained sandy soils identified during the survey, which are characteristic of upland areas.

3.5.3 Pine Savannah/Pine Flatwoods – Wetland

Pine savannah/pine flatwoods is the most common habitat type found throughout the survey corridor. Many of these areas are maintained for silviculture and are constantly changing due to harvesting, planting or thinning. This habitat is essentially flat or rolling topography with a canopy of pines along with a well-developed subcanopy of several tall shrub or understory species. The soils are usually sandy with a high-water table.

Similar to the upland pine plantations observed, the pine flatwoods contain a variety of planted pine species with the majority being loblolly and slash pine. Longleaf pine may be present but has mostly been removed in favor of the faster growing previously mentioned species. This habitat was previously fire dependent but now is typically man-altered through the use of thinning, selective harvesting and/or ditching. In contrast to the upland pine plantation, here a clear herbaceous understory is present, and where not maintained, it is dominated by one or two species throughout. These were generally swamp titi (*Cyprilla racemiflora*) and fetterbush. Other species observed include inkberry (*Ilex glabra*), wax myrtle (*Morella cerifera)*, sweetbay (*Magnolia virginiana*), and redbay (*Persea borbonia*). The groundcover contains a variety of panic grasses (*Panicum* spp.), blazing-stars (*Liatris* spp.), St. John's worts (*Hypericum* spp.), and broom sedges (*Andropogon* spp.). Some of the less-common but ecologically important herbs observed included pitcher plants (*Sarracenia* spp.), sundews (*Drosera* spp.), and club mosses (*Lycopodium* spp.).

3.5.4 Bottomland Hardwoods – Wetland

Bottomland hardwood forests are typically associated with floodplains of rivers and streams. These forests are characterized and maintained by a natural hydrologic regime of alternating wet and dry periods generally following seasonal flooding events. These habitats can vary widely in species and water level fluctuations depending on proximity to the associated water source and rainfall events throughout the year. These communities are defined by a well-developed canopy of swamp tupelo (*Nyssa* spp.*)*, bald cypress, red maple, sweetgum, boxelder *(Acer negundo*), cherrybark oak *(Quercus pagoda*), and American sycamore (*Platanus occidentalis)*. Overstory closure ranged from 30 to 50 percent.

During parts of the year, particularly in wetter months, little to no herbaceous vegetation may be present due to standing water throughout these flooded forests. A subcanopy of early successional species, plus many tall shrubs, are typically present. These include Chinese privet (*Ligustrum sinense*), arrowwood viburnum *(Viburnum dentatum*), wax myrtle, and black willow (*Salix nigra*). Vines were also very common in these communities, including greenbrier (*Smilax* spp.), poison ivy *(Toxicodendron radicans*), and muscadine grape *(Vitis rotundifolia*). Standing water was present within most of the bottomland hardwood forest habitats with a typical subcanopy/shrub layer of cover at 10 to 20 percent.

3.5.5 Scrub-Shrub – Wetland

Scrub-Shrub wetlands are usually a low, flat wetland community dominated by woody vegetation, less than 20 ft tall. Soils are very poorly drained, and surface water is present for extended periods, sometimes drying during late summer or during periods of drought. Species include true shrubs, young trees, and shrubs or trees that are stunted due to some environmental conditions.

Dominant shrub species observed during field surveys include wax myrtle, swamp titi, fetterbush, and gallberry (*Ilex coriacea*). Redbay and stunted bald cypress were also observed in several areas throughout the survey corridor. Field conditions at the time were extremely wet and very few herbaceous plants were observed. Vines were very common within the upland and wetland ecotones. Some of the species included blackberry (*Rubus* spp.), poison ivy, muscadine grape, and greenbrier.

3.5.6 Emergent – Wetland

Emergent wetlands, also referred to as freshwater marshes, are common in maintained rights of way throughout the survey corridor. These areas were often found alongside or adjacent to a forested wetland habitat type described above. This community is dominated by grasses and sedges as well as other herbs, including panic grasses, beak sedges (*Rhynchospora* spp.), sedges (*Carex* spp.), black needlerush (*Juncus roemerianus*), cattails (*Typha* spp.), and water pennyworts (*Hydrocotyle* spp.).

These areas were mostly found near gas pipelines or rights of way for overhead transmission lines where woody vegetation is either physically removed or treated with herbicides to maintain the herbaceous community. During site visits, many of these areas were extremely wet with water as much as 3 to 4 ft deep.

3.6 SOILS

A custom soil survey report for the survey corridor of the Port Bienville project was obtained on June 20, 2016 from the online NRCS Soil Survey for Hancock (MS045) and Pearl River (MS109) Counties, Mississippi (**Appendix E**). The Soil Surveys contain information that affects land use planning in survey areas of interest (AOI). They highlight soil limitations that affect various land uses and provide information about the properties of soils in the survey areas. The custom Soil Survey Report for the proposed reasonable alignment for the Port Bienville project (**Appendix E**) contains soil characteristic information and total area (acres) of each mapped soil unit in the projects AOI.

For Hancock County, Mississippi, the NRCS Web Soil Survey (2011) indicates that the mapped soil types of the project's survey corridor include: Atmore silt loam (At), Beauregard silt loam (Be), Escambia loam (EsA), Escambia loam (EsB), Eustis loamy fine sand (EuB), Guyton silt loam (Gu), Harleston fine sandy loam (HIA and HIB), Malbis fine sandy loam (MaB), McLaurin fine sandy loam (McB), Poarch fine sandy loam (PoA ,PoB, and PoC), Saucier fine sandy loam (SaA and SaB), Saucier-Susquehanna complex (ScB), Smithton fine sandy loam (St), Smithton fine sandy loam, frequently flooded (Su), Smithton association, frequently flooded (SW), and Trebloc association, frequently flooded (TR). For Pearl River County, Mississippi, the mapped soil types of the survey corridor include: Bibb sandy loam (Bd), Escambia fine sandy loam (EaA), Pits (Pa), Poarch loam (PoA), and Saucier loam (SaA). A description of each soil series or map unit within the project's AOI is provided below (https://soilseries.sc.egov.usda.gov).

The Atmore series consists of very deep, poorly drained, moderately slowly permeable soils in depressions and inter-stream divides. They formed in sandy and loamy marine sediments in the Southern Coastal Plain. Slopes range from 0 to 8 percent.

The Beauregard series consists of very deep, moderately well-drained, slowly permeable soils that formed in loamy alluvial sediments of Pleistocene age. These soils are on broad, nearly level and

gently sloping Coastal Plains. They are saturated for short periods during winter and early spring. Water runs off the surface at a medium to slow rate. Slope is dominantly 1 to 3 percent, but ranges from 0 to 5 percent.

The Escambia series consists of very deep, somewhat poorly drained, moderately to slowly permeable soils in the Southern Coastal Plain (MLRA 133A) and the Eastern Gulf Coast Flatwoods (MLRA 152A). They formed in sandy and loamy marine sediments of the Lower Coastal Plain. Slopes range from 0 to 8 percent.

The Eustis series consists of deep, somewhat excessively drained soils that formed in coarse-textured marine or fluvial sediments on smooth to strongly dissected parts of the Coastal Plain. Slopes range from 0 to 12 percent.

The Guyton series consists of very deep, poorly drained and very poorly drained, slowly permeable soils that formed in thick loamy sediments. These soils are on Coastal Plain local stream flood plains and in depressional areas on late Pleistocene age terraces. Slopes range from 0 to 1 percent.

The Harleston series consists of very deep, moderately well-drained, moderately permeable soils on terraces and uplands of the Southern Coastal Plain (MLRA 133A) and the Eastern Gulf Coast Flatwoods (MLRA 152A) Major Land Resource Areas. They formed in marine or stream deposits consisting of thick beds of sandy and loamy material. Slopes range from 0 to 12 percent.

The Malbis series consists of very deep, moderately well or well-drained, moderately slowly permeable soils on broad interfluves and uplands of the Southern Coastal Plain (MLRA 133). They formed in loamy sediments of the Coastal Plain. Slopes range from 0 to 12 percent.

The McLaurin series consists of very deep, well-drained, moderately permeable soils on dissected fluviomarine terraces of the Southern Coastal Plain Major Land Resource Area (MLRA 133A). They formed in loamy marine or stream sediments. Slopes range from 0 to 8 percent.

The Poarch series consists of very deep, moderately well and well-drained, moderately permeable soils on uplands of the Southern Coastal Plain Major Land Resource Area (MLRA 133A). They formed in unconsolidated sandy and loamy marine sediments. Slopes range from 0 to 8 percent.

The Saucier series consists of moderately well-drained, slowly permeable soils that have a moderate amount of plinthite in the subsoil. These soils formed in marine sediment that is loamy in the upper part and clayey in the lower part. These are nearly level to strongly sloping soils on upland ridges and hillsides of the Southern Coastal Plain and Eastern Gulf Coast Flatwoods. Slopes range from 0 to 12 percent.

The Susquehanna series consists of deep, somewhat poorly drained, soils that formed in marine or stream deposits of silty clay and clay. Permeability is very slow. These nearly level to steep soils are on erosional uplands of the Southern Coastal Plain. Slopes range from 1 to 17 percent.

The Smithton series consists of very deep, poorly drained, moderately slowly permeable soils that formed in loamy alluvial sediments. These level to nearly level soils are on Pleistocene and younger stream terraces of the Western and Southern Coastal Plains. Slopes are dominantly less than 1 percent, but range to 3 percent.

The Trebloc series consists of nearly level, poorly drained soils. Permeability is slow. These soils formed in moderately fine textured marine or fluvial sediment and are on stream terraces and in depressions on drainage ways on the uplands in the Eastern Gulf Coastal Flatwoods and the Southern Coastal Plain. Slopes are 0 to 2 percent.

The rail corridor alignment will intersect numerous soil types as indicated above. Characteristics such as color, texture, and the presence of redoximorphic features were recorded on Wetland Determination Data Forms – Atlantic and Gulf Coastal Plain Region for each data plot where an original soil sample was taken during the field wetland delineation. Wetland Determination Data Forms representative of each habitat type can be found in **Appendix F**. Photo log of field work can be found in **Appendix G**.

CHAPTER 4. SURVEY RESULTS BY CORRIDOR SEGMENTS

4.1 SEGMENT 11

Segment 11 is approximately 3.44 miles long and is located at the northern end of the survey corridor near Nicholson, Mississippi. Dominant land uses include prior-converted pine plantations, roadways, railroad, utility infrastructure, and residential. Existing habitats observed during the site survey consist of pine savannah/pine flatwoods, scrub/shrub wetlands, emergent wetland, and upland Pine Plantations. The segment also includes roadway, railroad, agriculture drainage features, and swales that convey storm water drainage from runoff during rain events. Segment 11 contains the least amount of wetlands with approximately 3% of the total acreage for this segment. (**Table 4**) Nine potential waters of the U.S. totaling 2.59 acres were delineated containing Bottomland Hardwoods (0.86), Scrub Shrub (0.69), Emergent (0.09), Open Water (0.77), and Riverine (0.18).

Segment 11 crosses a total of eight streams including three named streams of Alligator Branch, Second Alligator Branch and Indian Camp branch. (**Table 5**) Each stream was classified using the NC Stream Assessment Method (NC SAM) as mentioned within Chapter 2. The corridor begins near US Highway 11 and the existing railroad tracks. Two unnamed intermittent streams were surveyed with lengths of approximately 182 and 144 LF adjacent to the existing tracks at the start of the study corridor. Found near I-59, Alligator Branch runs diagonally through a box culvert under both the existing rail line over I-59 and the I-59 roadway for a total of approximately 240 LF. Outside of the culvert, Alligator Branch is a RPW classified as a perennial stream with a defined bed, bank and OHWM. On the north side of I-59 S within the survey corridor, Alligator Branch is entirely within a culvert under the highway. On the south side of I-59 N, the culvert ends near the survey corridor boundary and returns to a natural bottom. The OHWM of Alligator Branch within the survey corridor is approximately 40 feet. Uplands are located adjacent to the stream, and include species such as sugarberry (*Celtis laevigata*), water oak (*Quercus nigra*), southern magnolia (*Magnolia grandiflora*), greenbrier (*Smilax* sp.), and Chinese privet (*Ligustrum sinense*). Alligator Branch flows south, emptying into the Pearl River, a TNW, approximately 1.5 aerial miles south of where it occurs in the survey corridor.

Segment 11 also crosses Second Alligator Branch, an RPW classified as a perennial stream with a defined bed, bank and OHWM. The width of the stream within the limits of the corridor is an average of 36 ft wide therefore it was considered to be riverine for a total of approximately 0.18 acre within the corridor. Scrub-shrub wetlands are located adjacent to the stream with dominant vegetation species including buttonbush (*Cephalanthus occidentalis*), panic grass, and giant cane. The stream flows southwest into the Pearl River watershed. Stream 5, an unnamed ephemeral tributary of Second Alligator Branch, is also found nearby for a total of 93 LF within the study corridor.

Segment 11 also crosses Indian Camp Branch (Stream 6), an RPW water that is classified as an intermittent stream with a defined bed, bank, and OHWM. The OHWM of the stream within the limits of the corridor is an average of 6 ft wide. It is a distributary of the Pearl River and generally flows east.

Table 4. Segment 11 Wetlands and Other Waters

Wetland Number	Wetland Type	Acres
1	Bottomland Hardwood	0.79
2	Open Water	0.13
3	Scrub Shrub	0.13
4	Scrub Shrub	0.50
5	Riverine	0.18
6	Open Water	0.64
7	Scrub Shrub	0.06
8	Emergent	0.09
9	Bottomland Hardwood	0.07
	Total Open Water	**0.77**
	Total Riverine	**0.18**
	Total Wetlands	**1.64**

Table 5. Segment 11 Streams

Stream Number	Type	Name	Linear Feet (LF)
1	Intermittent	Unnamed Tributary	182
2	Intermittent	Unnamed Tributary	144
3	Perennial	Alligator Branch	240
4	Perennial	Second Alligator Branch	223
5	Ephemeral	Unnamed Tributary	93
6	Intermittent	Indian Camp Branch	216
7	Intermittent	Unnamed Tributary	1492
8	Intermittent	Unnamed Tributary	203
		Total LF Streams	**2,793**

Stream 7, a tributary of Indian Camp Branch, an RPW, is classified as an intermittent stream with a defined bed, bank and OHWM. The OHWM of the stream within the limits of the corridor is an average of 6 ft wide. It generally flows northeast from Indian Camp Branch, eventually draining into a scrub-shrub wetland, also located within the Segment 11 corridor. Stream 8, an unnamed intermittent stream also crosses the study corridor for a total of approximately 203 linear feet. The average width of stream 8 within the limits of the corridor is an average of 4 ft wide. These eight streams contained with Segment 11 account for over half of the streams found within the approximately 24-mile study corridor.

4.2 SEGMENT 10B

Segment 10B is approximately 5.17 miles long and is located near the northern end of the project survey corridor, between Segments 9 and 11. Dominant land uses within Segment 10B consist of roadway and utility infrastructure, and prior converted pine plantations. Existing habitats observed during the site survey include pine savannah/pine flatwoods, scrub-shrub wetlands, bottomland hardwoods, emergent wetlands and upland pine plantations. The segment consists of approximately

46 percent wetlands and OWUS. (**Table 6**) Nineteen potential waters of the U.S. totaling 58.38 acres were delineated containing Bottomland Hardwoods (2.76), Scrub Shrub (11.95), Emergent (1.68), Open Water (0.71), and Pine Savannah (41.28). This survey corridor segment also includes roadway and agriculture drainage features and swales that convey infrequent storm water drainage from runoff during rain events.

There are two streams within corridor 10B, one unnamed intermittent stream and a named perennial stream. (**Table 7**) Stream 9, the intermittent stream is approximately 3 feet wide with a defined bed and bank as well as an OHWM. The segment is bisected by Turtleskin Creek, a tributary of the Pearl River south of Texas Flat Road. Due to rainfall prior to the field survey, the creek was observed outside of its banks and no clear channel could be observed. Based upon aerial imagery on an adjacent pipeline corridor, it is estimated the creek is typically less than 10 ft wide. Bottomland hardwoods were present on either side of the creek, providing a substantial floodplain during and after heavy rainfall events.

Table 6. Segment 10B Wetlands and Other Waters

Wetland Number	Wetland Type	Acres
10	Emergent	0.33
11	Scrub Shrub	0.85
12	Scrub Shrub	0.75
13	Emergent	1.35
14	Pine Savannah	0.55
15	Scrub Shrub	0.16
16	Scrub Shrub	0.84
17	Scrub Shrub	0.22
18	Open Water	0.02
19	Bottomland Hardwood	0.30
20	Open Water	0.69
21	Scrub Shrub	5.55
22	Scrub Shrub	2.71
23	Bottomland Hardwood	0.74
24	Bottomland Hardwood	1.72
25	Pine Savannah	3.90
26	Scrub Shrub	0.87
27	Pine Savannah	14.27
28	Pine Savannah	22.56
	Total Open Water	**0.71**
	Total Wetlands	**57.67**

Table 7. Segment 10B Streams

Stream Number	Type	Name	Linear Feet (LF)
9	Intermittent	Unnamed Tributary	85
10	Perennial	Turtleskin Creek	265
		Total LF streams	**350**

4.3 SEGMENT 9

Segment 9 is approximately 5.98 miles long and is located between Segments 8A and 10B. The segment begins approximately 0.4 miles west of the Texas Flat Road and Mainline Road intersection and ends approximately 2.2 miles north of I-10. Dominant land uses within the limits of this corridor include prior-converted pine plantation of loblolly and slash pines, roadway, utility infrastructure, and farmlands. Open water and emergent wetland habitat exist along pipeline and utility right-of-way throughout this segment, likely resulting from disturbance during right-of-way construction and maintenance. Other existing habitats observed during the site survey include scrub-shrub wetland, pine savannahs, emergent wetlands, bottomland hardwoods, and pine plantation. The majority of Segment 9 consists of wetlands or OWUS with over 79 percent delineated as wetlands and another 1.63 percent delineated as OWUS. (**Table 8**) Thirty-five potential waters of the U.S. totaling 118.02 acres were delineated containing Bottomland Hardwoods (17.57), Scrub Shrub (19.78), Emergent (3.57), Open Water (2.36), and Pine Savannah (74.74). The corridor segment also includes roadway and agriculture drainage features and swales that convey infrequent stormwater drainage from runoff during rain events.

Segment 9 crosses Wolf Branch and an unnamed perennial stream, both tributaries of Catahoula Creek. (**Table 9**) During the site visit in March 2016, Wolf Branch was flooded well beyond its banks. From aerial photography it is estimated to have a typical bankfull width of approximately six to eight feet. The unnamed tributary was near bankfull, with a width of approximately 6 feet. Both streams are bordered on either side by bottomland hardwoods.

Table 8. Segment 9 Wetlands and Other Waters

Wetland Number	Wetland Type	Acres
28	Pine Savannah	8.61
29	Pine Savannah	35.30
30	Pine Savannah	0.78
31	Bottomland Hardwood	0.89
32	Pine Savannah	1.49
33	Bottomland Hardwood	2.65
34	Scrub Shrub	10.24
35	Pine Savannah	18.23
36	Scrub Shrub	4.00
37	Bottomland Hardwood	2.60
38	Scrub Shrub	5.54
39	Emergent	0.32
40	Bottomland Hardwood	1.32
41	Emergent	3.08
42	Bottomland Hardwood	2.12
43	Bottomland Hardwood	0.73
44	Bottomland Hardwood	0.99
45	Open Water	2.01
46	Open Water	0.01
47	Bottomland Hardwood	0.84
48	Bottomland Hardwood	1.17
49	Emergent	0.14
50	Bottomland Hardwood	0.33
51	Bottomland Hardwood	0.45
52	Open Water	0.33
53	Bottomland Hardwood	0.16
54	Open Water	0.01
55	Emergent	0.03
56	Bottomland Hardwood	3.15
57	Pine Savannah	1.07
58	Pine Savannah	3.39
59	Pine Savannah	0.19
60	Pine Savannah	2.48
61	Bottomland Hardwood	0.17
62	Pine Savannah	3.20
	Total Open Water	**2.36**
	Total Wetlands	**115.66**

Table 9. Segment 9 Streams

Stream Number	Type	Name	Linear Feet (LF)
11	Perennial	Wolf Branch Creek	279
12	Perennial	Unnamed Tributary	343
		Total LF streams	**622**

4.4 SEGMENT 8A

Segment 8A is a relatively short segment approximately 0.87 mile and is located between Segments 7 and 9. This segment consists of mostly pine savannahs and emergent wetlands north of I-10. This approximately 21-acre corridor is over 90 percent wetlands. (**Table 10**) Three potential waters of the U.S. totaling 19.05 acres were delineated containing Pine Savannah (9.07) and Emergent (9.98). No stream crossings were found within this corridor. Land uses in this area were consistent with other areas within the Stennis Space Center buffer zone. These include hunt clubs and silviculture practices. A large portion of the segment had been recently clear-cut. In this area, standing water was present along with several species of pitcher plants and sundews.

Table 10. Segment 8A Wetlands and Other Waters

Wetland Number	Wetland Type	Acres
63	Pine Savannah	2.08
64	Pine Savannah	6.99
65	Emergent	9.98
	Total Wetlands	**19.05**

4.5 SEGMENT 7

Segment 7 is approximately 4.84 miles long and is located near the southern end of the survey corridor, between Segments 8a and C. The segment begins approximately 1 mile south of US 90 and ends 1.5 miles north of Interstate 10 (I-10). Dominant land uses within the Segment 7 corridor consist of prior-converted pine plantations of loblolly and slash pines, roadway and utility infrastructure, residential, and cattle pasture. Existing habitats observed during the site survey include pine plantation, bottomland hardwoods, pine savannah/pine flatwoods, scrub shrub, emergent wetlands, and early succession pine plantation uplands. Much larger than Segment 8A, this approximately 117-acre corridor consists of 59 percent wetlands. (**Table 11**) Eighteen potential waters of the U.S. totaling 69.34 acres were delineated containing Bottomland Hardwoods (12.37), Scrub Shrub (2.27), Emergent (3.35), Pine Savannah (51.13), and Riverine (0.22). The segment also includes roadway drainage features that convey infrequent stormwater drainage from runoff during rain events.

Segment 7 crosses Bayou Lacroix, an RPW that is classified as a perennial stream. (**Table 12**) The proposed Segment 7 crossing of Bayou Lacroix is located within the northern portion of Segment 7, approximately 0.4 miles south of I-10. During field surveys, stream water levels were higher than normal due to prior heavy rainfall, resulting in flooding of the riparian zone adjacent to Bayou Lacroix. Because the Bayou Lacroix riparian zone was flooded at the time of the field survey, an OHWM was not observed in the field. Therefore, aerial imagery was used to identify the approximate OHWM of the stream within the limits of the corridor under normal stream flow conditions. The width of the stream within the limits of the corridor is an average of 40 ft wide therefore it was considered to be riverine for a total of approximately 0.22 acre. Bald cypress, red maple, boxelder, loblolly and slash pine dominate the riparian vegetation. Bayou Lacroix generally flows east, eventually draining to the Jourdan River, a TNW.

Table 11. Segment 7 Wetlands and Other Waters

Wetland Number	Wetland Type	Acres
66	Scrub Shrub	1.69
67	Pine Savannah	21.02
68	Bottomland Hardwood	7.34
69	Pine Savannah	2.89
70	Scrub Shrub	0.47
71	Pine Savannah	6.91
72	Riverine	0.22
73	Scrub Shrub	0.11
74	Emergent	3.34
75	Bottomland Hardwood	1.85
76	Emergent	0.01
77	Bottomland Hardwood	0.31
78	Pine Savannah	4.04
79	Pine Savannah	2.41
80	Bottomland Hardwood	0.26
81	Pine Savannah	6.90
82	Pine Savannah	6.96
83	Bottomland Hardwood	2.61
	Total Riverine	**0.22**
	Total Wetlands	**69.12**

Table 12. Segment 7 Streams

Stream Number	Type	Name	Linear Feet (LF)
13	Perennial	Bayound LaCroix	300
		Total LF streams	**300**

4.6 SEGMENT C (REVISED FROM SEGMENTS 1-6)

Segment C is approximately 3.39 miles in length beginning at the Port Bienville railroad and ending approximately 1-mile south of US-90 and covering approximately 82 acres. The corridor is bisected by several unnamed access roads used for both silviculture and pipeline maintenance. The abundance of deer stands would indicate this area is predominantly used for hunting purposes. Land uses for this area include roadway and utility infrastructure, residential, and hunt clubs in addition to silviculture practices that dominate the landscape.

This survey corridor is extremely low-lying and mostly wet with nearly 97 percent of the corridor consisting of bottomland hardwoods, emergent wetlands and modified Pine Savannahs. Nine potential waters of the U.S. totaling 79.85 acres were delineated containing Bottomland Hardwoods (40.97), Emergent (1.08), and Pine Savannah (37.80). (**Table 13**) No flowing streams were observed within this segment during the field surveys in late spring/early summer 2016. Ending at the south

end of the survey corridor, Segment C serves as the tie-in for the proposed rail line at the Port Bienville railroad.

Table 13. Segment C Wetlands and Other Waters

Wetland Number	Wetland Type	Acres
84	Bottomland Hardwood	7.87
85	Bottomland Hardwood	7.70
86	Bottomland Hardwood	18.67
87	Bottomland Hardwood	6.73
88	Pine Savannah	17.59
89	Emergent	0.72
90	Pine Savannah	5.38
91	Pine Savannah	14.83
92	Emergent	0.36
	Total Wetlands	**79.85**

According to available USGS topographic maps, Mulatto Bayou crosses the corridor south of Old Lower Bay Road. However, no flow was observed even after several large rain events. The hydrology of this area has been heavily altered through silviculture practices as well as a borrow pit found adjacent to the survey corridor. The northern end of this corridor traverses a portion of Lower Devils Swamp, a tributary of Bayou Philip. Bayou Philip eventually flows into Catahoula Creek found north of Waveland, MS.

CHAPTER 5. THREATENED AND ENDANGERED SPECIES

A desktop review of federal and state protected threatened and endangered species, federal candidate species, and those species that have been proposed to be listed as threatened or endangered under federal law and that could occur within the survey corridor was conducted in June and July 2016, see **Appendix H**. Also, a review of the USFWS letter dated December 12, 2014, of listed species that may occur within the project survey corridor was completed. Field surveys for protected species were performed concurrent with the wetland delineation, and the 200-foot survey corridor was also the survey area used for the T&E evaluation. Various federal and state laws provide protection for threatened and endangered plant and animal species.

5.1 FEDERAL

5.1.1 Bald and Golden Eagle Protection Act of 1940

The Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. §§ 668-668c) prohibits anyone without a permit issued by the Secretary of the Interior, from taking (pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb) any bald or golden eagles and bald or golden eagles' nests (active, inactive, or seemingly abandoned) under the authority of the U.S. Fish and Wildlife Service (USFWS).

5.1.2 Marine Mammal Protection Act of 1972

The Marine Mammal Protection Act (MMPA) (16 U.S.C. §§ 1361-1423h) was enacted in 1972 in response to increasing concerns that significant declines in some species of marine mammals were caused by human activities. The National Marine Fisheries Service (NMFS) and the USFWS have been charged with enforcing the protection of all marine mammals (approximately 125 species) and their habitats in accordance with this law, including the take[5] of any marine mammals in U.S. waters by U.S. citizens on the high seas and the importation of marine mammals and marine mammal products into the U.S., which is strictly prohibited. A full list of species protected can be reviewed at http://www.nmfs.noaa.gov/pr/species/mammals.

5.1.3 Endangered Species Act of 1973

The purpose of the Endangered Species Act (ESA) of 1973 (16 U.S.C. §§ 1531-1544) is to "protect and recover imperiled species and the habitat upon which they depend" and the USFWS and the NMFS are the two federal agencies responsible for enforcing this law. Under the provisions of the ESA, the listing status of a species under the ESA is determined as either endangered or threatened. "Endangered" is defined as a species "in danger of extinction throughout all or a significant portion of its range," and a "threatened" listing denotes a "species that is likely to become endangered within the foreseeable future." Candidate Species is defined as "species for which the USFWS has sufficient information to support proposals to list a species as threatened or endangered, and for which the service anticipates a listing proposal". Prior to any federal action, under Section 7 of the ESA, consultation with the USFWS and/or the NMFS is required to determine whether any federally listed species or designated critical habitat may occur in the area of impact and to determine the proposed

[5] To harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal (16 U.S.C. § 1362) and to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, collect or kill any marine mammal (50 CFR § 216.3)

action's potential effects on these species and/or habitat. All potential impacts to Federally-listed species are being coordinated with USFWS in accordance with the ESA.

In addition to listing a species for protection under the ESA, the USFWS may also designate "critical habitat" for a species, which is defined by the ESA as:

> *the specific areas within a geographic area occupied by a species…on which are found those physical and biological features essential to the conservation of the species which may require special management considerations or protection and specific areas outside of the geographical area occupied by the species…upon a determination by the Secretary that such areas are essential for the conservation of the species.*

5.2 STATE OF MISSISSIPPI

An endangered species, as defined by Mississippi law Nongame and Endangered Species Conservation Act 1974, is any species or subspecies of wildlife whose survival and continued welfare in the state is in jeopardy or is likely to become so in the near future. (**Table 14**) Under this law, a "take" means *to harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill wildlife*. Although species become endangered for a variety of reasons, such as loss of habitat, disease, and pollution, it has been estimated that man is responsible for the extinction of up to 1,000 species worldwide each year. Mississippi has 80 species and subspecies of plants and animals, which are officially recognized as endangered.

The Mississippi Natural Heritage Program (MNHP) identifies and maps in a spatial database (Biotics) the localities of Mississippi's rarest plants, animals, exemplary natural communities, and special geological features. This database is updated continuously and utilized to portray the distribution of each species, to determine its degree of rarity, and assist with development of state, national, and global priorities for the preservation of natural diversity.

The MNHP, established in 1976 as a cooperative agreement between The Nature Conservancy (TNC) and the Mississippi Parks Commission, is part of an international network of State Natural Heritage Programs and Conservation Data Centers, all building on the same data collection methodology. Full administration of the MNHP was assumed by the Mississippi Department of Wildlife, Fisheries, and Parks in 1978.

Table 14. Federal- or State-listed/Candidate Species of Potential Occurrence in the Survey Corridor

Common Name/Scientific Name	Federal Listing Status[1]	State Listing Status[1]	Habitat Description[2]	Suitable Habitat (Yes/No)[3]	Known Occurrences (Yes/No)[4]	Critical Habitat (Yes/No)[5]	Potential to Occur[6]
Alabama (=inflated) heelsplitter *Potamilus inflatus*	T	E	Inhabits slow- to moderate-flowing rivers with stable sand, mud and/or silt bottoms. In Mississippi, the heelsplitter still occurs in part of the Tombigbee River drainage.	Yes	No	No	Not Likely to Occur
Crystal darter *Crystallaria asprella*	–	E	In Mississippi, occurs in Bayou Pierre, Homochitto, Pearl River and Tombigbee watersheds; inhabits large creeks and rivers with clean sand and gravel substrates often near tributary confluences	No	No	No	Not Likely to Occur
Ironcolor shiner *Notropis chalybaeus*	–	E	In Mississippi, it historically occurred along the coastal area of the state in coastal river drainages, Pascagoula drainage and Pearl River systems. Lowland streams with abundant aquatic vegetation, open swamp habitat, and/or areas draining densely canopied woodlands.	Yes	No	No	Low
Pearl darter *Percina aurora*	C	E	It is assumed extirpated from Pearl River drainage, now only occurring in the Pascagoula River drainage and its freshwater tributaries. Prefers slow flowing waters along the downstream edge sandbar point bars, pools and/or deep runs over bedrock substrate.	No	No	No	Not Likely to Occur
Frecklebelly madtom *Noturus munitus*	–	E	In Mississippi, it occurs in major tributaries of the Tombigbee River and lower portions of the Pearl River drainage. Preferred habitat includes stable gravel or rubble riffles and rapids in main river channels and large tributaries	No	No	No	Not Likely to Occur

Common Name/Scientific Name	Federal Listing Status[1]	State Listing Status[1]	Habitat Description[2]	Suitable Habitat (Yes/No)[3]	Known Occurrences (Yes/No)[4]	Critical Habitat (Yes/No)[5]	Potential to Occur[6]
Atlantic sturgeon (Gulf subspecies) *Acipenser oxyrinchus desotoi*	T	E	In Mississippi, previously collected in the Pearl River upstream of Madison County and in the Bogue Chitto River upstream to Pike County; found in all saltwater habitats, except during spawning season when found in major rivers that empty into the Gulf of Mexico, including the Mississippi River and Pearl River.	No	No	No	Not Likely to Occur
Smalltooth sawfish *Pristis pectinata*	E	–	Shallow waters very close to shore over muddy and sandy bottoms. They are often found in sheltered bays, on shallow banks, and in estuaries or river mouths. They prefer warmer water temperature and are known to ascend inland in river systems	No	No	No	Not Likely to Occur
Louisiana quillwort *Isoetes louisianensis*	E	–	Slow-moving freshwater streams	Yes	No	No	Low
Eastern indigo Snake *Drymarchon couperi*	T	E	In the Southeast, indigo snakes are restricted to areas of xeric pine-oak sandhills, which are usually inhabited by gopher tortoises. These snakes use gopher tortoise burrows as shelter during the winter and during the warmer months for nesting and refuge from intense summer heat.	Yes	No	No	Low
Southern hognose snake *Heterodon simus*	–	E	Habitat includes open or sparsely wooded dry areas with deep sandy or sandy-loam soils.	No	No	No	Not Likely to Occur
Black pine snake *Pituophis melanoleucus lodingi*	T	E	14 counties in southern Mississippi; inhabits mature longleaf pine forests with sandy soil, an open canopy, moderately fire suppressed midstory, and a thick grassy understory	Yes	No	No	Low

Common Name/Scientific Name	Federal Listing Status[1]	State Listing Status[1]	Habitat Description[2]	Suitable Habitat (Yes/No)[3]	Known Occurrences (Yes/No)[4]	Critical Habitat (Yes/No)[5]	Potential to Occur[6]
Rainbow snake *Farancia erytrogramma*	_	E	Inhabits rivers, streams, springs, ponds and lakes associated with soils which are sandy enough to allow it to burrow	Yes	No	No	Low
Gopher tortoise *Gopherus polyphemus*	T	E	Dry, sandy uplands, such as oak-sandhills, scrub, pine flatwoods and coastal dunes of the southeastern United States.	No	No	No	Not Likely to Occur
Ringed map turtle *Graptemys oculifera*	T	E	Native to the Pearl River watershed of Mississippi and Louisiana; requires structure on which it can safely bask protected from predation and suitable nesting habitat (large, high sandbars adjacent to a river).	No	No	No	Low
Kemp's ridley sea turtle *Lepidochelys kempii*	E	E	Warm bays and coastal waters; tidal rivers; estuaries; sea grass beds; sandy coastal beaches are used for nesting	No	No	No	Not Likely to Occur
Leatherback sea turtle *Dermochelys coriacea*	E	E	Open ocean; deeper waters of the Gulf and coastal bays; coastal beaches and barrier islands suitable for nesting	No	No	No	Not Likely to Occur
Loggerhead sea turtle *Caretta caretta*	T	E	Marine open waters, inshore areas such as bays lagoons, salt marshes, creeks, ship channels, and mouths of large rivers; sandy coastal beaches are used for nesting	No	No	No	Not Likely to Occur
Hawksbill sea turtle *Eretmochelys imbricate*	E	E	Warm bays and shallow portions of oceans; seagrass beds; estuaries; mainland beaches and islands used for nesting	No	No	No	Not Likely to Occur
Peregrine falcon *Falco peregrinus*	DL	E	Known to migrate through inland Mississippi and along the Gulf Coast, occasionally wintering on the coast. Also occurs in a wide variety of habitats including Arctic Tundra, dense forested areas and coastal cliffs.	No	No	No	Not Likely to Occur

Common Name/Scientific Name	Federal Listing Status[1]	State Listing Status[1]	Habitat Description[2]	Suitable Habitat (Yes/No)[3]	Known Occurrences (Yes/No)[4]	Critical Habitat (Yes/No)[5]	Potential to Occur[6]
Piping plover *Charadrius melodus*	E[7]T[8]	E	Wintering habitat - open, sparsely vegetated coastal beaches and sandy mud flats; in Louisiana, habitat includes beaches and mudflats of barrier islands in southeastern coastal Parishes	No	No	No	Not Likely to Occur
Southeastern snowy plover *Charadrius nivosus*	–	E	In Mississippi, nests on the barrier islands and occasionally on mainland beaches in Harrison County. Any plovers breeding in Mississippi are assumed to be year-round residents. Inhabits expanses of flat, dry sand along seacoast beaches and forages at the edge of the water or on sand flats at tidal creeks	No	No	No	Not Likely to Occur
Red knot *Calidris canutus rufa*	T	–	Wintering habitat – intertidal marine habitats, especially near coastal inlets, estuaries, and bays, or along resting formations	No	No	No	Not Likely to Occur
Red-cockaded woodpecker *Picoides borealis*	E	E	Older, mature pine forest	Yes	No	No	Low
Wood stork *Mycteria americana*	T	E	In Mississippi, found along western edge of state in counties bordering the Mississippi River and some along the eastern edge of the state. Freshwater and estuarine wetlands, primarily nesting in cypress or mangrove swamps using sloughs or swamps for foraging habitat.	Yes	No	No	Low
Brown pelican *Pelecanus occidentalis*	DL	E	The brown pelican has been in decline along the Gulf Coast since the 1960s and is now protected. In Mississippi, they are an uncommon but regular visitor. They nest and forage from barrier islands as far as 12 miles from the coastline.	No	No	No	Not Likely to Occur
Black bear ***Ursus americanus***	DL	E	In Mississippi, found in counties along the Mississippi River, lower Pearl River and Pascagoula watersheds	Yes	No	No	Low

Common Name/Scientific Name	Federal Listing Status[1]	State Listing Status[1]	Habitat Description[2]	Suitable Habitat (Yes/No)[3]	Known Occurrences (Yes/No)[4]	Critical Habitat (Yes/No)[5]	Potential to Occur[6]
Florida panther ***Puma concolor coryi***	E	E	Presumed extirpated from Mississippi; inhabits mixed swamp forests and hardwood hammocks, less frequently occurring in upland pine forests and pine savannahs.	Yes	No	No	Not Likely to Occur
Fin or finback whale *Balaenoptera physalus*	E	—	Open Ocean	No	No	No	Not Likely to Occur
Humpback whale *Megaptera novaeangliae*	E	_	Open Ocean	No	No	No	Not Likely to Occur
West Indian manatee *Trichechus manatus*	E	E	In Mississippi, observed at a number of sites inshore along the Mississippi coast. Inhabits warm, marine open water, bays, and rivers where submerged aquatic and floating vegetation is found for foraging	No	No	No	Not Likely to Occur

[1] E = Endangered; T = Threatened; C = Candidate species; DL = Delisted; - = not listed

[2] All species descriptions, preferred habitat, and location of known occurrences are summarized from the IPaC database (Federal species) and from a report entitled *Endangered Species of Mississippi*[6].

[3] Suitable habitat determined based on field observations.

[4] Known occurrences based on desktop literature review for the survey corridor.

[5] Critical habitat based on USFWS IPaC database.

[6] Potential to Occur: This classifies the likelihood of potential to occur within the survey corridor. **Not likely to occur** = the survey corridor may contain suitable habitat; however, the current known range and distribution data available does not include the survey corridor; **Low** = the survey corridor is within the breeding and/or winter range of the species, suitable habitat is present, but there are no documented occurrences of the species within the survey corridor; High = suitable habitat is present and occurrence in the survey corridor is documented by MNHP or other credible sources

[7] Only the population within the Great Lakes Watershed

[8] All populations except the Great Lakes Watershed

[6] Mississippi Museum of Natural Science. 2014. Endangered Species of Mississippi. Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Museum of Natural Science, Jackson, Mississippi.

Inflated Heelsplitter (Alabama) – Federal and State listed – Threatened/Endangered

The inflated heelsplitter has an oval, compressed to moderately inflated, thin shell. The valves may gape anteriorly. The umbos are low, and a prominent posterior wing is present that may extend anterior to the beak in young individuals. The shell is brown to black and may have green rays in young individuals. The umbonal cavity is very shallow and the nacre is pink to purple (USFWS 2017a). The inflated heelsplitter appears more inflated due to a more developed and rounded posterior ridge. The posterior wing of the inflated heelsplitter is more pronounced and abruptly rounded over the dorsum.

The preferred habitat of this species is soft, stable substrates in slow to moderate currents. It has been found in sand, mud, silt and sandy gravel, but not in large gravel or armored gravel (Hartfield 1988). It is usually collected on the protected side of bars and may occur in depths over 20 feet. The occurrence of this species in silt may not indicate that the life cycle can be successful in that substrate. Adult mussels may survive limited amounts of silt where juveniles would suffocate (USFWS 2017a). The heelsplitter has been known to use the freshwater drum as a suitable host for its eggs; therefore, it could potentially be found in any river system the drum inhabits.

Although this species was historically known to occur within the Pearl River drainage system, it currently only occurs within a part of the Tombigbee River drainage system. Recently, this species has only been collected at two locations on the Pearl River in Mississippi and in the West Pearl River in Louisiana. It still occurs in the Amite River in Louisiana and parts of the Tombigbee River drainage in Mississippi. During field reconnaissance, the largest stream encountered was Bayou LaCroix, an outlet stream of the Bay St. Louis. The segment of Bayou LeCroix located within the survey corridor is relatively narrow, but does have slow to moderate currents and silty/clay substrates based on NRCS soil data. No sand bars are present in this segment and the depth of the Bayou is less than 20 ft. Although freshwater drum species (host) may be present in the Bayou LaCroix, the heelsplitter has not been known to occur in this stream system or area. Therefore, a no effect determination is recommended.

Crystal Darter - State listed - Endangered

The crystal darter is an elongate, slender species exhibiting a noticeably narrow caudal peduncle. Maximum total length is about 150 mm (6 in.). The head is relatively large and flat compared to other darters. It has four brown saddles on the back which extend downward and forward to the midline on each side. The area between the saddles is patterned with dark brown mottling. The sides have a row of oblong dark brown blotches. The belly is silvery white and a dark brown stripe extends from eye to eye around the snout (Mississippi Museum of Natural Science [MMNS] 2014).

The crystal darter once occurred from Wisconsin east to Ohio and south to Oklahoma, Louisiana, and Florida. Its current range is considerably reduced as it is absent from all of Ohio and Indiana. In Mississippi, the crystal darter occurs in the Bayou Pierre, Homochitto, Pearl, and Tombigbee watersheds. The species formerly occurred in the Pascagoula River watershed of Mississippi as well, but has not been collected there since the 1930's (MMNS 2014).

The crystal darter inhabits clean sand and gravel raceways of larger creeks and rivers. It is usually found in water deeper than 60 cm (ca. 2 ft) with moderate to strong current. In the altered main

channel of the Tennessee-Tombigbee Waterway, crystal darters are known to occur over remnant gravel patches that are often near tributary confluences (MMNS 2014).

The streams present within the survey corridor have slow to moderate current (flow) and silty mud bottoms. This is contrary to the fast-moving, sandy gravel bottoms preferred by the crystal darter. No suitable habitat was found within the survey corridor. Therefore, project is not anticipated to negatively impact this state listed species.

Ironcolor Shiner - State listed – Endangered

The ironcolor shiner is a small fish with a deep, compressed body that is generally arched and only reaches 2.5 inches in length (New York State Department of Environmental Conservation 2017). It is colorful, with straw yellow above, a dusky stripe along the back and a silvery-white color below. A very prominent black stripe runs along the side, beginning at a black spot at the base of the tail and continuing around the snout, covering both lips and its chin. The inside of the mouth is black. Scales are darkly outlined except just above the black stripe where a gold-orange streak may be present. Breeding males often have an orange-gold body and fins.

The ironcolor shiner is found primarily in lowland streams where stream reaches are characterized by abundant aquatic vegetation, open swamp habitat, and/or areas draining densely canopied woodlands. It has been observed in deep pool areas of creeks and small rivers, as well as in bodies of water where a moderate current exists. They occur in areas with aquatic vegetation, such as bladderwort, pondweed and Elodea. Sand seems to be important for spawning.

In Mississippi, this species of shiner has historically occurred within the coastal area of the state in the Coastal Rivers, Pascagoula and Pearl River drainage systems and may exist in the survey corridor, although none were observed during field investigations. Several creeks and streams are found within the survey corridor. Each stream had slow to moderate current and silty mud bottoms. The preferred aquatic vegetation was not observed in streams during field reconnaissance. Therefore, project is not anticipated to negatively impact this state listed species.

Pearl Darter - Federal and State listed – Candidate/Endangered

The pearl darter is a small freshwater fish that measures just two-and-one-half inches long. The pearl darter can grow to 2.95 inches with males reaching a larger adult size than females. The body of the pearl darter is olive to light brown in color with the sides marked with a series of dark oval to oblong blotches and a single black caudal spot located at the base of the caudal fin (MMNS 2014).

Although always believed to be rare, the species was historically found throughout hundreds of river miles between Louisiana and Mississippi. Historical distribution included localized sites in the Pearl and Pascagoula river drainages, Mississippi and Louisiana (IUNC 2017). Museum collections suggest that the pearl darter inhabited the main channels of large Pascagoula drainage tributaries from Jackson to Lauderdale counties, Mississippi, including the Pascagoula River, Black Creek, Leaf River, Okatoma Creek, Chickasawhay River, Bouie River, and Chunky Creek. Since 1983, pearl darters have only been found in scattered sites in the Pascagoula, Chickasawhay, Chunky, Leaf, and Bouie Rivers, and Okatoma and Black Creeks.

The species is now considered to be extirpated from the Pearl River drainage in both Mississippi and Louisiana (USFWS 2014). It is not known or believed to occur within the two counties that the project occurs (Pearl River and Hancock). Therefore, a no effect determination is recommended.

Frecklebelly Madtom - State listed – Endangered

This small species of fish is a member of the catfish family and can reach up to 3.5 inches in length. The frecklebelly inhabits stable gravel or rubble riffles and rapids in both the main river channels and in their large tributaries. It is intolerant of siltation and sedimentation; therefore, any form of habitat alteration is detrimental to its range and succession.

In Mississippi, the frecklebelly inhabits the major tributaries of the Tombigbee River as well as the lower portions of the Pearl River drainage. Because the survey corridor is not within the known range of the frecklebelly within Mississippi, and because no large tributaries with gravel bottoms were observed during the field reconnaissance, it is unlikely the frecklebelly madtom occurs within the survey corridor. Therefore, project is not anticipated to negatively impact this state listed species.

Gulf Sturgeon - Federal and State listed – Threatened/Endangered

The Gulf sturgeon is anadromous and spends the major part of the year in freshwater, migrating to saltwater in the fall. Gulf sturgeon return to their natal stream to spawn (Florida Fish and Wildlife Conservation Commission 2017). The best river habitat for Gulf sturgeon are long, spring-fed, free-flowing rivers. Steep banks and a hard bottom with an average water temperature of 60 to 72 degrees Fahrenheit are also characteristic of rivers that sturgeon inhabit. Sturgeons occupy the river bottom downstream of springs where they seek thermal refuge during hot summer days. Movement from the gulf and up-river movement generally occurs between February and April, while down-river movement occurs between September and November. Its diet consists of bottom-dwelling organisms; amphipods, isopods, crustaceans, and marine worms.

Historically, the Gulf sturgeon occurred from the Mississippi River to Charlotte Harbor, Florida. Today its current range is limited from the Suwannee River in Florida to the Pearl River in Mississippi and Louisiana.

River systems with viable populations include the Pearl, Pascagoula, Escambia, Yellow, Choctawhatchee Apalachicola, and Swanee rivers. The Gulf sturgeon rarely migrates far into the Mississippi River due to a natural lack of spawning habitat.

The total number of mature individual Gulf sturgeon is unknown, but scientists estimate that the Suwannee River supports about 7,650 adults. Estimates for Apalachicola River in Florida and Mississippi's Pascagoula and Pearl rivers range between 50 and 350 mature sturgeon.

No suitable habitat for the sturgeon occurs within the project's survey corridor. No large river or streams with steep banks are present. Sturgeon in Mississippi are limited to the ideal habitat of stretches of the Pearl River. Therefore, a no effect determination is recommended.

Smalltooth Sawfish – Federal - Endangered

Smalltooth sawfish inhabit shallow coastal waters of tropical seas and estuaries throughout the world. They are usually found in shallow waters (less than 32 feet) very close to shore over muddy

and sandy bottoms (National Oceanic and Atmospheric Administration [NOAA] 2015). They are often found in sheltered bays, on shallow banks, and in estuaries or river mouths. They prefer warmer water temperature of 71-82°F. They are known to ascend inland in river systems and have been shown to have a salinity preference of 18-24 parts per thousand. They reach 18-25 feet in length and have a lifespan of 25-30 years. They can weigh up to 770 pounds and feed mostly on fish and crustaceans.

Smalltooth sawfish prefer saline or brackish water. The project area is located inland and does not contain brackish or estuarine waters. There is no suitable habitat within the project's survey corridor. Therefore, a no effect determination is recommended.

Louisiana quillwort – Federal - Endangered

The Louisiana quillwort is a small, semi-aquatic, facultative evergreen plant with spirally-arranged leaves (sporophylls) arising from a globose, two-lobed corm. The pliant, hollow leaves are transversely septate and measure 0.12 inch wide and up to 16.0 inches long. These plants are valuable indicators of stream health. To date, 8 populations occur in Louisiana, 3 populations in Alabama, and 30 populations in Mississippi (TNC 2017). It was not until 1996 that Louisiana quillwort plants were verified in Mississippi. Most Mississippi colonies of quillwort are found in the DeSoto Ranger District of the DeSoto National Forest (Forrest, Perry, Stone, Harrison, and Jackson counties) with a smaller cluster of sites in North-Central Hancock County. One colony is known from Pearl River County (MMNS 2014).

Louisiana quillworts grow in mineral soil, usually light grey in color, in bottomlands that are periodically washed free of leaves and debris. Overstory trees are typically laurel oak, red maple, tuliptree, and swamp tupelo. Pine trees are only occasionally observed, but they may have been more common, as large old pine stumps are frequently observed around quillwort populations.

The Louisiana quillwort was listed as an endangered species by the USFWS in 1992 before populations were observed in Mississippi. Although the majority of known Mississippi colonies are found on public land, various land uses, including certain silviculture activities, military training, and some recreational activities, as well as natural alterations arising from impoundment of streams, may contribute to adverse impacts on quillwort habitat. Activities which negatively affect hydrology, water quality, and/or substrate stability could threaten population persistence in its habitat.

Some suitable habitat for the quillwort is present within the survey corridor. However, the health of the streams segments present were in decline due to silviculture practices, pollution, and debris There are two ephemeral streams, six intermittent streams, and five perennial streams within the project corridor. Most of the project crossings (Streams #1-9) occur at existing road and railroad culverts and do not represent placement of structures in undisturbed areas. Several of these crossing locations are above long sections of concrete culverts such as the Interstate 59 crossings of Alligator Creek. Therefore, potential impacts to stream habitat that could potentially contain Louisiana quillwort are not anticipated at these locations as they simply will be modifications of existing culverts. Thus, impacts to Louisiana quillwort are extremely unlikely to occur in these areas.

There are four new crossings of perennial streams along the project corridor where some impacts to stream habitat could occur. Three of these crossings (Streams #10, 11, and 12) are directly adjacent

to existing road box culverts or utility easements which have had some level of prior disturbance associated with previous construction activities. Only one (Stream # 13; Bayou LaCroix) of these four new crossings is in an area not directly adjacent to a utility easement or existing culvert. However, Bayou LaCroix has be severely impacted by conversion of forest to cattle pasture in the area of the proposed crossing. Approximately 50 acres of the riparian zone of this stream has been converted to pasture. Thus, the partially open canopy and disturbance from cattle operations has resulted in suboptimal to poor habitat for Louisiana quillwort in this perennial stream. It is unlikely the quillwort inhabits these streams and no quillwort were observed during field observations. Additionally, given the small potential footprint of new disturbance (eg, new culverts or bridges) on perennial streams, impacts to the Louisiana quillwort are extremely unlikely. Therefore, a determination of may affect, not likely to adversely affect is recommended for this species.

Eastern Indigo Snake - Federal and State listed – Threatened/Endangered

The eastern indigo snake (*Drymarchon couperi*) is a non-venomous, black snake. It is the longest snake native to the United States, ranging in size from 60 to 84 inches, and is entirely shiny bluish-black color, including the belly (Savannah River Ecology Laboratory [SREL] 2017a). The chin and sides of the head are usually colored reddish or orange-brown. Juvenile indigo snakes look very similar to adults, but have much more red on their heads. Indigo snakes are sexually dimorphic, with males growing to larger lengths than females.

Eastern indigo snakes are restricted to Florida and southern areas of Georgia, Alabama, and Mississippi. Until relatively recently, all indigo snakes in the U.S. were considered to be the same species, *D. corais* (SREL 2017a).

In the southeast, indigo snakes are restricted to areas with dry sand ridges and pine-oak sandhills (uplands), dominated by pines (primarily longleaf) and oaks. Gopher tortoises usually inhabit the areas where the eastern indigo snake is found. These snakes use gopher tortoise burrows as shelter during the winter and during the warmer months for nesting and refuge from intense summer heat. During the active season, indigo snakes may move long distances and often forage along wetland margins.

Indigo snakes are active strictly by day. During the summer they prefer wetland edges where prey is abundant, but move to drier habitats in the winter. Indigo snakes breed in the winter and are more active in cold weather than most other snakes. When cornered, they may flatten their heads, hiss and vibrate their tails, which produces a rattling sound. Despite these intimidating acts, the indigo snake rarely bites. Indigo snakes regularly feed on mammals, birds, frogs and other snakes, including rattlesnakes and cottonmouths. Also, these snakes will occasionally feed on young gopher tortoises.

In the past, periodic growing season fires created excellent upland habitat for the gopher tortoise, the presence of which is important to the Indigo snake in Mississippi. In recent years, fires have been excluded from formerly suitable habitat and burning is primarily performed in the dormant season; this sort of burning does not effectively control proliferation of hardwoods and brush. In parts of its range, this species has been adversely affected by the "gassing" of gopher tortoise burrows, a practice illegal in Mississippi. The last specimen actually collected in Mississippi was taken in 1939, and there

have been no verified observations of natural populations of the Indigo snake in Mississippi since the 1950s.[7]

Suitable habitat exists for the eastern indigo snake occurring in the survey corridor, particularly along wetland edges and in the summer months. They usually prefer pine oak sandhills usually inhabited by gopher tortoises. Due to the low probability of gopher tortoises in the majority of the survey corridor, in which the eastern indigo snake uses the tortoise burrows for shelter during winter, it is unlikely to inhabit the entire survey corridor, but may be restricted to the wetland areas where prey is abundant. However, due to lack of observation of the species in Mississippi since the 1950s, it may be extirpated. Therefore, a determination of may affect, not likely to adversely affect is recommended for this species.

Southern Hognose Snake - State listed – Endangered

Southern hognose snakes are fairly small, heavy-bodied snakes that reach about 24 inches in length (SREL 2017b). These snakes are easily distinguished from most snakes in the region by their pointed, upturned snouts. Unlike eastern hognose snakes (*Heterodon platirhinos*), which occur in several color patterns, southern hognose snakes are always gray, tan, or reddish in color with a series of dark brown blotches down the center of the back and alternating smaller blotches along the sides. They are never solid black like the eastern hognose. Although generally less elaborate than those of the eastern hognose, southern hognose snakes also often put on threat displays (including neck spreading, hissing, and playing) when confronted by a predator. Female southern hognose snakes are larger than males and the young resemble miniature adults.

Southern hognose snakes were historically found in the Coastal Plain of the eastern United States from southern North Carolina to southern Mississippi and in most parts of Florida. However, this species has declined in recent years and is now only found in scattered locations in South Carolina, North Carolina, Georgia, and Florida. Although both species of hognose snake in the southeast prefer sandy areas, southern hognose snakes are found almost exclusively in sandhill, pine flatwood and coastal dune habitats, and in the sand ridges of central Florida (SREL 2017b).

Southern hognose snakes are active strictly by day and are often seen on warm mornings in the spring and fall. They are highly fossorial (living underground) and are most often encountered crossing roads that pass through sandy habitats (SREL 2017b).

Hognose snakes feed almost exclusively on toads, although they will occasionally consume other prey. They seem to be immune to poisons produced by toads, and are equipped with enlarged teeth (called rear fangs) in the back of their mouths that are used to puncture inflated toads so that they may be more easily swallowed. Female southern hognose snakes lay 6 to 14 eggs in sandy soil or logs in the early summer. The eggs hatch in September or October (SREL 2017b).

Few sandy uplands are found in the survey corridor, which is primarily made up of dense forested wetlands with saturated soils. Studies show that the southern hognose snake may no longer even inhabit Mississippi, but instead is restricted to the Carolinas, Georgia, and Florida. If in Mississippi, it

[7] Mississippi Museum of Natural Science. 2014. Endangered Species of Mississippi. Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Museum of Natural Science, Jackson, Mississippi.

is most likely to occur in northern counties with sandy, pine flatwoods. Therefore, project is not anticipated to negatively impact this state listed species.

Black Pine Snake - Federal and State listed – Threatened/Endangered

The black pine snake is a large dark brown to black snake that prefers to inhabit mature, longleaf pine forests, similar to the gopher tortoise, with sandy soil, an open canopy, moderately fire-suppressed midstory and a thick grassy understory (MMNS 2014). Recent studies co-sponsored by the Mississippi Natural Heritage Program have shown that the black pine snake is usually found in rotting pine stumps and are located underground two-thirds of the time (MMNS 2014). It is considered critically imperiled and in decline along with its preferred habitat of longleaf pine forests due to timbering and conversion to agriculture.

Although the black pine snake has been known to occur in 14 counties within southern Mississippi, (excluding Hancock County) the species is now extremely rare over most of the historic range and has been extirpated from Louisiana and Lauderdale County, Mississippi. Its current range includes Pearl River County but does not include Hancock County (MMNS 2014). It is still relatively common within DeSoto National Forest in Mississippi. A recent study commissioned by USFWS found that 31 percent of historical black pine snake population segments have been extirpated and that another 26 percent are in serious jeopardy; the main reason for the decline being habitat destruction and fragmentation. In recent years, fires (controlled burning) has been excluded from some formerly suitable habitats in Mississippi, resulting in a dense understory of hardwoods and shrubs that prevent sunlight from reaching the forest floor, shading out food sources of the black pine snake (MMNS 2014).

Within Pearl River County where the black pine snake could potentially occur, the proposed project will occur on existing rail line. This includes potential maintenance activities on the railroad berm and the replacement of the existing rail with new rails. Therefore, significant expansion of the railroad foot print will not occur and there will not be extensive impacts to the surrounding habitat. Furthermore, habitat quality for the black pine snake adjacent to the project corridor in Pearl River County is poor because of the high degree of fragmentation and general exclusion of fire necessary to develop the long leaf pine ecosystems with an open canopy and grassy understory. Literature also states that the black pine snake may be found within stream or river corridors and near pitcher plant bogs, which were present within the survey corridor. However, the proposed project will not create any new crossings of streams in Pearl River County. All crossings will be at existing culverts. Thus, impacts to stream and wetland habitat that could potentially be used by the black pine snake will be extremely small, if any. Therefore, a determination of no effect is recommended for this species.

Rainbow Snake - State listed – Endangered

The rainbow snake is a large (up to 66 inches), non-venomous, highly aquatic snake that is seldom seen because of its secretive habits (SREL 2017c). Adults have three red stripes running down a glossy black back. The belly is red or pink with two or three rows of black spots. Yellowish coloration is often present on the head and sides. They have small dark eyes, smooth shiny scales, and a pointed tail tip. Male rainbow snakes are smaller than females but have relatively longer and thicker tails. Young rainbow snakes resemble adults but generally lack any yellow coloration.

Rainbow snakes are found in the Coastal Plain of the southern United States from southern Virginia to eastern Louisiana. In Mississippi, it has been recorded in Forrest, Jackson, Hancock, Lamar, Pearl River, and Copiah counties. Rainbow snakes are found in a variety of aquatic habitats but are most common in cypress swamps and flowing-water habitats such as blackwater creeks, streams, and rivers, with soils which are sandy enough to allow it to burrow. In coastal areas, rainbow snakes can be found in tidal or even brackish water. Although highly aquatic, rainbow snakes occasionally move overland and are sometimes found far from water.

Rainbow snakes are highly aquatic and spend most of their lives hidden amongst aquatic vegetation and debris. Unlike water snakes, rainbow snakes seldom bask out of the water, preferring to remain burrowed into vegetation or soil, and thus are seldom encountered anywhere in its range, implying that it is a relatively rare species. However, due to its secretive nature, may be much more common than it appears. Rainbow snakes are perhaps most frequently encountered crossing roads adjacent to aquatic habitats, particularly on rainy summer nights. When captured, rainbow snakes do not bite.

The wetlands and other aquatic habitats in the survey corridor provide suitable habitat for the rainbow snake, and it has been recorded in Hancock County, Mississippi. It is most likely to be found in the areas where hardwoods, cypress swamp, and emergent vegetation occurs, providing the ideal vegetative cover and habitat for both dwelling and foraging. Therefore, the project may adversely impact this state listed species.

Gopher Tortoise - Federal and State listed – Threatened/Endangered

The gopher tortoise is a large (shell 5.9 to 14.6 inches long), dark-brown to grayish-black terrestrial turtle, with shovel-like forefeet, and a gular projection beneath the head on the yellowish, hingeless plastron or undershell (Ernst and Barbour 1972).

Gopher tortoises, or “gophers” as they are commonly called, live in extensive subterranean burrows in dry upland habitats (Gopher Tortoise Council 2017). The habitats where gopher tortoises are found include longleaf pine sandhills, xeric oak hammocks, scrub, pine flatwoods, dry prairies, and coastal dunes. Tortoises can also live in manmade environments, such as pastures, old fields, and grassy roadsides. To be suitable for gopher tortoises, the habitat must have well-drained sandy soils for digging burrows, herbaceous food plants, and open sunny areas for nesting and basking. Human activities eliminated gopher tortoises from a significant portion of their historic range, but they still occur in Alabama, South Carolina, Louisiana, Mississippi and Georgia, with the majority of the remaining population in Florida.

Due to the saturated soil conditions unsuitable for burrowing, the lack of suitable herbaceous plants for foraging, the dense canopy that covers most of the pine plantation and shrub area of the survey corridor, it is unlikely the gopher tortoise occurs in the survey corridor. The pine flatwood areas are heavily modified due to logging and other silviculture activities, have poorly drained saturated soils with a high water table, and have a dense canopy that limits an herbaceous layer for available food and open areas for basking. Therefore, a no effect determination is recommended for this species.

Ringed Map Turtle - Federal and State listed – Threatened/Endangered

The ringed map turtle is small. Each shield of its upper shell (carapace) has a yellow ring bordered inside and outside with dark olive-brown; its undershell (plastron) is yellow. The head has a large

yellow spot behind the eye, two yellow stripes from the orbit backwards, and a characteristic yellow stripe covering the whole lower jaw (Cagle, 1953). Males grow to 4 inches and females to 7 inches in plastron length.

The ringed map turtle is native to the Pearl River watershed of Mississippi and Louisiana. It occurs mainly in the Pearl River and its largest tributary, the Bogue Chitto River. It occasionally appears in some of the smaller tributaries (The Turtle Room 2017). It is not found in the lower, tidally influenced sections of the lower West Pearl River and Pearl River drainage system. The ringed map turtle prefers wide, sand- or clay-bottomed rivers with strong currents and adjacent white sand beaches. An abundance of basking sites in the form of brush, logs and debris is also an important part of its habitat and on which it can safely bask, protected from predation and suitable nesting habitat (large, high sandbars adjacent to a river). These habitat features are threatened by modification conducted for flood control and sand and gravel mining.

Studies have shown stable populations of the ringed map turtle in northern portions of the Pearl River near reservoir sites. The ringed map turtle is not known to occur within the survey corridor, which lacks suitable foraging and nesting habitat. Therefore, a no effect determination is recommended for this species.

Sea Turtles

Four of the world's seven sea turtle species are protected under the ESA, by the NMFS when they occur in the Gulf of Mexico coastal waters and in U.S. territorial waters, and by USFWS when they occur on land (for example, during nesting). These species include the loggerhead, leatherback, Atlantic hawksbill, and Kemp's ridley and are described below. It is rare that these species inhabit inland water in coastal Mississippi.

Kemp's Ridley Sea Turtle - Federal and State listed – Endangered/Endangered

The Kemp's ridley turtle is the smallest of the sea turtles, with adults reaching about 2 feet in length and weighing up to 100 pounds (USFWS 2016a). The adult Kemp's ridley has an oval carapace that is almost as wide as it is long and is usually olive-gray in color. The carapace has five pairs of costal scutes (plates). Four inframarginal scutes are located in each bridge adjoining the plastron to the carapace, each of which is perforated by a pore. The head has two pairs of prefrontal scales (USFWS 2016a). The Kemp's ridley has a triangular-shaped head with a somewhat hooked beak with large crushing surfaces. This turtle is a shallow-water benthic feeder, with a diet consisting primarily of crabs. Preferred habitat consists of warm, isolated waters along the coast such as bays, bayous, tidal rivers, and offshore waters and estuaries during non-nesting and sandy coastal beaches during nesting

No suitable foraging or nesting habitat occurs within the survey corridor. Therefore, a no effect determination is recommended for this species.

Leatherback Sea Turtle - Federal and State listed – Endangered/Endangered

The leatherback is the largest, deepest diving, and most migratory and wide ranging of all sea turtles. The adult leatherback can reach 4 to 8 feet in length (USFWS 2016a). Its shell is composed of a mosaic of small bones covered by firm, rubbery skin with seven longitudinal ridges or keels. The skin is

predominantly black with varying degrees of pale spotting; including a notable pink spot on the dorsal surface of the head in adults. A tooth-like cusp is located on each side of the gray upper jaw; the lower jaw is hooked anteriorly. The paddle-like clawless limbs are black with white margins and pale spotting.

The preferred habitat of the leatherback is primarily very deep, open tropical and subtropical oceans that allow for deep diving No suitable habitat occurs within the survey corridor. Therefore, a no effect determination is recommended for this species.

Loggerhead Sea Turtle - Federal and State listed – Threatened/Endangered

Loggerheads were named for their relatively large heads, which support powerful jaws and enable them to feed on hard-shelled prey, such as whelks and conch (USFWS 2016a). The carapace (top shell) is slightly heart-shaped and reddish-brown in adults and sub-adults, while the plastron (bottom shell) is generally a pale yellowish color. The neck and flippers are usually dull brown to reddish brown on top and medium to pale yellow on the sides and bottom. Mean straight carapace length of adults in the southeastern U.S. is approximately 36 inches; corresponding weight is about 250 pounds (USFWS 2016a).

Preferred loggerhead habitat includes open deep water and marine open shallow water, especially with submerged seagrass beds, salt marshes, bays, tidal passes, and coastal dunes. This species is also known to inhabit warm water bodies over the continental shelf and regularly to enter marshes, estuaries and coastal rivers that contain aquatic plants, crustaceans, mollusks, jellyfish, squid, sea urchins and fish for forage.

No suitable habitat occurs within the survey corridor. Therefore, a no effect determination is recommended for this species.

Hawksbill Sea Turtle - Federal and State listed – Endangered/Endangered

The hawksbill sea turtle is one of seven species of sea turtles found throughout the world (USFWS 2016a). One of the smaller sea turtles, it has overlapping scutes (plates) that are thicker than those of other sea turtles. Adults range in size from 30 to 36 inches carapace length, and weigh 100 to 200 pounds. Its carapace (upper shell) is an attractive dark brown with faint yellow streaks and blotches and a yellow plastron (under shell). The name "hawksbill" refers to the turtle's prominent hooked beak (USFWS 2016a). The hawksbill turtles in the Gulf of Mexico are mainly found in Mexico, Texas, and Florida, with only isolated occurrences in other Gulf states. The hawksbill's preferred habitat consists of warm, shallow water habitats (usually less than 65 ft in depth) such as bays, shoals, and coral reefs located worldwide. Seagrass beds, estuaries, mainland beaches and islands are typically preferred for nesting. Thus, the hawksbill is not likely to occur in the survey corridor due to lack of suitable habitat. Therefore, a no effect determination is recommended for this species.

Peregrine Falcon - State listed – Endangered

The word "peregrine" means "wanderer" or "pilgrim," and peregrine falcons occur all over the world (Cornell Lab of Ornithology [CLO] 2017). In North America, they breed in open landscapes with cliffs (or skyscrapers) for nest sites. They can be found nesting at elevations up to about 12,000 feet, as well as along rivers and coastlines or in cities. In migration and winter, peregrine falcons can be found

in nearly any open habitat, but with a greater likelihood along barrier islands, mudflats, coastlines, lake edges, and mountain chains (CLO 2017a).

Peregrine falcons eat mostly birds, of an enormous variety. They have been observed killing birds as large as a sandhill crane, as small as a hummingbird, and as elusive as a white-throated swift. Typical prey include shorebirds, ptarmigan, ducks, grebes, gulls, storm-petrels, pigeons, and songbirds, including jays, thrushes, longspurs, buntings, larks, waxwings, and starlings. Peregrine falcons also eat substantial numbers of bats. They occasionally pirate prey, including fish and rodents, from other raptors (CLO 2017).

Typically, peregrine falcons nest on cliffs from about 25 to 1,300 feet high (and higher, including on the rim of the Grand Canyon). On these cliffs they choose a ledge that is typically around a third of the way down the cliff face. In places without cliffs, peregrines may use abandoned common raven, bald eagle, osprey, red-tailed hawk, or cormorant nests.

The survey corridor lacks ideal open habitat for the peregrine falcon, and does not provide suitable foraging habitat. The peregrine falcon is not likely to occur within the densely forested survey corridor. No sightings of the falcon were recorded during field reconnaissance. Therefore, project is not anticipated to negatively impact this state listed species.

Piping Plover - Federal and State listed – Endangered & Threatened/Endangered

These small, stocky migratory shorebirds have a sand-colored upper body, a white underside, and orange legs (USFWS 2016a). During the breeding season, adults have a black forehead, a black breast band, and an orange bill. Piping plovers use wide, flat, open, sandy beaches with very little grass or other vegetation. Nesting territories often include small creeks or wetlands. The plovers eat insects, spiders, and crustaceans. In the fall, plovers migrate south and winter along the coast of the Gulf of Mexico or other southern locations.

The wetlands in the survey corridor consist mostly of densely vegetated pine flatwoods with no surrounding beaches. The existing wetlands are also not ideal for piping plover foraging or as a stopover site. Piping plovers do not nest in inland Mississippi, but winter along coastal beaches and barrier islands. The survey corridor is located too far inland from the preferred coastal habitat of the piping plover. Therefore, a no effect determination is recommended for this species.

Southeastern Snowy Plover - State listed – Endangered

The snowy plover can be found across North and South America, Eurasia, and Africa (CLO 2017b). In North America, it is restricted to the Gulf and Pacific coasts of the United States. For habitat, the snowy plover prefers barren to sparsely vegetated sand beaches, dry salt flats in lagoons, dredge spoils deposited on beach or dune habitat, levees and flats at salt-evaporation ponds, river bars, along alkaline or saline lakes, reservoirs, and ponds. A natural or scraped depression on dry ground usually lined with pebbles, shell fragments, fish bones, mud chips, vegetation fragments, or invertebrate skeletons is preferred for nesting (USFWS 2016a).

The project survey corridor is primarily inland forested wetlands of pine and hardwoods, with scrub shrub understory. The area contains no suitable nesting or foraging coastal habitat preferred by the

snowy plover. Therefore, it is unlikely the snowy plover inhabits the area. Therefore, project is not anticipated to negatively impact this state listed species.

Red Knot - Federal listed Threatened

At 9 to 10 inches long, the red knot is a large, bulky sandpiper with a short, straight, black bill (USFWS 2016a). During the breeding season, the legs are dark brown to black, and the breast and belly are a characteristic russet color that ranges from salmon red to brick red. Males are generally brighter shades of red, with a more distinct line through the eye. When not breeding, both sexes look alike—plain gray above and dirty white below with faint, dark streaking. Red knots feed on invertebrates, especially small clams, mussels, and snails, but also crustaceans, marine worms, and horseshoe crab eggs. On the breeding grounds knots mainly eat insects. The primary wintering areas for the red knot include the southern tip of South America, northern Brazil, the Caribbean, and the southeastern and Gulf coasts of the U.S. (USFWS 2016a).

The red knot can be found in Mississippi during the winter months (October through March). Here, they forage on coastal sandy beaches, tidal mud flats, salt marshes, oyster reefs, and exposed bay bottoms. Red knots roost on high sand flats, reefs, and other areas protected from high tides.

The survey corridor consists primarily of forested wetlands and lack the sandy coastal habitat preferred by red knots. The survey corridor also lacks an important food source for red knots (coquina clams), that are common to Gulf beaches. Due to lack of suitable habitat and food source, and because of no known occurrences of the red knot in the inland survey corridor, the project is not anticipated to impact the red knot. Therefore, a no effect determination is recommended for this species.

Red-Cockaded Woodpecker - Federal and State listed – Endangered/Endangered

About the size of the common cardinal, the red-cockaded woodpecker is approximately 7 inches long, with a wingspan of about 15 inches. Its back is barred with black and white horizontal stripes. The red-cockaded woodpecker's most distinguishing feature is a black cap and nape that encircle large white cheek patches (Nemours Wildlife Foundation 2014). Rarely visible, except perhaps during the breeding season and periods of territorial defense, the male has a small red streak on each side of its black cap called a cockade, hence its name. Female red-cockaded woodpeckers lack the red cockade. Juvenile males have a red 'patch' in the center of their black crown. This patch disappears during the fall of their first year at which time their 'red-cockades' appear.

The diet of red-cockaded woodpeckers consists mostly of insects in the egg, larvae, and adult stages. These include beetles, ants, roaches, spiders and other insects found in or on pine trees. Fruits and seeds make up a small portion of the overall diet. Large, older trees are preferred for foraging. In general, males forage on the limbs and upper trunk while females forage on the trunk below the crown.

The red-cockaded woodpecker makes its home in mature pine forests (60+ years old). Longleaf pines are most commonly preferred, but other species of southern pine are also acceptable. While other woodpeckers bore out cavities in dead trees where the wood is rotten and soft, the red-cockaded woodpecker is the only one that excavates cavities exclusively in living pine trees. Cavities are excavated in mature pines, generally over 80 years old. The older pines favored by the red-cockaded

woodpecker often suffer from a fungus called red heart disease, which attacks the center of the trunk, causing the inner wood, the heartwood, to become soft. Cavity excavation takes from one to six years.

In Mississippi, the red-cockaded woodpecker mainly occurs in the southern two-thirds of the state. It has not been found in the Delta and only sporadically occurs in northern counties. Although historically the red-cockaded woodpecker was found to occur in Pearl River and Hancock Counties where the proposed project occurs, recent data from USFWS indicate that this species is not distributed in this area (USFWS 2002). However, USFWS data indicate that this species is present in the adjacent Harrison County, MS and St. Tammany Parish, LA. Thus, it is unlikely that the red-cockaded woodpecker would nest within the survey corridor given the lack of mature undisturbed pine stands. The pine plantations in the southeast are typically clearcut within 35 years of initial planting (University of Arkansas 2014). Pine plantations within and directly adjacent to the survey corridor are heavily managed and appear to be clearcut on a rotation of less than 35 years based on aerial photographs. Therefore, the presence of suitable nesting habitat (pine tree stand greater than 60 years old) within 0.5 miles of the survey corridor is highly unlikely. Many of the pine plantations within the survey corridor are less than 30 years old. While some suitable foraging habitat may be present within the survey corridor, this habitat is unlikely to be used by red cockaded woodpecker because of the low probability of suitable nesting habitat occurring within 0.5 miles of the survey corridor. Thus, impacts to potential suitable foraging habitat are not expected to impact this species. Therefore, a determination of may affect, not likely to adversely affect is recommended for this species.

Wood Stork - Federal and State listed – Threatened/Endangered

Wood storks are large, long-legged wading birds, about 50 inches tall, with a wingspan of 60 to 65 inches. The plumage is white except for black primaries and secondaries, and a short black tail. The head and neck are largely unfeathered and dark gray in color. The bill is black, thick at the base, and slightly decurved. Immature birds are dingy gray and have a yellowish bill.

Nesting has been restricted to Florida, Georgia, and South Carolina; however, they may have formerly bred in most of the southeastern United States and Texas (USFWS 2016a). A second distinct, non-endangered population of wood storks breeds from Mexico to northern Argentina.

Wood storks from both populations move northward after breeding, with birds from the southeastern United States population moving as far north as North Carolina on the Atlantic coast and into Alabama and eastern Mississippi along the Gulf coast, and storks from Mexico moving up into Texas and Louisiana and as far north as Arkansas and Tennessee along the Mississippi River Valley. Occasional sightings are known from all states along and east of the Mississippi River, and sporadic sightings in some states west of the Mississippi and in Ontario.

Storks are birds of freshwater and estuarine wetlands, including ponds, bayheads, flooded pastures, oxbow lakes, and ditches. They nest primarily in cypress or mangrove swamps. They feed in freshwater marshes, narrow tidal creeks, or flooded tidal pools. Particularly attractive feeding sites are depressions in marshes or swamps where fish become concentrated during periods of falling water levels.

The Wood Stork is listed as an endangered species by USFWS in only Florida, Georgia, Alabama, and South Carolina because at the time of listing, that was the range of the U.S. breeding population. Birds from Mexican and Guatemalan breeding populations can be found in the U.S. as well, but these birds are not considered endangered. It is assumed birds found in Mississippi came from the non-listed population.

In Mississippi, storks are found on the western edge of the state in those areas bordering the Mississippi River. Nesting wood storks have not been confirmed in Mississippi, although a report of possible nesting was made along the Mississippi River north of Vicksburg. Although storks are not known to nest in Mississippi, the forested wetland habitat, freshwater streams, and location of the project area may provide suitable stopover and foraging habitat. Therefore, a determination of may affect, not likely to adversely affect is recommended for this species.

Brown Pelican - Federal and State listed – Delisted/Endangered

The brown pelican is a wading bird with an oversized bill, sinuous neck, and big, dark body (CLO 2017c). They measure up to 54 inches long and weigh 8 to 10 pounds**.** Brown pelicans live year-round in estuaries and coastal marine habitats along both the east and west coasts. They breed between Maryland and Venezuela, and between southern California and southern Ecuador—often wandering farther north after breeding as far as British Columbia or New York. On the Atlantic and Gulf coasts they breed mostly on barrier islands, natural islands in estuaries, and islands made of refuse from dredging, but in Florida and southern Louisiana they primarily use mangrove islets (CLO 2017c). When not feeding or nesting, they rest on sandbars, pilings, jetties, breakwaters, mangrove islets, and offshore rocks.

Brown pelicans mostly eat small fish that form schools near the surface of the water—including menhaden, mullet, anchovies, herring, and sailfin mollies. A foraging pelican spots a fish from the air and dives headfirst from as high as 65 feet over the ocean, tucking and twisting to the left to protect its trachea and esophagus from the impact. As it plunges into the water, its throat pouch expands to trap the fish, filling with up to 2.6 gallons of water. Pelicans usually feed above estuaries and shallow ocean waters within 12 miles of shore. They occasionally feed by sitting on the surface and seizing prey with their bills, like other pelican species, usually when a dense school of fish is close to the surface and the water is too shallow and muddy to plunge. They also steal food from other seabirds, scavenge dead animals, and eat invertebrates such as prawns.

Ground nests range from depressions lined with grass to bulky structures of sticks, grass, and seaweed, while tree nests are usually well-built platforms of sticks lined with grass or leaves. The female builds the nest in 7–10 days as the male gathers progressively smaller sticks for her. She pushes sticks together with her bill and then forms a nest cup by pressing with her feet and body. The male brings new material for the female to add throughout incubation, and he may rearrange the nest while inside. Nests measure up to 30 inches across and 9 inches high on the outside, with an interior space up to 12 inches across and 4 inches deep.

In the 1960s, brown pelicans nearly disappeared from the Gulf Coast. Brown pelicans are now uncommon, regular visitors to the Mississippi coast and more sightings are reported each year.

The survey corridor is located inland from any large coastal body of water pelicans would need for access to their food source and nesting. No pelicans were observed during field reconnaissance and no suitable habitat is found within the survey corridor. Therefore, project is not anticipated to negatively impact this state listed species.

Black Bear - Federal and State listed – Delisted/Endangered

The American black bear is the smallest of the three bears species found in North America, and is found only in North America. Black bears have short, non-retractable claws that give them an excellent tree-climbing ability. American black bears are omnivorous, eating plants, fruits, nuts, insects, honey, salmon, small mammals, and carrion. In northern regions, they eat spawning salmon.

It is estimated that at least 600,000 black bears live in North America. In the United States, the population is estimated to be over 300,000 individuals. According to historical accounts, black bears once lived throughout Mississippi. Today, black bears are primarily found in counties along the Mississippi, Lower Pearl, and Pascagoula watersheds.

Mississippi is home to two subspecies of black bear—the Louisiana black bear (*Ursus americanus luteolus*) and Florida black bear (*Ursus americanus floridanus*) are unique subspecies with small populations. The Louisiana black bear was recently delisted; the Florida black bear is estimated to number 3,000.

Most of the bears in the state of Mississippi are found along the drainages of major rivers such as the Mississippi, Pearl, and Pascagoula, although bears can and have been known to show up just about anywhere. Most of the bears found in the state are believed to be transient males that have wandered across state lines. They are the dispersing products of breeding populations of bears that border the state in Arkansas, Louisiana, and Alabama. Black bears were listed as endangered in Mississippi in 1984. The Louisiana black bear, which is the subspecies that occurs in the southern half of the state, was listed as federally threatened in 1992. However, as noted above, it has recently been delisted. Only small differences in skull size and shape exist between the American black bear in north Mississippi and the Louisiana black bear found in the south. Mississippi Department of Wildlife, Fisheries, and Parks' (MDWFP) biologists currently estimate the Mississippi bear population at less than 150 bears in the entire state.

Suitable habitat occurs in the survey corridor, primarily in hardwood forested areas. No sightings of the black bear occurred during field reconnaissance. Pearl River and Hancock Counties are both listed as having frequent reported occurrences (11 to 30 sightings) of black bears based on data from 2002 to 2010 (Mississippi State University 2017). Based on reported occurrences of black bears in Mississippi, Pearl River and Hancock Counties have and there are no documents of it inhabiting the survey corridor. Because bears are larger, mobile animals, they are able to avoid temporary disturbances to their surroundings. Therefore, no direct impacts are anticipated. However, there will be a small amount of suitable habitat loss from the construction of the new railroad and increased fragmentation of habitat. Therefore, the project may adversely impact this state listed species.

Florida Panther - Federal and State listed – Endangered/Endangered

The Florida panther is tawny, brown on the back and pale gray underneath. It is one of 32 *Puma concolor* subspecies known by many names – puma, cougar, mountain lion, painter, catamount and

panther. Panthers historically ranged across the southeastern United States including Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, and parts of Tennessee and South Carolina. Now, the breeding population of Florida panthers is found only in the southern tip of Florida, south of the Caloosahatchee River. Females do not roam as widely and none has been documented outside of south Florida in decades.

Florida panthers are about 6 to 7 feet long – males are bigger than females. They are carnivores. They are skilled at hunting white-tailed deer, feral hogs, raccoons, and other medium-sized mammals and reptiles. Florida panthers also stalk birds.

Florida panthers utilize a diversity of warm climate habitats. They live in wetlands, swamps, upland forests, and stands of saw palmetto. Panthers are wide-ranging, secretive, and occur at low densities. They require large, contiguous areas to meet their social, reproductive, and energetic needs. Panther habitat selection is related to prey availability. Dense understory vegetation provides some of the most important feeding, resting, and denning habitat for panthers. The historic range of the Florida panther extended from Florida to Louisiana throughout the Gulf. Florida panthers live alone, unless a pair is mating or a female is raising cubs. Males roam much larger territories than the females. A male can occupy a territory over 200 to 250 square miles in size (National Wildlife Federation 2017).

The Florida panther probably once ranged over most of Mississippi. Unconfirmed reports of panthers in Mississippi over the past few years have been concentrated along the Mississippi River and along the lower Pearl River. No records could be located documenting the panther within the vicinity of the survey corridor.

The corridor's hardwood forested wetlands and swamp areas provide suitable habitat and food for the Florida panther, although it less frequently occurs in upland pine forests or pine savannahs. The lack of thick understory in most of the survey corridor is not suitable for denning. Therefore, a determination of may affect, not likely to adversely affect is recommended for this species.

Finback Whale – Federal listed – Endangered

The fin or finback whale is a large baleen whale that belongs to the cetacean species, and measures up to 90 feet in length. This whale is considered the second biggest whale in existence in terms of length right after the blue whale. The diet of fin whales consists largely of crustaceans, krill, squid, and fish. The fin whale can be found traveling throughout the world's major oceans, with the exception of the coldest regions.

No suitable habitat within the survey corridor. Therefore, a no effect determination is recommended for this species.

Humpback Whale - Federal listed – Endangered

An adult humpback whale can grow to an average length of 40 to 60 feet long and weigh as much as 44 tons. These marine mammals are generally either a dark grey or black, with white patches on their stomach and knobs (known as tubercles) covering their head.

The whale's back is largely flat with a small dorsal fin located down the far side of its back; however, when swimming the humpback may arch its back and flukes causing its back to look like a large hump.

Humpback whales have a pretty diverse diet when it comes to the baleen whale suborder and are known for eating small fish, krill, salmon, herring, mackerel, and capelin among other small prey. These whales hunt and feed during the summer months in cold waters and migrate toward warmer tropical areas during the winter months to mate and bear offspring.

No suitable habitat occurs within the project's survey corridor. Therefore, a no effect determination is recommended for this species.

West Indian Manatee - Federal and State listed – Endangered/Endangered

Manatees are protected under the Marine Mammal Protection Act, which prohibits the take (i.e., harass, hunt, capture, or kill) of all marine mammals (USFWS 2016a). Manatees are found in marine, estuarine, and freshwater environments. The West Indian manatee, *Trichechus manatus*, includes two distinct subspecies, the Florida manatee (*Trichechus manatus latirostris*) and the Antillean manatee (*Trichechus manatus manatus*). Manatees have large, seal-shaped bodies with paired flippers and a round, paddle-shaped tail. They are typically grey in color (color can range from black to light brown) and occasionally spotted with barnacles or colored by patches of green or red algae. The muzzle is heavily whiskered and coarse, single hairs are sparsely distributed throughout the body. Adult manatees, on average, are about 9 feet long and weigh about 1,000 pounds. At birth, calves are between 3 and 4 feet long and weigh between 40 and 60 pounds.

No suitable habitat occurs within the project's survey corridor. Therefore, a no effect determination is recommended for this species.

5.3 CONCLUSION

Due to potential suitable habitat observed within the survey corridor, the project may affect, but is not likely to adversely affect the following federally listed species: Louisiana quillwort, eastern indigo snake, red-cockaded woodpecker, wood stork, and the Florida panther.

The project would have no effect on all other federally listed species addressed in this document. No protected species were observed during field reconnaissance.

Only two state listed species may be negatively affected by the proposed project: the black bear and rainbow snake. Black bears are mobile animals and able to avoid temporary disturbances to their surroundings. Therefore, no direct impacts are anticipated. However, there will be a small amount of suitable habitat loss from the construction of the new railroad and increased fragmentation of habitat. The rainbow snake may be adversely impacted with the conversion of wetland and aquatic habitats to uplands as part of the proposed construction of the rail project. This construction may reduce the vegetative cover (habitat) and food source of the rainbow snake within the right of way and cause displacement. Potential impacts include being struck by construction equipment and vehicles when trying to escape its burrow/habitat, stress, and exposure to predators from lack of suitable cover. No other state lists species will be negatively affected by the proposed project.

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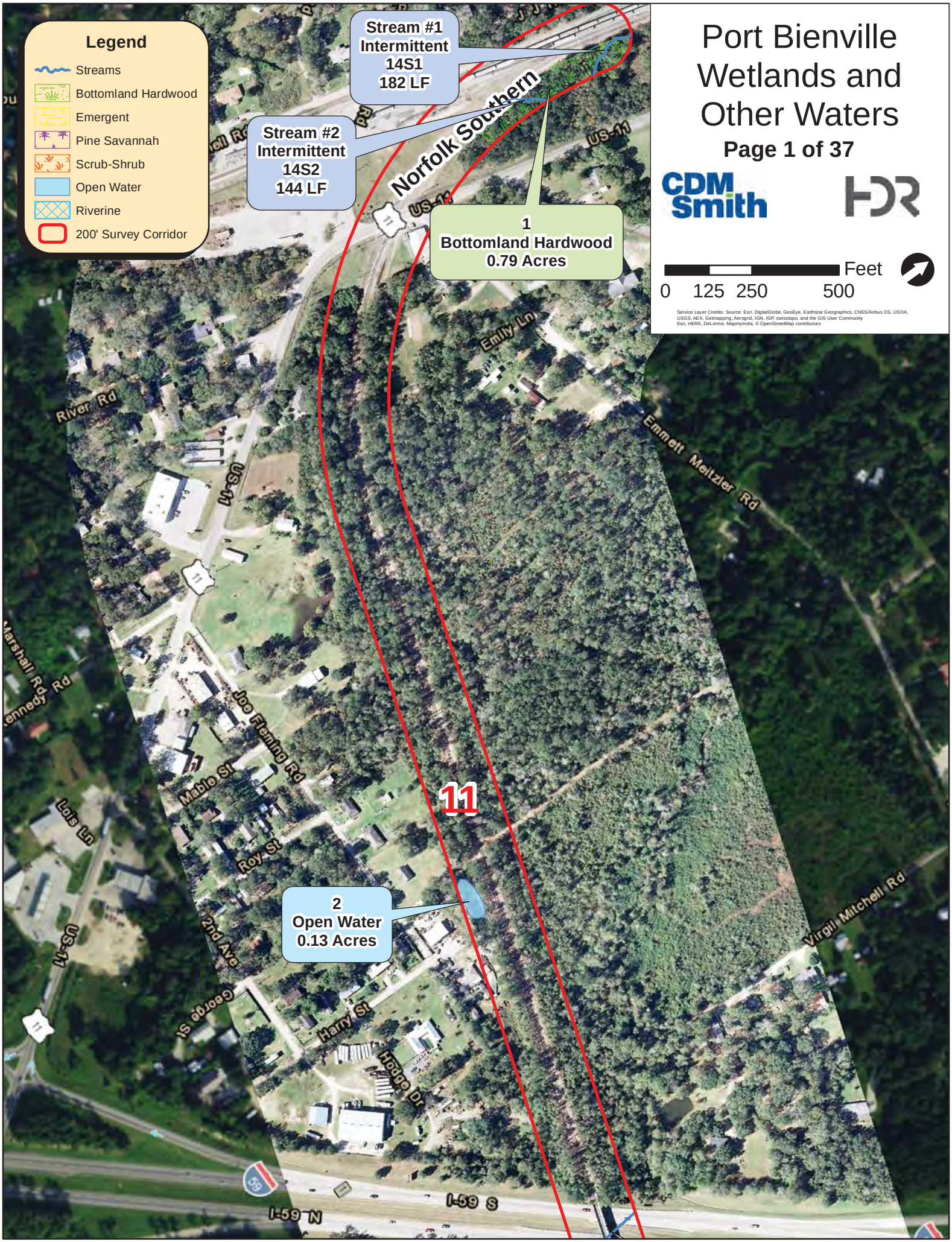
APPENDIX A — METHODS AND TOOLS

Table A-1. Methods and tools used to prepare the report.

Parameter	Method or Tool	Website	Reference
Wetland Delineation	1987 Manual	http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf	Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1, US. Army Engineer Waterways Experiment Station, Vicksburg, Miss.
	Regional Supplement	http://el.erdc.usace.army.mil/elpubs/pdf/trel08-30.pdf	U.S. Army Corps of Engineers. 2008. *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region*, ed. J.S. Wakely, R.W. Lichvar, and C.V. Noble. ERDC/ EL TR-08-03. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
Wetland Classification	USFWS / Cowardin Classification System	http://www.fws.gov/nwi/Pubs_Reports/Class_Manual/class_titlepg.htm	Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. *Classification of wetlands and deepwater habitats of the United States*. Government Printing Office, Washington, D.C.
Other waters Delineation	OHWM	http://www.usace.army.mil/inet/functions/cw/cecwo/reg/33cfr328.htm	Congressional Federal Register 33 Part 328 Definition of Waters of the United States.
Hydrology	Technical Standard	http://el.erdc.usace.army.mil/wrap/pdf/tnwrap05-2.pdf	U.S. Army Corps of Engineers. 2005. *Technical Standard for Water-Table Monitoring of Potential Wetland Sites, WRAP Technical Notes Collection* (ERDC TN-WRAP-05-02). U.S. Army Engineer Research and Development Center, Vicksburg, MS.
Plant Indicator Status	Southeast (Region 2) (Reed, 1988)	http://plants.usda.gov/wetinfo.html	Reed, P.B. Jr. 1988. *National list of plant species that occur in wetlands: Southeast* (Region 2) Washington. Biological Report NERC-88/26.2 for National Wetlands Inventory, Washington, D.C.
	National Wetland Plant List	https://rsgis.crrel.usace.army.mil/apex/f?p=703:1:3582582867881596	North American Digital Flora: National Wetland Plant List
	USDA Plant Database	http://plants.usda.gov/	Website (see Appendix A)
Soils Data	Soil Survey	Web Soil Survey: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx Soil Data Mart: http://soildatamart.nrcs.usda.gov/	Website
	Hydric Soil Indicators	http://soils.usda.gov/use/hydric/	USDA Natural Resources Conservation Service. 2006b. *Field indicators of hydric soils in the United States, Version 6.0*. ed. G. W. Hurt and L. M. Vasilas. Fort Worth, TX: USDA NRCS in cooperation with the National Technical Committee for Hydric Soils.

Parameter	Method or Tool	Website	Reference
Climate Data	Wets Table	http://www.wcc.nrcs.usda.gov/climate/wetlands.html	Website
Threatened and Endangered Species	Information Planning and Conservation (IPaC)	https://ecos.fws.gov/ipac/gettingStarted/index	Website
	Mississippi Natural Heritage Program (MNHP)	https://www.mdwfp.com/seek-study/science-resources/endangered-species.aspx	Mississippi Natural Heritage Program, 2015. Listed Species of Mississippi. Museum of Natural Science, Mississippi Department of Wildlife, Fisheries, and Parks, Jackson, MS. 3pp.
	National Oceanic and Atmospheric Administration Critical Habitat Mapper	http://www.nmfs.noaa.gov/pr/species/criticalhabitat.htm	Website

APPENDIX B — CORRIDOR MAPS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Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
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14S1
182 LF
Stream #2
Intermittent
14S2
144 LF
1
Bottomland Hardwood
0.79 Acres
2
Open Water
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US-11
Emily Ln
River Rd
US-11
Emmett Meitzler Rd
Marshall Rd
Kennedy Rd
Joe Fleming Rd
Mable St
Lois Ln
Roy St
US-11
2nd Ave
George St
Harry St
Hodge Dr
Virgil Mitchell Rd
I-59 N
I-59 S
11
Port Bienville
Wetlands and
Other Waters
Page 1 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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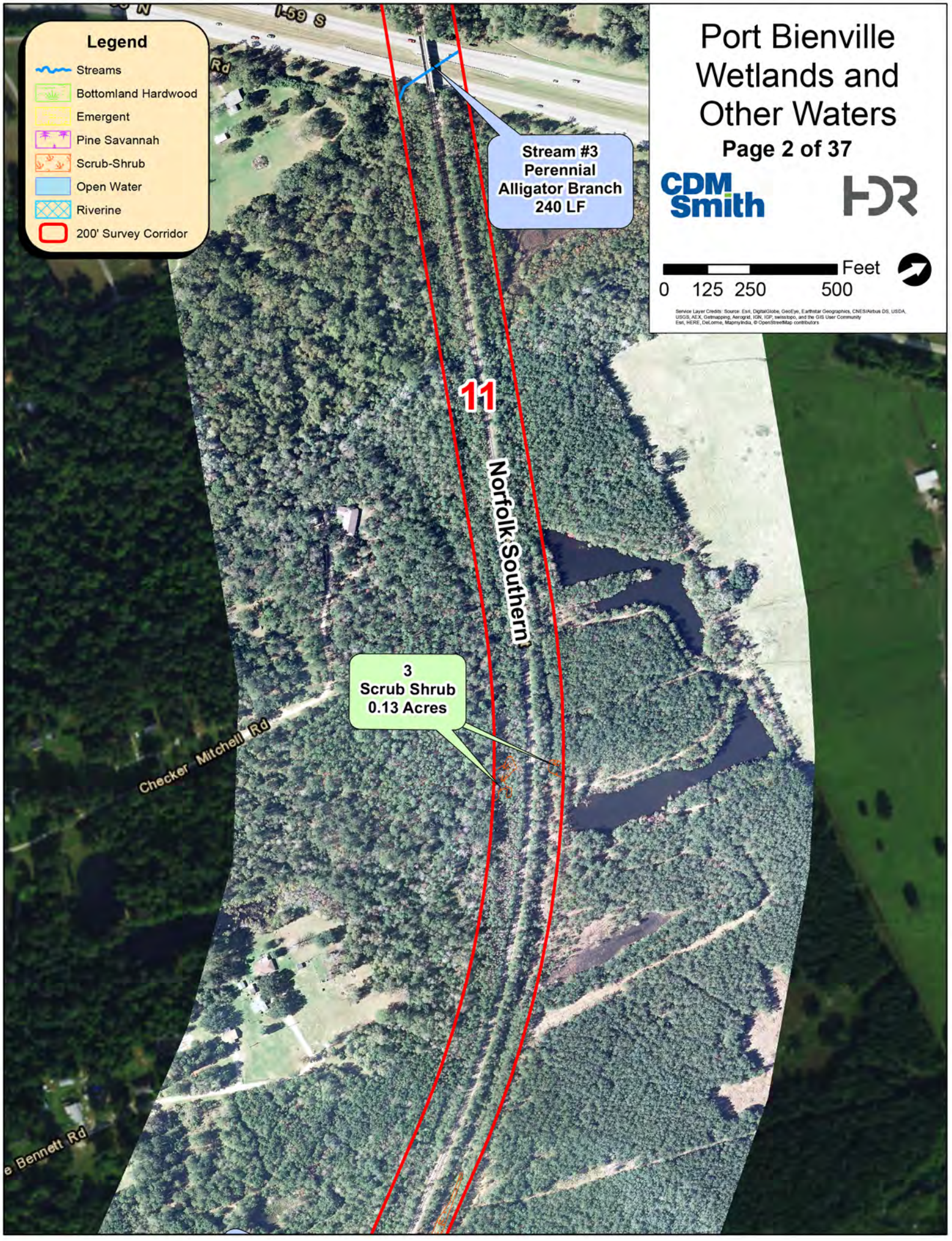
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Open Water
Riverine
200' Survey Corridor
I-59 S
Rd
Stream #3
Perennial
Alligator Branch
240 LF
11
Norfolk Southern
3
Scrub Shrub
0.13 Acres
Checker Mitchell Rd
e Bennett Rd
Port Bienville
Wetlands and
Other Waters
Page 2 of 37
CDM Smith
HDR
Feet
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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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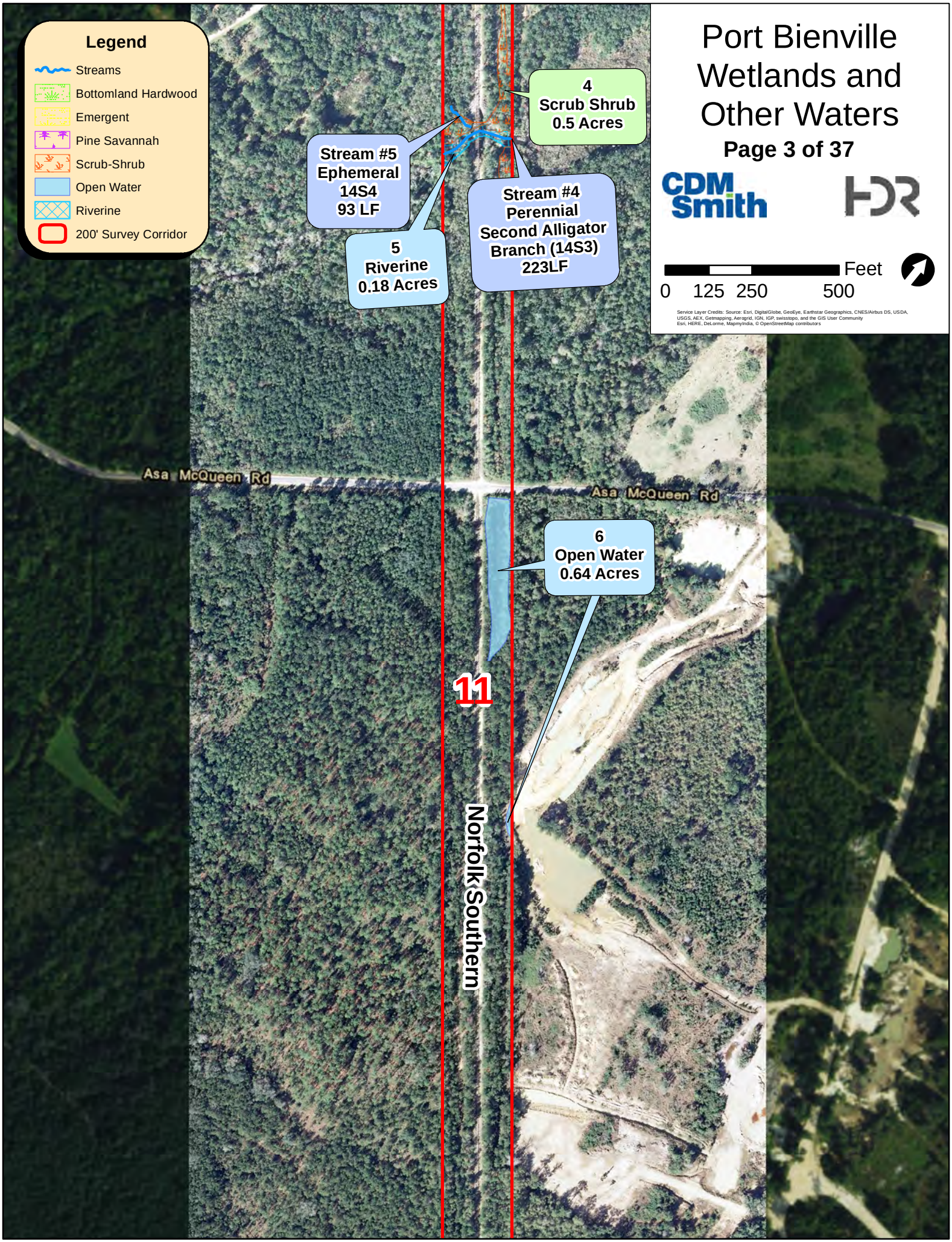
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Streams
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Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 3 of 37
CDM Smith
HDR
Feet
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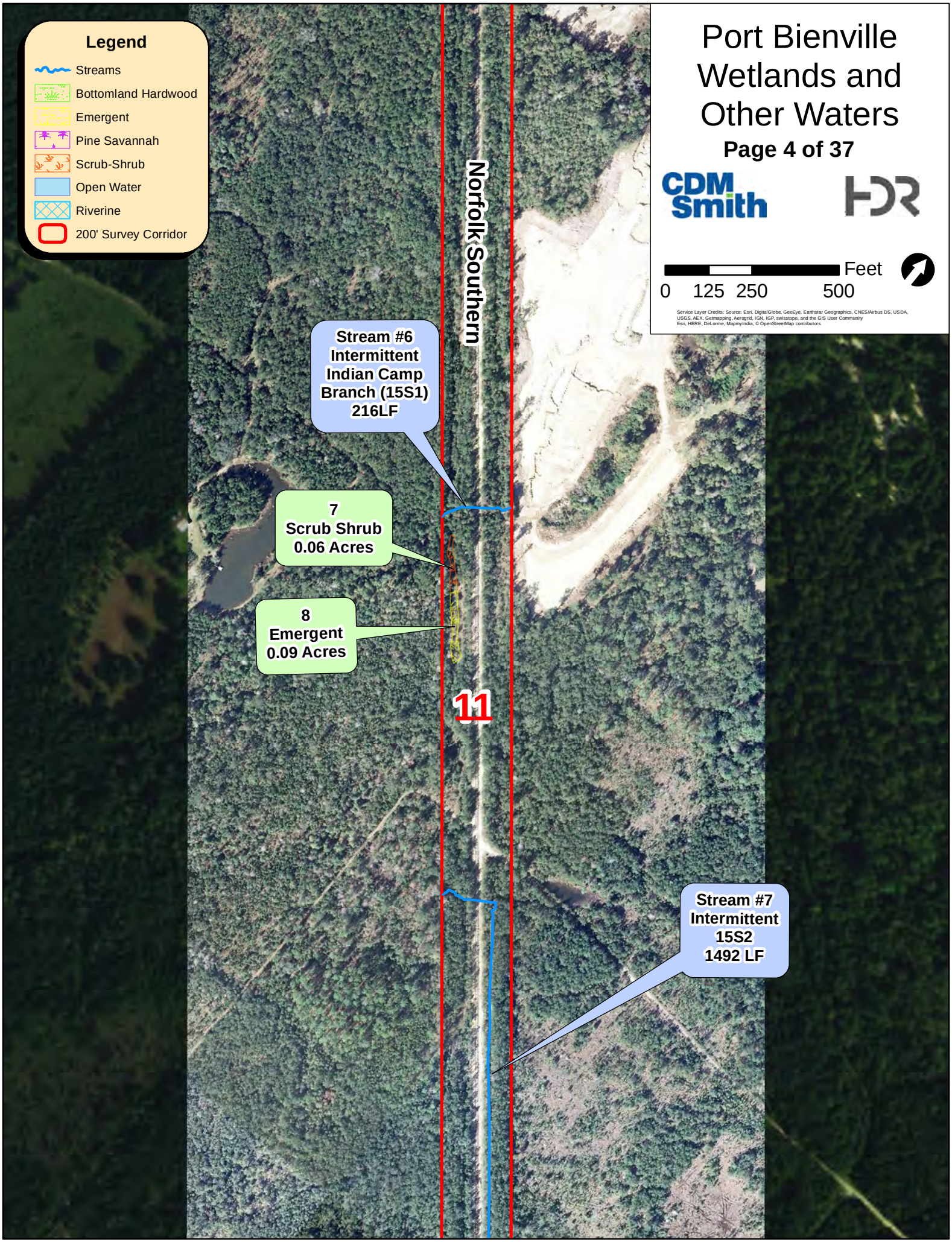
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors
4 Scrub Shrub 0.5 Acres
Stream #5 Ephemeral 14S4 93 LF
Stream #4 Perennial Second Alligator Branch (14S3) 223LF
5 Riverine 0.18 Acres
Asa McQueen Rd
Asa McQueen Rd
6 Open Water 0.64 Acres
11
Norfolk Southern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Port Bienville Wetlands and Other Waters
Page 4 of 37
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Norfolk Southern
Stream #6 Intermittent Indian Camp Branch (15S1) 216LF
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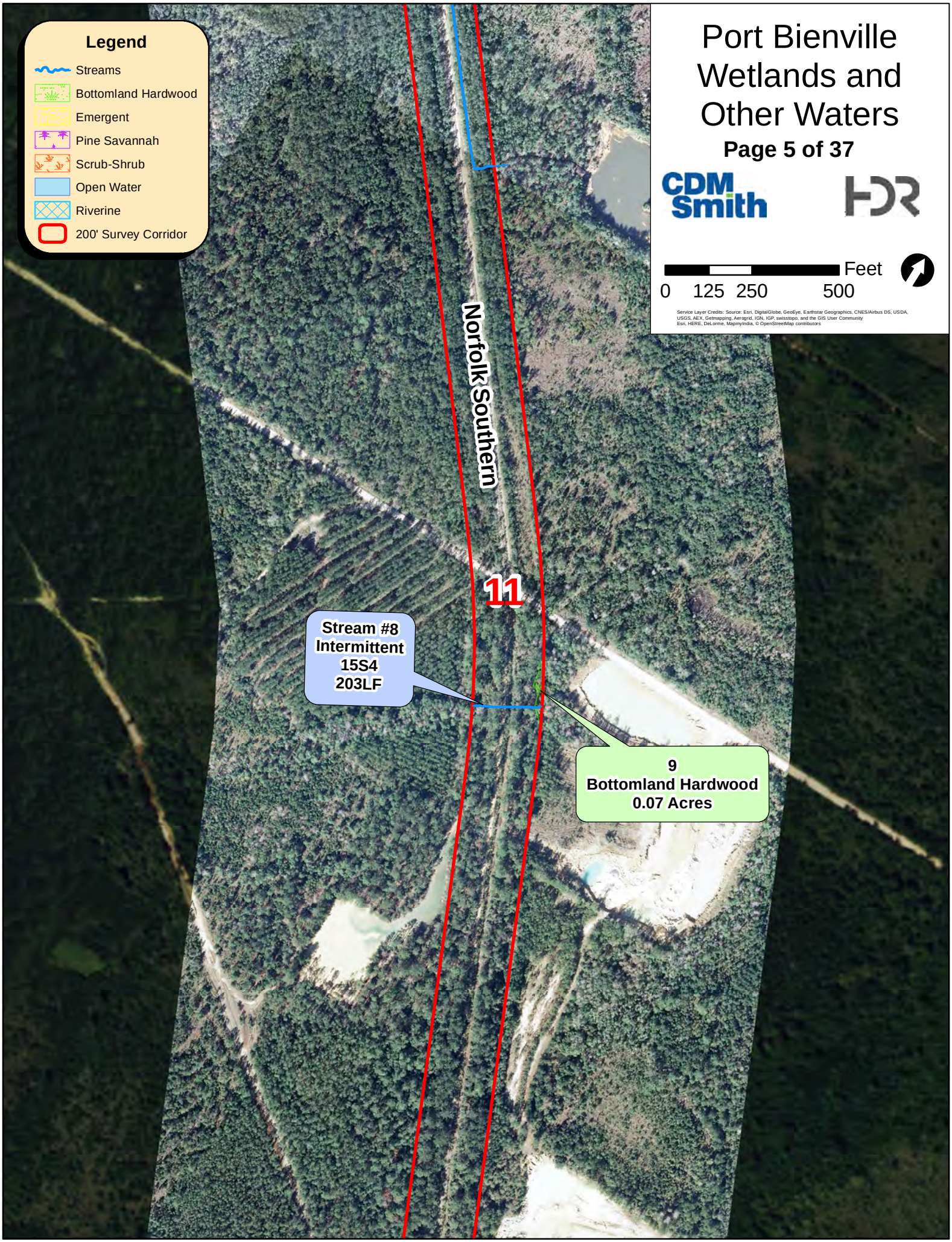
8 Emergent 0.09 Acres
11
Stream #7 Intermittent 15S2 1492 LF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200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 5 of 37
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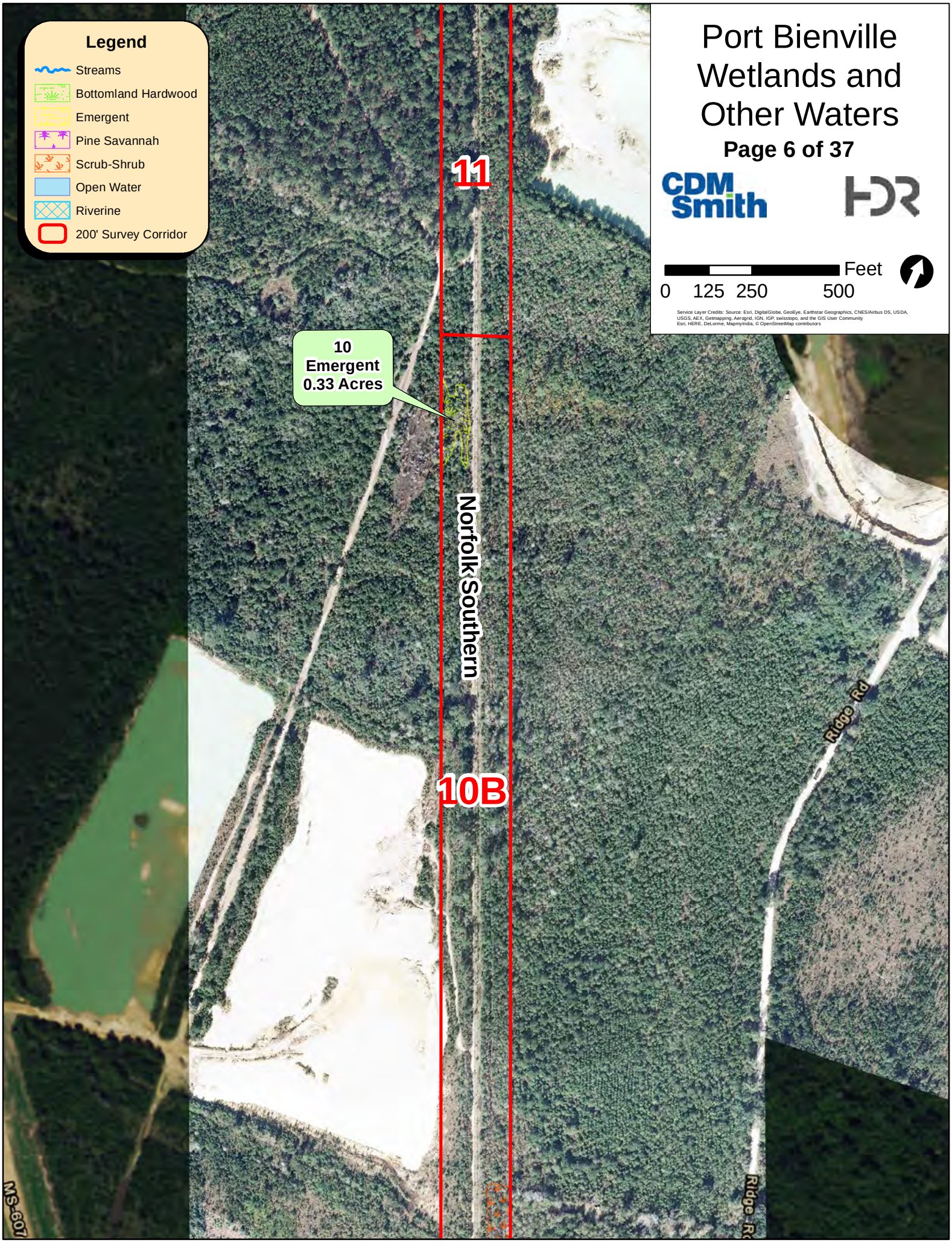
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Riverine
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Port Bienville Wetlands and Other Waters
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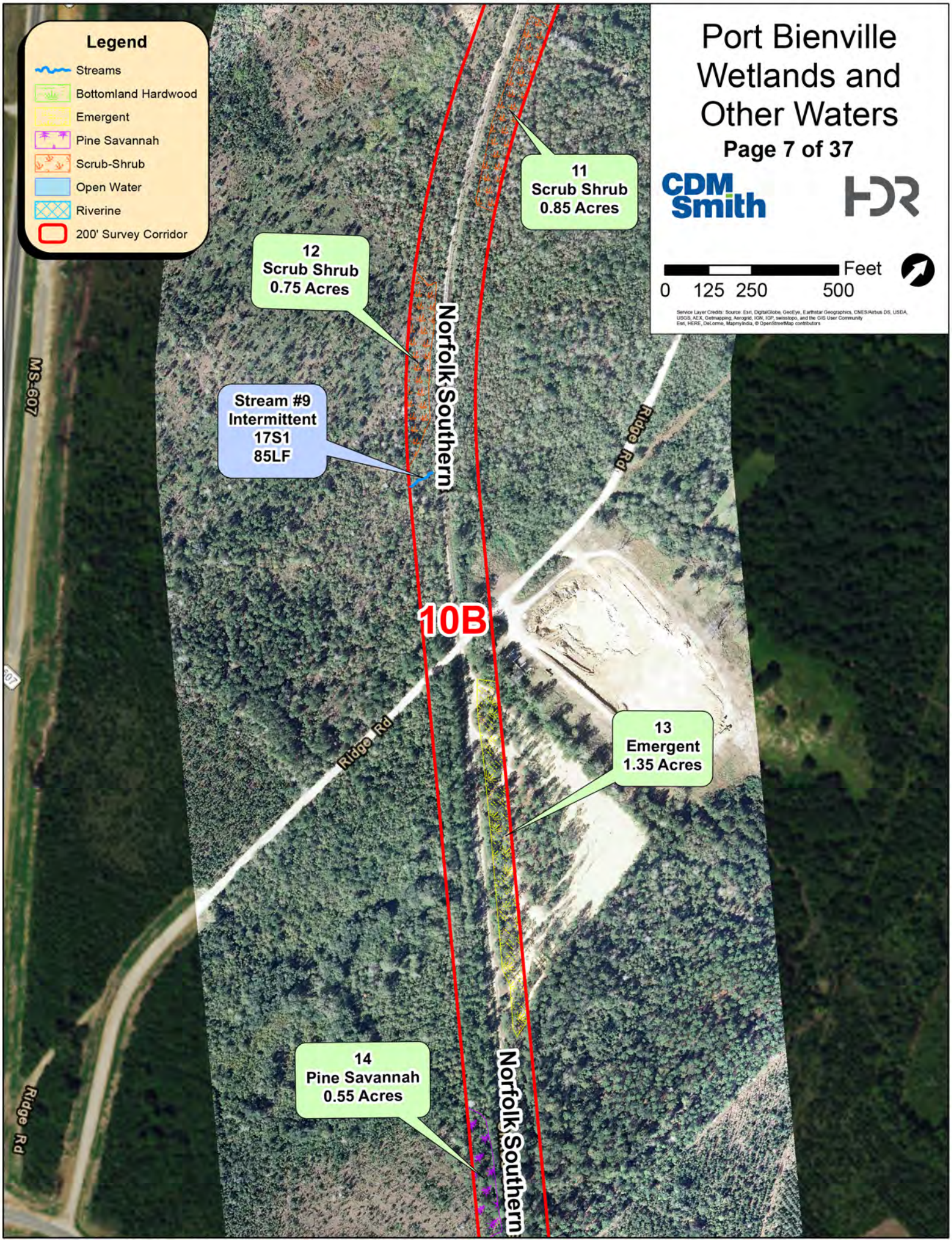
MS-607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Riverine
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Port Bienville Wetlands and Other Waters
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Scrub Shrub
0.85 Acres
12
Scrub Shrub
0.75 Acres
Stream #9
Intermittent
17S1
85LF
Norfolk Southern
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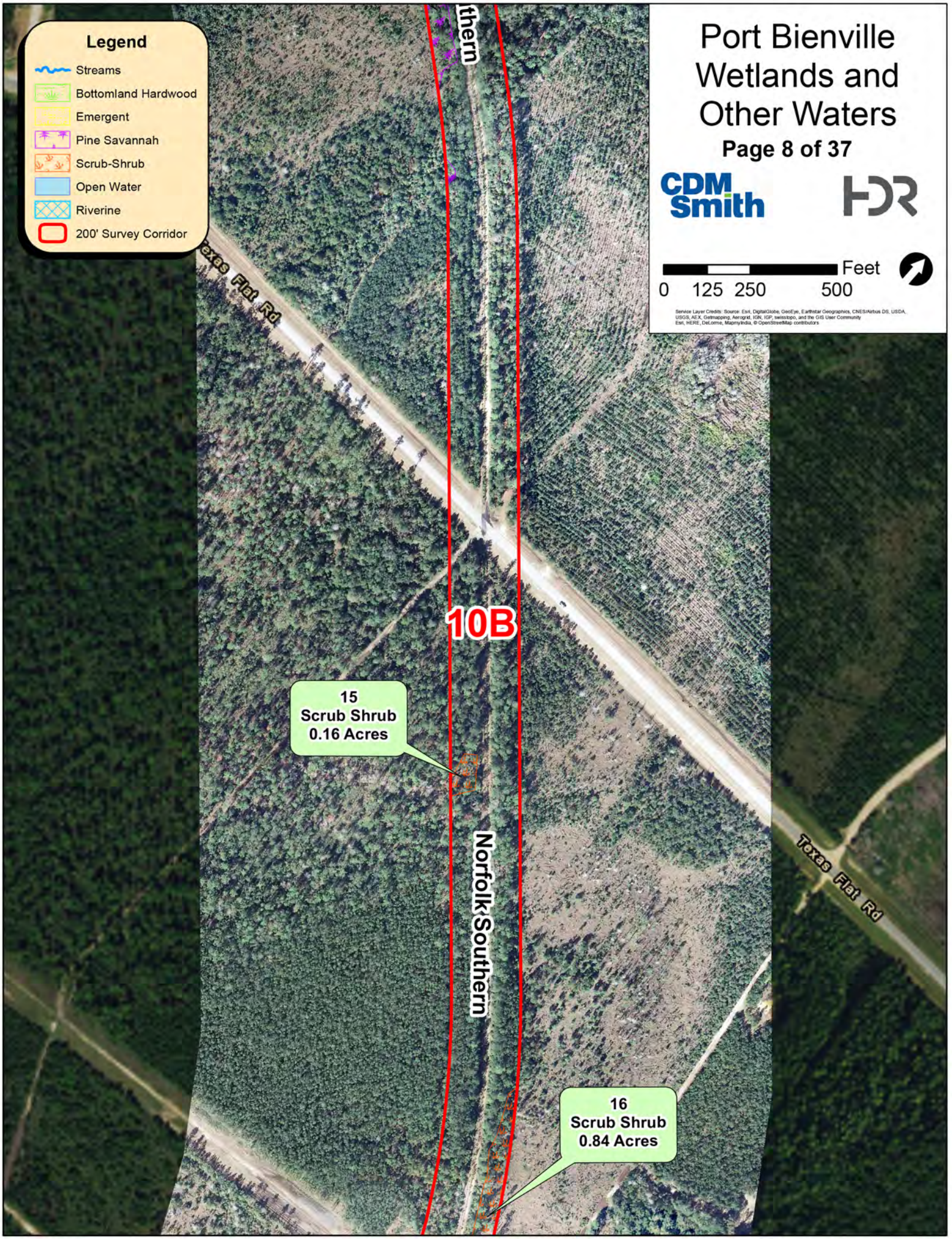
Norfolk Southern
Ridge Rd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thern
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Norfolk Southern
Texas Flat Rd
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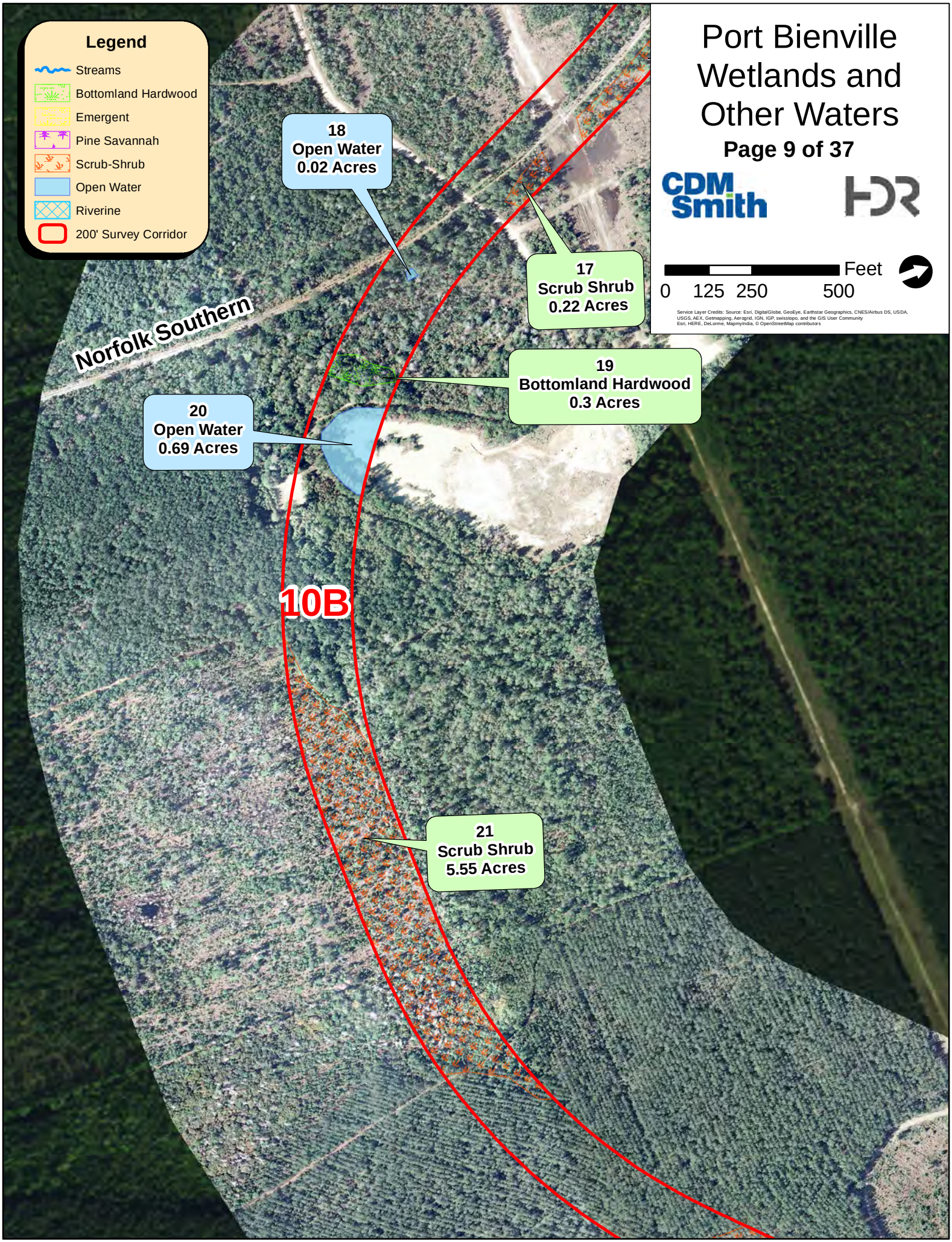
Scrub Shrub
0.84 Acres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Riverine
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Scrub Shrub
0.22 Acres
19
Bottomland Hardwood
0.3 Acres
20
Open Water
0.69 Acres
21
Scrub Shrub
5.55 Acres
Norfolk Southern
10B
Port Bienville
Wetlands and
Other Waters
Page 9 of 37
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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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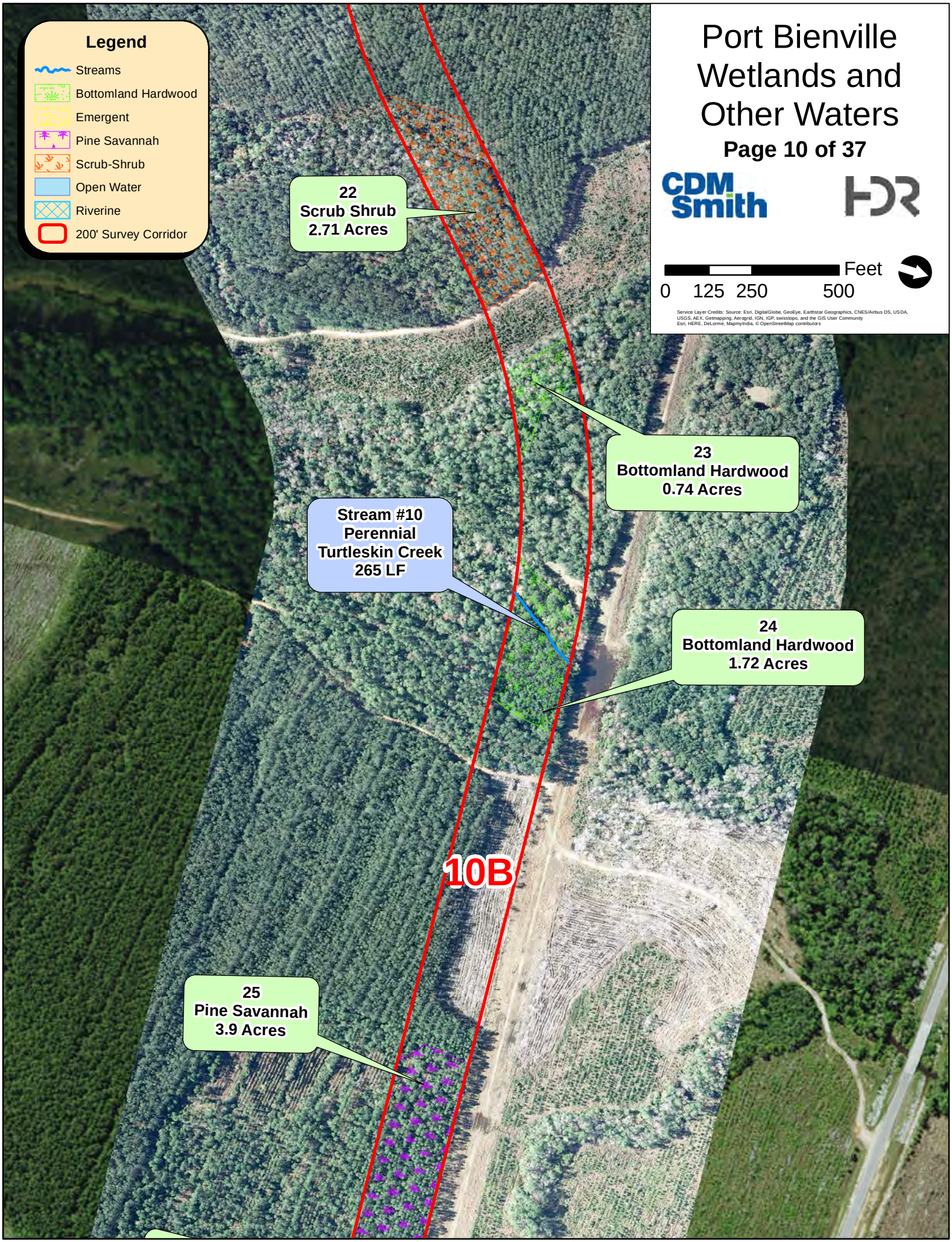
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Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 10 of 37
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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors
22 Scrub Shrub 2.71 Acres
23 Bottomland Hardwood 0.74 Acres
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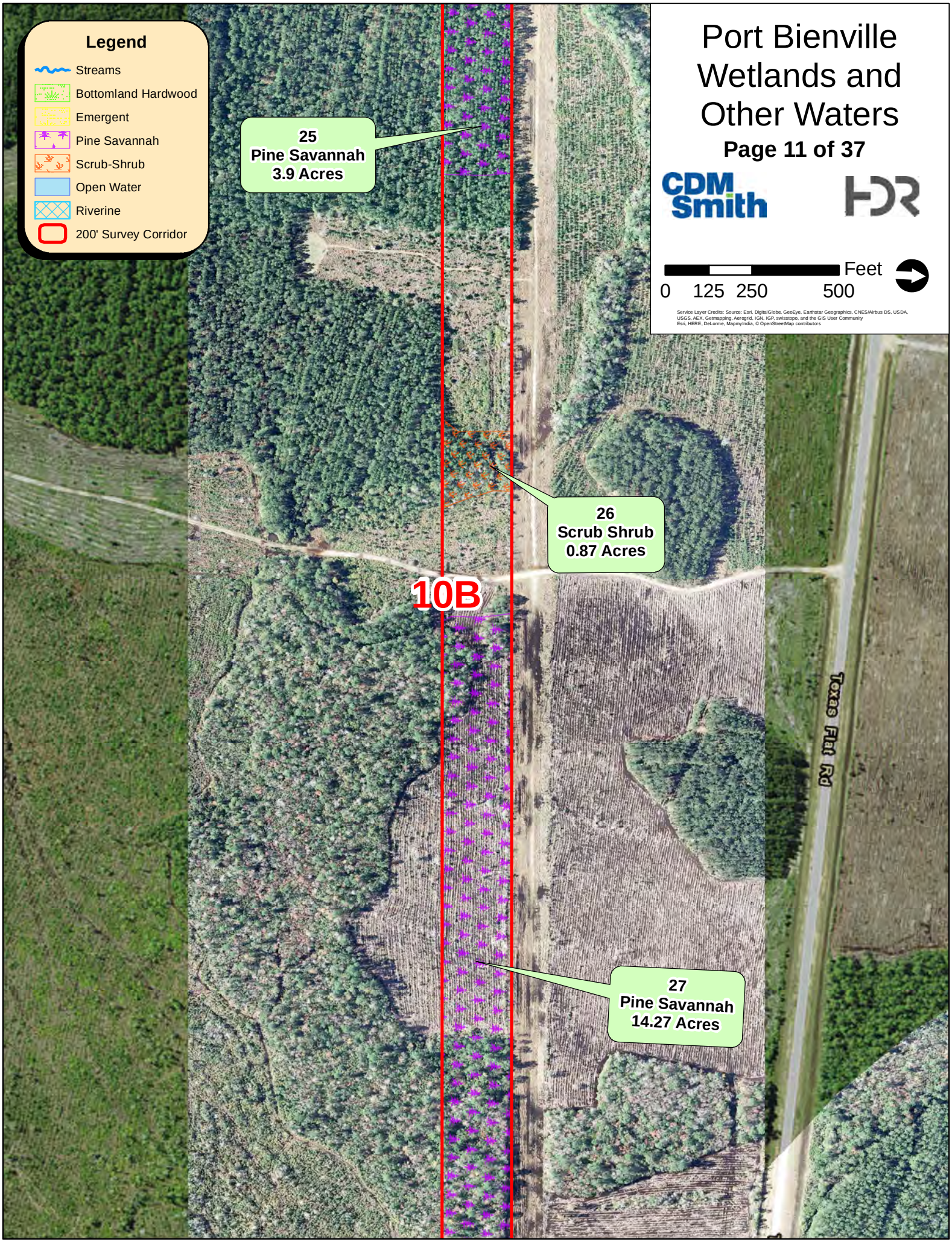
24 Bottomland Hardwood 1.72 Acres
10B
25 Pine Savannah 3.9 Acres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Emergent
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Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
25
Pine Savannah
3.9 Acres
26
Scrub Shrub
0.87 Acres
10B
27
Pine Savannah
14.27 Acres
Texas Flat Rd
Port Bienville
Wetlands and
Other Waters
Page 11 of 37
CDM Smith
HDR
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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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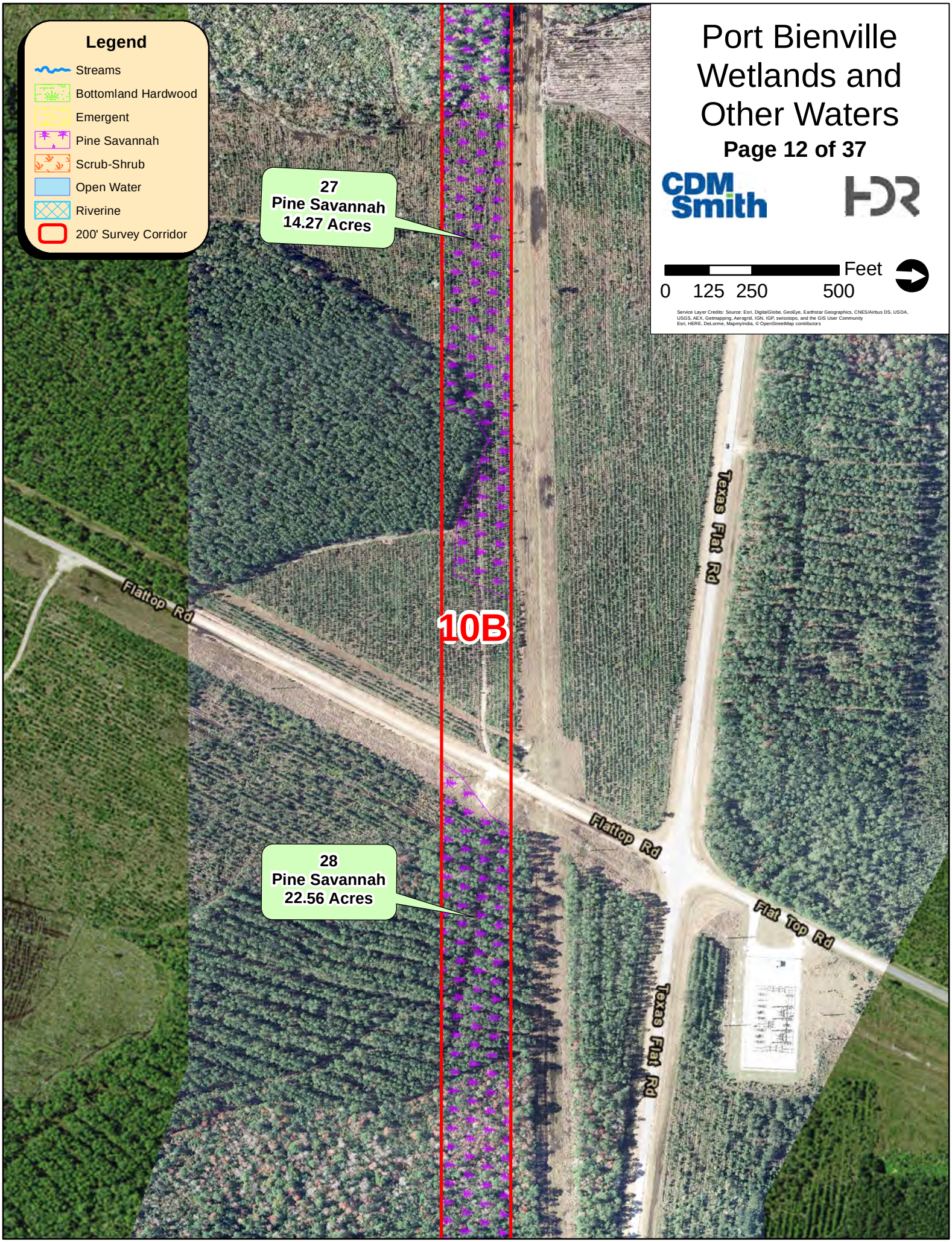
Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
27
Pine Savannah
14.27 Acres
28
Pine Savannah
22.56 Acres
10B
Flattop Rd
Texas Flat Rd
Flattop Rd
Flat Top Rd
Texas Flat Rd
Port Bienville
Wetlands and
Other Waters
Page 12 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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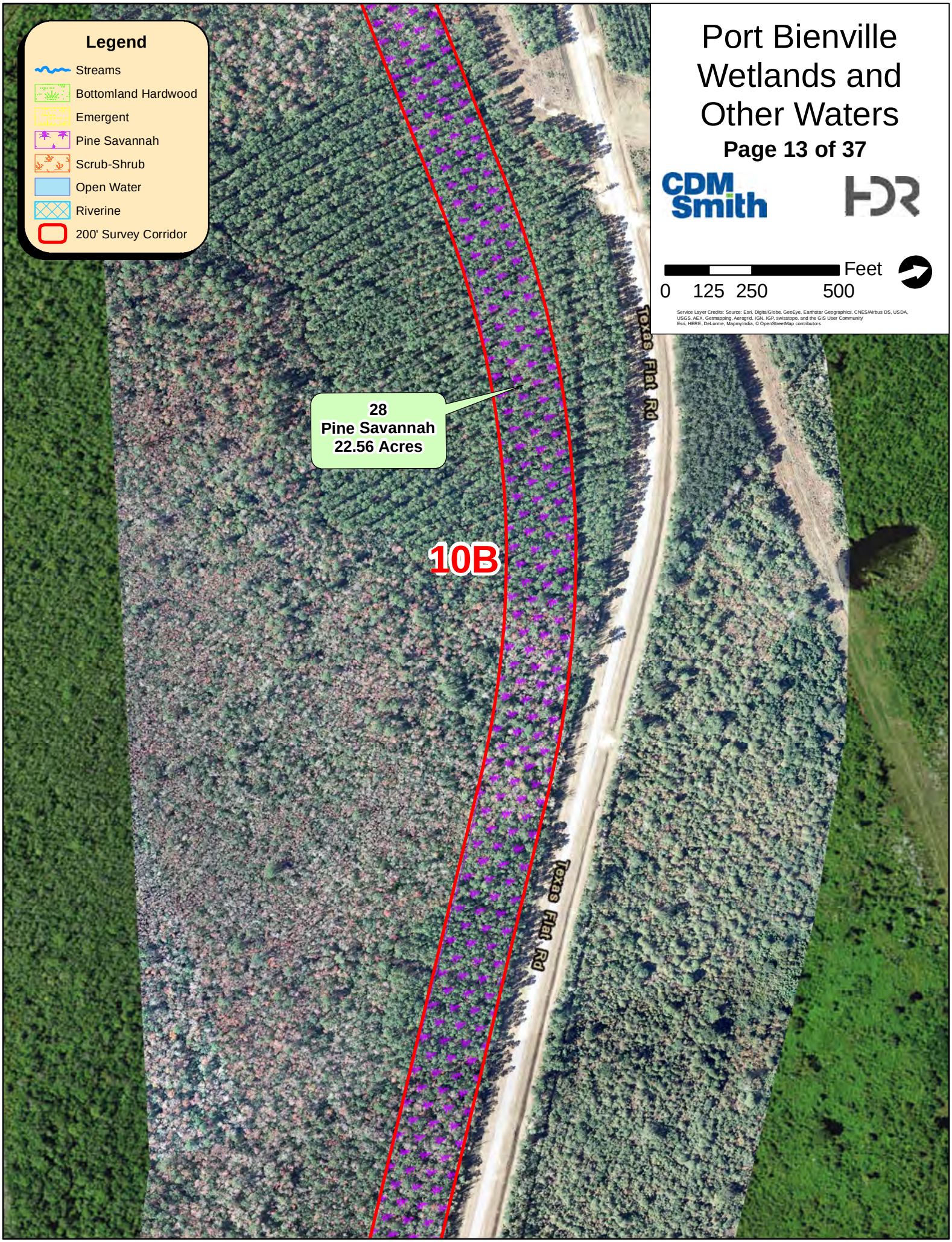
Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 13 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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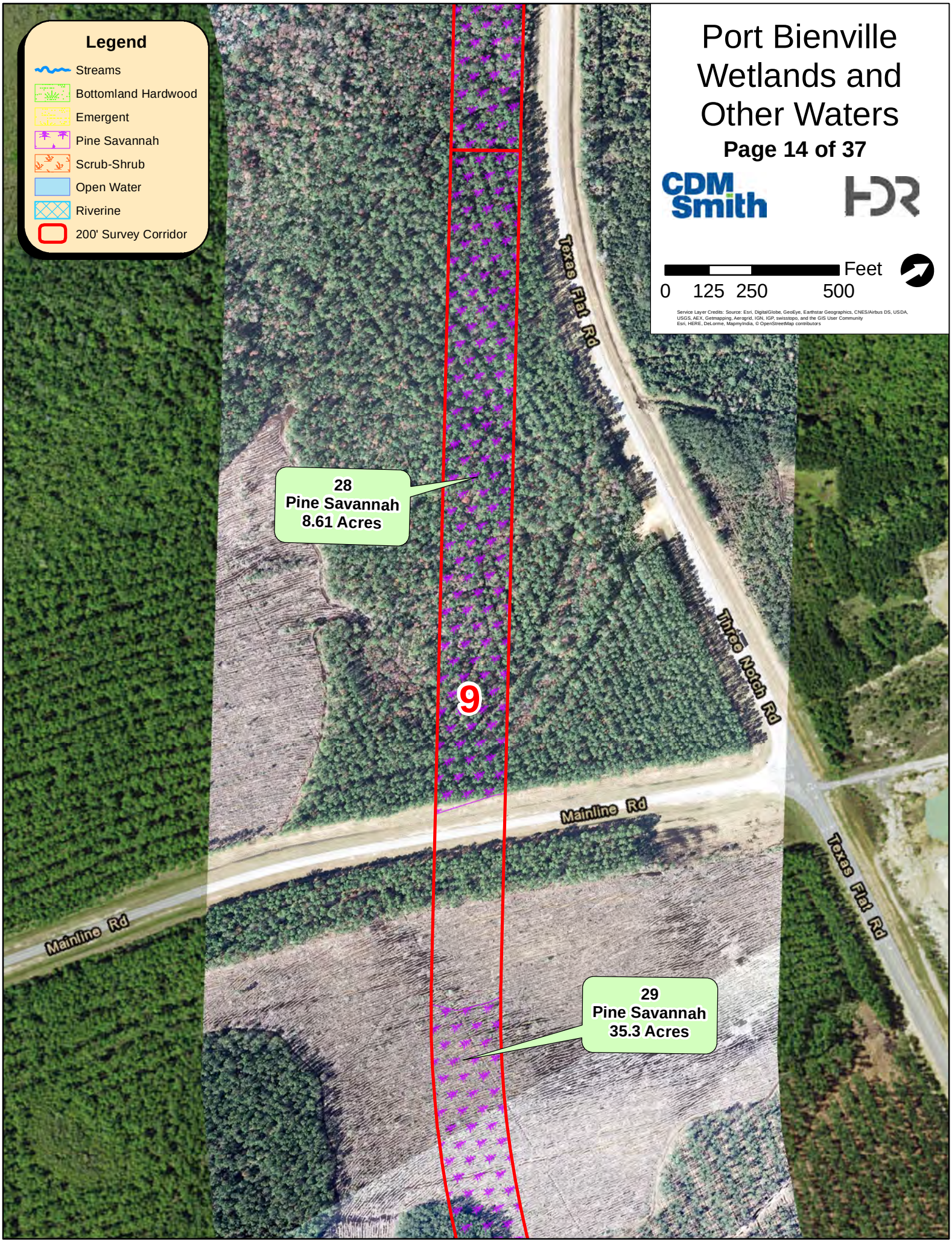
28
Pine Savannah
22.56 Acres
10B
Texas Flat Rd
Texas Flat Rd


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 14 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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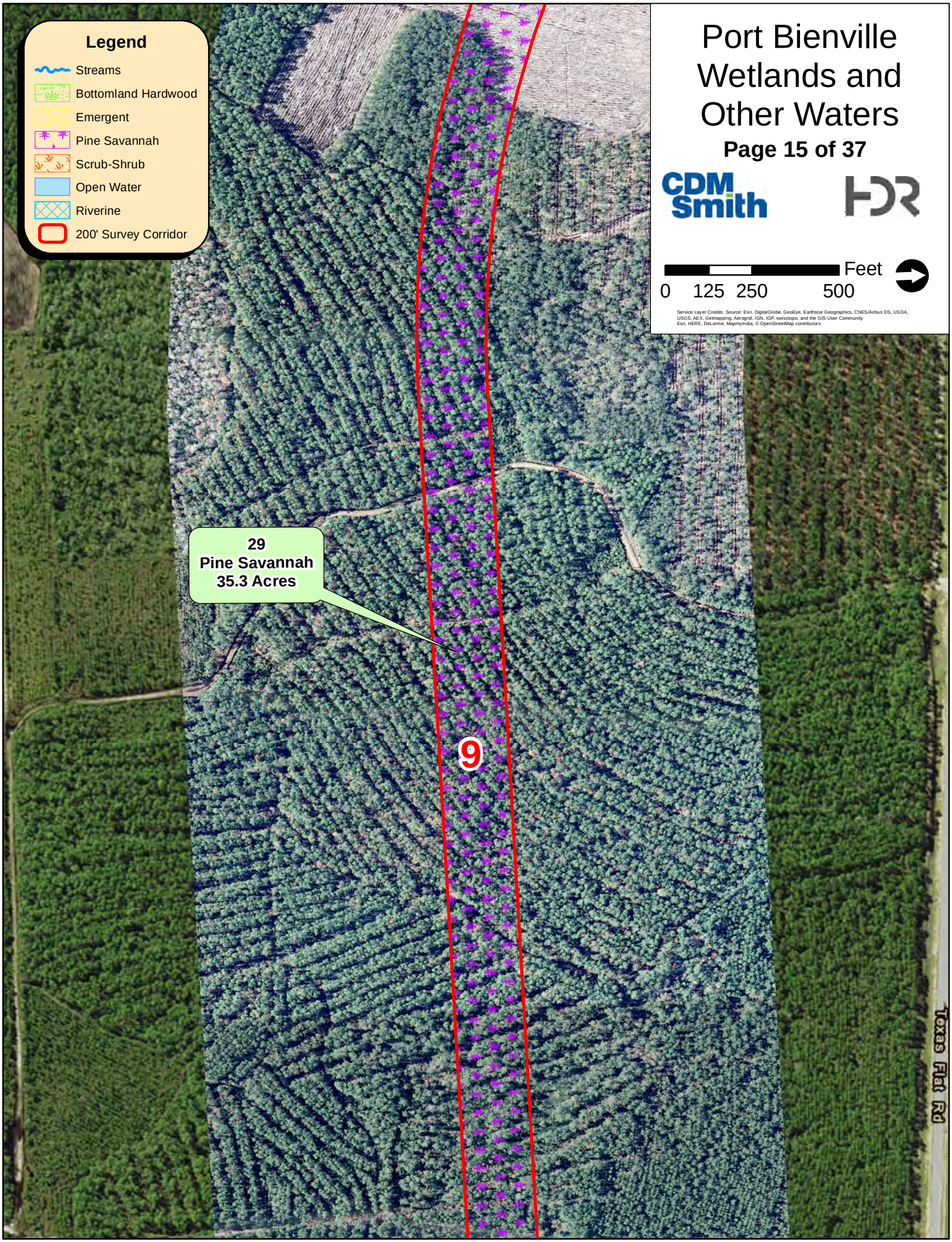
Texas Flat Rd
28
Pine Savannah
8.61 Acres
Three Notch Rd
9
Mainline Rd
Mainline Rd
Texas Flat Rd
29
Pine Savannah
35.3 Acres


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 15 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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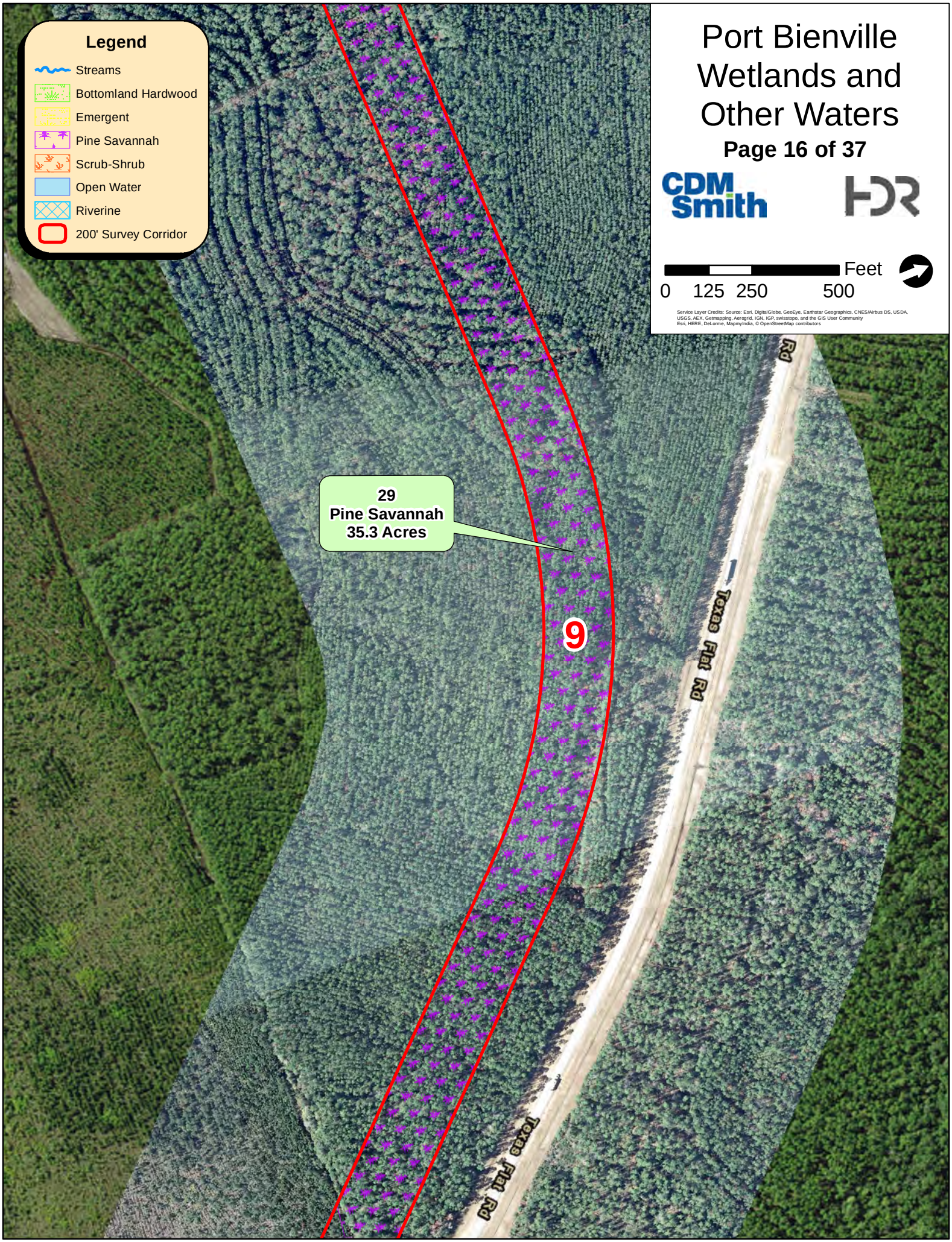
29
Pine Savannah
35.3 Acres
9
Texas Flat Rd


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 16 of 37
CDM Smith
HDR
Feet
0 125 250 500
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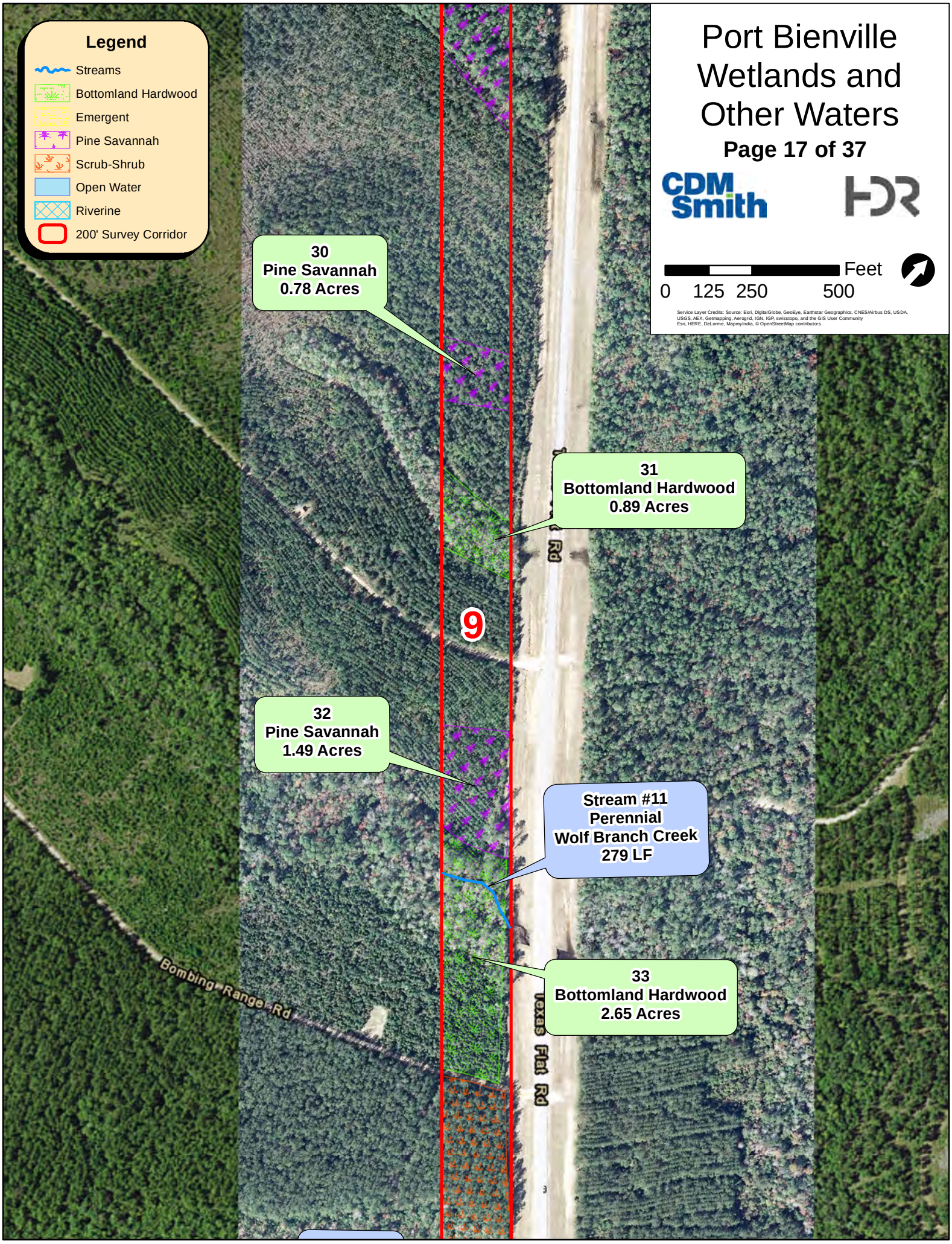
29
Pine Savannah
35.3 Acres
9
Texas Flat Rd
Texas Flat Rd
Rd


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 17 of 37
CDM Smith
HDR
Feet
0 125 250 500
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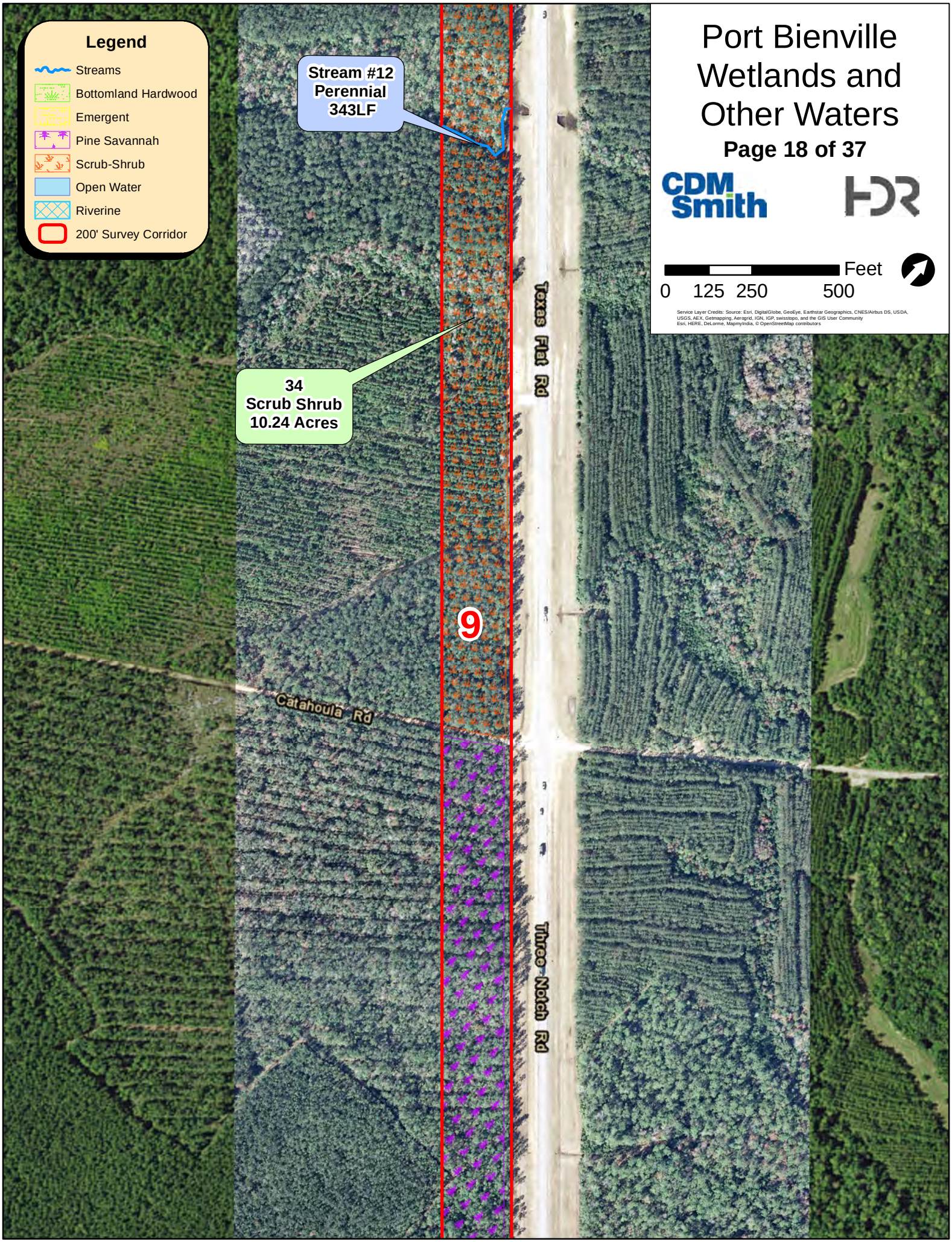
30
Pine Savannah
0.78 Acres
31
Bottomland Hardwood
0.89 Acres
9
32
Pine Savannah
1.49 Acres
Stream #11
Perennial
Wolf Branch Creek
279 LF
33
Bottomland Hardwood
2.65 Acres
Bombing Range Rd
Texas Flat Rd


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Stream #12
Perennial
343LF
34
Scrub Shrub
10.24 Acres
9
Texas Flat Rd
Catahoula Rd
Three Notch Rd
Port Bienville
Wetlands and
Other Waters
Page 18 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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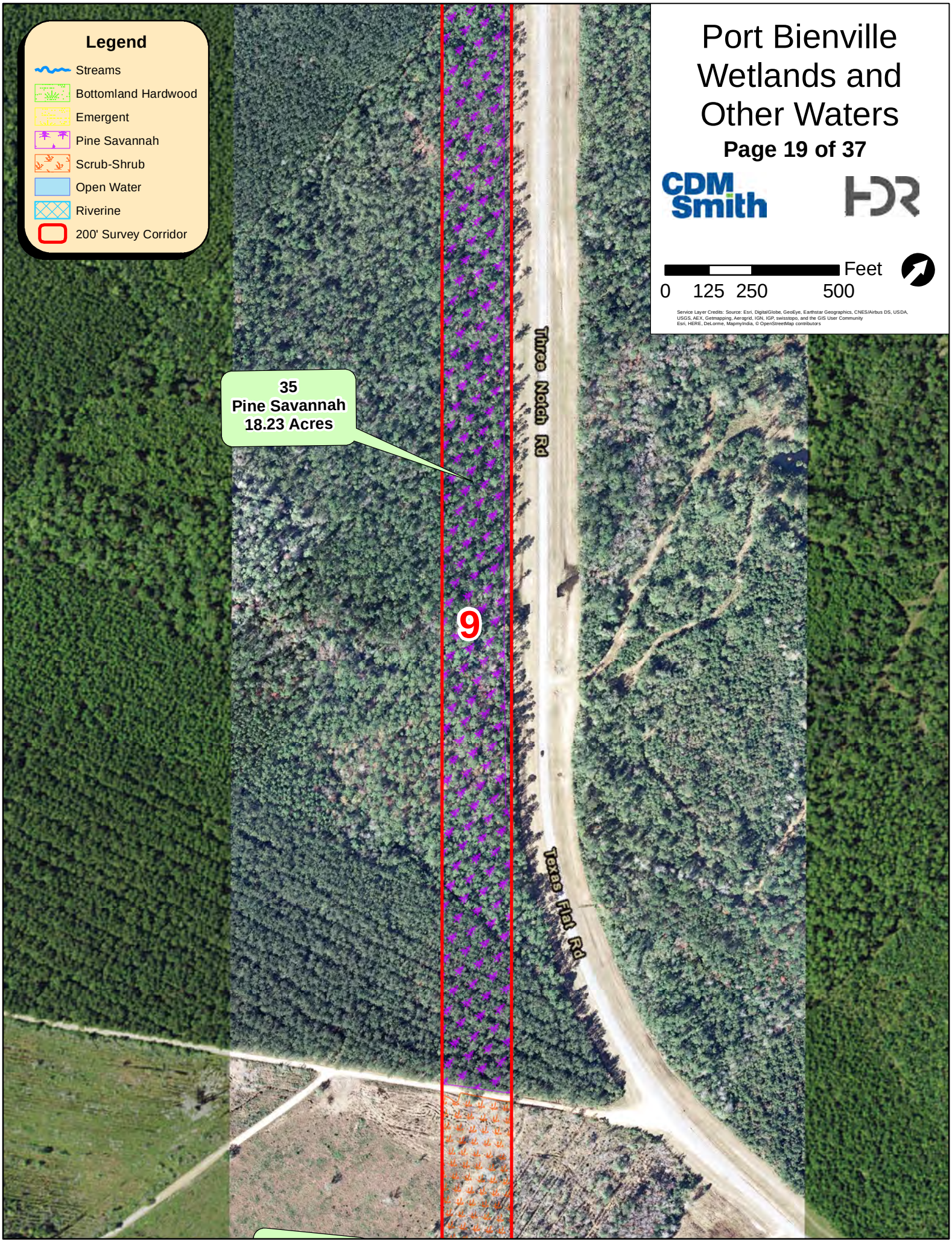
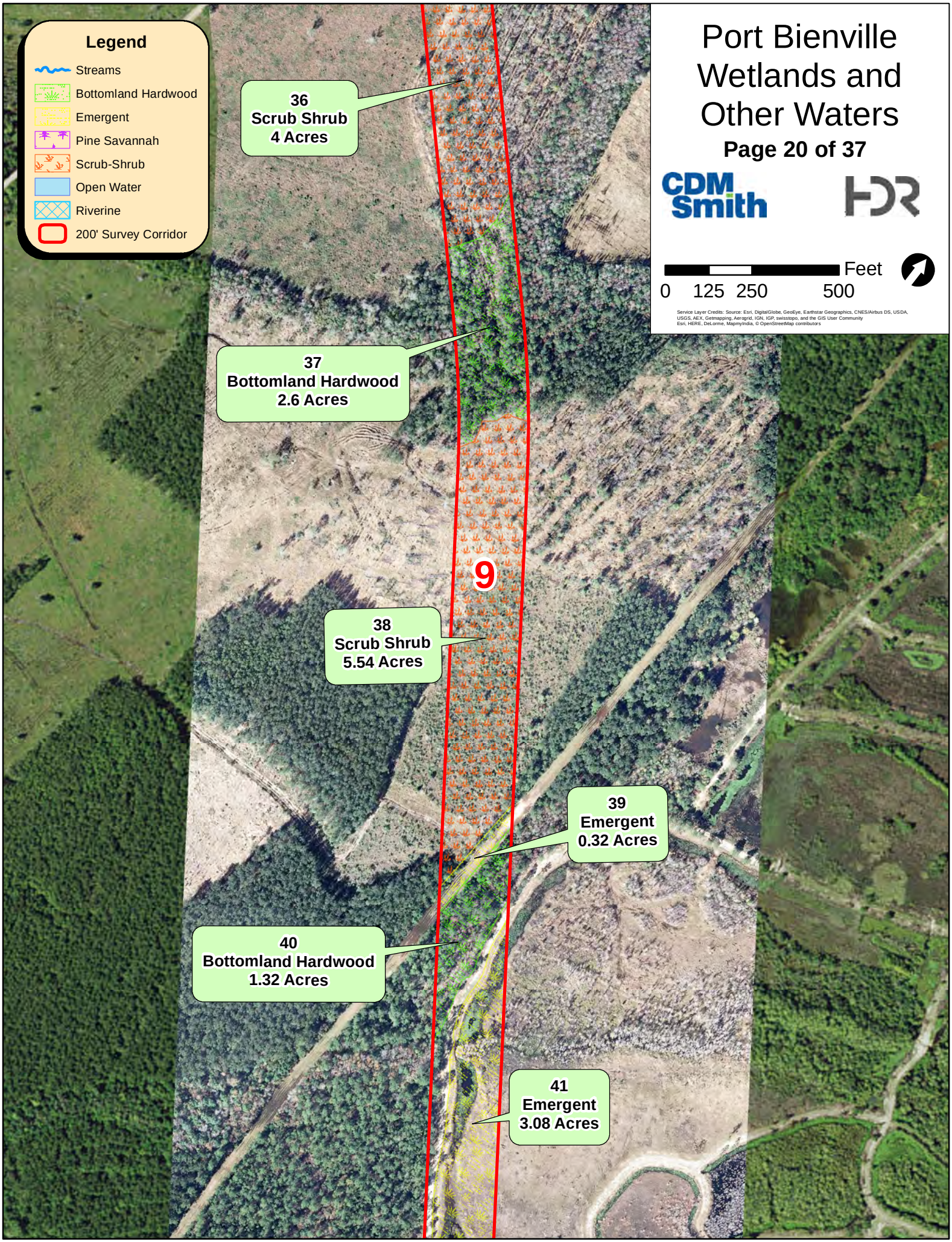

Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 19 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors
35
Pine Savannah
18.23 Acres
Three Notch Rd
9
Texas Flat Rd


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
36
Scrub Shrub
4 Acres
37
Bottomland Hardwood
2.6 Acres
9
38
Scrub Shrub
5.54 Acres
39
Emergent
0.32 Acres
40
Bottomland Hardwood
1.32 Acres
41
Emergent
3.08 Acres
Port Bienville
Wetlands and
Other Waters
Page 20 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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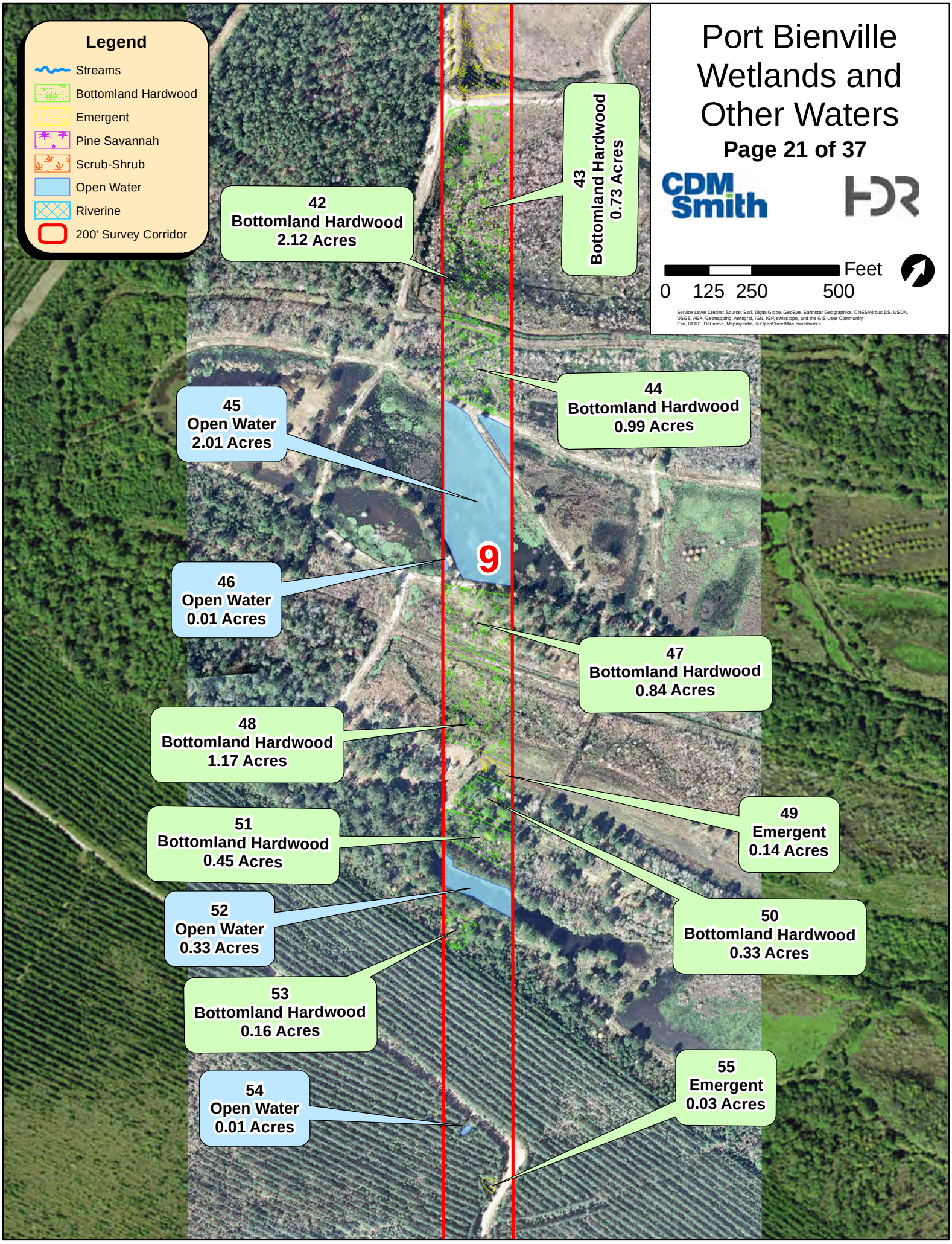
Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 21 of 37
CDM Smith
HDR
Feet
0 125 250 500
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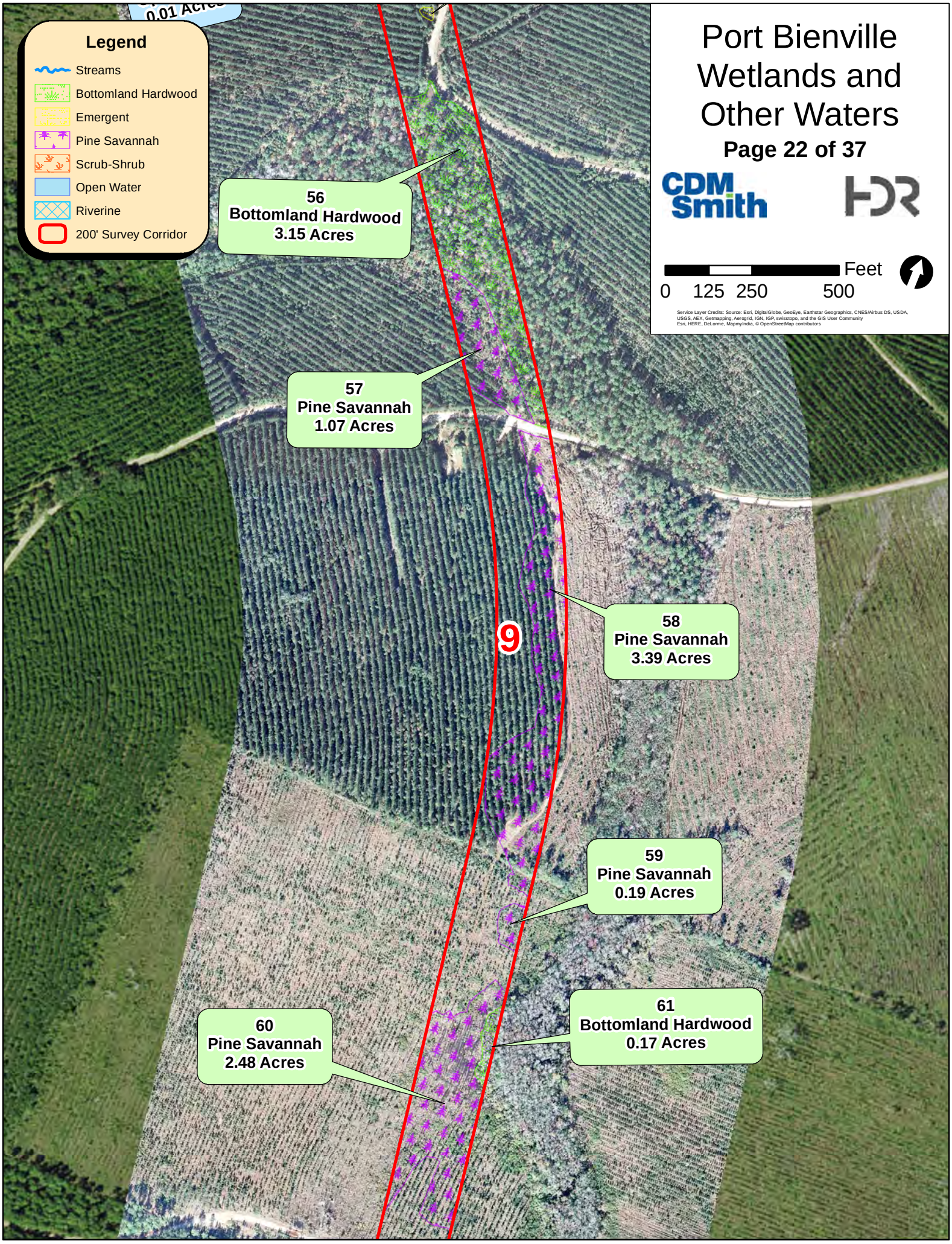
42 Bottomland Hardwood 2.12 Acres
43 Bottomland Hardwood 0.73 Acres
44 Bottomland Hardwood 0.99 Acres
45 Open Water 2.01 Acres
9
46 Open Water 0.01 Acres
47 Bottomland Hardwood 0.84 Acres
48 Bottomland Hardwood 1.17 Acres
49 Emergent 0.14 Acres
50 Bottomland Hardwood 0.33 Acres
51 Bottomland Hardwood 0.45 Acres
52 Open Water 0.33 Acres
53 Bottomland Hardwood 0.16 Acres
54 Open Water 0.01 Acres
55 Emergent 0.03 Acres


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 22 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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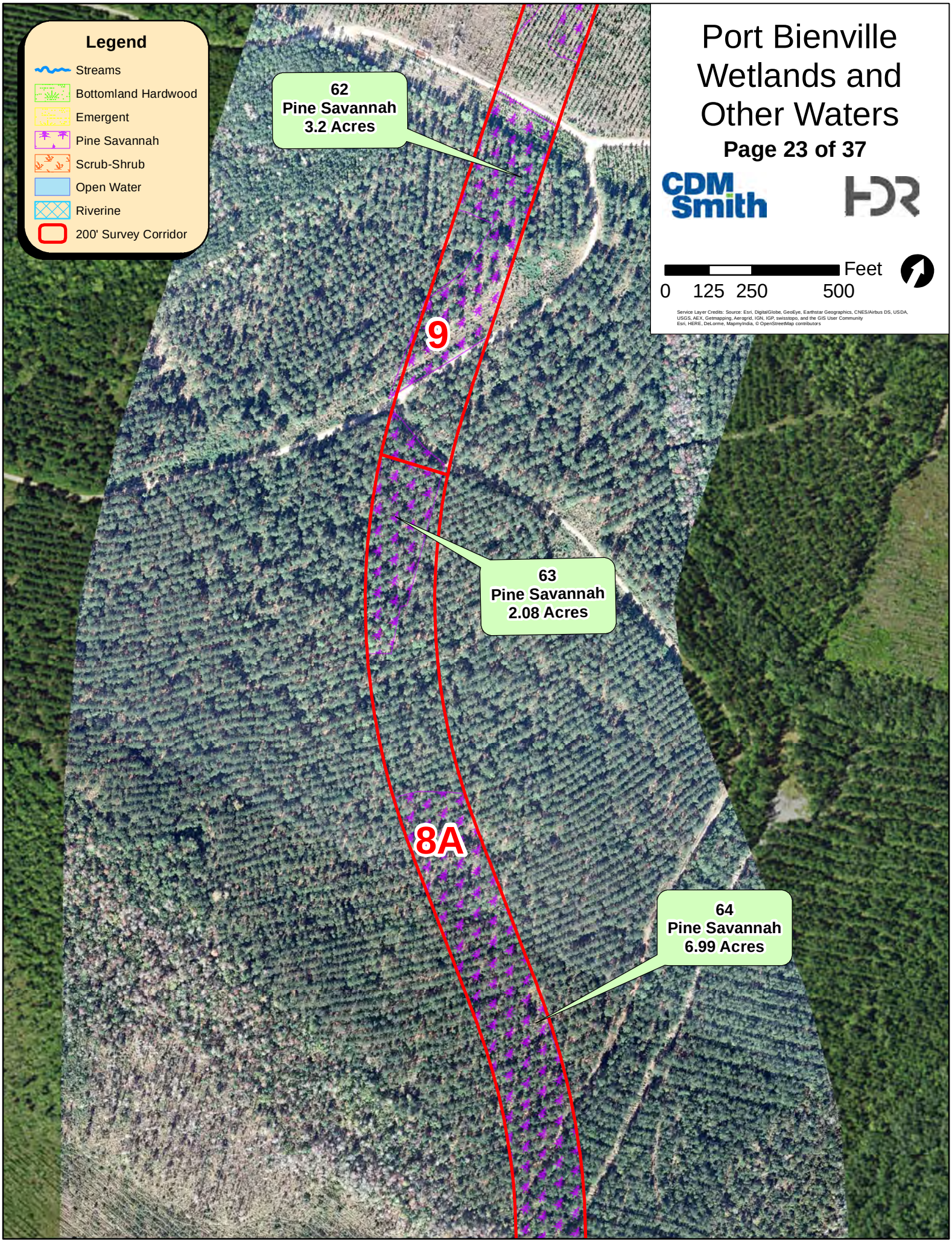
56
Bottomland Hardwood
3.15 Acres
57
Pine Savannah
1.07 Acres
9
58
Pine Savannah
3.39 Acres
59
Pine Savannah
0.19 Acres
60
Pine Savannah
2.48 Acres
61
Bottomland Hardwood
0.17 Acres


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
62
Pine Savannah
3.2 Acres
9
63
Pine Savannah
2.08 Acres
8A
64
Pine Savannah
6.99 Acres
Port Bienville
Wetlands and
Other Waters
Page 23 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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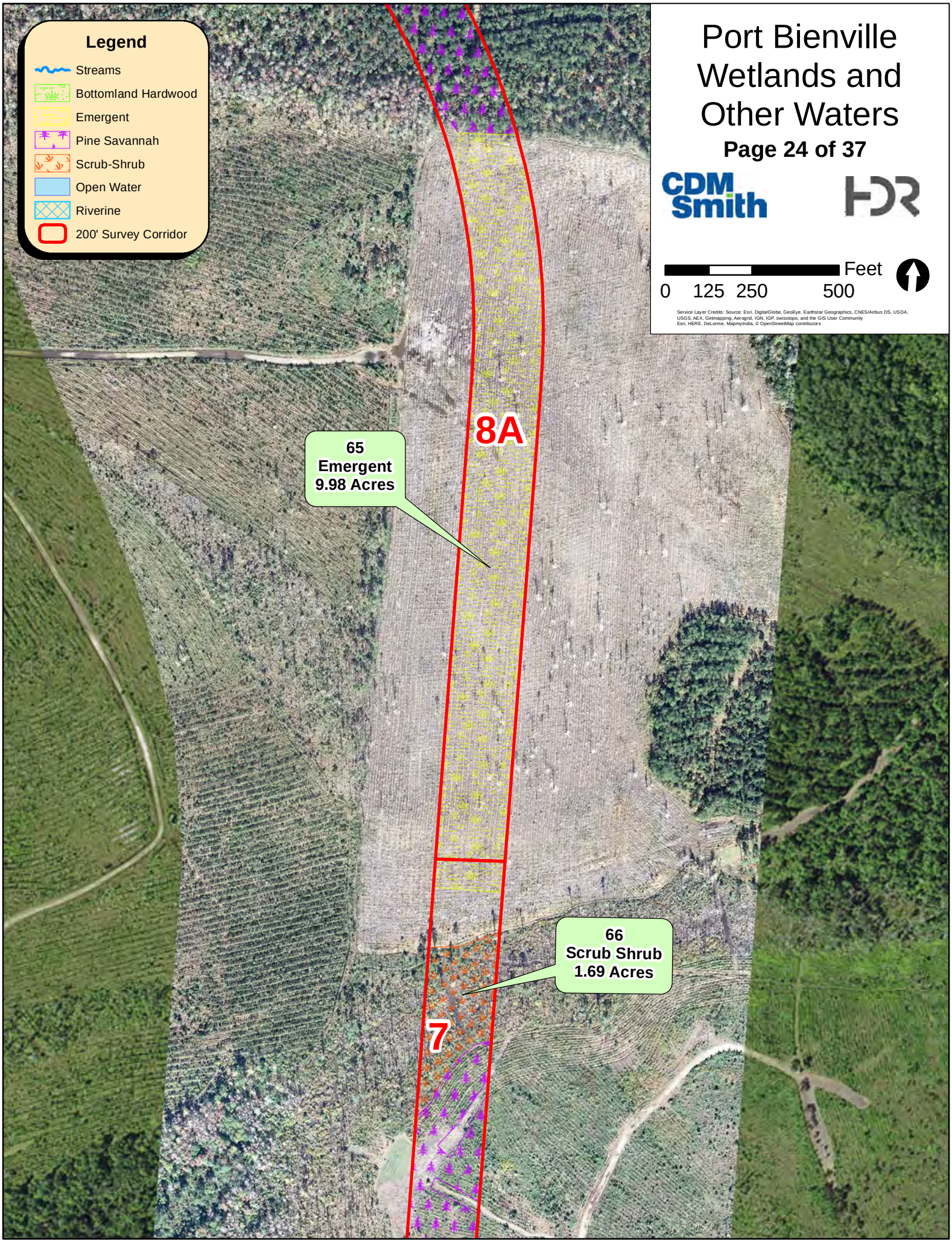
Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 24 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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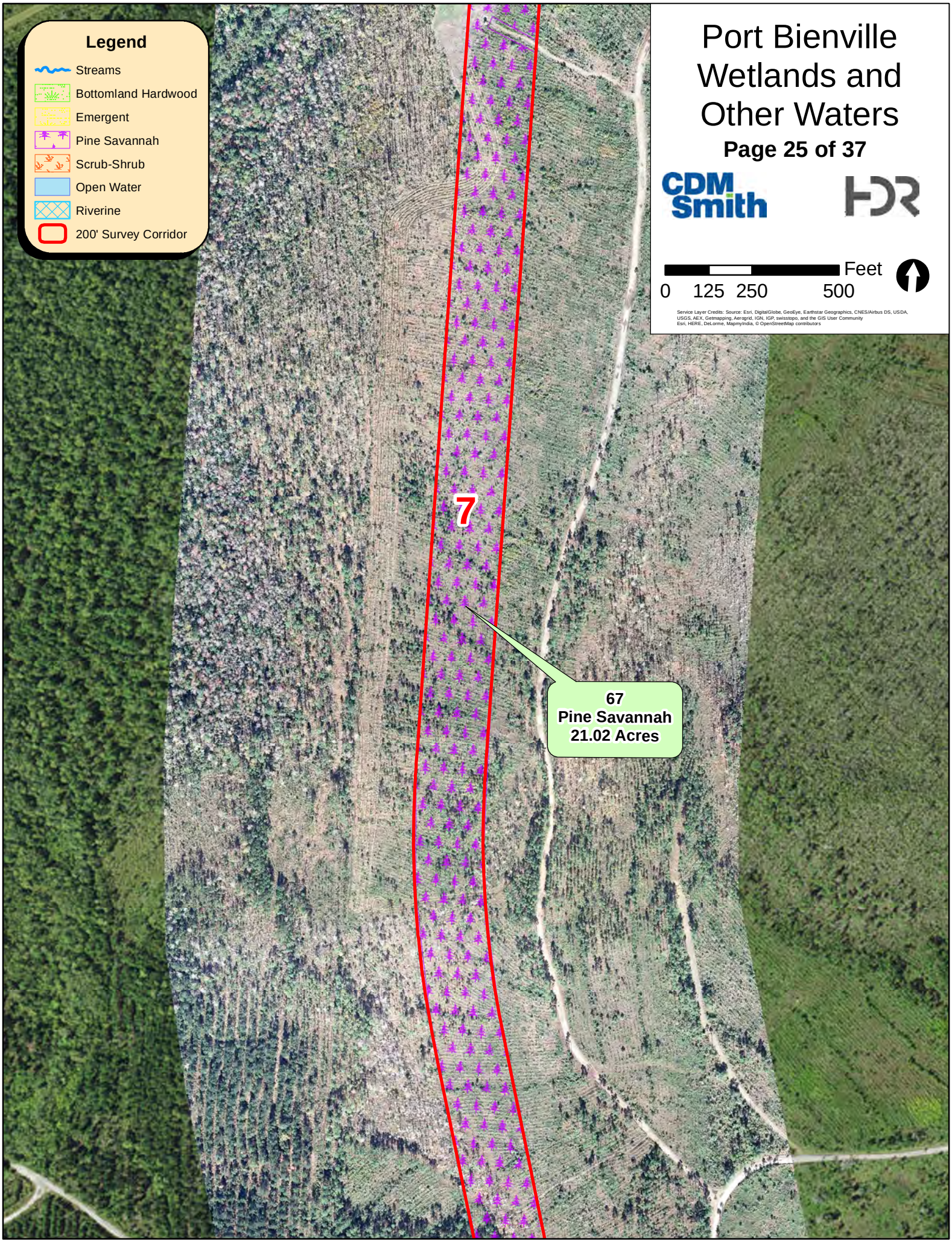
8A
65
Emergent
9.98 Acres
66
Scrub Shrub
1.69 Acres
7


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 25 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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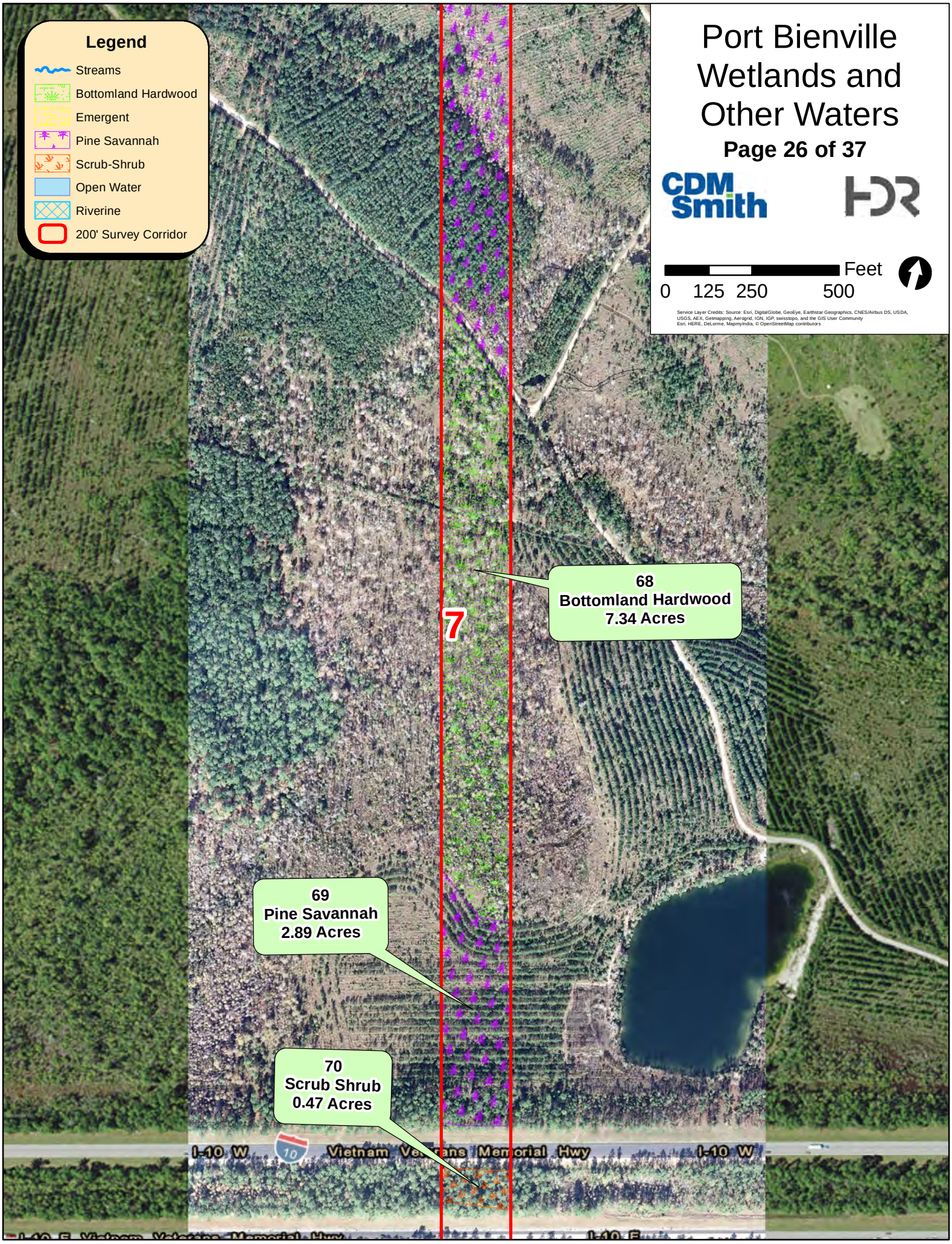
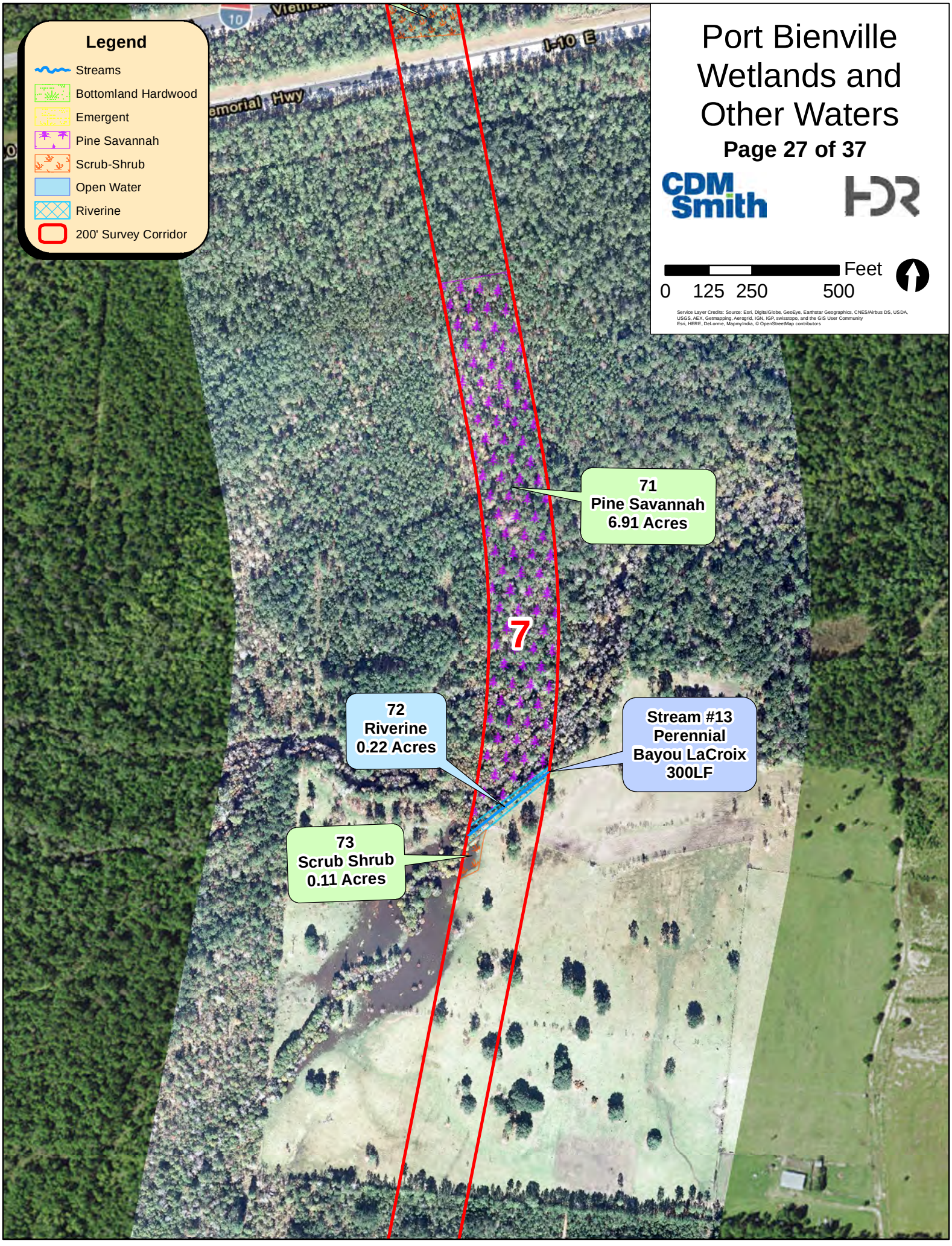
7
67
Pine Savannah
21.02 Acres


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 26 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors
68
Bottomland Hardwood
7.34 Acres
7
69
Pine Savannah
2.89 Acres
70
Scrub Shrub
0.47 Acres
I-10 W
Vietnam Veterans Memorial Hwy
I-10 W
I-10 E
Vietnam Veterans Memorial Hwy
I-10 E

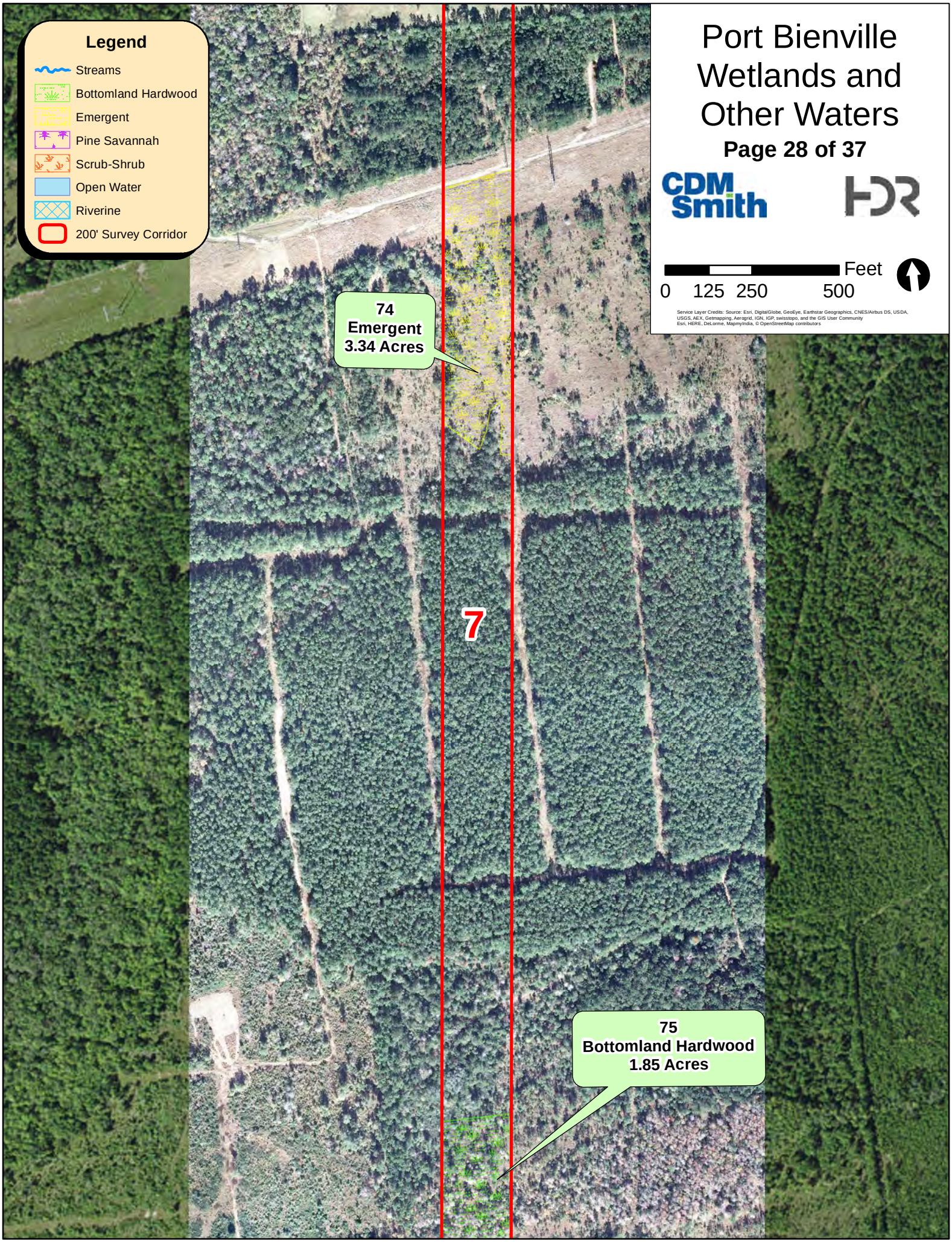


Port Bienville Wetlands and Other Waters

CDM Smith

HDR

0 125 250 500 Feet


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 28 of 37
CDM Smith
HDR
Feet
0 125 250 500
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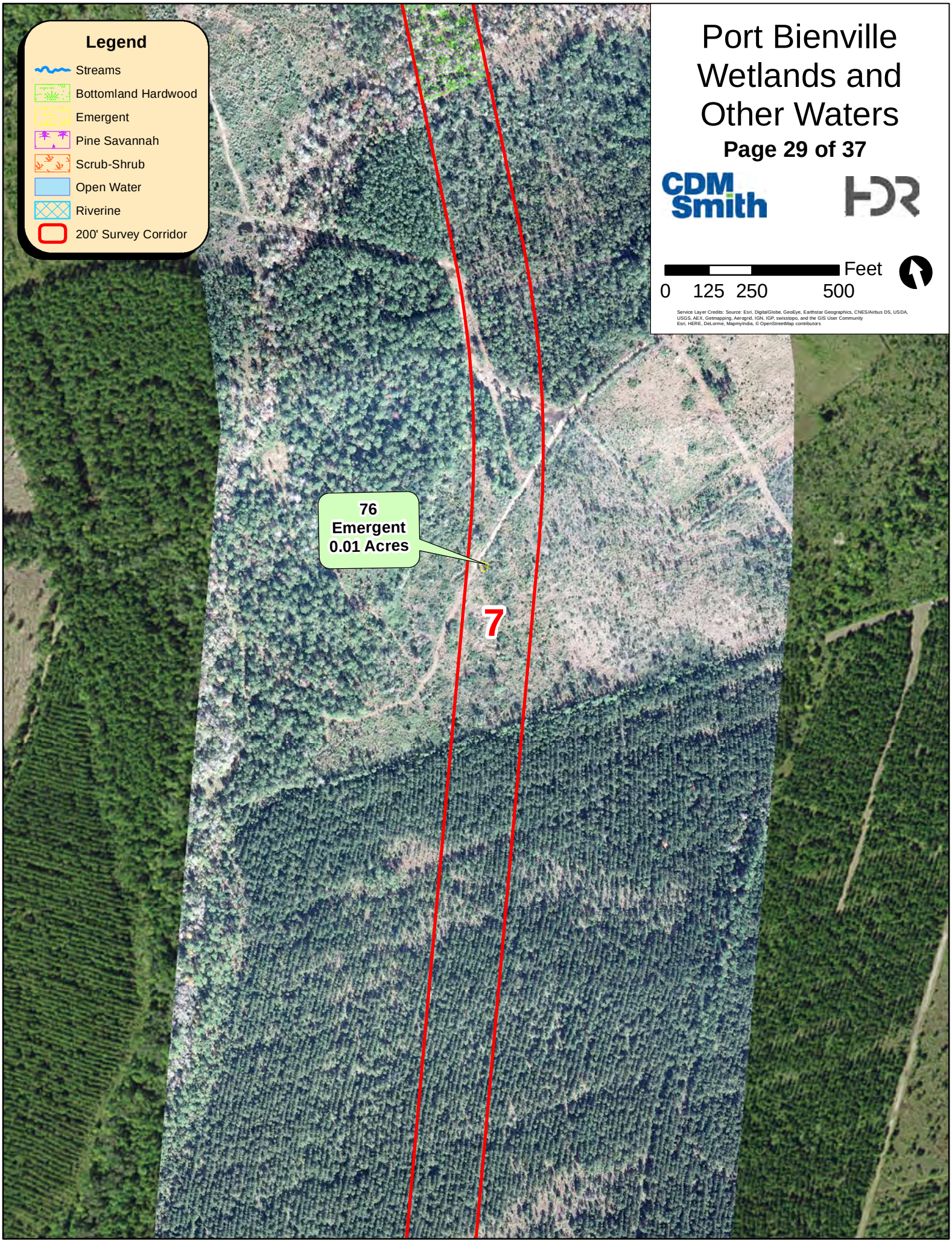
74
Emergent
3.34 Acres
7
75
Bottomland Hardwood
1.85 Acres


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 29 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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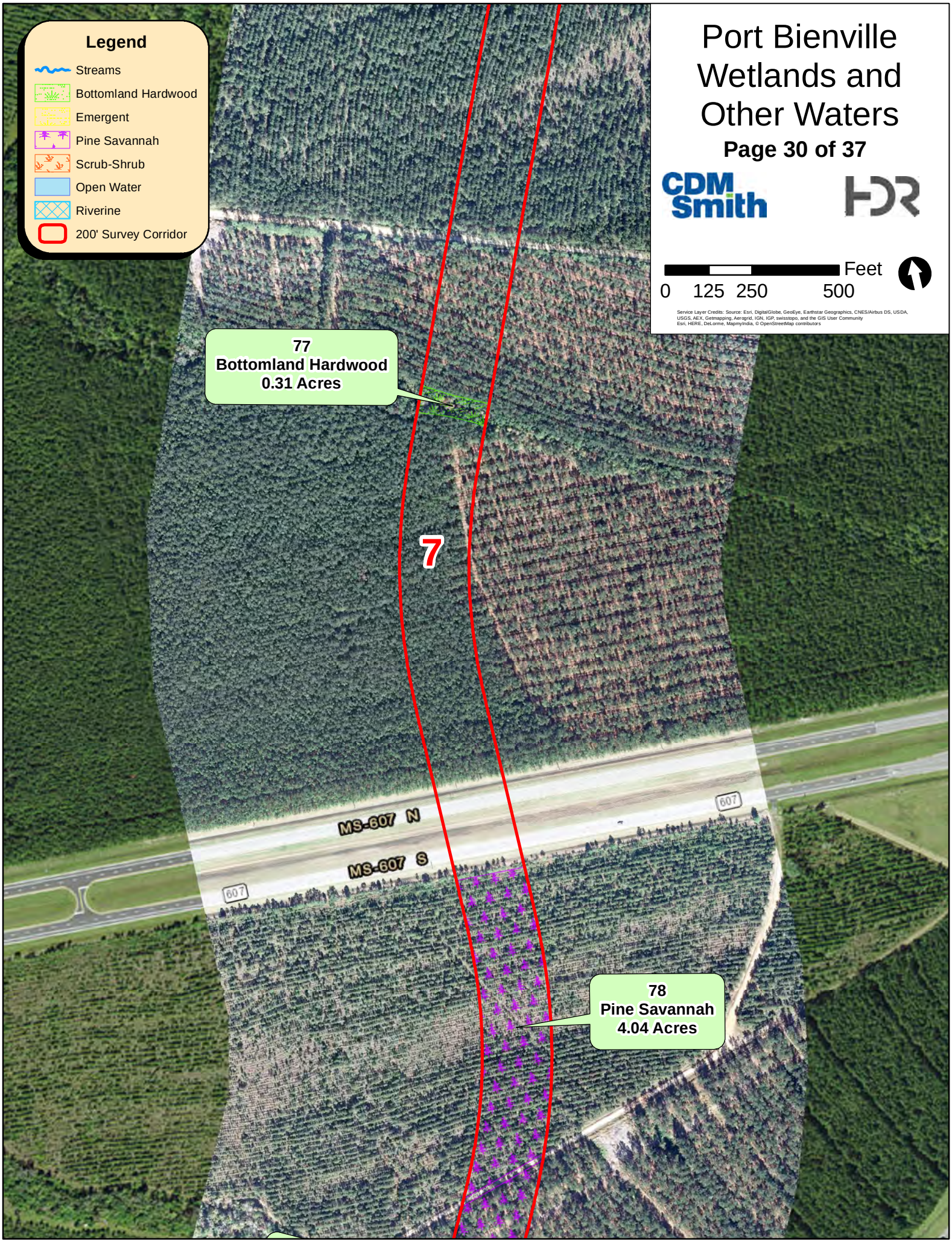
76
Emergent
0.01 Acres
7


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 30 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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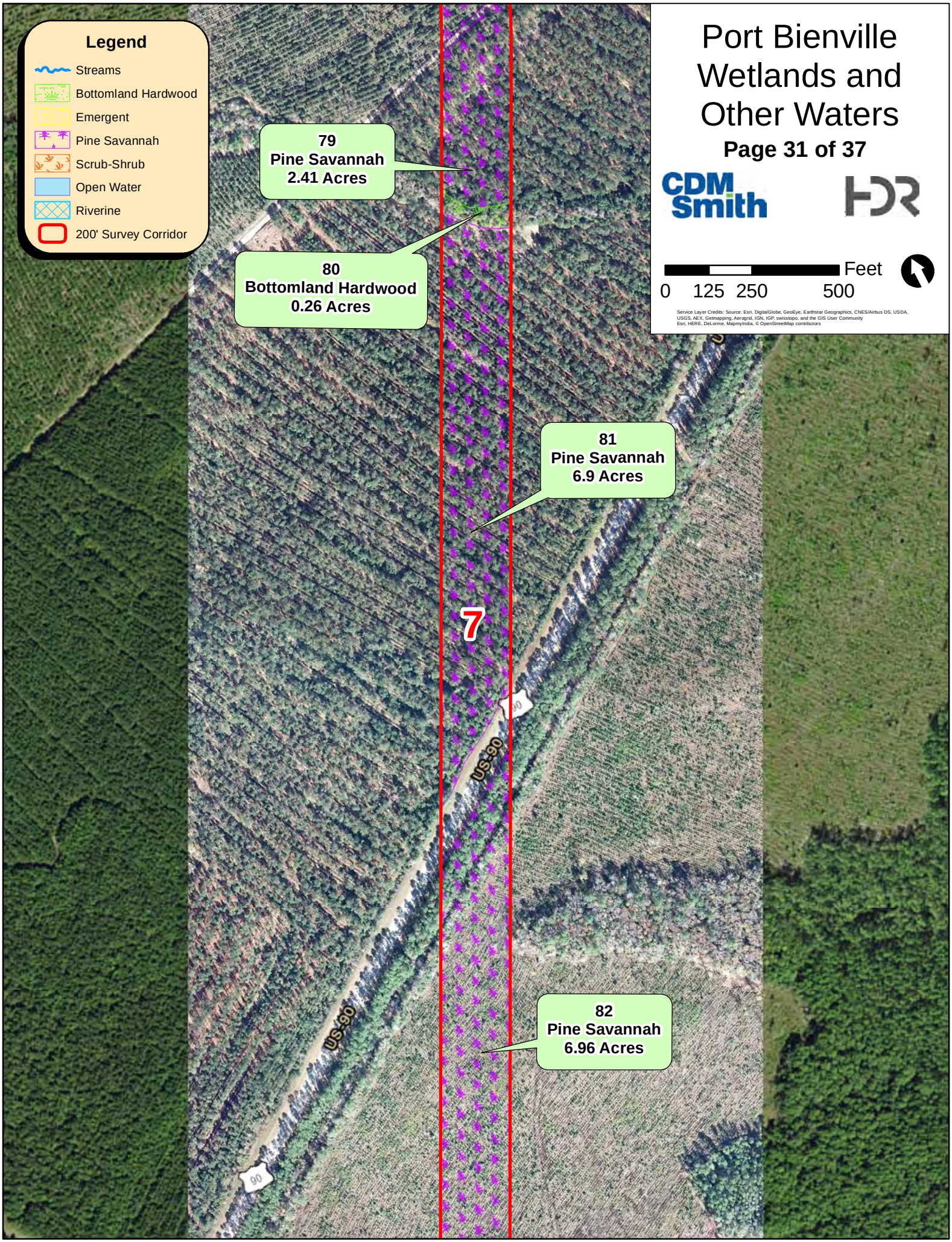
77
Bottomland Hardwood
0.31 Acres
7
MS-607 N
MS-607 S
607
607
78
Pine Savannah
4.04 Acres


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
79
Pine Savannah
2.41 Acres
80
Bottomland Hardwood
0.26 Acres
81
Pine Savannah
6.9 Acres
82
Pine Savannah
6.96 Acres
7
US-90
US-90
US-90
90
90
Port Bienville
Wetlands and
Other Waters
Page 31 of 37
CDM Smith
HDR
Feet
0 125 250 500
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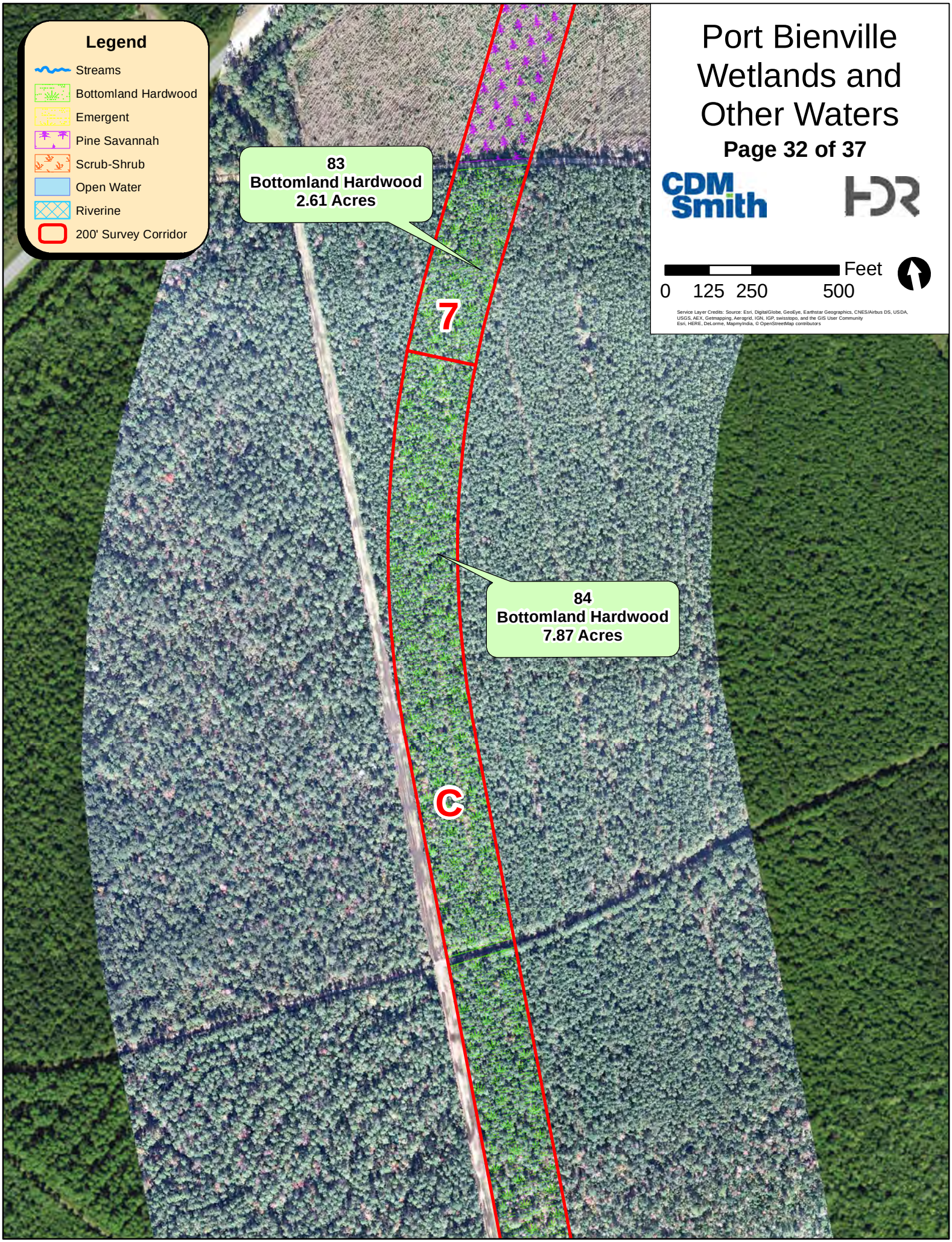
Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
83
Bottomland Hardwood
2.61 Acres
7
84
Bottomland Hardwood
7.87 Acres
C
Port Bienville
Wetlands and
Other Waters
Page 32 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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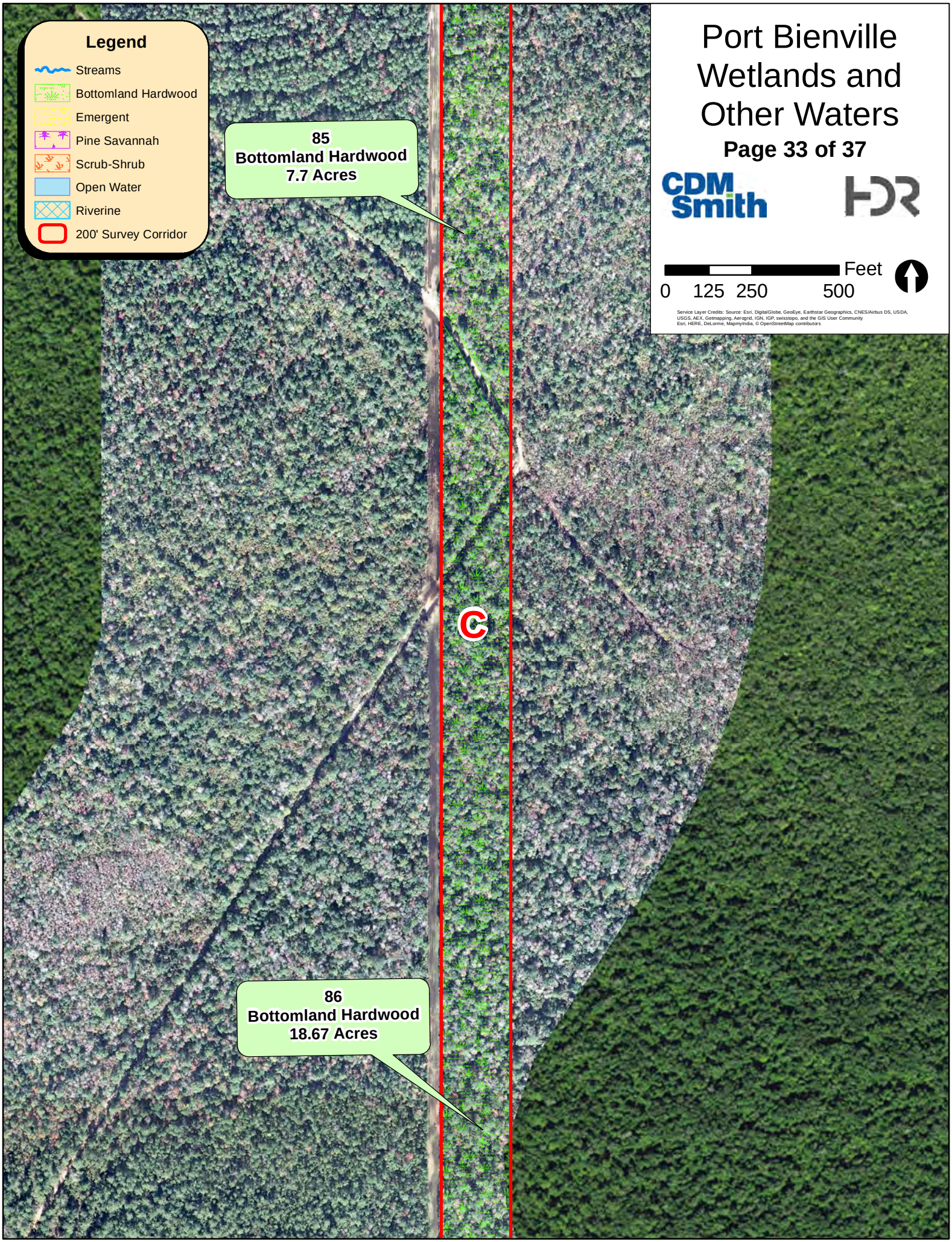
Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
85
Bottomland Hardwood
7.7 Acres
C
86
Bottomland Hardwood
18.67 Acres
Port Bienville
Wetlands and
Other Waters
Page 33 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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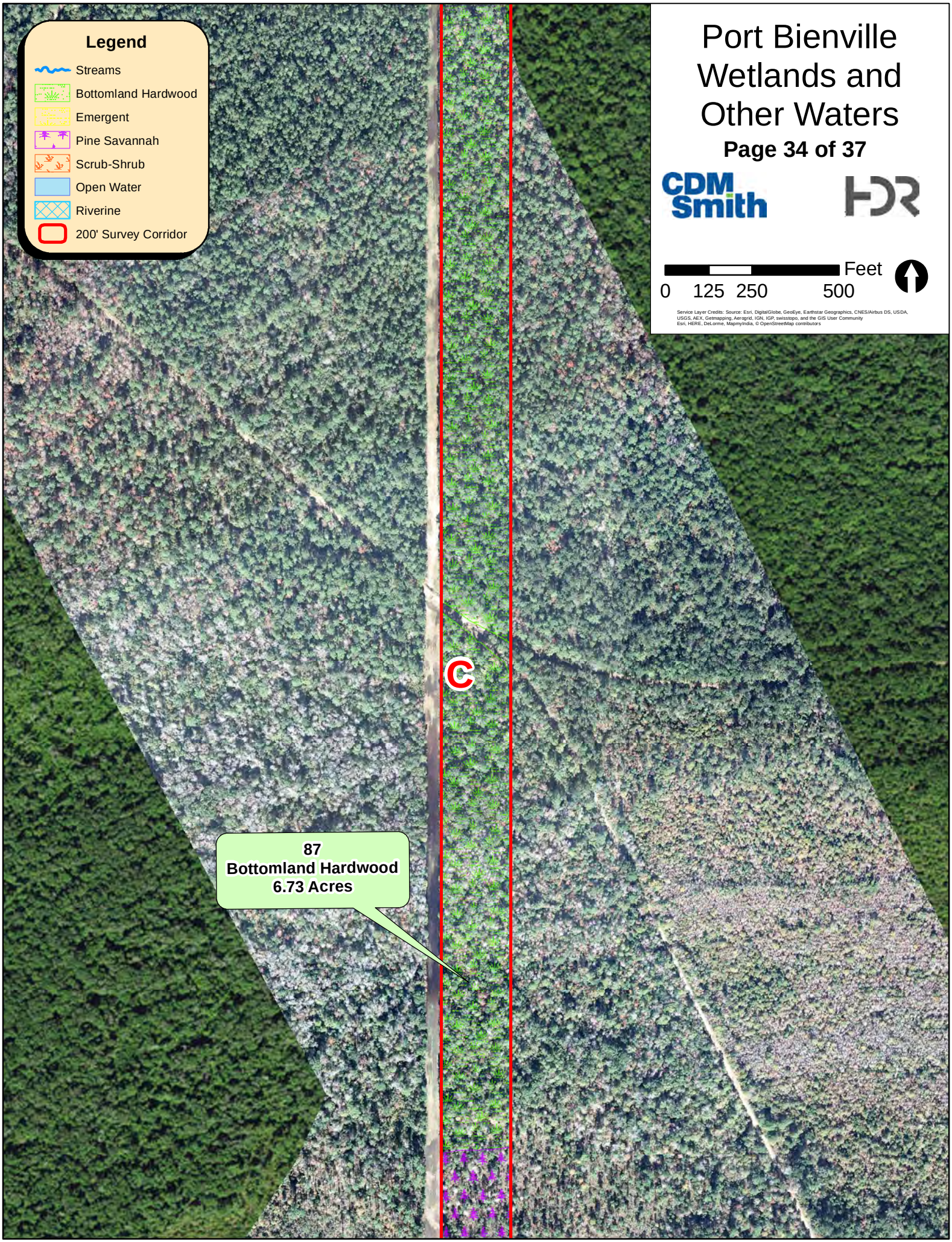
Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 34 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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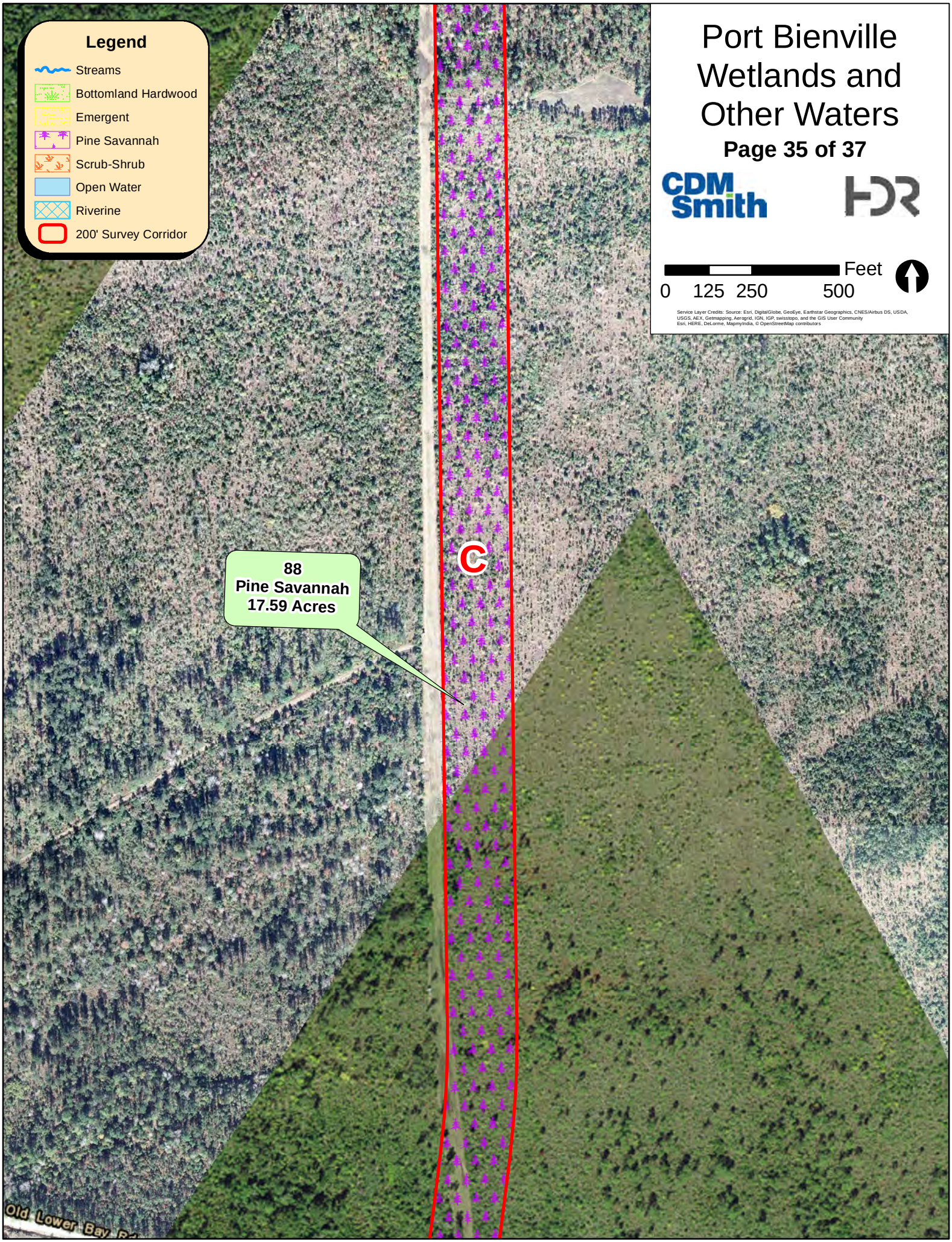
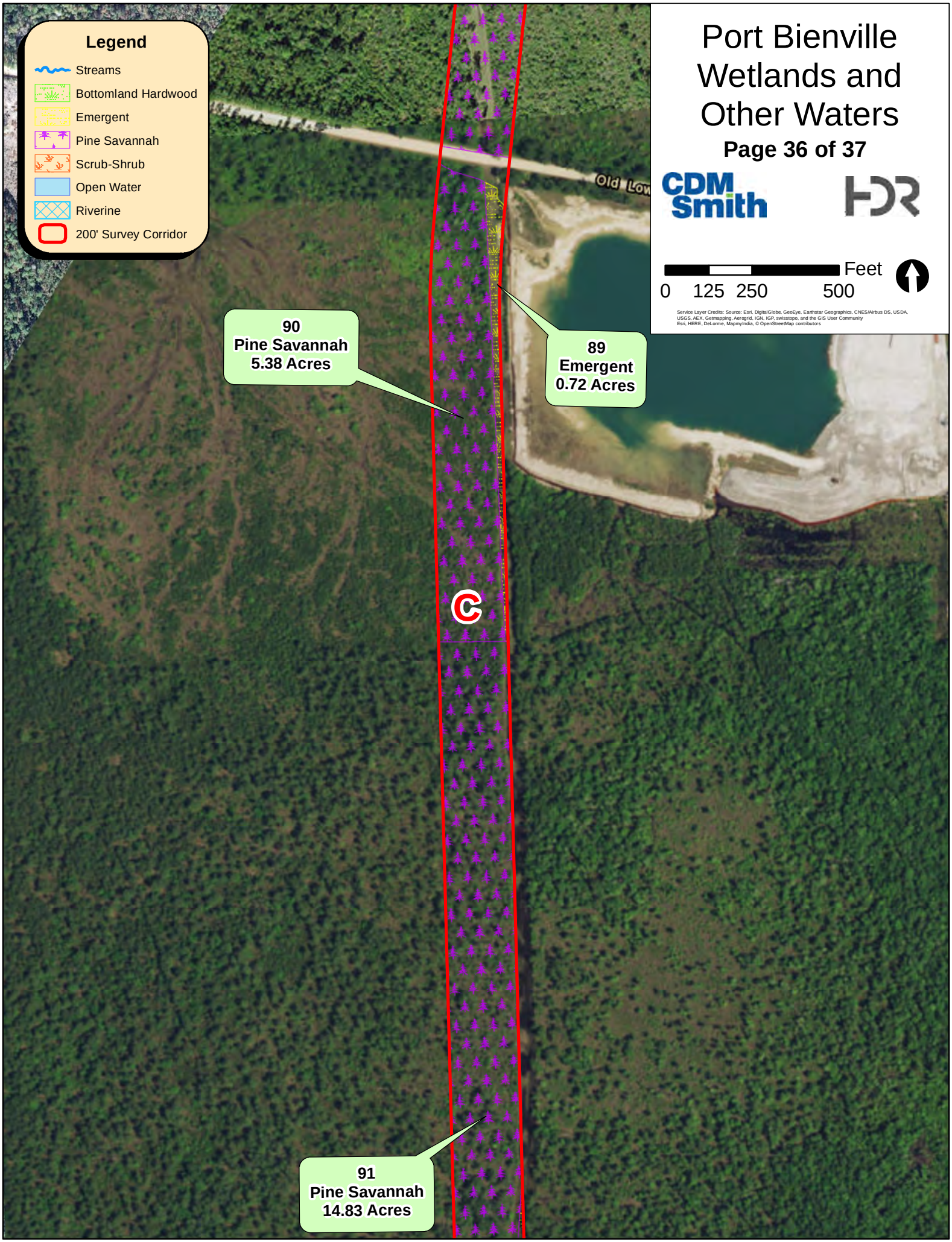
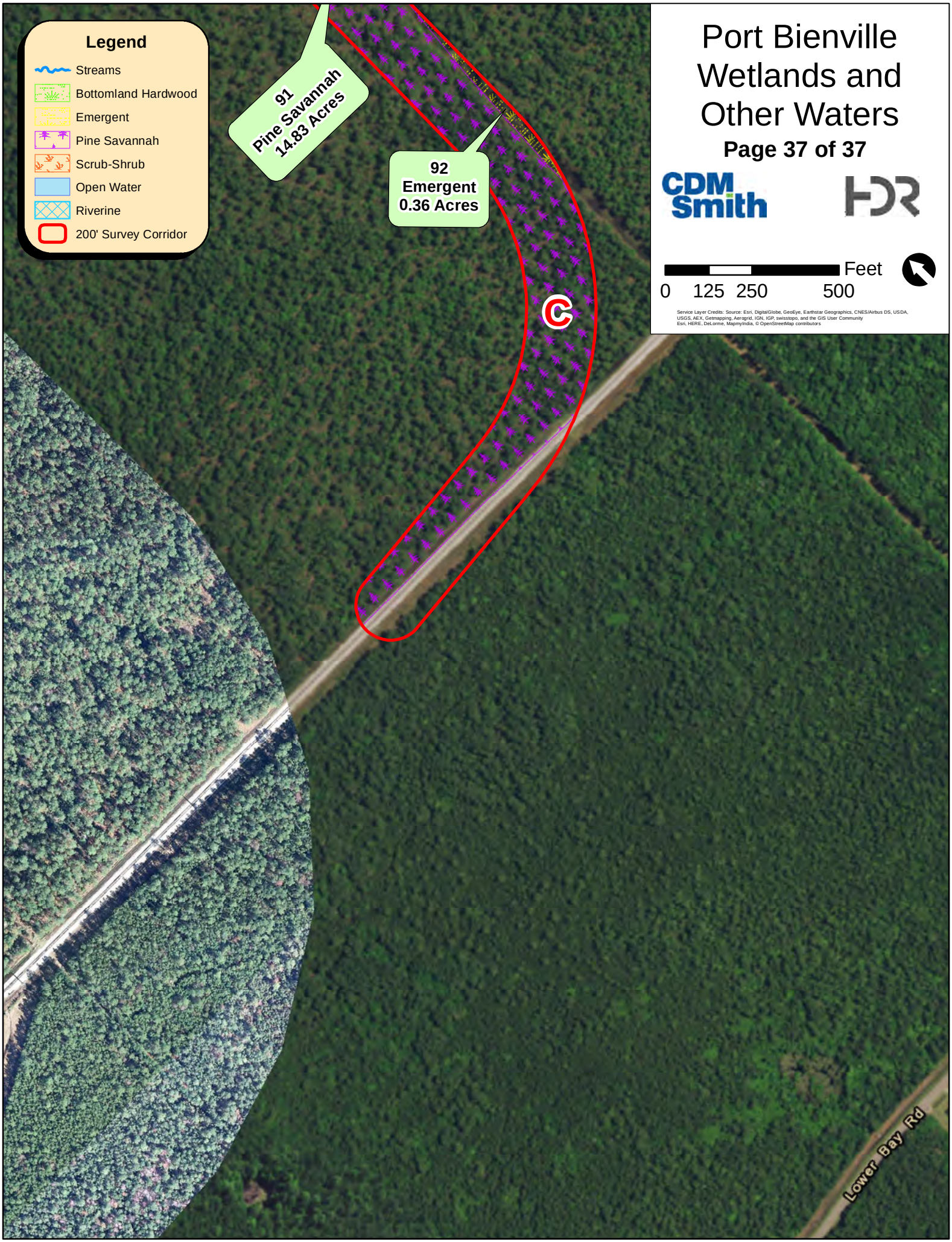
C
87
Bottomland Hardwood
6.73 Acres


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Port Bienville Wetlands and Other Waters
Page 35 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors
C
88
Pine Savannah
17.59 Acres
Old Lower Bay Rd


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
Old Low
90
Pine Savannah
5.38 Acres
89
Emergent
0.72 Acres
C
91
Pine Savannah
14.83 Acres
Port Bienville
Wetlands and
Other Waters
Page 36 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors


Legend
Streams
Bottomland Hardwood
Emergent
Pine Savannah
Scrub-Shrub
Open Water
Riverine
200' Survey Corridor
91
Pine Savannah
14.83 Acres
92
Emergent
0.36 Acres
C
Port Bienville
Wetlands and
Other Waters
Page 37 of 37
CDM Smith
HDR
Feet
0 125 250 500
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Lower Bay Rd

APPENDIX C — WETLANDS TABLE

Wetlands and Waters Table

WETLAND NUMBER	SEGMENT	WETLAND/WATER TYPE	ACRES
1	11	Bottomland Hardwood	0.79
2	11	Open Water	0.13
3	11	Scrub Shrub	0.13
4	11	Scrub Shrub	0.50
5	11	Riverine	0.18
6	11	Open Water	0.64
7	11	Scrub Shrub	0.06
8	11	Emergent	0.09
9	11	Bottomland Hardwood	0.07
10	10B	Emergent	0.33
11	10B	Scrub Shrub	0.85
12	10B	Scrub Shrub	0.75
13	10B	Emergent	1.35
14	10B	Pine Savannah	0.55
15	10B	Scrub Shrub	0.16
16	10B	Scrub Shrub	0.84
17	10B	Scrub Shrub	0.22
18	10B	Open Water	0.02
19	10B	Bottomland Hardwood	0.30
20	10B	Open Water	0.69
21	10B	Scrub Shrub	5.55
22	10B	Scrub Shrub	2.71
23	10B	Bottomland Hardwood	0.74
24	10B	Bottomland Hardwood	1.72
25	10B	Pine Savannah	3.90
26	10B	Scrub Shrub	0.87
27	10B	Pine Savannah	14.27
28*	10B	Pine Savannah	22.56
28*	9	Pine Savannah	8.61
29	9	Pine Savannah	35.30
30	9	Pine Savannah	0.78
31	9	Bottomland Hardwood	0.89
32	9	Pine Savannah	1.49
33	9	Bottomland Hardwood	2.65
34	9	Scrub Shrub	10.24
35	9	Pine Savannah	18.23
36	9	Scrub Shrub	4.00

WETLAND NUMBER	SEGMENT	WETLAND/WATER TYPE	ACRES
37	9	Bottomland Hardwood	2.60
38	9	Scrub Shrub	5.54
39	9	Emergent	0.32
40	9	Bottomland Hardwood	1.32
41	9	Emergent	3.08
42	9	Bottomland Hardwood	2.12
43	9	Bottomland Hardwood	0.73
44	9	Bottomland Hardwood	0.99
45	9	Open Water	2.01
46	9	Open Water	0.01
47	9	Bottomland Hardwood	0.84
48	9	Bottomland Hardwood	1.17
49	9	Emergent	0.14
50	9	Bottomland Hardwood	0.33
51	9	Bottomland Hardwood	0.45
52	9	Open Water	0.33
53	9	Bottomland Hardwood	0.16
54	9	Open Water	0.01
55	9	Emergent	0.03
56	9	Bottomland Hardwood	3.15
57	9	Pine Savannah	1.07
58	9	Pine Savannah	3.39
59	9	Pine Savannah	0.19
60	9	Pine Savannah	2.48
61	9	Bottomland Hardwood	0.17
62	9	Pine Savannah	3.20
63	8A	Pine Savannah	2.08
64	8A	Pine Savannah	6.99
65	8A	Emergent	9.98
66	7	Scrub Shrub	1.69
67	7	Pine Savannah	21.02
68	7	Bottomland Hardwood	7.34
69	7	Pine Savannah	2.89
70	7	Scrub Shrub	0.47
71	7	Pine Savannah	6.91
72	7	Riverine	0.22
73	7	Scrub Shrub	0.11
74	7	Emergent	3.34
75	7	Bottomland Hardwood	1.85
76	7	Emergent	0.01

WETLAND NUMBER	SEGMENT	WETLAND/WATER TYPE	ACRES
77	7	Bottomland Hardwood	0.31
78	7	Pine Savannah	4.04
79	7	Pine Savannah	2.41
80	7	Bottomland Hardwood	0.26
81	7	Pine Savannah	6.90
82	7	Pine Savannah	6.96
83	7	Bottomland Hardwood	2.61
84	C	Bottomland Hardwood	7.87
85	C	Bottomland Hardwood	7.70
86	C	Bottomland Hardwood	18.67
87	C	Bottomland Hardwood	6.73
88	C	Pine Savannah	17.59
89	C	Emergent	0.72
90	C	Pine Savannah	5.38
91	C	Pine Savannah	14.83
92	C	Emergent	0.36

**Note Wetland #28 is split over two segments (10B and 9)*

Wetlands by Type

WETLAND TYPE	TOTAL NUMBER	ACRES
EMERGENT	12	19.75
BOTTOMLAND HARDWOOD	28	74.53
PINE SAVANNAH	26	214.04
SCRUB-SHRUB	17	34.68
TOTAL	**83**	**343.02**

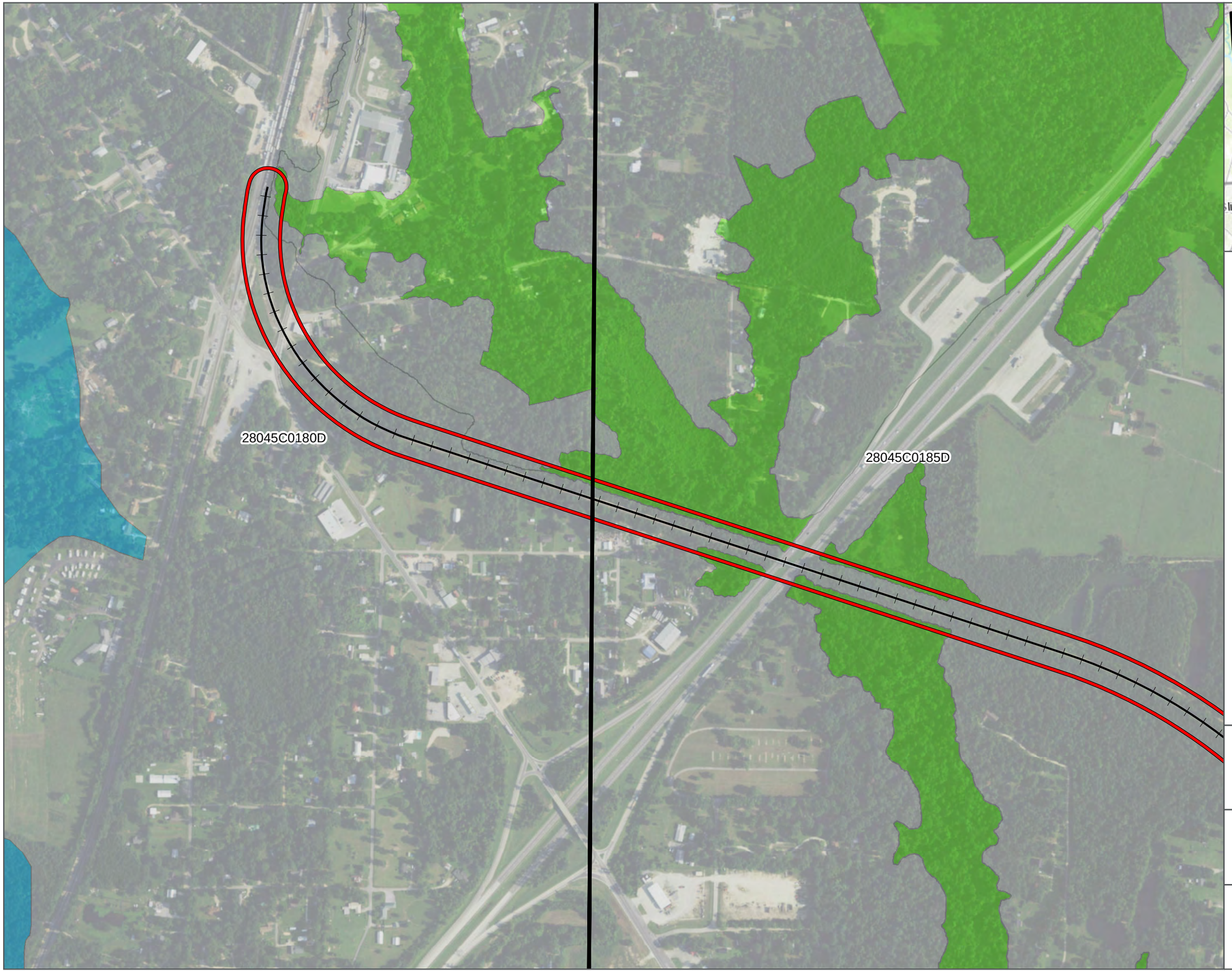
Other Waters

TYPE	TOTAL NUMBER	ACRES
OPEN WATERS	8	3.84
RIVERINE	2	0.40
TOTAL	**10**	**4.24**

Streams

STREAM NUMBER	SEGMENT	STREAM TYPE	NAME	LINEAR FEET (LF)
1	11	Intermittent	Unnamed Tributary	182
2	11	Intermittent	Unnamed Tributary	144
3	11	Perennial	Alligator Branch	240
4	11	Perennial	Second Alligator Branch	223
5	11	Ephemeral	Unnamed Tributary	93
6	11	Intermittent	Indian Camp Branch	216
7	11	Intermittent	Unnamed Tributary	1,492
8	11	Intermittent	Unnamed Tributary	203
9	10B	Intermittent	Unnamed Tributary	85
10	10B	Perennial	Turtleskin Creek	265
11	9	Perennial	Wolf Branch Creek	279
12	9	Perennial	Unnamed Tributary	343
13	7	Perennial	Bayou LaCroix	300
			Total LF Streams	**4,065**

APPENDIX D — FLOODPLAIN DATA



LEGEND

ALIGNMENT

STUDY AREA

FIRM PANEL

FLOODZONE

100 YR - BFE'S ESTABLISHED

100 YR - BFE'S NOT ESTABLISHED

OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

0 500 1,000

FEET

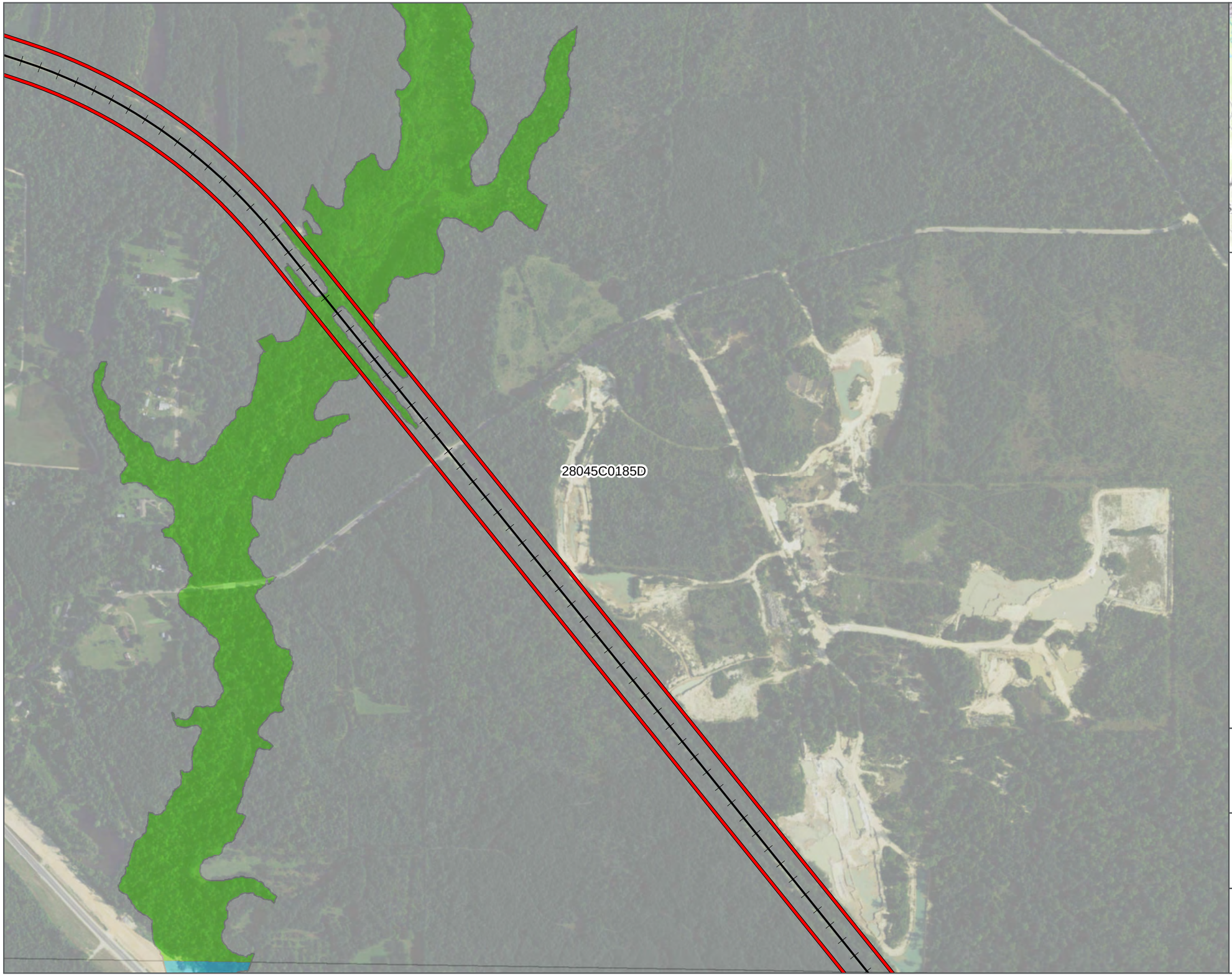
CDM Smith

listen. think. deliver.

HDR

FIGURE 1-1

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

0 500 1,000

FEET

CDM Smith

listen. think. deliver.

HDR

FIGURE 1-2

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016

LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

0 500 1,000
FEET

CDM Smith
listen. think. deliver.

HDR

FIGURE 1-3

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016

LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

0 500 1,000

FEET

CDM Smith

listen. think. deliver.

HDR

FIGURE 1-4

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016

LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

0 500 1,000

FEET

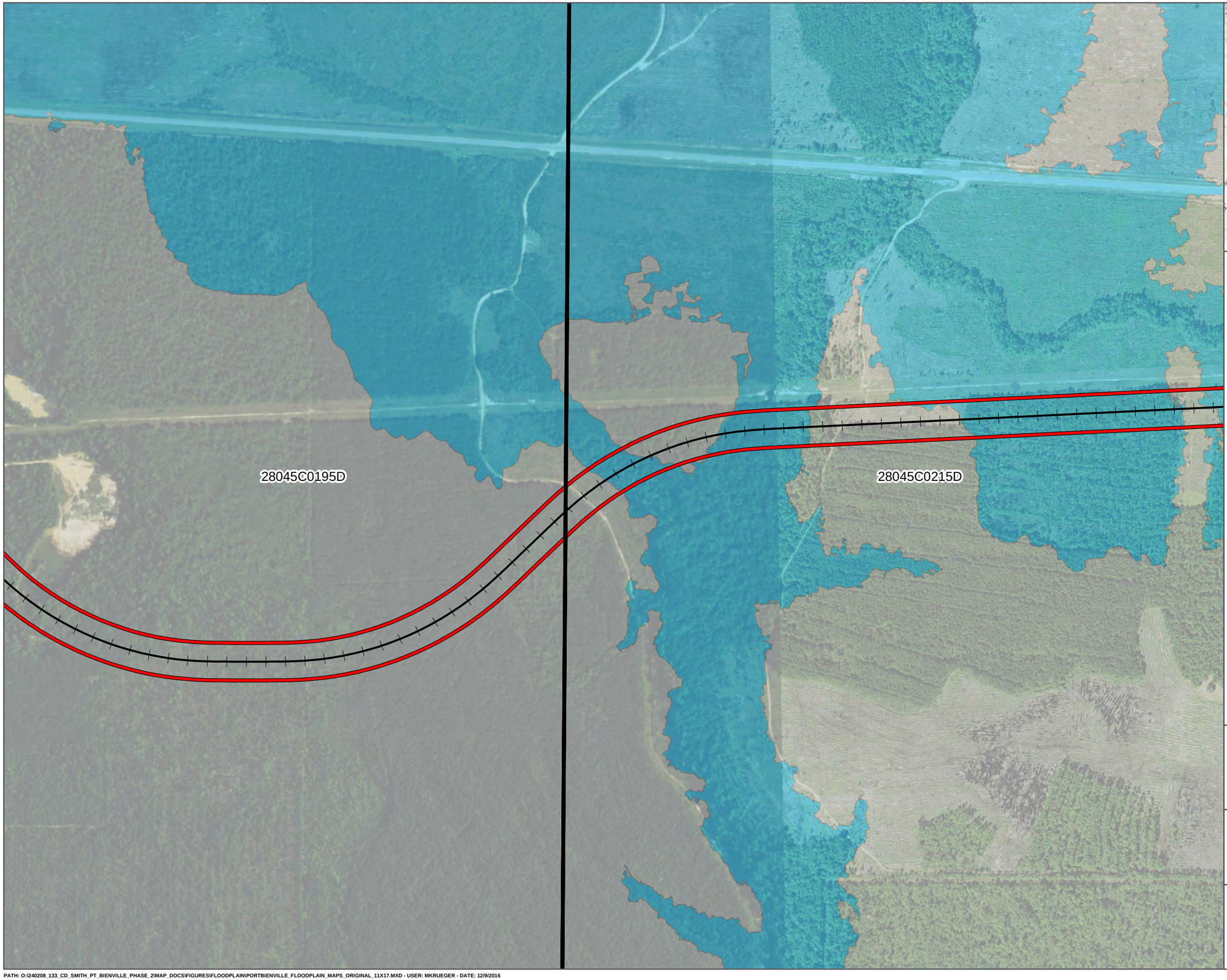
CDM Smith

listen. think. deliver.

HDR

FIGURE 1-5

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

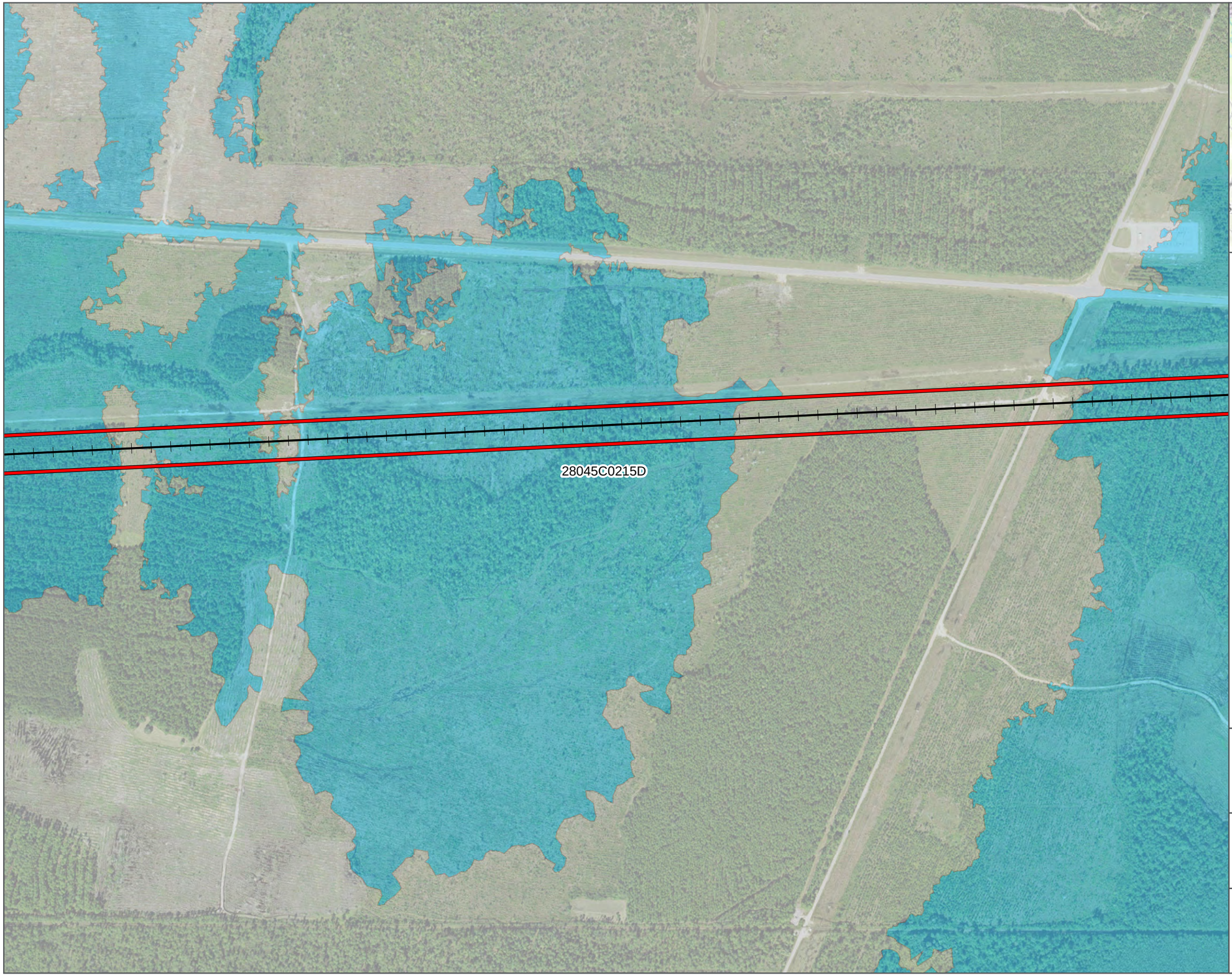
0 500 1,000
FEET

CDM Smith
listen. think. deliver.

HDR

FIGURE 1-6

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

0 500 1,000

FEET

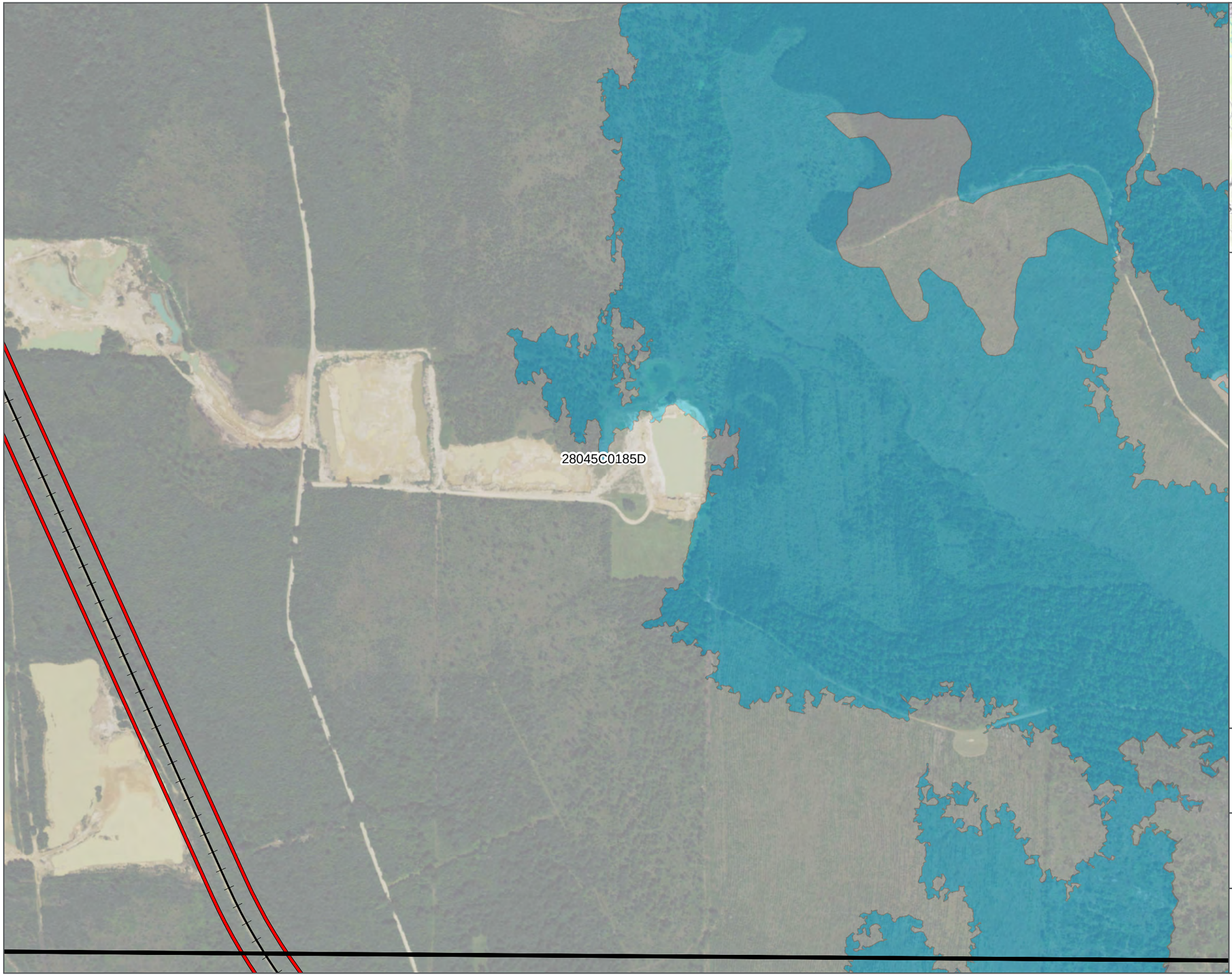
CDM Smith

listen. think. deliver.

HDR

FIGURE 1-7

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

0 500 1,000

FEET

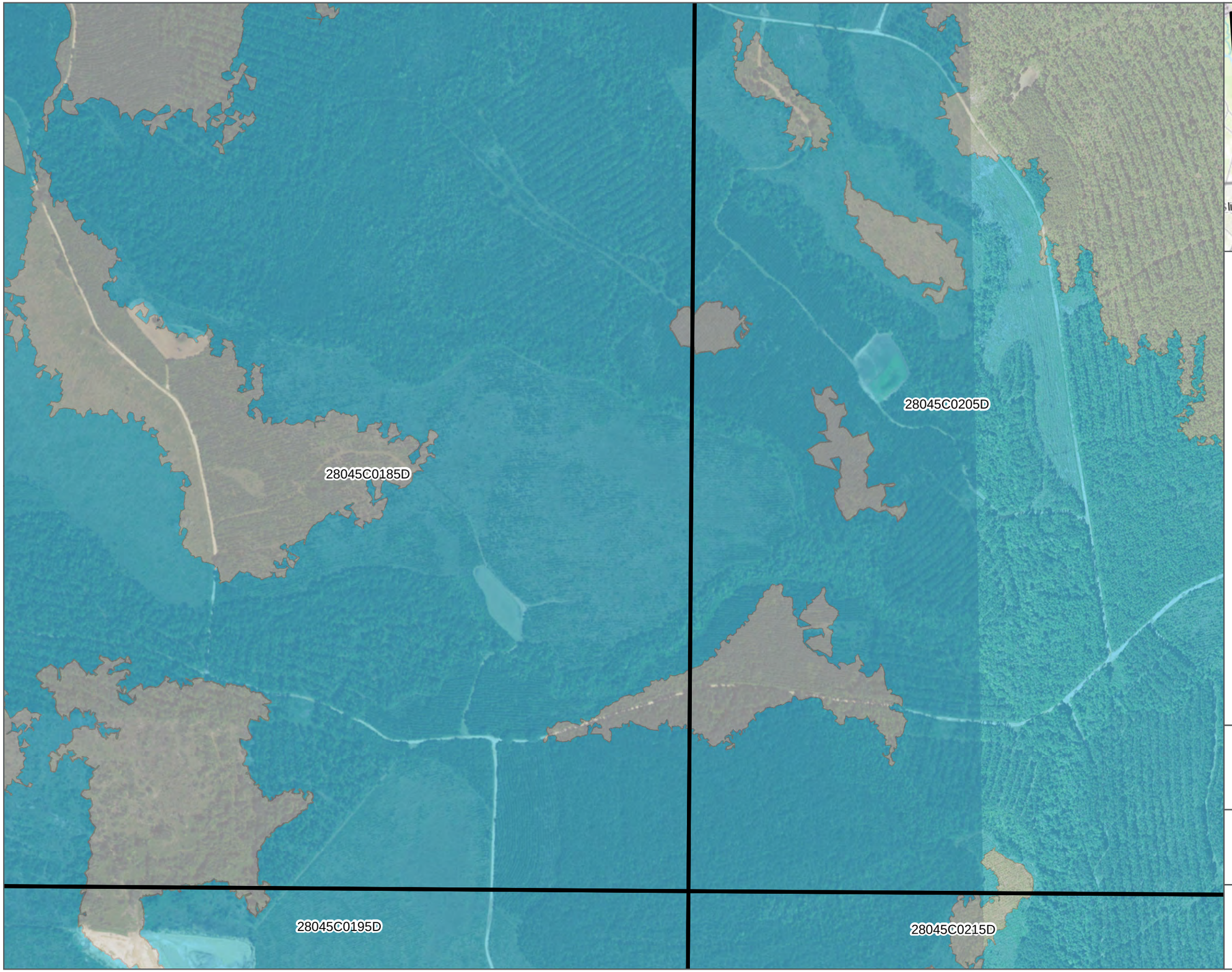
CDM Smith

listen. think. deliver.

HDR

FIGURE 1-8

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

0 500 1,000

FEET

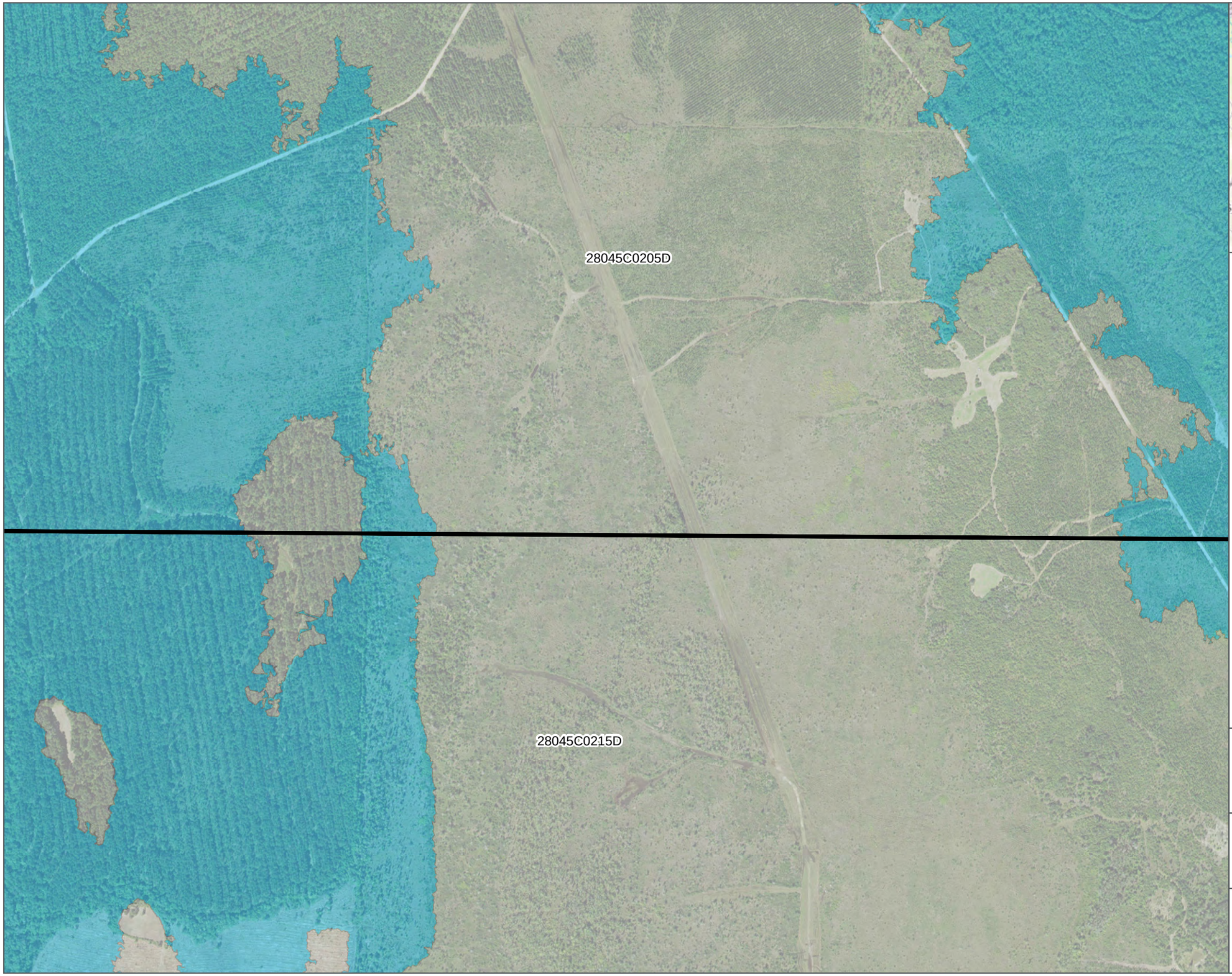
CDM Smith

listen. think. deliver.

HDR

FIGURE 1-9

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

0 500 1,000

FEET

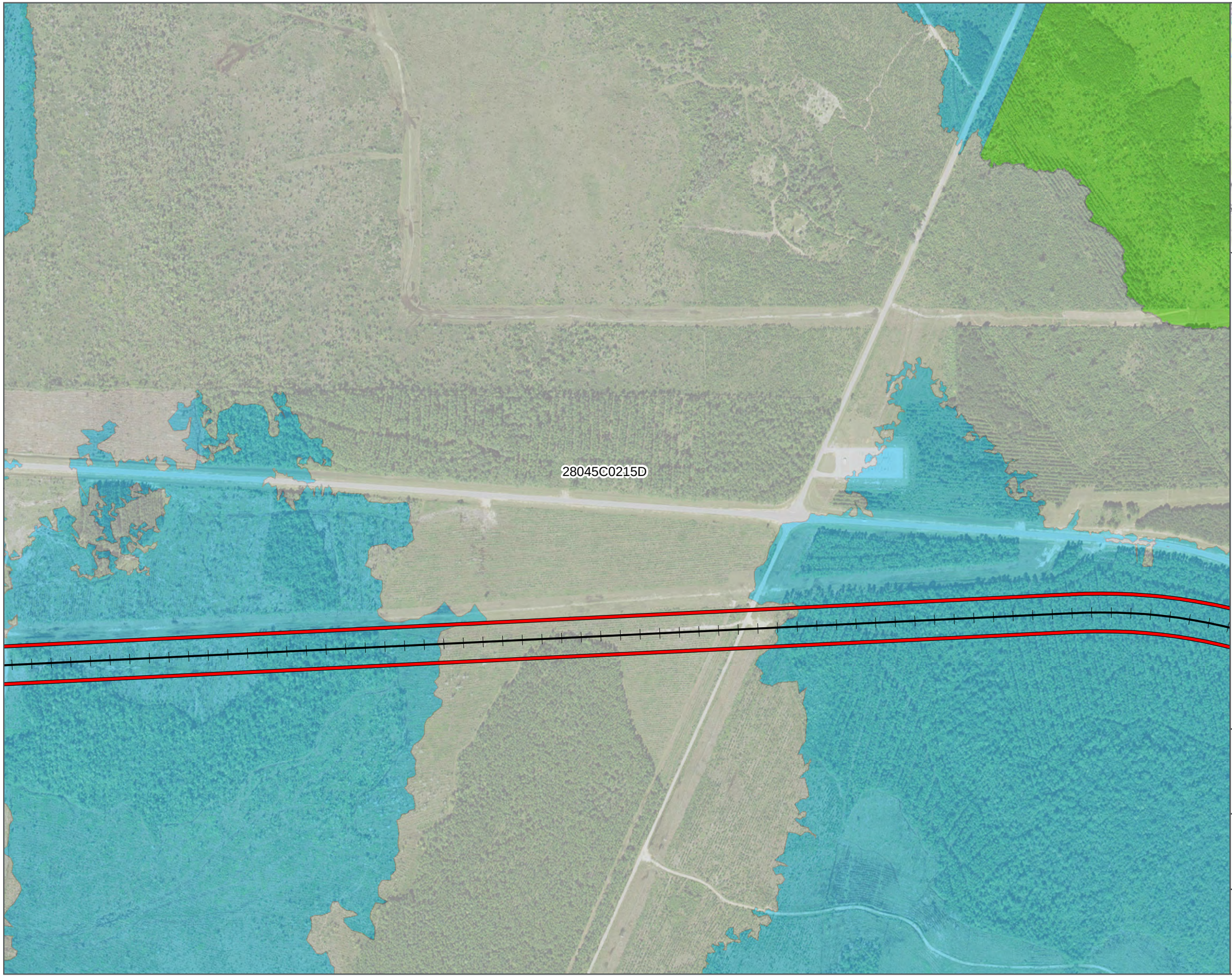
CDM Smith

listen. think. deliver.

HDR

FIGURE 1-10

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

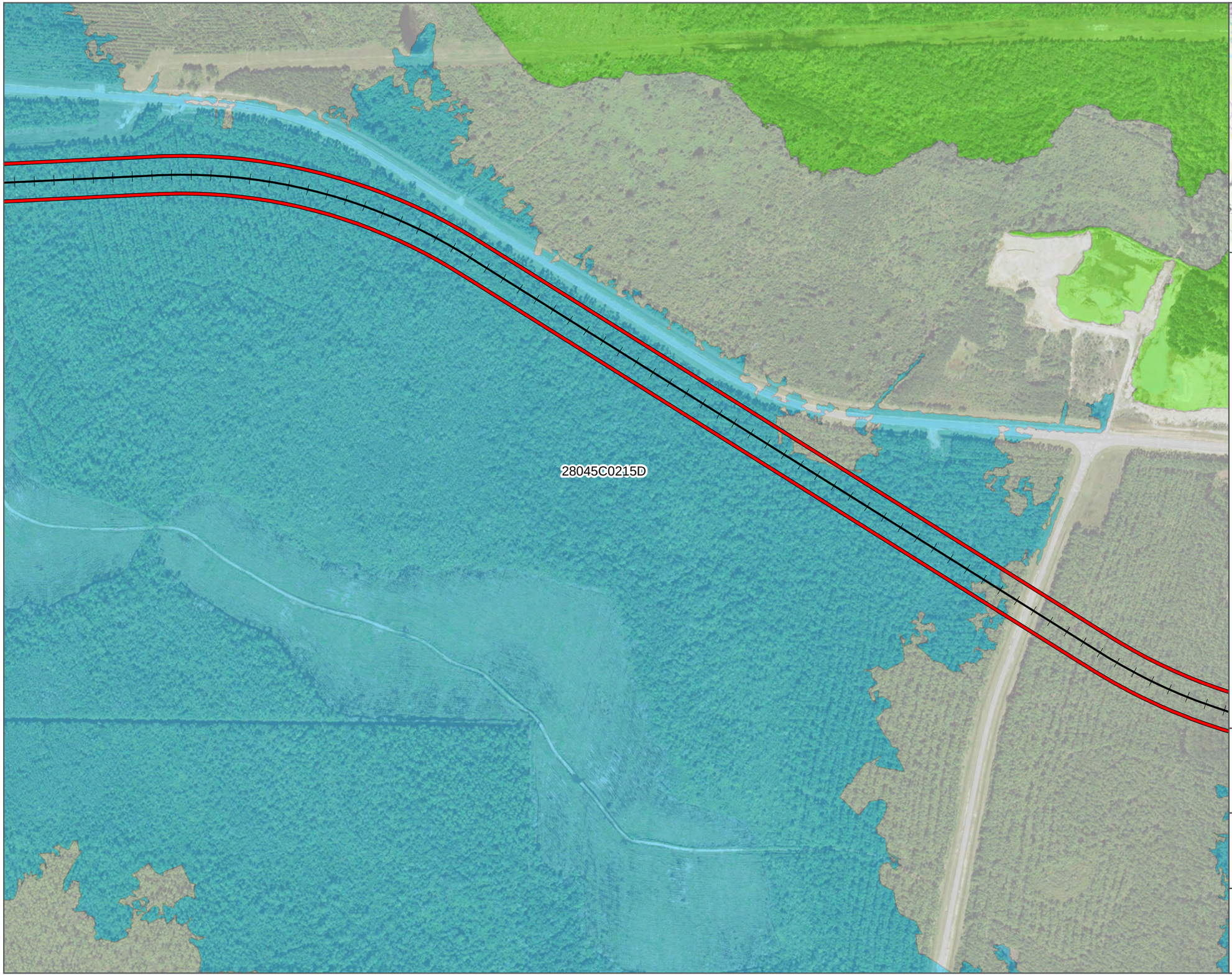
0 500 1,000
FEET

CDM Smith
listen. think. deliver.

HDR

FIGURE 1-11

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

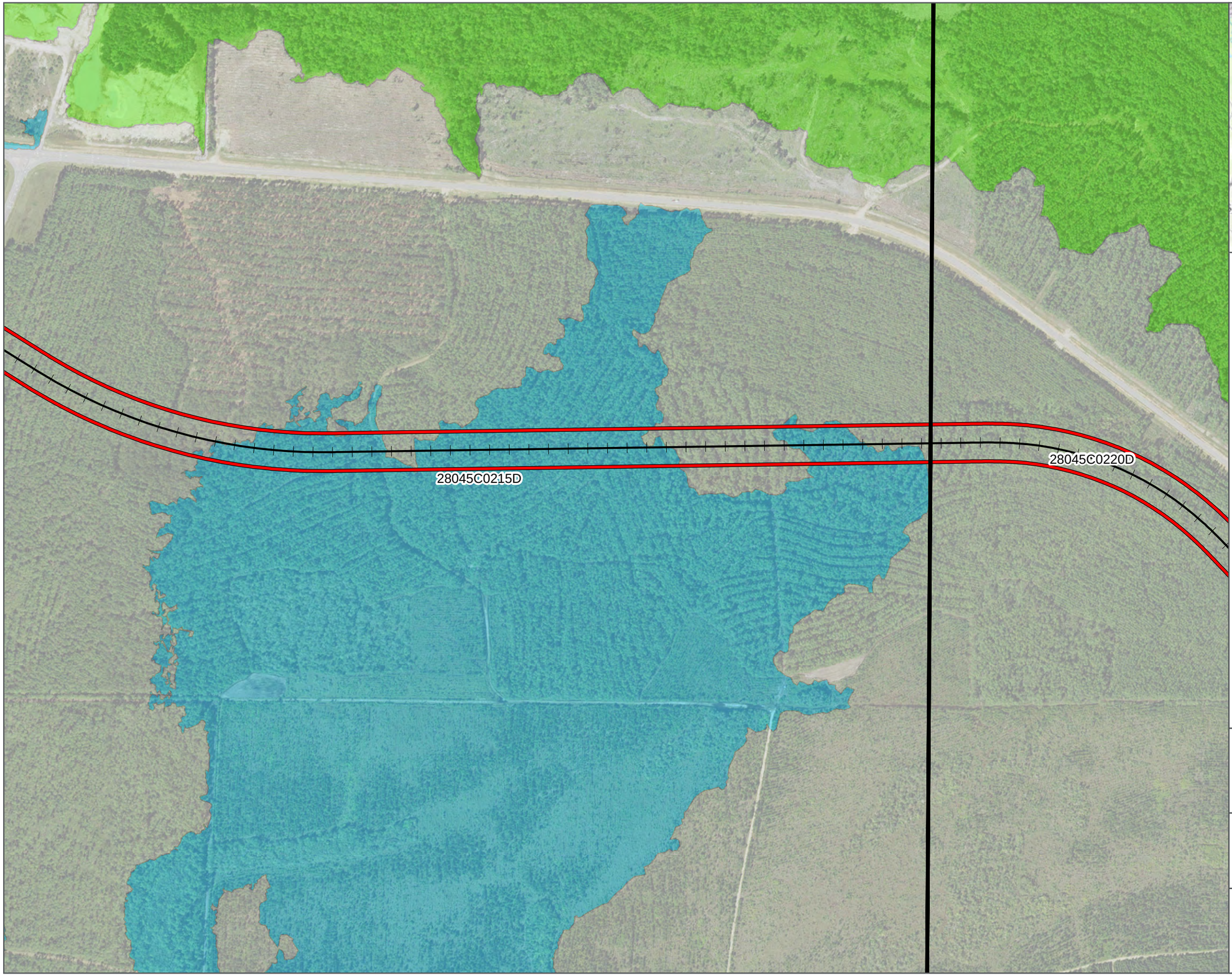
0 500 1,000
FEET

CDM Smith
listen. think. deliver.

HDR

FIGURE 1-12

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

0 500 1,000

FEET

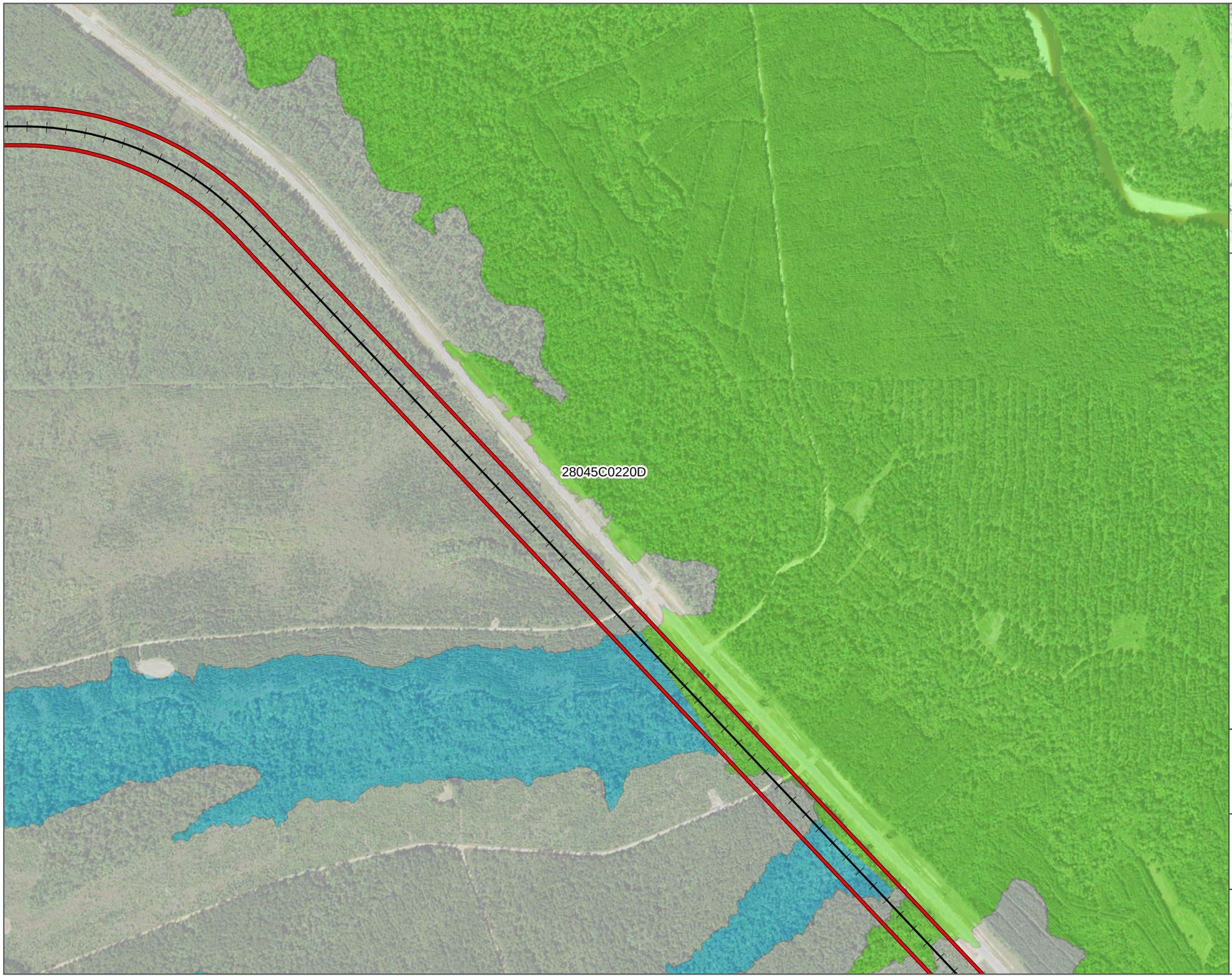
CDM Smith

listen. think. deliver.

HDR

FIGURE 1-13

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

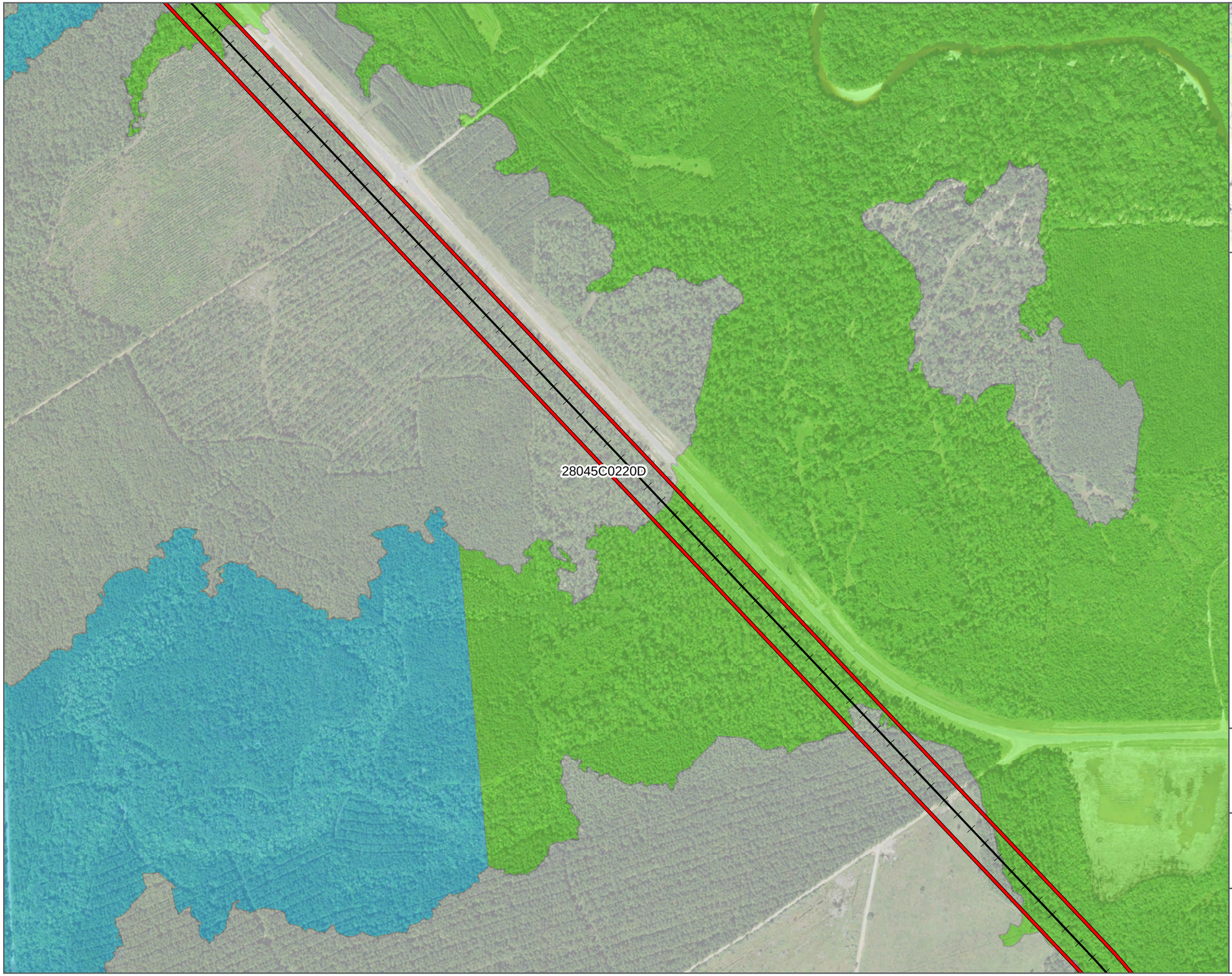
0 500 1,000
FEET

CDM Smith
listen. think. deliver.

HDR

FIGURE 1-14

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

0 500 1,000
FEET

CDM Smith
listen. think. deliver.

HDR

FIGURE 1-15

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016

LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

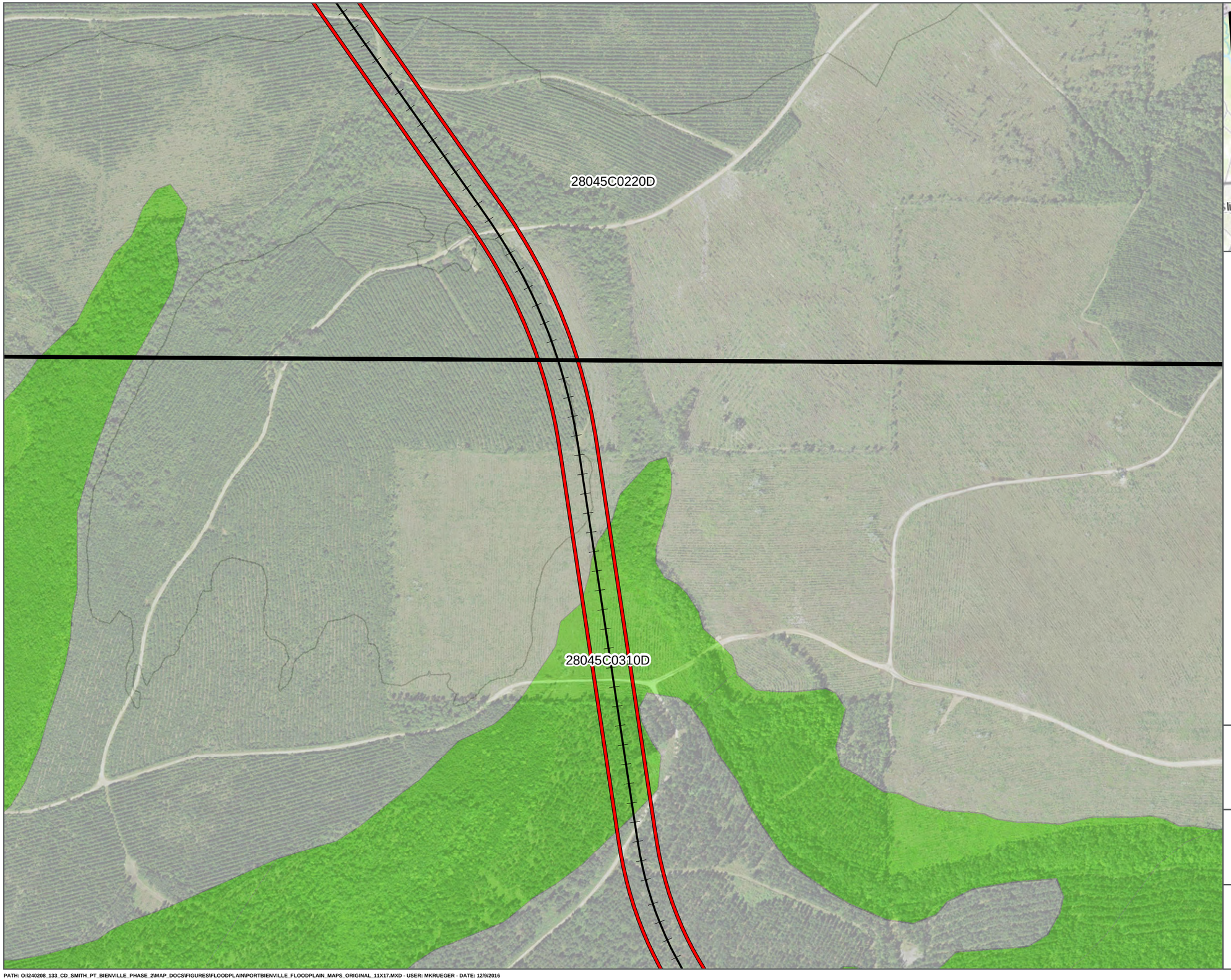
0 500 1,000
FEET

CDM Smith
listen. think. deliver.

HDR

FIGURE 1-16

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

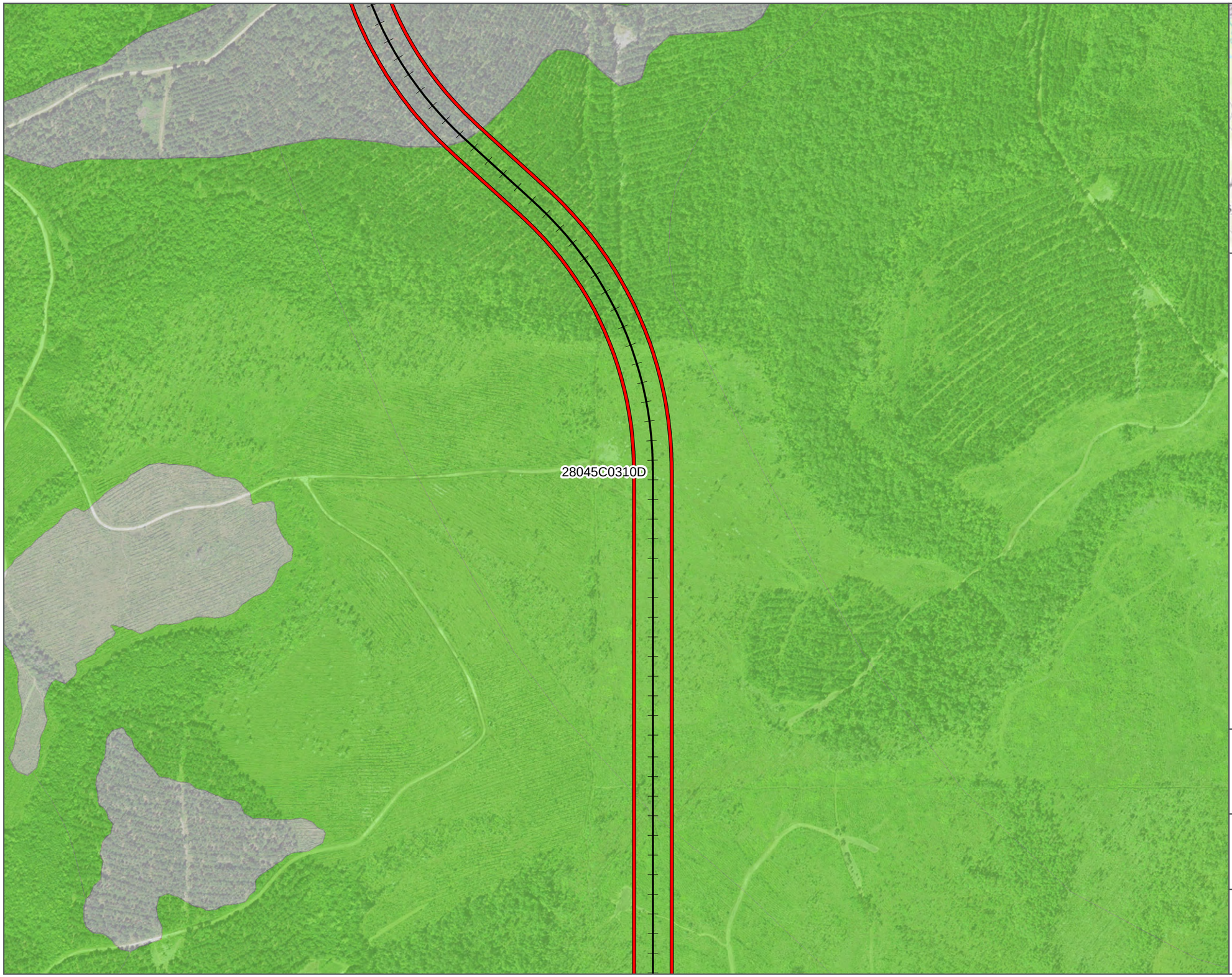
0 500 1,000
FEET

CDM Smith
listen. think. deliver.

HDR

FIGURE 1-17

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

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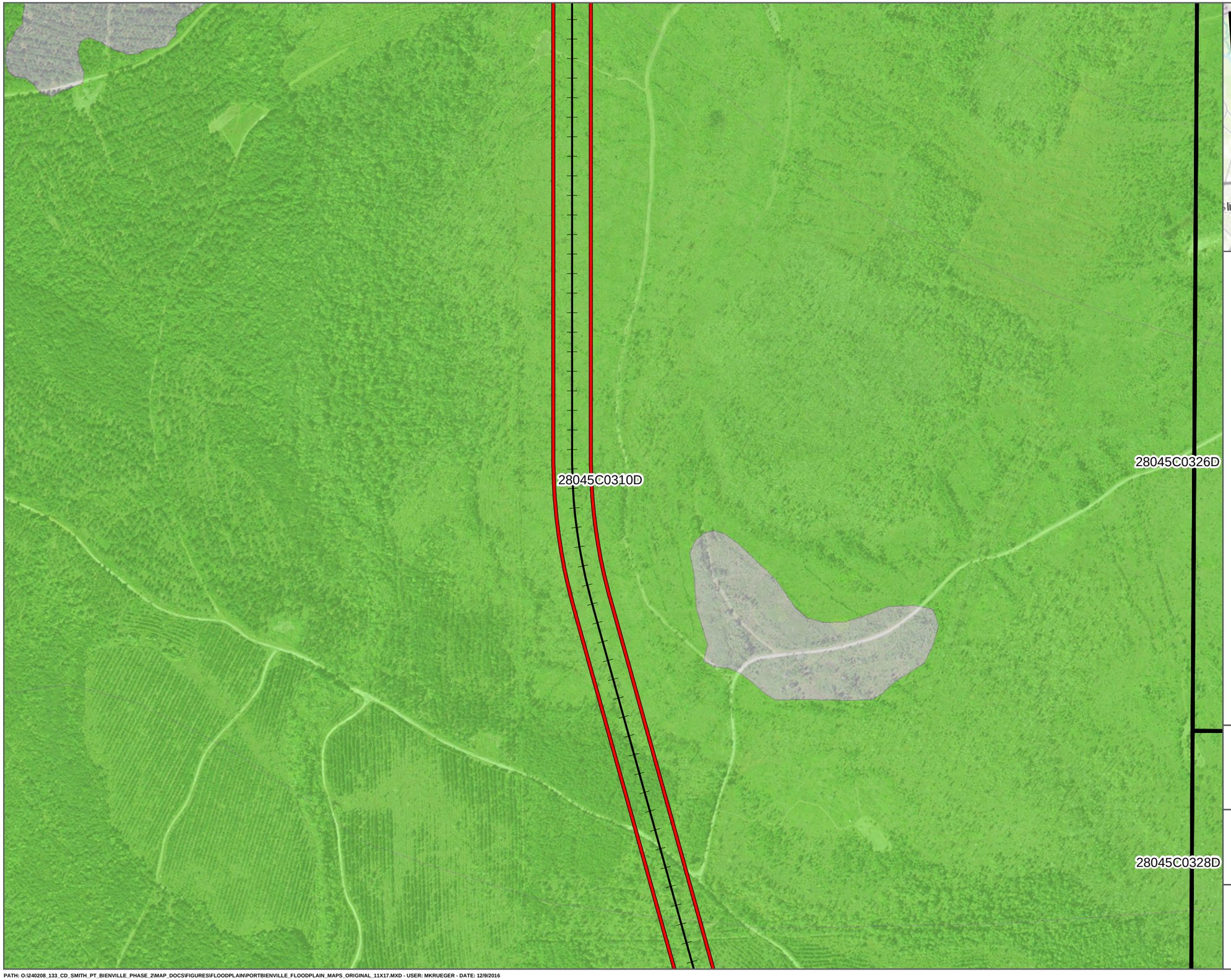
HDR

FIGURE 1-18

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

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FEET

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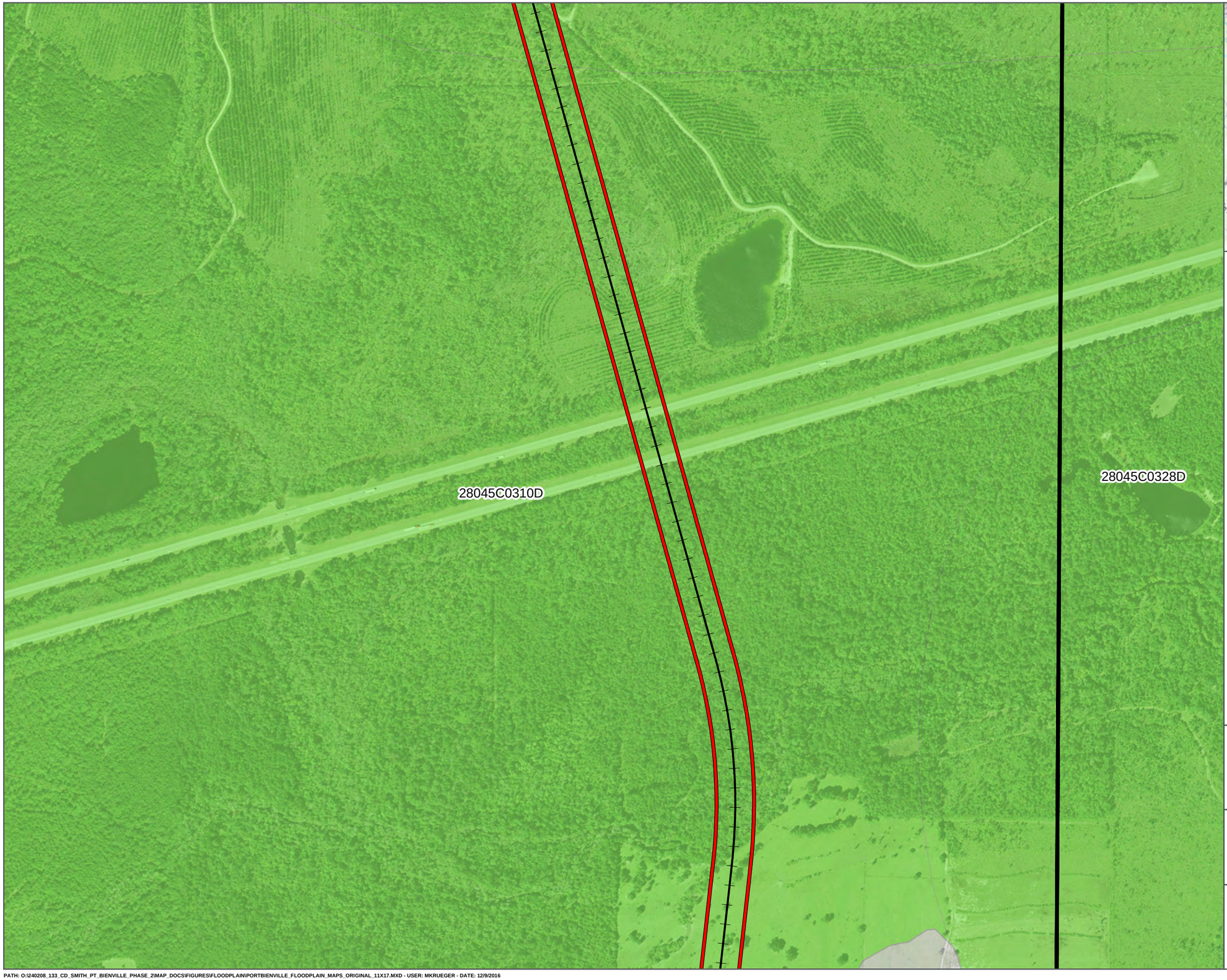
FIGURE 1-19

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

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FEET

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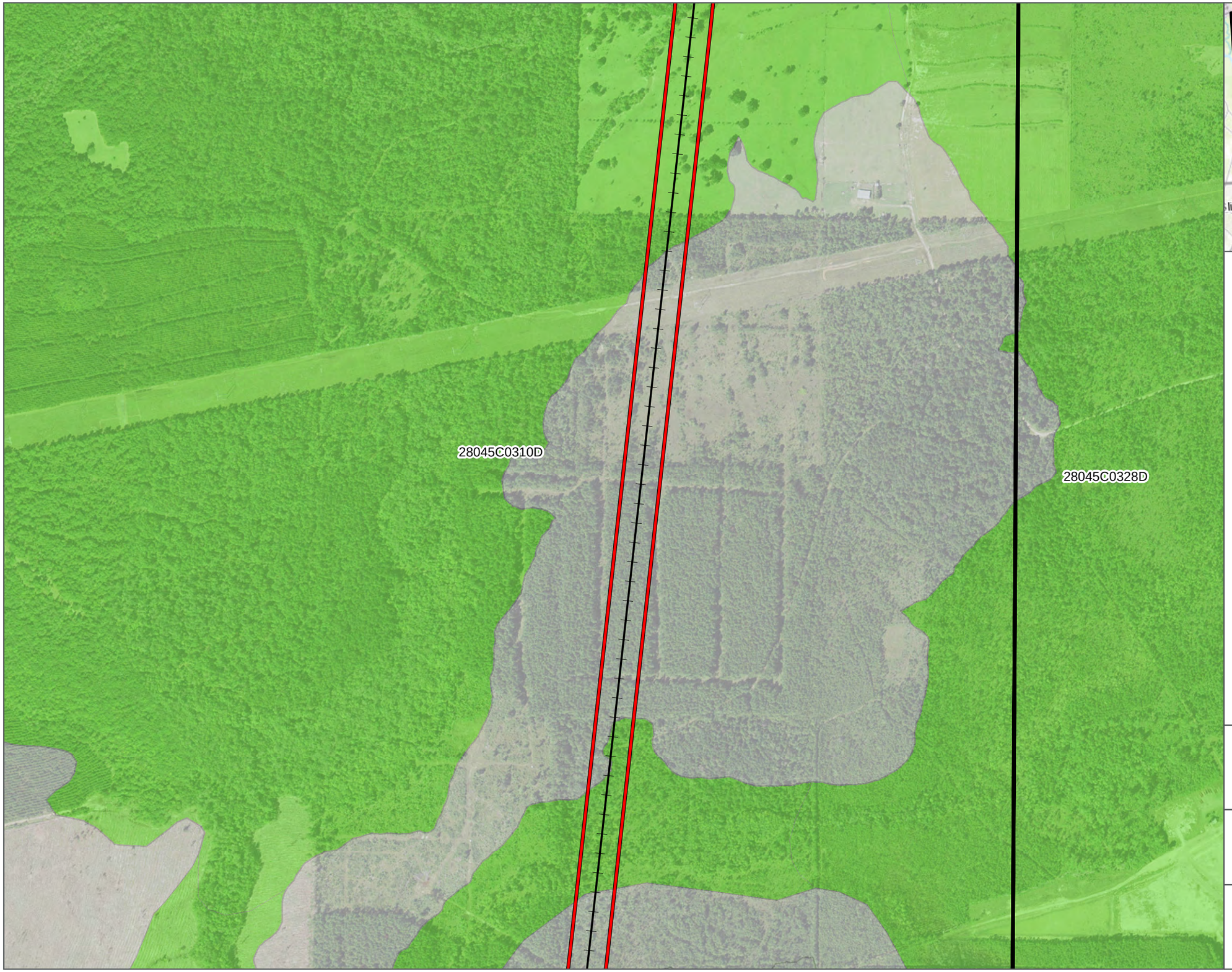
FIGURE 1-20

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

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FEET

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FIGURE 1-21

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016

LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

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FEET

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HDR

FIGURE 1-22

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016

LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

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FEET

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FIGURE 1-23

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016

LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

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FEET

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FIGURE 1-24

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016

LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

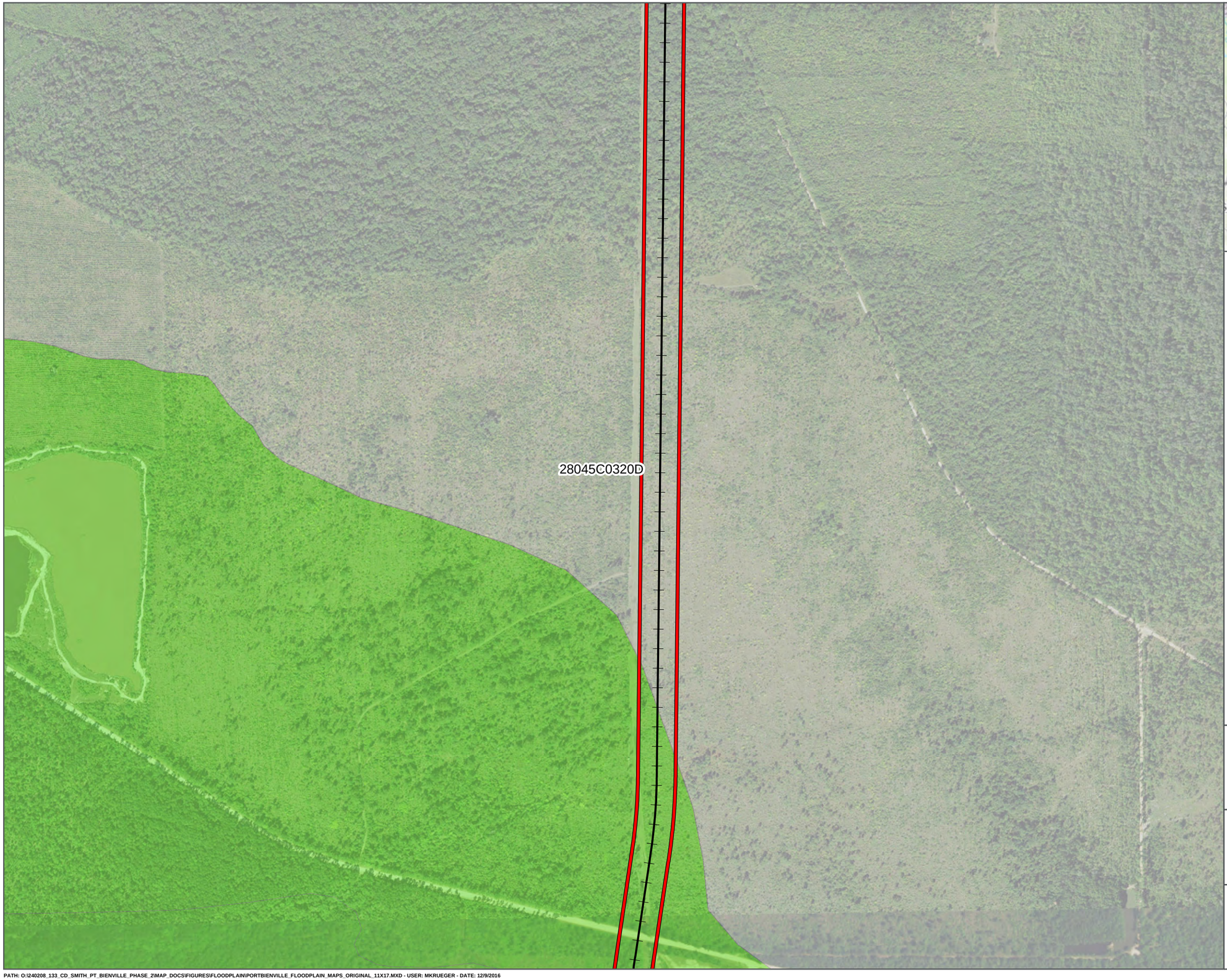
0 500 1,000
FEET

CDM Smith
listen. think. deliver.

HDR

FIGURE 1-25

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016



LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

0 500 1,000
FEET

CDM Smith
listen. think. deliver.

HDR

FIGURE 1-26

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016

LEGEND

- ALIGNMENT
- STUDY AREA
- FIRM PANEL

FLOODZONE

- 100 YR - BFE'S ESTABLISHED
- 100 YR - BFE'S NOT ESTABLISHED
- OUTSIDE 100 YR & 500 YR ZONE

DATA SOURCES: NWI, USDA, NHD, NRCS, ESRI

PORT BIENVILLE RAILROAD

FLOODPLAIN MAPS

N

0 500 1,000
FEET

CDM Smith
listen. think. deliver.

HDR

FIGURE 1-27

PATH: O:\240208_133_CD_SMITH_PT_BIENVILLE_PHASE_2\MAP_DOCS\FIGURES\FLOODPLAIN\PORTBIENVILLE_FLOODPLAIN_MAPS_ORIGINAL_11X17.MXD - USER: MKRUEGER - DATE: 12/9/2016

APPENDIX E — SOILS REPORT

United States Department of Agriculture

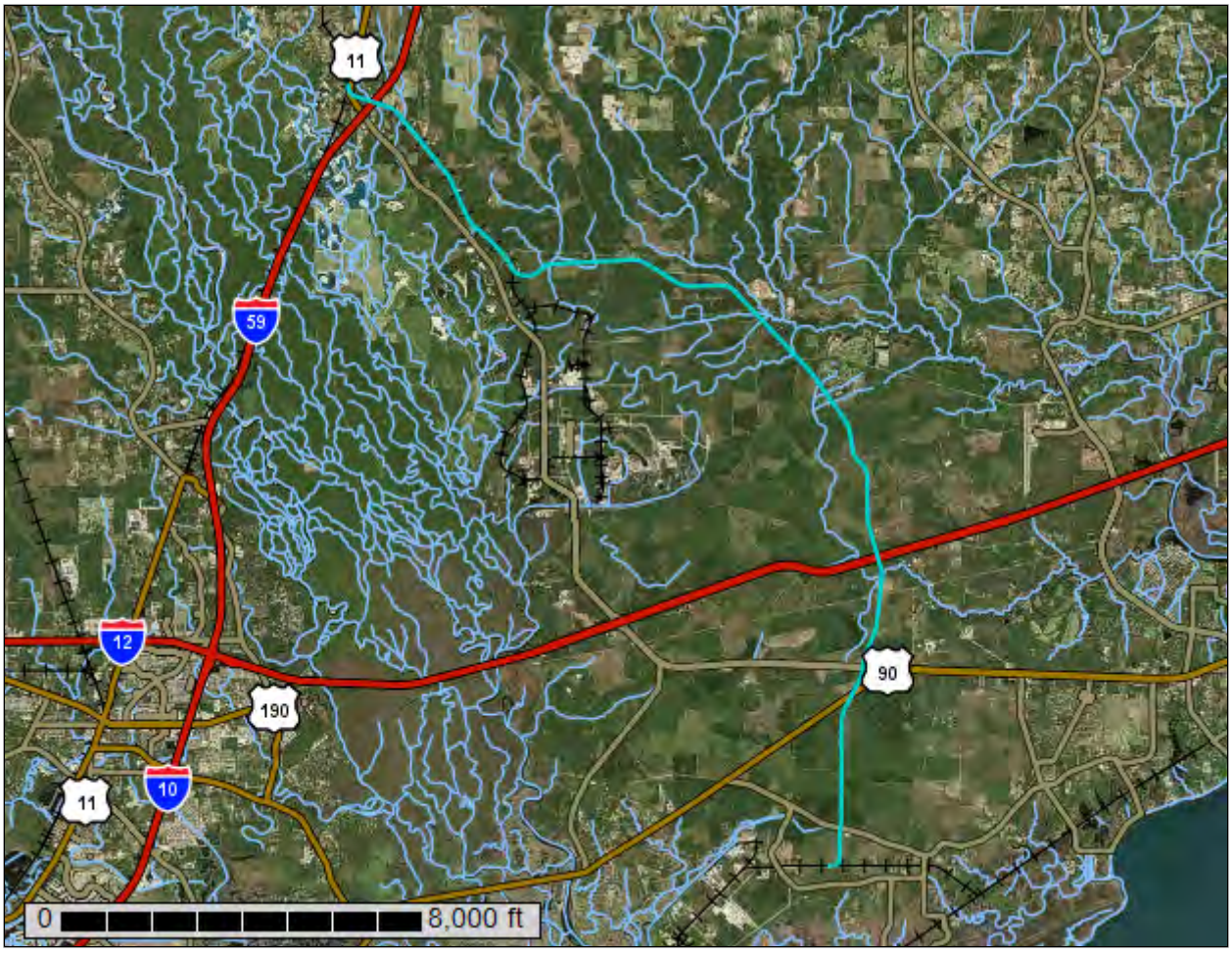
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hancock County, Mississippi, and Pearl River County, Mississippi

Port Bienville Railroad Preferred Alignment



June 20, 2016

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

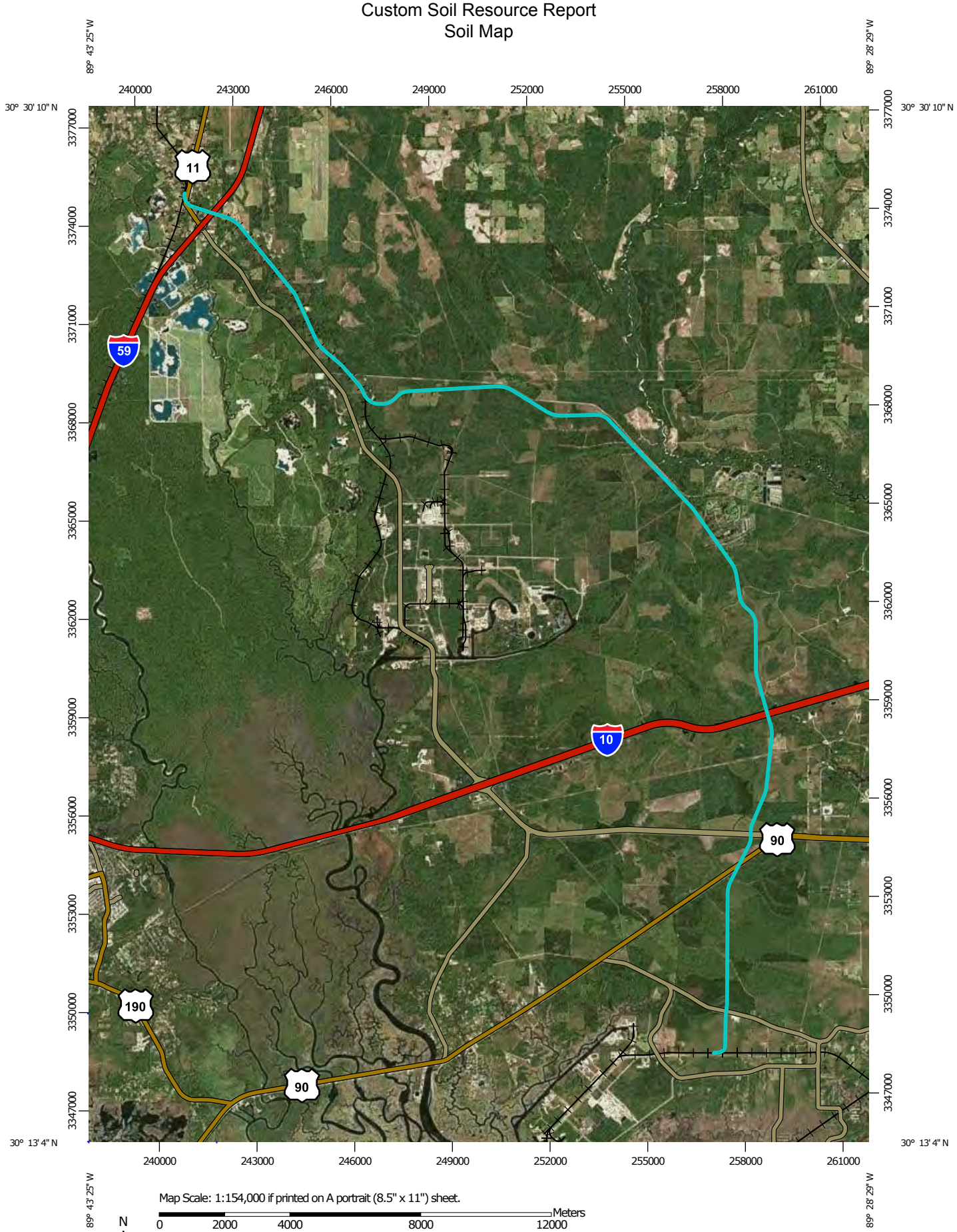
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hancock County, Mississippi
Survey Area Data: Version 12, Sep 22, 2015

Soil Survey Area: Pearl River County, Mississippi
Survey Area Data: Version 13, Sep 22, 2015

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 22, 2010—Jun 2, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Hancock County, Mississippi (MS045)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
At	Atmore silt loam, 0 to 2 percent slopes	100.6	17.5%
Be	Beauregard silt loam	26.3	4.6%
EsA	Escambia loam, 0 to 2 percent slopes	55.5	9.7%
EsB	Escambia loam, 2 to 5 percent slopes	14.0	2.4%
EuB	Eustis loamy fine sand, 2 to 5 percent slopes	1.6	0.3%
Gu	Guyton silt loam, 0 to 1 percent slopes, rarely flooded	54.8	9.5%
HlA	Harleston fine sandy loam, 0 to 2 percent slopes	11.1	1.9%
HlB	Harleston fine sandy loam, 2 to 5 percent slopes	7.6	1.3%
MaB	Malbis fine sandy loam, 2 to 5 percent slopes	5.3	0.9%
McB	McLaurin fine sandy loam, 2 to 5 percent slopes	12.5	2.2%
PoA	Poarch fine sandy loam, 0 to 2 percent slopes	2.6	0.4%
PoB	Poarch fine sandy loam, 2 to 5 percent slopes	22.2	3.9%
PoC	Poarch fine sandy loam, 5 to 8 percent slopes	0.7	0.1%
SaA	Saucier fine sandy loam, 0 to 2 percent slopes	17.3	3.0%
SaB	Saucier fine sandy loam, 2 to 5 percent slopes	6.7	1.2%
ScB	Saucier-Susquehanna complex, 2 to 5 percent slopes	10.0	1.7%
St	Smithton fine sandy loam	60.3	10.5%
Su	Smithton fine sandy loam, frequently flooded	41.6	7.2%
SW	Smithton association, frequently flooded	53.4	9.3%
TR	Trebloc association, frequently flooded	15.0	2.6%
W	Water	0.2	0.0%
Subtotals for Soil Survey Area		**519.3**	**90.3%**
Totals for Area of Interest		**574.9**	**100.0%**

Pearl River County, Mississippi (MS109)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Bd	Bibb sandy loam	4.0	0.7%
EaA	Escambia fine sandy loam, 0 to 2 percent slopes	27.4	4.8%
Pa	Pits	10.9	1.9%
PoA	Poarch loam, 0 to 2 percent slopes	9.8	1.7%
SaA	Saucier loam, 0 to 2 percent slopes	3.4	0.6%
Subtotals for Soil Survey Area		**55.6**	**9.7%**
Totals for Area of Interest		**574.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If

intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hancock County, Mississippi

At—Atmore silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t42g
Elevation: 20 to 270 feet
Mean annual precipitation: 57 to 69 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 215 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Atmore and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Atmore

Setting

Landform: Depressions, terraces, flats on divides
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Silty alluvium over fine-loamy alluvium derived from sedimentary rock

Typical profile

A - 0 to 5 inches: silt loam
Eg - 5 to 9 inches: silt loam
E/Bg - 9 to 30 inches: silt loam
Btg - 30 to 39 inches: silt loam
Btgv1 - 39 to 51 inches: silt loam
Btgv2 - 51 to 78 inches: clay loam
2C - 78 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 24 to 50 inches to plinthite
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 1.28 in/hr)
Depth to water table: About 0 to 8 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D

Minor Components

Escambia

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave

Harleston

Percent of map unit: 5 percent
Landform: Stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Poarch

Percent of map unit: 5 percent
Landform: Fluviomarine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex

Be—Beauregard silt loam

Map Unit Setting

National map unit symbol: c4w3
Elevation: 50 to 450 feet
Mean annual precipitation: 48 to 75 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 200 to 335 days
Farmland classification: Not prime farmland

Map Unit Composition

Beauregard and similar soils: 85 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Beauregard

Setting

Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 19 inches: silt loam
H3 - 19 to 60 inches: silt loam
H4 - 60 to 64 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very high (about 12.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D

Minor Components

Atmore

Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear

Smithton

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear

Escambia

Percent of map unit: 3 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

Harleston

Percent of map unit: 3 percent
Landform: Stream terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

EsA—Escambia loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: c4w6
Elevation: 20 to 200 feet
Mean annual precipitation: 42 to 75 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 220 to 350 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Escambia and similar soils: 85 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Escambia

Setting

Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 33 inches: fine sandy loam
H3 - 33 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C

Minor Components

Harleston
Percent of map unit: 3 percent
Landform: Stream terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Saucier
Percent of map unit: 3 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

Atmore
Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear

Guyton
Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Poarch
Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

EsB—Escambia loam, 2 to 5 percent slopes

Map Unit Setting
National map unit symbol: c4w7
Elevation: 20 to 200 feet
Mean annual precipitation: 42 to 75 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 220 to 350 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Escambia and similar soils: 85 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Escambia

Setting

Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 33 inches: fine sandy loam
H3 - 33 to 60 inches: loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

Minor Components

Harleston

Percent of map unit: 3 percent
Landform: Stream terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Atmore

Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear

Guyton

Percent of map unit: 3 percent
Landform: Terraces

Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Poarch
Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

Saucier
Percent of map unit: 2 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

EuB—Eustis loamy fine sand, 2 to 5 percent slopes

Map Unit Setting
National map unit symbol: c4w8
Mean annual precipitation: 60 to 75 inches
Mean annual air temperature: 64 to 70 degrees F
Frost-free period: 270 to 335 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Eustis and similar soils: 85 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eustis

Setting
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile
H1 - 0 to 6 inches: loamy fine sand
H2 - 6 to 24 inches: sand
H3 - 24 to 76 inches: loamy sand
H4 - 76 to 98 inches: sand

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A

Minor Components

Poarch

Percent of map unit: 4 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

Escambia

Percent of map unit: 4 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

Harleston

Percent of map unit: 4 percent
Landform: Stream terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Gu—Guyton silt loam, 0 to 1 percent slopes, rarely flooded

Map Unit Setting

National map unit symbol: 2w8y3
Elevation: 10 to 200 feet
Mean annual precipitation: 57 to 69 inches
Mean annual air temperature: 61 to 70 degrees F

Frost-free period: 215 to 270 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Guyton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Guyton

Setting

Landform: Flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Late plisetocene age terraces with loamy alluvium derived from sedimentary rock

Typical profile

A - 0 to 3 inches: silt loam
E - 3 to 27 inches: silt loam
Btg/E - 27 to 41 inches: silty clay loam
Btg - 41 to 70 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0
Available water storage in profile: Very high (about 12.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D

Minor Components

Myatt

Percent of map unit: 4 percent
Landform: Depressions on stream terraces, drainageways on stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear

Abita

Percent of map unit: 4 percent
Landform: Flats

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear

Stough

Percent of map unit: 2 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear

HlA—Harleston fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t42d
Elevation: 20 to 250 feet
Mean annual precipitation: 57 to 69 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 215 to 270 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Harleston and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harleston

Setting

Landform: Stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from sedimentary rock

Typical profile

A - 0 to 4 inches: fine sandy loam
E - 4 to 9 inches: fine sandy loam
BE - 9 to 13 inches: fine sandy loam
Bt1 - 13 to 24 inches: sandy loam
Bt2 - 24 to 43 inches: fine sandy loam
Bt3 - 43 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.6 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D

Minor Components

Bibb
Percent of map unit: 7 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave

Smithton
Percent of map unit: 4 percent
Landform: Depressions, drainageways
Landform position (three-dimensional): Tread, talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear

Stough
Percent of map unit: 4 percent
Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

HIB—Harleston fine sandy loam, 2 to 5 percent slopes

Map Unit Setting
National map unit symbol: 2t42f
Elevation: 20 to 250 feet
Mean annual precipitation: 57 to 69 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 200 to 270 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Harleston and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harleston

Setting

Landform: Marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium derived from sedimentary rock

Typical profile

Ap - 0 to 4 inches: fine sandy loam
E - 4 to 9 inches: fine sandy loam
BE - 9 to 13 inches: sandy loam
Bt1 - 13 to 43 inches: fine sandy loam
Bt2 - 43 to 80 inches: sandy clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D

Minor Components

Bibb

Percent of map unit: 7 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave

Smithton

Percent of map unit: 4 percent
Landform: Depressions, drainageways
Landform position (three-dimensional): Tread, talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear

Stough

Percent of map unit: 4 percent
Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear

Across-slope shape: Linear

MaB—Malbis fine sandy loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2w8xx
Elevation: 20 to 380 feet
Mean annual precipitation: 57 to 69 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 215 to 270 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Malbis and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Malbis

Setting

Landform: Fluviomarine terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy marine deposits derived from sedimentary rock

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bt - 7 to 26 inches: loam
Btv - 26 to 71 inches: sandy clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 39 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

Minor Components

Saucier

Percent of map unit: 5 percent
Landform: Fluviomarine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

Poarch

Percent of map unit: 4 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex

Benndale

Percent of map unit: 4 percent
Landform: Fluviomarine terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, crest
Down-slope shape: Convex
Across-slope shape: Convex

Escambia

Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave

McB—McLaurin fine sandy loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2syw1
Elevation: 40 to 430 feet
Mean annual precipitation: 57 to 68 inches
Mean annual air temperature: 61 to 68 degrees F
Frost-free period: 200 to 250 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Mclaurin and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mclaurin

Setting

Landform: Fluviomarine terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits derived from sedimentary rock

Typical profile

Ap - 0 to 6 inches: fine sandy loam
BE - 6 to 14 inches: sandy loam
Bt - 14 to 80 inches: sandy loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Minor Components

Smithdale

Percent of map unit: 10 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear

Benndale

Percent of map unit: 5 percent
Landform: Fluviomarine terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, crest, riser
Down-slope shape: Convex
Across-slope shape: Convex

PoA—Poarch fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t42k
Elevation: 30 to 340 feet
Mean annual precipitation: 57 to 69 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 215 to 270 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Poarch and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poarch

Setting

Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits derived from sedimentary rock

Typical profile

Ap - 0 to 7 inches: fine sandy loam
E - 7 to 12 inches: loam
Bt - 12 to 32 inches: loam
Btv1 - 32 to 66 inches: loam
Btv2 - 66 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Minor Components

Malbis

Percent of map unit: 5 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

Atmore

Percent of map unit: 5 percent
Landform: Depressions, terraces, interfluves
Landform position (two-dimensional): Toeslope, summit
Landform position (three-dimensional): Interfluve, dip
Down-slope shape: Concave
Across-slope shape: Concave

Escambia

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave

PoB—Poarch fine sandy loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2t42h
Elevation: 30 to 340 feet
Mean annual precipitation: 57 to 69 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 215 to 270 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Poarch and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poarch

Setting

Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits derived from sedimentary rock

Typical profile

A - 0 to 7 inches: fine sandy loam
E - 7 to 12 inches: loam
Bt - 12 to 32 inches: loam
Btv1 - 32 to 66 inches: loam
Btv2 - 66 to 80 inches: fine sandy loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Minor Components

Escambia

Percent of map unit: 8 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave

Malbis

Percent of map unit: 5 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

Harleston

Percent of map unit: 2 percent
Landform: Marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave

PoC—Poarch fine sandy loam, 5 to 8 percent slopes

Map Unit Setting

National map unit symbol: c4wr
Elevation: 100 to 300 feet
Mean annual precipitation: 48 to 75 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 200 to 335 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Poarch and similar soils: 85 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poarch

Setting

Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

H1 - 0 to 7 inches: fine sandy loam
H2 - 7 to 35 inches: loam
H3 - 35 to 60 inches: loam

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Minor Components

Escambia

Percent of map unit: 4 percent
Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

Harleston

Percent of map unit: 4 percent
Landform: Stream terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Smithton

Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear

SaA—Saucier fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w8xw
Elevation: 20 to 340 feet
Mean annual precipitation: 57 to 69 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 215 to 270 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Saucier and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saucier

Setting

Landform: Fluviomarine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over clayey fluviomarine deposits derived from sedimentary rock

Typical profile

A - 0 to 5 inches: fine sandy loam
BA - 5 to 12 inches: fine sandy loam
Bt - 12 to 26 inches: loam
Btv - 26 to 38 inches: loam
2Btv - 38 to 48 inches: silty clay loam
2Bt - 48 to 72 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.04 to 0.20 in/hr)
Depth to water table: About 18 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C

Minor Components

Malbis

Percent of map unit: 5 percent
Landform: Fluviomarine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

Poarch

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex

Escambia

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave

Atmore

Percent of map unit: 2 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave

SaB—Saucier fine sandy loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2w8xz
Elevation: 20 to 380 feet
Mean annual precipitation: 57 to 69 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 215 to 270 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Saucier and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saucier

Setting

Landform: Fluviomarine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over clayey fluviomarine deposits derived from sedimentary rock

Typical profile

A - 0 to 5 inches: fine sandy loam
BA - 5 to 12 inches: fine sandy loam
Bt - 12 to 26 inches: loam
Btv - 26 to 38 inches: loam
2Btv - 38 to 48 inches: silty clay loam
2Bt - 48 to 72 inches: silty clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.04 to 0.20 in/hr)
Depth to water table: About 18 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0

Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

Minor Components

Malbis

Percent of map unit: 6 percent
Landform: Fluviomarine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

Poarch

Percent of map unit: 4 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex

Escambia

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave

Atmore

Percent of map unit: 2 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave

ScB—Saucier-Susquehanna complex, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2w8y1
Elevation: 20 to 380 feet
Mean annual precipitation: 57 to 69 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 215 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Saucier and similar soils: 50 percent
Susquehanna and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saucier

Setting

Landform: Fluviomarine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over clayey fluviomarine deposits derived from sedimentary rock

Typical profile

A - 0 to 5 inches: fine sandy loam
BA - 5 to 12 inches: fine sandy loam
Bt - 12 to 26 inches: loam
Btv - 26 to 38 inches: loam
2Btv - 38 to 48 inches: silty clay loam
2Bt - 48 to 72 inches: silty clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.04 to 0.20 in/hr)
Depth to water table: About 18 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

Description of Susquehanna

Setting

Landform: Fluviomarine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty clay fluviomarine deposits over clayey fluviomarine deposits derived from sedimentary rock

Typical profile

Ap - 0 to 3 inches: fine sandy loam
E - 3 to 7 inches: fine sandy loam
Btss - 7 to 42 inches: clay
2Btssg - 42 to 60 inches: clay

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D

Minor Components

Poarch

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex

Malbis

Percent of map unit: 5 percent
Landform: Fluviomarine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear

Atmore

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave

St—Smithton fine sandy loam

Map Unit Setting

National map unit symbol: c4x6
Elevation: 20 to 400 feet
Mean annual precipitation: 40 to 75 inches
Mean annual air temperature: 61 to 72 degrees F
Frost-free period: 220 to 350 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Smithton and similar soils: 85 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Smithton

Setting

Landform: Terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 38 inches: sandy loam
H3 - 38 to 49 inches: loam
H4 - 49 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water storage in profile: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D

Minor Components

Guyton
Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Plummer
Percent of map unit: 3 percent
Landform: Flats
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Convex

Atmore
Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear

Harleston
Percent of map unit: 3 percent
Landform: Stream terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Su—Smithton fine sandy loam, frequently flooded

Map Unit Setting
National map unit symbol: c4x7
Elevation: 20 to 400 feet
Mean annual precipitation: 40 to 75 inches
Mean annual air temperature: 61 to 72 degrees F
Frost-free period: 220 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition
Smithton and similar soils: 85 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Smithton

Setting
Landform: Terraces

Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 38 inches: sandy loam
H3 - 38 to 49 inches: loam
H4 - 49 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D

Minor Components

Guyton

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Harleston

Percent of map unit: 3 percent
Landform: Stream terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Plummer

Percent of map unit: 3 percent
Landform: Flats
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Convex

Atmore

Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear

SW—Smithton association, frequently flooded

Map Unit Setting

National map unit symbol: c4wx
Elevation: 50 to 450 feet
Mean annual precipitation: 40 to 75 inches
Mean annual air temperature: 59 to 72 degrees F
Frost-free period: 200 to 335 days
Farmland classification: Not prime farmland

Map Unit Composition

Smithton and similar soils: 80 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Smithton

Setting

Landform: Terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 38 inches: sandy loam
H3 - 38 to 49 inches: loam
H4 - 49 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D

Minor Components

Harleston

Percent of map unit: 5 percent
Landform: Stream terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Bibb

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Trebloc

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear

TR—Trebloc association, frequently flooded

Map Unit Setting

National map unit symbol: c4x9
Elevation: 20 to 300 feet
Mean annual precipitation: 42 to 75 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 200 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Trebloc and similar soils: 85 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Trebloc

Setting

Landform: Terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty alluvium deposits

Typical profile

H1 - 0 to 6 inches: silt loam

H2 - 6 to 32 inches: silt loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D

Minor Components

Guyton

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Smithton

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear

Harleston

Percent of map unit: 3 percent
Landform: Stream terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Atmore

Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Pearl River County, Mississippi

Bd—Bibb sandy loam

Map Unit Setting

National map unit symbol: c623
Elevation: 50 to 450 feet
Mean annual precipitation: 60 to 75 inches
Mean annual air temperature: 64 to 70 degrees F
Frost-free period: 270 to 335 days
Farmland classification: Not prime farmland

Map Unit Composition

Bibb and similar soils: 95 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bibb

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy alluvium deposits

Typical profile

H1 - 0 to 48 inches: sandy loam
H2 - 48 to 65 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D

Minor Components

Dorovan

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear

EaA—Escambia fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2vy05
Elevation: 30 to 340 feet
Mean annual precipitation: 57 to 69 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 215 to 270 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Escambia and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Escambia

Setting

Landform: Terraces, flats, interfluves
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Crest, tread, rise
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Loamy fluviomarine deposits derived from sedimentary rock

Typical profile

Ap - 0 to 10 inches: fine sandy loam
E - 10 to 15 inches: fine sandy loam
Bt - 15 to 24 inches: fine sandy loam
Btv1 - 24 to 45 inches: loam
Btv2 - 45 to 59 inches: loam
Btvg - 59 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D

Minor Components

Malbis

Percent of map unit: 5 percent
Landform: Fluviomarine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

Poarch

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex

Atmore

Percent of map unit: 5 percent
Landform: Terraces, interfluves, depressions
Landform position (two-dimensional): Toeslope, summit
Landform position (three-dimensional): Head slope, interfluve, tread, dip
Down-slope shape: Concave
Across-slope shape: Linear, concave

Pa—Pits

Map Unit Setting

National map unit symbol: c62r
Mean annual precipitation: 60 to 75 inches
Mean annual air temperature: 64 to 70 degrees F
Frost-free period: 270 to 335 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits: 95 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Setting

Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

H1 - 0 to 80 inches: fine sandy loam

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Minor Components

Unnamed hydric soils (133de)

Percent of map unit: 2 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave

PoA—Poarch loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: c62s
Elevation: 100 to 300 feet
Mean annual precipitation: 48 to 75 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 200 to 335 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Poarch and similar soils: 95 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poarch

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

H1 - 0 to 6 inches: loam
H2 - 6 to 26 inches: loam
H3 - 26 to 64 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C

Minor Components

Smithton

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear

SaA—Saucier loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: c632
Elevation: 100 to 300 feet
Mean annual precipitation: 48 to 75 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 200 to 335 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Saucier and similar soils: 95 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saucier

Setting

Landform: Coastal plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over clayey marine deposits

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 38 inches: loam
H3 - 38 to 46 inches: silty clay loam
H4 - 46 to 64 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 30 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C

Minor Components

Smithton

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear

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APPENDIX F — DATA FORMS

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Port Bienville City/County: Hancock County Sampling Date: 3-28-2016

Applicant/Owner: Mississippi Department of Transportation State: MS Sampling Point: 84

Investigator(s): M. Sizemore, M. Wade Section, Township, Range:

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR or MLRA): LRR -T Lat: 30.28721 Long: -89.51943 Datum: NAD 83

Soil Map Unit Name: Smithton NWI classification: PFO4A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? [ ] Are "Normal Circumstances" present? Yes [✓] No [ ]

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? [ ] (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓]	No [ ]	
Wetland Hydrology Present?	Yes [✓]	No [ ]	

Remarks:

No rainfall within the past 3 days
84 degrees F; wind 0-5 mph, mostly cloudy
Bottomland Hardwood approximately 1/4 mile south of US-90

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [✓] Surface Water (A1)
- [✓] High Water Table (A2)
- [✓] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [✓] Inundation Visible on Aerial Imagery (B7)
- [✓] Water-Stained Leaves (B9)
- [✓] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [✓] Hydrogen Sulfide Odor (C1)
- [✓] Oxidized Rhizospheres along Living Roots (C3)
- [✓] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [✓] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [✓] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [✓] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [✓] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [✓]	No [ ]	Depth (inches):	0-8"
Water Table Present?	Yes [✓]	No [ ]	Depth (inches):	0-12"
Saturation Present? (includes capillary fringe)	Yes [✓]	No [ ]	Depth (inches):	0-12"

Wetland Hydrology Present? Yes [✓] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Standing water throughout the corridor.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 84

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa biflora	35	Y	OBL
2. Acer rubrum	20	Y	FAC
3. Acer negundo	10	N	FAC
4. Quercus pagoda	15	N	FACW
5. Platanus occidentalis	10	N	FACW
6.			
	90	= Total Cover	
50% of total cover: 45	20% of total cover: 18		
Sapling Stratum (Plot size:)			
1. Taxodium distichum	20	Y	OBL
2. Pinus taeda	10	N	FAC
3. Persea borbonia	30	Y	FACW
4.			
5.			
6.			
	60	= Total Cover	
50% of total cover: 30	20% of total cover: 12		
Shrub Stratum (Plot size:)			
1. Morella cerifera	25	Y	FAC
2. Cyrilla racemiflora	30	Y	FACW
3.			
4.			
5.			
6.			
	55	= Total Cover	
50% of total cover: 27.5	20% of total cover: 11		
Herb Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		= Total Cover	
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size:)			
1. Gelsemium sempervirens	20	Y	FAC
2. Smilax bona-nox	20	Y	FAC
3.			
4.			
5.			
	40	= Total Cover	
50% of total cover: 20	20% of total cover: 8		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes [x] No [ ]

Remarks: (If observed, list morphological adaptations below).

SOIL Sampling Point: 84

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3"	10 YR 3/2	100			RM	M	Loam	Saturated at the surface
3-12"	10 YR 5/2	100			RM	M		sandy loam, saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☑ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Port Bienville City/County: Hancock County Sampling Date: 3-30-2016

Applicant/Owner: Mississippi Department of Transportation State: MS Sampling Point: 92

Investigator(s): M. Sizemore, M. Wade Section, Township, Range:

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR or MLRA): LRR -T Lat: 30.52422 Long: -89.527861 Datum: NAD 83

Soil Map Unit Name: Atmore silt loam NWI classification: PFO4A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? [ ] Are "Normal Circumstances" present? Yes [✓] No [ ]

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? [ ] (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓]	No [ ]	
Wetland Hydrology Present?	Yes [✓]	No [ ]	

Remarks:

Recent rains in the past 24 hours
78 degrees F; wind 0-5 mph, mostly cloudy
Emergent wetland near Port Bienville RR, south of Old Lower Bay Rd

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [✓] Surface Water (A1)
- [✓] High Water Table (A2)
- [✓] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [✓] Inundation Visible on Aerial Imagery (B7)
- [✓] Water-Stained Leaves (B9)
- [✓] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [✓] Hydrogen Sulfide Odor (C1)
- [✓] Oxidized Rhizospheres along Living Roots (C3)
- [✓] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [✓] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [✓] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [✓] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [✓] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [✓]	No [ ]	Depth (inches):	0-8"
Water Table Present?	Yes [✓]	No [ ]	Depth (inches):	0-12"
Saturation Present? (includes capillary fringe)	Yes [✓]	No [ ]	Depth (inches):	0-12"

Wetland Hydrology Present? Yes [✓] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Standing water throughout the pipeline corridor.

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: 92

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size:)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size:)			
1. Eleocharis spp.	25	Y	FACW
2. Hypericum spp.	25	Y	FACW
3. Andropogon glomeratus	20	Y	FACW
4. Proserpinaca pectinata	25	Y	OBL
5. Sarracenia rubra	10	N	OBL
6. Xyris spp.	20	Y	OBL
7. Panicum virgatum	20	Y	FAC
8.			
9.			
10.			
11.			
	145 = Total Cover		

50% of total cover: 72.5 20% of total cover: 29

Woody Vine Stratum (Plot size:)			
1. Gelsemium sempervirens	15	Y	FAC
2.			
3.			
4.			
5.			
	15 = Total Cover		

50% of total cover: 7.5 20% of total cover: 3

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes [x] No [ ]

Remarks: (If observed, list morphological adaptations below).

SOIL Sampling Point: 92

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	10 YR 3/2	100			RM	M	Loam	Saturated at the surface
4-12"	10 YR 5/2	100			RM	M	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☑ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Port Bienville City/County: Hancock County Sampling Date: 3-15-2016

Applicant/Owner: Mississippi Department of Transportation State: MS Sampling Point: C7

Investigator(s): M. Sizemore, B. Brown Section, Township, Range:

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR or MLRA): LRR -T Lat: 30.426342 Long: -89.598576 Datum: NAD 83

Soil Map Unit Name: Escambia loam NWI classification: PFO1/4B

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? [ ] Are "Normal Circumstances" present? Yes [✓] No [ ]

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? [ ] (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓]	No [ ]	
Wetland Hydrology Present?	Yes [✓]	No [ ]	

Remarks:
Recent rains in the past 48 hours
70 degrees F; wind 5-10 mph, mostly sunny

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [✓] Surface Water (A1)
- [✓] High Water Table (A2)
- [✓] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [✓] Water-Stained Leaves (B9)
- [✓] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [✓] Hydrogen Sulfide Odor (C1)
- [✓] Oxidized Rhizospheres along Living Roots (C3)
- [✓] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [✓] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [✓] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [✓] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [✓] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [✓]	No [ ]	Depth (inches): 0-10"	
Water Table Present?	Yes [✓]	No [ ]	Depth (inches): 0"	
Saturation Present? (includes capillary fringe)	Yes [✓]	No [ ]	Depth (inches): 0-12"	**Wetland Hydrology Present?** Yes [✓] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Standing water throughout the corridor including across an old logging/hunt club road

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: C7

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus taeda	40	Y	FAC
2. Pinus elliottii	30	Y	FACW
3.			
4.			
5.			
6.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		
Sapling Stratum (Plot size:)			
1. Pinus taeda	30	Y	FAC
2. Nyssa spp.	20	Y	OBL
3.			
4.			
5.			
6.			
	50 = Total Cover		
50% of total cover: 25	20% of total cover: 10		
Shrub Stratum (Plot size:)			
1. Ilex coriacea	30	Y	FACW
2. Baccharis halimifolia	25	Y	FAC
3.			
4.			
5.			
6.			
	55 = Total Cover		
50% of total cover: 27.5	20% of total cover: 11		
Herb Stratum (Plot size:)			
1. Eleocharis spp.	25	Y	FACW
2. Hypericum spp.	25	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	50 = Total Cover		
50% of total cover: 25	20% of total cover: 10		
Woody Vine Stratum (Plot size:)			
1. Gelsemium sempervirens	15	Y	FAC
2. Rubus argutus	25	Y	FAC
3.			
4.			
5.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: C7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12"	10 YR 5/1	80	10 YR 6/8	20	C	M	Silty Sa	Saturated at the surface

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Port Bienville City/County: Hancock County Sampling Date: 3/15/2016

Applicant/Owner: Mississippi Department of Transportation State: MS Sampling Point: 15w3

Investigator(s): Ryan Hammons, Tara Kent Section, Township, Range: Section 0012, T7S, R17W

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR -T; MLRA -152A Lat: 30.450786 Long: -89.657226 Datum: NAD 27

Soil Map Unit Name: Escambia loam, 2 to 5 percent slopes NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? [ ] Are "Normal Circumstances" present? Yes [✓] No [ ]

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? [ ] (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓]	No [ ]	
Wetland Hydrology Present?	Yes [✓]	No [ ]	

Remarks:

Wetland is a depression with multiple inputs of flowing water.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [✓] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [✓] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [✓] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [✓] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [✓] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [✓] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [✓] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [ ]	No [✓]	Depth (inches):
Water Table Present?	Yes [✓]	No [ ]	Depth (inches): 4
Saturation Present? (includes capillary fringe)	Yes [✓]	No [ ]	Depth (inches): 4

Wetland Hydrology Present? Yes [✓] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appears to have Sphagnum sp. on soil surface.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 15w3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Magnolia grandiflora	50	yes	FAC
2. Acer rubrum	10	no	FAC
3.			
4.			
5.			
6.			
	60	= Total Cover	
50% of total cover: 30	20% of total cover: 12		
Sapling Stratum (Plot size: 15')			
1. Magnolia grandiflora	20	yes	FAC
2. Acer rubrum	5	yes	FAC
3.			
4.			
5.			
6.			
	25	= Total Cover	
50% of total cover: 12.5	20% of total cover: 5		
Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5')			
1. Carex sp.	30	yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	= Total Cover	
50% of total cover: 15	20% of total cover: 6		
Woody Vine Stratum (Plot size: 15')			
1. Gelsemium sempervirens	5	yes	FAC
2.			
3.			
4.			
5.			
	5	= Total Cover	
50% of total cover: 2.5	20% of total cover: 1		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 15w3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 5/2	75	10YR 5/8	25	C	M/PL		sandy-clay-loam
6-12	10YR 4/2	55	10YR 5/8	45	C	M		clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Port Bienville City/County: Pearl River County Sampling Date: 3/14/2016

Applicant/Owner: Mississippi Department of Transportation State: MS Sampling Point: 14w3

Investigator(s): Ryan Hammons, Tara Kent Section, Township, Range: Section 002, T7S, R17W

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR -T; MLRA -152A Lat: 30.471491 Long: -89.678026 Datum: NAD 27

Soil Map Unit Name: Pits NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? [ ] Are "Normal Circumstances" present? Yes [✓] No [ ]

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? [ ] (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓]	No [ ]	
Wetland Hydrology Present?	Yes [✓]	No [ ]	

Remarks:

Wetland is a flat, inundated swale, meandering through forest. Does not appear to be a result of excavation for railroad.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [✓] Surface Water (A1)
- [ ] High Water Table (A2)
- [✓] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [✓]	No [ ]	Depth (inches): 6
Water Table Present?	Yes [ ]	No [✓]	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes [✓]	No [ ]	Depth (inches): 0

Wetland Hydrology Present? Yes [✓] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water is present intermittently throughout wetland.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 14w3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus nigra	20	yes	FAC
2. Celtis laevigata	10	yes	FACW
3. Pinus elliottii	5	no	FACW
4.			
5.			
6.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		
Sapling Stratum (Plot size: 15')			
1. Quercus phellos	25	yes	FACW
2.			
3.			
4.			
5.			
6.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		
Shrub Stratum (Plot size: 15')			
1. Forestiera acuminata	20	yes	OBL
2. Ligustrum sinense	10	yes	FAC
3. Ilex vomitoria	5	no	FAC
4. Hypericum hypericoides	5	no	FAC
5.			
6.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 14w3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/3	100					loam	
1-5	10YR 5/4	50	10YR 6/8	50	C	M	loam	
5-12	10YR 3/1	65	5YR 4/6	15	C	M	loam	
			5YR 5/6	15	C	M	loam	
	5YR 2.5/1	5					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Port Bienville City/County: Hancock County Sampling Date: 3/16/2016

Applicant/Owner: Mississippi Department of Transportation State: MS Sampling Point: 16u1

Investigator(s): Ryan Hammons, Tara Kent Section, Township, Range: Section 005, T8S, R15W

Landform (hillslope, terrace, etc.): hilltop Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR or MLRA): LRR -T; MLRA -152A Lat: 30.371248 Long: -89.516326 Datum: NAD 27

Soil Map Unit Name: Atmore silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ] Soil [✓] or Hydrology [ ] significantly disturbed? [ ] Are "Normal Circumstances" present? Yes [ ] No [✓]

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? [ ] (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soil Present?	Yes [ ]	No [✓]	
Wetland Hydrology Present?	Yes [ ]	No [✓]	

Remarks:

Area is planted with rows of pine trees.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [ ]	No [✓]	Depth (inches): _____
Water Table Present?	Yes [ ]	No [✓]	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes [ ]	No [✓]	Depth (inches): _____

Wetland Hydrology Present? Yes [ ] No [✓]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 16u1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus taeda	25	yes	FAC
2.			
3.			
4.			
5.			
6.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		
Sapling Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	20% of total cover:		
Shrub Stratum (Plot size: 15')			
1. Lyonia lucida	10	yes	FACW
2. Ilex vomitoria	5	yes	FAC
3.			
4.			
5.			
6.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		
Herb Stratum (Plot size: 5')			
1. Andropogon virginicus	100	yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 15')			
1. Rubus argutus	5	yes	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 16u1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/1	100						loamy sand
3-12	10YR 5/2	50	7.5YR 5/8	20	C	M		loamy sand
	10YR 5/4	20	7.5YR 6/8	10	C	M		loamy sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes ☐ No ☑

Remarks:

Soil is disturbed from planting pine trees.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Port Bienville Railroad City/County: Hancock County Sampling Date: 2/2/16

Applicant/Owner: MDOT State: MS Sampling Point: 2-DP7

Investigator(s): A. Robinson, A. Roberts Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Pine Flats Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 30.335068 Long: -89.506554 Datum: NAD 27

Soil Map Unit Name: Beauregard silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? [ ] Are "Normal Circumstances" present? Yes [ ] No [✓]

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? [ ] (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soil Present?	Yes [ ]	No [✓]	
Wetland Hydrology Present?	Yes [ ]	No [✓]	

Remarks:

Mixed upland Pine stand within Gulf Coast Flatwoods - Representative Point. Heavy rainfall occurred within the last 24 hours. Received approximately 2" of rain on 4/1/16 with a total of approximately 3.5" of rainfall during the week.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [✓] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [ ]	No [✓]	Depth (inches):
Water Table Present?	Yes [ ]	No [✓]	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes [ ]	No [✓]	Depth (inches):

Wetland Hydrology Present? Yes [ ] No [✓]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Passed FAC-Neutral Test - 1:0

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: 2-DP7

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus taeda	65	Y	FAC
2. Fagus grandiflora	10	N	FACU.
3.			
4.			
5.			
6.			
	75 = Total Cover		
50% of total cover: 37.5	20% of total cover: 15		
Sapling Stratum (Plot size: 30')			
1. Pinus taeda	5	Y	FAC
2.			
3.			
4.			
5.			
6.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Shrub Stratum (Plot size: 30')			
1. Ilex opaca	5	Y	FAC
2. Ilex vomitoria	5	Y	FAC
3. Persea borbonia	5	Y	FACW
4. Magnolia grandiflora	5	Y	FAC
5.			
6.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Herb Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Woody Vine Stratum (Plot size: 30')			
1. Smilax bona-nox	5	Y	FAC
2. Toxicodendron radicans	5	Y	FAC
3.			
4.			
5.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes [x] No [ ]

Remarks: (If observed, list morphological adaptations below).

Late succession pine stand. Heavy understory

SOIL

Sampling Point: 31-DP7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	100					Silt loam	
4-14	10YR 5/2	100					Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Port Bienville City/County: Pearl River County Sampling Date: 3/14/2016

Applicant/Owner: Mississippi Department of Transportation State: MS Sampling Point: 14w1

Investigator(s): Ryan Hammons, Tara Kent Section, Township, Range: Section 039, T6S, R17W

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR -T; MLRA -152A Lat: 30.477899 Long: -89.692863 Datum: NAD 27

Soil Map Unit Name: Poarch loam, 0 to 2 perent slopes NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? [ ] Are "Normal Circumstances" present? Yes [✓] No [ ]

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? [ ] (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓]	No [ ]	
Wetland Hydrology Present?	Yes [✓]	No [ ]	

Remarks:

Recent rains throughout the region
70 degrees F; 7-10mph, partly cloudy

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [✓] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [✓] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [✓] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [ ]	No [✓]	Depth (inches):
Water Table Present?	Yes [ ]	No [✓]	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes [✓]	No [ ]	Depth (inches): 0

Wetland Hydrology Present? Yes [✓] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: 14w1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus taeda	50	yes	FAC
2. Celtis laevigata	30	yes	FACW
3. Quercus phellos	10	no	FACW
4.			
5.			
6.			
	90	= Total Cover	

50% of total cover: 45 20% of total cover: 18

Sapling Stratum (Plot size: 15')			
1. Acer rubrum	5	yes	FAC
2.			
3.			
4.			
5.			
6.			
	5	= Total Cover	

50% of total cover: 2.5 20% of total cover: 1

Shrub Stratum (Plot size: 15')			
1. Ligustrum sinense	25	yes	FAC
2. Ilex vomitoria	10	yes	FAC
3.			
4.			
5.			
6.			
	35	= Total Cover	

50% of total cover: 17.5 20% of total cover: 4

Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0	= Total Cover	

50% of total cover: 0 20% of total cover: 0

Woody Vine Stratum (Plot size: 15')			
1. Ampelopsis arborea	20	yes	FAC
2.			
3.			
4.			
5.			
	20	= Total Cover	

50% of total cover: 10 20% of total cover: 2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

heavy detritus on forest floor

SOIL

Sampling Point: 14w1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/2	100					loam	
3-9	10YR 4/2	60					loam	
	10YR 6/2	20	10YR 6/8	20	C	M	loam	
9-11	10YR 2/1	100					loam	
11-13	10YR 5/1	75	5YR 5/8	25	C	M	clay-loa	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Port Bienville Railroad City/County: Hancock County Sampling Date: 3/31/16

Applicant/Owner: MDOT State: MS Sampling Point: 31-DP3

Investigator(s): A. Robinson, A. Roberts Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Pine Flats Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 30.242461 Long: -89.512204 Datum: NAD 27

Soil Map Unit Name: Atmore silt loam, 0 to 2 percent slopes NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? [ ] Are "Normal Circumstances" present? Yes [✓] No [ ]

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? [ ] (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓]	No [ ]	
Wetland Hydrology Present?	Yes [✓]	No [ ]	

Remarks:

Late Succession Pine Stand within Gulf Coast Flatwoods- Forested Wetland. Object ID 29 30 and 35.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [✓] Surface Water (A1)
- [✓] High Water Table (A2)
- [✓] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [✓] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [✓] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [✓]	No [ ]	Depth (inches):	1"
Water Table Present?	Yes [✓]	No [ ]	Depth (inches):	0"
Saturation Present? (includes capillary fringe)	Yes [✓]	No [ ]	Depth (inches):	0"

Wetland Hydrology Present? Yes [✓] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Passed FAC-Neutral Test-2:0

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: 31-DP3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus taeda	80	Y	FAC
2.			
3.			
4.			
5.			
6.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Sapling Stratum (Plot size: 30')			
1. Pinus taeda	10	Y	FAC
2. Quercus nigra	5	Y	FAC
3.			
4.			
5.			
6.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		
Shrub Stratum (Plot size: 30')			
1. Ilex glabra	60	Y	FACW
2. Ilex vomitoria	10	N	FACW
3. Persea borbonia	5	N	FACW
4.			
5.			
6.			
	75 = Total Cover		
50% of total cover: 37.5	20% of total cover: 15		
Herb Stratum (Plot size: 30')			
1. Andropogon virginicus	5	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes [x] No [ ]

Remarks: (If observed, list morphological adaptations below).

Late succession pine stand. Heavy understory

SOIL

Sampling Point: 31-DP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	100					Sandy L	Saturated to the surface

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☑ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Hydric soil present according to NRCS Soils Report. Lack of redox features maybe due to past disturbance associated with conversion to Pine Plantations.

APPENDIX G — PHOTO LOG

Photo 1 - Representative photo of upland pine plantation. Note the lack of hydrology and hydrophytic vegetation.

Photo 2 – Representative photo of Pine Savannah/Pine Flatwoods

Photo 3 - Representative photo of bottomland hardwoods

Photo 4 - Representative photo of Scrub Shrub Habitat

Photo 5 - Representative photo of an upland early successional pine plantation. (1-3 years old)

Photo 6 - Representative photo of emergent wetlands (pipeline corridor)

Photo 7 - Turtleskin Creek flooded out of its banks (March 2016)

Photo 8 - Photo Example of Open Water

Photo 9 - Existing Port Bienville Railroad (near south project tie-in)

Photo 10 - Old Lower Bay Road near proposed Port Bienville Railroad Crossing

Photo 11 - Pitcher plants found within pine flatwoods

APPENDIX H — FEDERAL AND STATE T&E LISTS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Mississippi Ecological Services Field Office
6578 DOGWOOD VIEW PARKWAY, SUITE A
JACKSON, MS 39213
PHONE: (601)965-4900 FAX: (601)965-4340
URL: www.fws.gov/mississippiES/endsp.html

Consultation Code: 04EM1000-2016-SLI-0677 July 20, 2016
Event Code: 04EM1000-2016-E-01445
Project Name: Port Bienville Railroad Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: Port Bienville Railroad Project

Official Species List

Provided by:

Mississippi Ecological Services Field Office
6578 DOGWOOD VIEW PARKWAY, SUITE A
JACKSON, MS 39213
(601) 965-4900
http://www.fws.gov/mississippiES/endsp.html

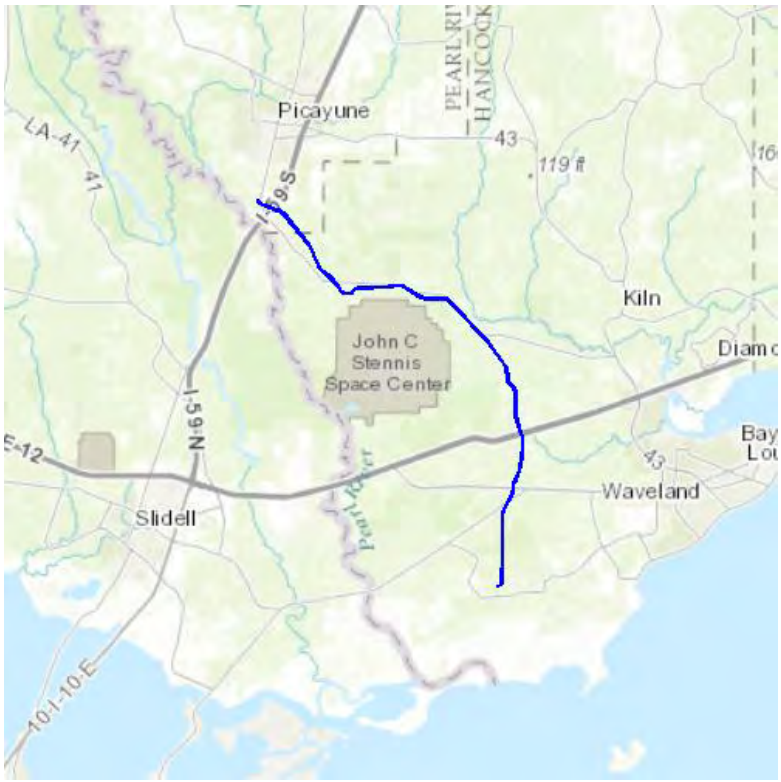
Consultation Code: 04EM1000-2016-SLI-0677
Event Code: 04EM1000-2016-E-01445

Project Type: TRANSPORTATION

Project Name: Port Bienville Railroad Project
Project Description: Railroad mostly on new Alignment

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: The coordinates are too numerous to display here.

Project Counties: Hancock, MS | Pearl River, MS

Endangered Species Act Species List

There are a total of 19 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	**Status**	**Has Critical Habitat**	**Condition(s)**
Piping Plover *(Charadrius melodus)* Population: except Great Lakes watershed	Threatened	Final designated	
Piping Plover *(Charadrius melodus)* Population: Great Lakes watershed	Endangered		
Red Knot *(Calidris canutus rufa)*	Threatened		
Red-Cockaded woodpecker *(Picoides borealis)* Population: Entire	Endangered		
Wood stork *(Mycteria americana)* Population: AL, FL, GA, MS, NC, SC	Threatened		
Clams			
Alabama (=inflated) heelsplitter *(Potamilus inflatus)* Population: Entire	Threatened		
Ferns and Allies			
Louisiana quillwort *(Isoetes louisianensis)*	Endangered		

Fishes			
Atlantic sturgeon (Gulf subspecies) *(Acipenser oxyrinchus (=oxyrhynchus) desotoi)* Population: Entire	Threatened	Final designated	
Pearl darter *(Percina aurora)*	Candidate		
Smalltooth sawfish *(Pristis pectinata)* Population: United States DPS	Endangered		
Mammals			
Finback whale *(Balaenoptera physalus)* Population: Entire	Endangered		
Humpback whale *(Megaptera novaeangliae)* Population: Entire	Endangered		
West Indian Manatee *(Trichechus manatus)* Population: Entire	Endangered	Final designated	
Reptiles			
Gopher tortoise *(Gopherus polyphemus)* Population: West of Mobile and Tombigbee Rivers	Threatened		
Hawksbill sea turtle *(Eretmochelys imbricata)* Population: Entire	Endangered	Final designated	
Kemp's Ridley sea turtle *(Lepidochelys kempii)*	Endangered		

Population: Entire			
Leatherback sea turtle *(Dermochelys coriacea)* Population: Entire	Endangered	Final designated	
Loggerhead sea turtle *(Caretta caretta)* Population: Northwest Atlantic Ocean DPS	Threatened	Proposed, Final designated	
Ringed Map turtle *(Graptemys oculifera)* Population: Entire	Threatened		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Robinson, Amber

From: Phillip Sanderson <Phillip.Sanderson@mmns.state.ms.us>
Sent: Friday, August 19, 2016 2:18 PM
To: Robinson, Amber
Subject: Species lists for Hancock and Pearl River Counties
Attachments: Hancock and Pearl River County rare species lists.docx

Hi Amber,

It was nice speaking with you earlier. I apologize for the difficulty in using our online database. I have attached a word file with these species. Please forgive the formatting and note at the top there is a key for colored fonts. Red = federally endangered, and green = federally threatened. There is a separate column for state endangered.

I hope this helps!

Andy Sanderson
Natural Heritage Program Coordinator
Mississippi Museum of Natural Science
2148 Riverside Drive
Jackson, MS 39202-1353
(601) 576-6046 [office]
(601) 354 -7227 [fax]

Green font indicates federally threatened.

Red font indicates federally endangered.

County	Scientific Name	Common Name	Global Rank	State Rank	State Status	Type
Hancock	Accipiter striatus	Sharp-shinned Hawk	G5	S1?B		Animal
Hancock	Acipenser oxyrinchus desotoi	Gulf Sturgeon	G3T2	S1	LE	Animal
Hancock	Aimophila aestivalis	Bachman's Sparrow	G3	S3B,S3S4N		Animal
Hancock	Ammodramus henslowii	Henslow's Sparrow	G4	S3N		Animal
Hancock	Ammodramus leconteii	Le Conte's Sparrow	G4	S3N		Animal
Hancock	Ammodramus maritimus	Seaside Sparrow	G5	S3		Animal
Hancock	Ammodramus nelsoni	Nelson's Sharp-tailed Sparrow	G5	S3N		Animal
Hancock	Ammodramus savannarum	Grasshopper Sparrow	G5	S3B,S3N		Animal
Hancock	Anas fulvigula	Mottled Duck	G4	S2B,S4N		Animal

Hancock	Anas rubripes	American Black Duck	G5	S2N		Animal
Hancock	Anhinga anhinga	Anhinga	G5	S3B,S1N		Animal
Hancock	Asio flammeus	Short-eared Owl	G5	S3N		Animal
Hancock	Atractosteus spatula	Alligator Gar	G3G4	S2		Animal
Hancock	Botaurus lentiginosus	American Bittern	G4	S3N		Animal
Hancock	Bufo nebulifer	Gulf Coast Toad	G5	S3		Animal
Hancock	Calidris canutus	Red Knot	G4	S2N		Animal
Hancock	Caretta caretta	Loggerhead Sea Turtle	G3	S1B, SNA	LE	Animal
Hancock	Celithemis amanda	Amanda's Pennant	G5	S2		Animal
Hancock	Charadrius melodus	Piping Plover	G3	S2N	LE	Animal
Hancock	Charadrius nivosus	Southeastern Snowy Plover	G4T3Q	S2	LE	Animal
Hancock	Colinus virginianus	Northern Bobwhite	G5	S3S4		Animal
Hancock	Corynorhinus	Rafinesque's	G3G4	S3		Animal

	rafinesquii	Big-eared Bat				
Hancock	Crystallaria asprella	Crystal Darter	G3	S1	LE	Animal
Hancock	Dermochelys coriacea	Leatherback Sea Turtle	G2	SNA	LE	Animal
Hancock	Drymarchon couperi	Eastern Indigo Snake	G3	SX	LE	Animal
Hancock	Egretta caerulea	Little Blue Heron	G5	S2B, S2N		Animal
Hancock	Egretta rufescens	Reddish Egret	G4	S2N		Animal
Hancock	Egretta thula	Snowy Egret	G5	S4B,S1N		Animal
Hancock	Egretta tricolor	Tricolored Heron	G5	S2B,S1N		Animal
Hancock	Enallagma pallidum	Pale Bluet	G4	S2		Animal
Hancock	Enallagma pollutum	Florida Bluet	G5	S2		Animal
Hancock	Enneacanthus gloriosus	Bluespotted Sunfish	G5	S3		Animal
Hancock	Eudocimus albus	White Ibis	G5	S2B,S3N		Animal
Hancock	Euphagus carolinus	Rusty Blackbird	G4	S2N		Animal

Hancock	Euphyes bayensis	Bay St. Louis Skipper	G1G3	S1		Animal
Hancock	Falco columbarius	Merlin	G5	SNA		Animal
Hancock	Falco peregrinus	Peregrine Falcon	G4	S1N	LE	Animal
Hancock	Farancia erytrogramma	Rainbow Snake	G5	S2	LE	Animal
Hancock	Fundulus jenkinsi	Saltmarsh Topminnow	G2	S3		Animal
Hancock	Gomphus hodgesi	Hodges' Clubtail	G3	S2		Animal
Hancock	Gomphus hybridus	Cocoa Clubtail	G4	S3		Animal
Hancock	Gomphus modestus	Gulf Coast Clubtail	G3	S3		Animal
Hancock	Gopherus polyphemus	Gopher Tortoise	G3	S2	LE	Animal
Hancock	Graptemys pearlensis	Pearl Map Turtle	G2G3	S2		Animal
Hancock	Haematopus palliatus	American Oystercatcher	G5	S1		Animal
Hancock	Haliaeetus leucocephalus	Bald Eagle	G5	S2B,S2N		Animal

Hancock	Heterandria formosa	Least Killifish	G5	S3		Animal
Hancock	Heterodon simus	Southern Hognose Snake	G2	SX	LE	Animal
Hancock	Himantopus mexicanus	Black-necked Stilt	G5	S3B		Animal
Hancock	Ictiobus niger	Black Buffalo	G5	S3		Animal
Hancock	Incilius nebulifer	Coastal Plain Toad	G5	S3S4		Animal
Hancock	Ixobrychus exilis	Least Bittern	G5	S3B		Animal
Hancock	Lepidochelys kempii	Kemp's Ridley Sea Turtle	G1	S1N	LE	Animal
Hancock	Limosa fedoa	Marbled Godwit	G5	S2N		Animal
Hancock	Macrodiplax balteata	Marl Pennant	G5	S3		Animal
Hancock	Malaclemys terrapin pileata	Mississippi Diamondback Terrapin	G4T3	S2		Animal
Hancock	Micrurus fulvius	Eastern Coral Snake	G5	S3S4		Animal
Hancock	Notropis chalybaeus	Ironcolor Shiner	G4	S1	LE	Animal
Hancock	Nyctanassa	Yellow-crowned	G5	S3B,S1N		Animal

	violacea	Night-Heron				
Hancock	Nycticorax nycticorax	Black-crowned Night-heron	G5	S3B,S4N		Animal
Hancock	Pandion haliaetus	Osprey	G5	S3B,S1S2N		Animal
Hancock	Pelecanus erythrorhynchos	American White Pelican	G4	S3N		Animal
Hancock	Pelecanus occidentalis	Brown Pelican	G4	S1N	LE	Animal
Hancock	Picoides borealis	Red-cockaded Woodpecker	G3	S1	LE	Animal
Hancock	Plegadis chihi	White-faced Ibis	G5	SNA		Animal
Hancock	Plestiodon anthracinus pluvialis	Southern Coal Skink	G5T5	S3S4		Animal
Hancock	Polyodon spathula	Paddlefish	G4	S3		Animal
Hancock	Procambarus shermani	Gulf Crayfish	G4	SNR		Animal
Hancock	Pseudotriton montanus	Mud Salamander	G5	S2		Animal
Hancock	Pteronotropis welaka	Bluenose Shiner	G3G4	S3		Animal

Hancock	Puma concolor coryi	Florida Panther	G5T1	SX	LE	Animal
Hancock	Quadrula refulgens	Purple Pimpleback	G3G4	S3S4		Animal
Hancock	Rallus elegans	King Rail	G4G5	S3		Animal
Hancock	Rana heckscheri	River Frog	G5	S1		Animal
Hancock	Regina rigida sinicola	Gulf Crayfish Snake	G5T5	S3?		Animal
Hancock	Rhadinaea flavilata	Pine Woods Snake	G4	S2S3		Animal
Hancock	Rynchops niger	Black Skimmer	G5	S2B,S3N		Animal
Hancock	Sciurus niger	Eastern Fox Squirrel	G5	S3S4		Animal
Hancock	Scolopax minor	American Woodcock	G5	S3B?, S4N		Animal
Hancock	Somatochlora provocans	Treetop Emerald	G4	S2		Animal
Hancock	Sternula antillarum	Least Tern	G4	S3B, S3N		Animal
Hancock	Thalasseus maximus	Royal Tern	G5	S1B,S4N		Animal
Hancock	Thalasseus sandvicensis	Sandwich Tern	G5	S1B,S4N		Animal

Hancock	Thamnophis proximus orarius	Gulf Coast Ribbon Snake	G5T4	SNR		Animal
Hancock	Trichechus manatus	Manatee	G2	S1N	LE	Animal
Hancock	Tyto alba	Barn owl	G5	S3		Animal
Hancock	Ursus americanus	Black Bear	G5	S1	LE	Animal

County	Scientific Name	Common Name	Global Rank	State Rank	State Status	Type
Hancock	Agalinis aphylla	Coastal Plain False-foxglove	G3G4	S3		Plant
Hancock	Agalinis filicaulis	Thin Stemmed False-foxglove	G3G4	S2		Plant
Hancock	Agalinis linifolia	Flaxleaf False Foxglove	G4?	S2		Plant
Hancock	Agalinis oligophylla	Ridge-stem False-foxglove	G4	S2		Plant
Hancock	Amaranthus australis	Southern Amaranth	G5	S1		Plant
Hancock	Amsonia ludoviciana	Creole Phlox	G3	SX		Plant
Hancock	Aristida simpliciflora	Southern Three-awned Grass	G3G4	S1		Plant

Hancock	Bartonia verna	White Screwstem	G5?	S3S4		Plant
Hancock	Burmannia biflora	Northern Burmannia	G4G5	S1		Plant
Hancock	Calopogon barbatus	Bearded Grass-pink	G4?	S2		Plant
Hancock	Calopogon multiflorus	Many-flower Grass-pink	G2G3	S1		Plant
Hancock	Carex exilis	Coast Sedge	G5	S2		Plant
Hancock	Chamaecyparis thyoides	Atlantic White Cedar	G4	S2		Plant
Hancock	Chasmanthium ornithorhynchum	Bird-Bill Spikegrass	G4	S1S2		Plant
Hancock	Cirsium lecontei	Leconte's Thistle	G2G3	S2		Plant
Hancock	Cleistesiopsis oricamporum	Small Coastal Plain Spreading Pogonia	GNR	S3		Plant
Hancock	Coreopsis gladiata	Southeastern Tickseed	G4G5	S3S4		Plant
Hancock	Coreopsis nudata	Georgia Tickseed	G3?	S1S2		Plant
Hancock	Cyperus articulatus	Jointed Flatsedge	G4G5	S1		Plant
Hancock	Cyperus drummondii	Drummond's Flatsedge	G5TNR	S1S2		Plant

Hancock	Cyperus esculentus var. macrostachyus		GNR	S2S3		Plant
Hancock	Cyperus lanceolatus	Epiphytic Flatsedge	G5?	S2S3		Plant
Hancock	Cyperus ovatus	Flatsedge	G4	S2S3		Plant
Hancock	Cyperus polystachyos var. polystachyos	Many-spike Flatsedge	G5T5?	S2S3		Plant
Hancock	Dalea carnea var. gracilis	Pine Barrens Prairie Clover	G5T3T4	S2S3		Plant
Hancock	Desmodium tenuifolium	Slim-leaf Tick-trefoil	G4	S2		Plant
Hancock	Dichanthelium nudicaule	Naked-stemmed Panic Grass	G3Q	S2		Plant
Hancock	Dichanthelium wrightianum	Wright's Witchgrass	G4	S1S2		Plant
Hancock	Eleocharis cellulosa	Carolina Spikerush	G4G5	S1		Plant
Hancock	Eleocharis elongata	Slim Spike-rush	G5?	S1		Plant
Hancock	Eleocharis equisetoides	Horse-tail Spikerush	G4	S3S4		Plant
Hancock	Eleocharis flavescens var. flavescens	Pale Spikerush	G5T5	S3S4		Plant

Hancock	Eleocharis olivacea	Capitate Spikerush	G5	S2?		Plant
Hancock	Eleocharis parvula	Small Spikerush	G5	S3S4		Plant
Hancock	Epidendrum magnoliae	Green-fly Orchid	G4	S2S3		Plant
Hancock	Eriocaulon texense	Texas Pipewort	G4	S2S3		Plant
Hancock	Eryngium aquaticum	Marsh Eryngo	G4	S1		Plant
Hancock	Eupatorium ivifolium	Ivy-leaf Throughwort	G5	S3S4		Plant
Hancock	Fuirena longa	Coastal Plain Umbrella-sedge	G3G4	S1		Plant
Hancock	Fuirena pumila	Dwarf Umbrella-sedge	G4	S3		Plant
Hancock	Fuirena scirpoidea	Southern Umbrella-sedge	G5	S2S3		Plant
Hancock	Gaylussacia nana	Dangleberry	G4	S2S3		Plant
Hancock	Helenium vernale	Spring Sneezeweed	G4?	S3S4		Plant
Hancock	Helianthus heterophyllus	Wetland Sunflower	G4	S3		Plant
Hancock	Hibiscus coccineus	Brillant Hibiscus	G4?	S1S2		Plant

Hancock	Ilex amelanchier	Juneberry Holly	G4	S3		Plant
Hancock	Ilex myrtifolia	Myrtle Holly	G5?	S3S4		Plant
Hancock	Isoetes louisianensis	Louisiana Quillwort	G2G3	S2		Plant
Hancock	Juniperus virginiana var. silicicola	Southern Red Cedar	G5T4T5	S2		Plant
Hancock	Lachnocaulon digynum	Pineland Bogbutton	G3	S2S3		Plant
Hancock	Lilaeopsis carolinensis	Carolina Lilaeopsis	G3G5	S2		Plant
Hancock	Linum floridanum var. chrysocarpum	Yellow-fruited Flax	G5?T3?	S2S3		Plant
Hancock	Ludwigia alata	Winged Seedbox	G3G5	S2		Plant
Hancock	Luziola bahiensis	Brazilian Loziola	G4G5	S1		Plant
Hancock	Macranthera flammea	Flame Flower	G3	S3		Plant
Hancock	Phaseolus polystachios var. sinuatus	Sandhill Bean	G5T3?	SH		Plant
Hancock	Physalis angustifolia	Coast Ground-cherry	G3G4	S3		Plant
Hancock	Pinguicula planifolia	Chapman's Butterwort	G3?	S2S3		Plant

Hancock	Pinguicula primuliflora	Southern Butterwort	G3G4	S3		Plant
Hancock	Platanthera integra	Yellow Fringeless Orchid	G3G4	S3		Plant
Hancock	Platanthera nivea	Snowy Orchis	G5	S3		Plant
Hancock	Polygala hookeri	Hooker's Milkwort	G3	S2		Plant
Hancock	Polygala leptocaulis	Swamp Milkwort	G4G5	S2		Plant
Hancock	Polygala leptocaulis	Swamp Milkwort	G4G5	S2		Plant
Hancock	Polygala leptostachys	Georgia Milkwort	G3G4	S1S2		Plant
Hancock	Pteroglossaspis ecristata	Smooth-lipped Eulophia	G2G3	S1		Plant
Hancock	Rhynchospora baldwinii	Baldwin's Beakrush	G4	S2		Plant
Hancock	Rhynchospora cephalantha	Capitate Beakrush	G5	S3		Plant
Hancock	Rhynchospora ciliaris	Ciliate Beakrush	G4	S3S4		Plant
Hancock	Rhynchospora colorata	Narrowleaf Whitetop	G5	S2S3		Plant
Hancock	Rhynchospora compressa	Flat-fruit Beakrush	G4	S3S4		Plant

Hancock	Rhynchospora curtissii	Curtiss's Beakrush	G4	S1		Plant
Hancock	Rhynchospora distans	Fascicled Beakrush	G5T4?	S3S4		Plant
Hancock	Rhynchospora filifolia	Threadleaf Beakrush	G5	S3		Plant
Hancock	Rhynchospora inundata	Drowned Hornedrush	G4?	S2S3		Plant
Hancock	Rhynchospora latifolia	Giant Whitetop Sedge	G5	S2S3		Plant
Hancock	Rhynchospora macra	Large Beakrush	G3	S2S3		Plant
Hancock	Rhynchospora microcarpa	Southern Beakrush	G5	S3S4		Plant
Hancock	Rhynchospora oligantha	Few-flowered Beakrush	G4	S3S4		Plant
Hancock	Rhynchospora pinetorum	Pinebarren Beaksedge	G5?T3?	S1		Plant
Hancock	Rhynchospora pleiantha	Brown Beakrush	G2G3	S1		Plant
Hancock	Rhynchospora plumosa	Plume Beakrush	G5	S3S4		Plant
Hancock	Rhynchospora rariflora	Few-flowered Beakrush	G5	S3S4		Plant

Hancock	Rhynchospora stenophylla	Chapman Beakrush	G4	S1S2		Plant
Hancock	Rhynchospora wrightiana	Wright's Beakrush	G5	S2		Plant
Hancock	Ruellia noctiflora	Night-flowering Ruellia	G2	S2		Plant
Hancock	Ruellia pinetorum	Pine Barren Ruellia	G5T3T4	S3		Plant
Hancock	Sageretia minutiflora	Tiny-leaved Buckthorn	G4	S2		Plant
Hancock	Schoenoplectus americanus	Three-square Bulrush	G5	S3S4		Plant
Hancock	Schoenoplectus tabernaemontani	Softstem Bulrush	G5	S2S3		Plant
Hancock	Scleria baldwinii	Baldwin's Nutrush	G4	S2S3		Plant
Hancock	Scleria muehlenbergii	Muehlenberg's Nutrush	G5	S3?		Plant
Hancock	Scleria reticularis	Reticulated Nutrush	G4	S1		Plant
Hancock	Scleria verticillata	Low Nutrush	G5	S1		Plant
Hancock	Selaginella ludoviciana	Gulf Spike-moss	G3G4	S1S2		Plant
Hancock	Spiranthes	Giant Spiral	G3	S2		Plant

	longilabris	Ladies'-tresses				
Hancock	Syngonanthus flavidulus	Yellow Pipewort	G5	S2		Plant
Hancock	Utricularia purpurea	Purple Bladderwort	G5	S2		Plant
Hancock	Vaccinium ashei	Highbush Blueberry	G5	SH		Plant
Hancock	Veratrum virginicum	Virginia Bunchflower	G5	S3		Plant
Hancock	Xyris drummondii	Drummond's Yellow-eyed Grass	G3	S3		Plant
Hancock	Xyris scabrifolia	Harper's Yellow-eyed Grass	G3	S3		Plant
Hancock	Zephyranthes chlorosolen	Evening Rainlily	G5	S2		Plant

County	Scientific Name	Common Name	Global Rank	State Rank	State Status	Type
Pearl River	Agalinis linifolia	Flaxleaf False Foxglove	G4?	S2		Plant
Pearl River	Agalinis oligophylla	Ridge-stem False-foxglove	G4	S2		Plant

Pearl River	Andropogon dealbatus	Wetland White Bluestem	GNR	S1S2		Plant
Pearl River	Andropogon perangustatus	Narrow-leaved Bluestem	GNR	S1S2		Plant
Pearl River	Aristida simpliciflora	Southern Three-awned Grass	G3G4	S1		Plant
Pearl River	Asclepias humistrata	Pinewoods Milkweek	G4G5	S3S4		Plant
Pearl River	Asclepias rubra	Red Milkweed	G4G5	S3S4		Plant
Pearl River	Bulbostylis barbata	Water-grass	GNR	S3S4		Plant
Pearl River	Calopogon barbatus	Bearded Grass-pink	G4?	S2		Plant
Pearl River	Carex decomposita	Cypress-knee Sedge	G3G4	S3		Plant
Pearl River	Carex exilis	Coast Sedge	G5	S2		Plant
Pearl River	Carex picta	Painted Sedge	G4G5	S3		Plant
Pearl River	Carex tenax	Wire Sedge	G5?	S2		Plant
Pearl River	Carex venusta var. venusta	Dark-green Sedge	G4T4?	S3S4		Plant
Pearl	Chamaecyparis	Atlantic White	G4	S2		Plant

River	thyoides	Cedar				
Pearl River	Chasmanthium ornithorhynchum	Bird-Bill Spikegrass	G4	S1S2		Plant
Pearl River	Cirsium lecontei	Leconte's Thistle	G2G3	S2		Plant
Pearl River	Collinsonia punctata	Spotted-leaf Horse-balm	GNR	S1		Plant
Pearl River	Coreopsis gladiata	Southeastern Tickseed	G4G5	S3S4		Plant
Pearl River	Cornus alternifolia	Alternate-leaf Dogwood	G5	S2		Plant
Pearl River	Crataegus brachyacantha	Blueberry Hawthorn	G4	S1?		Plant
Pearl River	Cyperus lanceolatus	Epiphytic Flatsedge	G5?	S2S3		Plant
Pearl River	Cyperus ovatus	Flatsedge	G4	S2S3		Plant
Pearl River	Desmodium tenuifolium	Slim-leaf Tick-trefoil	G4	S2		Plant
Pearl River	Dichanthelium wrightianum	Wright's Witchgrass	G4	S1S2		Plant
Pearl River	Eleocharis equisetoides	Horse-tail Spikerush	G4	S3S4		Plant
Pearl River	Epidendrum magnoliae	Green-fly Orchid	G4	S2S3		Plant

Pearl River	Eupatorium ivifolium	Ivy-leaf Throughwort	G5	S3S4		Plant
Pearl River	Fuirena pumila	Dwarf Umbrella-sedge	G4	S3		Plant
Pearl River	Fuirena scirpoidea	Southern Umbrella-sedge	G5	S2S3		Plant
Pearl River	Helenium brevifolium	Shortleaf Sneezeweed	G4	S2S3		Plant
Pearl River	Helenium vernale	Spring Sneezeweed	G4?	S3S4		Plant
Pearl River	Helianthus heterophyllus	Wetland Sunflower	G4	S3		Plant
Pearl River	Herbertia lahue ssp. caerulea	Herbertia	G4G5T4	S2		Plant
Pearl River	Hibiscus coccineus	Brillant Hibiscus	G4?	S1S2		Plant
Pearl River	Ilex amelanchier	Juneberry Holly	G4	S3		Plant
Pearl River	Ilex cassine	Dahoon Holly	G5	S2		Plant
Pearl River	Ipomoea macrorhiza	Large-stem Morning-glory	G3G5	S1		Plant
Pearl River	Isoetes louisianensis	Louisiana Quillwort	G2G3	S2		Plant
Pearl	Isoetes	Blackfoot Quillwort	G5	S2		Plant

River	melanopoda					
Pearl River	Lachnocaulon digynum	Pineland Bogbutton	G3	S2S3		Plant
Pearl River	Lindera subcoriacea	Bog Spice Bush	G2G3	S2		Plant
Pearl River	Linum macrocarpum	Large Fruited Flax	G2	S2		Plant
Pearl River	Macranthera flammea	Flame Flower	G3	S3		Plant
Pearl River	Marshallia trinervia	Broad-leaf Barbara's Button	G3	S3		Plant
Pearl River	Mikania cordifolia	Florida Keys Hempvine	G5	S3S4		Plant
Pearl River	Parnassia grandifolia	Large-leaved Grass-of-parnassus	G3	S2		Plant
Pearl River	Peltandra sagittifolia	White Arum	G3G4	S3		Plant
Pearl River	Pinguicula primuliflora	Southern Butterwort	G3G4	S3		Plant
Pearl River	Platanthera cristata	Crested Fringed Orchid	G5	S3S4		Plant
Pearl River	Platanthera integra	Yellow Fringeless Orchid	G3G4	S3		Plant
Pearl	Platanthera nivea	Snowy Orchis	G5	S3		Plant

River						
Pearl River	Polygala boykinii	Boykin's Milkwort	G4	S3S4		Plant
Pearl River	Polygala crenata	Crenate Milkwort	G4?	S2		Plant
Pearl River	Pteroglossaspis ecristata	Smooth-lipped Eulophia	G2G3	S1		Plant
Pearl River	Pycnanthemum setosum	Awned Mountain-mint	G4	S1		Plant
Pearl River	Rhynchospora baldwinii	Baldwin's Beakrush	G4	S2		Plant
Pearl River	Rhynchospora capitellata	Brownish Beakrush	G5	S2S3		Plant
Pearl River	Rhynchospora cephalantha	Capitate Beakrush	G5	S3		Plant
Pearl River	Rhynchospora chalarocephala	Loose-head Beakrush	G5	S3		Plant
Pearl River	Rhynchospora ciliaris	Ciliate Beakrush	G4	S3S4		Plant
Pearl River	Rhynchospora colorata	Narrowleaf Whitetop	G5	S2S3		Plant
Pearl River	Rhynchospora compressa	Flat-fruit Beakrush	G4	S3S4		Plant
Pearl River	Rhynchospora debilis	Savannah Beakrush	G4?	S3		Plant

Pearl River	Rhynchospora decurrens	Swamp-forest Beakrush	G3G4	S1		Plant
Pearl River	Rhynchospora filifolia	Threadleaf Beakrush	G5	S3		Plant
Pearl River	Rhynchospora grayi	Gray's Beakrush	G4	S2S3		Plant
Pearl River	Rhynchospora inundata	Drowned Hornedrush	G4?	S2S3		Plant
Pearl River	Rhynchospora latifolia	Giant Whitetop Sedge	G5	S2S3		Plant
Pearl River	Rhynchospora macra	Large Beakrush	G3	S2S3		Plant
Pearl River	Rhynchospora megalocarpa	Sandy-field Beakrush	G5	S3		Plant
Pearl River	Rhynchospora microcarpa	Southern Beakrush	G5	S3S4		Plant
Pearl River	Rhynchospora miliacea	Millet Beakrush	G5	S2S3		Plant
Pearl River	Rhynchospora mixta	Mingled Beakrush	G5	S3S4		Plant
Pearl River	Rhynchospora oligantha	Few-flowered Beakrush	G4	S3S4		Plant
Pearl River	Rhynchospora plumosa	Plume Beakrush	G5	S3S4		Plant
Pearl	Rhynchospora	Few-flowered	G5	S3S4		Plant

River	rariflora	Beakrush				
Pearl River	Rhynchospora stenophylla	Chapman Beakrush	G4	S1S2		Plant
Pearl River	Ruellia pinetorum	Pine Barren Ruellia	G5T3T4	S3		Plant
Pearl River	Scleria baldwinii	Baldwin's Nutrush	G4	S2S3		Plant
Pearl River	Scleria muehlenbergii	Muehlenberg's Nutrush	G5	S3?		Plant
Pearl River	Scleria reticularis	Reticulated Nutrush	G4	S1		Plant
Pearl River	Spiranthes longilabris	Giant Spiral Ladies'-tresses	G3	S2		Plant
Pearl River	Stewartia malacodendron	Silky Camellia	G4	S3S4		Plant
Pearl River	Tridens carolinianus	Carolina Fluff Grass	G3G4	S2S3		Plant
Pearl River	Tridens chapmanii	Chapman's Redtop	G5T3	S2		Plant
Pearl River	Vaccinium ashei	Highbush Blueberry	G5	SH		Plant
Pearl River	Veratrum virginicum	Virginia Bunchflower	G5	S3		Plant

County	Scientific Name	Common Name	Global Rank	State Rank	State Status	Type
Pearl River	Accipiter striatus	Sharp-shinned Hawk	G5	S1?B		Animal
Pearl River	Aimophila aestivalis	Bachman's Sparrow	G3	S3B,S3S4N		Animal
Pearl River	Amblyomma tuberculatum	Gopher Tortoise Tick	G2G3	S1		Animal
Pearl River	Anhinga anhinga	Anhinga	G5	S3B,S1N		Animal
Pearl River	Anodonta hartfieldorum	Cypress Floater	G4	S3S4		Animal
Pearl River	Arcidens confragosus	Rock Pocketbook	G4	S2S3		Animal
Pearl River	Crystallaria asprella	Crystal Darter	G3	S1	LE	Animal
Pearl River	Dromogomphus armatus	Southeastern Spinyleg	G4	S3		Animal
Pearl River	Egretta caerulea	Little Blue Heron	G5	S2B, S2N		Animal
Pearl River	Egretta thula	Snowy Egret	G5	S4B,S1N		Animal
Pearl River	Elanoides forficatus	Swallow-tailed Kite	G5	S2B		Animal

Pearl River	Eudocimus albus	White Ibis	G5	S2B,S3N		Animal
Pearl River	Euphagus carolinus	Rusty Blackbird	G4	S2N		Animal
Pearl River	Eutrichota gopheri	A Coprophagous Fly	G2G3	S2		Animal
Pearl River	Falco columbarius	Merlin	G5	SNA		Animal
Pearl River	Farancia erytrogramma	Rainbow Snake	G5	S2	LE	Animal
Pearl River	Gomphus modestus	Gulf Coast Clubtail	G3	S3		Animal
Pearl River	Gopherus polyphemus	Gopher Tortoise	G3	S2	LE	Animal
Pearl River	Graptemys oculifera	Ringed Map Turtle	G2	S2	LE	Animal
Pearl River	Graptemys pearlensis	Pearl Map Turtle	G2G3	S2		Animal
Pearl River	Haliaeetus leucocephalus	Bald Eagle	G5	S2B,S2N		Animal
Pearl River	Heterodon simus	Southern Hognose Snake	G2	SX	LE	Animal
Pearl River	Lampropeltis calligaster rhombomaculata	Mole Kingsnake	G5T5	S3?		Animal

Pearl River	Machimus polyphemi	A Robber Fly	G2	S1		Animal
Pearl River	Micrurus fulvius	Eastern Coral Snake	G5	S3S4		Animal
Pearl River	Moxostoma carinatum	River Redhorse	G4	S3		Animal
Pearl River	Mustela frenata	Long-tailed Weasel	G5	S2?		Animal
Pearl River	Notropis chalybaeus	Ironcolor Shiner	G4	S1	LE	Animal
Pearl River	Noturus munitus	Frecklebelly Madtom	G3	S2	LE	Animal
Pearl River	Nyctanassa violacea	Yellow-crowned Night-Heron	G5	S3B,S1N		Animal
Pearl River	Obovaria unicolor	Alabama Hickorynut	G3	S1S2		Animal
Pearl River	Ophisaurus mimicus	Mimic Glass Lizard	G3	SH		Animal
Pearl River	Passerina ciris	Painted Bunting	G5	S3S4B		Animal
Pearl River	Percina lenticula	Freckled Darter	G2	S2		Animal
Pearl River	Philonthus testudo	Western Gopher Tortoise Rove Beetle	G2	S1		Animal

Pearl River	Piranga olivacea	Scarlet Tanager	G5	S2?B		Animal
Pearl River	Pituophis melanoleucus lodingi	Black Pine Snake	G4T2T3	S2	LE	Animal
Pearl River	Plestiodon anthracinus pluvialis	Southern Coal Skink	G5T5	S3S4		Animal
Pearl River	Pleurobema beadleianum	Mississippi Pigtoe	G3	S3?		Animal
Pearl River	Pogonomyrmex badius	Florida Harvester Ant	G5	S2		Animal
Pearl River	Polyodon spathula	Paddlefish	G4	S3		Animal
Pearl River	Procambarus bivittatus	Ribbon Crayfish	G4	S3		Animal
Pearl River	Pteronotropis welaka	Bluenose Shiner	G3G4	S3		Animal
Pearl River	Quadrula refulgens	Purple Pimpleback	G3G4	S3S4		Animal
Pearl River	Rhadinaea flavilata	Pine Woods Snake	G4	S2S3		Animal
Pearl River	Stylurus laurae	Laura's Clubtail	G4	S3		Animal
Pearl River	Stylurus potulentus	Yellow-sided Clubtail	G2	S1		Animal

Pearl River	Stylurus townesi	Townes' Clubtail	G3	S1		Animal
Pearl River	Thalasseus maximus	Royal Tern	G5	S1B,S4N		Animal
Pearl River	Uniomerus declivis	Tapered Pondhorn	G5	S2S3		Animal
Pearl River	Ursus americanus	Black Bear	G5	S1	LE	Animal

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Mississippi Field Office
6578 Dogwood View Parkway, Suite A
Jackson, Mississippi 39213

December 12, 2014

IN REPLY REFER TO:
2013-I-210-EI

Mr. Rhea Vincent
MS Department of Transportation
401 North West Street
Jackson, Mississippi 39201

Dear Mr. Vincent:

The Fish and Wildlife Service (Service) has reviewed the information in your electronic mail dated November 12, 2014, regarding the Port of Bienville Project (Project No. 105494 FRA-0023-00(003)) in Hancock and Pearl River counties, Mississippi. Our comments are submitted in accordance with the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

According to your electronic mail, the information the Service is providing in this letter will be used to assess impacts of the proposed project on federally listed species. Included is a list of species that may occur within the entire project study area, not just in the areas identified in proposed alignment segments. The Service has interpreted the segments you sent as the proposed new alignment routes and alternative routes for the new and upgraded railroad; if this assumption is inaccurate, please submit further information that includes a key or a description of the information provided in your maps to our office.

Please include in future project assessments all aspects of construction including an evaluation of areas that will provide fill for the construction of the rail line. If fill for the project will be obtained from areas outside the location of the proposed project study area, then please contact our office with additional location and project information so that we may provide a revised species list.

The following federally listed species may occur in the project study area:

Louisiana Black Bear

The federally listed threatened Louisiana black bear (*Ursus americanus luteolus*) occurs primarily in bottomland hardwood and floodplain forests along the Mississippi River and the southern part of the state. Although the bear is capable of surviving under a range of habitat types, some necessary habitat requirements include hard mast, soft mast, escape cover, denning sites, forested corridors, and limited human access. Forest management practices, agricultural,

commercial and industrial development, and highways can cause adverse impacts to bear habitat by increasing human disturbance, fragmenting forests, and removing den trees.

Bald Eagle

Although the bald eagle (*Haliaeetus leucocephalus*) was officially removed from the List of Endangered and Threatened Species as of August 8, 2007, it continues to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (BGEPA). Bald eagles nest in Mississippi from December through mid-May in mature trees (e.g., bald cypress, sycamore, willow, etc.) near fresh to intermediate marshes or open water. Nest sites typically include at least one perch with a clear view of the water or area where the eagles usually forage. Bald eagles are vulnerable to disturbance during courtship, nest building, egg laying, incubation, and brooding. The Service developed the National Bald Eagle Management (NBEM) Guidelines to provide landowners, land managers, and others with information and recommendations regarding how to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance," which is prohibited by the BGEPA. A copy of the NBEM Guidelines is available at http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf

Gulf Sturgeon

The threatened Gulf sturgeon (*Acipenser oxyrhynchus desotoi*) is found in the Pearl, Leaf, and Pascagoula Rivers. Gulf sturgeons are primitive, anadromous fish that annually migrate from the Gulf of Mexico into freshwater streams to spawn. Subadults and adults spend eight to nine months each year in rivers. Although Gulf sturgeon activity is not well documented, the species has been found in the upper reaches of the Pearl, Leaf, Strong, Bouie, and Chickasawhay Rivers as far north as the Jackson metropolitan area. Adult and subadult holding areas have been identified in the Pascagoula River. The decline of the Gulf sturgeon is primarily due to limited access to migration routes and historic spawning areas, habitat modification, and water quality degradation.

Gopher Tortoise

The threatened gopher tortoise (*Gopherus polyphemus*) occupies a wide range of upland habitat types. The general physical and biotic features thought to characterize suitable tortoise habitat are: presence of well-drained, sandy soils, which allow easy burrowing; an abundance of diverse herbaceous ground cover; and an open canopy and sparse shrub cover, which allows sunlight to reach the ground floor. The gopher tortoise digs burrows for shelter, and groups of tortoises dig burrows in the same location, forming a colony. Some of the major threats to the species are habitat degradation (often attributed to fire suppression) and habitat fragmentation (often attributed to urbanization and agricultural/silvicultural conversion), which can result in forage reduction, direct human impacts, and reproductive isolation.

Ringed Map Turtle

The threatened ringed map turtle (*Graptemys oculifera*) is found in the Pearl River. It prefers river stretches with moderate currents, abundant basking sites, and sand bars for nesting. Stream modification in the Pearl River, such as flood control and urban development, has significantly contributed to the decline of the species. Water quality degradation has also posed a serious problem for the turtle.

Inflated Heelsplitter

The threatened inflated heelsplitter mussel (*Potamilus inflatus*) is found in the lower Pearl River, Noxubee, and Tombigbee watersheds. It inhabits areas with moderate to swift currents, and prefers riffle or shoal areas with stable bottoms composed of sandy gravel or firm mud gravel and cobble. Work activities that increase sedimentation and water turbidity, or alter channel geometry or flow could have adverse impacts on this species.

Louisiana Quillwort

The endangered plant Louisiana quillwort (*Isoetes louisianensis*) is a nonflowering grass-like plant that lives in water or in very wet habitats. Mature plants are six to ten inches long, mostly evergreen, with spore-bearing structures below ground. Surveys need to be conducted during the appropriate field season when the plants are visible, typically November into May. Timing varies depending upon rainfall, as plants completely dieback and are not visible when the intermittent streams, which are habitat for this species, have dried-up. Threats include activities that increase stream sedimentation, reduce stream flow, and reduce the overstory canopy cover.

According to information in the feasibility study you sent to our office on November 25, 2014, the proposed project will include several stream crossings and will impact several hundred acres of wetlands. These areas may provide suitable habitat for the federally endangered Louisiana quillwort. Additionally, wetlands provide important habitat for many migratory birds which are protected under the Migratory Bird Treaty Act (16 U.S.C. 703-712).

The Service looks forward to working with you throughout the project development. Please feel free to contact our office if you require additional information at this time. If you have any questions, please contact Amy Carson of our office, telephone: (601) 321-1130.

Sincerely,

for Stephen M. Ricks
Field Supervisor
MS Field Office