

APPENDIX E

LANDSCAPE MITIGATION PLAN

**PROJECT SOTER – LANDSCAPE MITIGATION PLAN
BERKELEY, DORCHESTER and
ORANGEBURG COUNTIES, SOUTH CAROLINA**

APPLICANT:

**BERKELEY COUNTY
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SUBMITTED TO:

U.S. Army Corps of Engineers, Charleston District (USACE)
South Carolina Department of Health and Environmental Control (SCDHEC)
South Carolina Department of Health and Environmental Control - Division of Ocean and
Coastal Resource Management (OCRM)
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U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS)
South Carolina Department of Natural Resources (SCDNR)
South Carolina Department of History and Archives State Historic Preservation Office (SCHPO)

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1. EXECUTIVE SUMMARY

Berkeley County Economic Development Authority is promoting a portion of the existing Camp Hall Commerce Park in Berkeley County to attract Project Soter, a major advanced manufacturing facility into South Carolina.

The Camp Hall Commerce Park (Camp Hall Site) is proposed for a singular large development known as Project Soter, which would include an initial investment of approximately \$1 billion with a projected labor force of up to 4,000 workers within 10 years of start of production. The potential development of the Camp Hall Site would provide a significant positive economic impact on Berkeley County, the Greater Charleston Area, and the State of South Carolina. The proposed development will impact a total of 192.86 acres of jurisdictional wetlands, 23.14 acres of non-jurisdictional isolated wetlands, and 1.85 acres of Relatively Permanent Waters (RPWs) on the Camp Hall Site.

In the absence of suitable existing wetland mitigation bank credits or an in-lieu fee program for the watershed, all required compensatory mitigation will be obtained through off-site landscape scale permittee-responsible mitigation activities utilizing the watershed approach. The Project Soter-Landscape Mitigation Plan was designed to achieve a landscape scale conservation outcome based on the priorities of both local and regional environmental advocacy groups and the Federal and State regulatory and resource agencies.

Located with the same watershed as the Camp Hall Site is 16,000 acre The Francis Beidler Forest (RAMSAR site no. 1773); one of only two RAMSAR sites in South Carolina, 37 sites in the United States, and 2,000 sites globally which have been designated by the RAMSAR Convention as “Wetlands of International Importance”. Therefore the overall goal of the watershed approach was to enhance and improve the protection of this critical national and global resource. The National Audubon Society oversees the Francis Beidler Forest, and based on its guidance two key tributaries, Dean Swamp and Walnut Branch, were defined as the top priority areas for immediate conservation.

Berkeley County, the Lord Berkeley Conservation Trust and the South Carolina Department of Natural Resources communicated the importance to consider the needs of the local community as an important aspect of a landscape mitigation approach. This included both the availability of public lands for recreation and the support and protection of rural lifestyles.

The regional conservation advocacy groups, specifically the Coastal Conservation League and the Low Country Open Land Trust, communicated the importance of creating a greenbelt of conserved lands around Charleston (the “Greenbelt”). The gap in protected lands between the Francis Beidler Forest and the Santee River Corridor was identified as an important area for conservation efforts. Based on this guidance, the Mitigation Plan focused selecting properties for inclusion in the Greenbelt gap between the Francis Beidler Forest and the Santee River Corridor.

Based on the guidance of these and other key stakeholders, and to meet the requirements of an acceptable mitigation plan as defined by the federal regulatory agencies, the proposed Project Soter – Landscape Mitigation Plan (Mitigation Project) was designed to include the following key components:

1. The Project Soter – Landscape Mitigation Plan will preserve and enhance approximately 1,533 acres of wetlands within approximately 2,496 acres of property to be permanently protected in the Dean Swamp and Walnut Branch watersheds, tributaries of Four Hole Swamp defined as critical priority areas needing protection by the National Audubon Society.

2. The featured landscape mitigation parcel, the Bannister Tract, is an approximately 1,667 acre forested tract on Sandy Run Creek (a component of the Dean Swamp sub-watershed). This tract has extensive bottomland hardwoods and pine flatwoods wetlands which are currently under intensive silviculture management that will be returned to natural condition through enhancement and restoration activities as described in this mitigation plan. This tract will be purchased and conveyed to the SCDNR for use as a wetland demonstration site and for use as a public access wildlife management area with the intent of designating the property as a SC Heritage Trust Preserve.
3. The Bannister Tract, Singletary Tract, and Dean Swamp Tract constitute approximately 2,160 acres of conserved land in the Greenbelt gap between The Francis Beidler Forest and the Santee River Corridor.
4. As a special condition of the permit and to fully satisfy the parameters of this Landscape Scale Mitigation Plan, the Applicant proposes to provide \$1.5 million (herein after, “Fund”) into an escrow account to be held by Lord Berkeley Conservation Trust. The funds are to be used for fee simple conservation property acquisition or to support conservation easements on important conservation properties. The conservation projects chosen for the Fund will be administered by the representatives of the following organizations: Audubon, Lord Berkley Land Trust, and the Low Country Open Land Trust (collectively, the “Fund Oversight Committee”).

The priority of use for the Funds will be for conservation projects such as follows:

1. Along Dean Swamp and its tributaries to provide connectivity between the Bannister Tract and Francis Beidler Forest;
2. Within the Four Hole Swamp watershed;
3. Upper Berkeley County; and
4. Projects of regional significance in the Greater Charleston Area.

The Fund Oversight Committee will approve these conservation projects to acquire additional parcels or easements that have not yet been identified, but that are an integral part of the overall Mitigation Project to mitigate impacts occurring on the Camp Hall Site as a result of the proposed project. Approval of conservation projects within Four Hole Swamp will require a majority vote of the Fund Oversight Committee; conservation projects outside of Four Hole Swamp watershed will require unanimous approval.

Finally, the Mitigation Project satisfies the USACE requirements under the 2010 USACE-Charleston District Compensatory Mitigation Guidelines (2010 Draft Compensatory Mitigation Guidelines) and includes the twelve components required by the 2008 United States Environmental Protection Agency (EPA) and Department of the Army, United States Army Corps of Engineers (USACE) 33 C.F.R. Parts 325 and 332 & 40 C.F.R. Part 230 (Mitigation Rule). Proposed mitigation activities are not anticipated to adversely impact protected species or cultural resources. The Permittee Responsible Mitigation Plan (PRMP), presented in Appendix E, includes specific goals and objectives for water resource mitigation, as well as site selection factors, site protection, baseline conditions of the mitigation and reference sites, mitigation work plan, maintenance plan, performance standards, monitoring requirements, long term management plans, adaptive management provisions, and financial assurances for its success.

In conclusion, the Mitigation Project is designed to achieve a meaningful landscape conservation outcome based on the guidance of the local and regional environmental groups and also satisfy the requirements of the State and Federal resource agencies.

2. PROJECT DESCRIPTION

The Project Soter – Landscape Mitigation Plan (hereinafter “Mitigation Project”) includes approximately 2,496 acres of proposed conservation easement areas located in Orangeburg, Berkeley, and Dorchester Counties, South Carolina. The Mitigation Project site is made up of private land holdings located along Sandy Run, Dean Swamp, and Walnut Branch, all of which are tributaries to Four Hole Swamp. This Mitigation Project is intended to provide mitigation for jurisdictional impacts to waters of the U.S. associated with the development of the Camp Hall Site. The mitigation area is within the same United States Geologic Survey (USGS) 8-digit Hydrologic Unit Code (HUC) 03050205 of the Four Hole Swamp watershed and is wholly located within the Middle Atlantic Coastal Plain EPA Level III Ecoregion (N 33.332°, W 80.300°; Figure 1 in Appendix A). The proposed Mitigation Project site provides the opportunity to protect a large contiguous acreage of wetlands and headwater tributaries that will further advance the efforts of the National Audubon Society and the Greenbelt - Ace Basin Conservation programs within the Four Hole Swamp watershed and provide desirable continuity to previously conserved lands as well as enhance and protect this RAMSAR resource of global significance.

The Mitigation Project area consists of bottomland hardwood, isolated ponds, and pine flatwoods wetlands along Tributaries to Four Hole Swamp including Walnut Branch, Sandy Run, and Dean Swamp tributaries. The mitigation plan will include wetland preservation, enhancement, and restoration of approximately 1,533 acres of wetlands and preservation of approximately 47,932 linear feet of streams within the 2,496 acre Mitigation Project.

The Permittee Responsible Mitigation Plan (PRMP) contained within the following pages is based upon the best information available at this time and all prescriptions and quantities provided herein for stream and wetland features are subject to change following USACE verification. Comments from the USACE, SCDHEC and resource agencies and the commenting public will be addressed in order to finalize this mitigation plan. Once all comments have been received and addressed, a Final Mitigation Plan will be prepared for approval. The Final Permittee Responsible Mitigation Plan (FPRMP) will include additional data and information to further support these proposed mitigation activities.

3. AVAILABLE MITIGATION

The anticipated Section 404 Individual Permit for the development of the Camp Hall site within the Four Hole Swamp watershed (HUC 03050205) near Ridgeville, Berkeley County, South Carolina requires mitigation for impacts to 192.86 acres of jurisdictional wetlands, 23.14 acres of non-jurisdictional isolated wetlands, and 1.85 acres of RPWs.

Since this large-scale mitigation effort cannot be addressed with existing mitigation banks or a single mitigation site, a landscape scale mitigation plan with multiple permittee-responsible mitigation sites are proposed to meet the required compensatory wetland mitigation requirement. The Applicant has prepared this PRMP to satisfy the proposed impacts to jurisdictional waters of the U.S.

This PRMP includes the Mitigation Project sites which is comprised of the Bannister Tract, Singletary Tract, Dean Swamp Tract, and the Walnut Branch Tracts and is intended to provide complete mitigation for jurisdictional impacts to waters of the U.S. associated with the development of the Camp Hall Site. All wetland and stream acreages are estimates in this PRMP and are subject to change, pending review/comments by the regulatory agencies.

A summary of the jurisdictional waters of the U.S. proposed for mitigation is provided below in Table 1.

Table 1. Summary of Wetland and Stream Mitigation

Project Soter - Landscape Mitigation Plan					
Mitigation Work Plan	Tract Acreage	Wetland Preservation Acreage	Wetland Enhancement Acreage	Wetland Restoration Acreage	Stream Preservation Linear Feet
Bannister Tract	1,667	431	249	203	28,857
Singletary Tract	112	100	0	0	6,402
Dean Swamp Tract	380	94	27	132	4,480
Walnut Branch Tracts	337	265	0	0	8,193
Total	2,496	890	276	335	47,932

¹The wetland acreages shown above illustrates the wetlands that are available for potential wetland mitigation. Wetlands located within forestry access roads and utility easement rights-of-way were not included in this assessment. In total the Mitigation Project proposes to protect approximately 1,533 acres of wetlands and approximately 9 miles of stream.

4. WATERSHED APPROACH

4.1. 8-DIGIT HUC FOUR HOLE SWAMP

The proposed mitigation site is within the Four Hole Swamp watershed (8-digit HUC 03050205). Four Hole Swamp originates in Calhoun County in the Atlantic Southern Loam Plains of South Carolina and drains approximately 653 square miles (418,000 acres) flowing generally from NW to SE through Orangeburg, Dorchester and Berkeley Counties. Just west of Ridgeville it abruptly turns SW and flows on through Dorchester County to its confluence with the Edisto River, just upstream from Givhans Ferry State Park (USACE 2000). Four Hole Swamp is a low gradient, black water, swamp-stream floodplain system that is separated by a low divide from the Congaree River Valley before joining the Edisto River to complete its journey to the Atlantic Ocean (NRCS 2010). Thus Four Hole Swamp is different from the usual river bottom swamp. This swamp-stream floodplain system is fed largely by springs and runoff from surrounding higher areas; significant tributaries to Four Hole Swamp include Cowcastle Creek and Dean Swamp (NRCS 2010). No major unbroken channel occupies the floodplain, yet swamp water moves slowly and relentlessly seaward through a network of waterways (NRCS 2010).

Through most of Four Hole Swamp's 62 mile length, the swamp's floodplain is about 1 ½ miles wide and woven with numerous braided channels (USACE 2000). The swamp is contained variously within gentle slopes and steep bluffs, with some bluffs being almost vertical and up to thirty feet in height. On and at the bases of some of these bluffs, some of which have exposed limestone outcrops, are some of the more unusual plants. Frequent clear, cool springs emerge from the bases of these bluffs. These attractive springs and seeps support numerous amphibians (USACE 2000).

The Four Hole Swamp watershed drains two EPA Level III Ecoregions from Calhoun County towards the South Carolina coast: Southeastern Plains and Middle Atlantic Coastal Plain. The upper reaches of the river's watershed covers the fertile Southeastern Plain (65) and, in the lower reaches where the proposed site is located, the predominant ecoregion is the Middle Atlantic Coastal Plain (63) (NRCS 2010). The Southeastern Plains can be described as irregular with broad inter-stream areas with a mosaic of cropland, pasture, woodland, and forest. The Middle Atlantic Coastal consists of low elevation, flat plains, with many swamps, marshes, and estuaries (NRCS 2010).

The watershed is comprised of mostly rural land cover, with less than 7 percent of the area being classified as "developed" according to the 2011 National Land Cover Dataset (NLCD 2015). The largest developed area in the Four Hole Swamp watershed includes the Town of Orangeburg which lies to the upper northwest portion of the watershed. Other small municipalities in the watershed including Cameron, Bowman, Santee, Eutawville, Holly Hill, and Harleyville make up other developed areas in the Four Hole Swamp watershed.

The rest of the land cover is divided relatively evenly between forested (34 percent), agricultural (30 percent), and woody/emergent wetlands (29 percent). "Evergreen Forest" makes up 18 percent of the non-wetland forest cover, mostly in the southern portion in the lower coastal plain of the watershed, which is characterized as the Middle Atlantic Coastal Plains EPA Level III Ecoregion (NLCD 2015). The concentration of agricultural lands is quite predominant throughout the watershed, especially in the northwest portion of the watershed while in the lower segment forestry tends to dominate. The majority of farmland in the watershed is devoted to field and forage crops (NLCD 2015, NRCS 2010). The high percentage of wetland land cover reflects the extensive floodplains of the Four Hole Swamp and its coastal plain tributaries.

The basin is an important area for conservation of coastal plain swamp-stream ecosystems. The proposed Mitigation Project site(s) are focused in the Dean Swamp watershed, a smaller tributary of Four Hole Swamp, but falls in-line with the existing overall conservation efforts to protect the Four Hole Swamp watershed. Within the Four Hole Swamp watershed, the National Audubon Society (Audubon), in conjunction with the Nature Conservancy, owns and protects the Francis Beidler Forest. Beidler Forest sits within the Four Holes Swamp, a 45,000-acre matrix of black water sloughs and lakes, shallow bottomland hardwoods, and deep bald cypress and tupelo gum flats (Audubon 2015). Four Holes Swamp is also a major tributary of the Edisto River, part of the Charleston area's famous ACE basin. Francis Beidler, a lumberman with good conservation instincts, bought part of the swamp as a business investment in the 1890s. Later generations of lumbermen cut much of the forest over the years, though Beidler's family helped preserve 1,800 acres of old-growth bald cypress and tupelo gum. By the late 1960s conservationists realized that further cutting would shrink the swamp to insignificance. The National Audubon Society (Audubon), working with The Nature Conservancy, raised \$1.5 million to buy the property at the heart of the swamp, and Audubon took over managing 3,415 acres (Graham 2011). Over 16,000 of the Four Hole Swamp and upland acres are owned by Audubon, buffered by 6,000 more acres under private conservation easements, and make up what is known as the Francis Beidler Forest (Audubon 2015, LOLT 2011).

Francis Beidler Forest is a protected swamp forest along a broad, flat-bottomed alluvial valley within the Four Holes Swamp watershed, constituting the largest remaining virgin stand of bald cypress and tupelo gum trees in the world and is also designated as a National Natural Landmark. More than 300 vertebrates and 300 plants depend upon the site for survival, and a number of threatened and/or vulnerable species are present, such as the International Union for Conservation of Nature and Natural Resources (IUCN) Red Listed Flatwoods Salamander (*Ambystoma cingulatum*) and several bat and snake species; threatened flora include Southern Twayblade (*Listera australis*), Green-fly Orchid (*Epidendrum magnoliae*), and Shadow-witch Orchid (*Ponthieva racemosa*). Some 140 species of birds are supported and the site has been designated a Bird Life Important Bird Area (IBA). The forest is principally owned by Audubon, with a parcel owned by The Nature Conservancy and a small parcel belonging to a private landowner, and a model management (and expansion) plan is being implemented. The site is used by bird- and nature-enthusiasts and students, as well as fishers and deer- and hog-hunters in some parts, and low-density farming and grazing occurs in the surrounding area. A principal hydrological role of the site is the improvement and maintenance of water quality of the waters flowing through it, but high levels of mercury have been found in the fish. Logging, farm run-off, and urban sprawl from Charleston are seen as potential threats from outside the site. The visitors' center offers a full range of environmental education programs. The Francis Beidler Forest (RAMSAR site no. 1773) is one of only two sites in South Carolina, 37 sites in the United States, and 2,000 sites globally which have been designated by the RAMSAR Convention as "Wetlands of International Importance". The other RAMSAR Site in South Carolina is the Congaree National Park located in the Midlands outside Columbia, SC. The Francis Beidler Forest is located in the same watershed as the proposed wetland impacts (LOLT 2011, RAMSAR).

It is the mission of the Francis Beidler Forest to maintain and/or enhance functional integrity of Four Hole Swamp and its watershed, and leverage that success to aid in the protection of the Edisto River Basin, of which Four Hole Swamp is a part (USACE 2000). "There is a definitive need for development of alternative compensatory mitigation options in this Service Area" (USACE 2000). Hence, incremental ecological improvement of the Four Hole Swamp watershed is offered via the proposed mitigation sites in critical conservation areas that are located adjacent and connected to the Francis Beidler Forest conservation tracts. The Bannister Tract is anticipated to be transferred to SCDNR, which will act as the long-term steward for the property, along with a number of other conservation easements along Sandy Run and Dean Swamp to create an anchor for future conservation efforts in connection with Audubon's conserved lands with the Beidler Forest. Of the total acreage being protected, 1,667 acres (Bannister Tract) will be donated to SCDNR with the intent to be dedicated as a SC Heritage Trust Preserve, which

will provide permanent access and recreational use for the local community members. The other mitigation tracts downstream of the Bannister Tract on Dean Swamp and Walnut Branch will be placed under a conservation easement to be held by one of the Land Trusts actively engaged in the Four Hole Swamp watershed. Figure 2a in Appendix A illustrates the proximity of the Mitigation Project with previously conserved lands.

The Four Hole Swamp watershed is also situated adjacent to the “Charleston Greenbelt” corridor which consists of protected and productive open lands surrounding Lowcountry cities. This “Charleston Greenbelt” concept was developed by the Lowcountry Open Land Trust (LOLT) with a mission to preserve wildlife habitats, outstanding natural areas, and sites of unique ecological significance, historical sites, forestlands, farmlands, watershed, open space and urban parks. LOLT is also a major partner with Audubon, and holds a majority of the conservation easements in the Four Hole Swamp watershed. The proposed mitigation sites fall within the Charleston Greenbelt initiative area and propose expansion of the current efforts by conservation groups within the Four Hole Swamp watershed with the acquisition of key tracts within the Dean Swamp watershed and Walnut Branch watershed which will intern support healthy ecosystems and abundant wildlife in the area, a chief goal of the LOLT. Figure 2 in Appendix A illustrates the proximity of the proposed Mitigation Project and the “Charleston Greenbelt”.

As mentioned previously, Four Hole Swamp comprises one-third of the Edisto River’s water flow. The Edisto in turn supplies 60 percent of the Ashepoo, Combahee, and Edisto (ACE) Basin’s freshwater supply (LOLT 2011). The ACE Basin is one of the largest undeveloped wetland ecosystems remaining along the Atlantic Coast and is recognized as a system supporting numerous high quality wetland plant communities and highly intact, extensive riparian habitats. It has been identified as a unique coastal ecosystem of national and regional significance under the National Wetlands Priority Conservation Plan (LOLT 2015, NWACC 2010). Today, 208,000 acres out of the 350,000-acre basin are now conserved (LOLT 2011). As a result, working ‘upstream’ within the Four Hole Swamp watershed can provide ecological benefits for the status of the ACE Basin downstream.

Many conservation programs within the Lowcountry are striving for the same goals of protecting and preserving the vital resources these coastal plain swamp-stream ecosystems provide. Other programs within the area include The Nature Conservancy, ACE Basin, Lord Berkeley Conservation Trust, Coastal Conservation League, U.S. Forest Service, U.S. Fish and Wildlife Service (FWS), the SC Department of Health and Environmental Control, Natural Resource Conservation Service (NRCS), and Ducks Unlimited, just to name a few.

4.1.1. Water Quality

4.1.1.1. Historical Changes of Aquatic Resources in Watershed

Historical changes in land cover from 1992 to 2011 were analyzed for the Four Hole Swamp watershed using the National Land Cover Database data and is illustrated on Figure 3 in Appendix A. During this 19 year time period, the developed areas increased slightly from 2 to 6 percent for the basin. Developed areas in the basin are noted in the SC DHEC 2007 report as low growth potential areas. Other land cover classes have remained generally the same over this period, with a slight decrease in forested land cover (9 percent of watershed). This fluctuation in forest cover could reflect slight urban growth and cycles of timber harvesting, as the number of “shrub/scrub” acres increased over the decade. This suggests that timber was harvested and the plots are beginning to regenerate over this time period.

Though substantial land cover changes have not occurred in the past 19 years, the region’s aquatic resources have been historically impacted. Between the 1780s and the 1980s, South Carolina lost 27 percent of its wetlands of all types (Dahl 1990). South Carolina is in the top six states for the most extensive wetlands losses in the United States since the 1970s (Mitsch and Gosselink 1993). Historically in the coastal plain, many hydrologic features were altered for agricultural development, and agricultural

land uses are very predominant within the Four Hole Swamp watershed. Rice was introduced into the region in the late seventeenth century and by 1720 accounted for half of South Carolina's economy. Initially, rice was produced inland, grown in swamps that were irrigated by fresh water streams (Berkeley County 1989). Planters bought thousands of acres in the bottomland hardwood forest areas for rice plantations (Upchurch, n.d.). This system employed a series of dams, dikes, and trunks with which to control water flow in and out of the fields as well as large reservoirs, called reserves, in which the fresh water was accumulated (Berkeley County 1989). These types of hydrologic modifications are evident when viewing GIS data such as the National Hydrography Dataset, which distinguishes man-made hydrographic features (e.g. ditches) from streams, and LiDAR data in the basin, which helps visualize hydrologic features in elevation. As many of these features were associated with agriculture, these areas were also affected by conversion from forest to farmland (US EPA 2012).

Bottomland hardwood forest in the US has substantially decreased in the past century. A 1988 report from the National Wetlands Research Center of the US Fish and Wildlife Service states that over 80 percent of the Southeast's original freshwater forested wetlands had been lost (Haynes, Allen and Pendleton 1988), including many acres of bottomland hardwood forests. Virgin cypress swamps were an important source of timber for early settlers and by the late 1930's, virgin cypress was extremely scarce (USFS 1998). Protection and restoration of these ecosystems has become a priority (USFS 1998). Haynes, Allen and Pendleton 1988; Kupfer, Meitzen and Pipkin 2010) as these areas serve a critical role by reducing the risk and severity of flooding to downstream communities by providing areas to store floodwater (US EPA 2012). In addition, these wetlands improve water quality by filtering and flushing nutrients, processing organic wastes, and reducing sediment before it reaches open water (US EPA 2012).

Along with the loss of bottomland hardwood forests, longleaf pine ecosystems have suffered loss within the southeast region. The longleaf pine ecosystem once covered approximately 90 million acres in the southeastern US. This unique ecosystem has been reduced to fewer than two million acres, representing a 97 percent decline in this important ecosystem. Today, only scattered patches of the longleaf pine/wiregrass ecosystem occur, primarily in the coastal plains of the Carolinas, Georgia, Florida, Alabama, Louisiana, and Texas. About half of these surviving stands of longleaf pine exist on public lands. Factors contributing to the demise of this ecosystem include fire suppression efforts, clearing for agriculture and development, aggressive logging at the turn of the last century, and conversion to other pine types for faster growth and profits. To protect and restore these valuable forests, restoration efforts from NRCS's Longleaf Pine Initiative and other regional conservation partners are working with forestland owners in nine states, including South Carolina, to restore longleaf pine forests (NRCS 2015).

4.1.1.2. Water Quality Issues in Watershed

The major water quality concern in the Four Hole Swamp watershed is fecal coliform ("FC") and biological (aquatic community) criteria (NRCS 2010). The South Carolina Department of Health and Environmental Control (the "SC DHEC") monitors approximately 20 permanent and random water quality stations in the watershed. Water quality stations are cited for fecal coliform, dissolved oxygen, aquatic community (macroinvertebrates) and mercury impairments more than any other impairment in the watershed. The fecal coliform impairments in the upper part of the watershed, cited as a result of nonpoint sources such as agricultural issues, failing septic systems, and overland contributions from impervious surfaces, is being addressed through the 2005 Four Hole Swamp TMDL.

The region's historical land cover change from the loss of longleaf pine and bottomland hardwood forests and the conversion to agricultural lands and silviculture practices with practices such as ditching and channelizing the land has posed water quality threats to the watershed. Hydrologic modifications such as shorter time of concentrations, decreases in infiltration and evapotranspiration rates have most likely altered the watershed's natural runoff characteristics. The increase in runoff rates has the potential to carry more pollutants, thus higher potential for impaired waters within the watershed, such as the ones listed above.

4.1.2. Wildlife

4.1.2.1. Historical Losses of Wildlife Habitat

Southeastern bottomland hardwood support high levels of diversity in both the flora and fauna. As well, longleaf pine habitats are noted for their extreme levels of diversity and have 29 species associated with the ecosystem, such as the federally endangered Red-cockaded Woodpecker (NRCS 2011). However, post European settlement disturbance and conversion of land use in the region has impacted this ecosystem substantially in the southern United States (US EPA 2012). Coastal plain hydrologic systems were modified by early settlers for agriculture, timber harvest and to support waterway travel. Since settlement, bottomland hardwood forest has been altered by timber and most substantially, conversion to agricultural land uses. Longleaf pine forests significant decrease can also be attributed to aggressive logging practices and clearing for agricultural land uses, along with development, fire suppression efforts, and conversion to other types of pine. Loss and fragmentation of habitat has been identified as a major threat to many of the species listed as threatened and endangered in South Carolina (NRCS 2010). Specifically, within the Beidler Forest, more than 300 vertebrates and 300 plants depend upon the swamp for survival, and a number of threatened and/or vulnerable species are present (LOLT 2011). A host of federally endangered or threatened flora and fauna are listed for the basin and SC DNR recognizes that habitat protection is of utmost importance to protection of these species (NRCS 2010).

Table 2. List of Federally Endangered or Threatened Species in the Four Hole Swamp watershed.

Plant Species	
Common Name (<i>Latin Name</i>)	Status
American chaffseed (<i>Schwalbea americana</i>)	Endangered
Bog Asphodel (<i>Narthecium americanum</i>)	Candidate
Canby's dropwort (<i>Oxypolis canbyi</i>)	Endangered
Pondberry (<i>Lindera melissifolia</i>)	Endangered
Wildlife Species	
Common Name (<i>Latin Name</i>)	Status
Arctic peregrine falcon (<i>Falco peregrinus tundrius</i>)	Recovery
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Recovery
Brown pelican (<i>Pelecanus occidentalis</i>)	Recovery
Red-cockaded woodpecker (<i>Picoides borealis</i>)	Endangered
Wood stork (<i>Mycteria americana</i>)	Endangered
Red wolf (<i>Canis rufus</i>)	Endangered
West Indian manatee (<i>Trichechus manatus</i>)	Endangered
Loggerhead sea turtle (<i>Caretta caretta</i>)	Threatened
Aquatic Species	
Common Name (<i>Latin Name</i>)	Status
Frosted Flatwoods salamander (<i>Ambystoma cingulatum</i>)	Threatened
Shortnose sturgeon (<i>Acipenser brevirostrum</i>)	Endangered

4.2. 10-DIGIT HUC DEAN SWAMP

Majority of the Mitigation Project sites are situated in the 10 digit HUC Dean Swamp subwatershed (0305020502). The subwatershed is located in Orangeburg and Berkeley Counties and consists primarily of Dean Swamp and its tributaries. The subwatershed has a drainage area of 103 square miles (66,766 acres) with a total of 158.2 stream miles and 397.5 acres of lake waters. All streams in the subwatershed are classified as Freshwater (SCDHEC 2012).

The sites are mostly within the lower portion of the Dean Swamp subwatershed HUC 10, situated adjacent to Dean Swamp and Sandy Run above Highway 311. At the level IV Ecoregion, the majority of the proposed site is within the Mid-Atlantic Floodplains and Low Terraces associated with Dean Swamp and Sandy Run floodplain and fluvial terraces. As well, parts of the watershed adjacent to these floodplains reach into the Carolina Flatwoods.

Land cover in the subwatershed is 51 percent forested (non-wetland forest), 24 percent wetlands, 20 percent agriculture, 3 percent developed and 1 percent open water according to the National Land Cover Database for 2011 (NLCD 2015). The large numbers of wetland in the watersheds correspond to the extensive swamp-stream floodplains of Dean Swamp and its tributaries, and 23 of the 24 percent are characterized as “woody wetlands” as opposed to “emergent herbaceous wetlands”. As well, the large percent of forested areas mostly attribute to the loblolly pine plantations that were most likely converted from the historical longleaf pine forests within the watershed.

4.2.1. Water Quality

4.2.1.1. Historical Changes of Aquatic Resources in Watershed

Historical changes in land cover were compared from 1992 to 2011 for the Dean Swamp watershed and is illustrated on Figure 4 in Appendix A. During this nineteen year period, the developed area remained in the 1 to 3 percent of the watershed and it is projected that there is a low potential of growth in the subwatershed (SCDHEC 2012). A slight decrease in forested land and increase in shrub/scrub in the watersheds suggest logging activity in the watershed. Continuing farming and agriculture activities and vast areas of floodplain wetlands have remained consistent over the last decade. Native upland hardwood forests continue to be harvested and converted to pine monoculture, largely loblolly (USACE 2000). Large industrial forestlands are above Dean Swamp in Orangeburg County (USACE 2000).

However, the watershed has not been without historical changes to aquatic resources. Much of the region experienced historical changes to support agriculture, including conversion of forested wetlands and uplands (Haynes, Allen and Pendleton 1988) and early hydrologic alterations such as water diversions, canals, and reservoirs for managing water. The lasting imprint of hydrologic and geomorphic alterations in the watershed is documented by the U.S. Forest Service in the coastal plain (USFS 2013). Alterations include dams, dikes, ditching and straightening channels, and water diversion (USFS 2013). A review of historical maps and aerial photographs (USGS) reveal many alterations to the landscape through the 20th century. Review of current National Hydrography Dataset and elevation data from LiDAR highlight these features in the watershed. It is now understood that these modifications affect the larger ecosystem by disrupting natural hydrologic regimes that maintain natural wetlands and streams.

The US Forest Service has documented the changes to hydrology and aquatic resources for watersheds within Francis Marion National Forest lands in the same eco-regions. Management strategies such as those suggested in the USFS Draft Forest Plan (2013) for Francis Marion National Forest put priority on restoring hydrology closer to “natural potential condition.” Aquatic resource restoration at the proposed bank site can help with moving forward with conservation goals that the US Forest Service recognizes as important, as well as conservation goals set forth by the Audubon’s Francis Beidler Forest and its partners

for the vital wetlands and uplands in the Four Hole Swamp watershed.

Along with the conservation goals for the US Forest Service, as stated previously, the mission of Audubon's Francis Beidler Forest and its partners is to significantly enhance land and habitat protection efforts through conservation easements to protect the Forest and lands directly linked to the Beidler Forest or to the Four Hole Swamp in order to create the most complete wetland system possible. Beidler Forest was originally established to preserve the vital 1,800 acres of old-growth swamp forest, one of only two such stands still left in the state. However, the natural resources of the Forest and Swamp provide outstanding recreational benefits as well. A visitor center, 1.75-mile boardwalk trail, and a canoe and kayak trail for naturalist-guided paddling tours provide visitors the chance to explore deep within the swamp's interior (Audubon 2015). Hence the importance of the Forest and its expansion to promote stewardship of the area for the benefit and enjoyment of the present and future generations by conservation, utilization, awareness, protection and enhancements of the watershed's resources.

4.2.1.2. Water Quality Issues in Watershed

Within the 10-digit HUC, there are three permanent and/or random water quality monitoring stations monitored by SCDHEC. Cedar Swamp is monitored by both E-115 and E-596 water quality monitoring stations, where E-596 is a macroinvertebrate sampling station. Aquatic life uses are fully supported based on macroinvertebrate community data (SCDHEC 2012) and SCDHEC's 2012 303(d) List of Impaired Waters. Dean Swamp is monitored by water quality monitoring station E-030. Aquatic life uses are fully supported at E-030 on Dean Swamp. There is a significant increasing trend in pH. Significant decreasing trends in total phosphorous and total nitrogen concentration suggest improving conditions for these parameters (SCDHEC 2012). However, recreational uses are not supported due to fecal coliform bacteria excursions, which are compounded by a significant increasing trend in fecal coliform bacteria concentration. Hence, WQMS E-030 is on the 2012 303(d) List of Impaired Waters due to fecal coliform violations.

Potential water quality impacts in this watershed and the proposed mitigation site could come from agricultural land uses in the uplands and areas adjacent to the mitigation sites that make their way into the floodplains. Agricultural land uses can contribute to common water quality issues including high nutrient loadings and fecal coliform bacteria. Agricultural land can be a source of fecal coliform bacteria via runoff from grazing pastures, improper land application of animal wastes, livestock operations, and livestock with access to waterbodies.

As well, adjacent timber harvesting practices in the watershed, such as the large industrial forestlands above Dean Swamp and the mitigation sites, can cause significant water quality problems if forestry activities are improperly managed. Sources of nonpoint source (NPS) pollution associated with forestry activities include removal of streamside vegetation, road construction and use, timber harvesting, and mechanical preparation for the planting of trees (US EPA 1996). Sediment is the pollutant most associated with forestry activities via accelerated erosion, mass wasting, and/or road construction and road use (US EPA 2005). Harvesting trees in the area beside a stream can affect water quality by reducing the streambank shading that regulates water temperature and by removing vegetation that stabilizes the streambanks. These changes can harm aquatic life by limiting sources of food, shade, and shelter (US EPA 1996). Such impacts from sediment loadings can include light reduction for photosynthesis for aquatic vegetation (physical), aquatic biota suffocation (physical), and the introduction of organic contaminants, heavy metals, nutrients and biological pollutants via the adsorption to sediment surfaces (biological/chemical).

4.2.2. Wildlife

4.2.2.1. Historical Losses of Wildlife Habitat

Southeastern longleaf pine and bottomland hardwood forest supports high levels of diversity in both the flora and fauna. However, post European settlement disturbance and conversion of land use in the region has impacted this ecosystem substantially in the southern United States (US EPA 2012). Coastal plain hydrologic systems were modified by early settlers for agriculture, timber harvest and to support waterway travel. Since settlement, bottomland hardwood and long leaf pine forests have been altered by timber and most substantially, conversion to agricultural land uses. Within the Four Hole Swamp and Dean Swamp watershed, both are predominately present. As hydrologic and ecological systems are closely related, hydrologic modifications and past land use practices in the watershed have led to an altered hydrologic regime, the loss of biodiversity and the loss of native ecosystems in some areas of the watershed. Loss and fragmentation of habitat has been identified as a major threat to many of the species listed as threatened and endangered in South Carolina (NRCS 2010).

Audubon recognizes the importance and potential for conservation management of the lands in these watersheds, especially in the river floodplains of South Carolina. Through the Beidler Forest, Audubon and its partners have been able to protect the largest stand (1,800 acres) of the untouched old growth virgin blackwater bald cypress and tupelo gum forest in the world, some of which are thousands of years old (NAWCC 2010). The Forest's wetland habitat supports over 300 vertebrates and 300 plant species, including 38 species of breeding neotropical migrants (NAWCC 2010) and a number of threatened and/or endangered species are present. As such, Beidler Forest is a Globally Important Bird Area, a scientific designation by the American Bird Conservancy and Audubon that recognizes sites that have vital habitat for bird populations. As such, SCDNR, the LOLT and the Lord Berkeley Conservation Trust recognize this importance and are striving to preserve these adjacent wetland and uplands within the Dean Swamp watershed to complete the Four Hole Swamp watershed's functionality.

4.3. 10-DIGIT HUC LOWER FOUR HOLE SWAMP

Within the Four Hole Swamp watershed, the Mitigation Project sites are also located in the 10 digit HUC Lower Four Hole Swamp subwatershed (0305020503). The subwatershed is located in Orangeburg, Berkeley and Dorchester Counties and consists primarily of Four Hole Swamp and its tributaries from Cow Castle Creek to its confluence with the Edisto River. The subwatershed has a drainage area of 287 square miles (183,907 acres) with a total of 501.4 stream miles and 931.9 acres of lake waters. All streams in the subwatershed are classified as Freshwater (SCDHEC 2012).

A portion of the Mitigation Project is located in the Lower Four Hole Swamp subwatershed HUC 10, situated adjacent to Walnut Branch, between Highway 178 and Interstate 26, until the confluence with Four Hole Swamp. At the level IV Ecoregion, the majority of the proposed site is within the Mid-Atlantic Floodplains and Low Terraces associated with Four Hole Swamp and Walnut Branch floodplain and fluvial terraces. As well, parts of the watershed adjacent to these floodplains reach into the Carolina Flatwoods.

Land cover in the subwatershed is 35 percent forested wetlands, 34 percent forested (non-wetland forest), 23 percent agriculture, 5 percent developed, 1.5 percent non-forested wetland and 0.4 percent open water according to the National Land Cover Database for 2011 (NLCD 2015). The large numbers of wetland in the watersheds correspond to the extensive swamp-stream floodplains of Four Hole Swamp and its tributaries, such as the Francis Beidler Forest being located within this subwatershed. The large percent of forested areas mostly attribute to the loblolly pine plantations that were most likely converted from the historical pine flatwoods and longleaf pine forests within the watershed.

In the northern portion of the Lower Four Hole Swamp subwatershed, SCDHEC's water quality monitoring stations on Providence Swamp (E-051) and Horse Range Swamp (RS-02303 and E-052) are incorporated in the 2005 Four Hole Swamp TMDL for fecal coliform impairments. Probable sources of fecal coliform bacteria that were identified in the subwatershed from the TMDL included grazing animals (especially cattle with access to streams), land application of litter, failing septic systems, urban runoff, and wildlife. As for where the Mitigation Project sites are located within this subwatershed, there are three SCDHEC monitoring stations along this section of Four Hole Swamp. At the upstream site (E-112), aquatic life uses are not supported due to dissolved oxygen excursions and therefore is on SCDHEC's 2012 303(d) impaired list. As well, this site is also on the 2012 303(d) list for fish consumption for mercury violations. There is a significant trend in pH at this location and significant decreasing trend in turbidity, suggesting improving conditions for this parameter. At the midstream site (E-100), aquatic life uses are fully supported. Although dissolved oxygen excursions have occurred, they were typical values seen in blackwater systems and were considered natural, not standard violations (SCDHEC 2012). There is a significant increasing trend in pH and recreational uses are not supported due to fecal coliform bacteria excursion (on the 2012 303(d) Impaired List). At the downstream site (E-015A), aquatic life and recreational uses are fully supported; however there is a significant increasing trend in five-day biochemical oxygen demand. The Mitigation Project on Walnut Branch drains directly to monitoring station E-100 on Four Hole Swamp, thus, the site has the potential to improve water quality impairments for this location and further protect downstream, such as station E-015A, from becoming impaired.

Potential water quality and wildlife impacts in this subwatershed and the proposed mitigation site could come from silviculture practices and agricultural land uses in the uplands and areas adjacent to the mitigation sites that make their way into the floodplains. For historical wildlife and aquatic resource losses within the subwatershed, since European settlement, bottomland hardwood and long leaf pine forests within this region have been altered by timber and most substantially, conversion to agricultural land uses. As well, the lower portion of this subwatershed is heavily impacted with mining practices (majority sand mines) and landfills. Though these facilities have individual NPDES permits, nonpoint source pollution can still be associated with these activities and a threat to the watershed's natural resources.

4.4. Areas for Watershed Improvement

After assessing the historical losses and concerns for water quality and wildlife in the aforementioned watersheds, the following items have been identified as areas for improvement.

4.4.1. Water Quality Needs in the Watershed

Due to the historical hydrologic and ecological alterations in the basin, and the priority that the National Audubon Society, US Forest Service (2013), USDA NRCS (2015), USFWS National Wetlands Research Center (Haynes, Allen and Pendleton 1988), the US EPA (US EPA 2012), and The Nature Conservancy (Land Trust Alliance 2015) on conservation of these lands, there is a need for wetland restoration, protection, and enhancement to improve hydrologic and ecological conditions. Land use practices associated with timber and agricultural in the watershed could pose a threat to water quality. Protection of these pine flatwoods, headwaters areas and floodplain forests is important for maintaining water quality downstream and meeting the goals of SC DHEC and EPA water quality standards. Bottomland hardwood forests provide critical ecosystem services, including storing floodwaters and reducing flooding to downstream communities and improving water quality by effectively filtering pollutants. In this way, restoring and protecting an important hydrologic resource in this part of the basin contributes to protecting water quality throughout the basin. Along with the environmental benefits to protecting water quality throughout this watershed, it is also recreationally important to preserve and protect this area, especially for the Francis Beidler Forest.

4.4.2. Wildlife Needs in the Watershed

Restoring hydrologic resources closer to their natural condition will help meet wildlife and forest management goals in the watershed. The importance of conservation management in the watershed is evident, especially within the swamp-stream floodplains. Four Holes Swamp and the lower ACE Basin are priority sites under the 1992 Emergency Wetlands Resources Act's Southeast Regional Wetlands Plan (NAWCC 2010). Francis Beidler Forest, Audubon, Nature Conservancy, and Lord Berkeley Conservation Trust's properties, downstream and adjacent of the Mitigation Project, are managed to protect natural resources that include bottomland hardwood forests and floodplain wetlands. Therefore, hydrologic restoration on the bank sites would complement this management goal on surrounding lands and further promote wildlife needs in the watershed, such as extending habitat for birds near the "Important Bird Area" at Beidler Forest. In addition, conserving the property will help provide conservation connectivity between the already protected Audubon and its partner's lands. Finally, it is recognized that climate change may impact habitats in the coastal plain region. Protecting lands within the coastal ACE River basins are important for resiliency in the face of a changing climate that may alter habitats. Therefore, the Nature Conservancy and their partners recommend conservation that abuts and expands existing protected lands to increase connectivity of habitat (Land Trust Alliance 2015).

4.4.3. Ecological (Physical, Chemical and Biological) Suitability and Technical Feasibility of the Site to Meet Water Quality and Wildlife Habitat Needs in Watershed

As previously mentioned, hydrologic alterations in the watershed have been recognized by USFS at similar watersheds in the ecoregions, such as in Francis Marion National Forest in Berkeley County, SC. These modifications in the watershed have altered hydrologic and geomorphic processes away from the "natural potential condition." The proposed mitigation site is an opportunity to support ecological management of the property in congruence with Audubon and its partner's goals on the surrounding Four Hole Swamp/Beidler Forest as well as address conservation goals for protection of swamp-stream floodplain, bottomland hardwood forest and long leaf pine ecosystems. Hydrologic regimes and habitat are closely related, especially in these coastal plain systems. Restoration goals may include: replanting of bottomland hardwoods along existing drainages and stream corridors, preservation of bottomland hardwoods along Sandy Run, Dean Swamp, Walnut Branch, and associated unnamed tributaries (all tributaries of Four Hole Swamp), enhancement of pine plantation to pine flatwoods communities within jurisdictional wetlands, enhancement of isolated pond wetlands interspersed throughout the existing pine plantation, establishment of protected riparian buffers, and the long-term establishment of long-leaf pine flatwoods communities predominately in the upland areas.

4.4.4. Offsite Threats to Mitigation Efforts Constructed within the Mitigation Project Sites

By the late 20th century excessive logging, drainage, farm chemicals, and urban sprawl threatened the Four Hole Swamp's integrity, namely the Beidler Forest. Currently the threats to water quality and aquatic/riparian habitats at the Mitigation Project site(s) include timber activities in the floodplain, surrounding agricultural land uses and mining activities. The site is frequently inundated by the Walnut Branch, Sandy Run and Dean Swamp floodwaters, therefore impacts (such as water quality) upstream could potentially affect the site. However, these areas are being addressed with conservation easements within the floodplain, the easements can play a role in mitigating water quality issues with adequate buffers that will protect the success for downstream ecosystems and users.

5. COMPENSATORY MITIGATION PLAN

5.1. GOALS AND OBJECTIVES

Proposed wetland mitigation activities within the Mitigation Project site(s) is expected to provide preservation and enhancement opportunities of pine flatwoods and bottomland hardwood wetlands along Walnut Branch, Sandy Run and Dean Swamp and the potential future establishment of long leaf pine forest in the uplands within the same 8 digit HUC (Four Hole Swamp watershed HUC 03050205) as the proposed impacts to the Camp Hall property.

5.1.1. Mitigation Project Objectives

The proposed Mitigation Project will provide numerous ecological and water quality benefits within the Four Hole Swamp watershed (HUC 03050205) and the Mid-Atlantic Coastal Plain ecoregion. The Four Hole Swamp watershed is primarily rural and agricultural with some industrial use. Streams and wetlands in the coastal plain of South Carolina have been heavily impacted as part of historical silviculture and agriculture land management practices. The potential threat of these practices is likely to impact terrestrial and aquatic habitats and disrupt habitat corridors.

The Mitigation Project is proposing to protect approximately 2,496 acres in perpetuity and further expand the conservation efforts of the National Audubon Society in the Four Hole Swamp watershed. The proposed Mitigation Project will potentially include:

- Protection of approximately 1,533 acres of wetland through the establishment of conservation easements.
- Preservation of approximately 890 acres of mature bottomland hardwood wetlands along Sandy Run, Dean Swamp, and Walnut Branch, all tributaries of Four Hole Swamp. Enhancement of approximately 611 acres of both clear cut and established pine plantation wetlands.
- Connectivity to other conserved lands, such as those managed by National Audubon Society. Fragmented landscapes are viewed as a top threat to wildlife and ecosystems (Land Trust Alliance 2014; NRCS 2010), thus a top conservation goal is connectivity.
- Provide ecological benefits to address water quality impairments, hydrologic modifications, and vital habitat within the Four Hole Swamp watershed.

Table 3 provides the estimated ecological benefits offered by the proposed Mitigation Project to water quality, hydrology and habitat.

Table 3. Objectives for the Mitigation Project

Water Quality Benefits	Accomplished By
Water quality	Benefit will be achieved through protection, enhancement, and preservation of existing riparian vegetation. Silviculture activities are currently active within a large portion of the Mitigation Project sites. Enhancement and preservation of these areas will allow the floodplain to continue to receive and filter runoff, thereby reducing nutrients and sediment concentrations reaching aquatic resources. As such, benefit will be achieved through the reduction of sediment loss with timber harvest/reforestation and the stabilization of eroding stream banks. Protection and enhancement of riparian vegetation will benefit surface water and groundwater quality by minimizing nitrogen and phosphorus concentrations in runoff from surrounding uplands, improving surface soil structure to facilitate groundwater infiltration, and protecting groundwater discharge areas along riparian corridors.
Hydrological Function Goals	Accomplished By
Floodplain function	Preserve existing floodplain functions by eliminating the threat of future silviculture operations which would most likely require the construction of logging roads to access portions of the property. Protection of the existing vegetation will also allow the floodplains of Walnut Branch, Sandy Run and Dean Swamp to function naturally providing benefits to water quality and habitat corridors.
Water Storage	Enhancement of buffer areas, including floodplain wetlands, will store more water during precipitation event than under current drainage conditions, thus, reducing flooding in the watershed.
Biological Function Goals	Accomplished By
Habitat for macroinvertebrates and fish	Protecting the existing properties, which are crossed by multiple drainages dotted wetland depressions, will preserve valuable floodplain habitat vital to the native macroinvertebrates and fish that inhabit the Mitigation Project sites.
Vegetative Habitat Protection	Preservation of bottomland hardwood ecosystems, which are under threat from silviculture practices maintains the presence of native species and diverse ecosystems that have historically been stripped from the Four Hole Swamp, Lower Four Hole Swamp and Dean Swamp watersheds.
Habitat Corridor Protection	The establishment of the Mitigation Project and associated conservation easements, with its proximity to previously conserved lands, will preserve natural travel corridors for native species and reduce habitat fragmentation.
Long Term Protection of Ecological Resources	The proposed protective mechanisms for lands within the Mitigation Project is expected to protect the proposed ecological benefits in perpetuity.

Conservation Goals	Accomplished By
Reduction of Habitat Fragmentation	Establishment of the proposed conservation and development restriction easements. According to SCDNR’s “Comprehensive Wildlife Conservation Strategy: 2005 – 2010”, Biologists have identified habitat protection as one of the most important actions to ensure protection of South Carolina priority species. Loss and fragmentation of habitat have been identified as a major threat to many of the species listed as threatened and endangered in South Carolina. The proposed Mitigation Project is in close proximity to Audubon, Nature Conservancy, and Lord Berkeley Conservation Trust properties and identified by the Nature Conservancy as a property of interest.

5.2. SITE SELECTION

An extensive process was undertaken to locate a suitable PRMP site(s) that meets and adheres to the USACE 33 CFR Parts 325 and 332 and EPA 40 CFR Part 230 and South Carolina Department of Health and Environmental Control (SCDHEC) – Office of Ocean and Coastal Resource Management (OCRM) Statutory Authority: 1976 Code § 48-39-10 through 48-39-230; R.30-4.G: Mitigation Criteria. In an effort to locate a site or sites which would provide the significant opportunity for ecological uplift a watershed approach was utilized, which took an in-depth look at the environmental issues facing the Four Hole Swamp watershed. A watershed approach focusing on the Four Hole Swamp watershed was utilized to search for the ideal PRMP site(s) to satisfy the compensatory wetland mitigation requirement for impacts associated with the Camp Hall Site while simultaneously furthering the conservation goals of Audubon and others. Based on the results of this analysis and the site selection process, it was determined that a large contiguous area with opportunities to protect a valuable aquatic resource and expand on the existing conservation efforts by the State and private conservation organizations would be preferred. In an effort to provide mitigation within close proximity to the impact site, a detailed search was conducted, but no sites were either available or could be located that could provide large scale land continuity for the protective site protection instruments.

The Mitigation Project area was selected because it meets the needs of the watershed and proposes to protect a significant portion of the Dean Swamp and Lower Four Hole Swamp watersheds, which is a priority for the National Audubon Society. The Mitigation Project is proposed as compensatory mitigation to off-set unavoidable impacts to jurisdictional wetlands due to the construction of the Industrial Site Development. In accordance with both the USACE –*Compensatory Mitigation Guidelines* (USACE 2010) and the most current federal mitigation regulations (Compensatory Mitigation for Losses of Aquatic Resources; Final Rule dated April 10, 2008) primary consideration was given toward identifying mitigation sites that: 1) supported a watershed restoration approach, 2) provided for In-Kind mitigation, and 3) existed within the primary service area.

The Mitigation Project tracts were selected for inclusion into this PRMP due to their location in the same 8-digit HUC and same Level IV Ecoregion as the impact site. The Mitigation Project sites were also chosen for in-kind wetland areas that are being disturbed on the impact site. Additionally, the Mitigation Project provides connectivity with previously conserved lands, allowing for ecosystem management continuity and an expansion of protected aquatic resources and wildlife habitat within the Four Hole Swamp watershed.

Consistent with the In-Kind mitigation requirements and location within the primary service area, the proposed impact site and potential mitigation sites are located within the Four Hole Swamp watershed (8-digit HUC 03050205).

5.2.1. Resource Equivalency

5.2.1.1. Comparison of Waters of the U.S.

The jurisdictional waters of the U.S. on the impact site are a mix of wet loblolly pine plantation, wet sweetgum plantation, isolated ponds, mixed pine-hardwood forest, bottomland hardwood forest, Non-Alluvial Swamp Forest, and RPWs. The proposed development will impact a total of 192.86 acres of jurisdictional wetlands, 23.14 acres of non-jurisdictional isolated wetlands, and 1.85 acres of RPWs on the Camp Hall Site.

The jurisdictional waters associated with the Mitigation Project site(s) include approximately 1,533 acres of palustrine, forested wetlands classified as a mix of bottomland hardwood, pine plantation flatwoods, and isolated ponds and approximately 47,932 linear feet (9 miles) of streams consisting of Cedar Swamp, Sandy Run, Dean Swamp, Walnut Branch, and associated unnamed tributaries. The site is also located within Four Hole Swamp watershed (8-digit HUC 03050205) approximately eleven miles northwest of the proposed Camp Hall Site.

The Mitigation Project will provide an excellent opportunity for the preservation, enhancement, and restoration of bottomland hardwood and pine flatwoods wetlands, within one of the primary focus areas for Audubon and the Four Hole Swamp watershed. Wetlands slated for preservation are generally high quality wetlands which will offset impacts to low and medium quality wetlands. In addition, the Mitigation Project integrates the Green Belt initiative with a primary goal of establishing a conservation zone around the Charleston metropolitan area and further expands the conservation goals of Audubon and the Nature Conservancy in the Four Hole Swamp watershed.

5.3. SITE PROTECTION

Long-term protection of the mitigation properties will involve either a conservation easement or a restrictive covenant. Each site protection instrument will specify permissible activities such as access, hunting, and other recreational uses under the restriction that the activity causes no negative effect on the functions and values of the aquatic resources within the mitigation properties. The following section provides site protection information for the properties involved in the Mitigation Project: Bannister Tract, Singletary Tract, Dean Swamp Tract, and the Walnut Branch Tracts (Mimms, Long, and Salisbury).

Bannister Tract

Ownership of the Mitigation Project

Upon issuance of a valid Section 404 permit by the USACE, the purchase of the Bannister property will be purchased in fee simple title by South Carolina Public Service Authority. Upon completion of the work activities specified in the Mitigation Plan, fee simple title to the Bannister tract will be conveyed to SCDNR for long-term stewardship.

Long Term Protective Instrument

Upon issuance of a valid Section 404 permit by the USACE, the Bannister property will be encumbered by conservation easement in a form similar to that used by Low Country Open Land Trust on the Boeing-Keystone Tract. The conservation easement will be held by the Low Country Open Land Trust.

Easement Holder	Contact Name	Phone	Address
Low Country Open Land Trust	Ashley Desmosthenes	(843) 577-6510	43 Wentworth Street Charleston, South Carolina 29401

Upon completion of the work activities specified in the Mitigation Plan, the Bannister property will be conveyed to SCDNR under a Long-Term Management Agreement with the intent for the property to be designated as SC Heritage Trust Preserve. The conservation easement will continue to be in effect in perpetuity.

Dean Swamp and Mimms Tracts

Ownership of the Mitigation Project

Upon issuance of a valid Section 404 permit by the USACE, the purchase of the Dean Swamp and Mimms properties will be completed in fee simple title by South Carolina Public Service Authority. Upon completion of the work activities specified in the Mitigation Plan, fee simple title to the Dean Swamp Tract will be conveyed to Lord Berkeley Conservation Trust and fee simple title to the Mimms tract will be conveyed to the Audubon Society.

Long Term Protective Instrument

Upon issuance of a valid Section 404 permit by the USACE, the Dean Swamp Tract, Mimms Tract, Long Tract, and Salisbury Tract properties will be encumbered by restrictive covenant in a form similar to that used by The Nature Conservancy on the Boeing-Fairlawn Tracts.

Identity of the Long-Term Steward

Property	Long-Term Steward	Contact Name	Phone	Address
Dean Swamp Tract	Lord Berkeley Conservation Trust	Raleigh West	(843) 899-5228	223 East Main Street, Suite B Moncks Corner, SC 29461
Mimms Tract	Audubon Society	TBD	(843) 462-2150	336 Sanctuary Road Harleyville, SC 29448

Singletary, Long, and Salisbury Tracts

Ownership of the Mitigation Project

The ownership of the Protected Property will stay with the current landowners.

Long Term Protective Instrument

Upon issuance of a valid Section 404 permit by the USACE, the Singletary, Long, and Salisbury properties will be encumbered by conservation easement in a form similar to the Corps 2010 Template Conservation Easement.

Property	Easement Holder	Contact Name	Phone	Address
Singletary Tract	Lord Berkeley Conservation Trust	Raleigh West	(843) 899-5228	223 East Main Street, Suite B Moncks Corner, SC 29461
Long Tract	Low Country Open Land Trust	Ashley Desmosthenes	(843) 577-6510	43 Wentworth Street Charleston, South Carolina 29401
Salisbury Tract	Low Country Open Land Trust	Ashley Desmosthenes	(843) 577-6510	43 Wentworth Street Charleston, South Carolina 29401

5.4. BASELINE CONDITIONS

5.4.1. Physiography, Topography, and Land Use

The Mitigation Project sites are located in the Coastal Plain physiographic province of South Carolina within the Four Hole Swamp watershed (USGS 8-digit HUC 03050205), specifically the Dean Swamp subwatershed (USGS 10-digit HUC 03050205-02) and the Lower Four Hole Swamp subwatershed (USGS 10-digit HUC 03050205-03). The Four Hole Swamp watershed drains two EPA Level III Ecoregions: Southeastern Plains and Middle Atlantic Coastal Plain. The majority of the proposed site, associated with Dean Swamp and Sandy Run, is within two Level IV Ecoregions: the Mid-Atlantic Floodplains and Low Terraces. In addition, parts of the proposed site reach into a third Level IV Ecoregion: the Carolina Flatwoods.

The Southeastern Plains in the northern portion of the HUC 8 Four Hole Swamp watershed can be described as irregular with broad inter-stream areas with a mosaic of cropland, pasture, woodland, and forest. The Middle Atlantic Coastal Plain Ecoregion, of which the Mitigation Project sites are located in, consists of low elevation, flat plains, with many swamps, marshes, and estuaries. Its low terraces, marshes, dunes, barrier islands, and beaches are underlain by unconsolidated sediments. Poorly drained soils are common, and the region has a mix of coarse and finer textured soils. Topography across the Mitigation Project sites is generally flat, with lower, bottomland hardwoods within the main drainages.

The Mitigation Project sites are currently utilized for silviculture uses. The sites are mostly within the lower portion of the Dean Swamp subwatershed HUC 10, situated adjacent to Dean Swamp and Sandy Run above Highway 311. Some sites located in the Lower Four Hole Swamp subwatershed HUC 10 are adjacent to Walnut Branch, between Interstate 26 and highway 178, until the confluence with Four Hole Swamp. Sites border and connect with the National Audubon Society's protected Francis Beidler Forest via the Walnut Branch and Dean Swamp mitigation project areas.

The Four Hole Swamp and the Dean Swamp watersheds are comprised of mostly rural land cover. Private land use in the area is a mix of silvicultural and agricultural land, with some interspersed low density residential areas. The largest developed area in the Four Hole Swamp watershed includes the Town of Orangeburg which lies to the upper northwest portion of the watershed. Additional developed area is made up of other small municipalities in the watershed including Cameron, Bowman, Santee, Eutawville, Holly Hill, and Harleyville. Land use within the Dean Swamp and Lower Four Hole Swamp subwatershed is mostly attributed to forested areas (34-51%), wetlands (24-31%), and agricultural lands (20-30%). The large percent of forested areas mostly attribute to the loblolly pine plantations that were most likely converted from the historical longleaf pine forests within the watershed. The majority of farmland in the watersheds is devoted to field and forage crops. The high percentage of wetland land cover reflects the extensive floodplains of the Four Hole Swamp and its coastal plain tributaries.

5.4.2. Soils

Soils within the Mitigation Project site(s) have been mapped by the United States Department of Agriculture (the “USDA”) Natural Resource Conservation Service (the “NRCS”) (USDA 2010) and are displayed on Figures 9 – 9c in Appendix A. Twenty-five soil series are mapped within the Mitigation Project: Alpin fine sand, Blanton fine sand, Bonneau loamy sand, Bonneau sand, Byars loam, Chipley sand, Coxville fine sandy loam, Coxville sandy loam, Dunbar sandy loam, Duplin loamy sand, Goldsboro sandy loam, Lynchburg fine sandy loam, Meggett loam, Mouzon fine sandy loam, Noboco loamy sand, Ocilla loamy sand, Osier loamy fine sand, Pantego fine sandy loam, Pelham sand, Rains sandy loam, Rutlege loamy fine sand, Stallings loamy sand, and Seagate loamy sand.

Table 4 shows the soil map units found within the Mitigation Project Site(s).

Table 4. Natural Resources Conservation Service Soils

Map Unit Name	Unit Symbol	Hydric Rating
Alpin fine sand, 0 to 6 percent slopes	ApB	Predominantly Non-Hydric
Blanton fine sand, 0 to 2 percent slopes	BlA	Predominantly Non-Hydric
Blanton fine sand, 2 to 6 percent slopes	BlB	Predominantly Non-Hydric
Bonneau loamy sand, 0 to 2 percent slopes	BoA	Non-Hydric
Bonneau sand, 0 to 4 percent slopes	BoB	Predominantly Non-Hydric
Byars loam	By	Predominantly Hydric
Chipley sand, 0 to 2 percent slopes	ChA	Predominantly Non-Hydric
Coxville fine sandy loam	Cu	Predominantly Hydric
Coxville sandy loam	Cx	Predominantly Hydric
Dunbar sandy loam	Dn	Predominantly Non-Hydric
Duplin loamy sand, 0 to 2 percent slopes	DpA	Non-Hydric
Goldsboro sandy loam, 0 to 2 percent slopes	GoA	Predominantly Non-Hydric
Lynchburg fine sandy loam	Ly	Predominantly Non-Hydric
Meggett loam	Mg	Hydric
Mouzon fine sandy loam	Mo	Predominantly Hydric
Noboco loamy sand, 0 to 2 percent slopes	NoA	Predominantly Non-Hydric
Noboco loamy sand, 2 to 6 percent slopes	NoB	Predominantly Non-Hydric
Ocilla loamy sand, 0 to 2 percent slopes	OcA	Predominantly Non-Hydric
Osier loamy fine sand, frequently flooded	Os	Hydric
Pantego fine sandy loam	Pa	Predominantly Hydric
Pelham sand	Pe	Predominantly Hydric
Rains sandy loam	Ra	Hydric
Rutlege loamy fine sand, frequently flooded	Ru	Hydric
Stallings loamy sand	Sa	Predominantly Non-Hydric
Seagate loamy sand	Se	Predominantly Non-Hydric

5.4.3. Jurisdictional Delineation

A jurisdictional determination request will be submitted to the USACE for all wetlands and streams associated with this Mitigation Project upon the acceptance of this PRMP.

5.4.4. Existing Plant Communities

The Natural Communities of South Carolina (Nelson 1986) was utilized to characterize the existing plant communities within the Mitigation Project area. Three predominant vegetative communities exist within the Mitigation Project sites: Bottomland Hardwood Forest, Loblolly Pine Plantation, and Isolated Ponds. A map illustrating the existing plant communities is included as Figures 12 – 12c in Appendix A.

Bottomland Hardwood Forest

The bottomland hardwood community within the Bannister Tract, Singletary Tract, Salisbury Tract, overstory consist largely of diamond-leaf oak (*Quercus laurifolia*), water oak (*Q. nigra*), and red maple (*Acer rubrum*), ash (*Fraxinus spp.*), swamp tupelo (*Nyssa biflora*), winged elm (*Ulmus alata*), American elm (*Ulmus americana*), American hornbeam (*Carpinus caroliniana*), sweetgum (*Liquidambar styraciflua*), and sweetbay (*Magnolia virginiana*). The understory in the bottomland hardwood community is limited by the overstory, ponding, and flowing drainage patterns, and includes dwarf palmetto (*Sabal minor*), giant cane (*Arundinaria gigantea*), roundleaf greenbrier (*Smilax rotundifolia*), and saplings from canopy species.

The main drainages and runs of the bottomland hardwood community include additional species that are not present or are present in limited numbers in the bottomland hardwood forest. The noticeable addition to the overstory is the presence of baldcypress (*Taxodium distichum*), while other species include swamp chestnut oak (*Quercus michauxii*), swamp tupelo, diamond-leaf oak, ash, and red maple. A limited understory includes southern arrowwood (*Viburnum dentatum*) and dwarf palmetto, and species from the overstory.

The edges of the bottomland hardwood community transition into surrounding communities, and contain additional species that are not present or are present in limited numbers in the interior of the bottomland hardwood forest. The edge overstory includes swamp chestnut oak, American holly (*Ilex opaca*), and sweetbay, while the understory includes giant cane, wax myrtle (*Morella cerifera*), and muscadine vine (*Vitis rotundifolia*).

Non-Alluvial Swamp Forest

The species composition is very similar to the bottomland hardwood forest, with the exception of the absence of dwarf palmetto in the understory. The overstory of the swamp forest consists largely of diamond-leaf oak, water oak, and red maple, though a limited number of loblolly pines and pond pines are also present. Saplings and shrubs include giant cane, American holly, redbay, sweetbay, and saplings from the hardwood overstory species. The herbaceous layer is very limited due to the overstory and ponding, and includes sedges, soft rush, greenbrier, and muscadine vine.

Mesic Mixed Hardwood Forest

A Mesic Mixed Hardwood Forest community is located on the bluffs adjacent to Marshall Branch and Walnut Branch. The overstory is dominated by diamond leaf oak (*Quercus laurifolia*), water oak (*Quercus nigra*), live oak (*Quercus virginiana*), red maple (*Acer rubrum*), pignut hickory (*Carya glabra*), sweetgum (*Liquidambar styraciflua*), and spruce pine (*Pinus glabra*). The understory includes ironwood (*Carpinus caroliniana*), horse sugar (*Symplocos tinctoria*), American holly (*Ilex opaca*), and Elliott's blueberry (*Vaccinium elliotii*), wild azalea (*Rhododendron canescens*), and dwarf palmetto (*Sabal minor*). The herbaceous and vine layers are relatively sparse, containing Virginia chain fern (*Woodwardia virginica*), netted chain fern (*Woodwardia areolata*), bladder sedge (*Carex intumescens*), poison ivy (*Toxicodendron radicans*), and muscadine (*Vitis rotundifolia*).

Calcareous Forest

A Calcareous Forest community is located on the bluffs adjacent to Marshall Branch. The overstory of this community is similar in composition to the Mesic Mixed Hardwood Forest community, with the addition of swamp chestnut oak (*Quercus michauxii*). The understory is generally more diverse than the mesic mixed hardwood forest, and includes buckeye (*Aesculus flava*), American beautyberry (*Callicarpa americana*), flowering dogwood (*Cornus florida*), red bud (*Cercis canadensis*), sparkleberry (*Vaccinium arboreum*), and American snowbell (*Styrax americanus*). The herbaceous layer is well developed and includes violets (*Viola* sp.), jack in the pulpit (*Arisaema triphyllum*), ebony spleenwort (*Asplenium platyneuron*), bloodroot (*Sanguinaria canadensis*), netted chain fern, and bladder sedge.

Loblolly Pine Plantation

The Bannister Tract contains even-aged planted loblolly pine (*Pinus taeda*) stands in various stages of rotation). The overstory within the pine plantations is dominated exclusively by established and bedded loblolly pine. The saplings and shrubs in the Bannister Tract loblolly pine plantations vary in percent cover based on age of the pine and when the stand was thinned, and within un-thinned stands this layer can be very limited.

Established stands include an understory of sweetbay, sweetgum, red maple, wax myrtle, diamond-leaf oak, bracken fern (*Pteridium aquilinum*), yellow jasmine (*Gelsemium sempervirens*), blackberry (*Rubus* spp.), fetterbush (*Lyonia lucida*), and inkberry (*Ilex glabra*). In addition, older established stands include common sweetleaf (*Symplocos tinctoria*), flowering dogwood (*Cornus florida*), and black cherry (*Prunus serotina*).

Clear-cut, or newly established loblolly pine plantations are dominated shrub and herbaceous layers, and have a different species composition when compared to more mature established stands. In addition to loblolly pine, these areas include broom sedge (*Andropogon virginicus*), dog fennel (*Eupatorium capillifolium*), blackberry, wax myrtle, yellow jasmine, velvet panic grass (*Dichanthelium scoparium*), needleleaf rosette grass (*D. aciculare*), and sugarcane plumegrass (*Saccharum giganteum*).

Isolated Ponds

Isolated ponds are seasonally to permanently flooded wetland depressions. The Bannister Tract ponds are dominated by a nearly closed canopy of hardwoods which includes swamp tupelo. The overstory in isolated ponds on the Bannister Tract includes swamp tupelo, loblolly pine, pond pine (*Pinus serotina*), sweetgum, red maple, and diamond-leaf oak. The understory includes sweetbay, redbay (*Persea borbonia*), wax myrtle, high bush blueberry (*Vaccinium corymbosum*), giant cane, fetterbush, laurel greenbrier (*Smilax laurifolia*), lanceleaf greenbrier (*S. smallii*), and sweet pepperbush (*Clethra alnifolia*).

5.4.5. Wildlife

The most common big game mammal expected to be found within the Mitigation Project sites are the white-tailed deer (*Odocoileus virginianus*) and feral pig (*Sus scrofa*). Small game species that occur on the Mitigation Project sites include rabbits (*Sylvilagus* spp.), raccoon (*Procyon lotor*), gray squirrel (*Sciurus carolinensis*), Eastern wild turkey (*Meleagris gallapavo*) and American woodcock (*Scolopax minor*) and wood duck (*Aix sponsa*). Important mammalian furbearers that were reported to inhabit the area include muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*), mink (*Mustela vison*), opossum (*Didelphis virginiana*), river otter (*Lutra canadensis*), red fox (*Vulpes vulpes*), grey fox (*Urocyon cinereoargenteus*), and coyotes (*Canis latrans*).

5.4.6. Protected Species

5.4.6.1. Federally Listed Species

Plants and animals listed as federally threatened and endangered are protected under the Endangered Species Act (P.L. 92-205) (ESA) which is administered and enforced by the United States Fish and Wildlife Service (USFWS). The bald eagle is federally protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. This report documents the results of a literature and database search and on-site survey to determine the likelihood that federally endangered or threatened species and the bald eagle will be impacted by the mitigation activities on these sites in Berkeley, Dorchester, and Orangeburg Counties, South Carolina.

A current list of federally endangered and threatened species for Berkeley, Orangeburg, and Dorchester Counties was compiled from the USFWS Information, Planning and Conservation System (USFWS 2015), the USFWS Charleston Field Office website (USFWS 2012a) and the South Carolina Department of Natural Resources (SCDNR) Natural Heritage Program website (SCDNR 2015). The three lists were combined and are listed in Table 5.

The South Carolina Rare and Endangered Species Inventory website, a Geographic Information System natural resources data layer that includes the locations of all documented occurrences of federally endangered and threatened species, was also reviewed for known occurrences of such species on or proximate to the subject project.

Table 5. Current list of federally protected species in Berkeley, Dorchester, and Orangeburg Counties, SC (USFWS 2015; SCDNR 2015) and their habitat types.

Common Name	Scientific Name	County	Status ¹	General Habitat Type
Vertebrates				
Atlantic sturgeon	<i>Acipenser oxyrinchus</i>	Berkeley	E	major river systems along the eastern seaboard
Bald eagle	<i>Haliaeetus leucocephalus</i>	Berkeley / Orangeburg	BGEPA	coastlines, rivers, large lakes or streams
Frosted Flatwoods Salamander	<i>Ambystoma cingulatum</i>	Berkeley	T, CH	pine areas maintained in an open state by fire with isolated ponds for breeding sites
Red-cockaded Woodpecker	<i>Picoides borealis</i>	Berkeley / Orangeburg / Dorchester	E	mature pine forests
Shortnose Sturgeon	<i>Acipenser brevirostrum</i>	Berkeley / Orangeburg	E	major river systems along the eastern seaboard
West Indian manatee	<i>Trichechus manatus</i>	Berkeley	E	coastal waters
Wood stork	<i>Mycteria americana</i>	Berkeley	E	marshes, swamps, lagoons, ponds, flooded fields; depressions in marshes are important during drought; also occurs in brackish wetlands
Vascular Plants				
American chaffseed	<i>Schwalbea americana</i>	Berkeley	E	fire maintained open pine forest
Canby's Dropwort	<i>Oxypolis canbyi</i>	Berkeley / Orangeburg	E	pond-cypress savannahs dominated by grasses, sedges or ditches next to bays; borders and shallows of cypress-pond pine ponds and sloughs
Pondberry	<i>Lindera melissifolia</i>	Berkeley	E	swamp and pond margins, sandy sinks, swampy depressions, wet flats

¹E Federally Endangered

¹T Federally Threatened

¹CH Critical Habitat

¹BGEPA Federally Protected under the Bald and Golden Eagle Protection Act

Methodology

A literature search and an on-site habitat assessment were conducted to determine the likelihood of the presence or absence of each of the above listed species. The lists received from USFWS and SCDNR were used as the baseline for the on-site habitat assessment and comparison. Aerial photography, the onsite habitat characterization, the on-site wetland delineation, and an on-site field survey were used to generalize habitat types on the site. General habitat types located on the tract are described below in the Habitats section.

Habitats

Habitats within the mitigation site are described in Section 5.4.4 above.

Literature Search, Database Review, and On-Site Habitat Assessment Results

Atlantic sturgeon

The Carolina and the South Atlantic Distinct Population Segments (DPS) of the Atlantic sturgeon were listed as endangered in February 2012 (NOAA 2012). A DPS is a vertebrate population or group of populations that is discrete from other populations of the species and significant in relation to the entire species. The ESA provides for listing species, subspecies, or distinct population segments of vertebrate species (NOAA 2012).

The Atlantic sturgeon is a long-lived, estuarine dependent, anadromous fish. Spawning adults migrate upriver in spring, beginning in February-March in the south. Adults spawn in freshwater of large rivers and migrate into estuarine and marine waters where they spend most of their lives. They spawn in moderately flowing water (46-76 cm/s) in deep parts of large rivers.

Bald eagle

The bald eagle was listed as endangered on March 11, 1967 (USFWS 1967). The species was reclassified from endangered to threatened throughout the lower 48 states on July 12, 1995 (USFWS 1995). It was proposed to be removed from the federal endangered species list on July 6, 1999 (USFWS 1999a). On July 9, 2007, the bald eagle was removed from the endangered species list (USFWS 2007). The bald eagle is still federally protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

The bald eagle, with a wingspread of about seven feet, is mainly dark brown and adults have a pure white head and tail. The bald eagle feeds primarily on fish but also takes a variety of bird, mammals, and turtles when fish are not readily available (USFWS 1992a). It nests in large, sturdy trees with open canopies typically near large open water bodies. Many nests are used annually. It has been documented that egg laying for the bald eagle peaks in late December in the South. The nesting season in the Southeast extends from October to May 15.

Frosted flatwoods salamander

The flatwoods salamander was listed as threatened on April 1, 1999 (USFWS 1999b). In 2009 the flatwoods salamander was divided into two distinct species: the frosted flatwoods salamander (*Ambystoma cingulatum*) and the reticulated flatwoods salamander (*Ambystoma bishopi*) due to a recognized taxonomic reclassification (USFWS 2009). The frosted flatwoods salamander is located east of the Apalachicola River Basin. Critical habitat (CH) has been designated for the frosted flatwoods salamander in Berkeley, Charleston, and Jasper counties, SC (USFWS 2009). The frosted flatwoods salamander occurs in isolated populations scattered across the lower southeastern Coastal Plain in Florida, Georgia, and South Carolina (USFWS 1999b, USFWS 2009). There are four known populations of frosted flatwoods salamander in South Carolina (USFWS 2009) with the closest population over 20 miles away on the Francis Marion National Forest (FMNF).

It is a slender, small-headed mole salamander. Adult dorsal color ranges from dark black to chocolate black with grayish or silvery network pattern or frosted appearance running along the lateral and dorsal surfaces. Aquatic larvae are long and slender, broad-headed and bushy-gilled, with white bellies and yellow stripes on the sides (Palis 1995).

Typical breeding sites are isolated wetland depressions, which dry completely on a cyclic basis, thus eliminating fish species. The isolated ponds are typically small with an open canopy allowing grasses and sedges to grow on the edge where adult salamanders will lay their eggs in the fall. During the non-breeding season, the fossorial adults return to the upland pine areas that are maintained by frequent fire.

Red-cockaded woodpecker (RCW)

In 1970, the RCW was officially listed as endangered (USFWS 2003). With passage of the ESA in 1973, the RCW received the protection afforded listed species under the ESA. The endangered status of the RCW primarily is due to four environmental factors that have been shown to limit its numbers: (1) hardwood encroachment; (2) a shortage of suitable cavity trees; (3) loss and fragmentation of habitat, and (4) demographic isolation (Conner and Rudolph 1991, Walters 1991, Rudolph and Conner 1994).

The RCW is endemic to pine forests of the southeast (Ligon 1970). RCWs are territorial, non-migratory, cooperative breeders (Lennartz et al. 1987). RCWs are unique in that they excavate cavities for roosting and nesting in living pines (USFWS 2003) and use living pines almost exclusively for foraging substrate, preferring longleaf pine when available (Walters 1991). RCWs require open pine woodlands and savannahs with large old pines for nesting and roosting habitat (i.e., cavity trees). Cavity trees must be in open pine stands with little or no hardwood midstory and few or no over-story hardwoods. For purposes of surveying, suitable nesting habitat consists of pine, pine/hardwood, and hardwood/pine stands that contain pines 60 years in age or older and that are within 0.5 mile of suitable foraging habitat. For the purposes of surveying, suitable foraging habitat consists of a pine or pine/hardwood stand in which 50 percent or more of the dominant trees are pines and the dominant pine trees are generally 30 years in age or older. (USFWS 2003)

Shortnose sturgeon

The shortnose sturgeon was listed as endangered on March 11, 1967 (32 FR 4001). It is an anadromous fish that spawns in the coastal rivers along the east coast of North America from the St. John River in Canada to the St. Johns River in Florida. In South Carolina, the species is present in the Waccamaw, Pee Dee, Black (Winyah Bay system), Santee, Cooper, Ashepoo, Combahee, Edisto, and Savannah Rivers (NMFS 1998). The shortnose sturgeon prefers the nearshore marine, estuarine and riverine habitat of large river systems (NMFS/NOAA 2012). Adults have separate summer and winter areas.

West Indian manatee

The West Indian manatee was listed as endangered on March 11, 1967 (USFWS 1967). It is a large gray or brown aquatic mammal averaging 10 feet long and weighing about 1,000 pounds (USFWS 1992a). During the winter months, the United States' manatee population confines itself to the coastal waters of the southern half of peninsular Florida and to springs and warm water outfalls as far north as southeast Georgia. During the summer months, they may migrate as far north as coastal Virginia on the east coast and the Louisiana coast on the Gulf of Mexico (USFWS 1992a). The West Indian manatee inhabits both salt and fresh water and may be encountered in canals, rivers, estuarine habitats, and saltwater bays (USFWS 1992a).

Wood stork

The U.S. breeding population of the wood stork was listed as endangered on February 28, 1984 (USFWS 1992a). The U.S. breeding population was down-listed to threatened and established as a distinct population segment on July 30, 2014. Wood storks are large, long-legged wading birds. They are 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 (USFWS 1992a).

Wood storks have been seen in South Carolina during every month of the year. However they are uncommon from December through mid-March (USFWS 1996). They typically nest in cypress/tupelo gum ponds with standing water. It is a highly colonial species usually nesting in large rookeries and feeding in flocks. The wood stork forages in a wide variety of shallow wetlands, wherever prey concentration reach high enough densities, in water that is shallow and open enough for the birds to be successful in their hunting efforts (Ogden et al. 1978, Browder 1984). Nesting wood storks generally use foraging sites that are located within 31 miles flight range of the colony (USFWS 1996).

American chaffseed

American chaffseed was listed as endangered on September 29, 1992 (USFWS 1992b). It is a perennial, erect herb in the figwort family with large, purplish-yellow tubular flowers. The fruit is a long and narrow capsule, enclosed in a loose-fitting sac-like structure that provides the basis for the common name, chaffseed (Musselman and Mann 1978 *in* USFWS 1992b). Flowering occurs from April to June (USFWS 1992a).

American chaffseed occurs in sandy acidic, seasonally moist to dry soils (USFWS 1992a). It typically occurs in fire-maintained ecosystems, such as the longleaf pine-wiregrass ecosystem of the southeastern coastal plain, open, moist pine flatwoods, and fire-maintained savannas. American chaffseed seems to require fire for persistence. One of the most serious threats to its continued existence is fire-suppression (USFWS 1992a).

Canby's dropwort

Canby's dropwort was listed as endangered on February 25, 1991 (USFWS 1991). It is a perennial herb with erect, hollow stems, aromatic foliage and elongate, stoloniferous rhizomes. It has minute white flowers produced in terminal or axillary umbels; sepals may be tinged red. The fruit is a strongly-winged schizocarp. The species flowers from May through early August and fruits in early fall (USFWS 1991).

This species occurs in pond cypress savannas, shallows and edges of cypress/pond pine sloughs, and wet pine savannas. The healthiest populations seem to occur in open bays or ponds which are wet most of the year and have little or no canopy cover.

Pondberry

Pondberry was listed as endangered on July 31, 1986 (USFWS 1986). Pondberry is a dioecious, deciduous shrub with pale yellow flowers. The fruit is a bright red drupe that matures in the fall. Flowering occurs late in February to mid-March; fruiting occurs from August to early October. The leaves have a strong, sassafras-like odor when crushed. Reproduction seems to be primarily vegetative by means of stolons (USFWS 1992).

Pondberry is found in shallow depression ponds of the sandhills, along margins of cypress ponds in the pineland coastal areas of South Carolina, and in seasonally wet, low areas among bottomland hardwoods in interior areas.

5.4.6.2. State Species of Concern

The South Carolina Nongame and Endangered Species Act outlines the State of South Carolina's role in establishing guidelines to protect wildlife species that have been determined to be of concern in the state. These state species of concern are those thought to have populations that are of declining, rare, or unknown status other than those listed under the Federal Endangered Species Act. While the state species of concern are not protected by law, the list provides a valuable tool for conservation measures and protection planning.

Table 6 provides the state species of concern for Marion County (February 2015) for which there may be suitable habitat within the mitigation site.

Table 6. Site Suitable, State Species of Concern for Berkeley, Dorchester and Orangeburg Counties, South Carolina*

Common Name	Scientific Name	County	Status ¹	Habitat	Documented Occurrence within 2 Miles of Site ²
Vertebrates					
Eastern Tiger Salamander	<i>Ambystoma trigrinum trigrinum</i>	Berkeley	S2,S3	Virtually any habitat, providing there is a terrestrial substrate suitable for burrowing and a body of water nearby suitable for breeding. In the southeastern U.S., requires relatively flatwoods ponds that do not contain fishes for breeding.	No
Spotted Turtle	<i>Clemmys guttata</i>	Berkeley / Dorchester	ST	Inhabits a variety of wetland types, including vernal pools, swamps, bogs and marshes, small streams, wet meadows, and early and mature wet forests.	No
Star-nosed Mole	<i>Condylura cristata</i>	Dorchester	S3	Tunnels in wet soils in flood plains, swamps, meadows, and other openings near water with nests placed in a hummock, under a stump or log, in humus among rotten tree roots, or in other areas above high water, often near a stream. Occasionally occurs in leaf mold on the floor of dense forests.	No
Rafinesque's Big-eared Bat	<i>Corynorhinus rafinesquii</i>	Berkeley / Dorchester / Orangeburg	SE	Roosts in cave entrances, hollow trees, crevices behind bark, and dry leaves in the forest. Also abandoned buildings and under bridges	No
American Swallow-tailed Kite	<i>Elanoides forficatus</i>	Berkeley / Dorchester	SE	Woodland and forested wetlands near nesting locations. Nests are built in trees, usually near water.	No
Gopher Tortoise	<i>Gopherus polyphemus</i>	Dorchester	SE	Dry landscapes with a well-drained, sandy substrate such as sandhill (pine-turkey oak), sand pine scrub, xeric hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, and mixed hardwood-pine communities. Prefers open habitats with ample herbaceous vegetation for food and sunlit areas for nesting.	No
Southeastern Bat	<i>Myotis austroriparius</i>	Berkeley / Dorchester / Orangeburg	S1	Roosting in spring and summer typically occurs in buildings and other structures, mines, and hollow trees (e.g., water tupelo, black gum, water hickory, black cypress). Foraging habitat is riparian floodplain forests or wooded wetlands with permanent open water nearby.	No

Common Name	Scientific Name	County	Status ¹	Habitat	Documented Occurrence within 2 Miles of Site ²
Eastern Woodrat	<i>Neotoma floridana floridana</i>	Berkeley / Dorchester	S3	Found in a range of different habitats, from coastal to mountain regions. It is often found in rocky areas and is known to nest under rocks and boulders. In woodland areas, nestings occurs beneath hollow logs or stumps and piles of wooden debris.	No
Florida Green Water Snake	<i>Nerodia floridana</i>	Berkeley	S2	Prefer to live in vegetation choked, still waters such as swamp and marshes. Also can be found in lakes, ponds, ditches, and slow rivers and occasionally in brackish water.	No
Pine or Gopher Snake	<i>Pituophis melanoleucus</i>	Berkeley / Orangeburg	S3	Flat and dry habitats with open canopies and are most common in sand hill and sandy pine barren habitats	No
Dwarf Siren	<i>Pseudobranchius striatus</i>	Orangeburg	ST	Cypress domes, cypress strands, marshes, lime-sink ponds, ditches, Carolina bays, and other shallow freshwater habitats, including both permanent and temporary waters. Cypress ponds in areas of acid pine flatwoods, thick vegetation or in bottomg mud and debris.	No
Gopher Frog	<i>Rana capito</i>	Berkeley / Dorchester / Orangeburg	S1	Native xeric upland habitats, particularly longleaf pine-turkey oak sand hill associations; also xeric to mesic longleaf pine flat woods, sand pine scrub, xeric oak hammocks, and ruderal successional stages of these habitats.	No
Least Tern	<i>Sterna antillarum</i>	Berkeley / Dorchester	S3	Sandy and pebbly beaches and on sandbars in large rivers.	No
Invertebrates					
Carolina Slabshell	<i>Elliptio congrua</i>	Orangeburg	S3	Swift water of medium sized rivers to smaller creeks. Prefers sandy substrates.	No
Savannah Lilliput	<i>Toxolasma pullus</i>	Orangeburg	S1	Lotic streams and ponds, where it prefers mud or sand near banks. Rarely found in deep water, but usually in small colonies in less than six inches of water.	No
Vascular Plants					
Coastal Plain False-foxglove	<i>Agalinis aphylla</i>	Berkeley	S1	Moist to wet pine savannas; disturbed savannas fields); also flatwoods, depressions in pinelands, bogs, and edges of cypress-gum ponds.	No

Common Name	Scientific Name	County	Status ¹	Habitat	Documented Occurrence within 2 Miles of Site ²
Incised Groovebur	<i>Agrimonia incisa</i>	Berkeley / Orangeburg	S2	Fire-maintained longleaf pine-oak community	No
Blue Maiden-cane	<i>Amphicarpum muehlenbergianum</i>	Berkeley / Orangeburg	S2,S3	moist to wet pine savannas and flatwoods, exposed shores and bottoms of ponds and lakes and margins of cypress-gum ponds.	No
Elliot's Bluestem	<i>Andropogon gyrans</i> var. <i>stenophyllus</i>	Berkeley	S1	Ditches, bogs, savannas, and pond margins	No
Broomsedge	<i>Andropogon mohrii</i>	Berkeley	S2	Permanently wet savannas and herb-dominated seepage slopes.	No
Purple Silkyscale	<i>Anthraenantia rufa</i>	Berkeley	S2	Wet pine flatwoods, wet pine savannas, and adjacent roadsides.	No
Piedmont Three-awned Grass	<i>Aristida condensata</i>	Berkeley / Orangeburg	S2	Sandy soil of low, open, and seasonally wet pineland and savannas	No
Wagner's Spleenwort	<i>Asplenium heteroresiliens</i>	Berkeley / Orangeburg	S1	Limestone and marl outcroppings in dense hardwood forests.	Yes
Black-stem Spleenwort	<i>Asplenium resiliens</i>	Berkeley / Dorchester / Orangeburg	S1	Base of cliffs or sinkholes, on limestone or other alkaline rocks. Also found in forest on boulders, ledges, and crevices of cliffs.	Yes
Coastal-plain Water-hyssop	<i>Bacopa cyclophylla</i>	Berkeley / Orangeburg	S1	Moist, sandy soil in low marshy areas near pine flatwoods	No
Northern Burmannia	<i>Burmannia biflora</i>	Berkeley	S2	Wet areas, including bogs, swamps, ditches, and lake shores.	No
Bearded Grass-pink	<i>Calopogon barbatus</i>	Berkeley	S2	Moist, acidic, sandy pine savannas and grasslands.	No
Many-flower Grass-pink	<i>Calopogon multiflorus</i>	Berkeley	S1	Well-drained soils of open, damp to somewhat drier pine savannas-flatwoods and meadows. Thrives with habitat disturbance from fire.	No
Window Sedge	<i>Carex basiantha</i>	Berkeley / Dorchester / Orangeburg	S2	Neutral or slightly acidic soils in mesic to wet mesic deciduous forests, usually on lower slopes above flood plains of rivers and streams	No
Chapman's Sedge	<i>Carex chapmanii</i>	Berkeley	S1	Well-drained, wet, sandy, acidic soils, sometimes over limestone, under deciduous or mixed deciduous-evergreen forests in floodplains of blackwater streams subject to intermittent floods of brief duration.	No

Common Name	Scientific Name	County	Status ¹	Habitat	Documented Occurrence within 2 Miles of Site ²
Cherokee Sedge	<i>Carex cherokeensis</i>	Berkeley / Dorchester	S2	Sandy loam woodlands	No
Ravenfoot Sedge	<i>Carex crus-corvi</i>	Berkeley	S2	Seasonally saturated or inundated soils in wet meadows, marshes, swamps, alluvial bottomlands	No
Cypress-knee Sedge	<i>Carex decomposita</i>	Orangeburg	S2	Undisturbed, organic-rich backwaters of swamps and pond margins. Occurs on floating or partially-submersed rotting logs or stumps.	No
Elliott's Sedge	<i>Carex elliotii</i>	Berkeley	S1	Acidic soil in swamp forests and forest openings, open seeps, sandy and peaty pond shores	No
Meadow Sedge	<i>Carex granularis</i>	Berkeley / Dorchester / Orangeburg	S2	Calcareous soils in low, wet woodlands, bottomland swamps, moist depressions in limestone cliffs, and abandoned fields, especially along borders, clearings, streams, and trails	Yes
Nutmeg Hickory	<i>Carya myristiciformis</i>	Berkeley	S2	Calcium-rich soils associated with higher bottomlands, moist hillsides, and stream banks	No
Scarlet Indian-paintbrush	<i>Castilleja coccinea</i>	Berkeley	S2	Circumneutral to alkaline soils in open areas with ample moisture and sun exposure such as herbaceous wetlands, fens, wet meadows, and open woodlands.	No
Ciliate-leaf Tickseed	<i>Coreopsis integrifolia</i>	Berkeley	S1	Moist sandy loam in semi-shaded areas along edges of low floodplain woodlands near small blackwater streams	No
Robbins Spikerush	<i>Eleocharis robbinsii</i>	Berkeley	S2	Sandy-peaty soils in shallow waters of fresh lakes and ponds	No
Three-angle Spikerush	<i>Eleocharis tricostata</i>	Berkeley	S2	Wet sandy or peaty soils of low depressions, pond margins, swamps, marshes, pine barrens, and savannas	No
Viviparous Spike-rush	<i>Eleocharis vivipara</i>	Dorchester	S1	Sandy and peaty soils, ditches, pond margins, shallow waters bordering pine-flatwoods and pine-palmetto scrub	No
Green-fly Orchid	<i>Epidendrum conopseum</i>	Berkeley / Dorchester	S3	High on the limbs of evergreen deciduous trees in hammocks, low woods, and cypress swamps	No
Ravenel's Eryngo	<i>Eryngium aquaticum</i> var. <i>ravenelii</i>	Berkeley	S1	Wet savannas with limestone close to the surface such as wet longleaf pine savanna and pine flatwoods next to drainages	No

Common Name	Scientific Name	County	Status ¹	Habitat	Documented Occurrence within 2 Miles of Site ²
Coastal-plain Thoroughwort	<i>Eupatorium recurvans</i>	Berkeley	S1	Moist areas, areas with acidic soils, and pine barrens.	No
Long-horn Orchid	<i>Habenaria quinqueseta</i>	Berkeley	S1	Rich, moist hardwood hammocks in dry to wet pine savannas and mixed oak-pine flatwoods, swamps, meadows, and roadsides	No
Southeastern Sneezeweed	<i>Helenium pinnatifidum</i>	Berkeley / Orangeburg	S2	Sandy and peaty substrate in small depressions and flatlands that are seasonally inundated and subject to frequent or occasional fire	No
Sarvis Holly	<i>Ilex amelanchar</i>	Dorchester / Orangeburg	S3	Sandy swamps; wet woods; stream banks	No
Walter's Iris	<i>Iris hexagona</i>	Berkeley	S1	Savannas, wet prairie, marshes, wet pinelands, and swamps	No
River Bank Quillwort	<i>Isoetes riparia</i>	Orangeburg	S2	Margins of lakes, ponds, and streams. Tidal shores or estuaries. Circumneutral or slightly acidic, oligotrophic waters.	No
Small's Bog Button	<i>Lachnocaulon minus</i>	Berkeley	S1	Wet, sandy or peaty soil along the margins of pineland or flatwoods ponds, or mildly acidic seepage areas and mildly acidic marshes	No
Slender Gayfeather	<i>Liatris gracilis</i>	Berkeley	S1	Well-drained and open areas of mesic to wet flatwoods, bogs, savannas, and deciduous woodlands	No
Southern Twayblade	<i>Listera australis</i>	Berkeley / Dorchester	S2	Rich humus of low moist woods, marshes, and sphagnum bogs	No
Pondspice	<i>Litsea aestivalis</i>	Berkeley / Orangeburg	S3	Wet, sandy or peaty, and acidic soil along margins of swamps, lime sink ponds, bay heads, small ponds, natural doline ponds and in low wet woodlands	No
Boykin's Lobelia	<i>Lobelia boykinii</i>	Berkeley / Orangeburg	S3	Cypress-gum depressions or ponds, wet pine savannas and flatwoods in either continuous, shallow standing water or areas that are seasonally very moist or inundated	No
Lance-leaf Seedbox	<i>Ludwigia lanceolata</i>	Berkeley	S1	Shallow water or marshes of low pine flatwoods with Sphagnum	No
Lance-leaf Loosestrife	<i>Lysimachia hybrida</i>	Berkeley	S1	Moist to mesic, hardpan clay or sandy soil of open woodlands, floodplains, and wetland margins	No
Bigleaf Magnolia	<i>Magnolia macrophylla</i>	Dorchester	S1	Rich alluvial, mesic woods and sheltered valleys. Shade tolerant.	No

Common Name	Scientific Name	County	Status ¹	Habitat	Documented Occurrence within 2 Miles of Site ²
Virginia Bunchflower	<i>Melanthium virginicum</i>	Berkeley	S2	Lowland prairies, bogs, marshes, wet open woods, savannas, and meadows.	No
Canada Moonseed	<i>Menispermum canadense</i>	Berkeley / Dorchester	S2,S3	Open deciduous woodlands and thickets, woodland borders, and semi-shaded riverbanks	No
Piedmont Water-milfoil	<i>Myriophyllum laxum</i>	Berkeley / Orangeburg	S2	Shallow, highly acidic water of natural sinkhole ponds and lakes, impoundments and beaver ponds, blackwater streams, backwaters, sloughs, drainage ditches, and canals.	No
Georgia Beargrass	<i>Nolina georgiana</i>	Orangeburg	S3	Sandy soil in pinelands, savanna, turkey-oak woods	No
Longstem Adder's-tongue Fern	<i>Ophioglossum petiolatum</i>	Berkeley	S1	Wet, sandy soils of ephemeral wetlands, moist talus and grassy areas, lake margins, swamps and streams, and damp hollows	No
Bead-grass	<i>Paspalum bifidum</i>	Berkeley	S2	Dry sand of mixed pine-oak woodlands	No
Spoon-flower	<i>Peltandra sagittifolia</i>	Berkeley	S2	Acidic bogs and swampy woodlands	No
Pineland Plantain	<i>Plantago sparsiflora</i>	Berkeley / Dorchester / Orangeburg	S2	Marshy/seasonally wet pine savannas and adjacent roadsides and ditches	Yes
Yellow Fringeless Orchid	<i>Platanthera integra</i>	Berkeley	S1	Organic black sandy peat of wet depressions within pine flatwoods, wet prairies, seepage often on slopes, marshes, swamps, and acid bogs.	No
Green-fringe Orchis	<i>Platanthera lacera</i>	Berkeley	S2	Moist, sandy soil of prairies, swamps, open woodlands, shrubby Sphagnum bogs, acidic gravelly seeps, low areas along streams, roadside clearances, and ditches	No
Shadow-witch Orchid	<i>Ponthieva racemosa</i>	Berkeley / Dorchester	S2	Moist soils over calcareous rock in the shady margins of woodland streams and ponds, sloughs, moist ravines, bottomlands, swamps, ravines, and wet savannas	No
Crestless Plume Orchid	<i>Pteroglossaspis ecristata</i>	Berkeley / Dorchester	S2	Range from very xeric to seasonally inundated or almost permanently saturated soils of scrub oak lands, pine rocklands, pine-palmetto flatwoods, and dry-mesic pine savanna	No

Common Name	Scientific Name	County	Status ¹	Habitat	Documented Occurrence within 2 Miles of Site ²
Bottom-land Post Oak	<i>Quercus similis</i>	Berkeley / Orangeburg	S1	Forests in wet stream bottomlands, flatwoods, river valleys	No
Awned Meadowbeauty	<i>Rhexia aristosa</i>	Berkeley / Orangeburg	S3	Limesink and depression ponds, Carolina bays, wet savannas	No
Piedmont Azalea	<i>Rhododendron flammeum</i>	Orangeburg	S3	Rocky, dry upland woods on dry slopes, sand hills, and ridges of rivers or stream banks	No
Short-bristle Baldrush	<i>Rhynchospora breviseta</i>	Berkeley	S1	Wet, sandy soils of pine savannas and pine flatwoods	No
Horned Beakrush	<i>Rhynchospora careyana</i>	Berkeley	S3	Mostly acidic soils in or along the shallow edges of ponds, ditches, marshes, swamps, lakes, streams, and flatwoods depressions.	No
Pocosin Beaksedge	<i>Rhynchospora cephalantha</i> var. <i>attenuate</i>	Berkeley	S1	Sphagnum peat seepage bogs and seasonally flooded ponds, depressions, savannas, and flatwoods	No
Harper Beakrush	<i>Rhynchospora harperi</i>	Berkeley / Orangeburg	S1	Sandy or peaty soils of bogs, stream banks, and edges of pineland or savanna ponds	No
Drowned Hornedrush	<i>Rhynchospora inundata</i>	Berkeley	S2	Sandy or peaty soils of drying shores and shallows of small ponds in savannas.	No
Few-flowered Beaked-rush	<i>Rhynchospora oligantha</i>	Berkeley	S2	Sandy or peaty soils of bogs, depressions in savannas, and open pinelands	No
Brown Beaked-rush	<i>Rhynchospora pleiantha</i>	Berkeley	S1	Sandy or peaty soils along shores of freshwater ponds, lakes, and lime sinks and moist pine savannas	No
Long-beaked Baldrush	<i>Rhynchospora scirpoides</i>	Berkeley	S1	Sandy or peaty soils of marshes and borders of sloughs and lakes, flatwoods depressions, beaver ponds, lime sinks, and wet savannas.	No
Chapman Beakrush	<i>Rhynchospora stenophylla</i>	Berkeley	S2	Sandy or peaty soils of bogs, seeps, pond shores, and depressions in pineland and savannas	No
Tracy Beakrush	<i>Rhynchospora tracyi</i>	Berkeley / Orangeburg	S3	Sandy or peaty soils of shallows of cypress domes, marshes and swales, and depressions and ponds in pineland and savannas	No
Sun-facing Coneflower	<i>Rudbeckia heliopsisidis</i>	Berkeley	S1,S2	Sandy or peaty soils in swales in pine-oak woodlands, seeps in meadows, and alluvium along streams	No

Common Name	Scientific Name	County	Status ¹	Habitat	Documented Occurrence within 2 Miles of Site ²
Sweet Pitcher-plant	<i>Sarracenia rubra</i>	Berkeley	S3	Acidic, seepage, or sandy-gravelly bogs, savannas, or on wet granite and near headwaters of small springs.	No
Baldwin Nutrush	<i>Scleria baldwinii</i>	Berkeley / Orangeburg	S2	Wet, sandy or peaty soils in pinelands, savannas, and borders of ponds and lagoons	No
Biltmore Greenbriar	<i>Smilax biltmoreana</i>	Berkeley	S2	Rich, open woods in ravines, along streams, and at bases of bluffs	No
Lace-lip Ladies'-tresses	<i>Spiranthes laciniata</i>	Berkeley	S1,S2	Swamps, marshes, meadows, dry to damp roadsides, ditches, and fields; occasionally in standing water	No
Pineland Dropseed	<i>Sporobolus lacinata</i>	Berkeley	S1	Pinelands and sandhills	No
Carolina Dropseed	<i>Sporobolus pinetorum</i>	Berkeley	S2	Wet to moist pine woodlands, in soils seasonally to semi-permanently saturated	No
Reclined Meadow-rue	<i>Thalictrum subrotundum</i>	Berkeley	S1,S2	Low swampy woodlands, slopes, cliffs, limestone sinks	No
Virginia Spiderwort	<i>Tradescantia virginiana</i>	Orangeburg	S1	Moist to mesic black soil prairies, sand prairies, savannas, thickets, openings and edges of woodlands, and sandstone cliffs	No
Carolina Fluff Grass	<i>Tridens carolinianus</i>	Berkeley / Orangeburg	S1	Sandy soils in upland pinelands mesic swales in sandhills	No
Least Trillium	<i>Trillium pusillum</i> var. <i>pusillum</i>	Berkeley / Dorchester	S1	Bottomland forests along small streams, ecotones of calcareous savannas and swamp forests, or moist slopes	No
Nodding Pogonia	<i>Triphora trianthophora</i>	Berkeley	S2	Dark, moist, and leaf-lined depressions on gentle slopes in mixed deciduous old-age/maturing forests	No
Greater Bladderwort	<i>Utricularia macrorhiza</i>	Berkeley	S1	Lakes, interdunal ponds, wet marshes, and rivers and streams	No
Piedmont Bladderwort	<i>Utricularia olivacea</i>	Orangeburg	S2	Seasonally dry ponds/depressions in sand pine scrub	No
Short-leaved Yellow-eyed Grass	<i>Xyris brevifolia</i>	Berkeley	S1	Acidic, sandy, and moist soils of savannas and cleared areas	No
Florida Yellow-eyed Grass	<i>Xyris difformis</i> var. <i>floridana</i>	Berkeley	S2	Moist soils of pine flatwoods, stream banks, and floodplains usually in seasonally flooded areas that draw down during the growing season	No

Common Name	Scientific Name	County	Status ¹	Habitat	Documented Occurrence within 2 Miles of Site ²
Elliott Yellow-eyed Grass	<i>Xyris elliotii</i>	Berkeley	S2	Wet, acidic, sandy soils in flatwoods, marshes, pineland pond margins, cypress swamps, clay-based Carolina bays, and lime sinks	No
Savanah Yellow-eyed Grass	<i>Xyris flabelliformis</i>	Berkeley	S1	Moist acidic sands or sandy-peats of pine flatwoods, pineland pond shores, or lakeshores	No
Pineland Yellow-eyed Grass	<i>Xyris stricta</i>	Dorchester	S1	Moist sandy or peaty soils in depression ponds, seeps, and ditches of pine savannas and wet meadows	No

¹ SE – State Endangered

ST – State threatened

S1 – Critically imperiled state-wide because of extreme rarity or special factor

S2 – Imperiled state-wide because of extreme rarity

S3 – Rare or uncommon in state

² South Carolina Rare, Threatened & Endangered Species Inventory – Data Availability for the Gresham and Johnsonville Quadrangles, accessed March 26, 2015.

*Federally protected species are not included here but are discussed in detail in the biological assessment.

5.4.7. Regional Corridors and Adjacent Natural Areas

The Mitigation Project site(s) are located in the Dean Swamp subwatershed 10-digit HUC 03050205-05 and the Lower Four Swamp Watershed 10 digit HUC 03050205-03, situated adjacent to Dean Swamp, Sandy Run, and Walnut Branch, all tributaries to Four Hole Swamp. The proposed Mitigation Project site(s) are focused on the Four Hole Swamp watershed and its tributaries which falls in-line with the existing overall conservation efforts to protect the Four Hole Swamp watershed (8-digit HUC 03050205).

Within the Four Hole Swamp watershed, the National Audubon Society (Audubon) in conjunction with the Nature Conservancy owns and protects the Francis Beidler Forest. Beidler Forest sits within the Four Holes Swamp, a matrix of black water sloughs and lakes, shallow bottomland hardwoods, and deep bald cypress and tupelo gum flats (Audubon 2015). Over 16,000 of the Four Hole Swamp and upland acres are owned by the National Audubon Society, buffered by 6,000 more acres under private conservation easements, and make up what is known as the Francis Beidler Forest (Audubon 2015, LOLT 2011). Beidler Forest is one of the largest forested wetland habitat protection projects on the East Coast of the United States, including approximately 1,800 acres of the largest old growth cypress-tupelo swamp forest in the world (LOLT 2011). The Beidler Forest was named a RAMSAR Wetland of International Importance in 2008 and is recognized as both a National Natural Landmark and an Important Bird Area (LOLT 2011). It is the mission of the Francis Beidler Forest to maintain and/or enhance functional integrity of Four Hole Swamp and its watershed, and leverage that success to aid in the protection of the Edisto River Basin, of which Four Hole Swamp is a part (USACE 2000). Hence, incremental ecological improvement of the Four Hole Swamp watershed is offered via the proposed mitigation sites that are located adjacent and connected to the Francis Beidler Forest conservation tracts.

The Mitigation Project site(s) are also situated within and adjacent to the “Charleston Greenbelt” corridor which consists of protected and productive open lands surrounding Lowcountry cities. This “Charleston Greenbelt” concept has been developed Lowcountry Open Land Trust (LOLT). It is LOLT’s mission to preserve wildlife habitats, outstanding natural areas, and sites of unique ecological significance, historical sites, forestlands, farmlands, watershed, open space and urban parks. With the proposed mitigation sites

adjacent to this Lowcountry Greenbelt, it will advance connectivity in order to support healthy ecosystems and abundant wildlife in the area. LOLT is a major partner with Audubon, and holds a majority of the conservation easements in the Four Hole Swamp watershed.

5.4.8. Cultural Resources and Environmental Screening

A cultural resources literature review was conducted on March 30, 2015 and April 6, 2015 by an Amec Foster Wheeler Archaeologist. The goal of the background literature review was to determine if any previously recorded archaeological sites or historic resources were within or adjacent to the project tract. Research was conducted at the South Carolina Department of Archives and History (SCDAH) in Columbia, South Carolina, and at the South Carolina Institute of Archaeology and Anthropology (SCIAA) in Columbia, SC. The information collected was supplemented with digital data available from ArchSite, an on-line Geographical Information System created and maintained by SCDAH and SCIAA. The records examined at SCDAH included a review of the SCDAH Finding Aid for previous architectural surveys near the project tract. The records examined at SCIAA include the master archaeological site maps, state archaeological site files, and any associated archaeological reports.

Archaeological Sites

A review of the files and records at SCIAA revealed that two sites were identified within the project tract. There were eleven identified recorded sites within a one-mile radius of the project tract. Six sites within one mile of the project tract have been recommended for additional work or are eligible for the National Register of Historic Places (NRHP). Sites 38BK1826 and 38BK1827 are Civil War Earthworks that were fortifications known as Dennis' Fort. Records for site 38BK255 were unavailable; the site is located outside the project tract. Sites 38DR149 is located adjacent to the project tract boundary and is recommended for additional work. Site 38DR150 is eligible and located along the extent of the one mile radius. Site 38DR73 is located south of the project tract boundary and is eligible for the NRHP. Site 38DR157 which consists of low density prehistoric scatter is located within the project area but is ineligible for the NRHP. Cultivation and erosion have caused this site to lose integrity for further study. Site 38DR347 is eligible for the NRHP and is located inside the project tract. The site is located along US Highway 78 along a high bluff overlooking the Four Holes Swamp. The site consists of remnants of an 18th century causeway that crosses Four Hole Swamp, a bridge and road from the early 20th century and the existing bridge constructed in 1948. Archaeological evidence for this site relates to American Revolutionary and Civil Wars. Many skirmishes and encampments were located in this area during those wars.

Table 7. Archaeological Sites within a 1.0 Mile Radius of the Project Tract.

Site No.	Description	NRHP Status
38BK1826	Civil War Earthworks	Additional Work
38BK1827	Civil War Earthworks	Additional Work
38BK2555	Unknown	Unknown
38DR2	Prehistoric Ceramic Scatter	Ineligible
38DR17	Prehistoric Ceramic Scatter	Ineligible
38DR73	Woodland Site	Eligible
38DR149	Prehistoric Ceramic Scatter	Additional Work
38DR150	Mississippian Site	Eligible
38DR157	Prehistoric Scatter	Ineligible
38DR344	Prehistoric Ceramic Scatter	Ineligible
38DR347	American Revolution Outpost and Skirmish Site	Eligible

Historic Structures

A review of the ArcSite on-line database files and records at SCIAA and SCDAH revealed that there are twenty-six historic structures within a one mile radius of the project tract. The Hilton House (410-0143) and the Four Holes Swamp Monument (410-0144) are located within the project tract but are ineligible. Structure 454-0011 (S. F. Singletary & Son General Store) is an historic structure located on Highway 176 approximately 0.8 miles south of the project area and it is eligible for the NRHP.

Table 8. Surveyed Structures within a 1.0 Mile Radius of the Mitigation Project Sites.

Site No.	Description	NRHP Status
410-0011	Mamie Ayers House	Ineligible
454-0001	Rev. Stephen Williams Home	Ineligible
454-0002	Unknown House	Ineligible
454-0003	Unknown Structure	Ineligible
454-0004	Unknown Structure	Ineligible
454-0005	Lou Hunter House	Ineligible
454-0006	Dean Swamp Bridge	Ineligible
454-0007	Singletary/Weatherford House	Ineligible
454-0008	Stephen Mckinley Singletary House	Ineligible
454-0009	Unknown Structure	Ineligible
454-0010	Stephen Singletary House	Ineligible
454-0011	Singletary and Son General Store	Ineligible
454-0012	Alva Mims Rental Home	Ineligible
454-0013	Dennis' Confederate Fort	Ineligible
454-0014	Ebenezer A.M.E. Church Cemetery	Ineligible
454-0015	James Benjamin Singletary House	Ineligible
454-0016	Godfrey's Mill House	Ineligible
454-0017	S.F. Singletary & Son General Store	Eligible
1169	Unknown Structure	Ineligible
1168	Unknown Structure	Ineligible
410-0144	Four Holes Bridge Monument	Ineligible
410-0143	Hilton House	Ineligible
410-0141	Limestone Baptist Cemetery	Ineligible
410-0142	Old Harley Cemetery	Ineligible
410-1082	Brownlee Cemetery	Ineligible
219-0704	DeLee Cemetery	Ineligible

National Register Sites

There are no National Register Listed Properties or Traditional Cultural Properties within one mile of the project tracts.

Summary

The background literature review identified eleven previously recorded archaeological sites within a one mile radius. There are two identified site located within the project tract. Site 38DR157 is ineligible Site 38DR347 is historically significant and is eligible for the NRHP. S. F. Singletary & Son General Store, located approximately 0.8 mile outside the project tract, is eligible for the National Register of Historic Places but at the time of this report is not listed. The Hilton House (410-0143) and the Four Holes Swamp Monument (410-0144) are located within the project tract but are ineligible. There are no records of

Traditional Cultural Properties or National Landmark sites in the vicinity of the project area. To reiterate, there are two structures and two identified archaeological site within the project area.

The Mitigation Project sites are generally to be used as a wetland mitigation area with buffer zones. Minor land disturbing alterations associated with wetland enhancement activities may occur in sections of the project areas. A general predictive model based on the location of cultural resources indicates a relationship exists between archaeological site location, relative topography, and available water sources (Anderson 1996). Prehistoric sites in the Coastal Plains are most often located on well drained low slope areas adjacent to water or uplands overlooking water. Prehistoric sites are also often found located in the vicinity of lithic raw material sources regardless of slope or proximity to water.

5.5. MITIGATION WORK PLAN

5.5.1. Mitigation Project Site(s)

The Mitigation Project site(s) are located within the Four Hole Swamp watershed and generally lie along Sandy Run, Dean Swamp, and Walnut Branch. The Mitigation Project consists of the Bannister Tract, Singletary Tract, Dean Swamp Tract, and the Walnut Branch Tracts. The site is generally located at 33.333 °N and 80.301 °W. The proposed mitigation tracts are either under an option to purchase agreement by Resource Environmental Solutions, LLC or other holding entities or are currently in negotiations to be optioned. The Mitigation Project encompasses approximately 2,496 acres of protected land and is expected to permanently protect approximately 1,533 acres of wetlands.

The Mitigation Project will be made up of multiple tracts of land. The primary tract of land, known as the Bannister Tract, will place approximately 1,667 acres under a protective agreement with the SCDNR and the Low Country Land Trust with an intent to dedicate the tract as a Heritage Trust Preserve. The Bannister Tract will include approximately 910 acres of wetland preservation/enhancement and protect approximately 2.64 miles (13,932 linear feet) of Cedar Swamp, Sandy Run, and associated unnamed tributaries.

The other properties that will make-up the Mitigation Project will be placed under conservation easements to be held by either the Low Country Land Trust, Lord Berkley Land Trust, or the Audubon Society and will include approximately 623 acres of wetland preservation and enhancement.

No construction activities will take place in the preservation areas.

5.5.2. Wetland Preservation

Wetland preservation activities within the Mitigation Project is anticipated to protect approximately 890 acres of wetlands, as shown in Figures 11 – 11c in Appendix A. The proposed wetland preservation areas lie directly adjacent to many streams and unnamed tributaries within the proposed mitigation corridor and consist of a mix of high quality bottomland hardwood forests communities. Wetlands within the Mitigation Project will be protected through the establishment of a conservation easement with a minimum 75 foot buffer (Bannister Tract, Dean Swamp Tract, and Mimms Tract) and maximum 100 foot buffer on the other tracts (Singletary, Long, and Salisbury) and an additional 200 foot no construction buffer (total 300 feet buffer) where possible.

5.5.3. Wetland Enhancement

Wetland enhancement activities within the Mitigation Project are proposed on the Bannister Tract and the Dean Swamp Tract as shown in Figures 11, 11a, 11b, 13, and 14 of Appendix A. The majority of the wetlands not found within the floodplain of Cedar Swamp, Sandy Run, Dean Swamp, and associated unnamed tributaries have been converted to loblolly pine plantation and are in various stages of production. For the purposes of this mitigation work plan the pine plantation has been categorized as clearcut, greater than 15-year, or less than 15-years of age. An in-depth discussion of the plant communities associated with the pine plantation community found within the Bannister Tract can be found in Section 5.4.4.

The proposed wetland enhancement activities will primarily consist of converting existing pine plantation wetlands into pine flatwoods and longleaf forest communities, where applicable. Sections of the pine plantation that have encroached into the bottomland hardwood communities will be converted back into bottomland hardwood forest. The wetland enhancement work plan to be implemented on the Bannister Tract and Dean Swamp Tract has been categorized by activities based on the existing habitat and a detailed discussion is located below for each proposed enhancement activity.

Pine Flatwoods Enhancement (Thinning/Burning)

Sections of the Bannister Tract and the Dean Swamp Tract that have been planted and have stands of existing loblolly pine greater than 15 years old will be thinned and considered for prescribed burning. Thinning of the planted pine will be conducted to reduce the basal area of the existing loblolly pine stands to open the forest canopy to allow for the recolonization of herbaceous and understory layers associated with the pine flatwoods community. A prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecotype. Depending on the conditions and success of burned areas, the frequency of successive fires will be prescribed. Where necessary, appropriate plant species will be planted to increase species diversity and accelerate forest regeneration.

Pine Flatwoods Enhancement (Thinning/Flattening/Burning)

Sections of the Bannister Tract and the Dean Swamp Tract that have been planted and have stands of loblolly pine less than 15 years old will be thinned and the topography will be smoothed with tracked and wheeled forestry machinery to match the surrounding contours to reduce furrows that were constructed during the planting process. Mechanical mulching equipment may be used during this process to thin the pines and deposit the resulting pine chips into the depressional areas. The existing loblolly pine stands will be thinned to appropriate ratios to mimic the pine flatwoods communities. At the appropriate time, a prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecosystem. Depending on the conditions and success of burned areas, the frequency of successive fires will be prescribed. Where necessary, appropriate plant species will be planted to increase species diversity and accelerate forest regeneration.

5.5.4. Wetland Restoration

Wetland restoration activities within the Mitigation Project are proposed on the Bannister Tract and the Dean Swamp Tract as shown in Figures 11, 11a, 11b, 13, and 14 of Appendix A. The proposed wetland restoration activities will primarily consist of converting replanting clearcut wetlands with either pine flatwoods, bottomland hardwood, or isolated pond communities. The wetland restoration work plan to be implemented on the Bannister Tract and Dean Swamp Tract has been categorized by activities based on the existing habitat and a detailed discussion is located below for each proposed enhancement activity.

Bottomland Hardwood Vegetative Restoration

Sections of the Bannister Tract where the existing pine plantation have encroached into the bottomland hardwood communities located along Cedar Swamp, Sandy Run, and associated unnamed tributaries will be cleared and replanted with appropriate native hardwood species. Prior to clearing activities, herbicides may be used to control unwanted vegetation, as appropriate. Clearing activities may include mechanized equipment to smooth out the raised beds to restore the natural and historic topography. The residual pine stumps will be sheared below ground elevation or extracted from the soil only if necessary. After the clearing activities are complete and if necessary, equipment will be utilized to remove debris from the area (e.g. roots, stumps, limbs, etc.). The residual debris will be piled in the adjacent uplands for disposal. Once the site preparation activities are completed, the wetland area will be planted with appropriate bottomland hardwood species.

Isolated Pond Restoration

Sections of the Bannister Tract and Dean Swamp Tract have isolated ponds that have been impacted through silviculture practices. The majority of these areas have been encroached upon to expand timber production. The vegetative enhancement activity will be same as for the Bottomland Hardwood Vegetative Enhancement. Existing native hardwood species will not be removed during the clearing activities. Once the site preparation activities are completed, the wetland area will be planted with appropriate isolated pond species.

Pine Flatwoods Restoration

Sections of the Bannister Tract and the Dean Swamp Tract that have been clear cut prior to the execution of this mitigation plan. Appropriate wetland areas not associated with the bottomland hardwood forest community will be converted into pine flatwoods/pine savannah communities. Prior to mechanical activities herbicides may be used to control unwanted vegetation, as appropriate. Machinery may be used on the raised beds to smooth the landscape to mimic the historical topography and reduce the existing rutting that has occurred from clearcutting activities. During this process, the residual pine stumps will be sheared below ground elevation or extracted from the soil as necessary. After the clearing operations are complete, equipment will be employed to remove debris from the area (e.g. roots, stumps, limbs, etc.). The residual debris will be piled in the adjacent uplands for disposal. It is anticipated that the existing road infrastructure will be used for fire breaks. Once the site preparation activities are complete, the wetland area will be planted with appropriate pine flatwoods species. At the appropriate time, a prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecotype.

5.5.5. Upland Buffer Enhancement

The upland loblolly plantation and clearcut buffers (75 feet) along the wetland enhancement and preservation areas within the Bannister and Dean Swamp Tract will be restored/converted to a longleaf pine forest ecosystem, where appropriate. Existing clear cut areas within the upland buffer will be planted with longleaf pine seedlings and other species, as appropriate, at a rate of 450 stems per acre. Existing loblolly plantation stands will remain intact through the required monitoring period. At the appropriate time, a prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecotype.

It is anticipated that the existing upland areas not converted to longleaf pine and the remaining upland loblolly plantation areas, not associated with mitigation activities, within the Banister Tract will be converted to a longleaf pine ecosystem at a future time by the SCDNR at their discretion and in accordance with their WMA management plan.

5.5.6. Prescribed Burns

Prescribed burning will be implemented every two to three years in the pine flatwoods enhancement areas and the upland longleaf restoration areas. Fire intensity will be adjusted in subsequent years to provide the best results of this habitat management technique. All initial and subsequent burns will be conducted by prescribed fire professionals with experience within the region. Specifically, only Certified Prescribed Fire Managers will conduct these burns. Burns will be conducted when conditions favor fire across the range of forest communities within the Mitigation Project Site. The burns will not be conducted when ponded water dominates the site or when dry weather creates dangerous fire conditions and fire control problems. Burning will only operate during conditions where smoke will have the least effect on adjacent populated areas.

5.5.7. Wetland Reference Areas

Wetland reference areas will be identified within either the Mitigation Project tracts, Francis Marion National Forest, or Francis Beidler Forest. The target plant communities of the Mitigation Project wetland enhancement areas will attempt to replicate the species composition of the reference wetlands and show a progression towards the vegetation strata and diversity of the reference site by the end of the monitoring period.

5.5.8. Stream Preservation

Stream preservation activities within the Mitigation Project is anticipated to protect approximately 47,932 acres (9 miles) of streams consisting of Cedar Swamp, Sandy Run, Dean Swamp, Walnut Branch and associated tributaries. For the purposes of this PRMP, streams lengths were calculated using the available USGS hydro lines. Further evaluation of the streams will be conducted following the acceptance of this PRMP and the information will be provided in the FPRMP. Streams within the Mitigation Project will be protected through the establishment of a conservation easement with a minimum 75 foot buffer (Bannister Tract, Dean Swamp Tract, and Mimms Tract) and maximum 100 foot buffer on the other tracts (Singletary, Long, and Salisbury) and an additional 200 foot no construction buffer (total 300 feet buffer) where possible.

5.5.9. Planting Plan

A planting plan will be developed following the acceptance of this PRMP. The planting plan for the different ecosystems will be developed to mimic the natural plant communities similar to high functioning ecosystems, such as Francis Beidler Forest and/or Francis Marion National Forest.

5.6. MAINTENANCE PLAN

All access roadways used for vehicular access within the Mitigation Project tracts will be used as fire breaks and future access to the properties. Annual inspection will be conducted on all access roadways and fire breaks as needed. All maintenance activities will be consistent with the long-term management practices and objectives. All other activities (prescribed burns, mechanical treatment, and chemical treatment) to be conducted are considered part of the mitigation work plan.

5.7. PERFORMANCE STANDARDS

All measurements and photographs taken during each monitoring year will be compared to the previous year's data to ensure that the project is progressing towards the stated goals. The data and comparisons will be interpreted to indicate whether the wetland restoration and enhancement area are meeting the restoration/enhancement goals of creating a diverse wetland ecosystem. The following criteria will be used in determining the necessary performance to determine success or failure of the mitigation activities within the Mitigation Project Site:

5.7.1. Wetland Preservation

Initial success will be achieved upon approval by USACE of the conservation easement documentation and the recordation of the easement within the local jurisdiction. Permanent photograph stations will be used to document any changes during the five-year monitoring period in existing vegetation, particularly invasive and noxious species, and hydrologic indicators. The final monitoring report will document that all preserved areas are intact in their approved condition.

5.7.2. Wetland Enhancement and Restoration

Vegetative monitoring documents a minimum of 320 planted stems per acre survive at the end of year 3, and 260 planted stems per acre survive at the end of year 5, and no more than 25 percent of any one species and no more than 1 percent invasive species. Height, lateral growth and root collar diameter demonstrates an increase over baseline and each prior monitoring period. Planted vegetation demonstrates an average 5 to 7 feet in height at the end of year 5. If volunteers are utilized to meet the set performance standards, species will be tagged in the field as a volunteer and the same data collected as for planted stems.

5.7.3. Stream Preservation

Initial success will be achieved upon approval by USACE of the conservation easement documentation and the recordation of the easement within the local jurisdiction. The stream top-of-bank will be surveyed on the conservation easement plat to be submitted to the local jurisdiction for recordation with the County Records Office. The condition of each preservation reach will be documented with yearly photographs, for the duration of the required monitoring period, taken at permanent photographic monitoring locations. The final monitoring report will document that all preserved areas are intact in their approved condition.

5.8. MONITORING REQUIREMENTS

Monitoring activities will take place for a minimum period of 5 years. Monitoring reports will be submitted to the Interagency Review Team (IRT) by March 15 of the year following the monitoring period. It is anticipated that the following activities will be incorporated into the proposed monitoring plan and will be further refined following acceptance of the PRMP:

5.8.1. Wetland Preservation

Visual assessments will be conducted annually to qualitatively evaluate Mitigation Project site conditions. Permanent photograph stations will be established at representative locations within the wetland preservation areas. The placement of stations should consider spatial distribution of the wetland preservation areas and document various wetland types. Each photograph station will be permanently marked in the field using rebar with a standard survey cap as well as a tall poly-vinyl chloride (PVC) pipe to aid in location (metal pipe to be used in areas where prescribed burns are planned). Photograph stations will be located with three-dimensional coordinates and georeferenced to NAD83-State Plane Feet.

Successive photographs taken at the photograph station will replicate the orientation and capture area of previous photographs. Photographs will also be used to document significant or adverse changes in other portions of the wetland preservation area.

5.8.2. Wetland Enhancement and Restoration

Vegetative monitoring will occur between July 1 and mid-October. Data collected will include stem count and for each stem: height, root collar diameter, lateral growth, include number and species. The presence of invasive species will be noted. All data will be included in the monitoring report. Boundaries of each plot will be staked and marked. Plots will represent approximately two percent of planted area and planting should occur during November 2015 to March 2016. For each plot, all stems will be tagged, numbered, and species noted.

5.8.3. Stream Preservation

Stream preservation monitoring stations will be established in representative areas along the protected streams. The placement of stations will consider spatial distribution of the stream preservation areas and document a variety of stream orders. Stream condition will be documented annually at permanent photograph stations. Each photograph station will be permanently marked in the field using rebar with a standard survey cap and a 10-foot tall PVC or metal pole with the photograph number demarcated. Photograph stations will be located with three-dimensional coordinates and georeferenced to NAD83-State Plane Feet. Successive photographs taken at the photograph station will replicate the orientation and capture the area of previous photographs.

5.9. LONG-TERM MANAGEMENT PLAN

The Long-Term Management and Maintenance Plan ("LTMP") provides a description of how the mitigation areas will be managed to ensure the long-term sustainability of the resource, including party responsible for long-term management. A summary of the various parcels is provided below in Table 9.

Table 9. Long-term Management Breakdown

Tract Name	Bannister	Dean Swamp	Mimms	Singletary	Long	Salisbury
Current owner	Plum Creek	Plum Creek	MWV	Celeste Singletary et al.	Walnut Branch, LLC	Dorchester Mining, LLC
Acreage	1,667	380	177	112	85	75
Interim Owner	South Carolina Public Service Authority			N/A		
Long-Term owner	DNR	Lord Berkeley Conservation Trust	Audubon			
Long-Term Protective Instrument	LOLT Conservation Easement	LBCT Conservation Easement tract	LOLT Conservation Easement	USACE-approved Conservation Easement		
Easement Holder	Low Country Open Land Trust	LBCT or Other Ownership	Audubon	Lord Berkeley Conservation Trust	Low Country Open Land Trust	
Easement Endowment	Funds paid to Easement Holder	N/A		Funds paid to Easement Holder		
Long-Term manager	SCDNR	Lord Berkeley Conservation Trust	Audubon	Land Trust for America	Land Trust for America	Land Trust for America
Long-term management endowment	Ongoing Timber revenue		Endowment funded to compensate Long-Term Manager			

5.9.1. Bannister Tract

5.9.1.1. Ownership of the Mitigation Site

Upon issuance of a valid Section 404 permit by the USACE, the purchase of the Bannister property will be completed in fee simple title by South Carolina Public Service Authority. Upon completion of the work activities specified in the Mitigation Plan, fee simple title to the Bannister tract will be conveyed to SCDNR for long-term stewardship.

5.9.1.2. Identity of the Long-Term Steward

Upon issuance of a valid Section 404 permit by the USACE, the Bannister property will be encumbered by a conservation easement in a form similar to that used by Low Country Open Land Trust on the Boeing-Keystone Tract. The conservation easement will be held by the Low Country Open Land Trust.

Easement Holder	Contact Name	Phone	Address
Low Country Open Land Trust	Ashley Desmosthenes	(843) 577-6510	43 Wentworth Street Charleston, South Carolina 29401

Upon completion of the work activities specified in the Mitigation Plan, the Bannister property will be conveyed to SCDNR under a Long-Term Management Agreement. The conservation easement will continue to be in effect in perpetuity.

5.9.1.3. Easement Holder Funding Mechanism

Funds will be provided for enforcement of the conservation easement through a non-wasting endowment in an amount agreed upon with the Easement Holder.

5.9.1.4. Identity of Long-Term Steward

The SCDNR will be the Long-Term Steward of the Bannister property and the property will be managed in accordance with an Agreement between SCDNR and the Corps of Engineers in a form similar to that used for the Boeing-Keystone property (“Long-Term Management Agreement”). The Long-Term Steward Contact information is provided in Table 4.13.

Long-Term Steward	Contact Name	Phone	Address
South Carolina Department of Natural Resources	Billy Dukes Chief of Wildlife Management	(803) 744-3939	South Carolina Department of Natural Resources Post Office Box 167 Columbia, South Carolina 29202

5.9.1.5. Long-Term Management

Long-term management begins once the Compensatory Mitigation described under the Plan is successfully completed and approved by the Corps and SCDHEC, and title to the Protected Property is conveyed to SCDNR. Long-term management by SCDNR will occur in accordance with the Conservation Easement, the Agreement, the Plan, and as defined by South Carolina Code of Laws Title 51, Chapter 17. The required long-term management activities include but are not limited to the items specified below:

- a) Site Inspections and Reporting. Upon conveyance of the Protected Property, SCDNR shall inspect to ensure that the approved signage on the Protected Property remains intact. SCDNR will enforce trespass, vandalism and other laws of the State of South Carolina as observed on the Protected Property.
- b) Conservation Easement Monitoring. LOLT will annually monitor the Protected Property to ensure compliance with the terms of the Conservation Easement. SCDNR will comply with the terms of the Conservation Easement.
- c) Access Road Maintenance. The primary access roads on the Protected Property will be maintained by SCDNR as part of the long-term management. Road maintenance includes the repair and maintenance of culverts or any other crossings that facilitate access to, over or through the Protected Property.
- d) Other Activities. SCDNR may engage in other acts not prohibited and not inconsistent with the Purpose of this Agreement. Such activities include timber harvesting, burning, and longleaf pine planting.

Nothing herein shall be construed to authorize the Corps and/or SCDHEC to institute any proceedings against SCDNR for any changes to the Protected Property caused by circumstances beyond SCDNR's control, including the U.S. Department of Justice (DOJ) on behalf of the USACE, and their respective successors and assigns, and no general third party beneficiary rights, including but not limited to third party rights of enforcement.

5.9.1.6. Enforcement

Enforcement shall be defined in the Long-Term Management Agreement, in a similar fashion as provided for on the Boeing-Keystone property.

5.9.1.7. Long-Term Management Funding Mechanism

Funds for long-term maintenance of the Bannister Tract will be available from timber harvests. Section 5.6 of this Mitigation Plan, describes the management of the approximately 458 acres of uplands on the Bannister tract that are located outside of the wetlands and protected wetland buffers. These uplands are presently planted with loblolly pine. The Mitigation Plan describes a long-term management program of harvesting 458 acres of uplands over time and replanting it with longleaf pine. Revenue generated from the harvesting of existing loblolly pine stands on the uplands outside the wetland mitigation area, and revenues generate by periodic thinning the planted longleaf stands in the uplands which will also be necessary as part of overall site management, will be used by SCDNR for long term management of the Bannister tract.

Following completion of the mitigation activities, long-term management costs for the Bannister Tract will be low as the protected areas will be preserved wetlands. The primary costs will be related to periodic, prescribed burns of the uplands that will penetrate the wetlands to some extent, management of invasive species, management of site access, and maintenance of the road system suitable for light duty use.

5.9.2. Dean Swamp and Mimms Tracts

5.9.2.1. Ownership of the Mitigation Project

Upon issuance of a valid Section 404 permit by the USACE, the purchase of the Dean Swamp Tract and Mimms Tract will be completed in fee simple title by South Carolina Public Service Authority. Upon completion of the work activities specified in the Mitigation Plan, fee simple title to the Dean Swamp tract will be conveyed to Lord Berkeley Conservation Trust and fee simple title to the Mimms tract will be conveyed to the Audubon Society.

The residual portions of the properties not included in the restricted areas within the Mimms Tract and Dean Swamp Tract will be used by Audubon and Berkeley County, respectively, for secondary purposes which may include silviculture, community agriculture fields, research projects/facilities, and other uses. This residual area will not be included under the conservation easements or long-term stewardship responsibilities.

5.9.2.2. Long-Term Protective Instrument

Upon issuance of a valid Section 404 permit by the USACE, the Dean Swamp and Mimms properties will be encumbered by restrictive covenant in a form similar to that used by The Nature Conservancy on the Boeing-Fairlawn Tracts.

5.9.2.3. Identity of Long-Term Steward

Property	Long-Term Steward	Contact Name	Phone	Address
Dean Swamp Tract	Lord Berkeley Conservation Trust	Raleigh West	(843) 899-5228	223 East Main Street, Suite B Moncks Corner, SC 29461
Mimms Tract	Audubon Society	TBD	(843) 462-2150	336 Sanctuary Road Harleyville, SC 29448

5.9.2.4. Long-Term Management

Long-term management begins once the Compensatory Mitigation Activities described under the Plan for the respective property is successfully completed and approved by the Corps and SCDHEC. Long-term management by the Long-Term Steward will occur in accordance with the Restrictive Covenant. The required long-term management activities include but are not limited to the items specified below:

- Site Inspections and Reporting. Upon conveyance of the Protected Property, the Long-Term Steward shall inspect to ensure that the approved signage on the Protected Property remains intact. The Long-Term steward will enforce trespass, vandalism and other laws of the State of South Carolina as observed on the Protected Property.
- Access Road Maintenance. The primary access roads on the Protected Property will be maintained by the Long-Term Steward as part of the long-term management. Road maintenance includes the repair and maintenance of culverts or any other crossings that facilitate access to, over or through the Protected Property.
- Other Activities. The Long-Term Steward may engage in other acts not prohibited and not inconsistent with the Restrictive Covenant. Such activities include timber harvesting, burning, and longleaf pine planting.

5.9.2.5. Enforcement

Enforcement shall be defined in the Restrictive Covenant, in a similar fashion as provided for on the Boeing-Fairlawn properties.

5.9.2.6. Long-Term Management Funding Mechanism

Funds for long-term maintenance will be provided through a non-wasting endowment in an amount provided for under the Long-Term Management Agreement.

5.9.3. Singletary, Long, and Salisbury Tracts

5.9.3.1. Ownership of the Mitigation Project

The ownership of the Protected Property will stay with the current landowners.

5.9.3.2. Long-Term Protective Instrument

Upon issuance of a valid Section 404 permit by the USACE, the Singletary, Long, and Salisbury properties will be encumbered by conservation easement in a form similar to the Corps 2010 Template Conservation Easement.

Property	Easement Holder	Contact Name	Phone	Address
Singletary	Lord Berkeley Conservation Trust	Raleigh West	(843) 899-5228	223 East Main Street, Suite B Moncks Corner, SC 29461
Long	Low Country Open Land Trust	Ashley Desmosthenes	(843) 577-6510	43 Wentworth Street Charleston, South Carolina 29401
Salisbury	Low Country Open Land Trust	Ashley Desmosthenes	(843) 577-6510	43 Wentworth Street Charleston, South Carolina 29401

5.9.3.3. Easement Holder Funding Mechanism

Funds will be provided for enforcement of the conservation easement through a non-wasting endowment in an amount agreed upon with the Easement Holder.

5.9.3.4. Identity of the Long-Term Steward

The Long-Term Steward for the lands encumbered by the conservation easement will be third party entity under a long-term contract to perform the long-term management obligations.

5.9.3.5. Long-Term Management

Long-term management begins once the Compensatory Mitigation Activities described under the Plan for the respective property is successfully completed and approved by the Corps and SCDHEC. Long-term management by the Long-Term Steward will occur in accordance with the Long-Term Stewardship Agreement.

A primary goal of this Mitigation Project is to create a self-sustaining natural aquatic system that achieves the intended level of aquatic ecosystem functionality with minimal human intervention, including long-term site maintenance. The anticipated mitigation activities within the Mitigation Project will include wetland and stream preservation only. Long-term management activities will include annual site visits by the Long-Term Steward to inspect preservation areas, identify any issues such as signs of trespass and vandalism, invasive species occurrences, and perform sign maintenance to ensure the easement is clearly marked. A brief report will be prepared and submitted to USACE describing any issues, as well as any corrective actions to be taken. Long Term Management Reports (LTMP) reports will be submitted to the USACE annually for the first five years post-monitoring (years 6 to 10). From years 11 to 25 a report will be submitted every five years. From Year 25 - Perpetuity LTMP reports will no longer be submitted pending approval from the USACE.

5.9.3.6. Enforcement

Enforcement of the Long-Term Stewardship Agreement shall performed by the Easement Holder under their obligations as defined in the Conservation Easement, with third-party enforcement rights provided to The Corps and SCDHEC.

5.9.3.7. Long-Term Management Funding Mechanism

Funds for long-term maintenance will be provided through a non-wasting endowment in an amount agreed upon with the Long-Term Steward. The amount of the non-wasting endowment will be finalized prior to the issuance of the FPRMP.

5.10. ADAPTIVE MANAGEMENT PLAN

In the event, one or more of the performance objectives within the Project Area fails to achieve the necessary performance standards as specified in the PRMP, the permit applicant and/or its Agents shall notify the USACE immediately. Adaptive management activities may consist of corrective actions and additional monitoring of the approved Mitigation Project or implementation of an alternate PRMP. Failure to actively pursue and implement an approved mitigation plan or to develop and implement an adaptive management plan may be grounds for modification, suspension or revocation of the associated USACE authorization.

5.11. FINANCIAL ASSURANCES

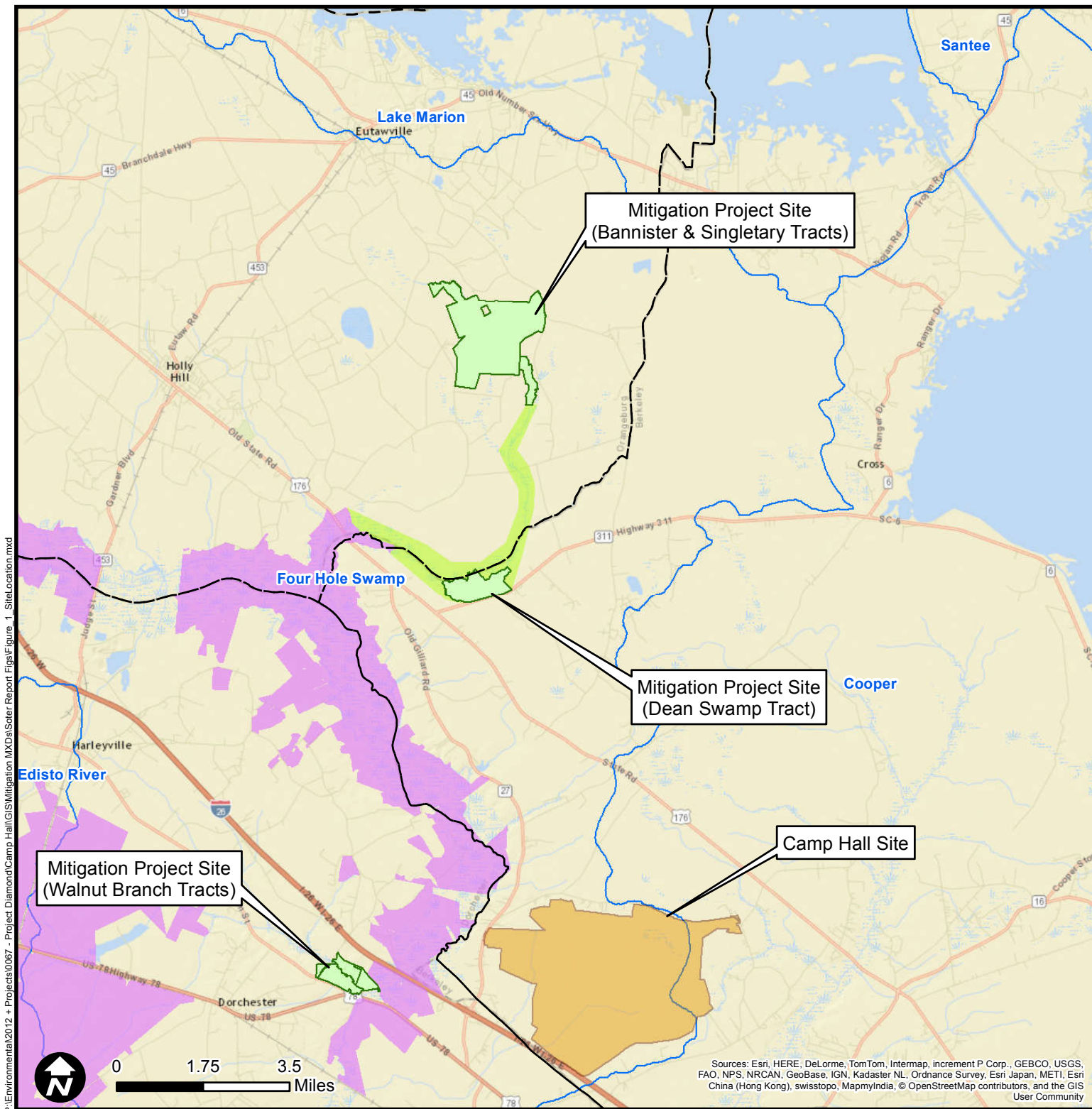
Financial assurances will be provided in the form of performance bonds for the mitigation activities specified in the mitigation work plans of this Mitigation Plan. The bonds will assure performance of construction and monitoring work to restore, enhance and or preserve the aquatic resources as described in the mitigation work plans. The amounts of the performance bonds will be determined in conjunction with USACE once the proposed mitigation activities outlined in the Mitigation Plan have been approved.

6. REFERENCES

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APPENDIX A: MAPS AND FIGURES



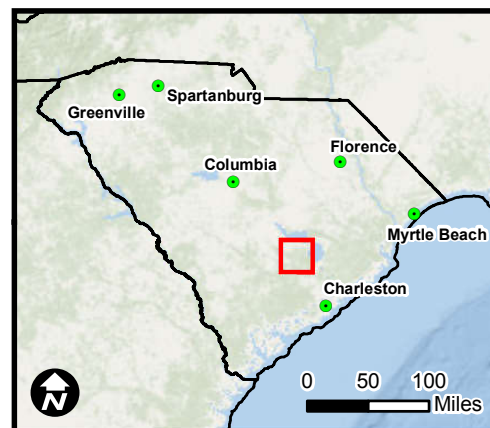
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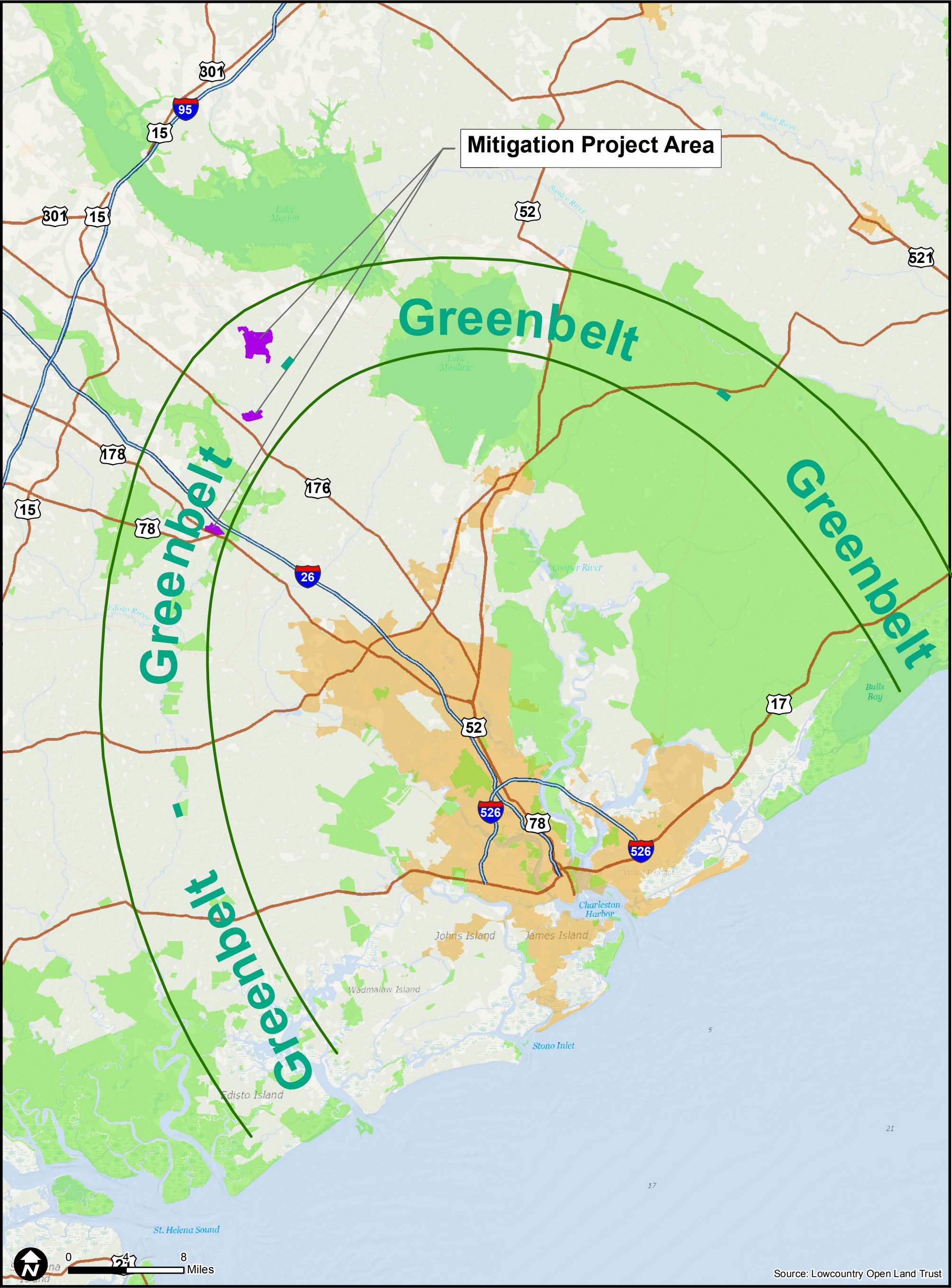
Drawn By: BWS

Reviewed By: WAR

Date: 03/25/2015

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P:\Environmental\2012 - Projects\067 - Project Diamond\Camp Hill\GIS\Mitigation MXDs\Soter Report Figs\Figure 2 Greenbelt_CS.mxd

Source: Lowcountry Open Land Trust

Legend

- Existing Private, Protected, and Public Lands
- 2010 Urbanized
- Interstates
- Highway

Job No. 6250150080

Drawn By: CLS

Reviewed By: WAR

Date: 03/31/2015

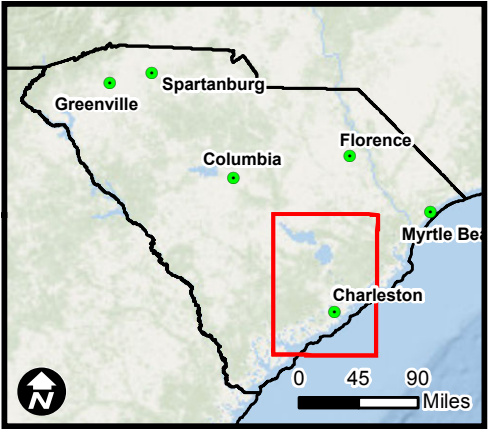
Figure 2. Growth & Conservation in the Balance

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

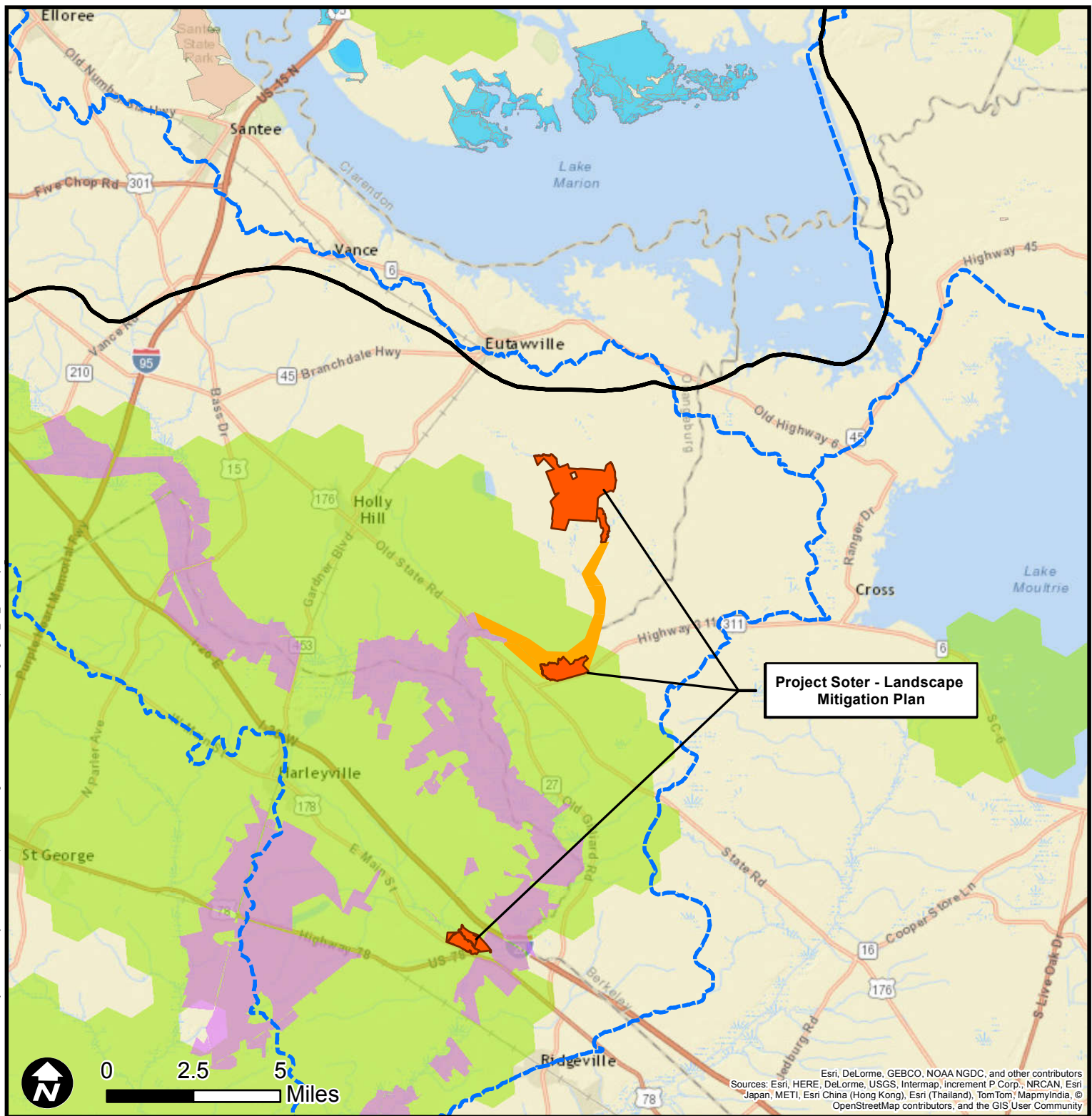
Thoughtful conservation is needed outside of the urban growth boundary in balance with development throughout the region.

Greenbelt - Focus area for thoughtful conservation and intended connectivity.

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Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri
Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, ©
OpenStreetMap contributors, and the GIS User Community

Legend

- Mitigation Project Boundary
- Priority Easement Acquisition Area
- Fish and Wildlife Service (FWS)
- Private Owned Protected Lands
- The Nature Conservancy Priority Areas
- SC Ecoregion Level III
- USGS HUC 8

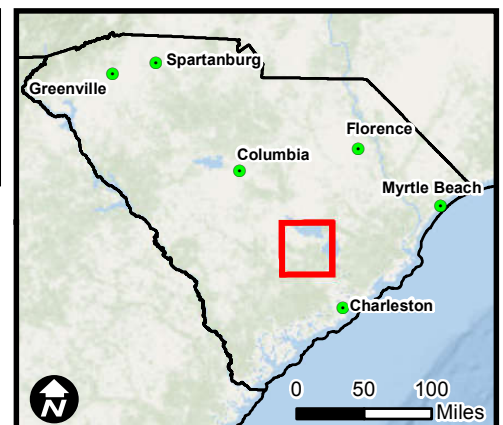
Figure 2a. Proximity to Conserved Lands Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester County
South Carolina



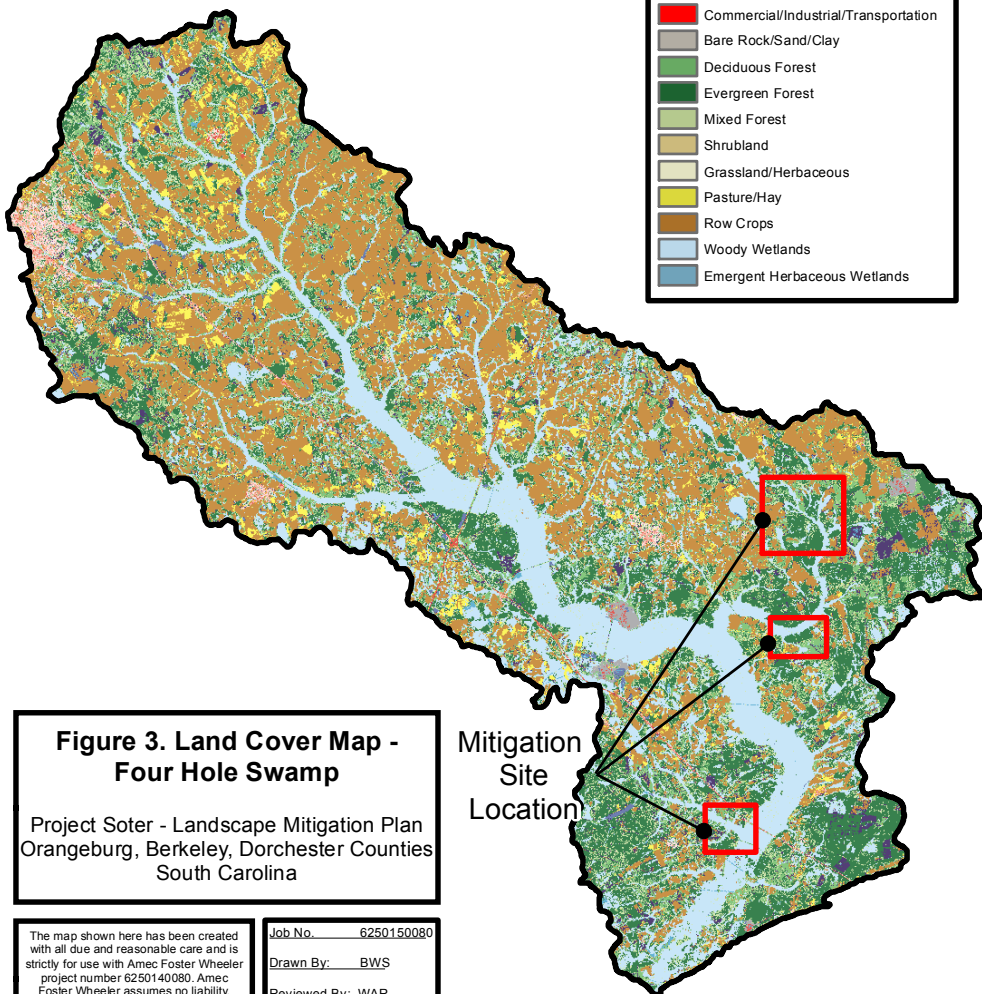
Job No. 6250150080
Drawn By: BWS
Reviewed By: WAR
Date: 03/25/2015

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1992



**Figure 3. Land Cover Map -
Four Hole Swamp**

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Orangeburg, Berkeley, Dorchester Counties
South Carolina

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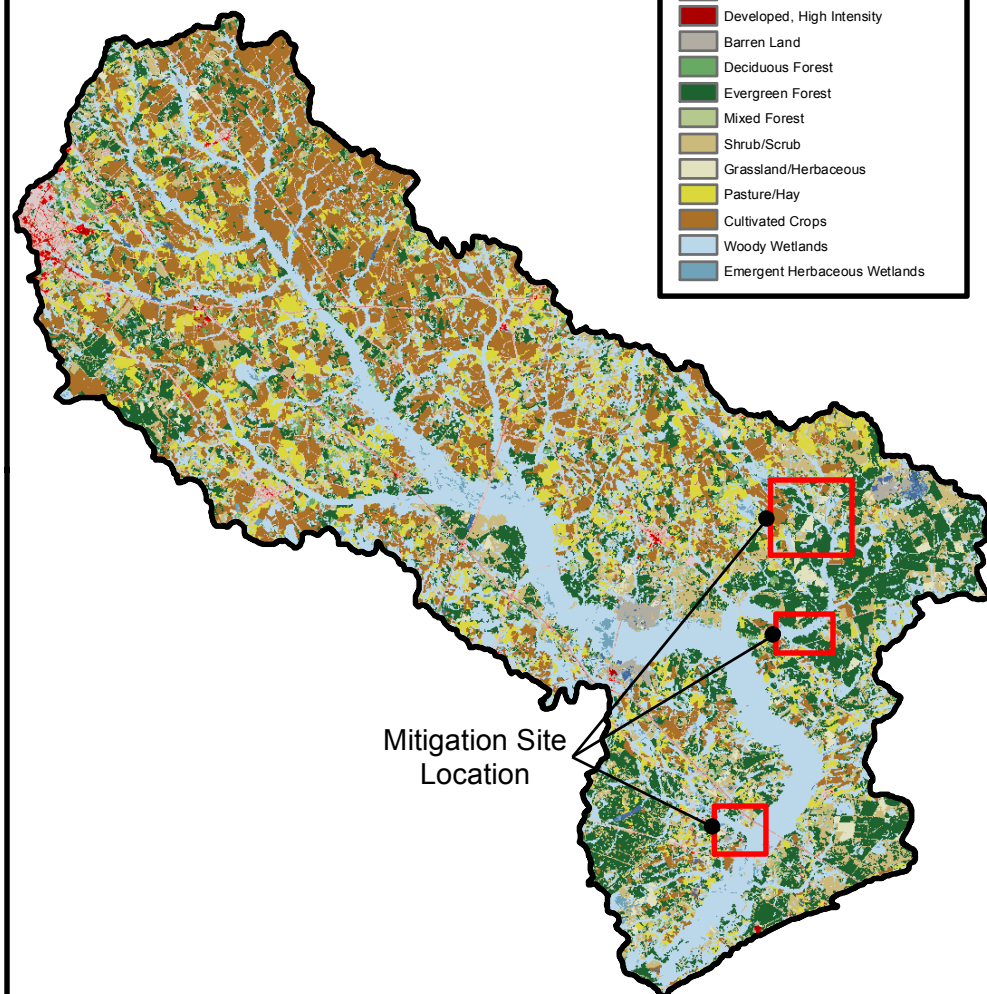
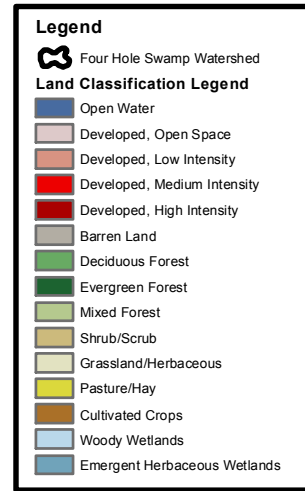
Job No. 6250150080
Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015



0 3.75 7.5
Miles



2011



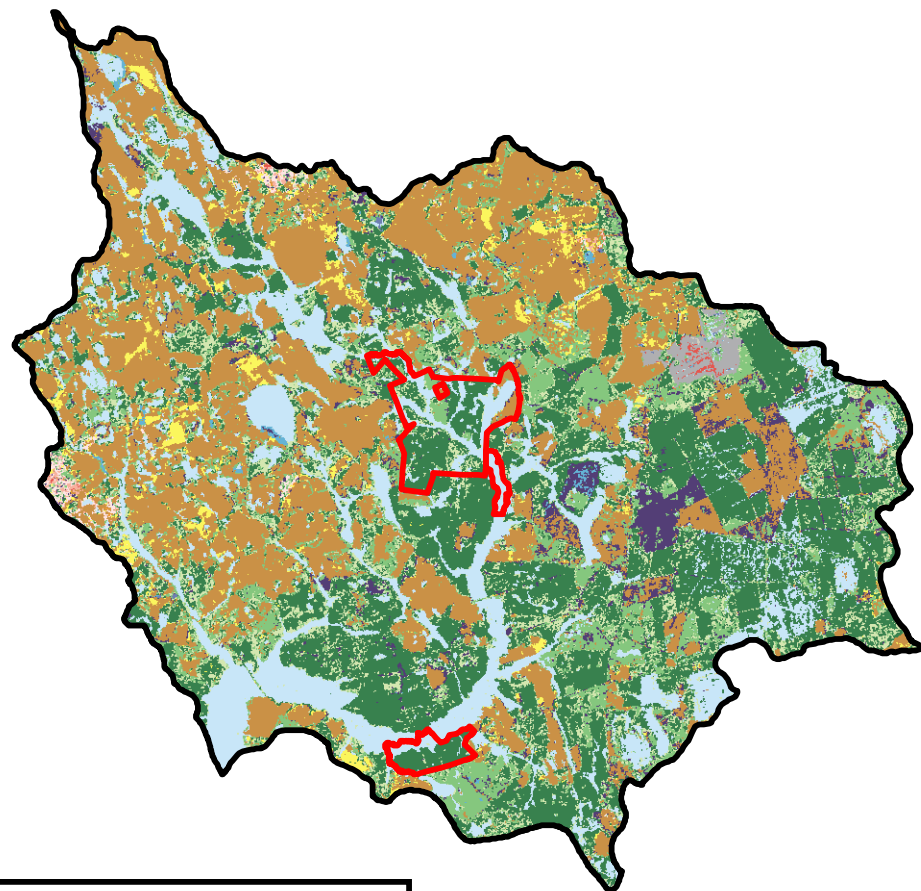
Mitigation Site
Location

0 3.75 7.5
Miles



1992

0 1.25 2.5 Miles



**Figure 4a. Land Cover Map -
Dean Swamp**

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

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Job No. 6250150080
Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015



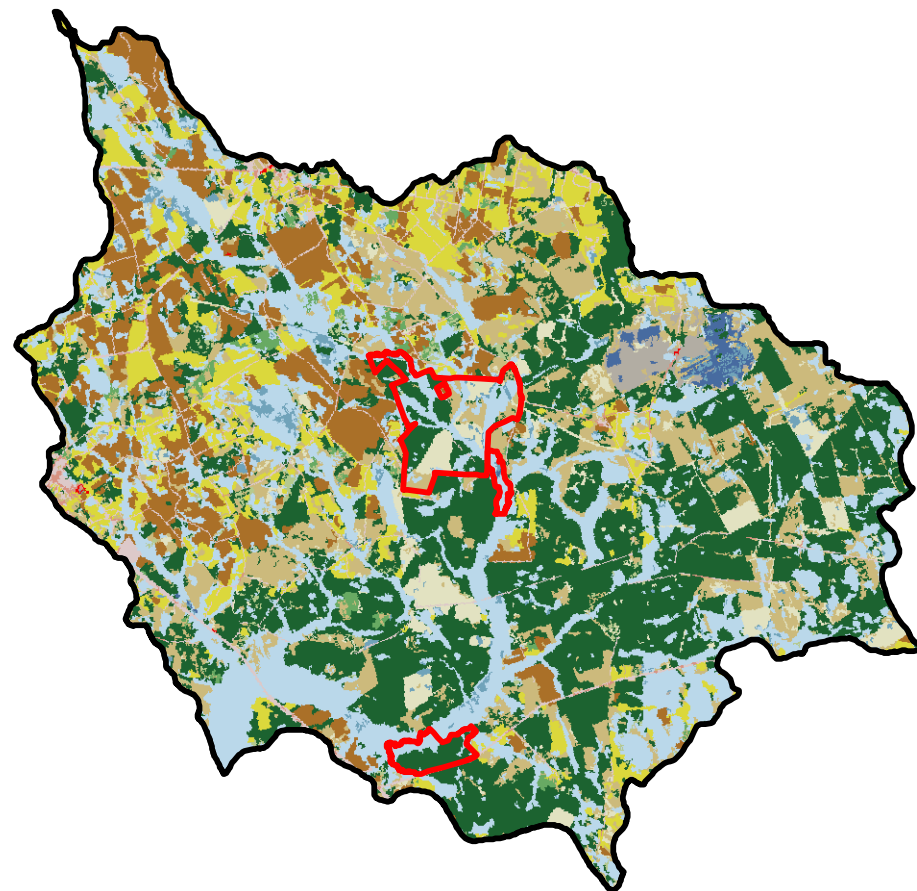
Legend

- Mitigation Project Boundary
- Dean Swamp Watershed
- Land Classification Legend**
 - Open Water
 - Urban/Recreational Grasses
 - Low Intensity Residential
 - High Intensity Residential
 - Commercial/Industrial/Transportation
 - Bare Rock/Sand/Clay
 - Deciduous Forest
 - Evergreen Forest
 - Mixed Forest
 - Shrubland
 - Grassland/Herbaceous
 - Pasture/Hay
 - Row Crops
 - Woody Wetlands
 - Emergent Herbaceous Wetlands



2011

0 1.25 2.5 Miles

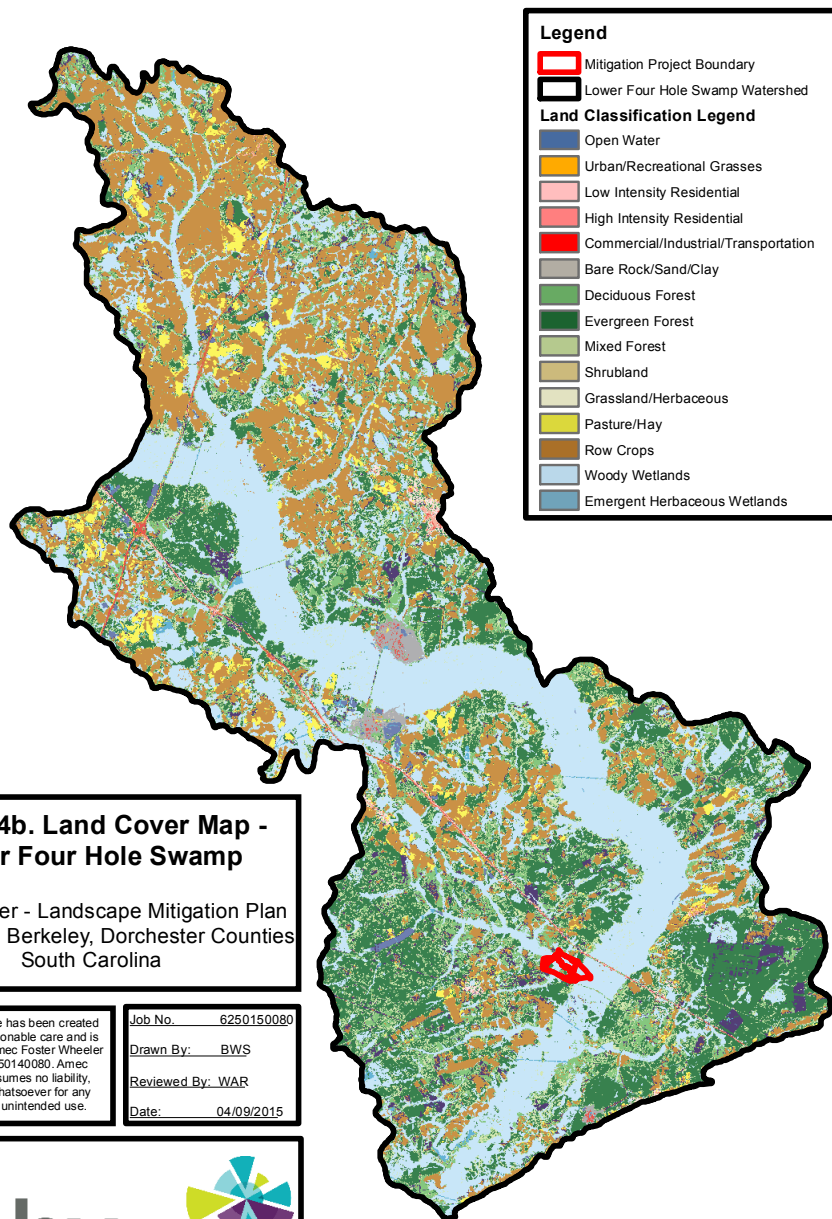


Legend

- Mitigation Project Boundary
- Dean Swamp Watershed
- Land Classification Legend**
 - Open Water
 - Developed, Open Space
 - Developed, Low Intensity
 - Developed, Medium Intensity
 - Developed, High Intensity
 - Barren Land
 - Deciduous Forest
 - Evergreen Forest
 - Mixed Forest
 - Shrub/Scrub
 - Grassland/Herbaceous
 - Pasture/Hay
 - Cultivated Crops
 - Woody Wetlands
 - Emergent Herbaceous Wetlands



1992



**Figure 4b. Land Cover Map -
Lower Four Hole Swamp**

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

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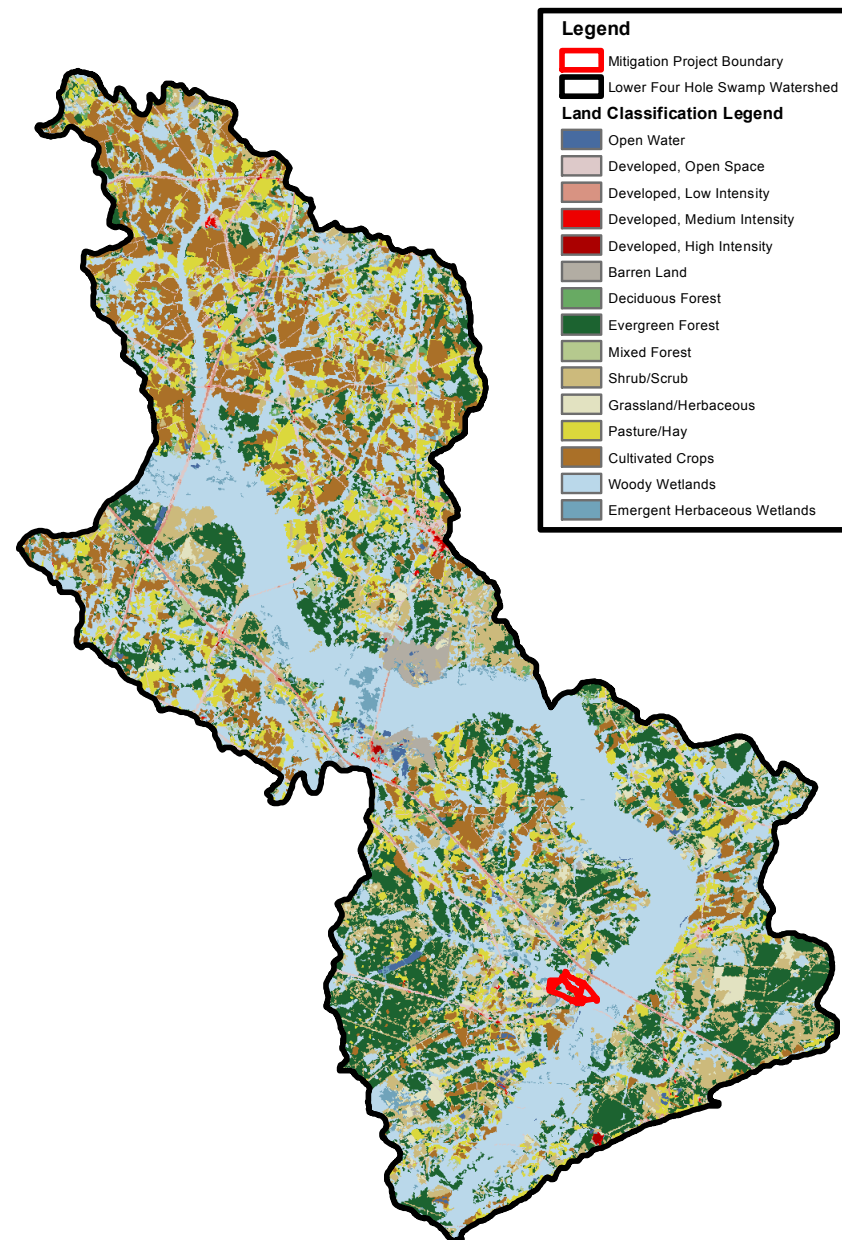
Date: 04/09/2015



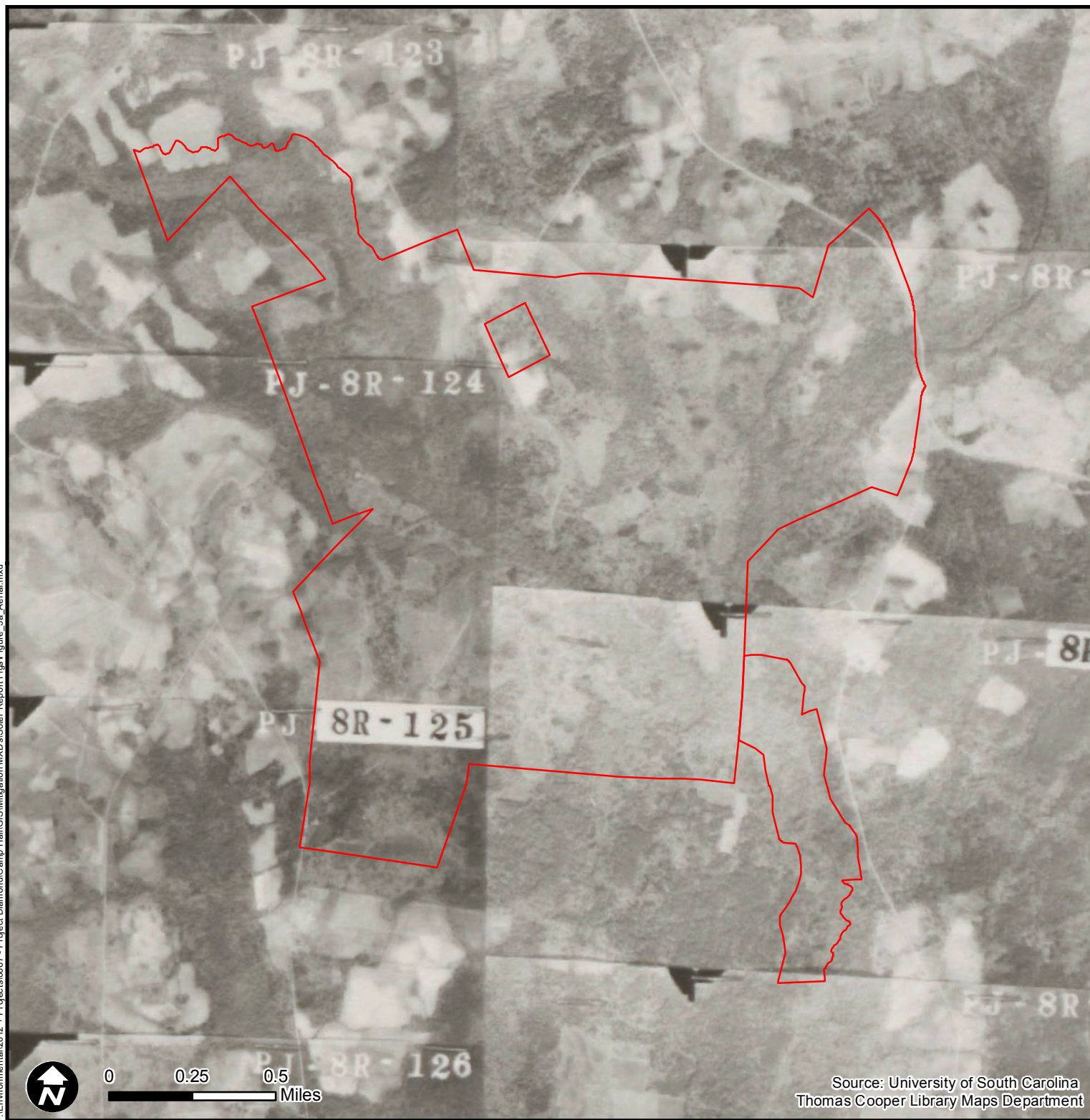
0 2.5 5
Miles



2011



0 2.5 5
Miles



Legend

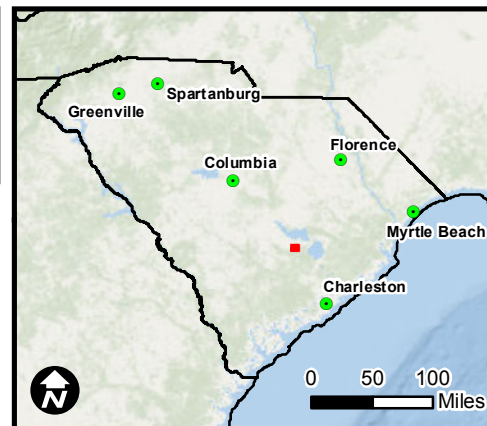
 Mitigation Project Boundary

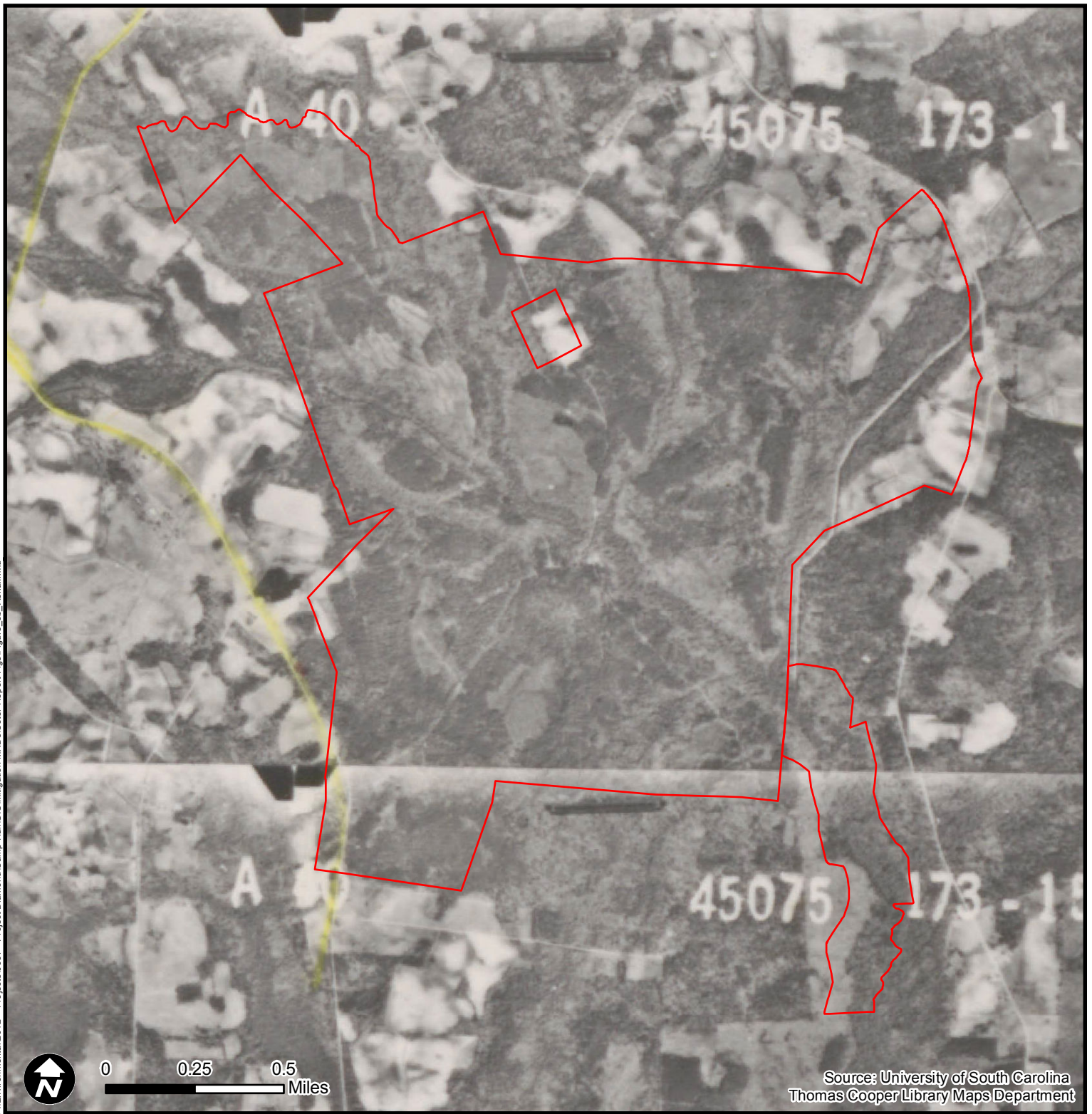
Figure 5a. Aerial Map - 1958

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

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Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015

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Legend

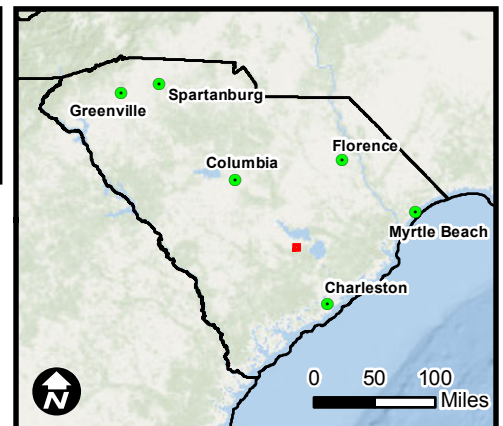
 Mitigation Project Boundary

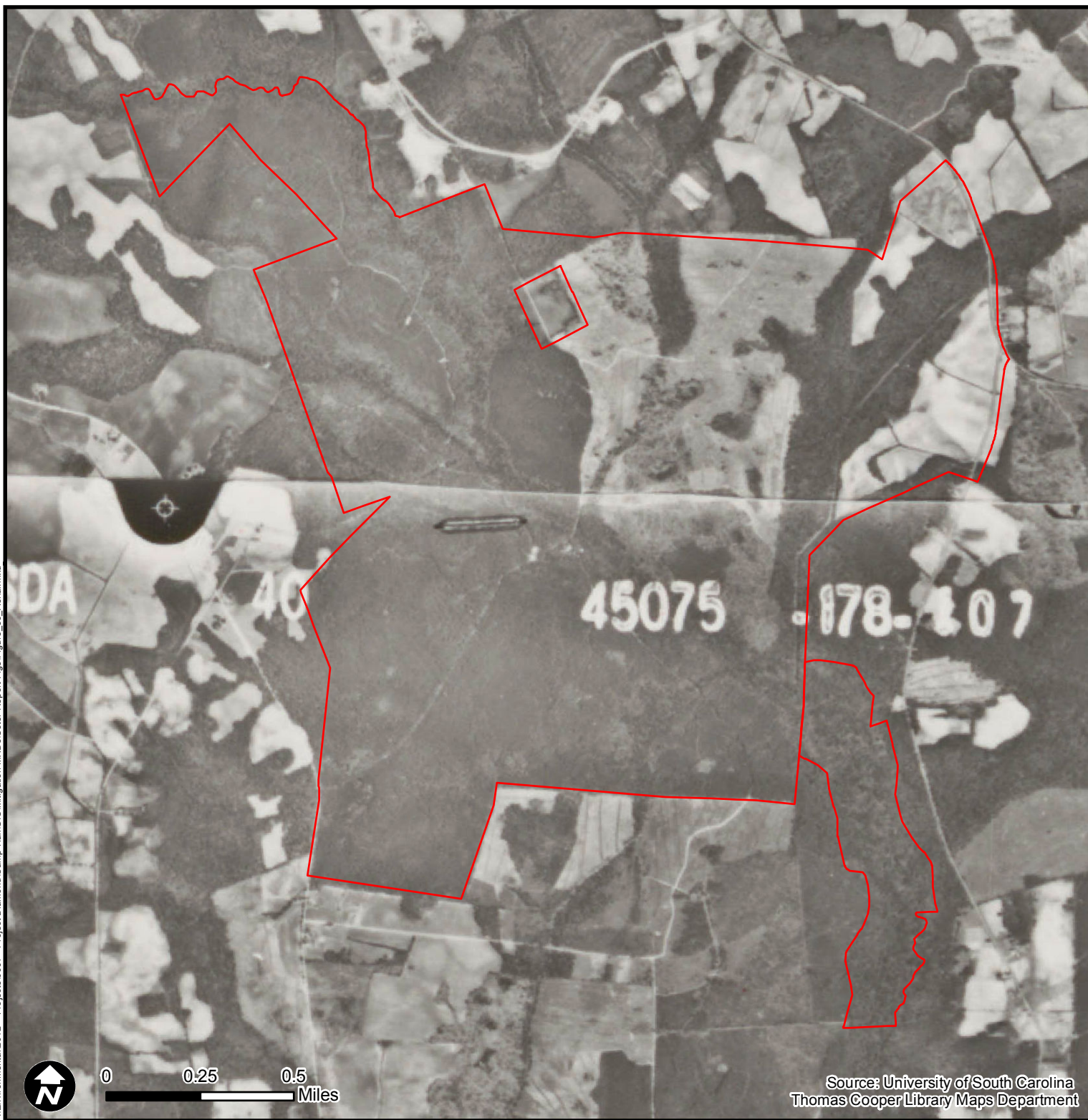
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Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015

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Figure 5b. Aerial Map - 1973

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina





Legend

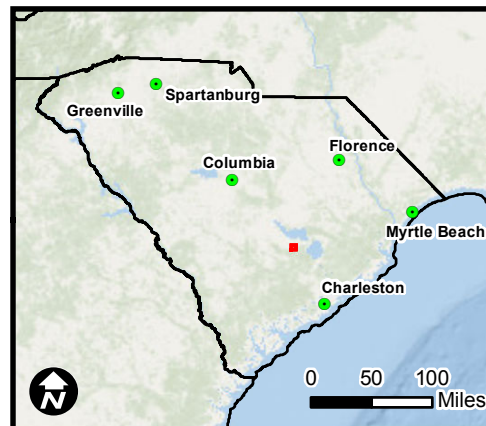
 Mitigation Project Boundary

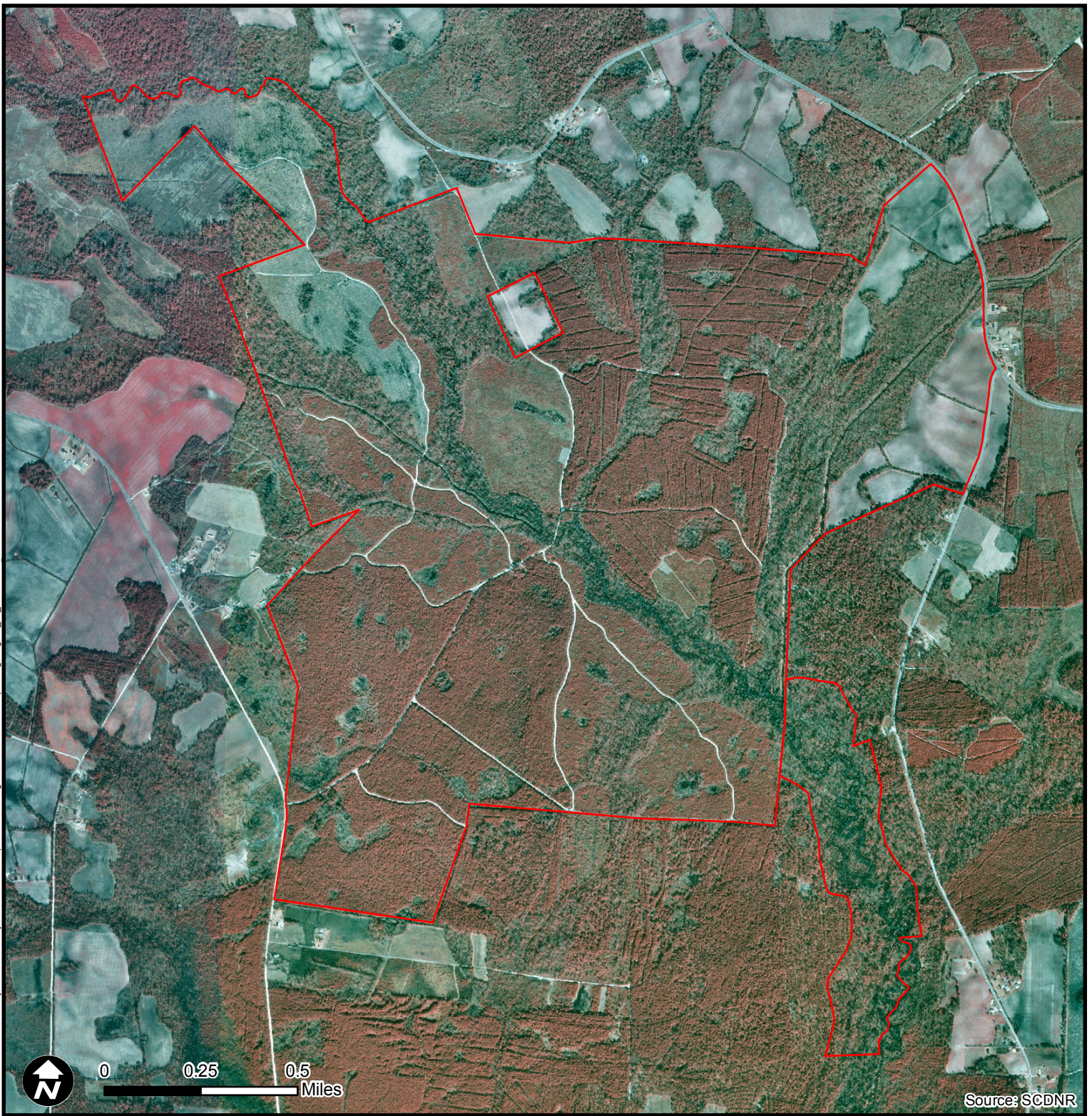
Job No. 6250150080
Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015

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Figure 5c. Aerial Map - 1981

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina





Legend

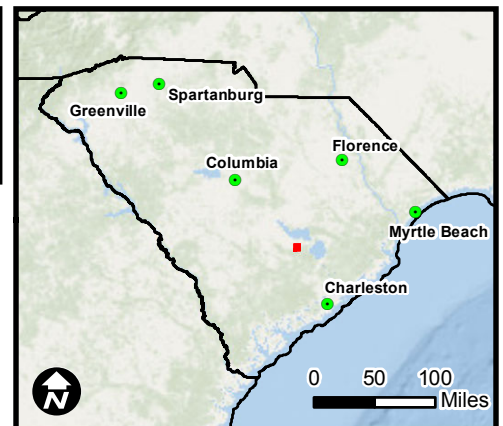
 Mitigation Project Boundary

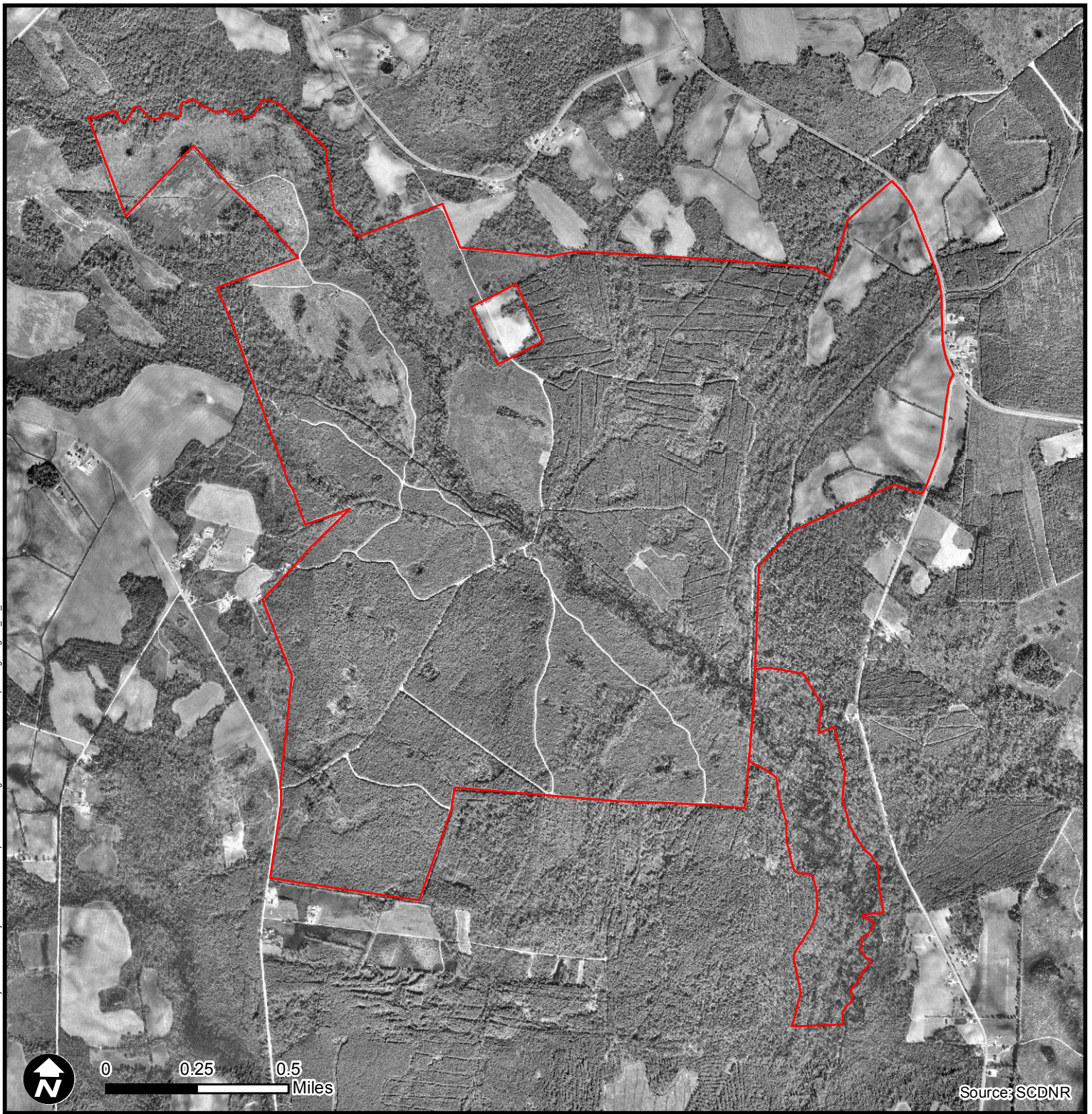
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Reviewed By: WAR
Date: 04/06/2015

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Figure 5d. Aerial Map - 1994

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina





Legend

 Mitigation Project Boundary

Job No. 6250150080

Drawn By: BWS

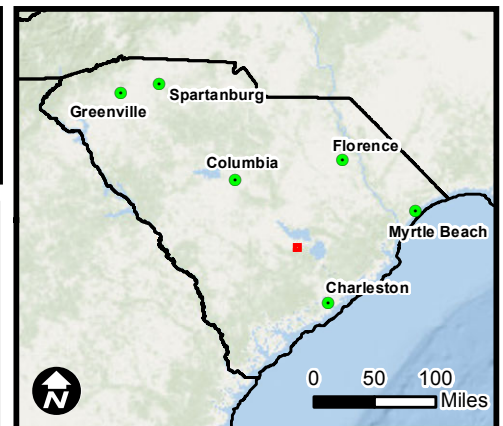
Reviewed By: WAR

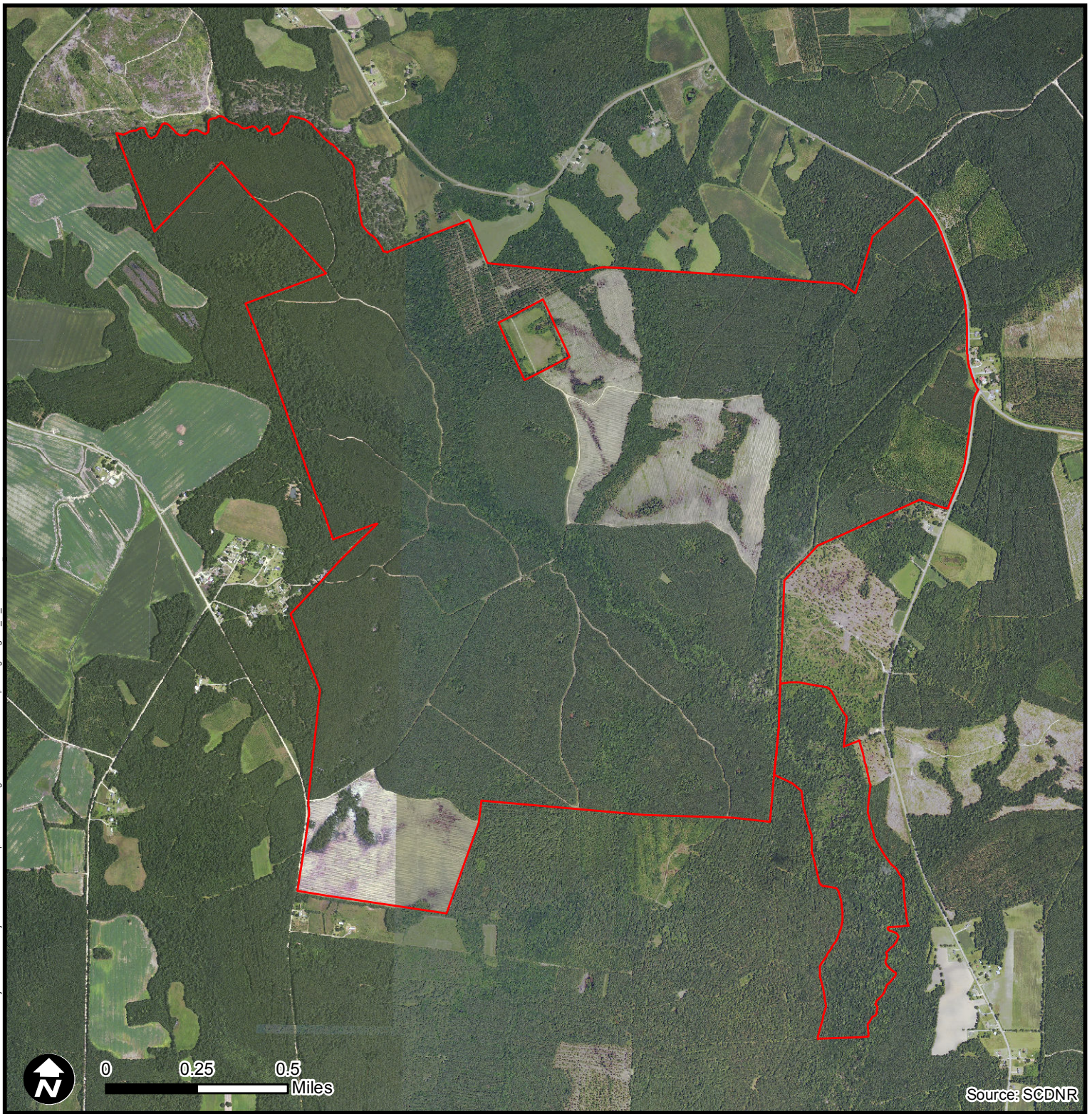
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Figure 5e. Aerial Map - 2002

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Orangeburg, Berkeley, Dorchester Counties
South Carolina





Legend

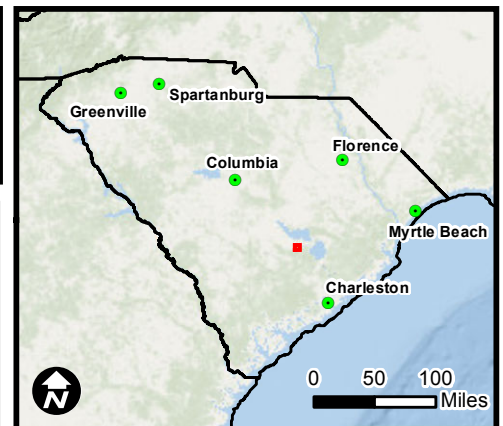
 Mitigation Project Boundary

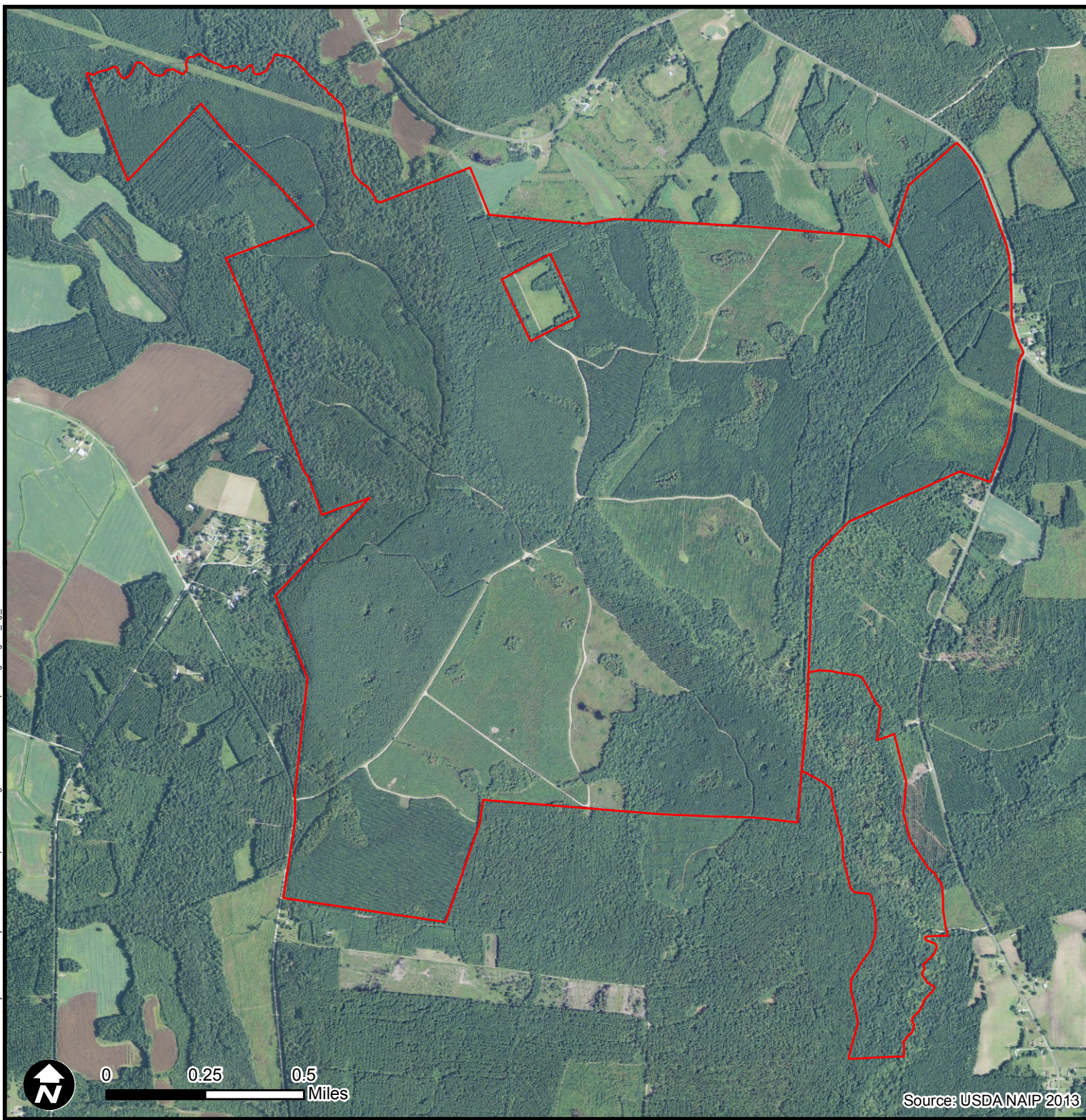
Figure 5f. Aerial Map - 2005

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

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Drawn By: BWS
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Legend

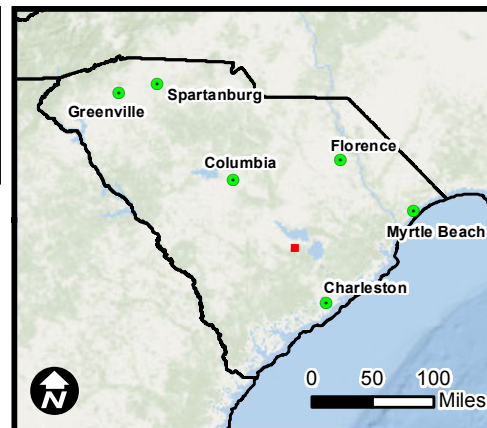
 Mitigation Project Boundary

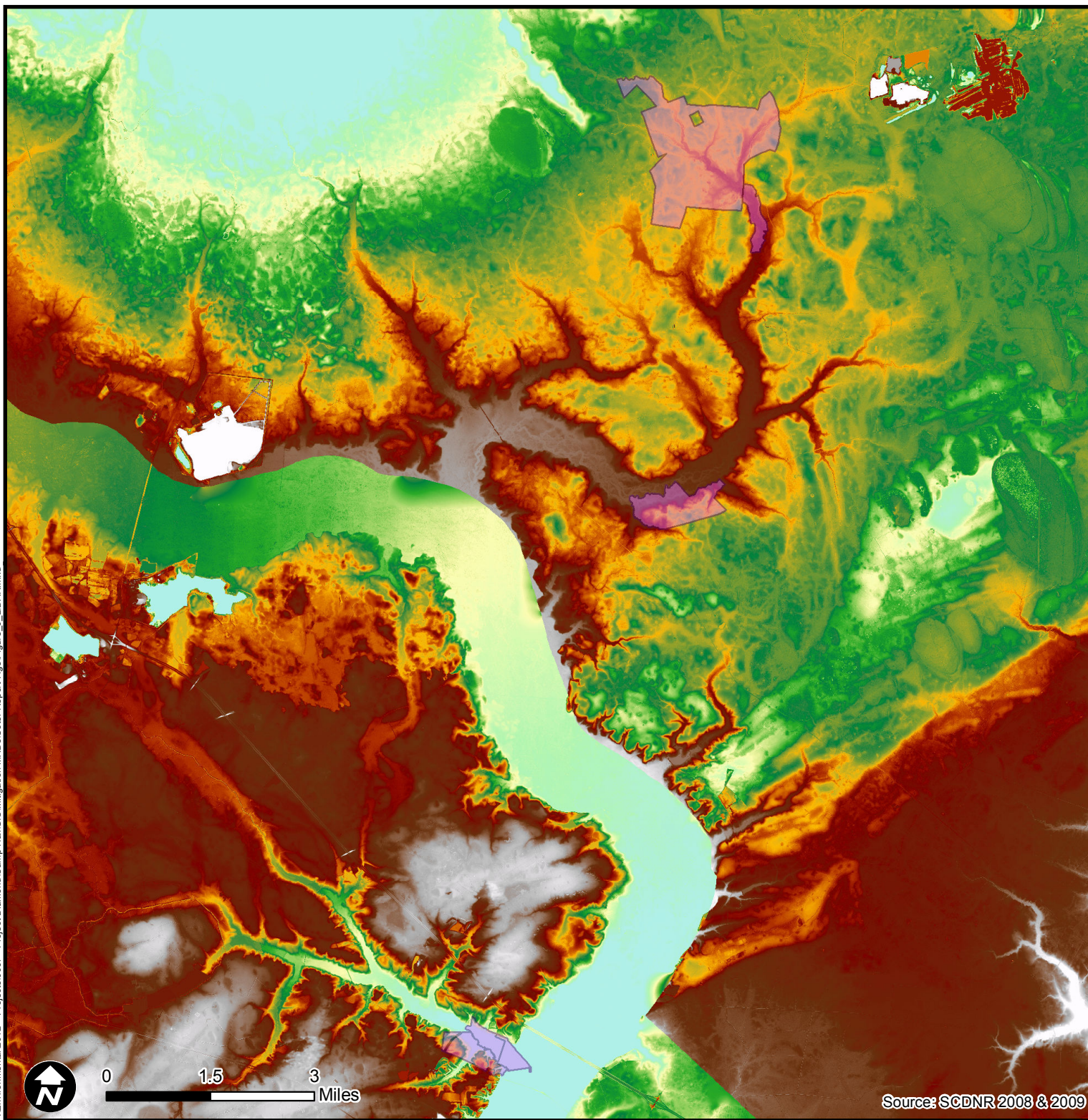
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Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015

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Figure 5g. Aerial Map - 2013

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina





Legend

Mitigation Project Boundary

Elevation (ft)
 High : 110
 Low : 45

Figure 6. LiDAR Map

Project Soter - Landscape Mitigation Plan
 Orangeburg, Berkeley, Dorchester Counties
 South Carolina

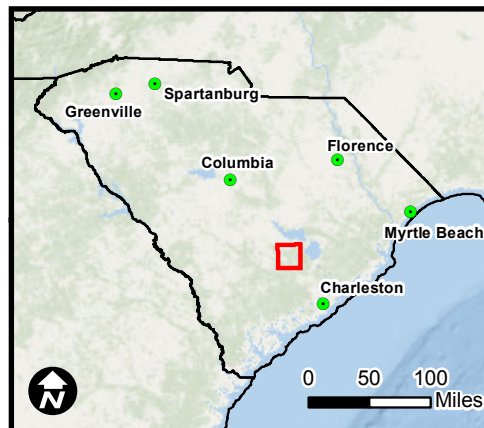
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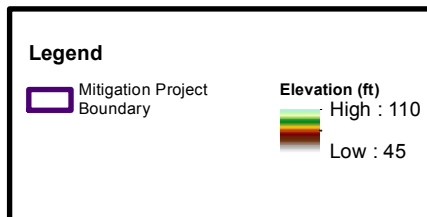
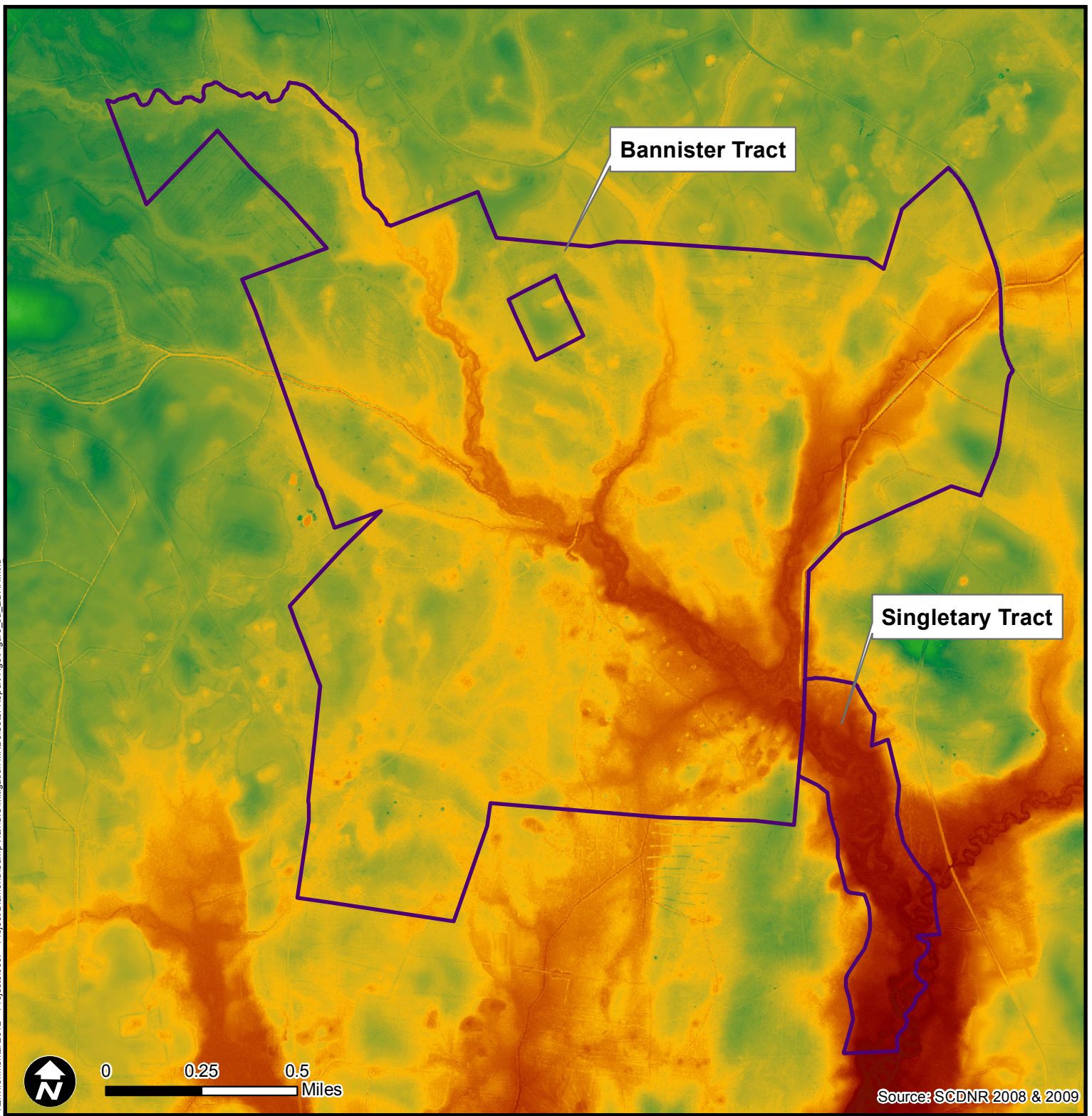
Drawn By: BWS

Reviewed By: WAR

Date: 04/06/2015

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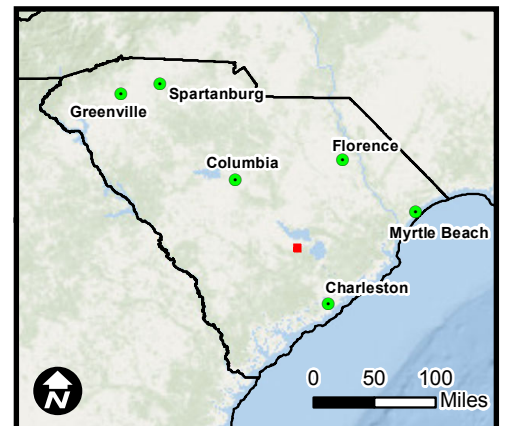


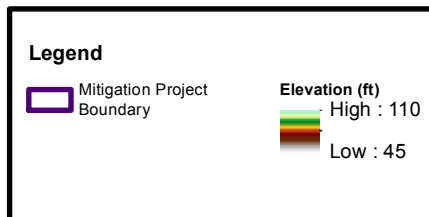
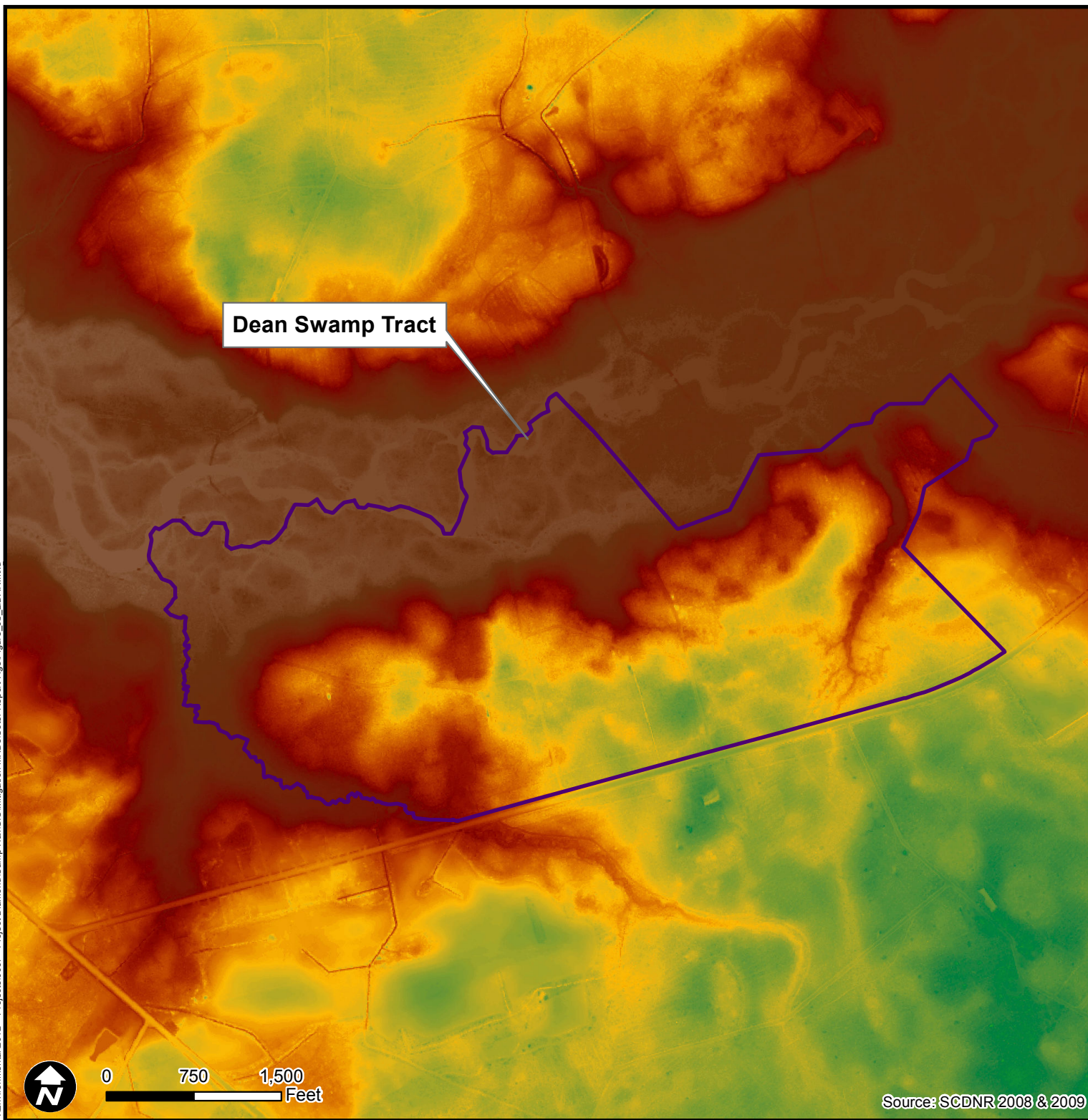


Job No. 6250150080
Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015

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Figure 6a. LiDAR Map
Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

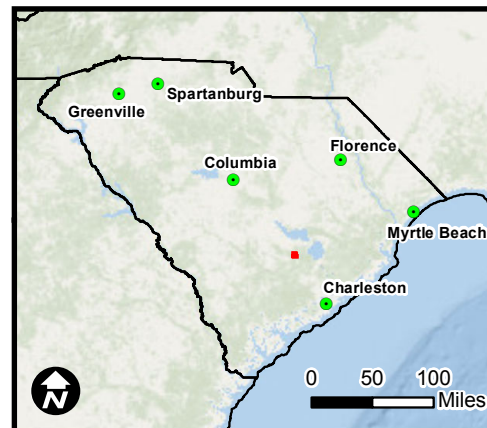




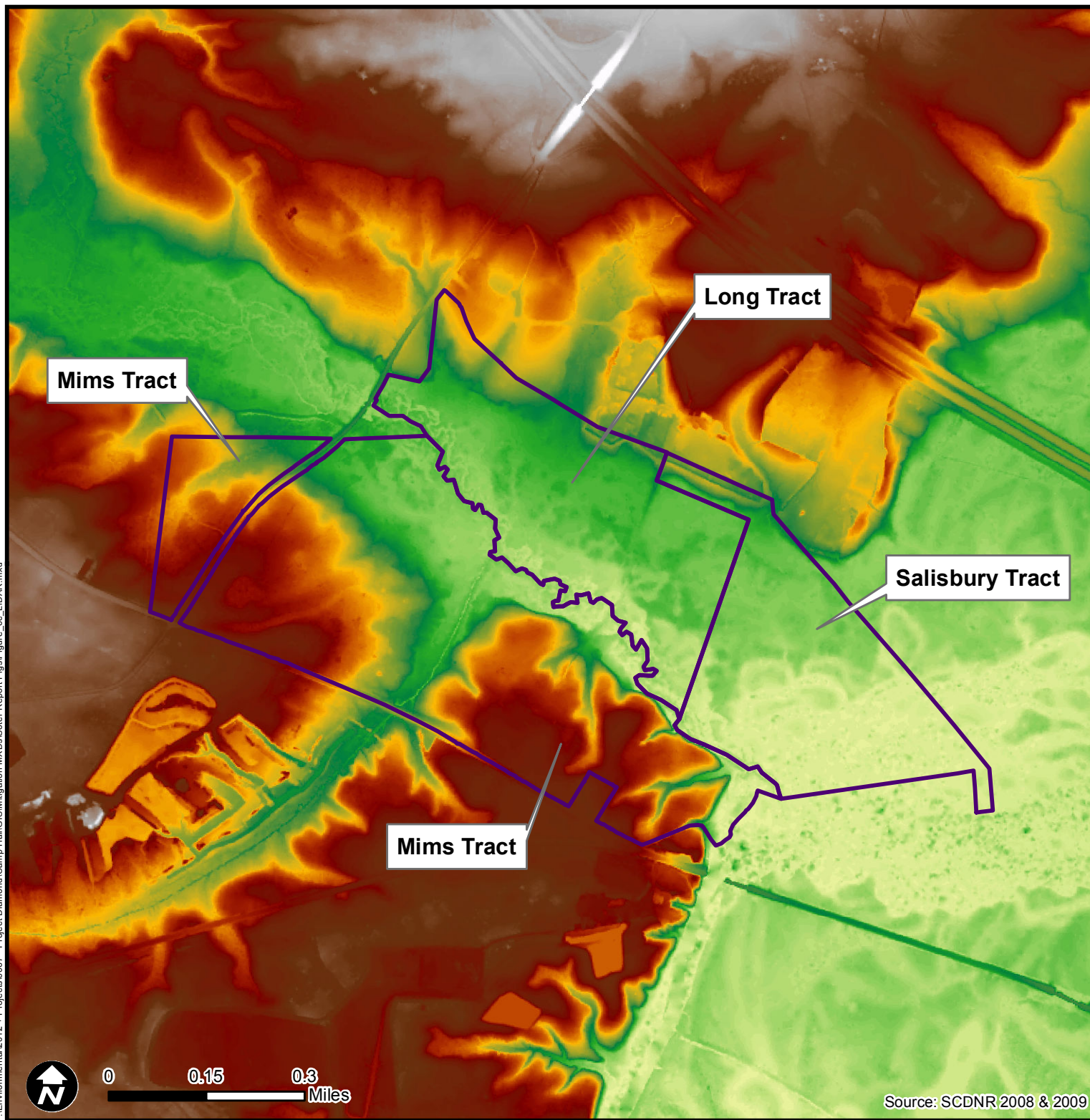
Job No. 6250150080
Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015

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Figure 6b. LiDAR Map
Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina



P:\Environmental\2012 + Projects\0067 - Project Diamond\Camp Hill\GIS\Mitigation MXDs\Soter Report Figs\Figure_6c_LiDAR.mxd



Legend

Mitigation Project Boundary

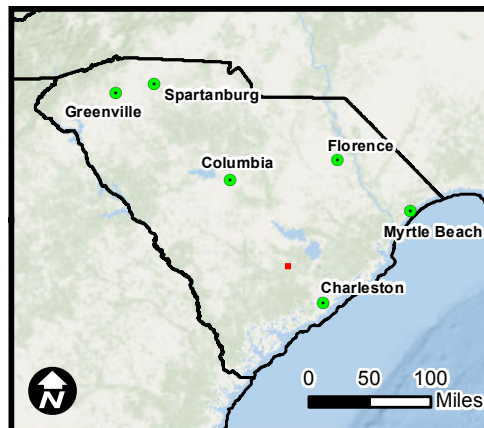
Elevation (ft)
High : 110
Low : 25

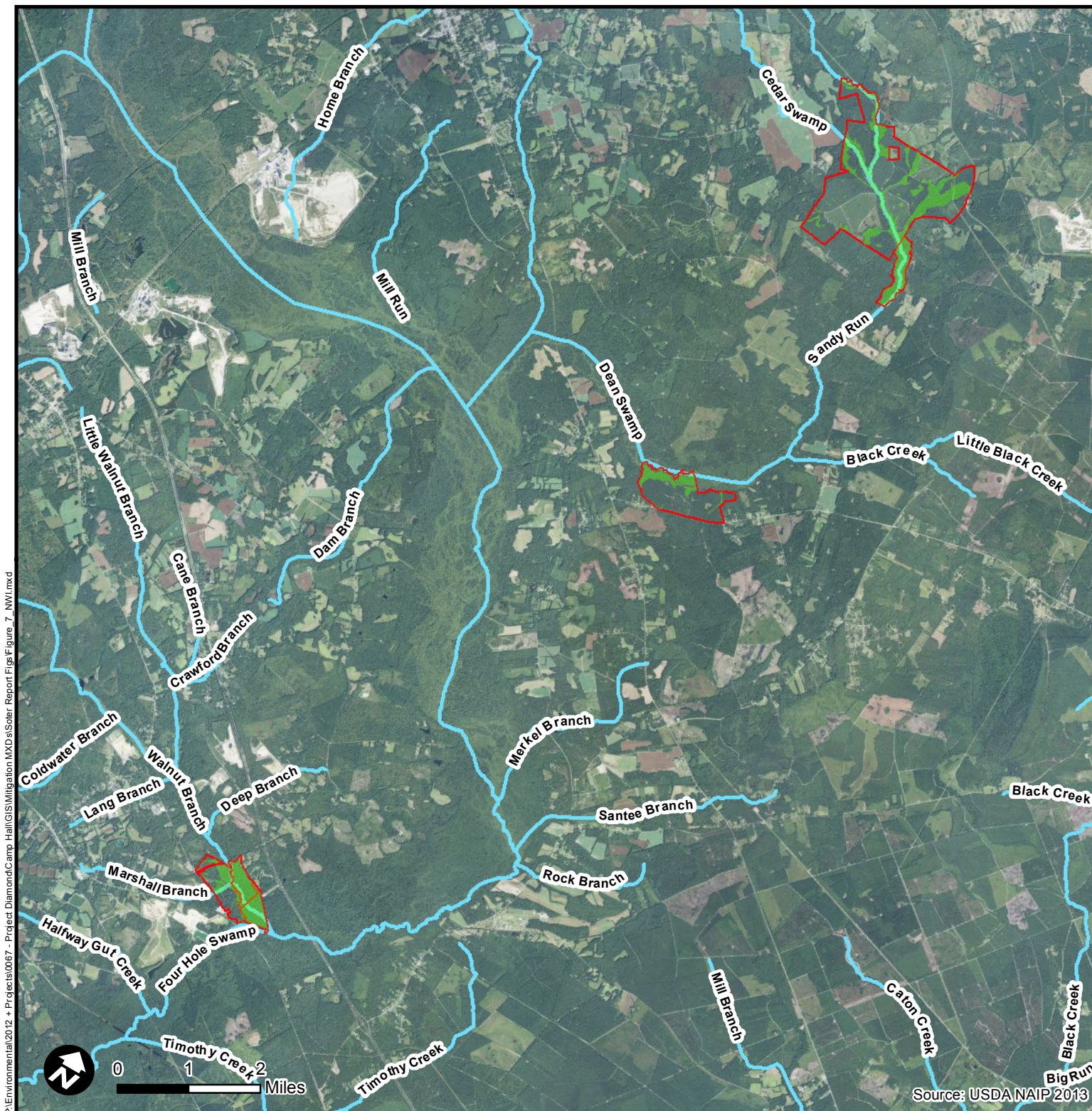
Figure 6c. LiDAR Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

Job No. 6250150080
Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015

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Legend

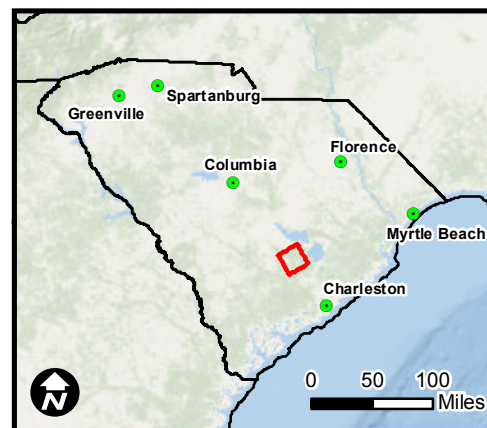
- Mitigation Project Boundary
- USGS Streams
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

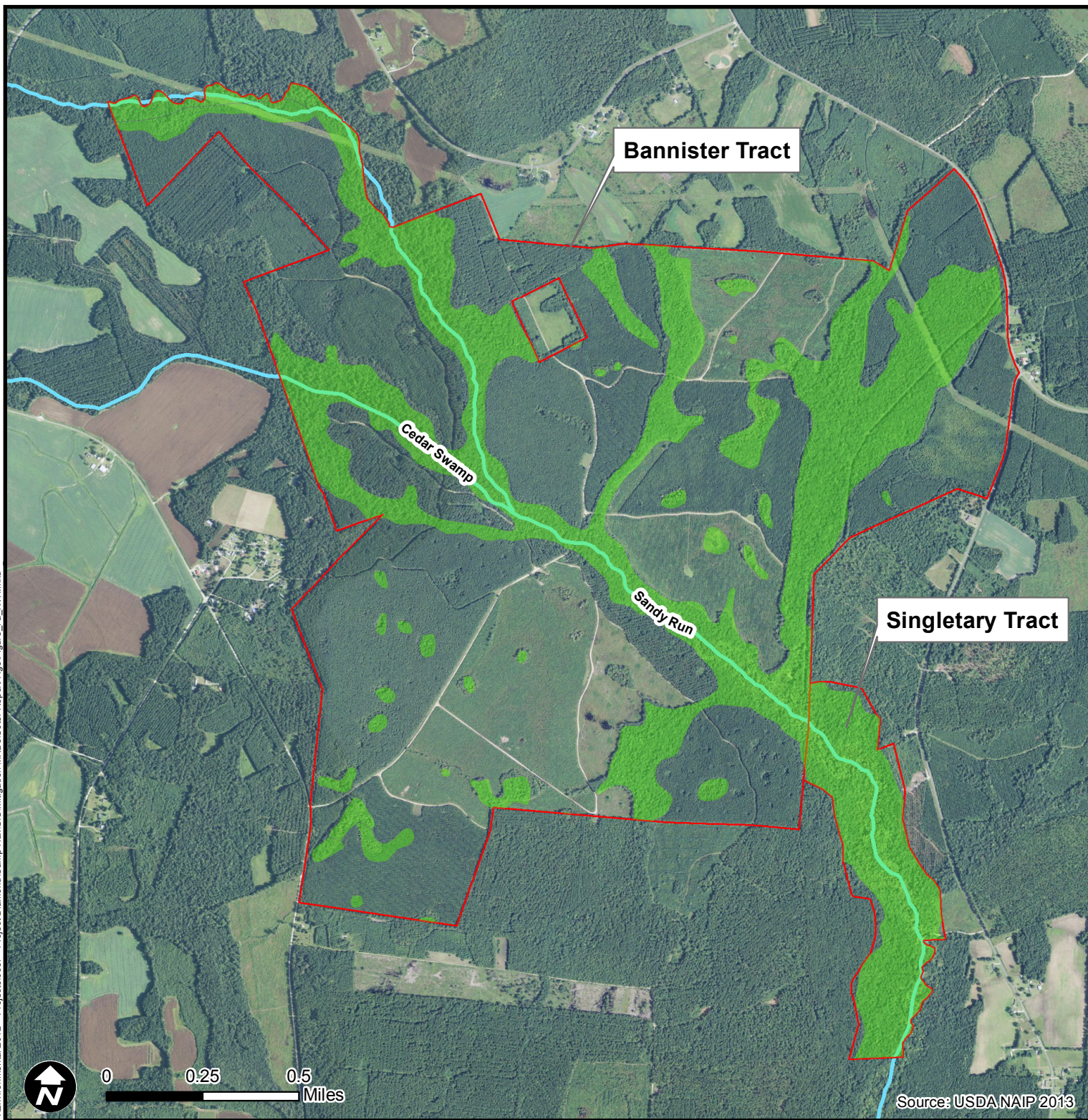
Job No. 6250150080
 Drawn By: BWS
 Reviewed By: WAR
 Date: 04/06/2015

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Figure 7. National Wetland Inventory Map

Project Soter - Landscape Mitigation Plan
 Orangeburg, Berkeley, Dorchester Counties
 South Carolina





Legend

- Mitigation Project Boundary
- USGS Streams
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

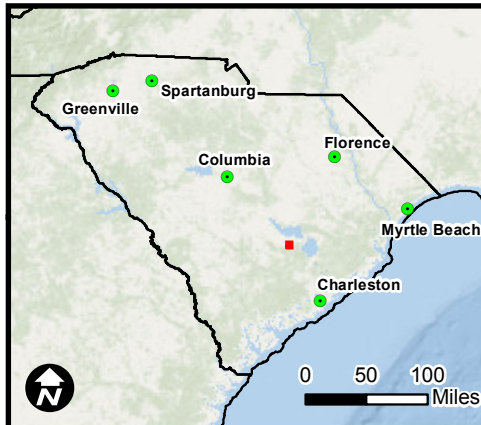
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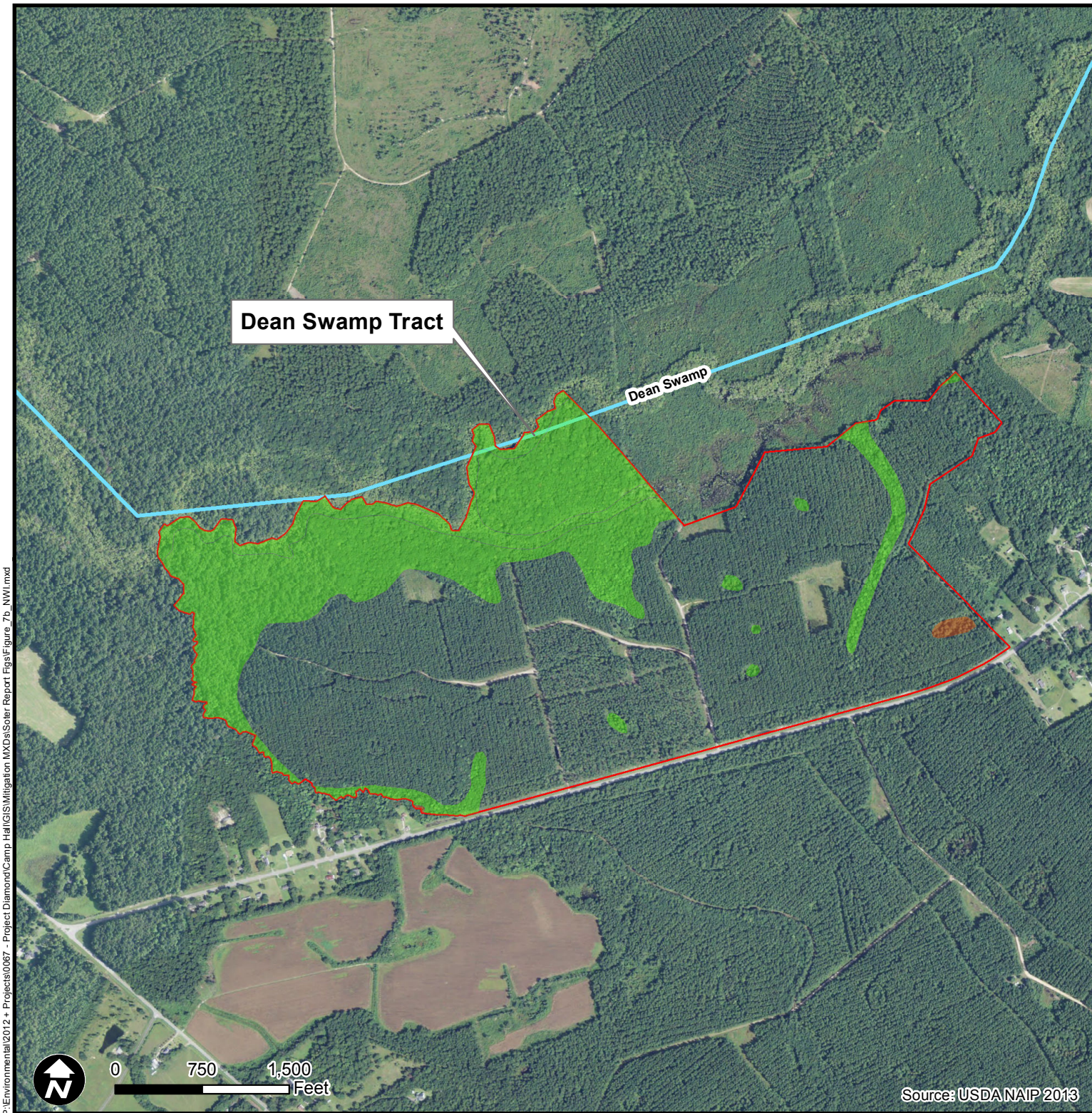
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Figure 7a. National Wetland Inventory Map
 Project Soter - Landscape Mitigation Plan
 Orangeburg, Berkeley, Dorchester Counties
 South Carolina

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Legend

- Mitigation Project Boundary
- USGS Streams
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

Job No. 6250150080

Drawn By: BWS

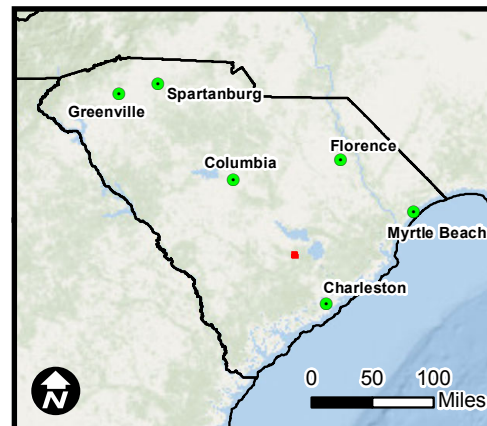
Reviewed By: WAR

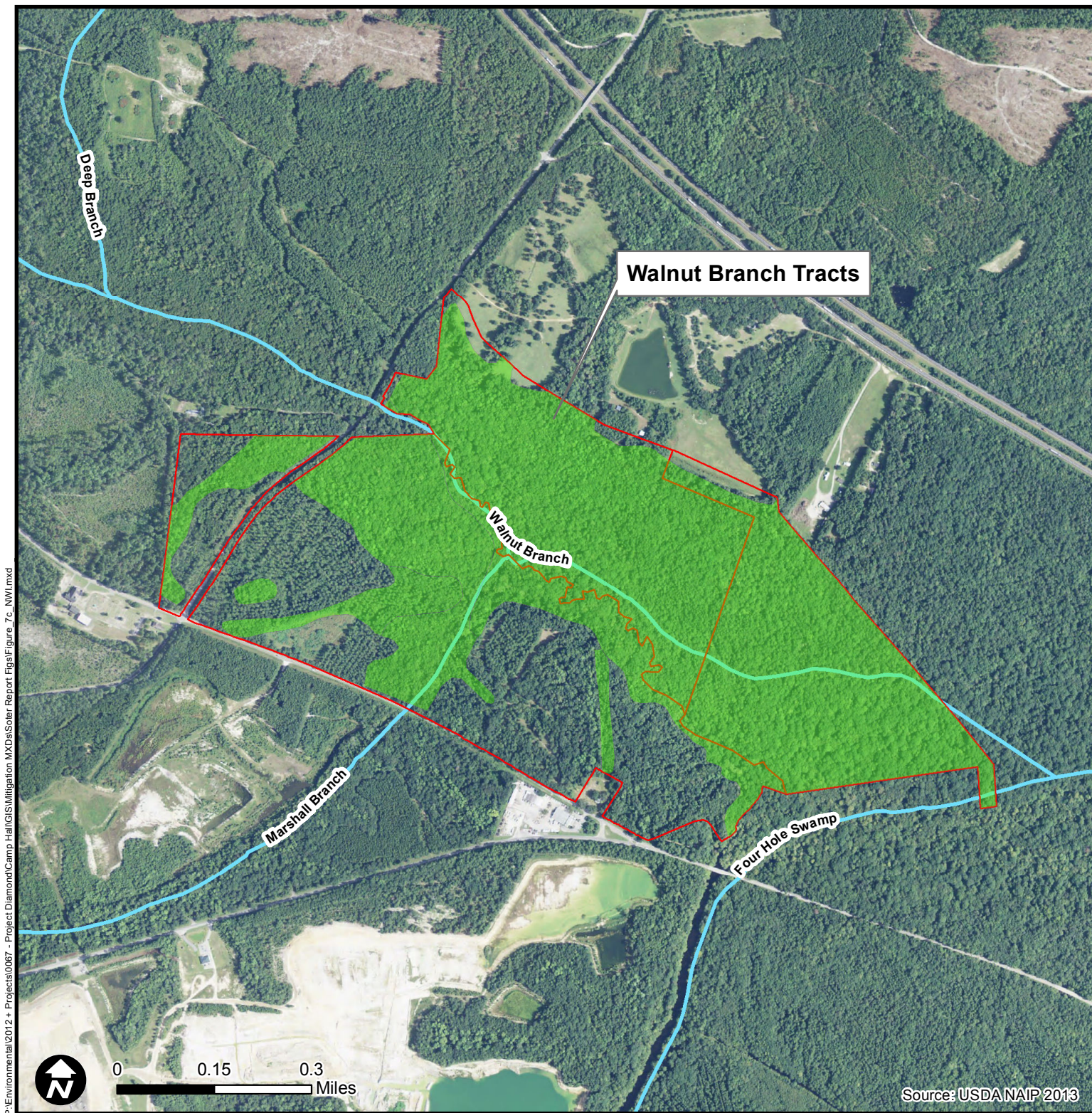
Date: 04/06/2015

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Figure 7b. National Wetland Inventory Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina





Legend

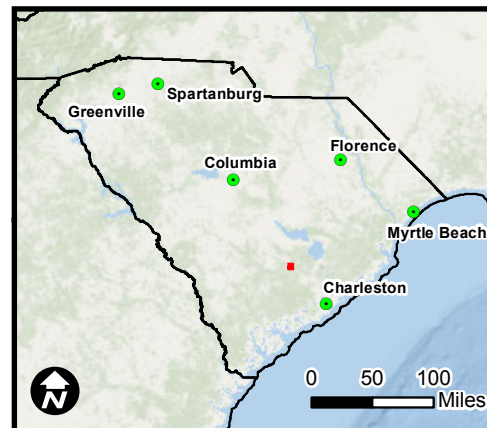
- Mitigation Project Boundary
- USGS Streams
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

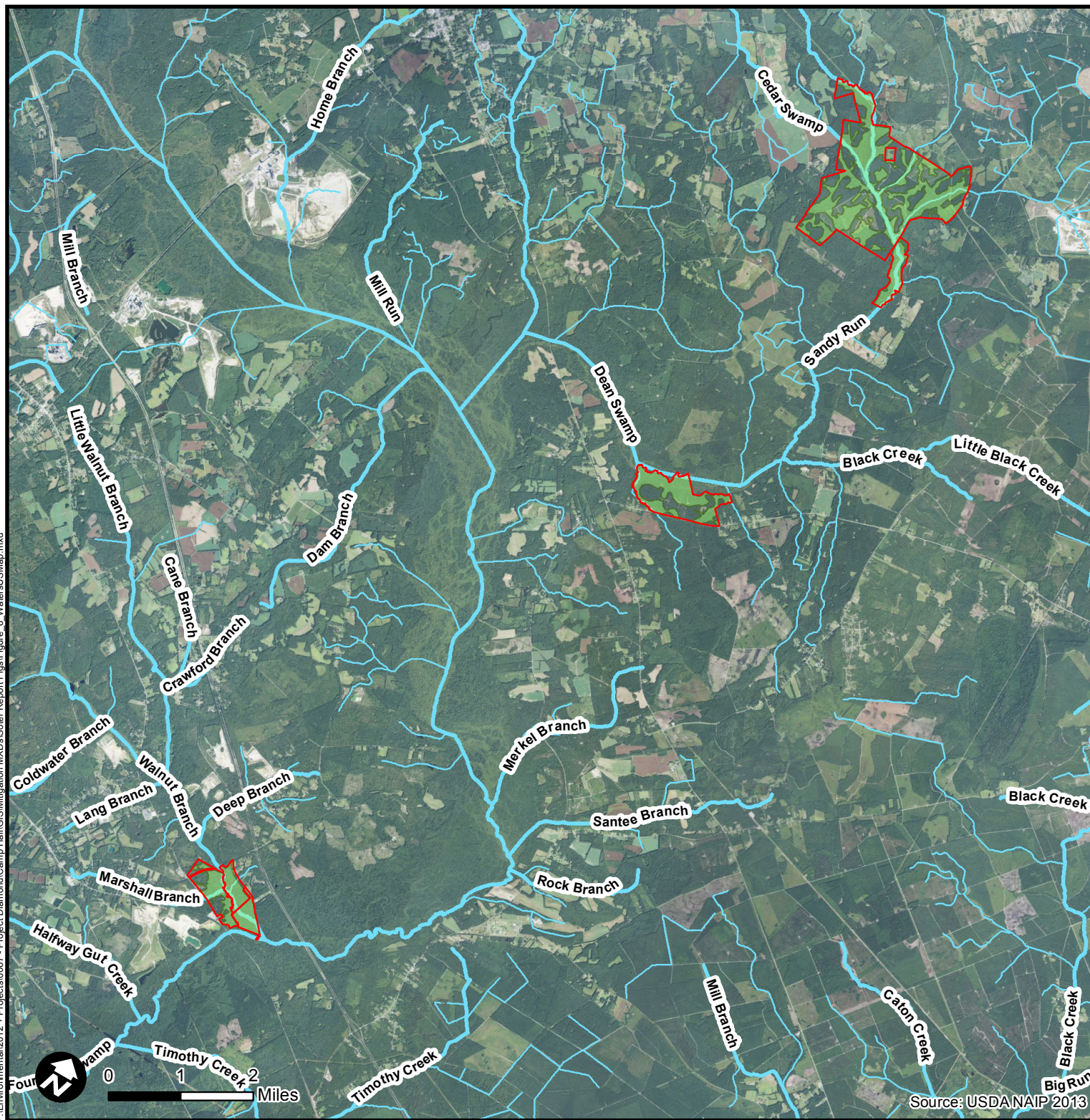
Job No. 6250150080
 Drawn By: BWS
 Reviewed By: WAR
 Date: 04/06/2015

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Figure 7c. National Wetland Inventory Map

Project Soter - Landscape Mitigation Plan
 Orangeburg, Berkeley, Dorchester Counties
 South Carolina





Legend




-  Mitigation Project Boundary
-  Estimated Wetlands (~1,533 Acres)
-  USGS Streams

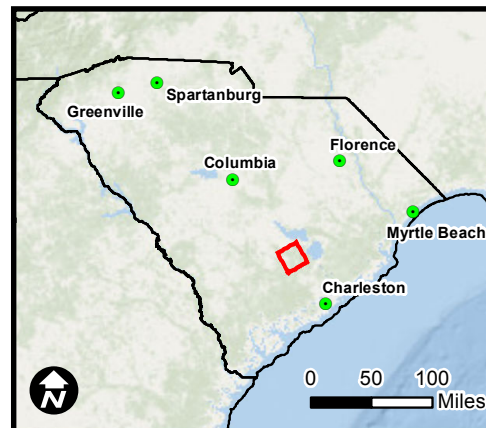
Figure 8. Approximate Waters of the US Map

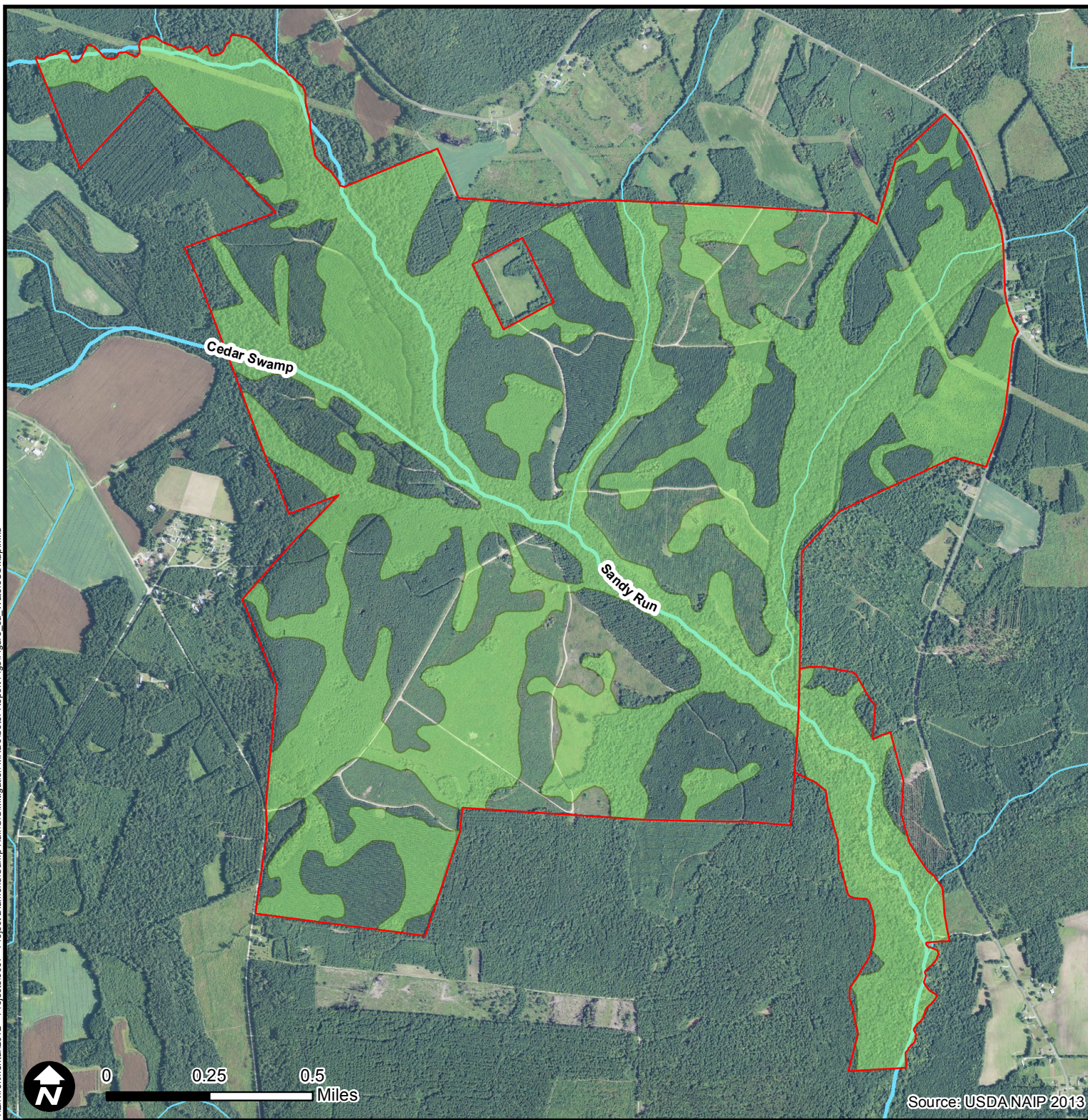
Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina



Job No.
6250150080
Drawn By:
BWS
Reviewed By:
WAR
Date:
03/25/2015

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.





Legend




-  Mitigation Project Boundary
-  Estimated Wetlands (~1,010 Acres)
-  USGS Streams

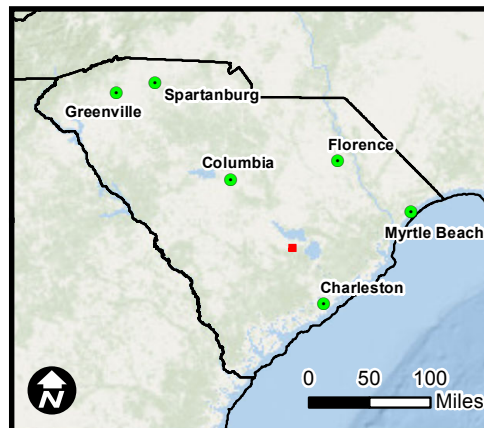
Figure 8a. Approximate Waters of the US Map

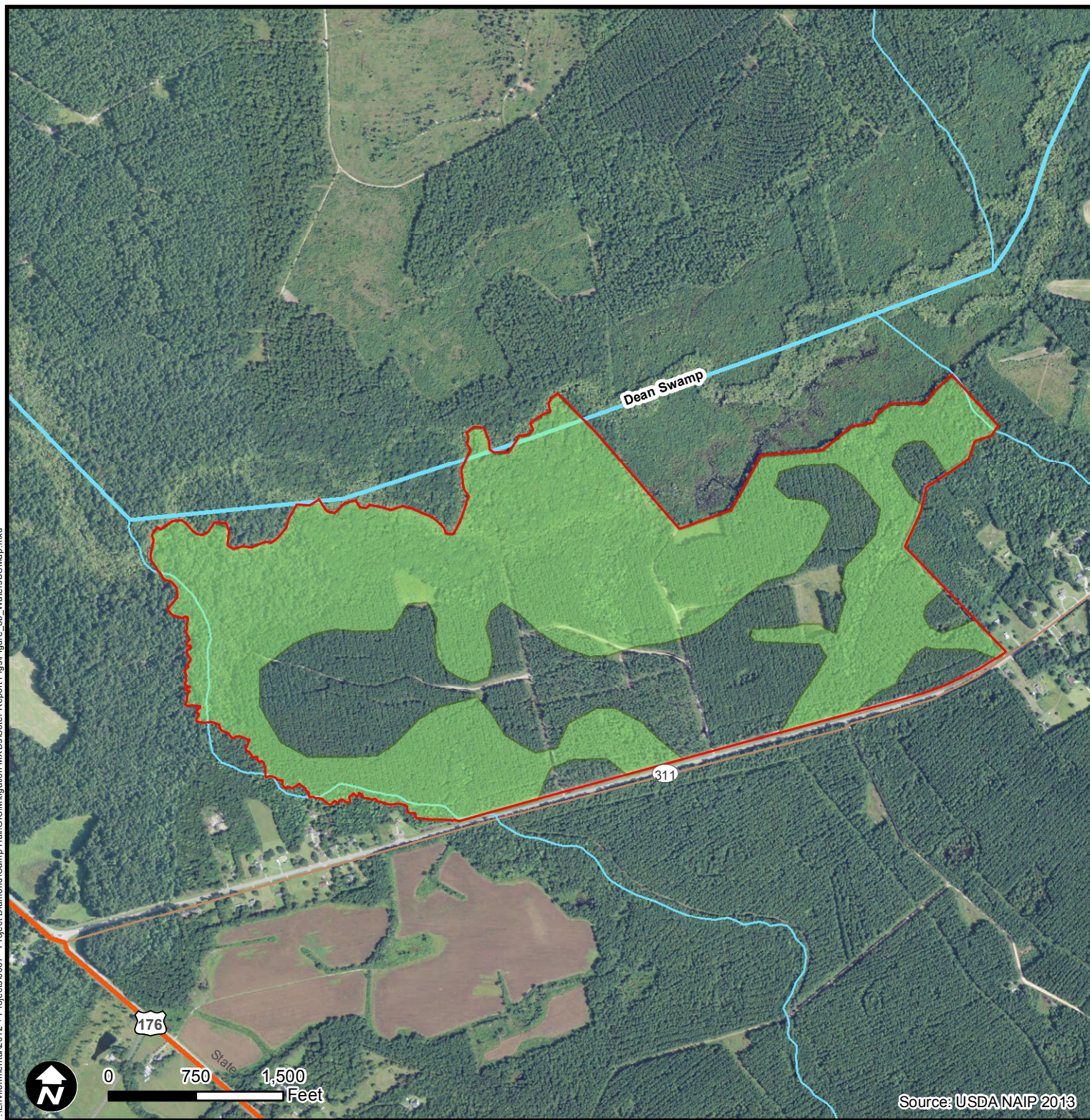
Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina



Job No.
6250150080
Drawn By:
BWS
Reviewed By:
WAR
Date:
03/25/2015

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Legend

- Mitigation Project Boundary
- Estimated Wetlands (~258 Acres)
- USGS Streams

Job No.
6250150080

Drawn By:
BWS

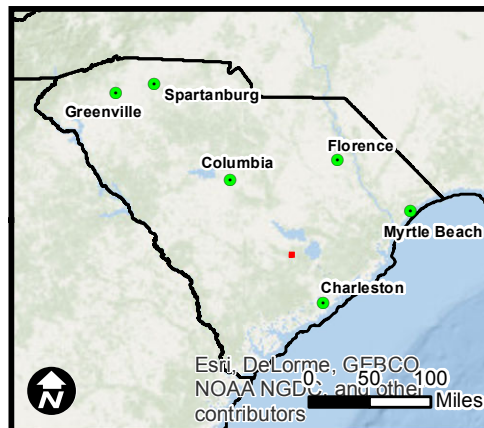
Reviewed By:
WAR

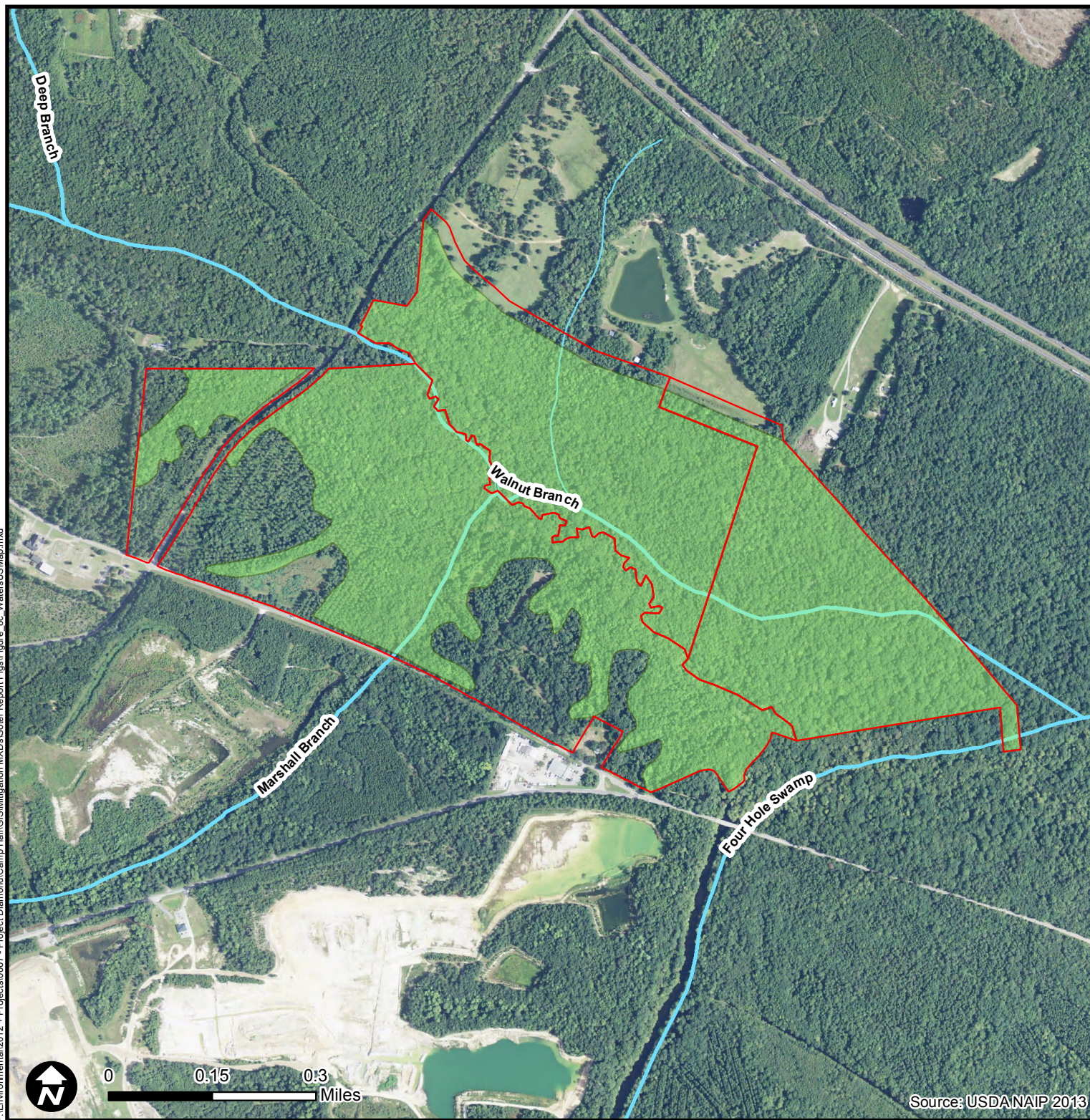
Date:
03/25/2015

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Figure 8b. Approximate Waters of the US Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina





Legend

- Mitigation Project Boundary
- Estimated Wetlands (~265 Acres)
- USGS Streams

Figure 8c. Approximate Waters of the US Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina



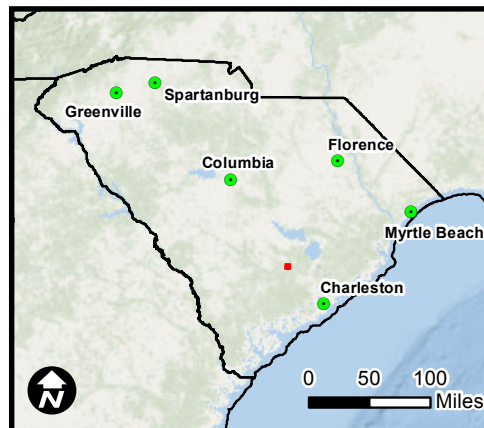
Job No.
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Drawn By:
BWS

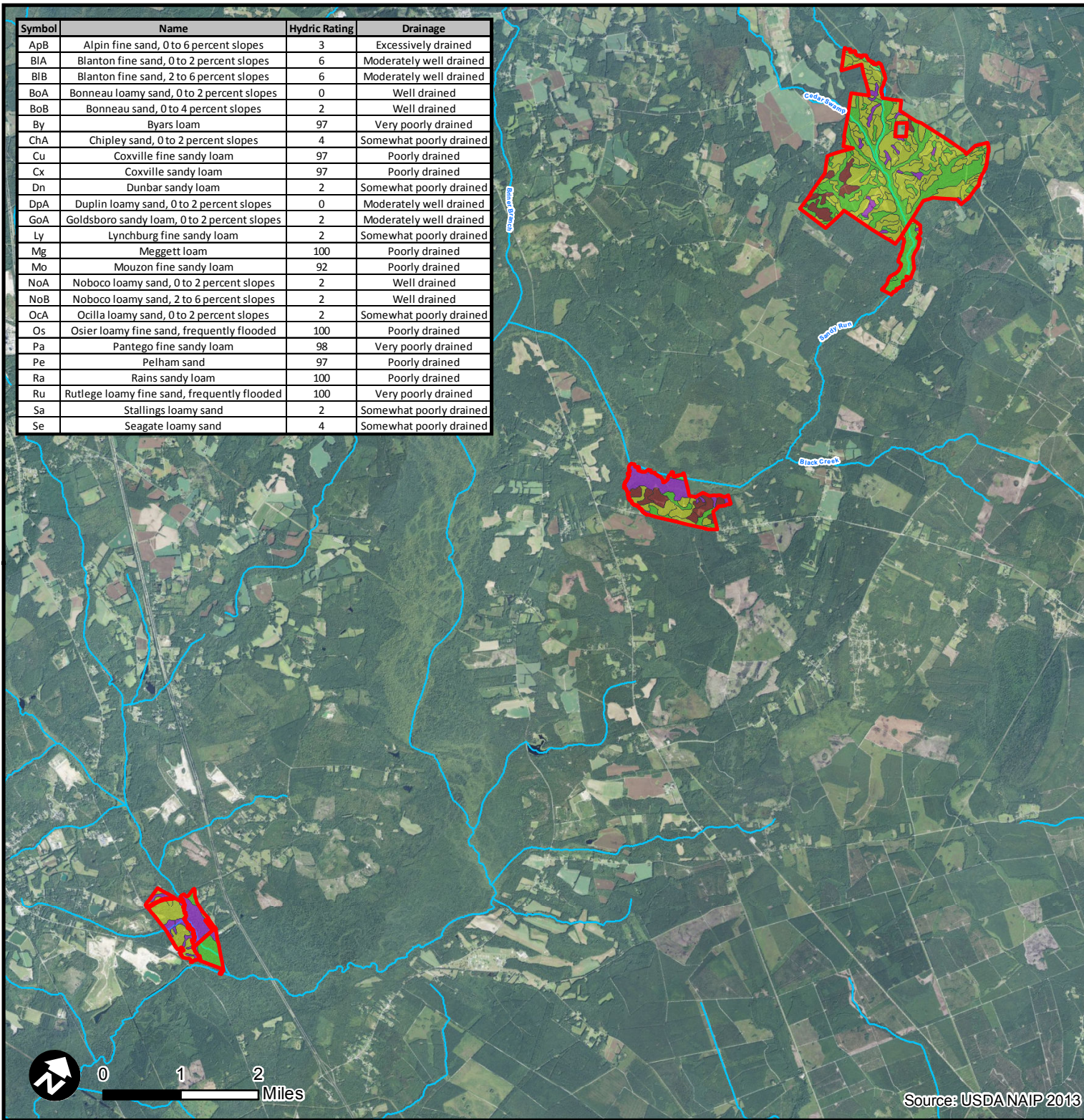
Reviewed By:
WAR

Date:
03/25/2015

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Symbol	Name	Hydric Rating	Drainage
ApB	Alpin fine sand, 0 to 6 percent slopes	3	Excessively drained
BIA	Blanton fine sand, 0 to 2 percent slopes	6	Moderately well drained
BIB	Blanton fine sand, 2 to 6 percent slopes	6	Moderately well drained
BoA	Bonneau loamy sand, 0 to 2 percent slopes	0	Well drained
BoB	Bonneau sand, 0 to 4 percent slopes	2	Well drained
By	Byars loam	97	Very poorly drained
ChA	Chipleay sand, 0 to 2 percent slopes	4	Somewhat poorly drained
Cu	Coxville fine sandy loam	97	Poorly drained
Cx	Coxville sandy loam	97	Poorly drained
Dn	Dunbar sandy loam	2	Somewhat poorly drained
DpA	Duplin loamy sand, 0 to 2 percent slopes	0	Moderately well drained
GoA	Goldsboro sandy loam, 0 to 2 percent slopes	2	Moderately well drained
Ly	Lynchburg fine sandy loam	2	Somewhat poorly drained
Mg	Meggett loam	100	Poorly drained
Mo	Mouzon fine sandy loam	92	Poorly drained
NoA	Noboco loamy sand, 0 to 2 percent slopes	2	Well drained
NoB	Noboco loamy sand, 2 to 6 percent slopes	2	Well drained
OcA	Ocilla loamy sand, 0 to 2 percent slopes	2	Somewhat poorly drained
Os	Osier loamy fine sand, frequently flooded	100	Poorly drained
Pa	Pantego fine sandy loam	98	Very poorly drained
Pe	Pelham sand	97	Poorly drained
Ra	Rains sandy loam	100	Poorly drained
Ru	Rutledge loamy fine sand, frequently flooded	100	Very poorly drained
Sa	Stallings loamy sand	2	Somewhat poorly drained
Se	Seagate loamy sand	4	Somewhat poorly drained



Legend

Mitigation Project Boundary

USGS Streams

Soils Hydric Rating

Nonhydric

Predominantly Nonhydric

Predominantly Hydric

Hydric

Job No. 6250150080

Drawn By: BWS

Reviewed By: WAR

Date: 04/06/2015

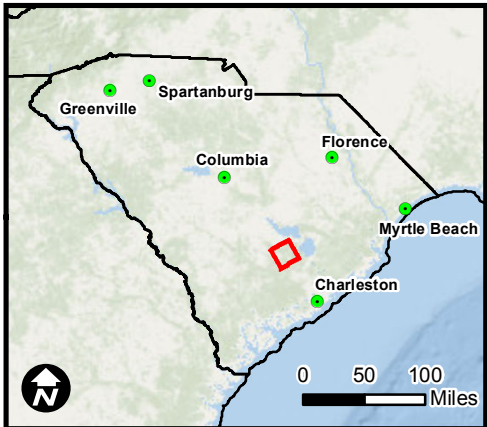
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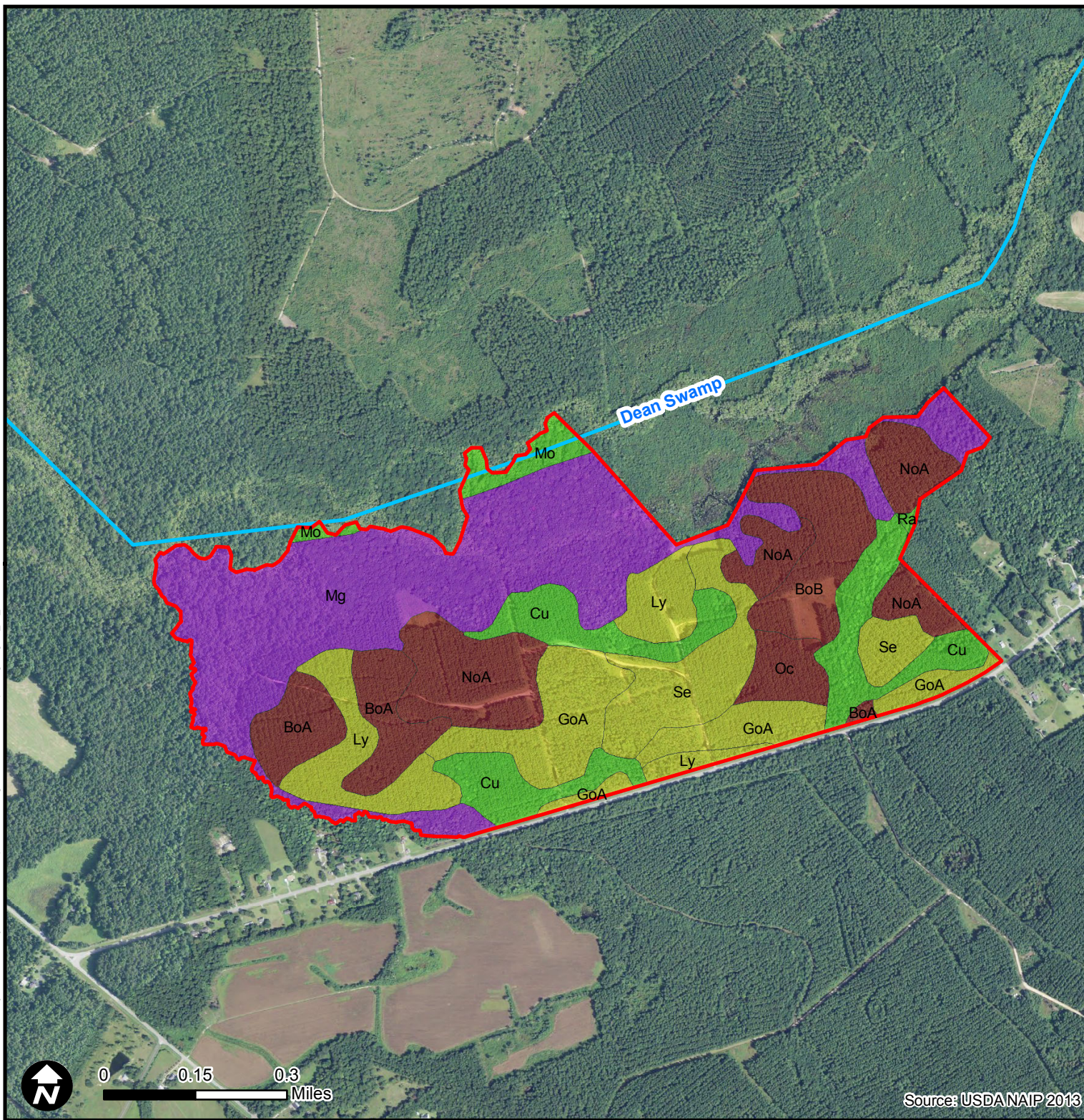
Figure 9. USDA Soil Survey Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

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Legend

Mitigation Project Boundary

USGS Streams

Soils Hydric Rating

- Nonhydric
- Predominantly Nonhydric
- Predominantly Hydric
- Hydric

Job No. 6250150080

Drawn By: BWS

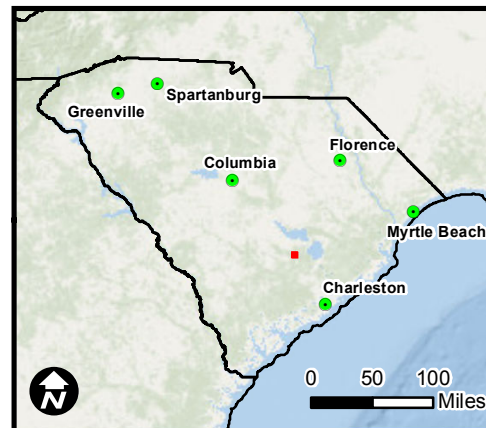
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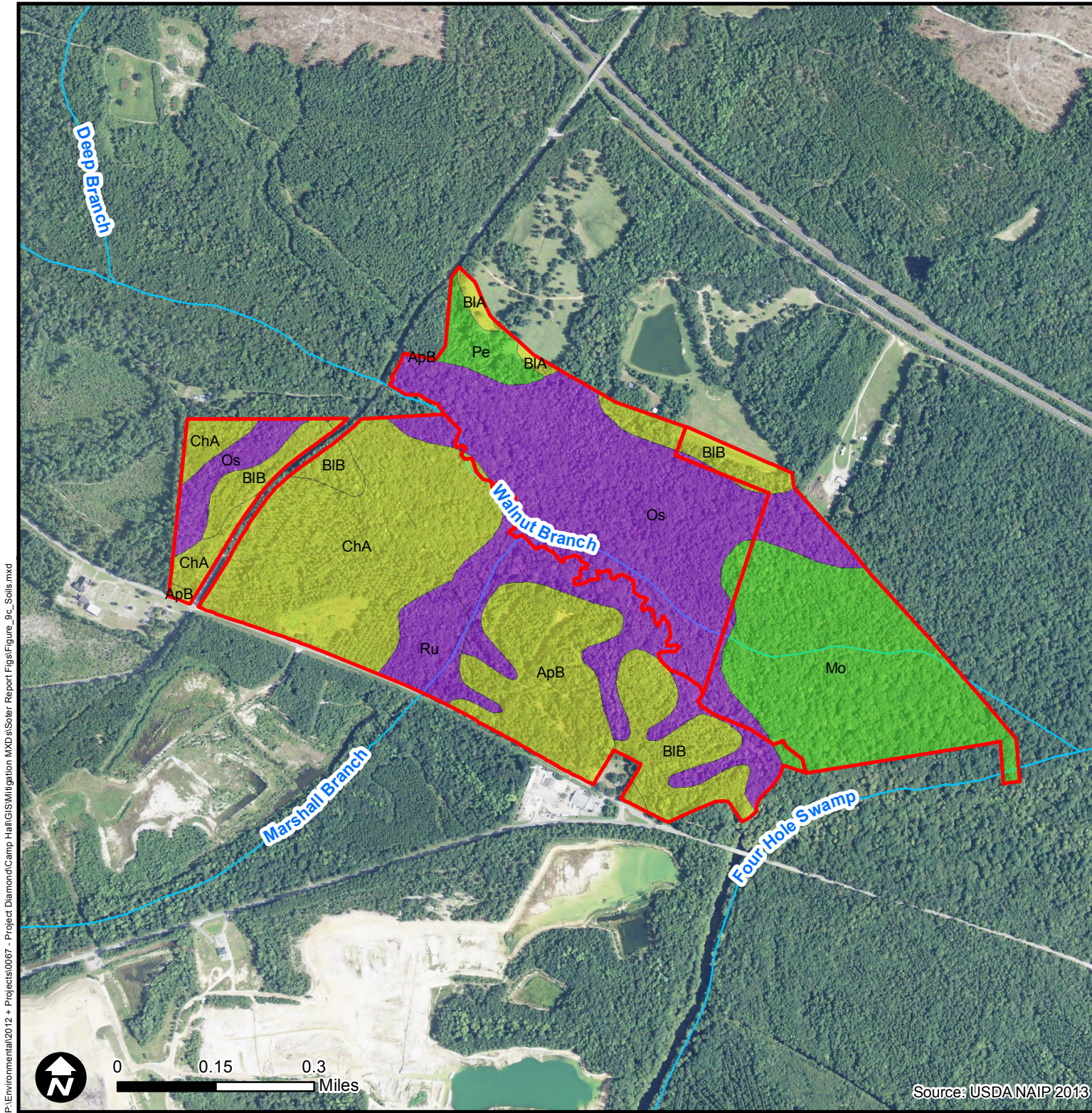
Date: 04/06/2015

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Figure 9b. USDA Soil Survey Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester County
South Carolina





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Legend

Mitigation Project Boundary

USGS Streams

Soils Hydric Rating

Nonhydryc

Predominantly Nonhydryc

Predominantly Hydryc

Hydryc

Figure 9c. USDA Soil Survey Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester County
South Carolina

Job No. 6250150080

Drawn By: BWS

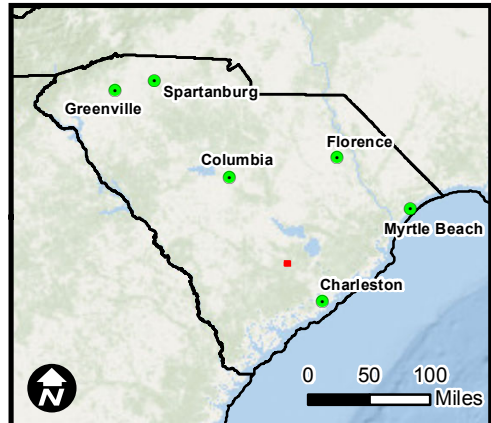
Reviewed By: WAR

Date: 04/06/2015

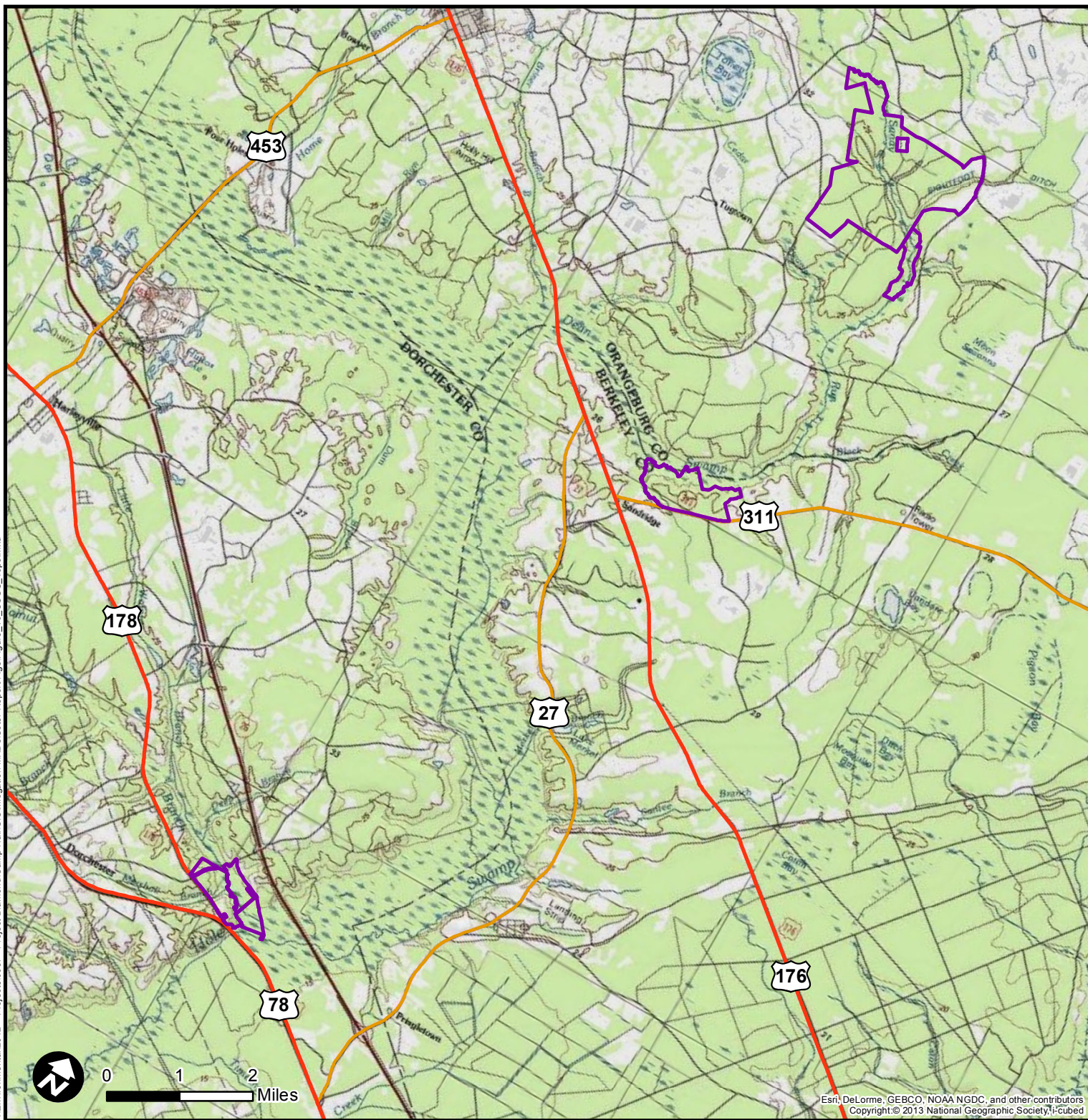
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Legend

- Mitigation Project Boundary
- Highway
- Major Road

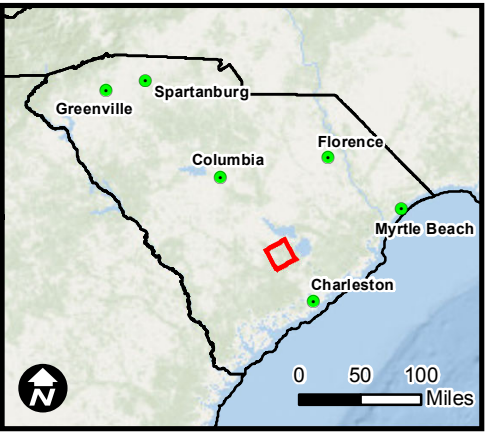
Job No. 6250150080
Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015

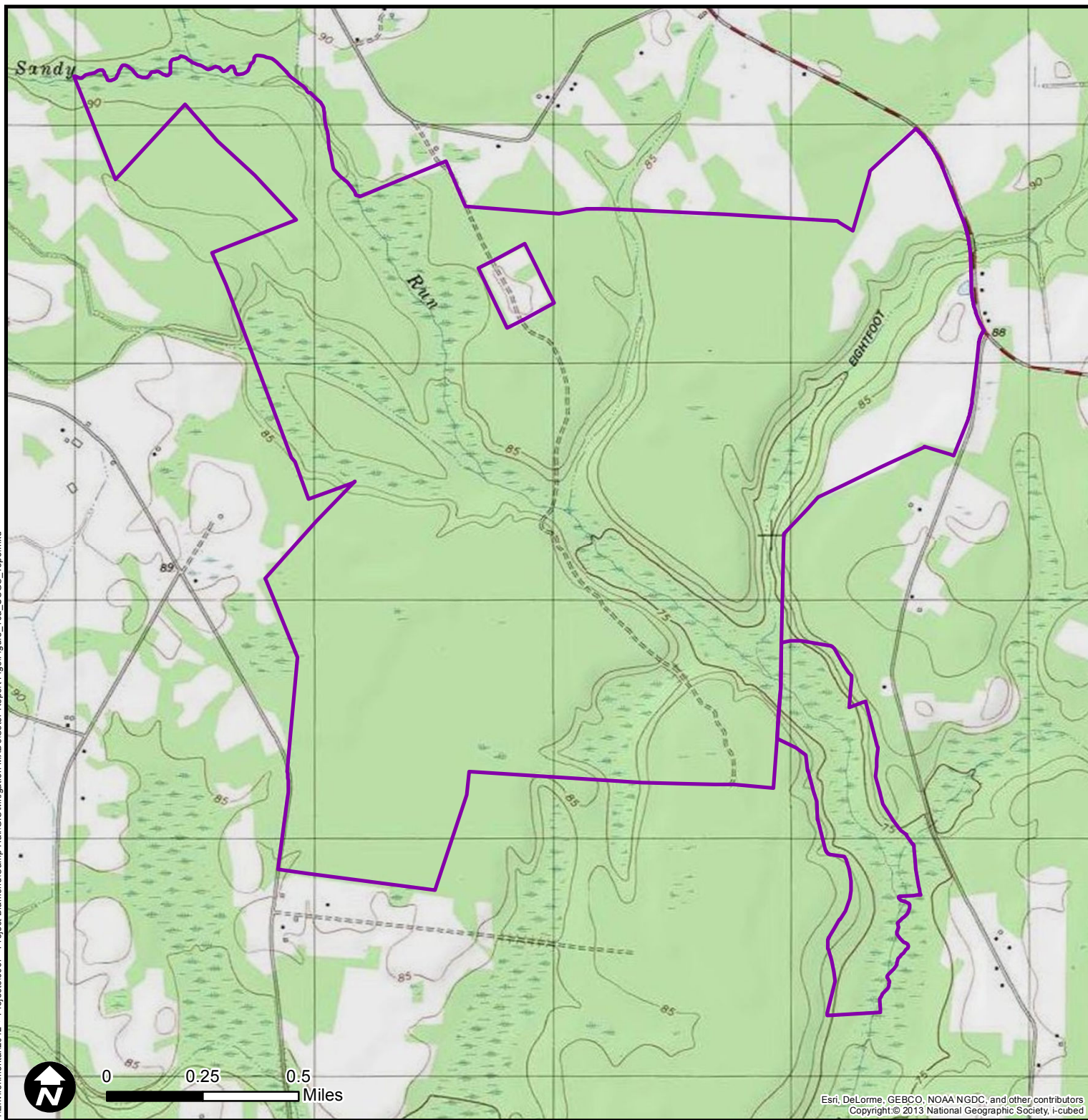
The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250150080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

Figure 10. USGS Topographic Map
Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

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Legend




-  Mitigation Project Boundary
-  Highway
-  Major Road

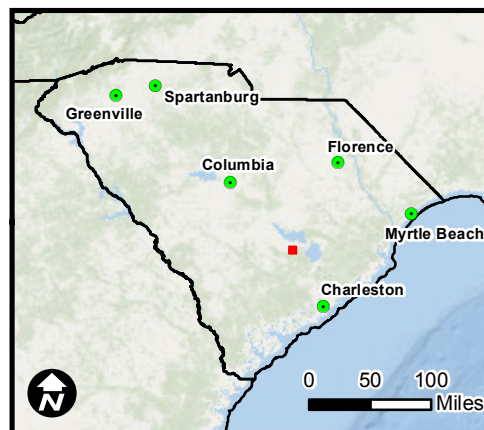
Figure 10a. USGS Topographic Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

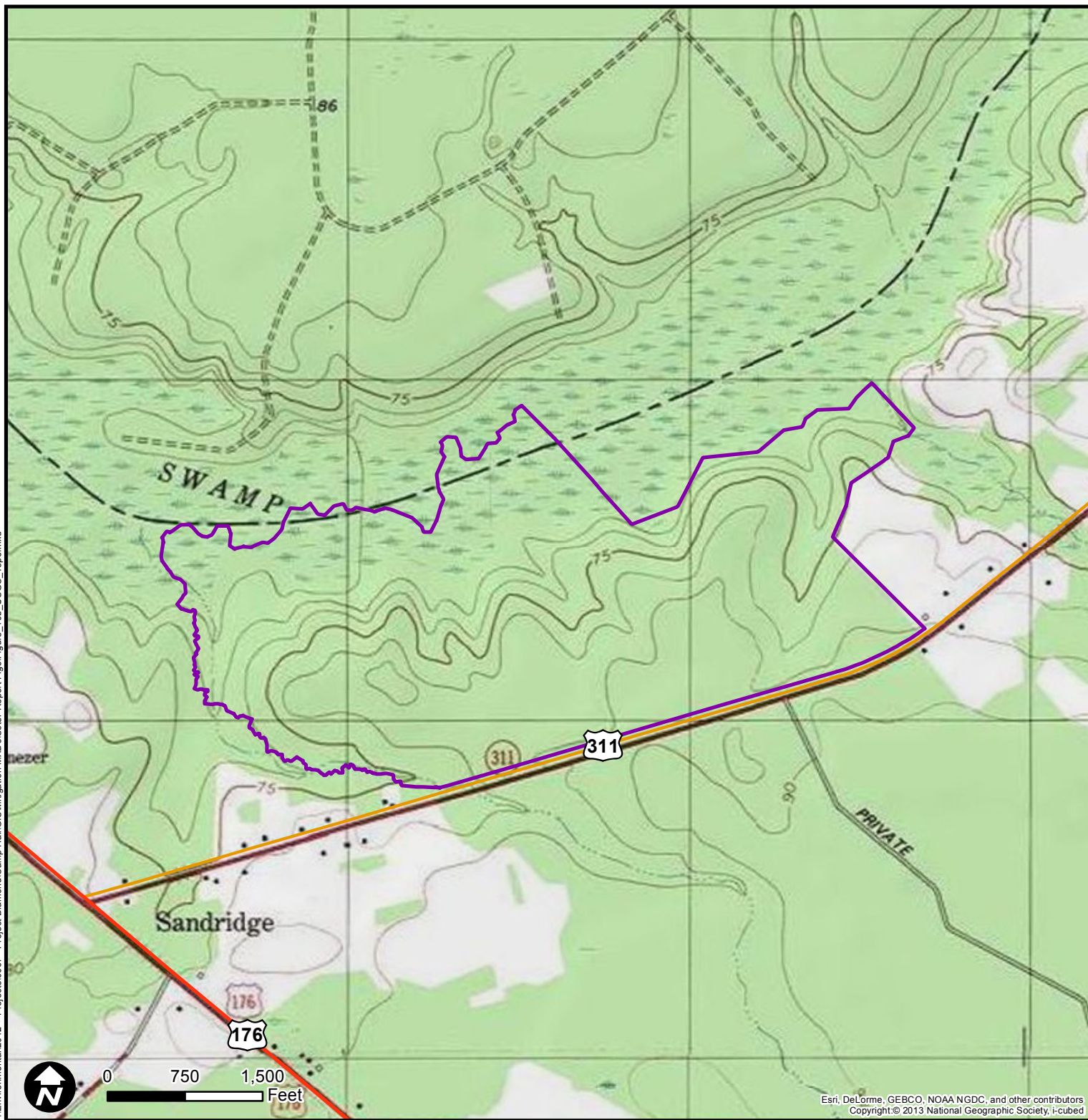


Job No. 6250150080
Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015

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Legend




-  Mitigation Project Boundary
-  Highway
-  Major Road

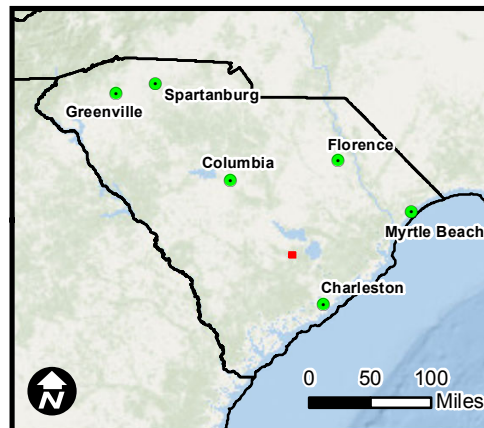
Figure 10b. USGS Topographic Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

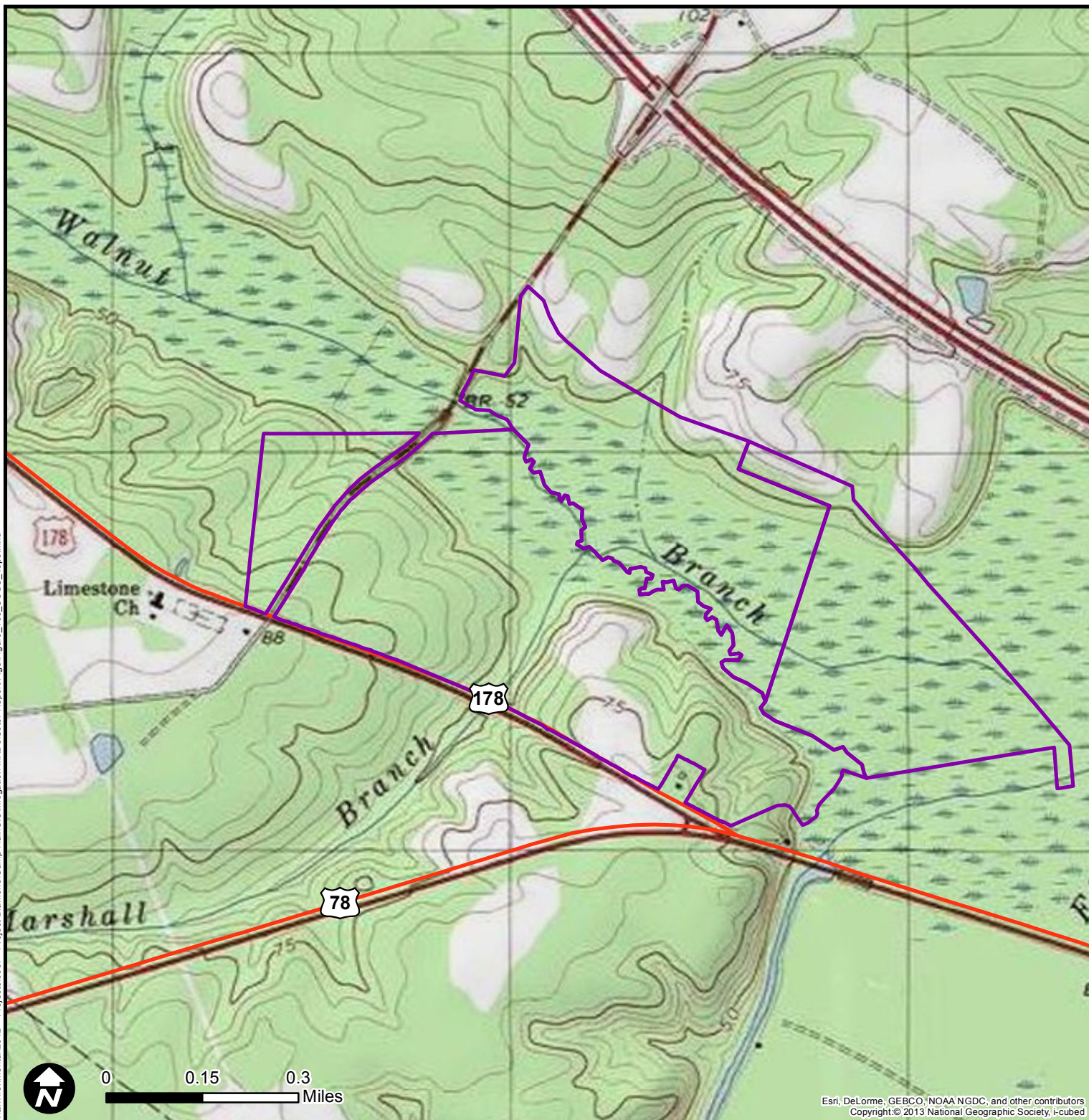


Job No. 6250150080
Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015

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Legend



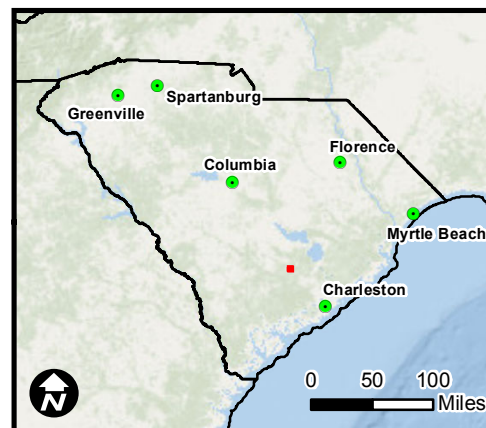
-  Mitigation Project Boundary
-  Highway

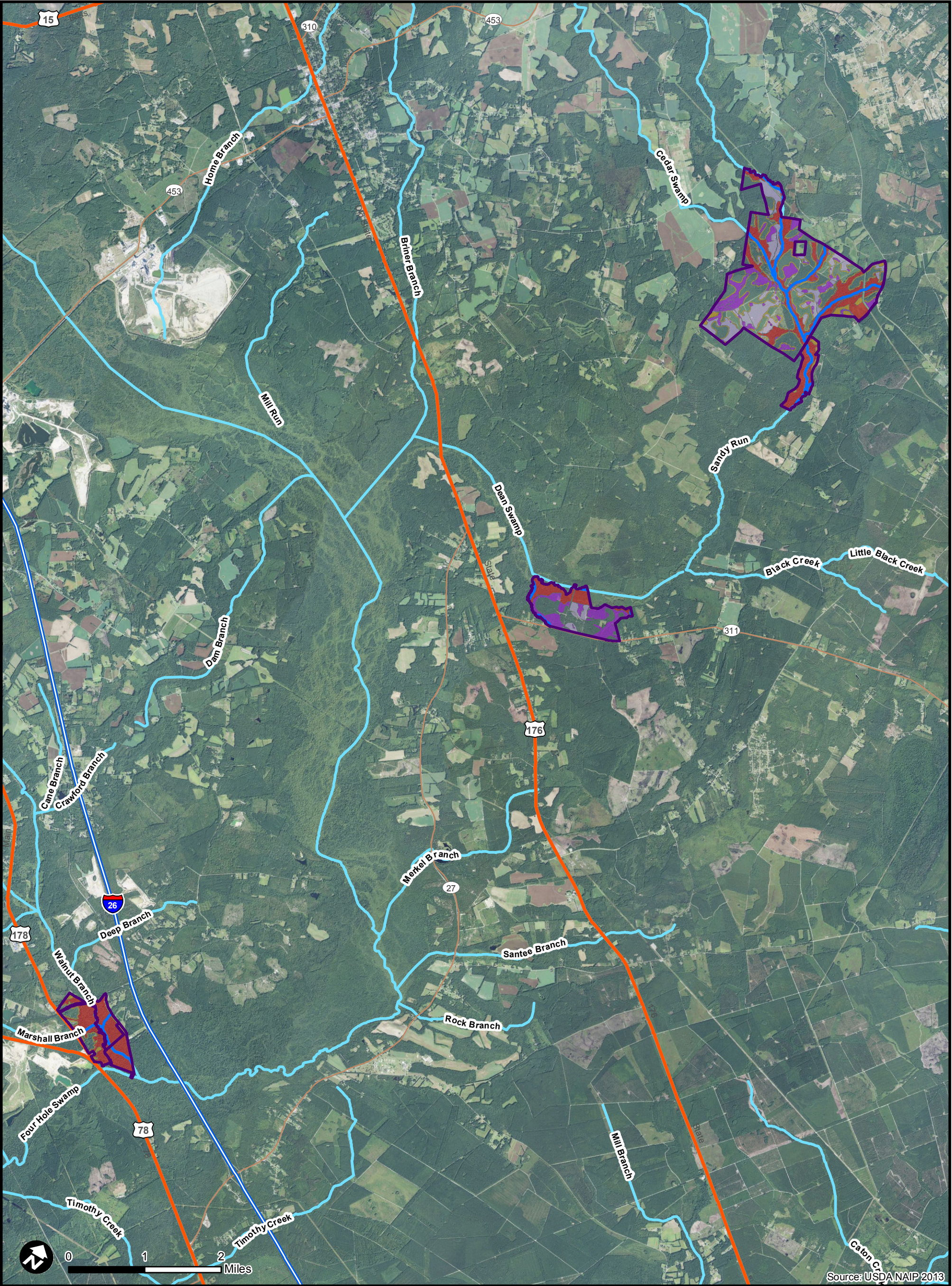
Figure 10c. USGS Topographic Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

Job No. 6250150080
Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015

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P:\Environmental\2012 - Projects\0067 - Project Diamond\Camp Hill\GIS\Mitigation MXDs\Soter Report Figs\Figure 11 Mitigation Workplan.mxd

Legend

- Mitigation Project Boundary
- USGS Streams

Mitigation Work Plan

- Wetland Restoration (~335 Acres)
- Wetland Enhancement (~276 Acres)
- Wetland Preservation (~890 Acres)
- Estimated Upland Buffer (~376 Acres)
- Stream Preservation (~47,932 LF)

Job No. 6250150080

Drawn By: WAR

Reviewed By: WAR

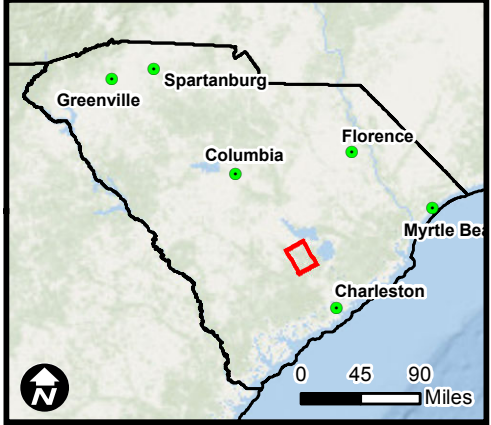
Date: 04/09/2015

Figure 11. Mitigation Work Plan

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.

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P:\Environmental\2012 - Projects\0067 - Project Diamond\Camp Hall\GIS\Mitigation MXDs\Soter Report Figs\Figure 11a. Mitigation Workplan.mxd

Source: USDA NAIP 2013

Legend

- Mitigation Project Boundary
- USGS Streams
- Forestry Road
- Mitigation Work Plan - 4/14/2015**
- Wetland Enhancement (~249 Acres)
- Wetland Restoration (~203 Acres)
- Wetland Preservation (~531 Acres)
- Estimated Upland Buffer (~274 Acres)
- Stream Preservation (~35,259 LF)

Job No. 6250150080

Drawn By: WAR

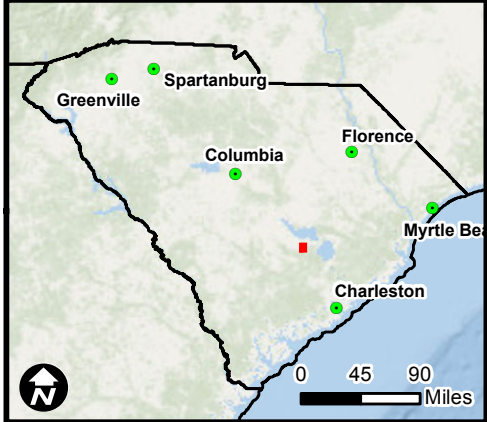
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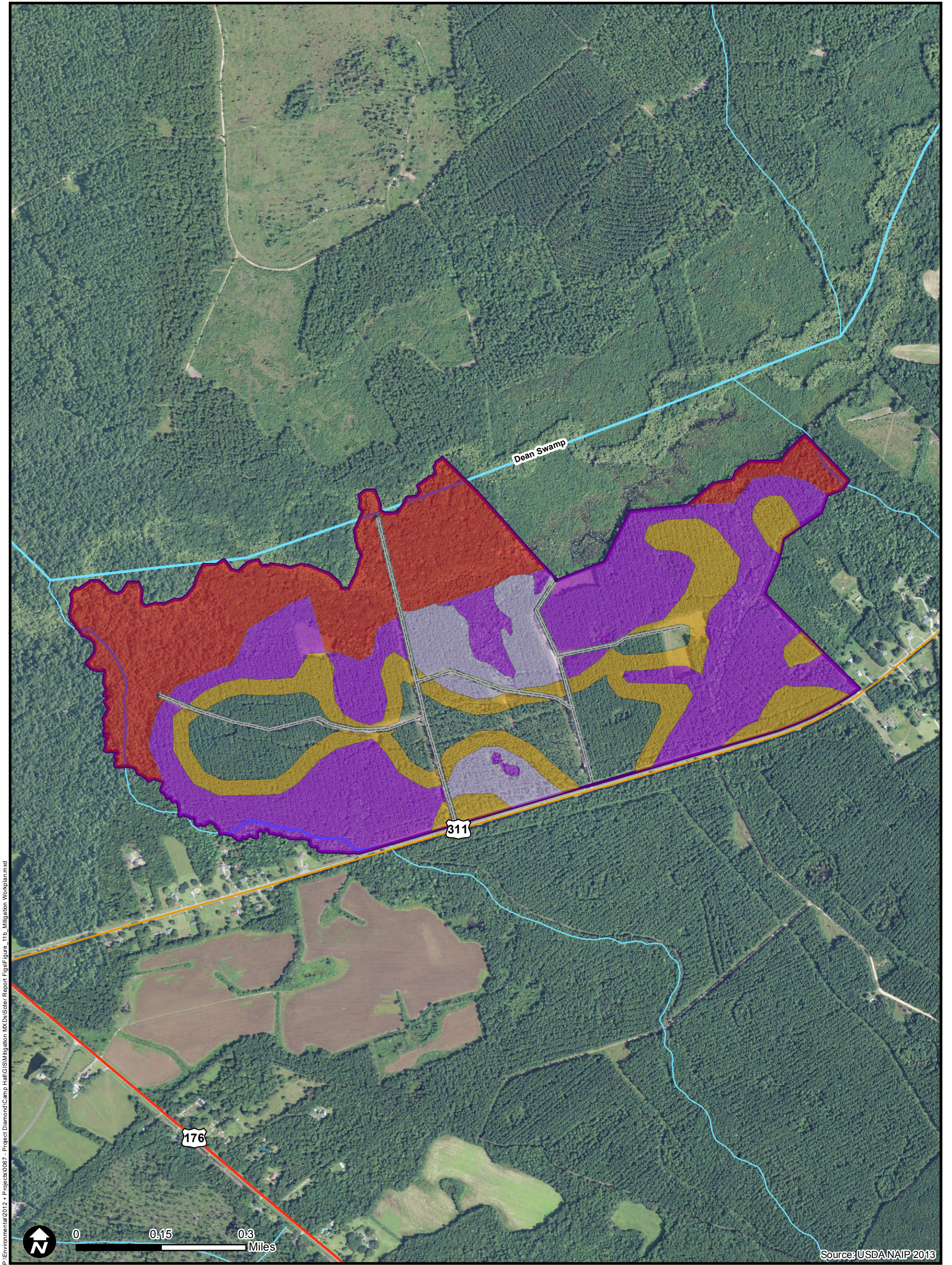
Date: 04/09/2015

Figure 11a. Mitigation Work Plan

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.





Source: USDA NAIP 2013

P:\Environmental\2012 - Projects\Diamond Camp Hall\GIS\Mitigation MXDs\Soter Report Figs\Figure 11b. Mitigation Workplan.mxd

Legend

- Mitigation Project Boundary
- Forestry Roads
- USGS Streams
- Mitigation Work Plan**
 - Wetland Enhancement (~27 Acres)
 - Wetland Restoration (~132 Acres)
 - Bottomland Hardwood Preservation (~94 Acres)
 - Estimated Upland Buffer (68 Acres)
 - Stream Preservation (~4,480 LF)

Job No. 6250150080

Drawn By: BWS

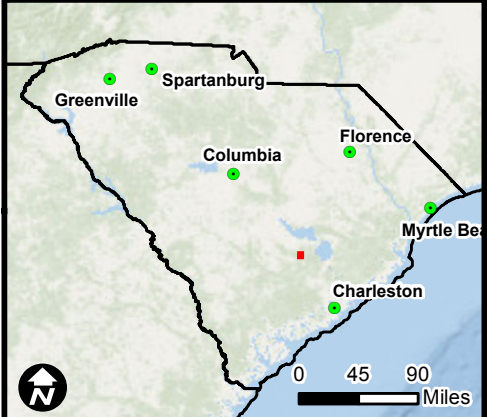
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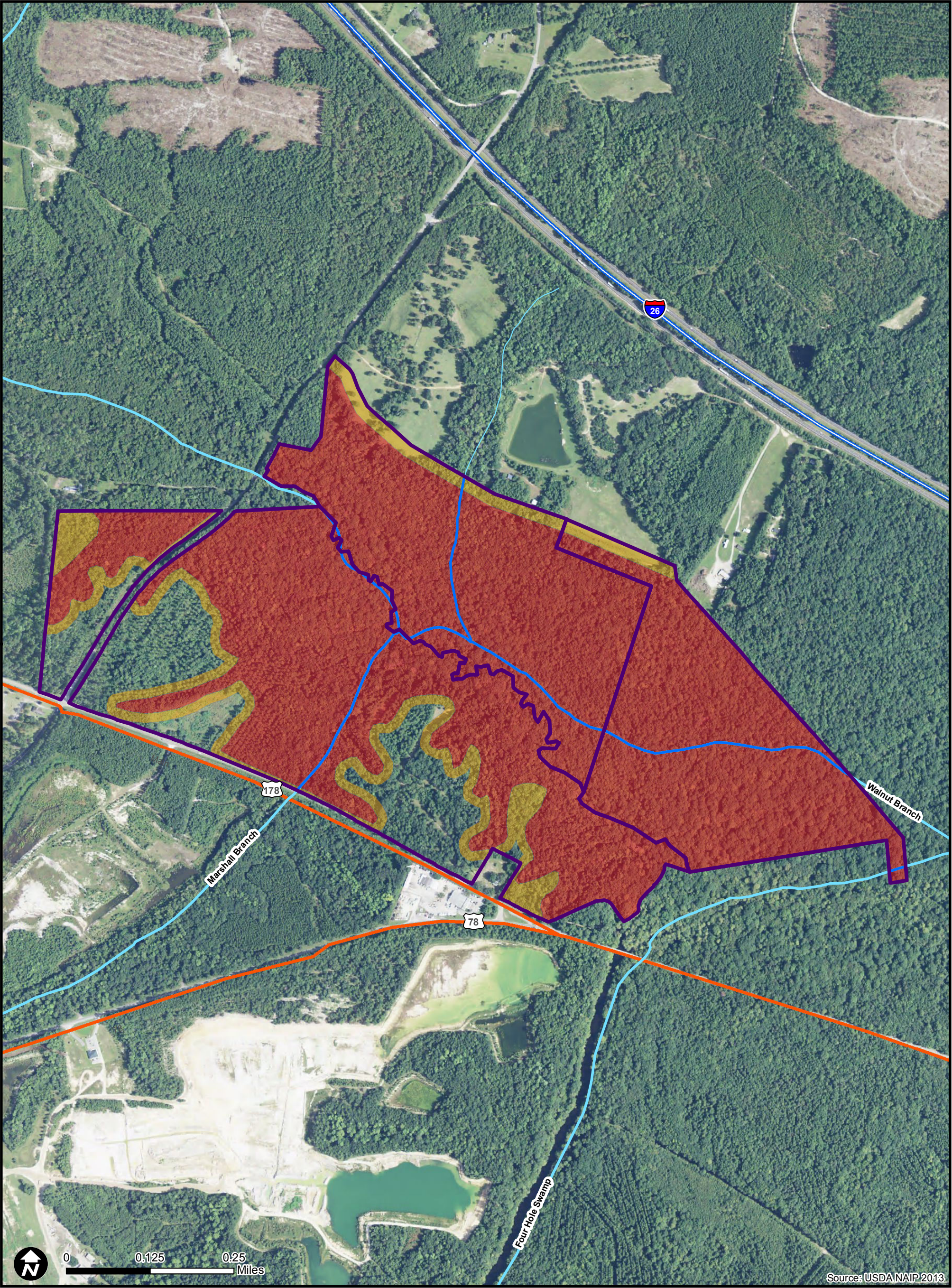
Date: 04/09/2015

Figure 11b. Mitigation Work Plan

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.










P:\Environmental\2012 - Projects\0067 - Project Diamond\Camp Hill\GIS\Mitigation MXDs\Soter Report Figs\Figure 11c Mitigation Workplan.mxd

Source: USDA NAIP 2013

Legend

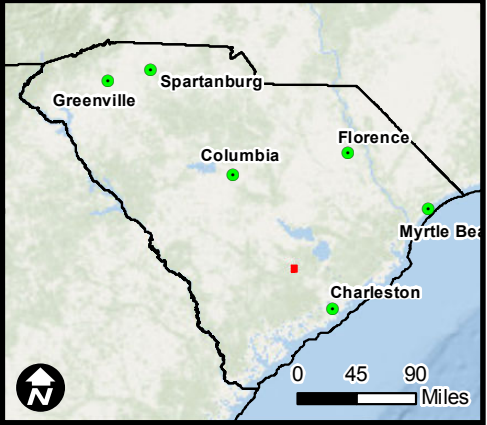
-  Mitigation Project Boundary
-  USGS Streams
-  Wetland Preservation (265 Acres)
-  Estimated Upland Buffer (34 Acres)
-  Stream Preservation (~8,193 LF)

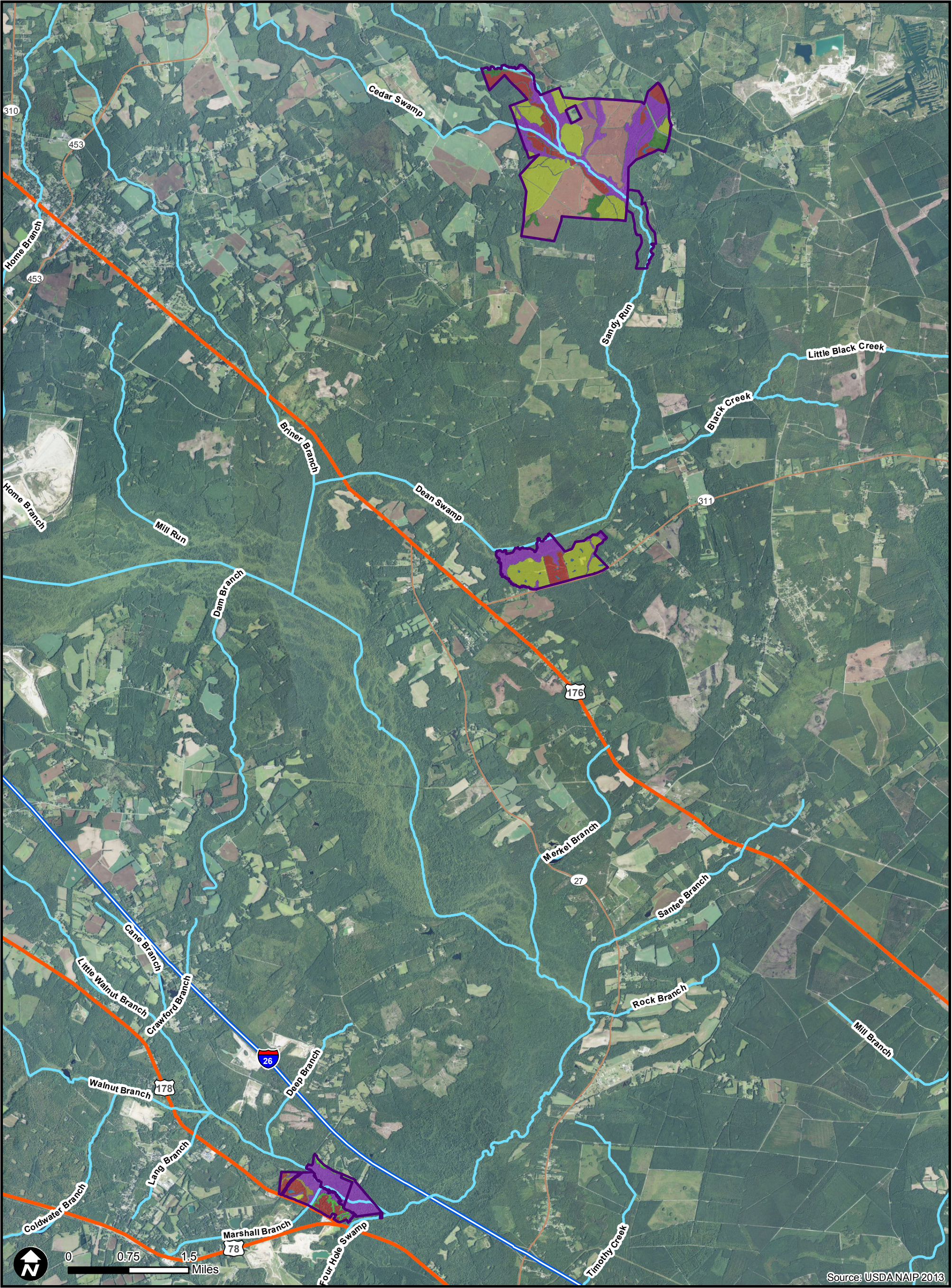
Job No. 6250150080
Drawn By: WAR
Reviewed By: WAR
Date: 04/06/2015

Figure 11c. Mitigation Work Plan

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.





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Source: USDANAIP 2013

Legend

- Mitigation Project Boundary
- USGS Streams
- Interstate
- Highway
- Major Road

Plant Community

- Bottomland Hardwood
- Calcareous Forest
- Clear Cut
- Isolated Ponds
- Mesic Hardwood Forest
- Non Alluvial Swamp Forest
- Pine Plantation <= 15 Years
- Pine Plantation > 15 Years

Job No. 6250150080

Drawn By: BWS

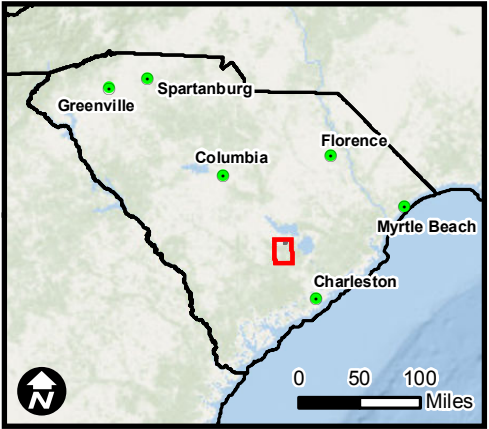
Reviewed By: WAR

Date: 04/07/2015

Figure 12. Plant Communities Map
Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

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Legend
Mitigation Project Boundary
USGS Streams
ForestryRoads_12

Plant Community
Bottomland Hardwood
Clear Cut
Isolated Ponds
Non Alluvial Swamp Forest
Pine Plantation <= 15 Years
Pine Plantation > 15 Years

Job No. 6250150080

Drawn By: WAR

Reviewed By: WAR

Date: 04/08/2015

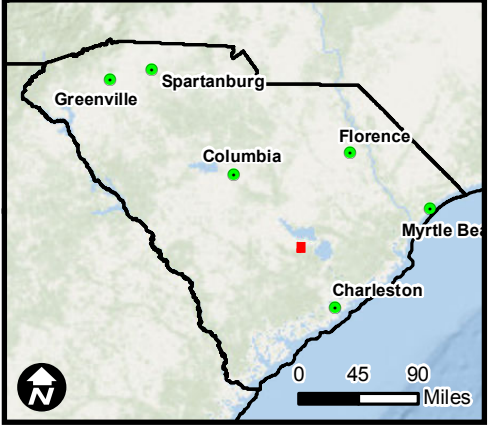
Figure 12a. Plant Communities Map (At Receipt of Property)

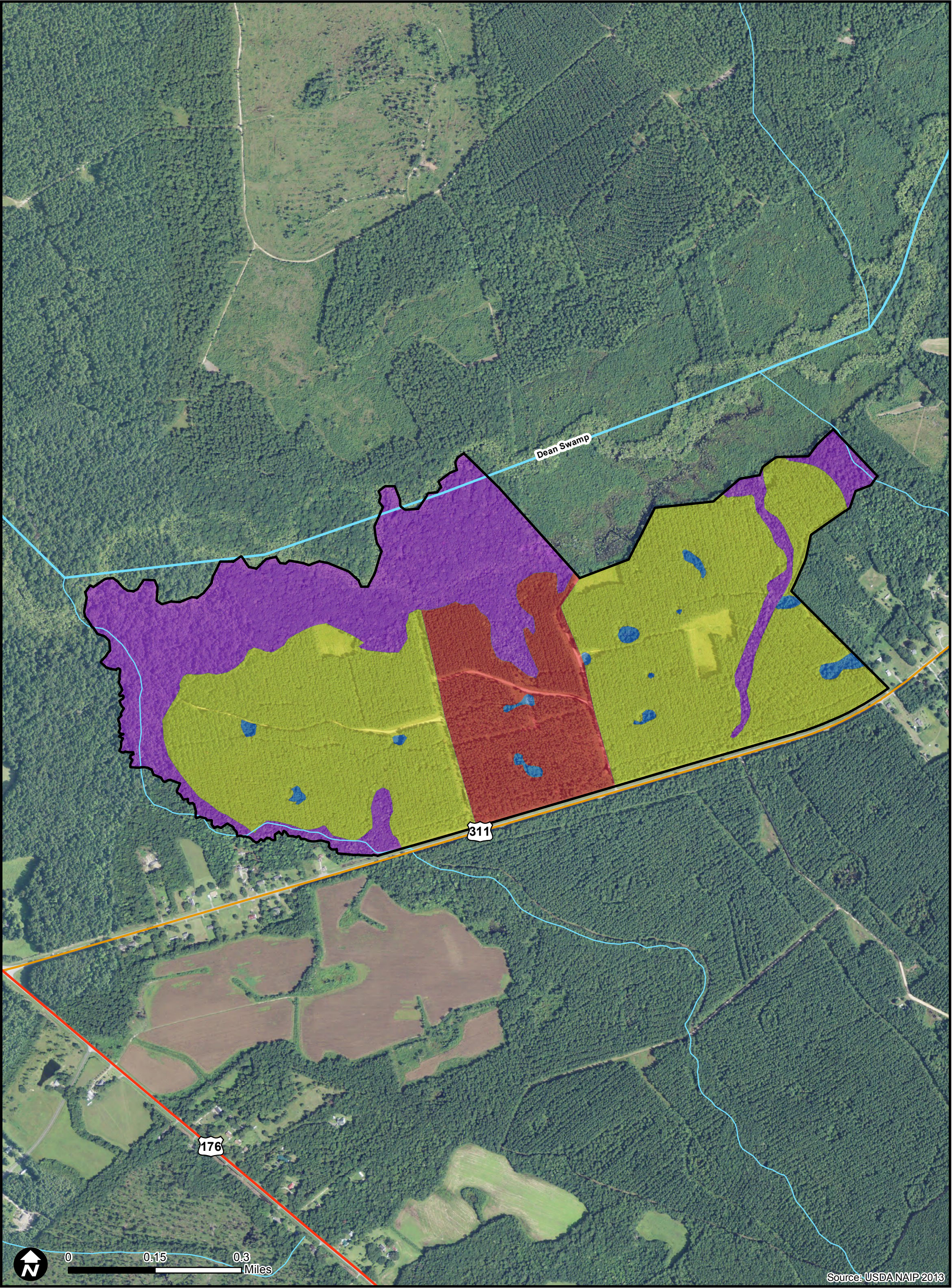
Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.


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Source: USDA NAIP 2013

Legend

- Mitigation Project Boundary
- USGS Streams
- Highway
- Major Road

Plant Community

- Bottomland Hardwood
- Calcareous Forest
- Clear Cut
- Isolated Ponds
- Mesic Hardwood Forest
- Non Alluvial Swamp Forest
- Pine Plantation <= 15 Years
- Pine Plantation > 15 Years

Job No. 6250150080

Drawn By: WAR

Reviewed By: WAR

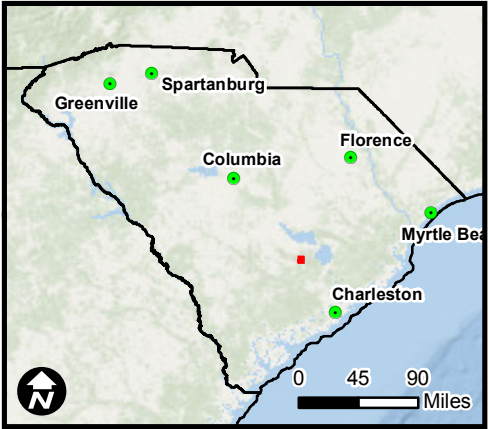
Date: 04/07/2015

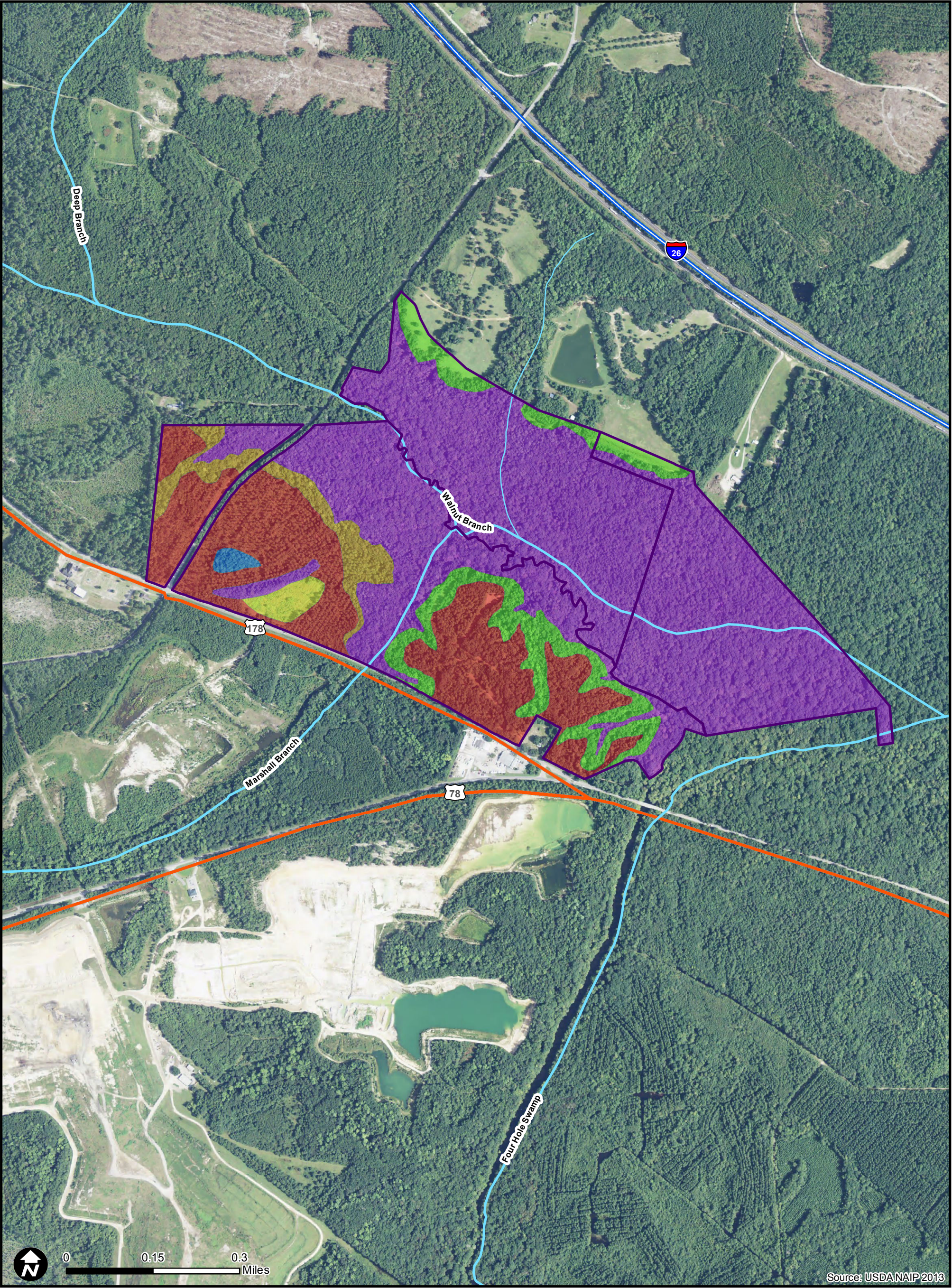
Figure 12b. Plant Communities Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250150080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

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Source: USDA NAIP 2013

Legend

Mitigation Project Boundary

USGS Streams

Plant Community

- Bottomland Hardwood
- Calcareous Forest
- Clear Cut
- Isolated Ponds
- Mesic Hardwood Forest
- Non Alluvial Swamp Forest
- Pine Plantation <= 15 Years
- Pine Plantation > 15 Years

Job No. 6250150080

Drawn By: WAR

Reviewed By: WAR

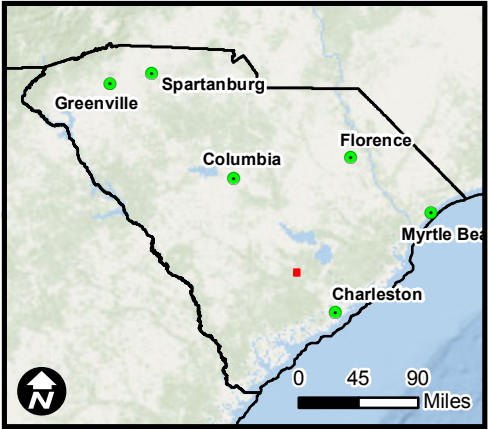
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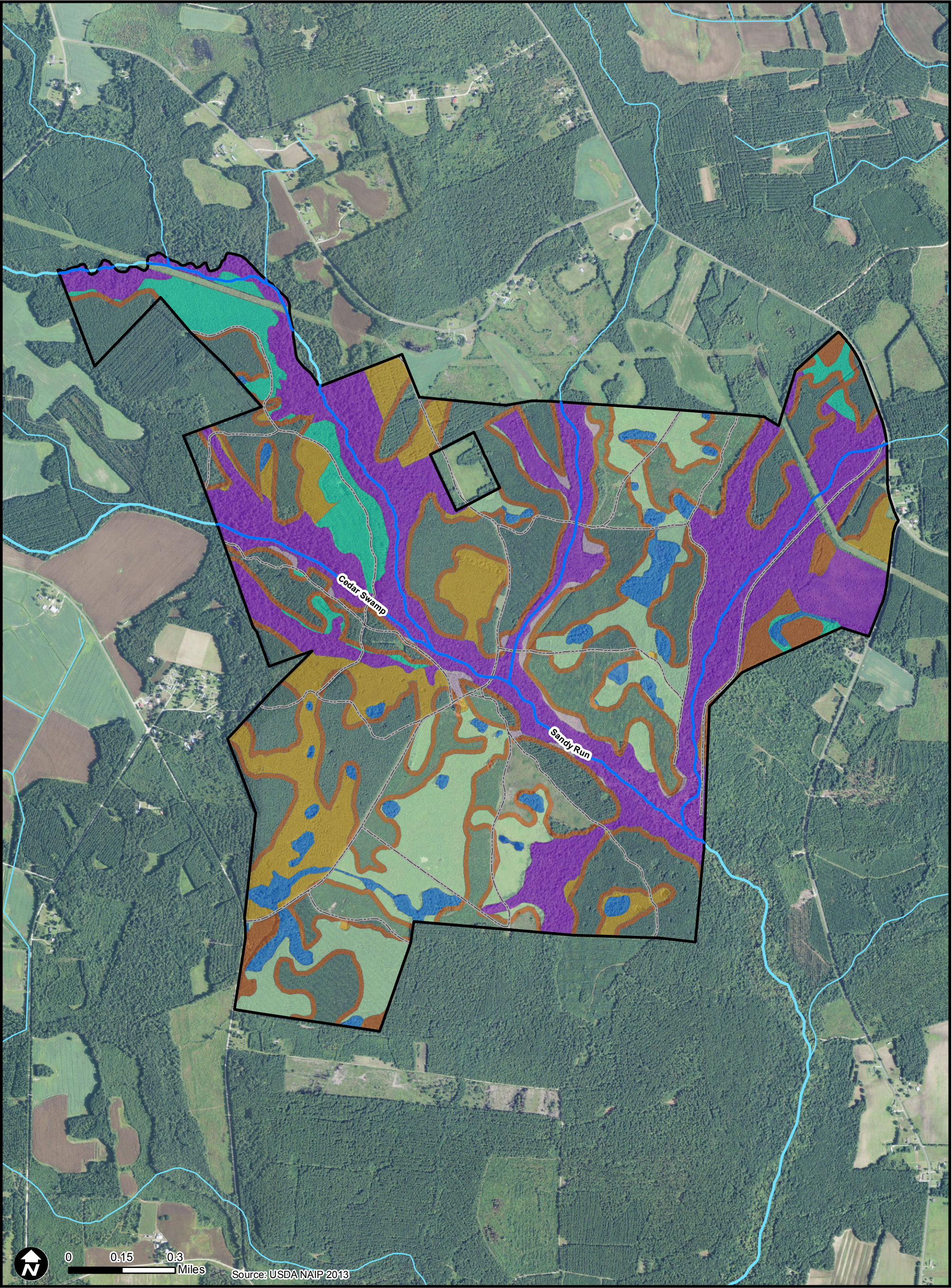
Figure 12c. Plant Communities Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

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P:\Environmental\2012 - Projects\0067 - Project Diamond\Camp Hall\GIS\Mitigation MXDs\Soter Report Figs\Figure_13_WetlandEnhancement_Bannister.mxd

Legend

- Bannister Tract
- Forestry Road
- USGS Streams

Mitigation Work Plan

- < 15 Pine Flatwood Enhancement (177 Acres)
- > 15 Pine Flatwood Enhancement (72 Acres)
- Bottomland Hardwood Restoration (12 Acres)
- Bottomland Hardwood Preservation (431 Acres)
- Isolated Ponds Restoration (62 Acres)
- Pine Flatwood Restoration (129 Acres)
- Upland Buffer (261 Acres)
- Stream Preservation (~28,857 LF)

Job No. 6250150080

Drawn By: WAR

Reviewed By: AWC

Date: 04/08/2015

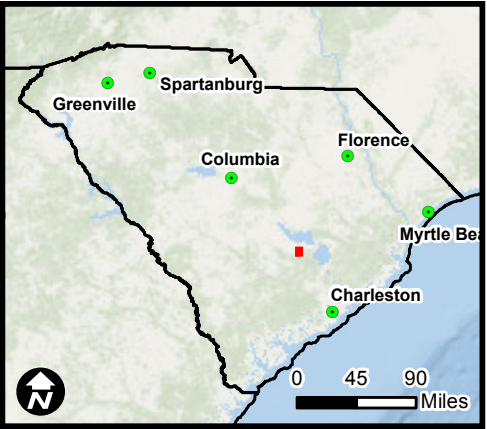
Figure 13. Mitigation Work Plan

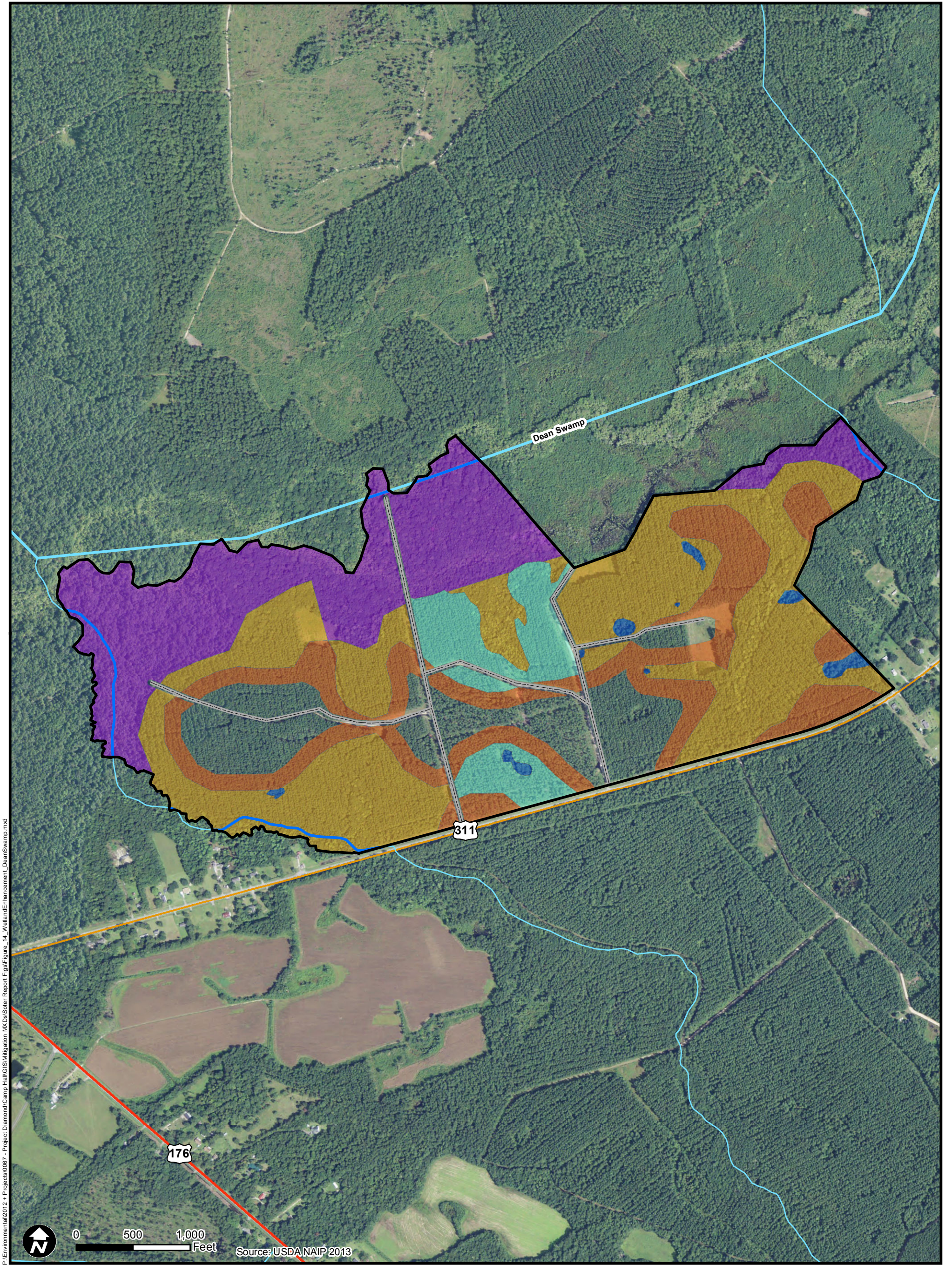
Bannister Tract

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

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AN res COMPANY





P:\Environmental\2012 - Projects\0067 - Project Diamond\Camp Hall\GIS\Mitigation MXDs\Soter Report Figs\Figure 14 - Wetland Enhancement - DeanSwamp.mxd

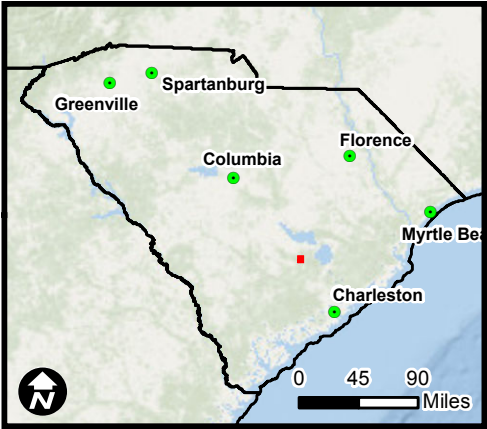
Legend	
Mitigation Project Boundary	Mitigation Work Plan
Forestry Roads	> 15 Pine Flatwoods Enhancement (27 Acres)
USGS Streams	Bottomland Hardwood Preservation (94 Acres)
Highway	Isolated Ponds Restoration (4 Acres)
Major Road	Pine Flatwood Restoration (128 Acres)
	Estimated Upland Buffer (68 Acres)
	Stream Preservation (~4,480 LF)

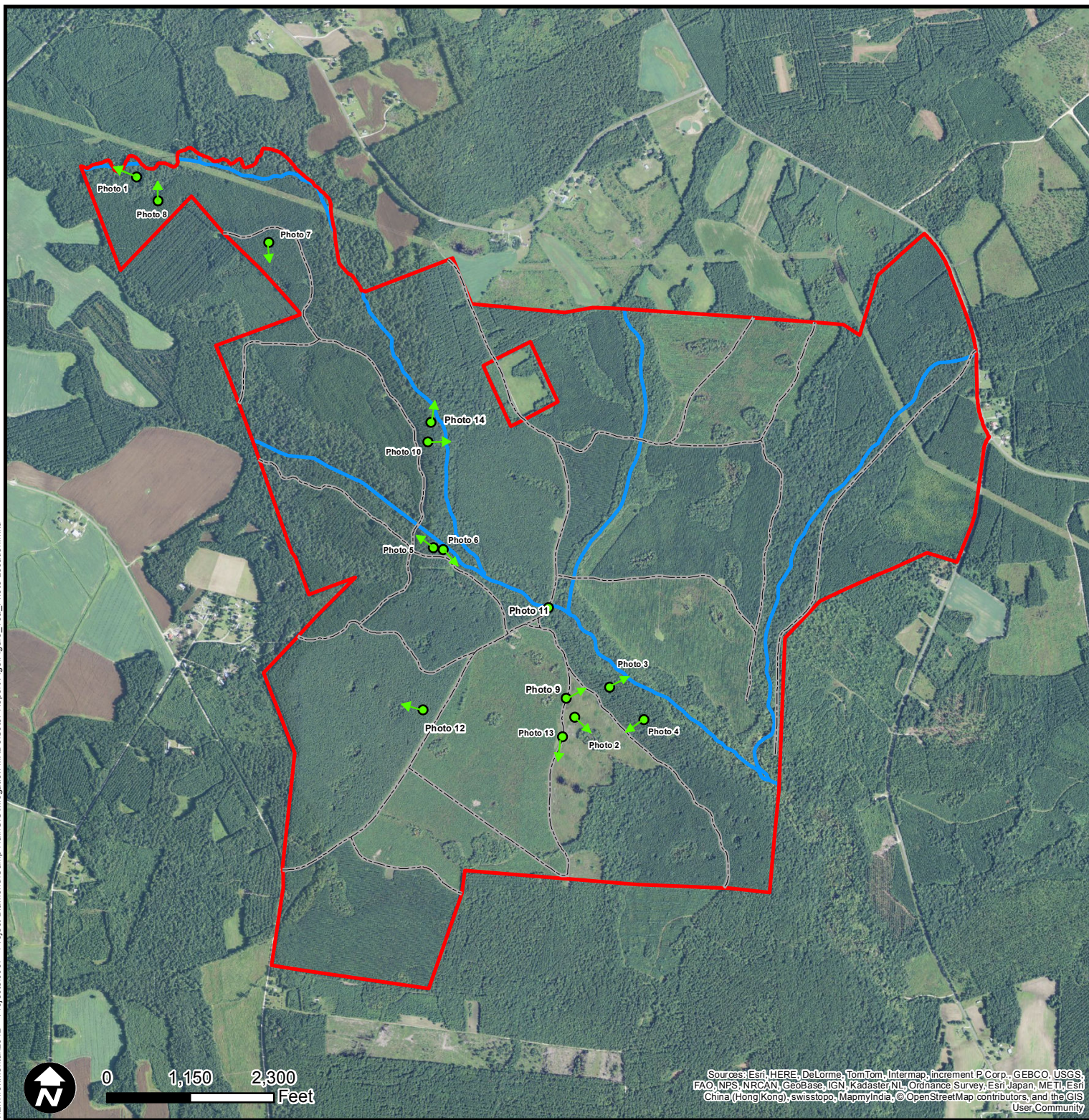
Job No.	6250150080
Drawn By:	BWS
Reviewed By:	WAR
Date:	04/09/2015

Figure 14. Mitigation Work Plan Dean Swamp

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

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Legend

- Photo Locations
- Forestry Road
- + Mitigation Site
- Stream

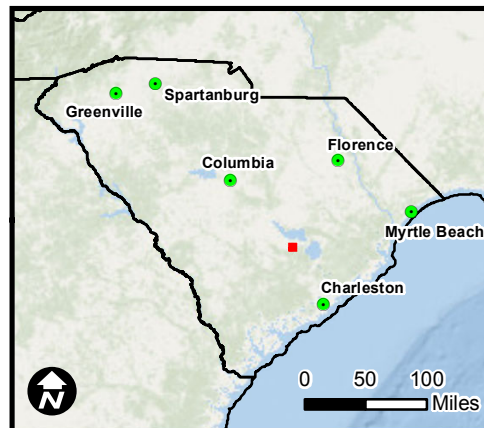
Figure 15a. Photo Locations Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

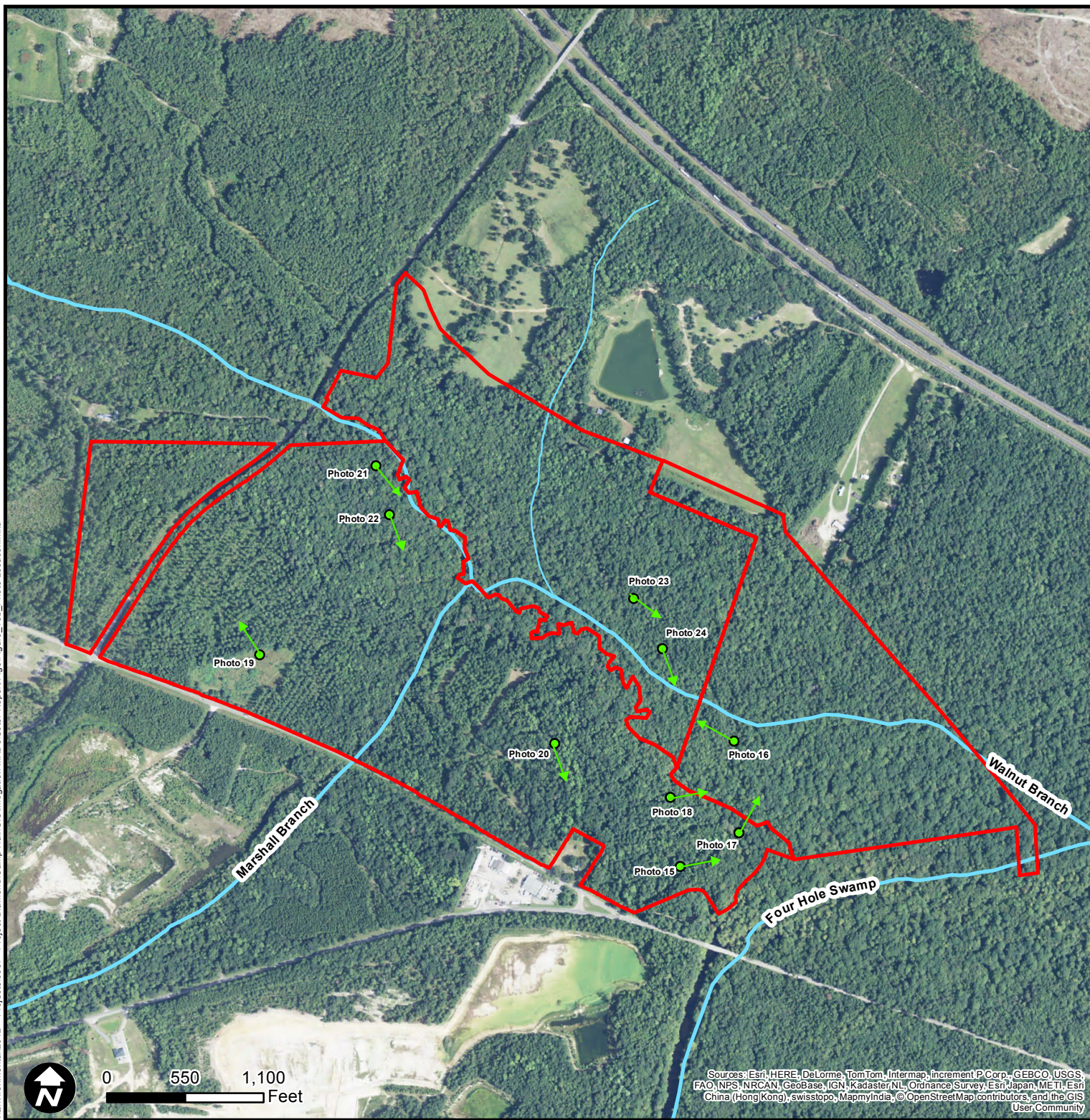


Job No. 6250150080
Drawn By: CLS
Reviewed By: WAR
Date: 03/25/2015

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P:\Environmental\2012 - Projects\067 - Project Diamond\Camp Hall\GIS\Mitigation MXDs\Soter Report Figs\Figure_15b_Photo Locations.mxd



Legend

- Photo Locations
- ⬮ Mitigation Project Boundary
- ~ USGS Streams

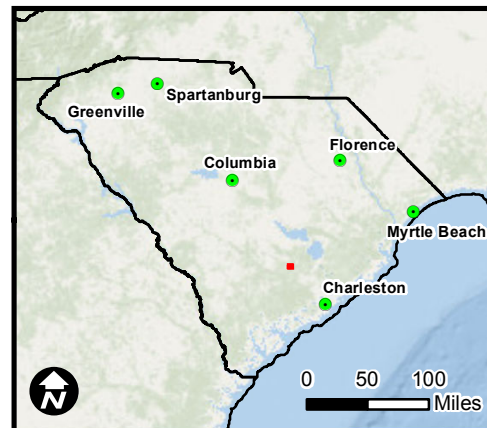
Figure 15b. Photo Locations Map

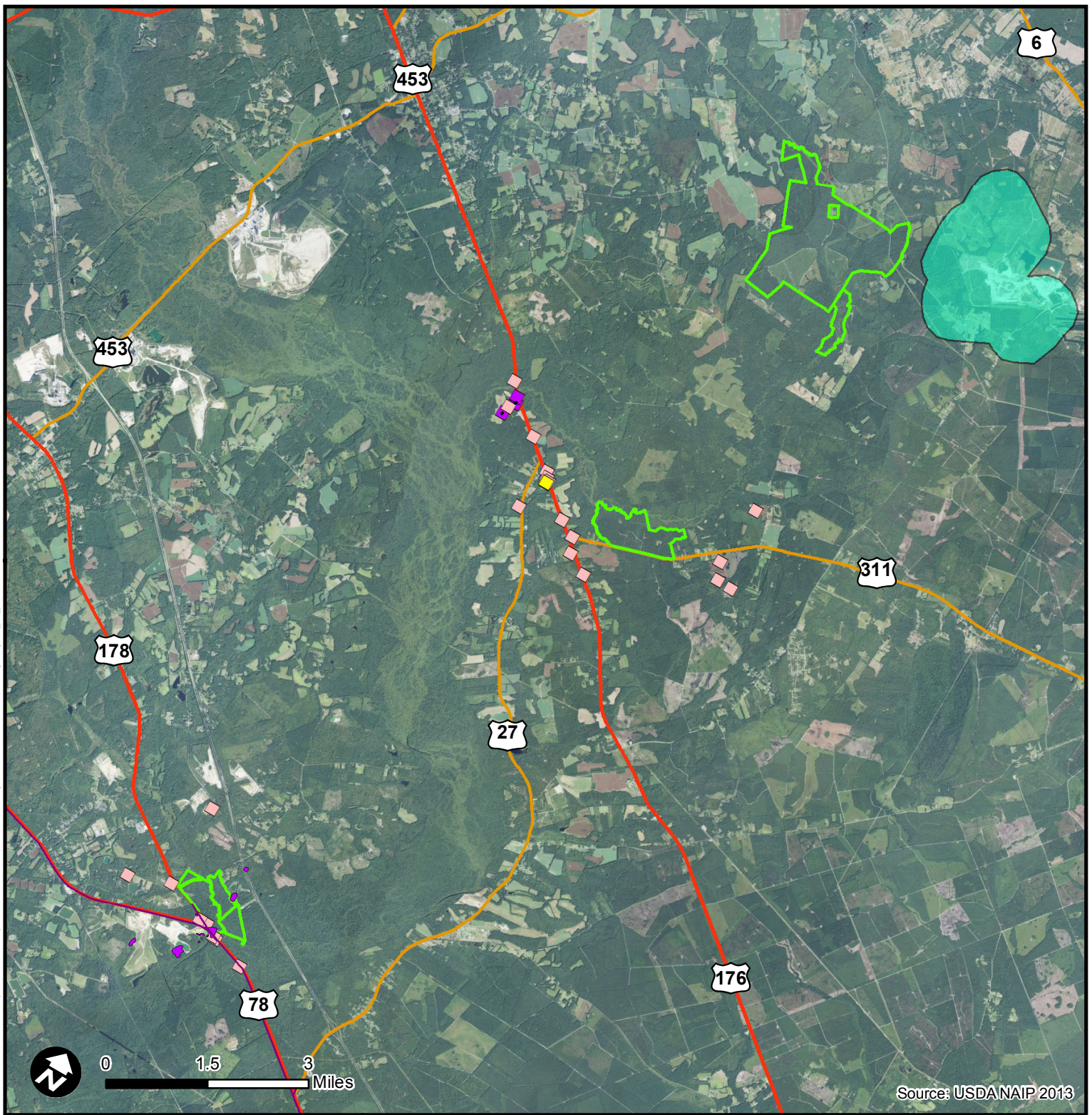
Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina



Job No. 6250150080
Drawn By: CLS
Reviewed By: WAR
Date: 03/25/2015

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Legend

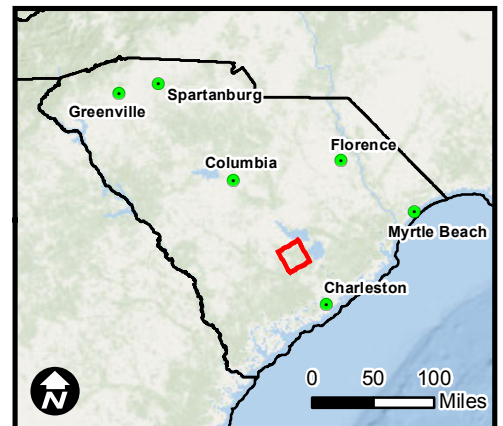
Archaeological Sites	Major Road
Survey Areas	Historic Structures
Mitigation Project Boundary	Eligible Structures
Highway	Not Eligible Structures

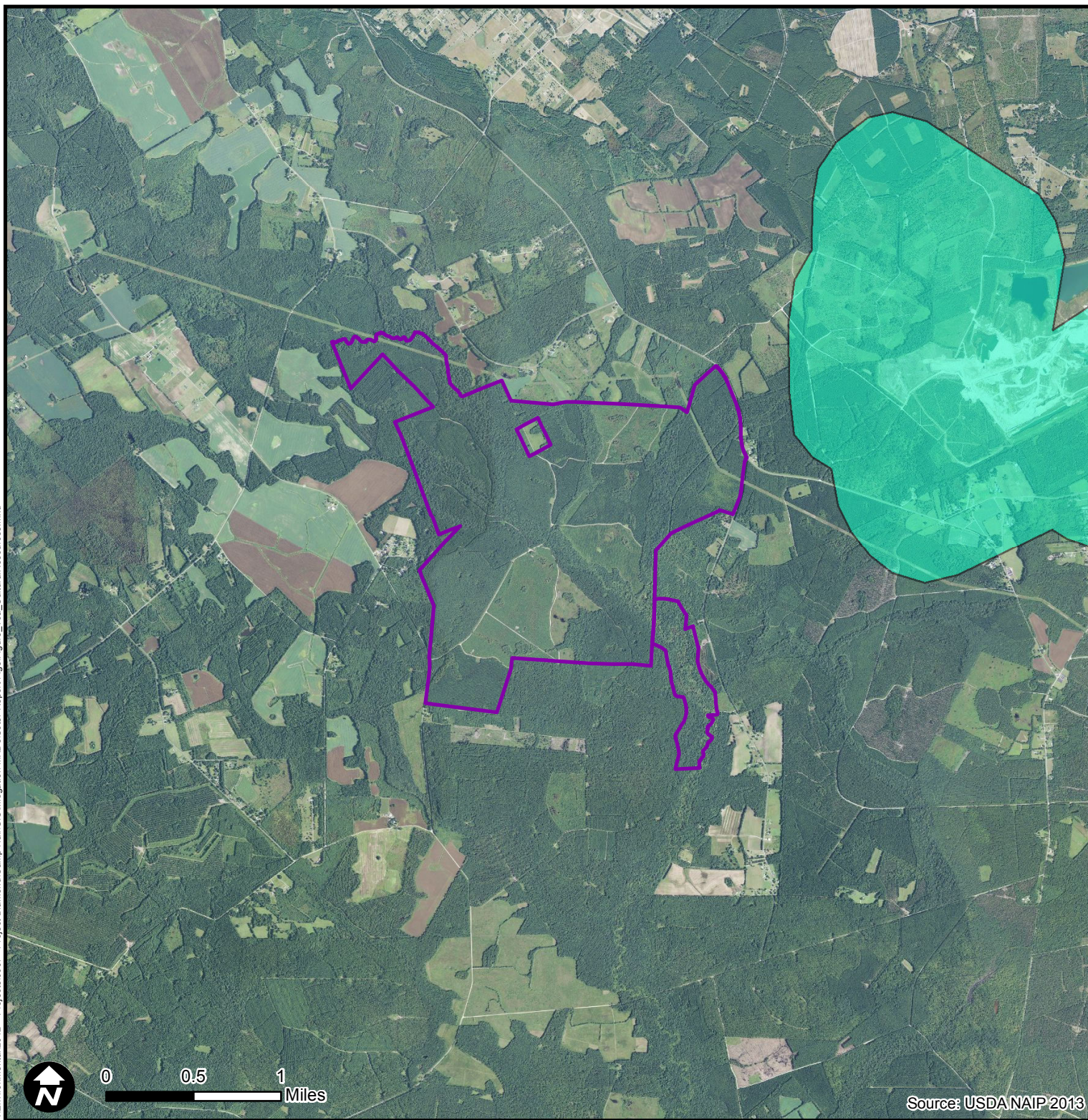
Figure 16. Cultural Resources Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

Job No. 6250150080
Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015

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Legend

Mitigation Project Boundary

Archaeological Sites

Survey Areas

Historic Structures

Eligible Structures

Not Eligible Structures

Job No. 6250150080

Drawn By: BWS

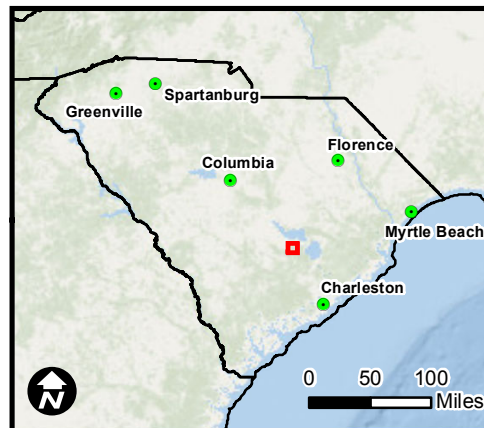
Reviewed By: WAR

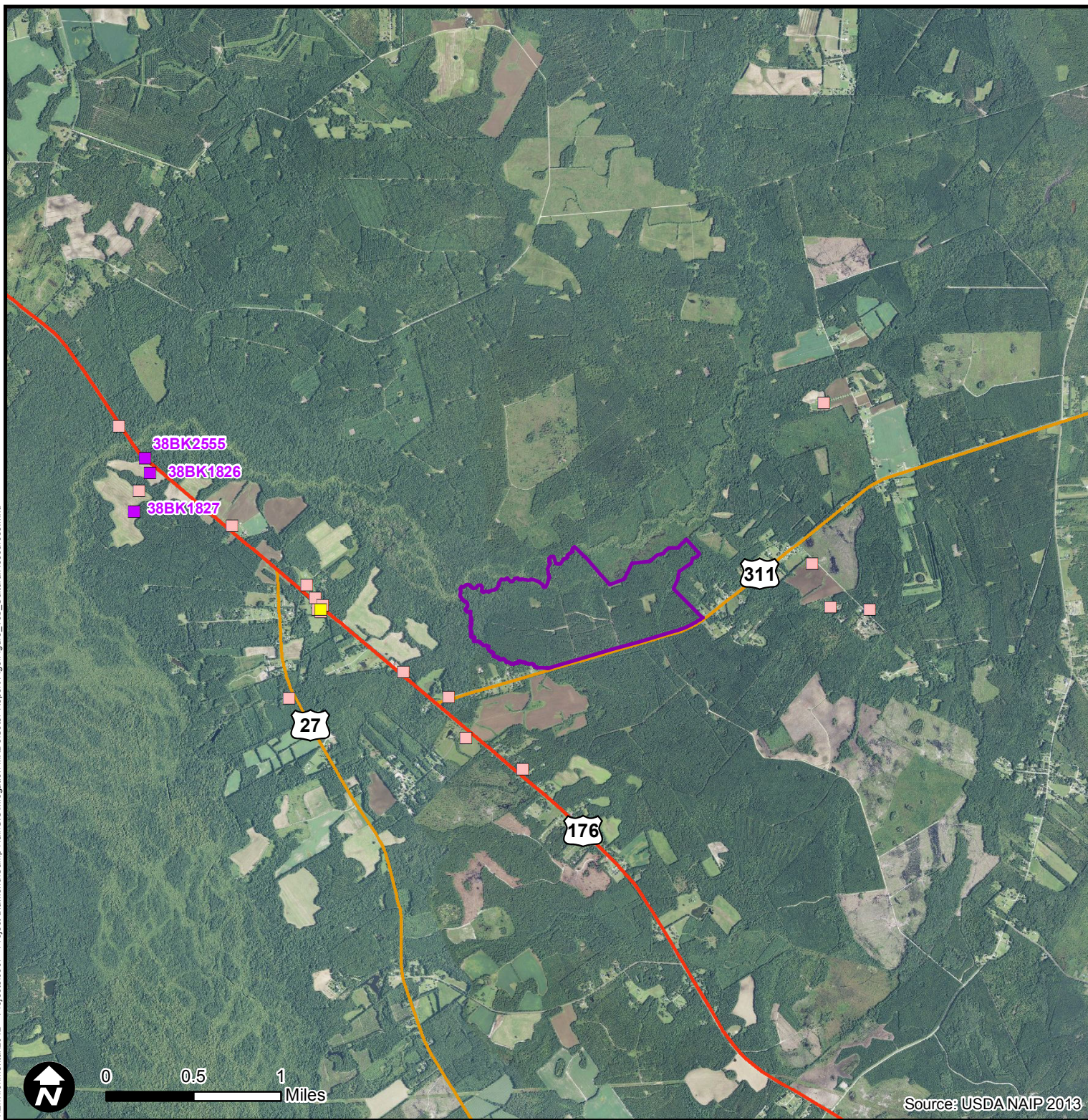
Date: 04/07/2015

The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250150080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

Figure 16a. Cultural Resources Map

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina





Legend

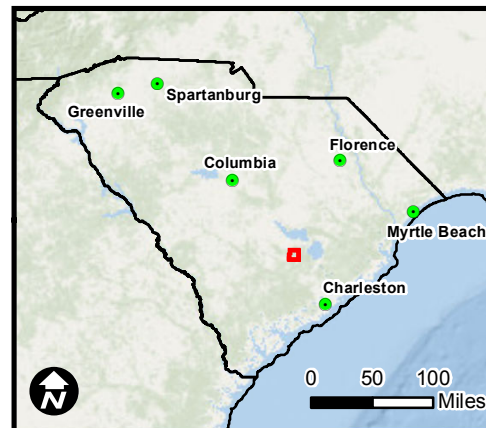
- Mitigation Project Boundary
- Major Road
- Survey Areas
- Highway
- Historic Structures
- Eligible Structures
- Not Eligible Structures

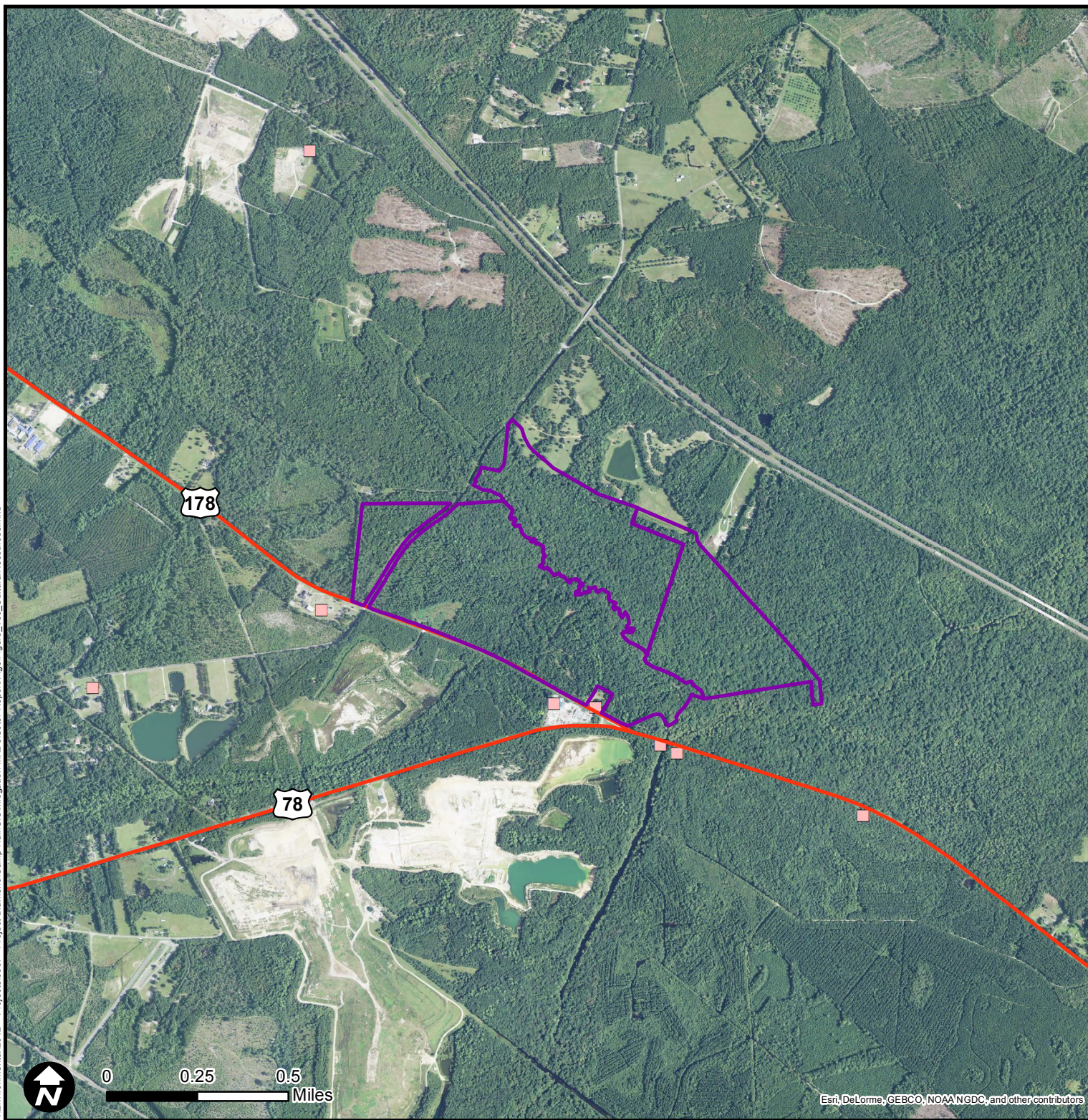
Figure 16b. Cultural ResourcesMap

Project Soter - Landscape Mitigation Plan
Orangeburg, Berkeley, Dorchester Counties
South Carolina

Job No. 6250150080
Drawn By: BWS
Reviewed By: WAR
Date: 04/06/2015

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Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

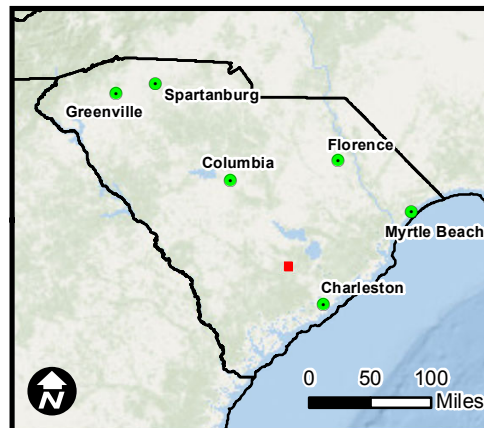
- Legend**
- Mitigation Project Boundary
 - Highway
 - Archaeological Sites
 - Survey Areas
 - Historic Structures**
 - Eligible Structures
 - Not Eligible Structures

Job No. 6250150080
 Drawn By: BWS
 Reviewed By: WAR
 Date: 04/06/2015

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Figure 16c. Cultural Resources Map

Project Soter - Landscape Mitigation Plan
 Orangeburg, Berkeley, Dorchester Counties
 South Carolina



**APPENDIX B: DRAFT SITE
PROTECTION INSTRUMENTS
(USACE Template)**

Charleston District Conservation Easement Model of September 2010

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STATE OF SOUTH CAROLINA CONSERVATION EASEMENT AND ACCEPTANCE

COUNTY OF _____

THIS INDENTURE, is made this _____ day of _____, 20____, by and between _____ ("Grantor(s)"), of _____, South Carolina, and _____, ("Grantee(s)"), of _____, South Carolina.

WHEREAS, Grantor is the owner in fee simple of certain real property [*"real property" includes surface waters and wetlands, any interest in submerged lands, uplands, associated riparian/littoral rights*] located in _____ County, South Carolina, more particularly described [*description of tract must include: 1) acreage, and 2) reference the surveyed plat(s) required below*] ("Protected Property");

WHEREAS, Grantor desires to convey to the Holder a conservation easement placing certain limitations and affirmative obligations on the Protected Property for the protection of wetlands, scenic, resource, environmental, and other values, and in order that the Protected Property shall remain substantially in its natural condition forever;

WHEREAS, Holder is qualified to hold a conservation easement, and is either

(a) a governmental body empowered to hold an interest in real property under the laws of this State or the United States; or

(b) a charitable, not-for-profit or educational corporation, association, or trust [*qualified under § 501(c)(3) and §170 (h) of the Internal Revenue Code*], the purposes or powers of which include one or more of the purposes (a) - (d) listed below;

(a) retaining or protecting natural, scenic, or open-space aspects of real property;

(b) ensuring the availability of real property for recreational, educational, or open-space use;

(c) protecting natural resources;

(d) maintaining or enhancing air or water quality.

WHEREAS, Grantor and Holder agree that third-party rights of enforcement shall be held by the U.S. Army Corps of Engineers, Charleston District and the S.C. Department of Health and Environmental Control ("Third-Parties," to include any successor agencies), and may be exercised through the appropriate enforcement agencies of the United States and the State of South Carolina, and that these rights are in addition to, and do not limit, the rights of enforcement under Department of the Army permit number _____, or any permit or certification issued by the Third-Parties.

[Insert for approved mitigation banks: WHEREAS, the Protected Property has been approved by the Third-Parties for use as a mitigation bank, to be known as _____ Mitigation Bank;]

COVENANTS, TERMS, CONDITIONS, AND RESTRICTIONS

A. PURPOSE

1. The purpose of this Conservation Easement is to ensure the Property will be preserved in a "Natural Condition", as defined herein in perpetuity and to prevent any use of the Property that will materially impair or interfere with the Conservation Values of the property (the "Purpose"). Grantor intends that this Conservation Easement will confine the use of the Property to such activities, including without limitation, those involving the restoration, enhancement, and/or preservation of aquatic resources in a manner consistent with the conservation purposes of this Conservation Easement.

2. The term "natural condition," as referenced in the preceding paragraph and other portions of this conservation easement, shall mean the condition of the property, as it exists at the time this Conservation easement is executed, as well as future restoration, enhancement, or other changes to the property that occur directly as a

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result of the compensatory mitigation measures required by section 404 Permit(s) pursuant [to the Mitigation Banking Instrument *[and/or described in the Final Mitigation and Monitoring Plan]* dated, _____, 20__ (“Mitigation Plan”), the cover page and Executive Summary of which are attached as Exhibit “_,” including implementation, maintenance, and monitoring activities (collectively, “Compensatory Mitigation”).

3. **Baseline Documentation.** The Current Conditions (which may or may not include restoration and enhancement efforts pursuant to compensatory mitigation activities), of the Property as of the date of this Deed are further documented in a "Present Conditions Report," dated, _____, 20__ and prepared by [*preparer's name*], which report is acknowledged as accurate by Grantor and Grantee. The present conditions report includes:

(a) a current aerial photograph of the Protected Property at an appropriate scale taken as close as possible to the date the donation is made;

(b) on-site photographs taken at appropriate locations on the Protected Property, including of major natural features; and,

(c) a surveyed plat of the Protected Property showing all relevant property lines, all existing man-made structures, improvements, features, and major, distinct natural features such as waters of the United States, and shall be recorded in the RMC office for each county in which the Protected Property is situated prior to the recording of this Conservation Easement, and is recorded at [insert book and page references, county and date of recording]

(d) [etc. - insert any additional documentation which may be used to evidence the natural condition of the Protected Property]

The Present Conditions Report has been provided to both parties and will be used by Grantee to assure that any future changes in the use of the Property will be consistent with the terms of this Deed. However, the Present Conditions Report is not intended to preclude the use of other evidence to establish the condition of the Property as of the date of this Deed.

4. **Baseline Documentation Update.** After the completion of the compensatory mitigation activities on the protected property, Grantor, grantee, and third-parties agree that the baseline documentation can and should be updated to reflect the new conditions of the protected property. In the event that such an update is needed, grantor agrees to provide such necessary update, including photographs, narratives, and any other data needed to accurately reflect the conditions of the protected property.

5. Grantor certifies to Third Parties and Grantee that to the Grantors actual knowledge, there are no previously granted easements existing on the property that interfere or conflict with the Purpose of this Conservation Easement as evidenced by the title Report attached at “Exhibit _.”

6. **Current Liens.** [*fill in as appropriate*] At the time of conveyance of this Easement, the Property is subject to a Mortgage or Deed of Trust, the holder of which has agreed, by separate instrument, a copy of which is attached hereto as **Exhibit** __, to subordinate its rights in the Property to the extent necessary to permit the Trust to enforce the purposes of this Easement in perpetuity and to prevent any modification or extinguishment of this Easement Deed by the exercise of any rights of the Deed of Trust holder.

NOW THEREFORE, for the foregoing consideration, and in further consideration of the restrictions, rights, and agreements herein, Grantor hereby conveys to Holder a conservation easement over the Protected Property consisting of the following:

B. PROHIBITED USES

Any activity on or use of the property inconsistent with the Purpose of this Conservation Easement and not reserved as a right of Grantor is prohibited. These Restrictions shall run with the land and be binding on Grantor’s heirs, successors, administrators, assigns, lessees, or other occupiers and users, and are subject to the Reserved Rights which follow. The Following uses by Grantor, Grantee, their respective guests, agents, assigns, employees, representatives, successors, and third parties are expressly prohibited on the Property except as otherwise provided herein or unless specifically provided for in the Section 404 Permit and any amendments thereto, the Mitigation

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Plan, and any easements and reservations of rights in the chain of title to the property at the time of this conveyance (as set forth on Exhibit __):

1. **General.** There shall be no filling, flooding, excavating, mining or drilling; no removal of natural materials; no dumping of materials; and, no alteration of the topography in any manner.
2. **Waters and Wetlands.** In addition to the General restrictions above, there shall be no draining, dredging, damming or impounding; no changing the grade or elevation, impairing the flow or circulation of waters, reducing the reach of waters; and, no other discharge or activity requiring a permit under applicable clean water or water pollution control laws and regulations, as amended.
3. **Trees/Vegetation.** There shall be no clearing, burning, cutting or destroying of trees or vegetation, except as expressly authorized in the Reserved Rights; there shall be no planting or introduction of non-native or exotic species of trees or vegetation.
4. **Activities.** No industrial activities, commercial activities, residential activities, or agricultural activities (including livestock grazing) shall be undertaken or allowed.
5. **Structures.** There shall be no construction, erection, or placement of buildings, billboards, or any other structures, nor any additions to existing structures.
6. **New Roads.** There shall be no construction of new roads, trails or walkways without the prior written approval of the Holder and Third-Parties, including of the manner in which they are constructed.
7. **Utilities.** There shall be no construction or placement of utilities or related facilities without the prior written approval of Holder and Third-Parties.
8. **Pest Control.** There shall be no application of pesticides or biological controls, including for problem vegetation, without prior written approval from the Holder and Third-Parties.
9. **Subdivision.** There shall be no legal or de facto division, subdivision or portioning of the property.
10. **Other Prohibitions.** Any other use of, or activity on, the Protected Property which is or may become inconsistent with the purposes of this grant, the preservation of the Protected Property substantially in its natural condition, or the protection of its environmental systems, is prohibited.

[11. *Additional, case-specific restrictions may need to be inserted*]

C. GRANTEE'S RIGHTS

To accomplish the Purpose of this Conservation Easement, Grantor, its successor and assign hereby grants and conveys the following rights to Grantee and Third Parties.

1. To preserve and protect the Conservation Values of the Property, including enforcing the terms of this Conservation Easement in order to assure the protected property remains in its "natural condition," defined herein, in perpetuity.
2. To enter upon the property at reasonable times in order to monitor compliance with and to otherwise enforce the terms of this Conservation Easement.
3. To prevent any activity on or use of the property that is inconsistent with the Purpose of this Conservation Easement and to require the restoration of such areas or features of the Property that may be damaged by any act, failure to act, or any use that is inconsistent with the Purpose of this Conservation Easement.

Charleston District Conservation Easement Model of September 2010

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4. All mineral, air, and water rights necessary to protect and sustain the biological resources of the Property, provided that any exercise or sale of such rights by Grantee shall not result in conflict with the Conservation Purpose.

5. All present and future development rights allocated, implied, reserved or inherent in the properties; such rights are hereby terminated and extinguished, and may not be used or transferred to any portion of the Properties.

6. The right to enforce by means, including, without limitation, injunctive relief, the terms and conditions of this Conservation Easement.

D. GRANTOR'S RESERVED RIGHTS

Notwithstanding the foregoing Restrictions, Grantor reserves for Grantor, its heirs, successors, administrators, and assigns the following Reserved Rights, which may be exercised upon providing prior written notice to Holder and to Third-Parties, except where expressly provided otherwise:

1. **Landscape Management.** Landscaping by the Grantor to prevent severe erosion or damage to the Protected Property or portions thereof, or significant detriment to existing or permitted uses, is allowed, provided that such landscaping is generally consistent with preserving the natural condition of the Protected Property.

2. **Forest Management.** Harvesting and management of timber by Grantor is limited to the extent necessary to protect the natural environment in areas where the forest is damaged by natural forces such as fire, flood, storm, insects or infectious organisms. *[Additional language related to fire management plans may be added as necessary]* Such timber harvest and management shall be carried out in accordance with Best Management Practices approved by the South Carolina Forestry Commission or successor agency, as amended.

3. **Recreation.** Grantor reserves the right to engage in any outdoor, non-commercial recreational activities, including hunting (excluding planting or burning) and fishing, with cumulatively very small impacts, and which are consistent with the continuing natural condition of the Protected Property. No written notice required.

4. **Mineral Interests.** Grantor specifically reserves a qualified mineral interest (as defined in § 170(h)(6) of the Internal Revenue Code) in subsurface oil, gas or other minerals and the right to access such minerals. However, there shall be no extraction or removal of, or exploration for, minerals by any surface mining method, nor by any method which results in subsidence or which otherwise interferes with the continuing natural condition of the Protected Property.

5. **Road Maintenance.** Grantor reserves the right to maintain existing roads, trails or walkways. Maintenance shall be limited to: removal or pruning of dead or hazardous vegetation; application of permeable materials (e.g., sand, gravel, crushed) necessary to correct or impede erosion; grading; replacement of culverts, water control structures, or bridges; and, maintenance of roadside ditches.

6. **Vegetation, Debris, and Exotic Species Removal.** Grantor reserves the right to engage in the removal or trimming of vegetation downed or damaged due to natural disaster, removal of man-made debris, removal of parasitic vegetation (as it relates to the health of the host plant) and removal of non-native or exotic plant or animal species.

7. **Compensatory Mitigation.** Grantor reserves the right to perform any restoration, enhancement, and other wetland mitigation activities required by Section 404 permit's and/or Mitigation Banking Instruments, including the use of all equipment necessary to successfully complete any mitigation requirements contained therein.

Charleston District Conservation Easement Model of September 2010

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8. **Other Reserved Rights.** Grantor reserves the right to engage in all acts or uses not prohibited by the Restrictions, and which are not inconsistent with the conservation purposes of this grant, the preservation of the Protected Property in its natural condition, and the protection of its environmental systems.
9. *[Insert for approved mitigation banks: 7. Grantor reserves the sole and unrestricted right to sell credits or other entitlements or interests in the Protected Property in order to perfect and carry out the purpose of a mitigation bank.]*
10. *[Additional, case-specific reservations may be listed, e.g., fire or wildlife management plans.]*

E. GENERAL PROVISIONS

The following General Provisions shall be binding upon, and inure to the benefit of, the Grantor, Holder and Third-Parties, and the heirs, successors, administrators, assigns, lessees, licensees and agents of each:

1. **Marking of Property.** Grantor shall install and maintain permanent signs saying “Protected Natural Area” or establish an equivalent, permanent, marking system along the boundary of any protected areas such as upland buffers, riparian zones, and aquatic resources.
2. **Rights of Access and Entry.** Holder and Third-Parties shall have the right to enter and go upon the Protected Property for purposes of inspection, and to take actions necessary to verify compliance with the Restrictions. Holder shall also have the rights of visual access and view, and to enter and go upon the Protected Property for purposes of making scientific or educational observations and studies, and taking samples, in such a manner as will not disturb the quiet enjoyment of the Protected Property by Grantor. No right of access or entry by the general public to any portion of the Protected Property is conveyed by this Conservation Easement.
3. **Enforcement.** In the event of a breach of the Restrictions by Grantor or another party, the Holder or one of the Third-Parties must notify the Grantor in writing of the breach. The Grantor shall have thirty (30) days after receipt of such notice to undertake actions that are reasonably calculated to swiftly correct the conditions constituting the breach. If the Grantor fails to take such corrective action within thirty (30) days, or fails to complete the necessary corrective action, the Holder and/or the Third-Parties may undertake such actions, including legal proceedings, as are necessary to effect such corrective action. Among other relief, Holder and/or Third-Parties shall be entitled to a complete restoration for any breach of the Restrictions. Breaches of General Provisions of this Conservation Easement shall be actionable without notice. The costs of a breach, correction or restoration, including the Holder’s expenses, court costs, and attorneys’ fees, shall be paid by Grantor, provided Grantor is determined to be responsible for the breach. Enforcement shall be at the discretion of the Holder and/or Third-Parties, and no omission or delay in acting shall constitute a waiver of any enforcement right. These enforcement rights are in addition to, and shall not limit, enforcement rights available under other provisions of law or equity, or under any applicable permit or certification.
4. **Events Beyond Grantor’s Control.** Nothing herein shall be construed to authorize the Holder or Third-Parties to institute any proceedings against Grantor for any changes to the Protected Property caused by acts of God or circumstances beyond the Grantor’s control such as earthquake, fire, flood, storm, war, civil disturbance, strike, the unauthorized acts of third persons, or similar causes.
5. **Obligations of Ownership.** Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Protected Property. Grantor shall keep the Protected Property free of any liens or other encumbrances for obligations incurred by Grantor. Holder shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Protected Property, except as expressly provided herein. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits which may apply to the exercise of the Reserved Rights.
6. **Long Term Management.** Grantor will accomplish the long-term management activities identified in the approved mitigation plan, dated _____. The required activities include but are not limited to *management activities (i.e., control of invasive species, fire, etc) and the maintenance and/or replacement of structures (fences,*

Charleston District Conservation Easement Model of September 2010

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ditch plugs, weirs, etc) that are critical to the long-term success of the mitigation activities as described in the approved mitigation plan.

7. **Extinguishment.** In the event that changed conditions render impossible the continued use of the Protected Property for the conservation purposes, this Conservation Easement may only be extinguished, in whole or in part, by judicial proceeding.

8. **Eminent Domain.** Whenever all or part of the Protected Property is taken in the exercise of eminent domain so as to substantially abrogate the Restrictions imposed by this Conservation Easement, the Grantor and Holder shall join in appropriate actions at the time of such taking to recover the full value of the taking, and all incidental and direct damages due to the taking.

9. **Proceeds.** This Conservation Easement constitutes a real property interest immediately vested in Holder. In the event that all or a portion of this Protected Property is sold, exchanged, or involuntarily converted following an extinguishment or the exercise of eminent domain, Holder shall be entitled to the fair market value of this Conservation Easement. The parties stipulate that the fair market value of this Conservation Easement shall be determined by multiplying the fair market value of the Protected Property unencumbered by this Conservation Easement (minus any increase in value after the date of this grant attributable to improvements) by the ratio of the value of this easement at the time of this grant to the value of the Protected Property (without deduction for the value of this Conservation Easement) at the time of this grant. The values at the time of this grant shall be the values used, or which would have been used, to calculate a deduction for federal income tax purposes, pursuant to Section 170(h) of the Internal Revenue Code (whether eligible or ineligible for such a deduction). Holder shall use its share of the proceeds in a manner consistent with the purposes of this Conservation Easement.

10. **Notification.** Any notice, request for approval, or other communication required under this Conservation Easement shall be sent by registered or certified mail, postage prepaid, to the following addresses (or such address as may be hereafter specified by notice pursuant to this paragraph):

To Grantor: _____

To Holder: _____

To Third Parties: U.S. Army Corps of Engineers
Attn: Regulatory Division
69A Hagood Avenue
Charleston, South Carolina 29403

9. **Assignment.** This Conservation Easement is transferable, but only to a qualified holder under 501 (C)(3) and § 170(h) of the Internal Revenue Code as described herein. As a condition of such transfer, the transferee shall agree to all of the restrictions, rights, and provisions herein, and to continue to carry out the purposes of this Conservation Easement. Assignments shall be accomplished by amendment of this Conservation Easement under paragraph 12. Grantee shall notify Third Parties at least 60 days prior to any such assignment or transfer.

10. **Failure of Holder.** If at any time Grantee is unable or fails to enforce this Conservation Easement, or if Grantee ceases to be a qualified holder under §501(c)(3) and § 170(h) of the Internal Revenue Code, and if within a reasonable period of time after the occurrence of one of these events the Grantee fails to make an assignment pursuant to paragraph 9, then the Holder's interest shall become vested in another qualified holder in accordance with an appropriate (e.g., cy pres) proceeding in a court of competent jurisdiction.

11. **Subsequent Transfer.** Grantor agrees to incorporate the terms of this Conservation Easement in any deed or other legal instrument which transfers any interest in all or a portion of the Protected Property. Grantor agrees to provide written notice of such transfer to Grantee and Third Parties at least 60 days prior to the date of transfer. The

Charleston District Conservation Easement Model of September 2010

See <http://www.sac.usace.army.mil> for latest edition of this model.

failure of Grantor to comply with this paragraph shall not impair the validity or enforceability of this Conservation Easement.

12. **Amendment.** This Conservation Easement may be amended, but only in writing signed by all parties hereto, and provided such amendment does not affect the purpose of this Conservation Easement or the status of the Grantee under any applicable laws, including S.C. Code Title 7, Chapter. Any amendments must be consistent with the conservation purposes of this grant.

13. **Severability.** Should any separable part of this Conservation Easement be found void or unenforceable by a court of competent jurisdiction, the remainder shall continue in full force and effect.

14. **Warranty.** Grantor warrants that it owns the Protected Property in fee simple, and that Grantor either owns all interests in the Protected Property which may be impaired by the granting of this Conservation Easement or that there are no outstanding mortgages, tax liens, encumbrances, or other interests in the Protected Property which have not been expressly subordinated to this Conservation Easement. Grantor further warrants that Holder shall have the use of and enjoy all the benefits derived from and arising out of this Conservation Easement.

15. **Habendum Clause.** To have and to hold, this Easement together with all and singular the appurtenances and privileges belonging or in any way pertaining thereto, either in law or equity, either in possession or expectancy, for the proper use and benefit of the Grantee, its successors and assigns, forever.

[Signature Pages Attached]

See <http://www.sac.usace.army.mil> for latest edition of this model.

Charleston District Conservation Easement Model of September 2010

Charleston District Conservation Easement Model of September 2010

See <http://www.sac.usace.army.mil> for latest edition of this model.

**Continuation of Signature Page
For Deed of Conservation Easement**

GRANTEE:

Signature: _____

(Witness)

(Witness)

[type/print name of grantee]

[Title and Organization]

STATE OF SOUTH CAROLINA)
) ss.
COUNTY OF _____)

I, a Notary Public, do hereby certify that _____ personally appeared before me this
day and acknowledged the due execution of the foregoing instrument.

WITNESS my hand and seal this _____ day of _____, 20 ____.

(Signature of Notary Public)

(Typed/Printed name of Notary Public)

NOTARY PUBLIC FOR SOUTH CAROLINA
My Commission Expires: _____

Charleston District Conservation Easement Model of September 2010

See <http://www.sac.usace.army.mil> for latest edition of this model.

Approval by Third-Parties

U.S. Army Corps of Engineers,
Charleston District,

By: _____

[type/print name]

Title: _____

S.C. Department of Health and
Environmental Control

By: _____

[type/print name]



Title: _____

APPENDIX C: PHOTO LOG

**Project Soter – Landscape Mitigation Plan
Photographic Log
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log
March - April 2015





	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 1
	Photographer: WR Description: View of bottomland hardwood forest along the Sandy Run floodplain in the northwest portion of the tract.
	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 2
	Photographer: WR Description: View of isolated pond that drains southeast to Sandy Run in the southeast portion of the tract.

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Photographic Log
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log
March - April 2015





 A photograph showing a flooded bottomland hardwood forest. The water is dark and still, reflecting the surrounding trees and vegetation. In the foreground, there are green, spiky plants growing out of the water. The trees are mostly bare or have sparse green leaves, suggesting a late winter or early spring setting.	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 3
	Photographer: WR
 A photograph of a wet loblolly pine plantation stand. The ground is covered in brown, dry leaves and pine needles. Several tall, slender pine trees are visible, with their trunks spaced out. In the background, there is a small body of water reflecting the sky. The overall scene is a typical representation of a managed wetland forest.	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 4
	Photographer: WR
	Description: View of wet loblolly pine plantation stand in the northwest portion of the tract.

**Project Soter – Landscape Mitigation Plan
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Berkeley, Dorchester, and Orangeburg Counties, SC**

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March - April 2015



	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 5
	Photographer: WR
	Description: View upstream of Cedar Swamp in the north-central portion of the tract.
	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 6
	Photographer: WR
	Description: View downstream of Cedar Swamp in the north-central portion of the tract.

**Project Soter – Landscape Mitigation Plan
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Berkeley, Dorchester, and Orangeburg Counties, SC**

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March - April 2015



	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 7
	Photographer: WR
	Description: View of an un-thinned loblolly pine plantation stand in the north-central portion of the tract.
	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 8
	Photographer: WR
	Description: View of a thinned loblolly pine plantation stand in the northwest portion of the tract.

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	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 9
	Photographer: WR
	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 10
	Photographer: WR
	Description: View of a young loblolly pine plantation stand (foreground) in the northwest portion of the tract.
	Description: View of bottomland hardwood forest edge along Sandy Run in the north-central portion of the tract.

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Photographic Log
Berkeley, Dorchester, and Orangeburg Counties, SC

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 March - April 2015



Client: Berkeley County Economic Development

Location:
Bannister Tract

Project No.:
6250150080.01

Date:
03.26.15

Photo No.:
11

Photographer:
WR

Description:
View of an existing bridge that crosses Sandy Run just below the confluence with Cedar Swamp.



Client: Berkeley County Economic Development

Location:
Bannister Tract

Project No.:
6250150080.01

Date:
03.26.15

Photo No.:
12

Photographer:
WR

Description:
View of the recent clear-cutting activities along the central portion of the tract.

**Project Soter – Landscape Mitigation Plan
Photographic Log
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log
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Client: Berkeley County Economic Development
Location: Bannister Tract
Project No.: 6250150080.01
Date: 03.26.15
Photo No.: 13
Photographer: WR
Description: View of the existing forestry access roads within the tract.





Client: Berkeley County Economic Development
Location: Bannister Tract
Project No.: 6250150080.01
Date: 03.26.15
Photo No.: 14
Photographer: WR
Description: View of Sandy Run and associated bottomland hardwood community.

**Project Soter – Landscape Mitigation Plan
Photographic Log
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log
March - April 2015





	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 15
	Photographer: LD
	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 16
	Photographer: LD
	Description: View of the bottomland hardwood forest along Walnut Branch.

**Project Soter – Landscape Mitigation Plan
Photographic Log
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log
March - April 2015





	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 17
	Photographer: LD Description: Bottomland hardwood forest community within the floodplain of Walnut Branch.
	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 18
	Photographer: LD Description: View of the swamp adjacent to Walnut Branch.

**Project Soter – Landscape Mitigation Plan
Photographic Log
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log
March - April 2015





	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 19
	Photographer: LD
	Description: View of an open field within the uplands of the Walnut Branch Tracts.
	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 20
	Photographer: LD
	Description: View of the uplands along Walnut Branch. The bluff along Walnut Branch is approximately 20 feet high above the floodplain in some locations.

**Project Soter – Landscape Mitigation Plan
Photographic Log
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log
March - April 2015





	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 21
	Photographer: LD
	Description: View of Walnut Branch.
	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 22
	Photographer: LD
	Description: View of the floodplain along Walnut Branch.

**Project Soter – Landscape Mitigation Plan
Photographic Log
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log
March - April 2015



 A photograph showing a calm stream or branch flowing through a dense forest. The water reflects the surrounding green trees and foliage. A fallen log is visible in the foreground on the left.	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 23
	Photographer: LD
 A photograph of a grassy floodplain area within a forest. Sunlight filters through the trees, creating dappled light on the green grass. Several tree trunks are visible in the background.	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 24
	Photographer: LD
	Description: View of the floodplain along Walnut Branch.

APPENDIX D: LANDOWNER AUTHORIZATION FORMS

Land Owner Authorization Forms
to be submitted at a later date.