PROSPECTUS
UPPER PEARL MITIGATION BANK

LEAKE COUNTY, MISSISSIPPI

Sponsored by
Wildlife Mississippi
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Submitted to:
U.S. Army Corps of Engineers, Regulatory Branch,
Vicksburg District

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1.0 INTRODUCTION

Wildlife Mississippi submits this prospectus to the U.S. Army Corps of Engineers, Vicksburg District (Vicksburg District), and the Interagency Review Team (IRT) to initiate evaluation of the proposed Upper Pearl Mitigation Bank (UPMB) pursuant to the plan to establish a bottomland hardwood wetland and stream mitigation bank in the upper reaches of the Pearl River watershed Hydrologic Unit Code (HUC) 03180001. The prospectus has been prepared in accordance with the Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (Federal Registry/Vol. 73, No. 70/Thursday, April 10, 2008/Rules and Regulations) and with guidance presented by the U.S. Army Corps of Engineers (USACE), Vicksburg District, Prospectus (33 CFR §332.8(d)(2)/40 CFR §230.98(d)(2)). The purpose of this document is to provide a sufficient level of detail to support informed public and IRT decisions regarding the objectives, establishment and operation of the UPMB proposal.

1.1 Bank Sponsor and Owner Wildlife Mississippi

Wildlife Mississippi is the Sponsor of the UPMB. The land will be owned in fee simple by Wildlife Mississippi prior to the placement of the conservation easement. Wildlife Mississippi will assume long-term ownership and management of the UPMB. Wildlife Mississippi will remain as the bank Sponsor assisting with establishment and long-term management of the bank.

1.2 Site Location

The UPMB consists of approximately 696.40 acres of land that either directly abuts the Pearl River or within the Pearl River floodplain within portions of Leake County, Mississippi. The UPMB will include approximately 91.77 acres of preservation and approximately 274.05 acres of bottomland hardwood enhancement. As a component of the UPMB, the project will include stream riparian buffer mitigation consisting of approximately 144.65 acres of riparian buffer enhancement, 1.39 acres of riparian buffer restoration, and 12.29 acres of riparian buffer preservation. The UPMB is located within the central portion of Leake County, Mississippi. The UPMB is located approximately 6 miles east of Carthage, Mississippi (Figure 1). The UPMB is more specifically located within portions of Sections 1, 9, & 17, Township 10 North, Range 8 East, Section 36 Township 11 N, Range 8 East, and Sections 29, 30, 31 Township 11 North, Range 8 East, Leake County, Mississippi (Figure 2).

As previously mentioned, the UPMB will be comprised of approximately 696.40 acres within one large tract of land. The UPMB can be accessed by a private drive off Highway 16 to the north and Dan Road on the south. Access can also be gained using Battle Bluff Road, which transects the central portion of the UPMB. The center Global Positioning System (GPS) coordinates for Tract 1 are Latitude N32.748 and Longitude W-89.424. The UPMB is located within the following 12-digit Hydrologic Unit Codes (HUC): Johnson Creek-Jones Creek 080602030205, Holcomb Creek-The Pearl River 080602030207, Thompson Creek-Brushy Creek 080602030203 and King Creek-The Pearl River 08060203024. UPMB is located within the 10-digit HUC Foster Creek-The Pearl River 0806020302 and 8-digit HUC 03180001 Upper Pearl River (Appendix A, Figure 4).

The primary service area for UPMB is the Upper Pearl River HUC 03180001 found within the Pearl Basin HUC 031800. The secondary service area for the UPMB is the Middle Pearl-Strong Sub-basin HUC 03180002. The Upper Pearl Subbasin drainage area covers approximately 2,463 square miles and extends over portions of Leake, Attala, Choctaw, Winston, Neshoba, and Scott County, Mississippi. The UPMB is located within the central portion of Leake County, Mississippi which is bisected by the Pearl River (Figure 4).

Much of the upper reaches of the Upper Pearl River watershed consisted historically of bottomland hardwoods, cypress/tupelo wetlands, and scrub/shrub swamp wetlands. However, as with many floodplains much of this area was deforested and converted to agricultural/silviculture uses. Leake County has a very large amount of livestock farms including mostly poultry and cattle, in addition to a very large amount of short rotation loblolly pine plantation. This region also represents an important flyway for migratory bird species, such as, waterfowl and neotropical migrants, threatened and endangered species, and important species such as the Louisiana Black Bear.

2.0 PROJECT GOALS AND OBJECTIVES

The UPMB is a small part of a +/- 8,849-acre conservation effort on lands owned by Wildlife Mississippi along the Pearl River throughout different areas within the state. The proposed UPMB will encompass 696.40 +/- acres, which has been selected by Wildlife Mississippi from a larger 4,616-acre purchase within Leake County along the Pearl River. The goal of Wildlife Mississippi is to re-establish a functioning and sustainable bottomland hardwood ecosystem back to the Bank site. Through restoration, enhancement and preservation activities, the Bank Sponsor hopes to improve such wetland functions as flood storage capacity, wildlife habitat and sediment retention/water quality functions back to the Bank site. Wildlife Mississippi intends for the UPMB to serve as a wetland and stream mitigation bank offering for sale, mitigation credits as compensation for unavoidable impacts to wetlands associated with Department of the Army (the "DA") Section 404 permits and/or U.S. Army Corps of Engineers (the "USACE") Civil Works Projects. Once restored, protection of the PRVMB will be accomplished by the application of a perpetual conservation easement.

UPMB is traversed by reaches of The Pearl River, which flows southwest through portions of the Bank Property before emptying into Lake Borgne approximately 180 miles south of the Bank Property. Additionally, small segments of Beckham Branch, unnamed perennial streams and intermittent streams transect the UPMB property and converge with The Pearl River within the limits of the Bank Property. The UPMB will also enhance the riparian buffer zones along The Pearl River and its tributaries. The UPMB is abutting existing bottomland hardwood forests to the north and south, which are also planned to be placed under permanent conservation easements, allowing the Sponsor to reduce habitat fragmentation by restoring the forestlands within the floodplains of the Pearl River and the Pearl River watershed. An additional goal of the Sponsor is to place permanent protections along as much of the Pearl River as possible in order to protect the city of Jackson's water supply, among others.

The majority of the surrounding area is forested, with bottomland hardwoods in the lower areas and pine plantation on the edges and often within the Pearl River floodplain UPMB will further promote the restoration of bottomland hardwood forest and riparian buffers along The Pearl River

and its tributaries within Leake County, Mississippi particularly within the upper reaches of this basin. The project will further reduce fragmentation of forestland within this region and provide connectivity to primary drainage features within the upper portion of the Pearl River watershed. The UPMB project would remove the ongoing silviculture activities within the Bank Property and restore the Bank Property to its historic bottomland hardwood ecosystem within the Pearl River watershed.

Table 1: Current Habitat Types and Land Uses for UPMB (Figure 6)

Habitat Type	Acreage	Linear Feet	Percentage
Emergent Wetlands	67.83		9.74%
BLH Forested Wetlands	179.48		25.77%
Hardwood Forested Uplands	127.11		18.25%
Cypress Tupelo Wetlands	104.07		14.94%
Pine Plantation Forested Wetlands	134.76		19.35%
Pine Plantation Uplands	12.09		1.74%
Open Field Uplands	12.27		1.76%
Perennial Streams	31.25	19,900.50	4.49%
Intermittent Streams	4.03	12,861.17	0.58%
Interior Access Roads	10.10		1.45%
Highway and Utility Rights-of-Way	13.41		1.93%
TOTALS	**696.40**	**32,761.67**	**100.0%**

Table 2: Proposed Mitigation Bank Habitat Types for UPMB (Figure 14)

Proposed Mitigation Type	Current Habitat Type	Linear Feet	Acreage	Total Acres
Wetland Enhancement	BLH Forested Wetlands		101.23	274.05
	Pine Plantation Wetlands		122.83	
	Emergent Wetlands		49.99	
Upland Enhancement	Uplands		113.46	113.46
Cypress/Tupelo Preservation	Cypress Tupelo Complex		91.77	91.77
Riparian Buffer Restoration	Various Habitat Types		1.39	158.33
Riparian Buffer Enhancement	Various Habitat Types		144.65	
Riparian Buffer Preservation	Various Habitat Types		12.29	
In-Stream Restoration	Perennial Stream	200	0.06	0.06
Non-Mitigation	Pearl River	13,850.71	29.23	58.73
	Perennial Streams	5,849.79	1.96	
	Intermittent Streams	12,861.17	4.03	
	Highway ROW		7.35	
	Utility ROW		6.06	
	Access Roads		10.10	
TOTALS		**32,761.67**	**696.40**	**696.40**

3.0 ECOLOGICAL SUITABLITY OF THE SITE

3.1 Historic Site Conditions

UPMB is located within Leake County, Mississippi. Leake County is located in the central part of Mississippi having a total land area of 499,840 acres. The county is bisected by the Pearl River with both halves of the county drained mostly via the Pearl River, which flows south eventually discharging into the Gulf of Mexico. Historically, Leake County was mainly a farming area with primary crops of cotton and soybeans. The UPMB lands are currently, and have been historically, used for silviculture purposes, which utilized short rotation loblolly pine wherever possible. This property as well as a large portion of the surrounding area was owned by a timber real-estate investment trust headquartered in Birmingham, Alabama.

3.2 Summary of Current Site Conditions

3.2.1 Current Land Uses

The vast majority of the UPMB property is utilized for silvicultural purposes. Alterations to the historic landscape would include interior roadways, rutting, and drainage improvements in support of the silvicultural activities. The current land use for timber production purposes is similar to the adjacent properties.

3.2.2 Current Vegetation

Forested Wetlands- The forested wetlands within the UPMB property exhibit three (3) different existing conditions.

Mature Cypress/Tupelo Forested Wetlands:
There approximately 104.07 acres of cypress/tupelo wetlands within the UPMB property. This wetland habitat located within UPMB contains nearly 100% canopy closure has remained largely unaltered from human interventions through time due to limited access and wet conditions. Commonly associated with old meanders and tributaries of the Pearl River, these depressional and slack water areas are isolated from normal flow through hydrology but are still influenced by overbank flooding from the bayou as well as storm water runoff. This is significant due to the interrelated nature of the riparian systems associated with the Pearl River and its tributaries and the adjacent forested wetland complex. This habitat serves to facilitate hydrology internally through the property as well as assist in the stabilizing the hydroperiod at normal water levels. These systems are critical in that they serve as important nutrient sinks and nutrient cycling complexes as well as by providing critical habitat functions. These areas are permanently to semi-permanently inundated depressions that receive nutrient input during increased hydroperiods and serve to store and later cycle the nutrients through plant uptake. These cypress/tupelo wetlands also serve as vital habitat for certain piscivorous species as well as amphibians and reptiles. Wintering waterfowl also derive benefit from this type of habitat. Swamp tupelo (*Nyssa biflora*) and bald cypress (*Taxodium distichum*) are the dominant species with occurrences of overcup oak (*Quercus lyrata*), swamp chestnut oak (*Quercus michauxii*), water oak (*Quercus nigra*), willow oak (*Quercus phellos*), red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), water hickory (*Carya aquatica*), American sycamore (*Platanus occidentalis*), American hornbeam (*Carpinus caroliniana*), and American elm (*Ulmus americana*) around the fringe of the wetland habitat.

Wet Pine Plantation:
There are approximately 134.76-acres of planted pine wetland habitat within the UPMB property. These areas are under intensive silviculture management of loblolly pine (*Pinus taeda*). The current wet pine plantation areas within this area were observed to be approximately 15-20-year-old growth. Species such as Chinese privet (*Ligustrum sinense*), Yaupon (*Ilex vomitoria*), groundsel tree (*Baccharis halimifolia*), lamp rush (*Juncus effusus*) and cotton grass bulrush (*Scirpus cyperinus*) were also observed. The overall species composition and

density is lacking in these areas. Additionally, the presence of the invasive Chinese privet further degrades this habitat.

The soil matrix color within the planted pine wetland habitats ranges from a 5/1 (gray), 5/2 (grayish brown) to a 6/2 (light brownish gray) on the 10YR Munsell Soil Color Chart. There is a soil mottle present at (~10% - 30%) with a soil mottle color of 4/6 (strong brown) on the 10YR and 7.5YR charts. Hydrological indicators observed within the planted pine wetland habitats include standing water, saturation, inundation, high water table, sediment & drift deposits, crayfish burrows, waters marks on the base of trees, moss trim lines, drainage patterns, and oxidized rhizospheres along living roots.

Bottomland Hardwood Forested Wetlands:
There are approximately 179.48 acres of bottomland hardwood forested wetlands within the UPMB. These forested wetlands within the UPMB were observed to be degraded and have been subjected to clear-cut timber harvests within the past 25-30 years. It is evidenced that the vegetation within these areas was allowed to naturally restore following the timber harvest activities. As a result, a significant amount of light-seeded, soft mast species have established within these areas. These species include American sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), sweetgum (*Liquidambar styraciflua*), box elder (*Acer negundo*), and sugarberry (*Celtis laevigata*) within minor occurrences of water oak (*Quercus nigra*), willow oak (*Quercus phellos*). Additionally, portions of this habitat were dominated by Chinese privet (*Ligustrum sinense*). The overall species composition and density is lacking in these areas. Additionally, the presence of the invasive Chinese privet further degrades this habitat.

The soil matrix color within the forested wetland habitats ranges from a 5/1 (gray), 5/2 (grayish brown) to a 6/2 (light brownish gray) on the 10YR Munsell Soil Color Chart. There is a soil mottle present at (~10% - 30%) with a soil mottle color of 4/6 (strong brown) on the 10YR and 7.5YR charts. Hydrological indicators observed within the BLH wetland habitats include saturation, inundation, high water table, sediment & drift deposits, crayfish burrows, waters marks on the base of trees, moss trim lines, drainage patterns, and oxidized rhizospheres along living roots.

Emergent Wetland- There are approximately 67.83 acres of emergent wetland habitat within the UPMB property. These areas were subject to clear-cut timber activities and left fallow. As result, invasive species such as Chinese privet (Ligustrum sinense) has begun to establish. The primary species observed within this habitat type includes: Chinese privet (*Ligustrum sinense*), cottongrass bulrush (*Scirpus cyperinus*), smartweed (*Polygonum hydropiperoides*), rosette grass (*Dichanthelium acuminatum*), common boneset (*Eupatorium perfoliatum*), lamprush (*Juncus effusus*), meadowbeauty (*Rhexia mariana*), beach fox glove (*Agalinis fasciculata*), plume grass (*Saccharum giganteum*), *Carex* spp., and Brazilian vervain (*Verbena incompta*) with occurrences of black willow (*Salix nigra*) and American sycamore (*Platanus occidentalis*) in the sapling stratum.

The soil matrix color within the emergent wetland habitats ranged from a 5/1 (grayish brown) to a 6/1 (gray) on the 10YR Munsell Soil Color chart. There is a

soil mottling present (~10-30%) with a soil mottle color ranging from a 3/4 (dark yellowish brown) to a 4/4, 4/6 (dark yellowish brown) and 5/8 (yellowish brown) on the 10YR and 7.5YR charts. Hydrologic indicators observed within these emergent wetland habitats included: saturation, high water table, crawfish burrows, and oxidized rhizospheres along living roots.

Uplands- The remaining portions of the subject property are comprised of a forested hardwood upland, open field uplands, and planted pine upland types. The primary vegetative species within the upland habitats included: tulip poplar (*Liriodendron tulipifera*), American beech (*Fagus grandifolia*), water oak (*Quercus nigra*), ironwood (*Carpinus caroliniana*), loblolly pine (*Pinus taeda*), American holly (*Ilex opaca*), *Solidago spp., Lespedeza spp. Eupatorium spp.,* among others. The soils within the upland habitat are a 4/4, 5/3, to 5/4 (yellowish brown) on the 10YR page of the Munsell Soil Color Chart with limited to no soil mottling.

3.2.3 Current Hydrology

The field reconnaissance confirmed the presence of one (1) main drainage feature that transect the limits of the property. The Pearl River is a perennial stream, which contains year-round flows and transects the UPMB property in a generally northeast to southwest orientation. The Pearl River contains a mean width of approximately 80-120 feet and is considered the property's primary drainage feature. The Pearl River has flows in a northerly direction before converging with the Mississippi River. It should be noted that a small segment of Beckham Branch, transects the UPMB property. Additional unnamed perennial streams were also identified within the UPMB property. These perennial streams are tributaries of the Pearl River.

Intermittent streams identified within the UPMB are unnamed tributaries of The Pearl River, previously described. These streams contain seasonal flows and provide the secondary drainage source for storm water runoff for the property. These streams convey storm water flows from the center of the site into The Pearl River and the larger perennial streams.

The current hydrology has been altered from the historical hydrologic regime through property alterations associated with timber production and forestry techniques. The primary alterations within the Bank Property include culverts and road crossings. Additionally, removal of in-stream impediments caused by road crossings and culverts will alleviate backwater congestion; promote exchange of surface and subsurface waters, and the transfer of materials between the stream channels, wetlands, and floodplain networks present within the Bank Property. The current hydrology of the Bank Property is depicted in Figure 7.

3.2.4 Historic Hydrology

The Bank Property is located within the Pearl River Basin with portions of the storm water flows conveyed through The Pearl River and its unnamed tributaries. The Pearl River is also directly empties into the Gulf of Mexico approximately 400 miles downstream. The drainage area associated with the Bank Property is collectively

approximately 92,670 acres that, as described, flow through the Bank Property prior to the convergence of the Pearl River with Mississippi River.

Sources of hydrology on the Bank include rainfall, sheet flow and overbank flooding of The Pearl River and its tributaries and wetlands. Interior drainage has been compromised in one particular area where an undersized and misplaced culvert has impeded flows and restricted aquatic organism passage. The historic hydrology of the Bank Property and the adjacent properties are depicted in Figure 8.

3.2.5 Mapped Soil Types

Soils – As evidenced by the *Soil Survey for Leake County Mississippi*, published in October 1980 by the USDA - Soil Conservation Service [now Natural Resources Conservation Service (NRCS)], the soils on the subject property primarily consist of 53.5% Jena-Kirkville-Kinston complex (JkB), 41.9% Rosebloom and Arkabutla (RK) 28%, 2.9% Smithdale fine sandy loam, 8 to 15 percent slopes (SmD2), 2.5% Ora fine sandy loam, 5 to 8 percent slopes, eroded (OrC), 0.4% Ora fine sandy loam, 2 to 5 percent slopes (OrB), and approximately 3.7% water (Figure 9).

3.2.6 Property Encumbrances

An electric transmission line right of way bisects UPMB property. The UPMB property is also divided by a public road known as Battle Bluff Rd, and its ROW, which bridges the Pearl River. These areas will be non-mitigation lands. No other encumbrances were identified within the Bank Property.

3.2.7 Adjacent Property Development

UPMB is connected to and primarily surrounded by natural tributaries and forested wetland areas. When considering a one (1) mile radius around the Bank Property, the current land use type consists of 80% forestland, 1% cultivated cropland, 11% pasture/open field or fallow, 6% rural development and 2% water (Figure 10).

3.2.8 Preliminary Jurisdictional Determination

The UPMB property was delineated in late August and early September of 2021. A copy of the wetland delineation report was submitted prior to the draft of this document to the USACE, Vicksburg District on October 13, 2021.

3.3 Water Rights and Hydrological Influences

3.3.1 Water Rights

The State of Mississippi treats water resources under the theory of absolute ownership and rule of capture, provided capture does not result in harm to neighbors.

3.3.2 General Watershed Characteristics

3.2.2.1 Water Sources and Losses

The sources of water to the project area are currently direct precipitation and surface flow from adjacent land from the north to south. Additionally, overland flooding from The Pearl River and its tributaries provide a source of surface water during normal seasonal flooding events. Storm water flows across the site generally via overland flows into drainages interconnected to The Pearl River.

Leake County is located within the Central part of Mississippi. The Pearl River transects the center of the County. Other notable streams include Beckham Branch and Indian Branch that flow into the Pearl River sections that transect or abut the UPMB.

The total annual average precipitation is 55 +\- inches.

3.3.2.2 Hydroperiod

Hydric soils indicate that the site is either currently inundated or saturated in the upper soil profile for at least 14 consecutive days per year. This site is comprised primarily of Jena-Kirkville-Kinston complex (JkB) and Rosebloom and Arkabutla (RK) soils which, in this area, typically are poorly drained and have a seasonal high-water table between the 18 and 30 inches below the surface during the months of January through April.

3.4 Water Quality

Based upon the Mississippi Department of Environmental Quality (MDEQ) 2018 listing for impaired waterbodies (303d), multiple tributaries of the Pearl River are designated as Aquatic Life Use Support Impaired Use due to Biological Impairment. Consequently, planting of bottomland hardwood tree species for this project will result in overall water quality improvements due to increased filtration and plant uptake. Elimination of current forestry activities will result in the reduction of agricultural pesticides and herbicides, reduction of use of nitrogenous or phosphorous fertilizers, and minimization of sedimentation/siltation as well as TSS and turbidity (i.e., nonpoint source pollution prevention). Perhaps the most beneficial aspect to water quality is the long-term conservation easement that will prevent future clearcut harvesting or land conversion that could have serious detrimental effects on water quality. Especially considering the growing poultry and livestock agriculture industry in nearby areas that could likely move in closer to the river and/or have a much higher chance of non-point source pollution without an adequate forested/vegetated buffer.

4.0 Wildlife Values

Bottomland hardwood forests provide important ecosystem functions, including maintenance of water quality, habitat for fish and wildlife species, regulation of flooding and stream recharge. The Pearl River watershed supports a hugely diverse number of fauna including 130 native fish species and over 40 mussel species.

The threatened ringed map turtle (*Graptemys oculifera*) is known to occur in most reaches of the Pearl River. Some data suggests the population is declining in the area of the proposed UPMB. The threats identified with the declining numbers include the following:

- habitat modification (de-snagging, channelization, impoundment, and erosion),
- water quality degradation (pollution & siltation),
- over-utilization (collection for the pet trade and shooting of basking turtles for recreation);
- disturbance of nesting and basking (due to recreation and boating); and,
- The subsequent recovery plan (1988) identified predation as an additional threat.

The implementation of the UPMB could potentially benefit the threatened ringed map turtle (*Graptemys oculifera*) with the reduction in silviculture practices and the protection and enhancement of the existing riparian buffers along the Pearl River. The proposed activities associated with the UPMB could potentially reduce any erosion, pollution, or siltation from the UPMB property.

There are no Wildlife Management Areas (WMAs) areas in close proximity to the UPMB, however the Yockanookany WMA is approximately 10 miles north of the bank property, and the Yockanookany river confluences with the Pearl River approximately 10 miles southwest of the property. There is also the Pearl River WMA in Madison County near Canton. The Pearl River also provides the water source for the Ross Barnett Reservoir, which is a popular recreation outlet and a functional water supply and flood storage lake just outside the city of Jackson, MS. As a result, restoration and enhancement of this property will undoubtedly serve the purpose of increasing habitat and reducing fragmentation and as an interconnecting corridor habitat for the Louisiana Black Bear and other wildlife species, as well as protect the water source for numerous native fauna and fish within the Pearl River and the Reservoir. The rehabilitation of the forest will also provide wintering habitat for neotropical migrants and other native wildlife.

5.0 Bank Establishment

5.1 Mitigation Bank Overview

5.1.1 Bottomland Hardwood Wetland Mitigation

5.1.1.1. Wetland Enhancement

Bottomland Hardwood Wetland Enhancement
The Sponsor proposes the enhancement of 101.23-acres of bottomland hardwood wetland habitat. This selected wetland enhancement area currently exists as a degraded bottomland hardwood forested wetland habitat. These habitats are currently degraded from the past timber management and the establishment of Chinese privet (*Ligustrum sinense*). The overstory vegetation within these areas is dominated heavily by soft mast species including American sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), sweetgum (*Liquidambar styraciflua*), box elder (*Acer negundo*), and sugarberry (*Celtis laevigata*) within minor occurrences of water oak (*Quercus nigra*), willow oak (*Quercus phellos*). The wetlands enhancement areas include an understory component of Chinese privet (*Ligustrum sinense*), poison ivy (*Toxicodendron radicans*), and sawtooth blackberry (*Rubus argutus).*

To complete the wetland enhancement activities, timber stand improvement (TSI) activities will be conducted to remove a portion of the soft mast dominated understory and midstory. These TSI activities may include selective timber harvest, individual stem injection, and/or forestry mowing. Following the removal of a portion of the overstory component, these areas will be underplanted with primarily hard mast tree seedlings in an effort to achieve a 50/50 to 60/40 hard mast to soft mast ratio mimicking the natural bottomland hardwood habitat that historically dominated area.

Planted Pine Wetland Enhancement
The Sponsor proposes the enhancement of 122.83-acres of planted pine wetland habitat. This selected wetland enhancement area currently exists as a loblolly pine plantation.

To complete the wetland enhancement activities, the planted pine will be removed followed by the planting native bottomland hardwood species.

Emergent Wetland Enhancement
The Sponsor proposes the enhancement of 49.99-acres of emergent wetland habitat. This selected wetland enhancement area currently exists as fallow fields with the presence of Chinese privet (*Ligustrum sinense*).

To complete the wetland enhancement activities, the vegetation in this area will be sprayed with herbicide and subsequently burned. These activities will be followed with the planting native bottomland hardwood species.

5.1.1.3. Wetland Preservation

The Sponsor proposes to protect approximately 91.77 acres of cypress/tupelo wetlands located within the Bank Property. No management practices are anticipated for the cypress/tupelo wetland preservation areas other than exotic species control. Exotic species will account for no more than 1% coverage at all times. Existing forested wetlands found on the site will be perpetually protected with the application of a conservation easement.

5.1.2 Stream Mitigation

5.1.2.1 Stream (In-Stream)

The Sponsor proposes to conduct in-stream improvements within a stream channel re-establishing the connectivity to the natural floodplain. It is proposed to improve connectivity of stream channels through the use of culvert replacement at a road crossing on a perennial stream channel. This process renews the hydrologic and material transfers between the floodplains and stream channels, promotes the creation of riparian and aquatic habitats, and allows movement of aquatic species.

5.1.2.2 Stream Riparian Buffer

5.1.2.2.1 Stream Riparian Buffer Restoration

Approximately 1.39-acres of stream riparian buffer will be restored by initially restoring the natural floodplain connectivity to the stream channel and re-establishing native bottomland hardwood vegetation within the riparian buffer areas. Native bottomland hardwood species will be planted within the designated buffer on either side of the streams designated in the restoration areas.

5.1.2.2.2 Stream Riparian Buffer Enhancement

Approximately 144.65-acres of stream riparian buffer will be enhanced by re-establishing native bottomland hardwood vegetation within the riparian buffer areas. Native bottomland hardwood species will be planted within the designated buffer on either side of the streams designated in the enhancement areas.

5.1.2.2.3 Stream Riparian Buffer Preservation

Approximately 12.29 acres of stream riparian buffer will be protected in its current state.

5.2 Mitigation Work Plan

5.2.1 Hydrologic Work Plan

5.2.1.1 Streams (In-Stream)

The historic silvicultural land uses on the Bank Property have resulted in disconnection of a stream channel and altered the natural stream dynamics. An undersized and misplaced culvert has resulted in scouring of the downstream reach. Additionally, the placement of the culvert has resulted in fragmentation of aquatic organism passage. As a result, it is proposed to enhance stream connectivity through the replacement and proper placement of an approved culvert for targeted perennial stream crossing.

5.2.1.2 Stream Riparian Buffer

The historic silvicultural land uses on the UPMB Property have resulted in the removal of the natural bottomland hardwood riparian buffer habitats along The Pearl River. Full details regarding the vegetative enhancement activities is described in below in Section 5.2.2. Figure 11 depicts the location of the hydrologic work plan designed for the UPMB.

5.2.2 Vegetative Plantings

5.2.2.1 Bottomland Hardwood Wetland Mitigation

5.2.2.1.1 Bottomland Hardwood Wetland Enhancement

As previously discussed, it is proposed to enhance approximately 101.23-acres of bottomland hardwood wetlands within the Bank Property. Portions of the UPMB property have been subjected to intensive silvicultural management activities over the years. These practices have resulted in a degraded bottomland hardwood habitat that is heavily dominated by soft mast species. The current vegetative composition of these areas is discussed above in Section 5.1.1.2. It is proposed to conduct Timber Stand Improvement (TSI) activities within these areas to reduce the amount of soft mast species. TSI activities may consist of selective timber harvest, individual stem injection, and/or forestry mowing. Following the removal of a portion of the overstory component, these areas will be underplanted with primarily hard mast tree seedlings in an effort to achieve a 50/50 to 60/40 hard mast to soft mast ratio mimicking the natural bottomland hardwood habitat that historically dominated area. Tree seedlings species will consist of hard mast species included within Table 3 below.

5.2.2.1.2 Planted Pine Wetland Enhancement

The planted pine wetland enhancement areas will be planted using a mixture of hard mast and soft mast species during the non-growing season (i.e., December – March). Prior to planting, site preparation will be conducted using mechanical and chemical means, such as, cut and remove, forestry mulching or shredding and herbicidal application, and possibly burning. Invasive and undesirable species control will be conducted throughout the entire project area over the life of the Bank.

The Sponsor does not anticipate degrees of soil settlement requiring planting deferment. The site will be prepared in such a manner that soil disturbance will be avoided or minimized to the maximum extent practicable, and site preparation has been planned such that favorable conditions for planting will be established and maintained throughout the preparation activities. Site preparation activities will be documented with digital photographs and provided to the IRT during times in which these activities take place.

Planting procedures will adhere to the following specifications:

a. One (1) to two (2) year old bare-root seedlings obtained from a registered licensed regional nursery grower and of a regional eco-type species properly stored and handled to ensure viability will be planted at the Bank during the period December 15 through March 15 (planting season). Events, such as, spring flooding may warrant storage of trees with planting in late spring or early summer. If seedlings listed are not available, then substitutions may be made if they are approved by the IRT. The anticipated schedule for planting is the non-growing season of 2022-2023. The Sponsor will plant appropriate species in such a manner to ensure adequate species diversity and to ensure that monotypic tree rows will not be established;

b. Seedlings will be planted following a 10’ x 10’ spacing to achieve an initial stand density of, at minimum, 435 seedlings per acre;

c. Species selected for planting will be planted in a random mixture as dictated by terrain and edaphic conditions. The species selected will be site appropriate in terms of habitat design, soil-moisture regime and species diversity. Ten or more species may be represented in the planting assemblage to insure adequate species diversity. The exact species and quantities for planting will be determined by the availability of such species from commercial nurseries providing localized ecotype seedlings. Seedlings would certainly be mixed upon plantings so that areas are not comprised of a single species. The distribution of stems will create a mosaic of hard and soft mast species that will provide seasonally available forages for a wide range of indigenous wildlife including the Mississippi black bear. The availability of soft mast species is

important during the summer and hard mast is critical in the fall and early winter for the buildup of fat reserves in black bears preparing for denning. Single species plantings will generally be avoided.

d. The Bank will be maintained, on an as-needed basis, by the use of mechanical or chemical control or some combination thereof in order to control exotic species colonization or other plant competition.

e. Sponsor will use all prudent efforts (physical, chemical, and/or mechanical) to remove and control Chinese tallow tree and any other possible exotic vegetation from the Bank Property. The Bank will be monitored to prevent infestation by noxious/exotic vegetation. Exotic species (e.g., Chinese tallow and Chinese privet) shall not comprise more than 5% cover and noxious species (e.g., honey locust, black willow, and cotton wood) shall not comprise more than 20% of the total stem density. The Bank Property will be monitored for the colonization of exotic and noxious species throughout the life of the Bank.

5.2.2.1.3 Emergent Wetland Enhancement

As previously discussed, it is proposed to enhance approximately 49.99-acres of emergent wetlands within the Bank Property. Portions of the UPMB property have been subjected to intensive silvicultural management activities over the years. These practices have resulted in an emergent wetland habitat in fallow fields. The current vegetative composition of these areas is limited to an herbaceous layer with few sapling and shrub species. In addition, invasives such as Chinese privet (Ligustrum sinense) has begun to establish. It is proposed to conduct similar enhancement activities as those proposed for the planted pine wetland enhancement areas.

Table 3: Plant Species Proposed for the Bank Property:

Bottomland Hardwood Plantings		
Common Name	Scientific Name	Percent Composition
nuttall oak*	*Quercus nuttallii*	20%
willow oak	*Quercus phellos*	15%
water oak	*Quercus nigra*	12%
bald cypress*	*Taxodium distichum*	12%
pecan	*Carya illinoinensis*	5%
overcup oak*	*Quercus lyrata*	5%
green ash	*Fraxinus pennsylvanica*	5%
red maple	*Acer rubrum*	5%
sweetgum	*Liquidambar styraciflua*	5%
common persimmon	*Diospyros virginiana*	5%
sugarberry	*Celtis laevigata*	5%
American elm	*Ulmus Americana*	1%
water hickory*	*Carya aquatica*	5%

*Species to be concentrated within natural low-lying swales and contours.

For a given planting, a minimum of 240 trees/acre will be present following the third full growing season and 150 trees/acre following the 5th growing season. Tree species will be planted to achieve an overall composition, on average, of seven (7) to ten (10) target species or greater per acre from the species listed in Table 3 above, with no single species comprising more than 25% of the stocking and hard mast species comprising between 50 to 60% of the total species planted. At Year 10, the overall stand density shall be composed, on average, of seven (7) to ten (10) target tree species/acre or greater at a minimum density of 120 trees/acre, including desirable natural recruits with a target hard to soft mast ratio of 50/50 to 60/40.

5.2.2.2 Riparian Buffer

5.2.2.2.1 Riparian Buffer Restoration

The proposed mitigation plan for the UPMB includes the restoration of approximately 1.39-acres of riparian buffer along the primary and secondary drainages within the Bank Property. Vegetative restoration activities within these areas will include activities similar to those described in Section 5.2.2.1.3 above.

5.2.2.2.2 Riparian Buffer Enhancement

The Sponsor is proposing to enhance approximately 144.65-acres of riparian buffers along the primary and secondary drainages within the UPMB property. Enhancement activities conducted

within these areas would include similar activities to those described in Sections 5.2.2.1.1 and 5.2.2.1.2 above.

5.2.3 Noxious/Exotic Species Control

Exotic and nuisance species such as Chinese privet species shall not comprise more than 5% cover and noxious species (e.g., honey locust, black willow, cotton wood, thistle, and baccharis) shall not comprise more than 20% of the total stem density. Exotic and/or noxious species will be removed using various techniques which may include pre-and post-emergent herbicide applications, direct application by spray and/or injection, mowing and any other successful technique during initial planting. The percent cover of invasive plants will be monitored during short-term and long-term success monitoring and appropriate action taken, if needed. (Please reference 5.2.2. Vegetative Plantings.)

5.2.4 Monitoring

Monitoring shall commence immediately following plantings such that a baseline is established for the UPMB. Monitoring will then occur following the growing seasons in years 1, 3, 5, 8 and 10 so that any corrective measures by the Sponsor may be undertaken. Monitoring reports will be submitted to the Chair of the IRT no later than December 15th following monitoring activities. Monitoring efforts will be conducted to verify the success of the restoration activities and will include vegetative surveys, wildlife observations, hydrologic observations, and overall property assessments.

5.3 Proposed Service Area

5.3.1 Primary Service Area

The UPMB will be established to provide mitigation to compensate for impacts to Waters of the United States, including wetlands and streams, within the Vicksburg District. The service area for the UPMB is the Pearl River Basin (HUC #031800) of Mississippi. The service area encompasses all or portions of the counties Choctaw, Attala, Winston, Leake, Neshoba, Kemper, Newton, Scott, Madison, Rankin, Hinds, Smith, Simpson, Copiah, Jefferson Davis, Lawrence, Lincoln, Pike, Walthall, Marion, Lamar, Pearl River and Hancock in Mississippi. (Figure 15).

Decisions authorizing use of credits from the UPMB for impacts outside of the designated service area and for out-of-kind impacts will be made on a case-by-case basis by the USACE Vicksburg District.

5.4 General Bank and Need and Technical Feasibility

UPMB is proposed to provide compensatory mitigation for Vicksburg District approved projects within the 6-Digit Hydrologic Unit Code (HUC) 031800 (The Pearl River Basin). Projects located outside the HUC 031800 would be evaluated on a case by case basis by the District.

In addition to providing mitigation for activities associated with continued population growth within the Jackson Metro area and surrounding communities, the proposed service area has a history of oil and gas exploration and production, federal water control projects and considerable linear activities, including transportation, power transmission and pipelines.

5.5 Future Ownership and Long-Term Management Strategy

5.5.1 Sponsor/Operations Manager/Long-Term Management

Wildlife Mississippi
POC: Mr. Steven Gruchy
P.O. Box 187
Amory, MS 38821

5.5.2 Landowner/Long-Term Ownership

Wildlife Mississippi
P.O. Box 187
Amory, MS 38821

5.5.3 Agent

Headwaters, Inc.
P.O. Box 2836
Ridgeland, MS 39158
www.headwaters-inc.com
POC: Mr. Josh Brown

5.5.4 Perpetual Site Protection Mechanism

To ensure long-term protection of the Bank Property, the Sponsor will be responsible for maintaining and protecting lands contained within the UPMB in perpetuity, unless the lands are transferred to a state or federal resource agency, non-profit conservation organization, or this responsibility is contractually conveyed to another person, all of which will be subject to approval by the Vicksburg District. A conservation easement will be prepared to include a non-profit or state agency as the Grantor and Holder. This conservation easement specifically prohibits activities that would reduce the quality of the restored wetlands. The conservation easement also specifies permissible activities such as hunting, fishing and recreational use given the activity causes no negative effect on the functions and values of the restored wetlands. Forest management within the conservation easement would be allowed, given that this activity is performed to maintain or improve the overall ecological function of the Bank. Impacts that adversely affect the function and value of the Bank, which are caused by permissible activities, will required permitting and subsequent mitigation.

5.5.5 Sponsor Qualifications

The Sponsor, Wildlife Mississippi, has protected, restored, or enhanced approximately 596,620 acres within the State of Mississippi since its establishment as a non-profit conservation organization in 1997. They currently own and operate over 14,900 acres of mitigation properties in Mississippi including 4 other approved mitigation banks, and numerous Permittee Responsible Mitigation Areas. For the

Upper Pearl Mitigation Bank, Mr. Steven Gruchy will be the primary operator for the Bank Property, management, and office operations. Mr. Steven Gruchy will be supported by Headwaters, Inc. who have considerable experience in mitigation banking in Vicksburg, New Orleans and the Mobile Districts.

6.0 Conclusion

In summary, the UPMB has the potential to restore, enhance, and protect approximately 696.40 acres of bottomland hardwood habitat. The UPMB will include approximately 91.77 acres of preservation, 274.05 acres of bottomland hardwood enhancement, 144.65 acres of riparian buffer enhancement, 1.39 acres of riparian buffer restoration, and 12.29 acres of riparian buffer preservation following the completion of the planned wetland and stream mitigation work plan described within the contents of this Prospectus. The planned Bank Property would be protected and maintained by a Conservation Easement in perpetuity. More detailed information regarding financial assurances, monitoring provisions, and credit release schedules will be provided in the subsequent draft MBI and will reflect current standards within the Vicksburg District.

7.0 References

Code of Federal Regulations, Title 33, Parts 325 and 332 and Title 40, Part 230, as published on pages 19594-19704 in the Federal Register dated 10 April 2008.

United States Department of Agriculture – Natural Resources Conservation Service, Web Soil Survey, Leake County, Mississippi.
http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

United States Department of Agriculture – Soil Survey of Leake County, Mississippi, issued October 1980.

Mississippi Department of Environmental Quality, Mississippi Water Quality Inventory: Integrated Report (305(b)/303(d)).
http://www.deq.Mississippi.gov/portal/DIVISIONS/WaterPermits/WaterQualityStandardsAssessment/WaterQualityInventorySection305b/2012IntegratedReport.aspx

http://www.deq.Mississippi.gov/portal/Portals/0/planning/305b/2012/12%20IR1%20Appendix%20A%20Text%20and%20Maps%20FINAL%201-25-13.pdf

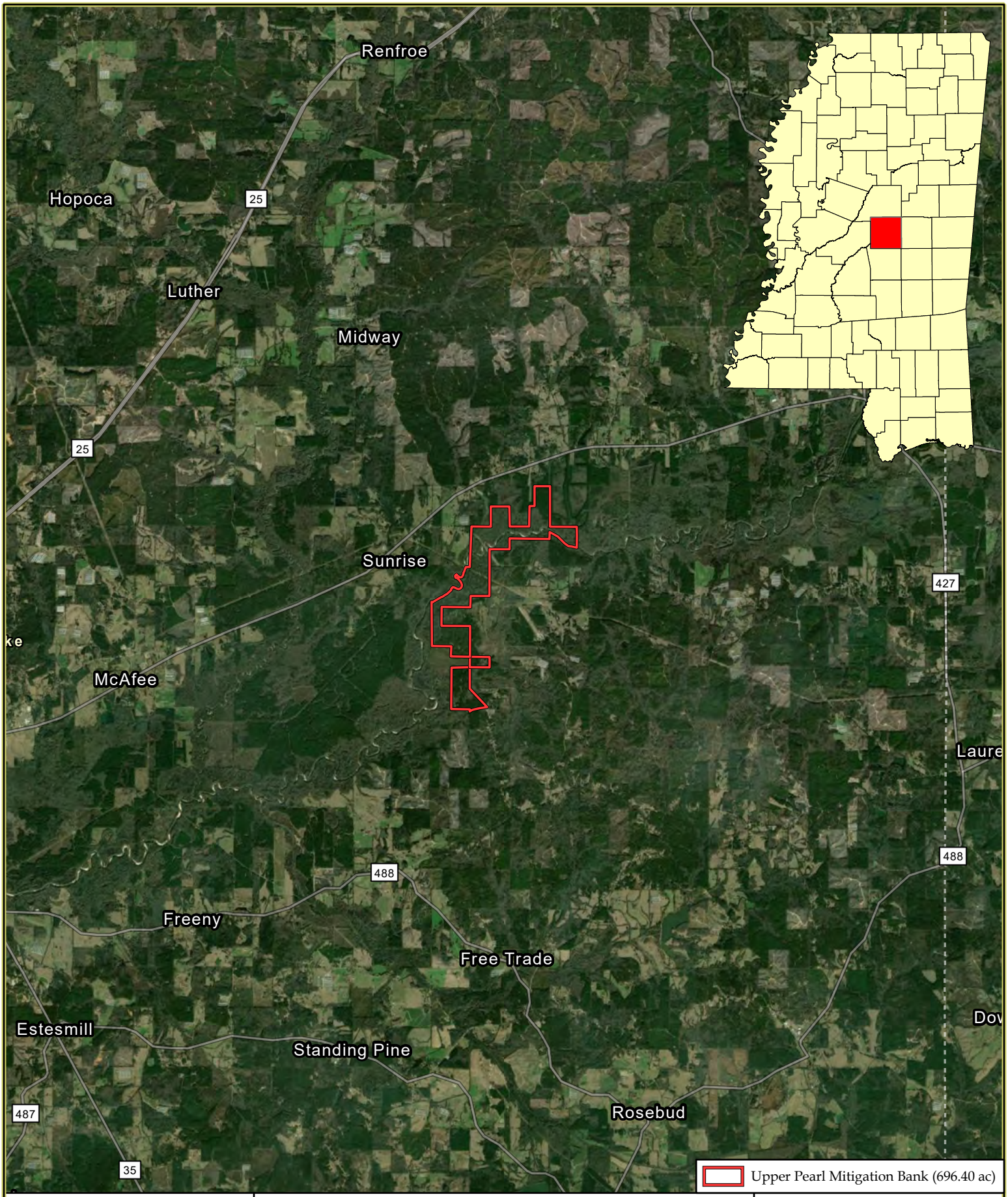
National Wetland Plant List, Version 3.2. U.S. Army Corps of Engineers, 2016.
http://wetland_plants.usace.army.mil/

The Natural Communities of Mississippi. Mississippi Department of Wildlife and Fisheries Mississippi Natural Heritage Program 2009.

http://www.wlf.Mississippi.gov/sites/default/files/pdf/page_wildlife/6776are%20Natural%20Communities/ LA_NAT_COM.pdf

http://law.justia.com/codes/mississippi/2015/title-51/chapter-3/article-1/section-51-3-7/

Figures



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Created by: JDL

Upper Pearl Mitigation Bank

Leake County, Mississippi

Figure 1 - Vicinity Map

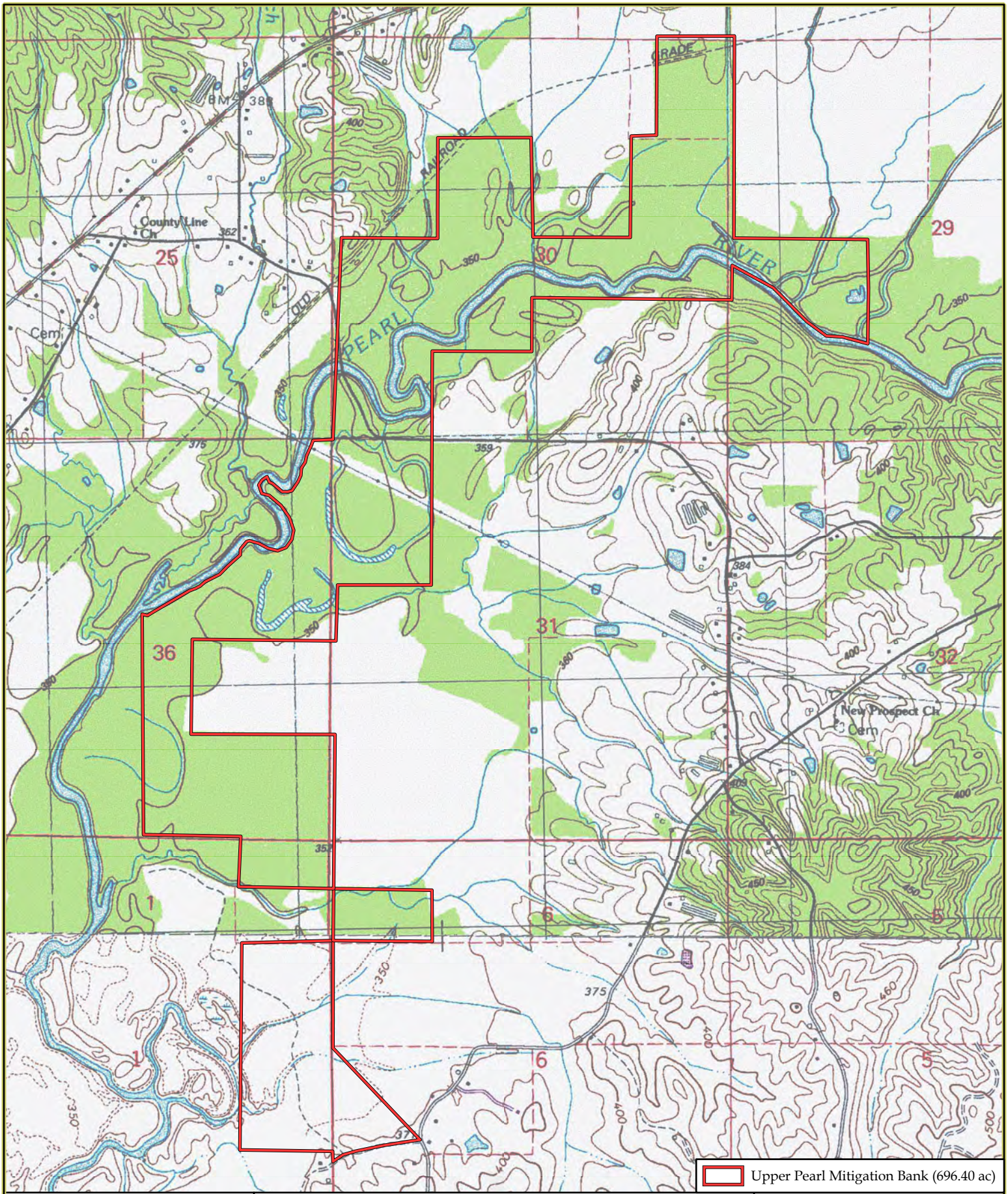
0 4,490 8,980 Feet

1:100,000

N

NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

ESRI World Imagery Basemap



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Upper Pearl Mitigation Bank

Leake County, Mississippi

Figure 2 - Site Location Map

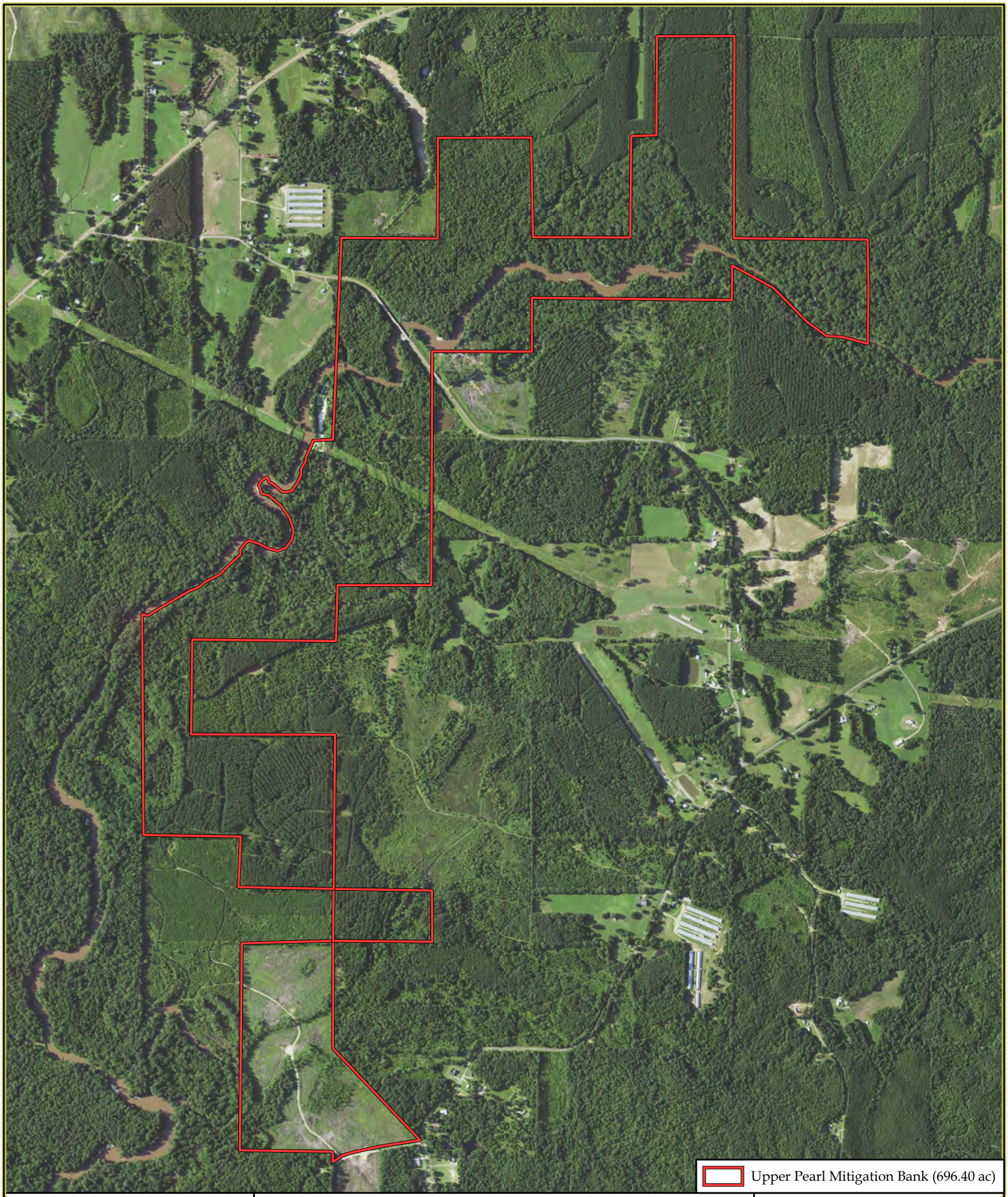
0 900 1,800 Feet

1:20,000

N

NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

USGS Mcafee/Renfroe(MS) Quad Basemap



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Upper Pearl Mitigation Bank

Leake County, Mississippi

Figure 2 - Site Location Map

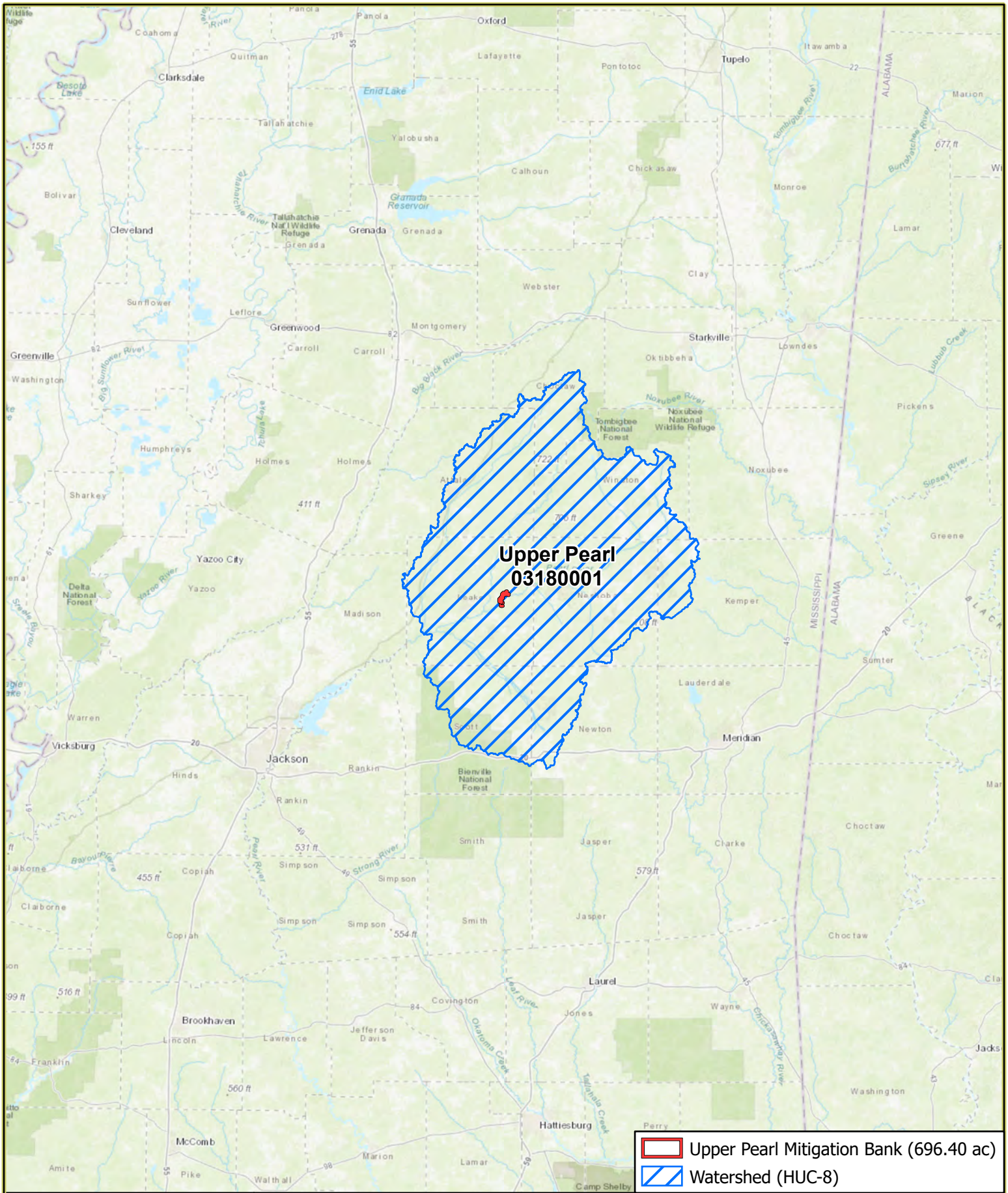
0 900 1,800 Feet

1:20,000

N

NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

USDA NAIP 2020 Imagery Basemap



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Leake County, Mississippi

Figure 4 - Watershed Location Map

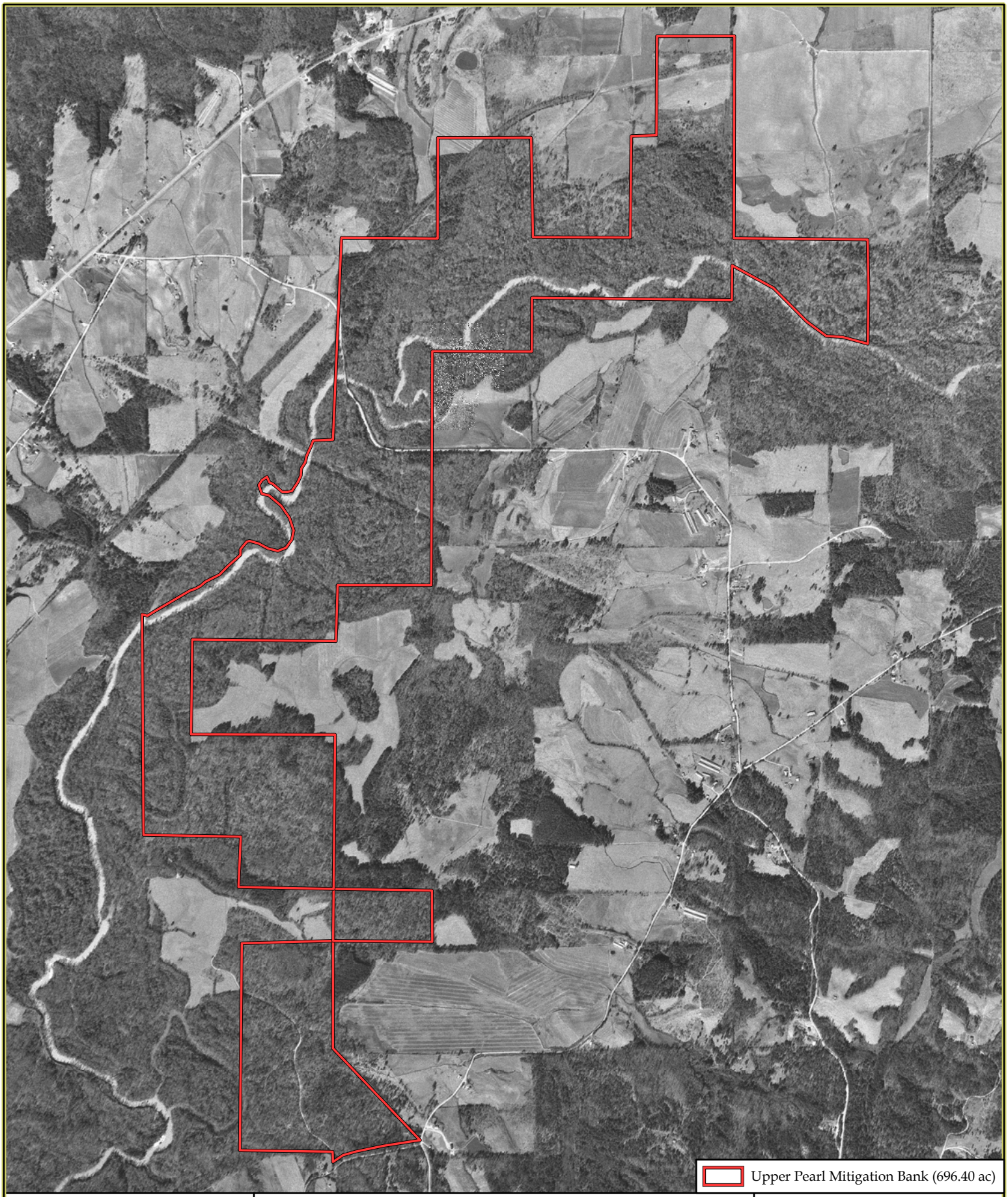
0 67,350 134,700 Feet

1:1,500,000

N

NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

ESRI Topographic Basemap



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Upper Pearl Mitigation Bank

Leake County, Mississippi

Figure 5 - Historical Imagery Site Location Map

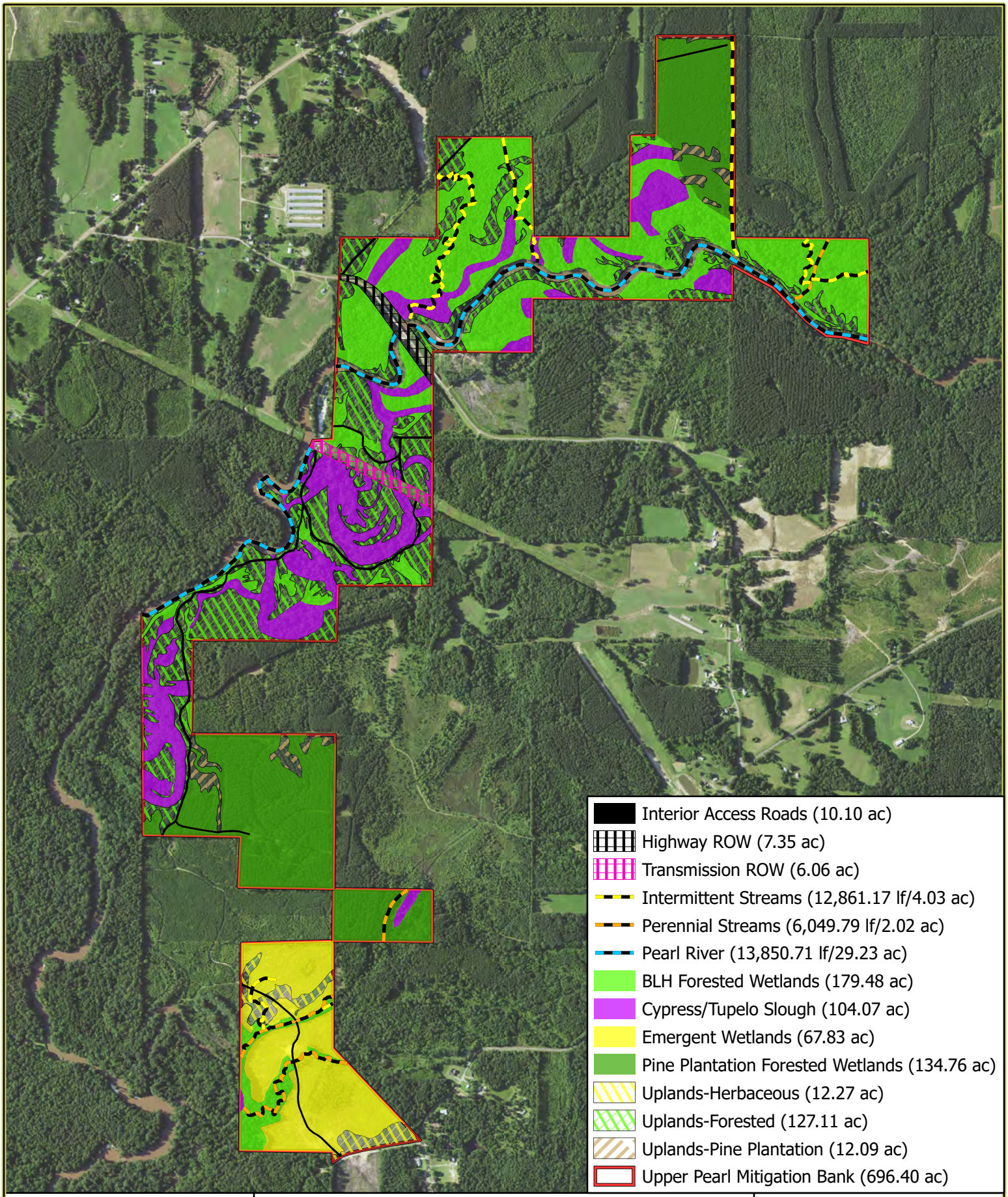
0 900 1,800 Feet

1:20,000

N

NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

1970 Aerial Photography



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Leake County, Mississippi

Figure 6 - Current Habitat Map

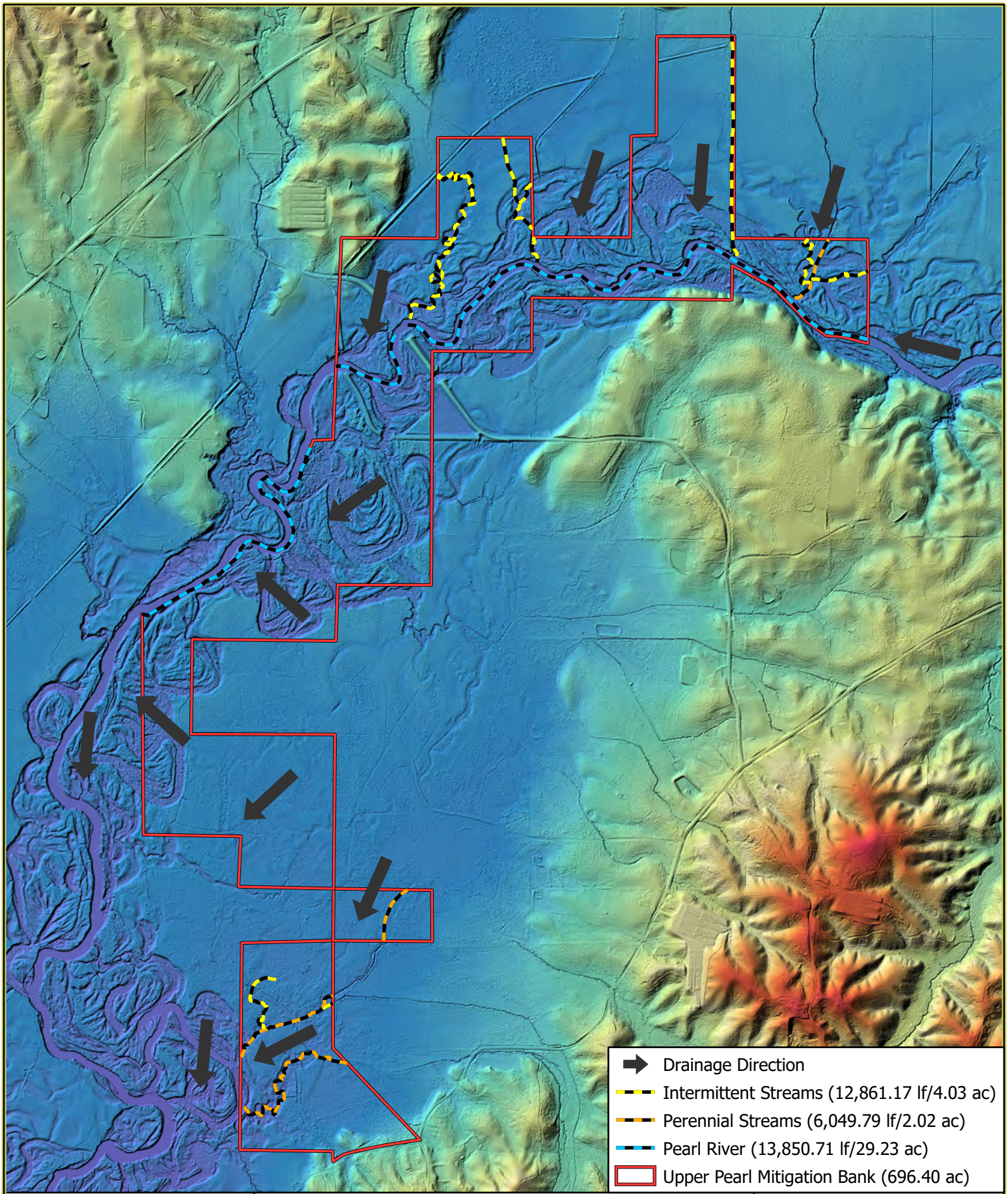
0 900 1,800 Feet

1:20,000

N

NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

USGS Mcafee/Renfroe(MS) Quad Basemap



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Leake County, Mississippi

Figure 7 - Current Hydrology Map

0 900 1,800 Feet
1:20,000

N

NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

USGS Mcafee/Renfroe(MS) Quad Basemap

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Figure 8 - Historical Hydrology Map

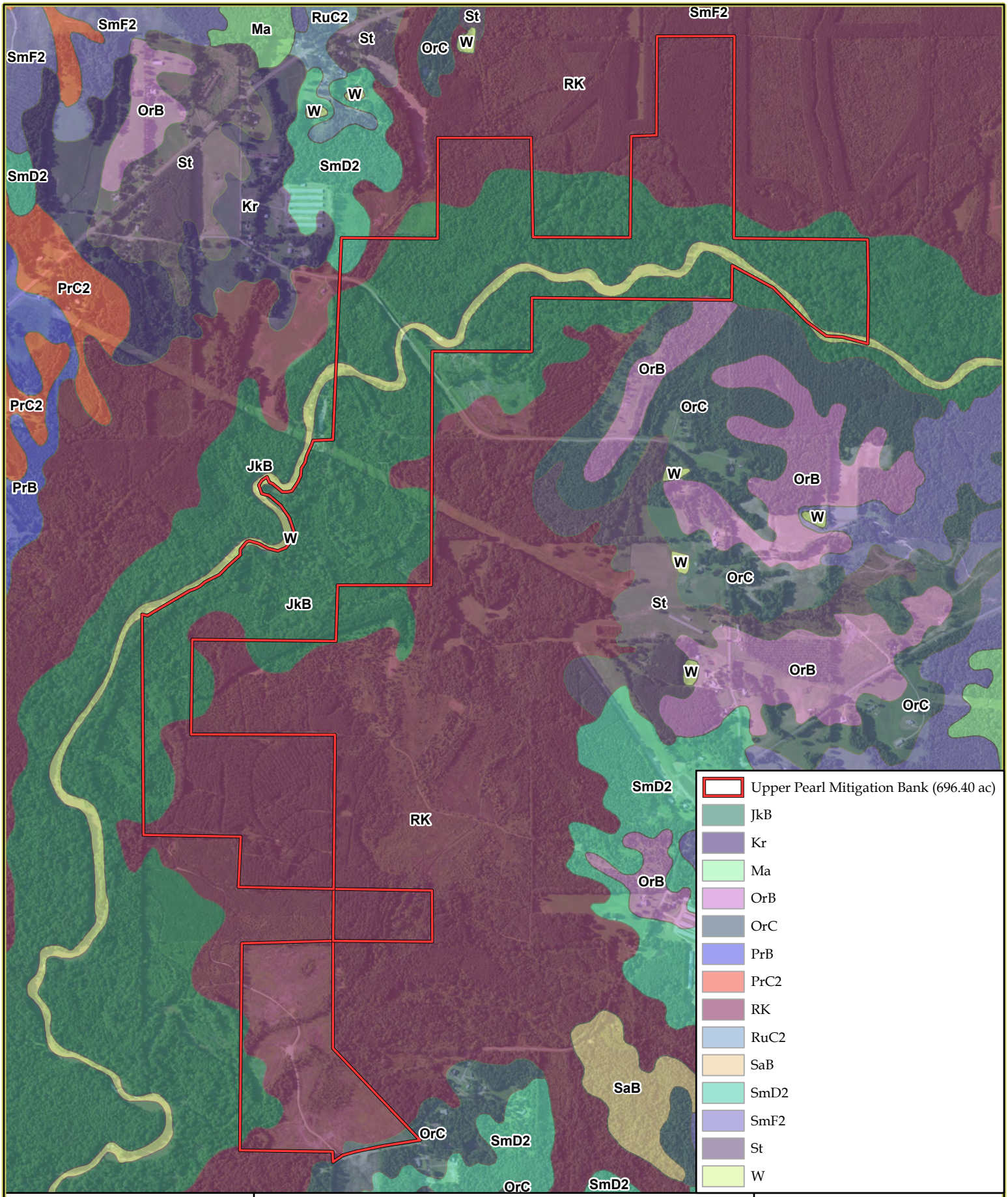
0 15,715 31,430 Feet

1:350,000

N

NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

USGS National Map Basemap



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Leake County, Mississippi

[Figure 9 - NRCS Soils Map]

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0 900 1,800 Feet
1:20,000

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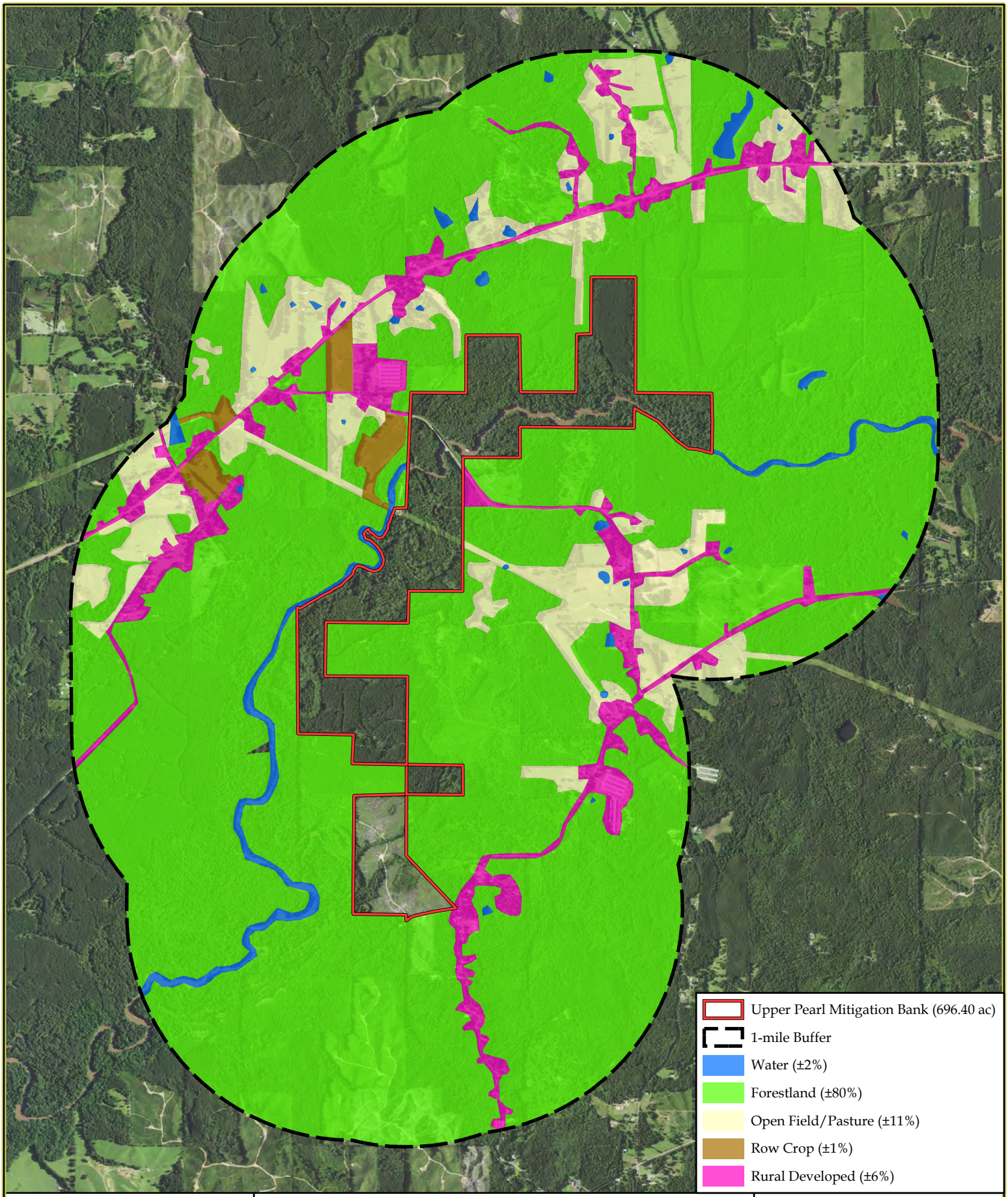
NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

USDA NAIP 2020 Imagery Basemap



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Leake County, Mississippi

Figure 10 - Surrounding Land Use Map

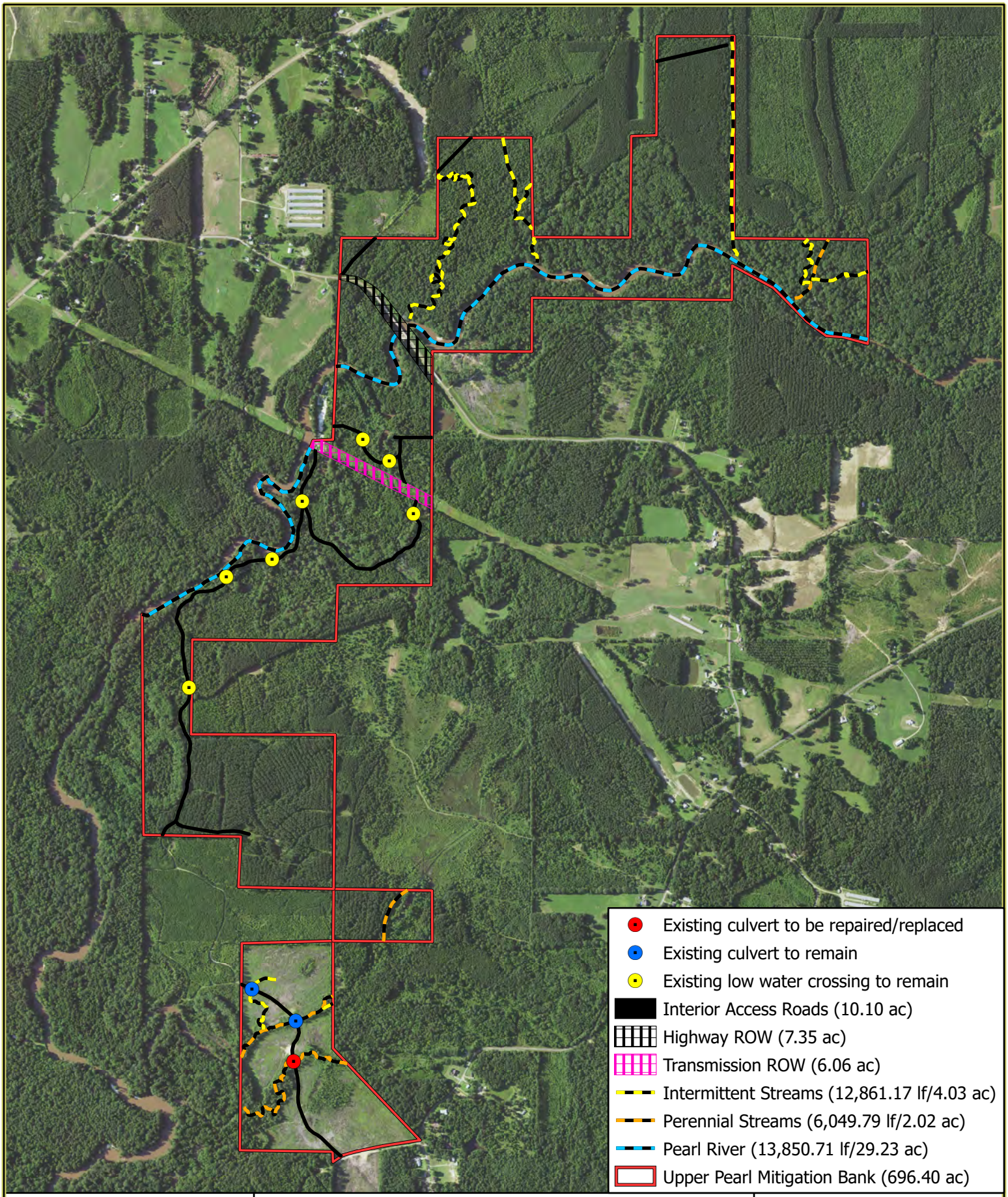
0 1,575 3,150 Feet

1:35,000

N

NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

USDA NAIP 2020 Imagery Basemap



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Leake County, Mississippi

Figure 11 - Hydrologic Work Plan Map

0 900 1,800 Feet
1:20,000

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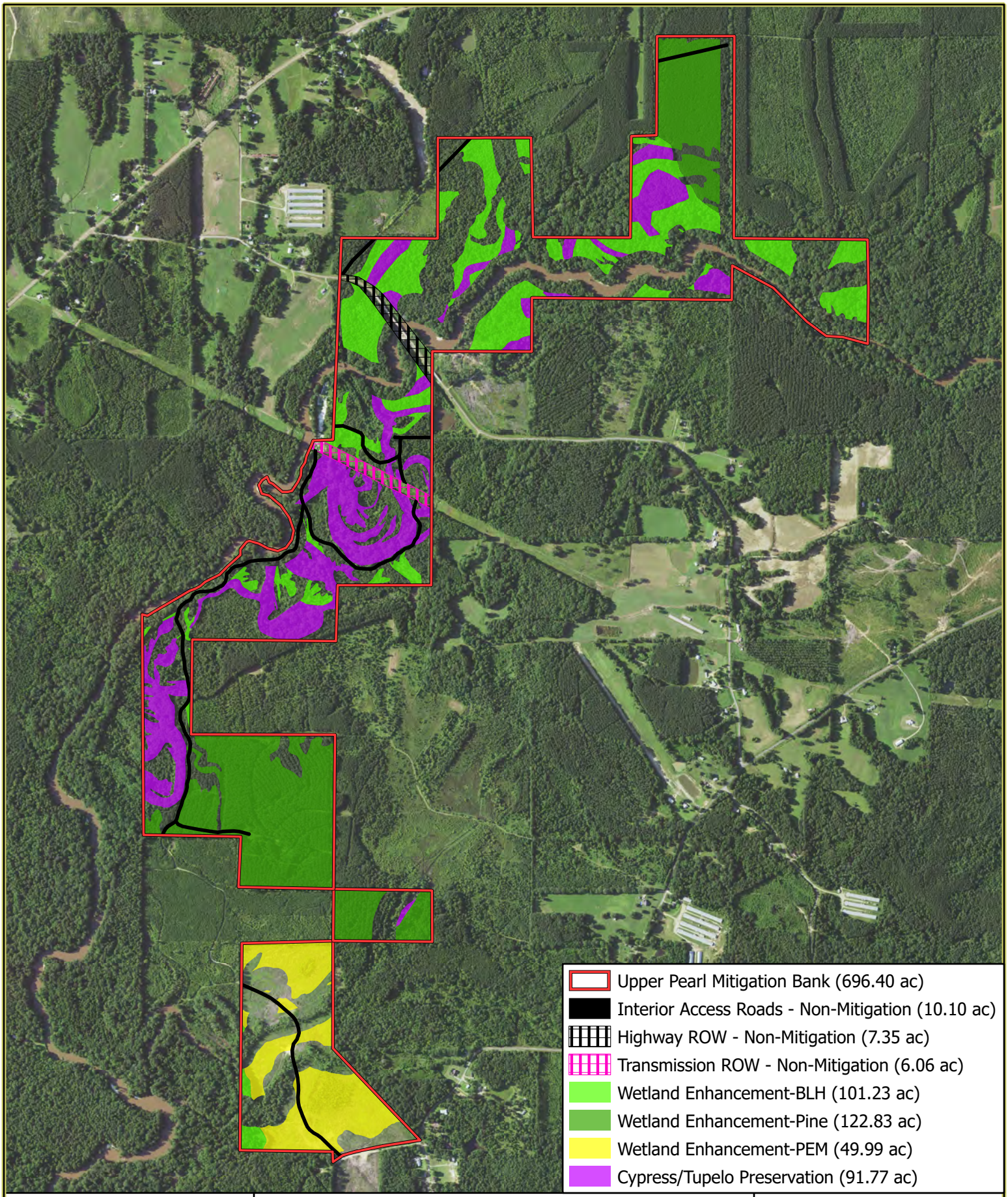
NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

USDA NAIP 2020 Imagery Basemap



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Leake County, Mississippi

Figure 12 - Wetland Mitigation Map

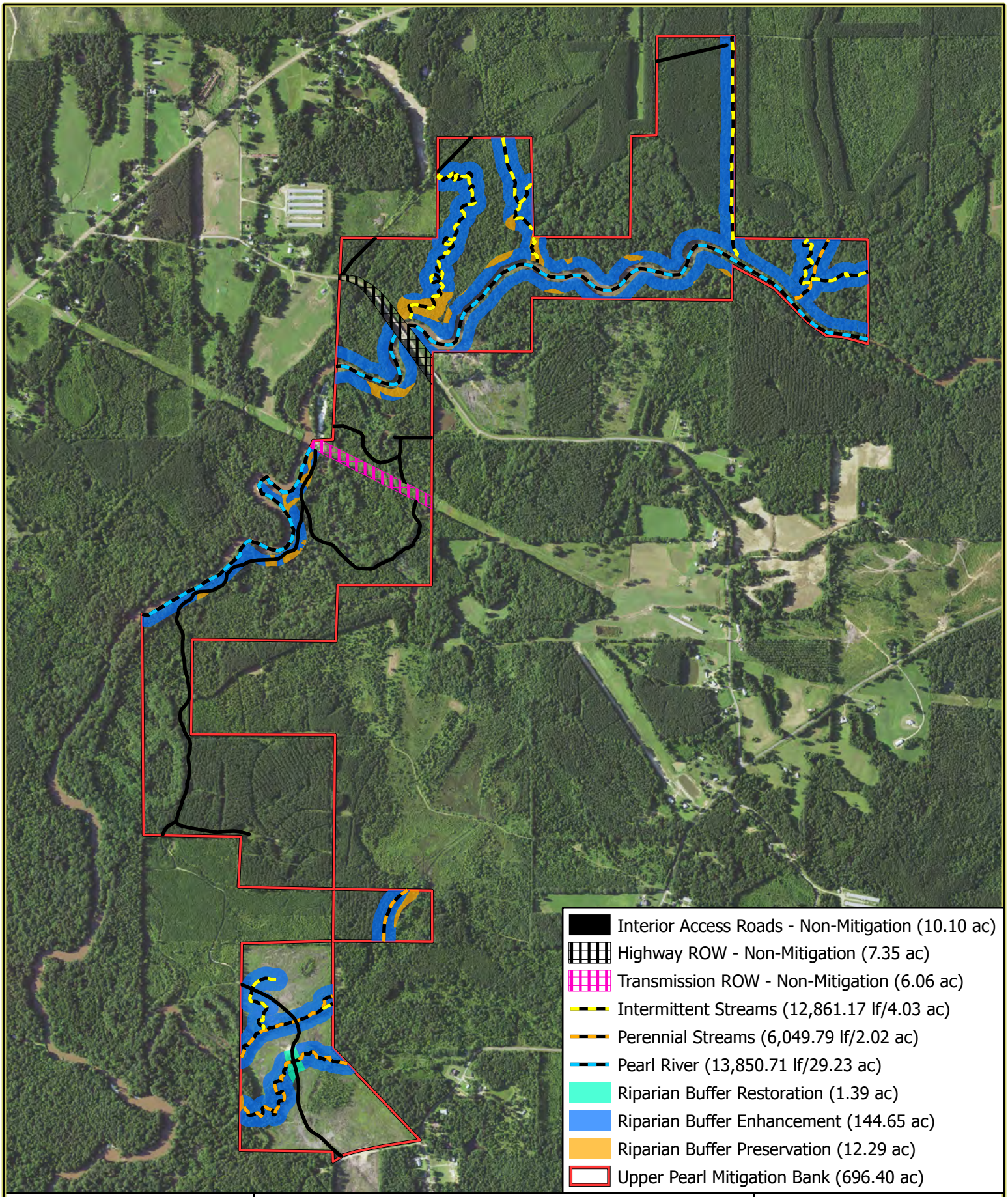
0 900 1,800 Feet

1:20,000

N

NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

USDA NAIP 2020 Imagery Basemap



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Leake County, Mississippi

Figure 13 - Stream Mitigation Map

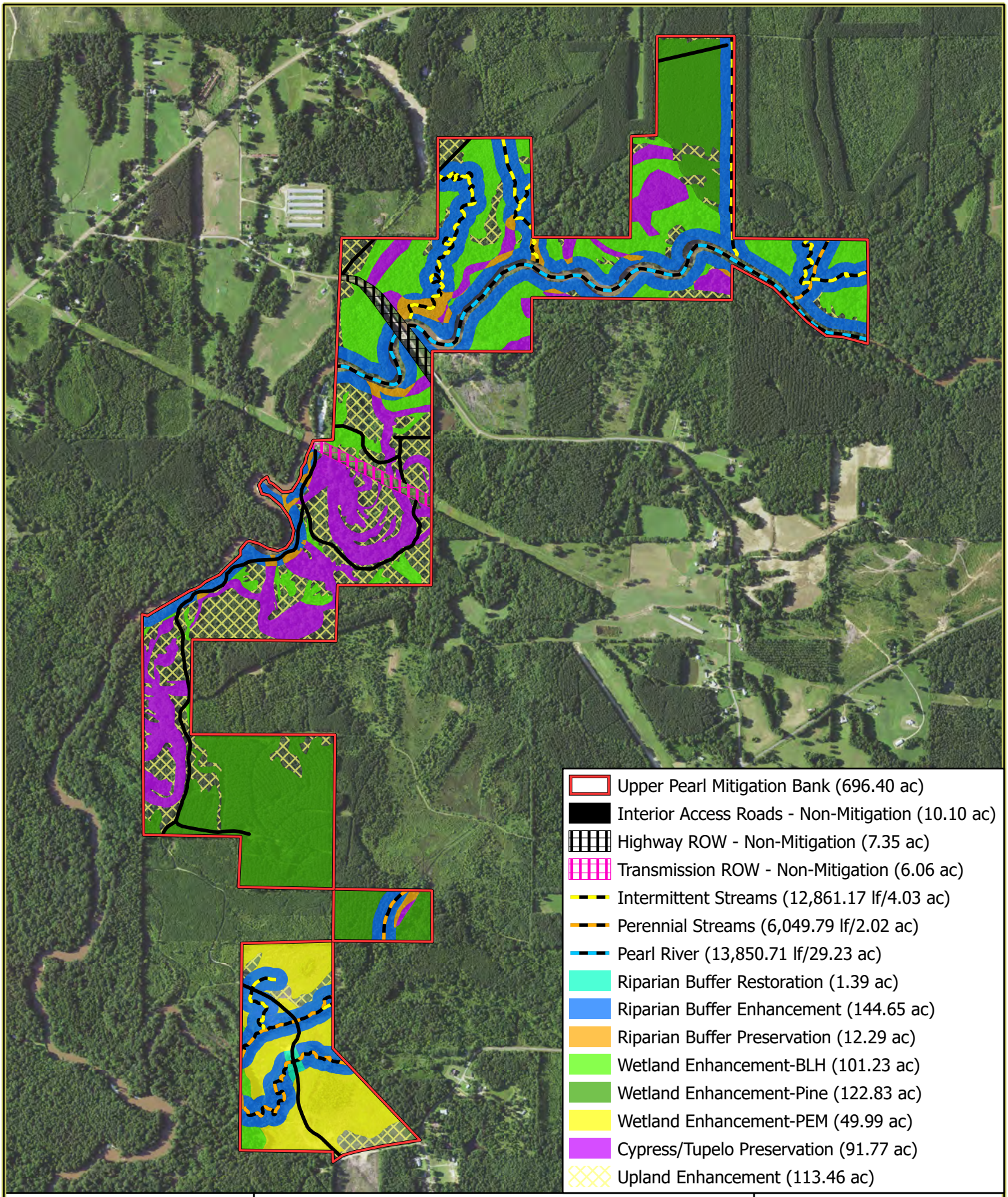
0 900 1,800 Feet

1:20,000

N

NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

USDA NAIP 2020 Imagery Basemap



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Leake County, Mississippi

Figure 14 - Proposed Mitigation Bank Map

0 900 1,800 Feet

1:20,000

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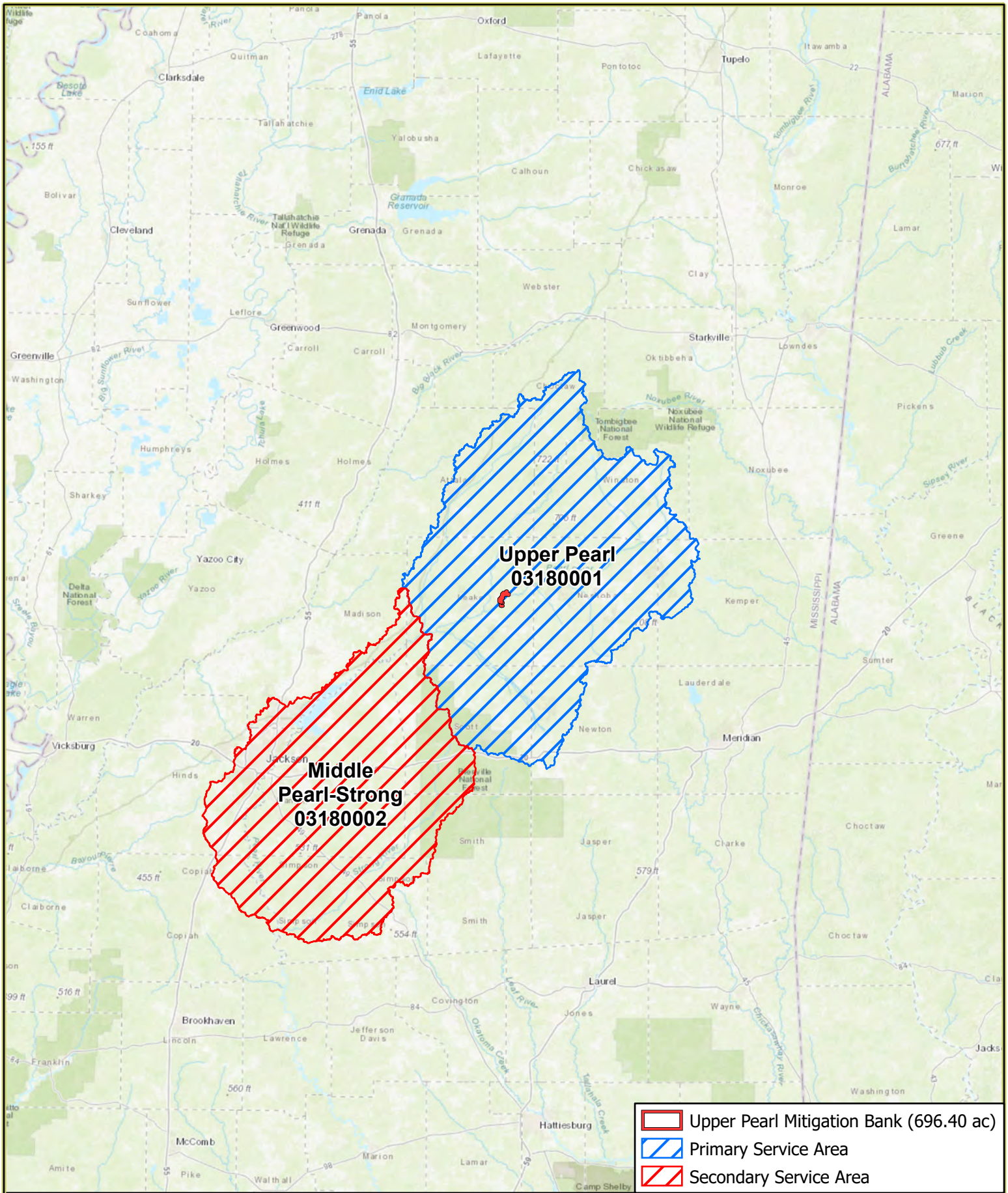
NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

USDA NAIP 2020 Imagery Basemap



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Leake County, Mississippi

Figure 15 - Service Area Map

0 67,350 134,700 Feet

1:1,500,000

N

NAD 1983 2011 StatePlane Mississippi East FIPS 2301 Ft US

ESRI Topographic Basemap

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