



26 May 2022

US Army Corps of Engineers
Savannah District / Regulatory Division
Attention: Ms. Sarah Wise
100 West Oglethorpe Ave
Savannah, GA 31402-0889

**Subject: Individual Permit Application
Bryan County Mega Site
Bryan, Georgia
SAS-2015-00235**

RLC# 14-225.7

Dear Ms. Wise:

On behalf of the Georgia Department of Economic Development and Savannah Harbor-Interstate 16 Corridor Joint Development Authority, please find attached a Section 404 Individual Permit Application requesting authorization to impact 221.36 acres of jurisdictional wetland, 0.98 acres of jurisdictional ditch and 763 linear feet of stream to facilitate construction of an Electric Vehicle Original Equipment Manufacturing site. The project area totals approximately 2,541.25 acres located adjacent to and east of Highway 280 and adjacent to and south of Interstate 16 within Bryan County, Georgia (32.164165°, -81.450411°).

The attached information includes the following:

- Project Description
- CESAS Form 19
- Figures/Site Maps
- Permit Drawings
- Off-Site Alternatives Information
- On-Site Alternatives
- Compensatory Mitigation Calculations
- Threatened & Endangered Species, IPaC Database & Edges Information
- Cultural & Archaeology Resources Documentation
- Adjacent Landowner Information

We greatly appreciate your assistance with this project. If you have any questions or require additional information, please do not hesitate to contact us at (912) 443-5896.

Sincerely,

Alton Brown, Jr.
Principal
Resource & Land Consultants

Enclosures

cc: Mr. Pat Wilson – Georgia Department of Economic Development
Mr. Trip Tollison - Savannah Harbor-Interstate 16 Corridor Joint Development Authority
Ms. Anna Chafin - Savannah Harbor-Interstate-16 Corridor Joint Development Authority
Mr. Jason Chambless – Thomas & Hutton
Mr. Bradley Smith – GADNR-EPD

May 2022

Bryan County Mega Site

Prepared For:

Georgia Department of Economic Development

&

Savannah Harbor-Interstate 16 Corridor Joint Development Authority



RESOURCE+LAND
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Bryan County Mega Site

SECTION 404 INDIVIDUAL PERMIT APPLICATION
May 2022

Applicants: Georgia Department of Economic Development &
Savannah Harbor-Interstate 16 Corridor Joint Development Authority



RESOURCE+LAND
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Brockington
CULTURAL RESOURCES CONSULTING

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- A: CESAS Form 19
- B: Figures/Site Maps
- C: Permit Drawings
- D: Off-Site Alternatives
- E: On-Site Configurations
- F: Compensatory Mitigation Calculations
- G: Threatened & Endangered Species Documentation, IPaC Database & Edges Information
- H: Cultural & Archaeological Resources Documentation
- I: Adjacent Landowner Information

1.0 INTRODUCTION:

The Georgia Department of Economic Development (“GDEcD”) and the Savannah Harbor-Interstate 16 Corridor Joint Development Authority (“JDA”) are proposing the development of an approximately 2,541.25-acre tract generally located adjacent to and east of Highway 280 and adjacent to and south of Interstate 16 within Bryan County, Georgia (32.164165°, -81.450411°)(“Bryan County Mega-Site” or the “Site”). Development of the Site will accommodate construction of an electric-vehicle, original-equipment-manufacturing (“EVOEM”) assembly facility for the purpose of producing and distributing fully electric vehicles.

2.0 BACKGROUND:

Georgia Department of Economic Development. GDEcD is the state's sales and marketing arm, the lead agency for attracting new business investment, encouraging the expansion of existing industry and small businesses, aligning workforce education and training with in-demand jobs, locating new markets for Georgia products, attracting tourists to Georgia, and promoting the State as a destination for arts and a location for film, music and digital entertainment projects, as well as planning and mobilizing state resources for economic development. GDEcD seeks to improve the lives and welfare of all Georgians by creating jobs and promoting economic development opportunities.

In January 2022, the Site was identified in connection with an on-going, state-wide assessment of potential locations suitable to support new industries and business expansion. These assessments are performed pursuant to GDEcD’s mission and fully leveraging its expertise. GDEcD identifies these sites based on a number of criteria known to be important for target economic development opportunities, including proximity to population centers and potential work forces, proximity to existing shipping ports, airports, availability and condition of rail and interstate highway infrastructure, availability of utilities and utility infrastructure, and site buildability. GDEcD’s assessments and subsequent analyses have identified only a handful of, so called, “mega-sites.” These unique sites met initial screening criteria summarized above. Importantly, these mega-sites are also large enough to support the type and scale of project proposed here. In addition, given the fast-paced and highly-competitive business of state-recruitment for these projects, these sites were identified because they were reasonably available. These are key factors and criteria in GDEcD’s site-selection decisions at the State level.

GDEcD’s proactive efforts to identify suitable locations for economic development projects of this scale is a key component of the State’s successes in this (again) highly-competitive, fast-paced, international competition. In addition, Georgia has natural advantages, including a diverse and well-educated work force, exceptional technical colleges and universities, a desirable climate, relatively low cost of energy, diverse, renewable and replenishing natural resources, the Nation’s 4th largest port operations, four major interstate highways, and the World’s busiest airport. These factors weigh heavily on target companies’ site-selection decisions at the national and international level.

Savannah Harbor-Interstate 16 Corridor Joint Development Authority. In late 2014, GDEcD received a request for information regarding potential tracts within Georgia that would qualify for an automotive OEM facility. The proposed manufacturing plant/facility included up to a \$1 billion private capital investment, would have created 2,000 jobs with the potential to create up to 4,000 jobs within ten years after the start of production. The Bryan County Mega-Site was a finalist for the project; however, a site within a neighboring state was selected for that project. Recognizing the potential regional impact of that project, the JDA including Chatham, Bryan, Effingham, and Bulloch Counties was formed. The JDA was created by joint resolutions of its four member counties (Bryan, Bulloch, Chatham & Effingham Counties) in 2015 for the purpose of creating jobs and investment in the region and to deliver a pad ready mega-site for the purposes of constructing an automotive OEM facility. The members of the JDA have successfully developed and/or promote numerous sites within the four-county region including:

- Belfast Commerce Park, Bryan County Mega-Site and Interstate Centre within Bryan County
- Gateway II Cannady Site, Gateway II Riggs Rail Site and Southern Gateway Commerce Park within Bulloch County

- Chatham County Economic Development Site and Savannah Manufacturing Center within Chatham County
- Georgia International Rail Park, Georgia International Trade Center, and Savannah Gateway Industrial Hub, and Savannah Portside International Park within Effingham County

Specific to this project, the JDA worked with GDEcD to recruit this EVOEM opportunity for Georgia and worked as an advocate for the four-county region, highlighting the area’s significant advantages for this project – e.g., infrastructure, work force.

The Request for Proposal. In early 2022, the GDEcD and several other states, received a Request for Proposal (“RFP”) from a leader in the electric vehicle industry (the “Company”), who develops and produces all electric vehicles, products, and services related to sustainable transportation. The Company sought proposals that met several specifications and could accommodate construction of a new EVOEM assembly facility, with required utilities. The Company seeks to expand its production capacity for additional electric vehicle lines and electric vehicle components with this new operation. The RFP announced the Company’s desire to locate within a state that is committed to supporting the growth of the United States electric vehicle industry.

Bryan County Mega-Site. As briefly mentioned above and in direct response to numerous RFP’s received by GDEcD and the JDA from 2014-2018, GDEcD and the JDA initiated all site entitlement work necessary to deliver a pad ready mega-site for the purposes of constructing an automotive OEM facility. The actions associated with this entitlement effort included land procurement, preparation of water extension design plans, site grading design plans, sewer treatment design plans, entrance road design plans, property survey, topo survey, etc. Specific to 404, the JDA completed a wetland delineation, completed a wetland survey, completed a threatened & endangered species survey, completed a cultural and archeological resources phase I survey, developed a conceptual site plan using the JDA and GDEcD expertise for such planning, prepared permit drawings, prepared and submitted a 404-permit application, and coordinated with the state and federal agencies and obtained a draft permit from the USACE in July 2019.

In light of the 2022 RFP criteria, GDEcD worked to identify the best fit for this opportunity within Georgia — recognizing that it was engaged in a highly-competitive process, targeting a rare and highly-coveted project, and competing with many of its sister states. GDEcD revisited its prior assessments of specific sites GDEcD leveraged its relationships with regional advocates like the JDA in responding to the RFP and has been working with the Company since early 2022 to bring the project to Georgia. The stakes are as great as the scope and scale of this EVOEM opportunity could bring \$5.9 billion in private capital investment and roughly 10,000+ jobs related to the investment. Considering the scope, size and specific criteria of the project and the entitlement history associated with the Bryan County Mega-Site, the Company announced its selection of Georgia for its new EVOEM facility in May 2022. Having invested significant resources and countless hours in pursuit of this opportunity and an optimal site, the JDA and GDEcD are pleased to submit this application for the development of Bryan County Mega-Site that meets the Company’s specifications for its construction of a unique, new EVOEM assembly facility. In April 2022, the company signed a Letter of Intent to be followed by an Economic Development Agreement for the project, which, among other things, requires GDEcD and the JDA to obtain required permits and prepare the site for the EVOEM assembly facility on the extremely aggressive timeline required to support the Company’s plans and success in the rapidly-developing and highly-competitive electric vehicle innovation industry.

3.0 BASIC & OVERALL PROJECT PURPOSE:

The basic purpose of the proposed project is to develop a site that can accommodate the construction of an EVOEM assembly facility. The overall project purpose is to efficiently and timely provide a construction-ready site that meets all siting criteria for the initial and build out construction of the EVOEM assembly facility.

4.0 EXISTING SITE CONDITIONS:

The subject site is uniquely suited for construction of an EVOEM assembly facility when considering location, topography, and existing habitat conditions. The proposed site is located in the southeast quadrant of the Interstate 16 and Highway 280 intersection and the 2,541.25-acre site was created by assembling only five parcels. Creating a similar sized parcel along any other intersection adjacent to Interstate 16 or Interstate 95 would require assembling many more parcels and in some cases more than 50. The topography ranges from elevation 20 feet within the wetland/floodplain along Black Creek to almost 90 feet within the development area near Interstate 16. These elevations and topographic changes are not common for properties within the lower Coastal Plain or Bryan County, Georgia. While wetlands and waters of the U.S. typically make up 30 percent or more of any large tract within the Coastal Plain of Georgia, only 16 percent of the proposed project area consists of wetlands and/or waters of the U.S. Lastly, the site has been intensively managed for timber production and while this is not uncommon for the coast of Georgia, the project could not have been timed any better when considering the age of the timber within the site. Much of the timber within the upland has been harvested within the past five years.

A jurisdictional determination was obtained for portions of the property in 2015 and an updated request including the entire Mega-Site was submitted to the USACE in 2021 and 2022. Based on this information, the 2,541.25-acre project area contains 1,880.68 acres of upland, 625.98 acres of jurisdictional wetland, 29.32 acres of non-jurisdictional wetland, 6.51 acres of pond, 1.58 acres of ditch and 763 linear feet of stream. As documented and recorded during the field surveys, dominant habitats include managed pine plantation (both upland and wetland), slope wetlands, depressional wetlands, intermittent streams, man-made ponds, open field, man-made ditches, and existing roads. The general location of each habitat is depicted on Figure 2, Appendix G. The following summary provides a brief description of each habitat.

- Managed Pine Plantation: The property consists of intensively managed pine plantation consisting of both upland and wetland. The stand age for this habitat varies across the site from recently planted to 20 years old and species composition is dictated by topography, soils and hydrology (i.e. upland pine plantation and wetland pine plantation). A general summary of species composition is as follows:
 - Upland Pine Plantation: loblolly pine (*Pinus taeda*), live oak (*Quercus virginiana*), sweetgum (*Liquidambar styraciflua*), wax myrtle (*Myrica cerifera*), blackberry (*Rubus argutus*), fetterbush (*Lyonia lucida*), broomsedge (*Andropogon virginicus*), saw palmetto (*Serenoa repens*), bracken fern (*Pteridium aquilinum*), yellow jessamine (*Gelsemium sempervirens*), and poison Ivy (*Toxicodendron radicans*).
 - Wetland Pine Plantation: slash pine, loblolly pine, red maple (*Acer rubrum*), sweetgum, water oak (*Quercus nigra*), willow oak (*Quercus phellos*), wax myrtle, swamp titi (*Cyrilla racemiflora*), fetterbush, greenbrier (*Smilax laurifolia*), blackberry, gaint Cane (*Arundinaria gigantea*), black-stem chainfern (*Woodwardia virginica*), netted chainfern (*Woodwardia areolata*), and poison ivy.
- Slope Wetlands: This habitat consists of slope wetland areas generally located along the perimeter of the site. Portions of this habitat have been recently timbered and are naturally regenerating with a variety of tree, shrub and herbaceous species. Other areas contain a relative mature canopy with a dense understory of shrub species. Species composition includes water oak, red maple, red bay, sweetgum, black gum (*Nyssa biflora*), bald cypress (*Taxodium distichum*), wax myrtle, fetterbush, titi, sphagnum moss (*Sphagnum* spp.), poison ivy, blackstem chainfern, greenbrier, blackberry, and netted chainfern.
- Depressional Wetland: The study area contains numerous isolated forested wetlands. These areas are generally consist of isolated wetlands with mature overstory and varying degrees of shrub and herbaceous cover: slash pine, red maple, red bay, sweetgum, black gum, bald cypress, fetterbush, wax

myrtle, titi, sphagnum moss, poison ivy, blackstem chainfern, greenbrier, blackberry, and netted chainfern.

- Intermittent Streams: The intermittent streams are located in the central portions of the forested wetland systems on the southwestern portion of the project area. These streams average approximately three feet in width and twelve inches in depth. The streams lack vegetation and consist of sand and mud bed and banks of varying heights. These streams appear to have been impacted by past land management activities, have been excavated and are incised.
- Man-Made Pond: Several small open water ponds are located on the eastern portion of the property which consist of a deep open water habitat with herbaceous vegetation along the water's edge. These areas were created through a combination of excavation and dam construction.
- Open Field: The open fields consist of herbaceous vegetation and while these areas may have been used for agricultural purposes in the past, today these fields are used for recreational purposes.
- Man-Made Ditches: This habitat is defined by bed and bank of the feature with little to no vegetation present. The ditches were presumably constructed for silvicultural purposes and extend through several wetland areas across the site.
- Existing Road: Jernigan Road is a county-maintained dirt road which extends west to east through the center of the property.

Table 1. Habitat Summary

Habitat Type	Area (ac)
Depressional Wetlands	38.5
Existing Road	19.4
Managed Pine Plantation (including ditches)	1,836.8
Man-made Pond	6.5
Open Field	93.8
Slope Wetlands (including stream and ditches)	546.2
Total	2,541.2

5.0 PROPOSED PROJECT & DEVELOPMENT PLAN:

In July 2018, the USACE issued a public notice for impacts to jurisdictional wetland within the Bryan County Mega-Site to facilitate development of a gas-powered automobile OEM site. Since that time, the auto industry has continued to shift its focus towards production of electric vehicles and many leading auto manufacturers goals to cease building petroleum powered cars. The transformation of the automotive industry towards electrification requires construction of much larger and complex OEM facilities designed specifically for production of electric vehicles. Because the previously proposed project, which accommodates gas-powered automobile production, does not accommodate the requirements for an EVOEM assembly facility, revisions to the site plan were required. This site plan has been developed to meet the specific requirements of the EVOEM opportunity and RFP, to support and sustain its broad and complex operations, and to accommodate its many components, e.g., vehicle assembly and painting facilities, battery cell production facilities, product and technology facilities, testing, training, and distribution facilities and related infrastructure and support services.

The access for the facility will be provided on Highway 280 at two locations. The northern entrance is approximately 0.25 miles south of the Interstate 16/Highway 280 Interchange. The second access point will be located approximately 1.1 miles south of the Interstate 16/Highway 280 Interchange.

The EVOEM assembly facility's vehicle production components will accommodate various processes, including form pressing, fabrication, painting, product completion/assembly, quality control and special products production. The required distribution components include a train yard, truck yard, and finished product yard. The EVOEM complex will also include employee services components supporting the large workforce (e.g., food services, medical facilities, employee parking, training facilities, and administrative workspaces). The storage component will include the central storage building and liquid storage building. The quality facilities will include a product testing area, testing station, and other miscellaneous buildings required for quality assurance support. Additional components include waste facilities, security facilities, and utility facilities.

Facility layout was dictated by a variety of design considerations including topography, avoidance of aquatic resources, the advanced principles and methods of innovative/robotic assembly, as well as logistics and operational requirements for material flow and positioning during the production process. As depicted in the attached permit drawings, the proposed site plan includes development of 2,009.9 acres within the 2,541.25-acre tract. The project requires 194.07 acres of unavoidable wetland impact and 763 linear feet of intermittent stream impact for general site development and access roads, 1.58 acres of ditch impact for general site development and access roads, and 27.29 acres of wetland impact for rail access. Exhibits depicting the proposed site plan and associated jurisdictional area impacts are provided in Appendix C.

It is important to note that the transformation of the automobile industry from gas-powered to electric has dramatically impacted the design and size of automotive OEM facilities. Based on past RFP's from 2014-2021, the footprint of the typical OEM facility required to accommodate the processes for the production of a gas-powered automobile totaled roughly 1,000 acres with approximately 12MM square feet (275 acres) under roof. The footprint of this EVOEM campus required to accommodate the production processes for electric vehicles, such as the proposed project, totals 2,009 acres with approximately 28MM square feet (643 acres) under roof.

6.0 ALTERNATIVES ANALYSIS:

As part of the overall project, thorough alternatives analysis was completed. A review of the 404(b)(1) guidelines indicates that "(a) Except as provided under section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." The guidelines define practicable alternatives as "(q) The term *practicable* means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes."

The guidelines outline further consideration of practicable alternatives: "(1) For the purpose of this requirement, practicable alternatives include, but are not limited to: (i) Activities which do not involve a discharge of dredged or fill material into the waters of the United States or ocean waters; (ii) Discharges of dredged or fill material at other locations in waters of the United States or ocean waters; (2) An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded, or managed to fulfill the basic purpose of the proposed activity may be considered."

Following the guidelines above, an evaluation of the No Action Alternative, seven alternative sites including the preferred site, and three on-site configurations including the preferred on-site configuration was performed. As noted above, the proposed permit drawings depicting the proposed site plan are provided in Appendix C. Mapping information for off-site alternatives is provided in Appendix D and on-site configuration alternatives are provided in Appendix E.

The following "Practicability/Reasonability Screening Selection Criteria" were applied to each alternative to confirm whether the particular alternative and/or on-site configuration was practicable.

6.1 Practicability/Reasonability Screening Selection Criteria: The following provides a summary of each key criterion.

- Capable of being done considering cost: Site development costs must be reasonable considering scope, scale, and type of project, total costs, funding source, etc.
- Capable of being done considering logistics: Specific logistics requirements were associated with geographic location, size, entitlements, utilities, proximate infrastructure, site access, and other factors.
 - The project site must be within 60 minutes of an international airport.
 - The project site must be located within a reasonable commute distance of a diverse and skilled labor force of sufficient population to meet and sustain the production facility (~10,000+ jobs).
 - The project site must be contiguous and sufficiently sized to support the massive scale of an EVOEM assembly facility (which roughly translates to a minimum of ~2,100 acres of unencumbered land).
 - The project site must have sufficient developable area to support approximately 28MM sq ft. of EVOEM assembly facility and attendant features.
 - The project site must be fully entitled and free from encumbrances that could not be resolved or avoided on the strict project development timeline.
 - The project site must have or be capable of obtaining reliable and sustainable utility services to meet the needs of the EVOEM assembly facility; where utilities were not already available, the costs and timeline for providing the required service were considered in the screening criteria.
 - The project site requires uninterrupted and efficient access to the Nation’s transportation and shipping infrastructure. Specifically, the project site needs to have immediate access to one or more Interstate Highways for large trucks and trailers and needs to have onsite (or reasonably attainable) rail infrastructure, and access to class-one rail. Access to shipping ports was equally critical, however, all sites evaluated were relatively similarly situated with respect to this criterion.
- Property can be reasonably obtained: The project site must be available or could be acquired specifically for development of an EVOEM. Consideration was given to the timeline and potential costs associated with obtaining the required parcel(s).
- Property can be reasonably expanded: The project site must be able to reasonably accommodate future expansion.
- Property can be reasonably managed: The project site cannot contain restrictions precluding operation or management of the site for the intended use.
- Property can meet the basic project purpose: The project site must meet the basic project purpose.
- Property can meet the overall project purpose: The project site must meet the overall project purpose.

The following provides a summary of the alternatives analysis and a description of each alternative evaluated as part of this permit application package.

6.2 No Action Alternative:

A “no action” alternative must be considered, and complete avoidance of wetlands was the first alternative considered for this project. Due to the location of aquatic resources across the State and the size and scale of the EVOEM assembly facility (~28MM sq ft. of building footprint with attendant facilities and infrastructure), it was determined that complete avoidance of aquatic resource impacts was not feasible, even before the other myriad criteria were considered. Unlike more routine and smaller scale development activities, highly-specialized industrial developments of this scale do not allow much flexibility in facility design or layout. At this scale and complexity, assembly facility layout and design are inextricable from productive capacity and are further impacted by numerous design constraints (e.g., the need for efficient and safe production and product progression; materials proximity in required quantities for use in manufacture and assembly; the need to

provide for efficient and safe employee ingress/egress, on-site mobility, safety, and comfort; and the need to maintain security). These design constraints are further complicated, intertwined, and sometimes vague, because of the need for automotive OEM owners and operators to protect their proprietary processes. For these reasons, even minor modifications to the assembly facility footprints are often not feasible. The presence of wetlands and/or streams is not unique to the project site and impacts to these resources would be required regardless of site location within the state. Because the “no-action” alternative and complete avoidance of impacts prohibits construction of an EVOEM assembly facility, this alternative was determined to be unreasonable and not practicable.

6.3 Off-Site Alternatives & On-Site Configurations: Considering the site selection criteria, the GDEcD evaluated six alternative sites including the preferred site and four on-site configurations including the preferred design. Exhibits depicting off-site alternatives are provided in Appendix D and exhibits depicting on-site configurations are provided in Appendix E.

6.3.1 Preferred Site: The preferred alternative totals approximately 2,541.25 acres generally located adjacent to and east of Highway 280 and adjacent to and south of Interstate 16 within Bryan County, Georgia. Based on review of aerial photography, habitats are typical for undeveloped property within Bryan County. A description of habitats is provided above. The NWI, National Hydrography Dataset (NHD) and USGS maps depict 581.3 acres of wetland and 21,672 linear feet of stream. Portions of the property are located within the 100-year flood zone. Review of aerial photographs, U.S. Geological Survey topographic maps, National Wetlands Inventory maps, the Natural Resource Conservation Service Soil Survey and the U.S. Fish and Wildlife Service’s Information, Planning, and Conservation System (IPaC) indicates this site does not contain any threatened or endangered species or habitat required to support any listed species. Review of Georgia’s Natural Archaeological and Historic Resources GIS (GNAHRGIS), historic resources are present on the property and within the general vicinity on adjacent properties. The following provides a summary of each criterion reviewed for the preferred site:

- This alternative is capable of being done considering total cost, funding source, etc.
- This alternative is capable of being done considering logistics for the following reason:
 - This alternative is located within 60 minutes of Savannah/Hilton Head International Airport.
 - This alternative can provide a skilled labor force suitable to support and sustain the projected number of manufacturing and technology employees.
 - This alternative totals 2,541.25 acres of contiguous land which meets the minimum tract size requirement and provides logistics efficiency required for design and production.
 - This alternative does not contain any land use restrictions that prohibit construction of an EVOEM assembly facility.
 - This alternative currently contains utility services or access to utility services can be extended to the site (water, sewer, electrical, gas, phone, cable, etc.).
 - This alternative is located adjacent to Interstate 16 with direct interstate access from Highway 280 and Class I railroad access can be reasonably brought to the site.
- This alternative can be reasonably obtained. The site is currently controlled by the JDA and has been identified as a regional mega-site by GDEcD.
- This alternative can accommodate both the initial and build out needs for the proposed assembly facility.
- This alternative can be reasonably managed and does not contain restrictions precluding operation or management of the site for the intended use.
- This alternative meets the basic project purpose which is to construct an EVOEM facility.
- This alternative meets the overall project purpose to provide an entitled site which complies with all siting criteria and can support an approximately 28MM square foot (sf) EVOEM assembly facility.

In summary, the preferred site meets all the site screening criteria and is therefore a practicable alternative.

6.3.2 Off-Site Alternative 1: This tract totals 1,693 acres and is located adjacent to and west of Highway 441 and south of Highway 49 within Baldwin County. Based on review of aerial photography, habitats are typical for undeveloped property within Baldwin County. The site contains agricultural field, managed pine plantation, forested slope wetland, streams and an open water pond. The site appears to consist of relatively mature timber. The NWI, NHD and USGS maps depict 93.1 acres of wetland and 34,522 linear feet of stream. Portions of the property are located within the 100-year flood zone. Review of aerial photographs, U.S. Geological Survey topographic maps, National Wetlands Inventory maps, the Natural Resource Conservation Service Soil Survey and the U.S. Fish and Wildlife Service's Information, Planning, and Conservation System (IPaC) indicates this site does not contain any threatened or endangered species or habitat required to support any listed species. Review of Georgia's Natural Archaeological and Historic Resources GIS (GNAHRGIS) indicates historic resources are present on the property and within the general vicinity on adjacent properties. The following provides a summary of each criterion reviewed for this off-site alternative:

- This alternative is capable of being done considering total cost, funding source, etc.
- This alternative is not capable of being done considering logistics. The following summarizes the criteria that are and are not met pertaining to logistics.
 - This alternative is not located within 60 minutes of an international airport. The closest international airport is Hartsfield-Jackson International Airport over 90 miles to the north of the site.
 - This alternative cannot meet the labor force requirements for this specific project.
 - This alternative totals 1,693 acres of contiguous land which does not meet the minimum tract size requirement and fails to provide logistics efficiency required for design and production.
 - This alternative does not contain any land use restrictions that prohibit construction of an EVOEM assembly facility.
 - This alternative currently contains utility services or access to utility services can be extended to the site (water, sewer, electrical, gas, phone, cable, etc.).
 - This alternative is not located adjacent to a major interstate. Interstate 16 is over 30 miles west of the site. Class I rail service is adjacent to the site.
- This alternative can be reasonably obtained. The site is currently controlled by the Development Authority of the City of Milledgeville and Baldwin County and has been identified as a regional mega-site by GDEcD.
- This alternative cannot accommodate both the current and potential future expansion needs for the proposed assembly facility due to the size of the site.
- This alternative can be reasonably managed and does not contain restrictions precluding operation or management of the site for the intended use.
- This alternative meets the basic project purpose which is to construct an EVOEM facility.
- This alternative does not meet the overall project purpose to provide an entitled site which complies with all siting criteria and can support an approximately 28MM square foot (sf) EVOEM assembly facility.

In summary, Off-Site Alternative 1 does not meet all site screening criteria and is therefore not a practicable alternative.

6.3.3 Off-Site Alternative 2: This alternative totals approximately 1,758 acres located 5.5 miles west of Interstate 75, adjacent to and north of Highway 96, and east of Highway 49 in Peach County. Based on review of aerial photography, habitats are typical for agricultural property within Peach County. The site contains agricultural field, orchards, managed pine plantation, forested slope wetland, streams and an open water

pond. Aerial imagery documents timber harvesting has occurred on the property within the past 6 years. The NWI, NHD and USGS maps depict 11.6 acres of wetland and 6,532 linear feet of stream. Portions of the property are located within the 100-year flood zone. Review of aerial photographs, U.S. Geological Survey topographic maps, National Wetlands Inventory maps, the Natural Resource Conservation Service Soil Survey and the U.S. Fish and Wildlife Service's Information, Planning, and Conservation System (IPaC) indicates this site does not contain any threatened or endangered species or habitat required to support any listed species. Review of Georgia's Natural Archaeological and Historic Resources GIS (GNAHRGIS) indicates the property does not contain any cultural or archaeological sites. The following provides a summary of each criterion reviewed for this off-site alternative:

- This alternative is capable of being done considering total cost, funding source, etc.
- This alternative is not capable of being done considering logistics. The following summarizes the criteria that are and are not met pertaining to logistics.
 - This alternative is not located within 60 minutes of an international airport. The closest international airport is Hartsfield-Jackson International Airport over 90 miles to the north of the site.
 - This alternative cannot meet the labor force requirements for this specific project.
 - This alternative totals 1,758 acres of contiguous land which does not meet the minimum tract size requirement and does not provide logistics efficiency required for design and production.
 - This alternative contains a conservation easement on the western 200 acres of the site which prohibits construction of an EVOEM assembly facility.
 - This alternative currently contains utility services or access to utility services can be extended to the site (water, sewer, electrical, gas, phone, cable, etc.).
 - This alternative is not located adjacent to a major interstate. Interstate 75 is 5.5 miles east of the site. Class I rail service is adjacent to the site.
- This alternative can be reasonably obtained. The site is currently controlled by the Development Authority of Peach County and has been identified as a regional mega-site by GDEcD.
- This alternative cannot accommodate both the current and potential future expansion needs for the proposed assembly facility due to the size of the site and restrictions associated with a conservation easement.
- This alternative cannot be reasonably managed and does contain restrictions precluding operation or management of the site for the intended use.
- This alternative does not meet the basic project purpose which is to construct an EVOEM assembly facility.
- This alternative does not meet the overall project purpose to provide an entitled site which complies with all siting criteria and can support an approximately 28MM square foot (sf) EVOEM assembly facility.

In summary, Off-Site Alternative 2 does not meet all site screening criteria and is therefore not a practicable alternative.

6.3.4 Off-Site Alternative 3: This alternative totals 2,360 acres located adjacent to and west of Interstate 75 and east of Highway 41 within Bartow County. Based on review of aerial photography, habitats are typical for undeveloped property within Bartow County. The site contains clear-cut upland, managed pine plantation, forested slope wetland, streams and an open water pond. Aerial imagery documents timber harvesting has occurred within several areas of the property within the past within the past 24 months. The NWI, NHD and USGS maps depict 82.6 acres of wetland and 19,566 linear feet of stream. Portions of the property are located within the 100-year flood zone. Review of aerial photographs, U.S. Geological Survey topographic maps, National Wetlands Inventory maps, the Natural Resource Conservation Service

Soil Survey and the U.S. Fish and Wildlife Service's Information, Planning, and Conservation System (IPaC) indicates this site does not contain any threatened or endangered species or habitat required to support any listed species. Review of Georgia's Natural Archaeological and Historic Resources GIS (GNAHRGIS) indicates the property does not contain any cultural or archaeological sites. The following provides a summary of each criterion reviewed for this off-site alternative:

- This alternative is capable of being done considering total cost, funding source, etc.
- This alternative is not capable of being done considering logistics. The following summarizes the criteria that are and are not met pertaining to logistics.
 - This alternative is not located within 60 minutes of an international airport. The closest international airport is Hartsfield-Jackson International Airport over just over 60 miles to the north of the site.
 - This alternative can provide a skilled labor force suitable to support and sustain the projected number of manufacturing and technology employees.
 - This alternative totals 2,360 acres of contiguous land which does meet the minimum tract size requirement and provides logistics efficiency required for design and production.
 - This alternative does not contain any land use restrictions that prohibit construction of an EVOEM assembly facility.
 - This alternative currently contains utility services or access to utility services can be extended to the site (water, sewer, electrical, gas, phone, cable, etc.).
 - This alternative is located adjacent to Interstate 75. Rail service is not located adjacent to the site and extension of rail access would require significant property acquisition, extension of over 2.3 miles of rail line, and construction of an overpass on Highway 41.
- This alternative can be reasonably obtained. The site is currently controlled by the Development Authority of Bartow County and has been identified as a regional mega-site by GDEcD.
- This alternative can accommodate both the current and potential future expansion needs for the proposed assembly facility due to the size of the site.
- This alternative can be reasonably managed and does not contain restrictions precluding operation or management of the site for the intended use.
- This alternative meets the basic project purpose which is to construct an EVOEM assembly facility.
- This alternative does not meet the overall project purpose to provide an entitled site which complies with all siting criteria and can support an approximately 28MM square foot (sf) EVOEM assembly facility.

In summary, Off-Site Alternative 3 does not meet all site screening criteria and is therefore not a practicable alternative.

6.3.5 Off-Site Alternative 4: This alternative totals 2,350 acres located adjacent to and east of Highway 19 within Clayton & Henry Counties. Based on review of aerial photography, habitats are typical for undeveloped property within Clayton & Henry Counties. The site contains clear-cut upland, managed pine plantation, forested slope wetland, streams and an open water pond. Aerial imagery documents timber harvesting has occurred within several areas of the property within the past two to three years. The NWI, NHD and USGS maps depict 97.6 acres of wetland and 57,569 linear feet of stream. Portions of the property are located within the 100-year flood zone. Review of aerial photographs, U.S. Geological Survey topographic maps, National Wetlands Inventory maps, the Natural Resource Conservation Service Soil Survey and the U.S. Fish and Wildlife Service's Information, Planning, and Conservation System (IPaC) indicates this site does not contain any threatened or endangered species or habitat required to support any listed species. Review of Georgia's Natural Archaeological and Historic

Resources GIS (GNAHRGIS) indicates the property does not contain any cultural or archaeological sites. The following provides a summary of each criterion reviewed for this off-site alternative:

- This alternative is capable of being done considering total cost, funding source, etc.
- This alternative is not capable of being done considering logistics. The following summarizes the criteria that are and are not met pertaining to logistics.
 - This alternative is located within 60 minutes of an international airport. The closest international airport is Hartsfield-Jackson International Airport which is 12 miles to the north of the site.
 - This alternative totals 2,350 acres of contiguous land which meets the minimum tract size requirement and provides logistics efficiency required for design and production. The site is surrounded by existing residential development which creates logistics conflicts when accessing the site to and from Interstate 75.
 - This alternative does not contain any land use restrictions that prohibit construction of an EVOEM assembly facility.
 - This alternative currently contains utility services or access to utility services can be extended to the site (water, sewer, electrical, gas, phone, cable, etc.).
 - This alternative is not located adjacent to a major interstate and the site is approximately 5 miles west of Interstate 75. The site is surrounded by existing residential development and the continuous traffic to access the site from Interstate 75 would conflict with the existing residential development. The site is located adjacent to a Class I railroad.
- This alternative can be reasonably obtained. The site is currently controlled by the Clayton County Water Authority.
- This alternative can accommodate both the current and potential future expansion needs for the proposed assembly facility.
- This alternative can be reasonably managed and does not contain restrictions precluding operation or management of the site for the intended use.
- This alternative does not meet the basic project purpose which is to construct an EVOEM assembly facility.
- This alternative does not meet the overall project purpose to provide an entitled site which complies with all siting criteria and can support an approximately 28MM square foot (sf) EVOEM assembly facility.

In summary, Off-Site Alternative 4 does not meet all site screening criteria and is therefore not a practicable alternative.

6.3.6 Off-Site Alternative 5: This alternative totals 3,826.26 acres located adjacent to and west of Highway 67 and south of Interstate 16 within Bulloch County. Based on review of aerial photography, habitats are typical for undeveloped property within Bulloch County. The site contains clear-cut upland, managed pine plantation, forested slope wetland, and streams. Aerial imagery documents timber harvesting has occurred within several areas of the property within the past two to three years. The NWI, NHD and USGS maps depict 1,272 acres of wetland and 41,802 linear feet of stream. Portions of the property are located within the 100-year flood zone. Review of aerial photographs, U.S. Geological Survey topographic maps, National Wetlands Inventory maps, the Natural Resource Conservation Service Soil Survey and the U.S. Fish and Wildlife Service's Information, Planning, and Conservation System (IPaC) indicates this site does not contain any threatened or endangered species or habitat required to support any listed species. Review of Georgia's Natural Archaeological and Historic Resources GIS (GNAHRGIS) indicates the property does not contain any cultural or archaeological sites. The following provides a summary of each criterion reviewed for this off-site alternative:

- This alternative is capable of being done considering total cost, funding source, etc.
- This alternative is not capable of being done considering logistics. The following summarizes the criteria that are and are not met pertaining to logistics.
 - This alternative is located within 60 minutes of Savannah/Hilton Head International Airport.
 - This alternative totals 3,862 acres of contiguous land which meets the minimum tract size requirement and provides logistics efficiency required for design and production.
 - This alternative contains land use restrictions that prohibit construction of an EVOEM assembly facility. The site contains a perpetual Natural Resources Conservation Easement that prohibits any development activities within the property.
 - This alternative currently contains utility services or access to utility services can be extended to the site (water, sewer, electrical, gas, phone, cable, etc.).
 - This alternative is not located adjacent to a major interstate; however, the site is provided direct access to Interstate 16 located 4 miles north. The site is not located adjacent to a Class 1 railroad and extension of rail access would require property acquisition, extension of over 2 miles of rail line, and construction of an overpass on Highway 280.
- The property is privately owned and it is assumed that this alternative can be reasonably obtained.
- Due to the conservation easement, this alternative cannot accommodate both the current and potential future expansion needs for the proposed assembly facility.
- This alternative cannot be reasonably managed and contains restrictions precluding operation or management of the site for the intended use.
- This alternative does not meet the basic project purpose which is to construct an EVOEM facility.
- This alternative does not meet the overall project purpose to provide an entitled site which complies with all siting criteria and can support an approximately 28MM square foot (sf) EVOEM assembly facility.

In summary, Off-Site Alternative 5 does not meet all site screening criteria and is therefore not a practicable alternative.

6.3.7 Off-Site Alternative 6: This alternative totals 631 acres located adjacent to and east Old River Road and north of John Carter Road within Chatham County. Based on review of aerial photography, habitats are typical for undeveloped property within Chatham County. The site contains cleared and graded upland developed as pad ready sites, forested slope wetland, and storm water ponds. Aerial imagery documents that development activities have occurred within the site over the past 5 years. The NWI, NHD and USGS maps depict 192.3 acres of wetland and 17,286 linear feet of stream. Portions of the property are located within the 100-year flood zone. Review of aerial photographs, U.S. Geological Survey topographic maps, National Wetlands Inventory maps, the Natural Resource Conservation Service Soil Survey and the U.S. Fish and Wildlife Service's Information, Planning, and Conservation System (IPaC) indicates this site does not contain any threatened or endangered species or habitat required to support any listed species. Review of Georgia's Natural Archaeological and Historic Resources GIS (GNAHRGIS) indicates the property does not contain any cultural or archaeological sites. The following provides a summary of each criterion reviewed for this off-site alternative:

- This alternative is capable of being done considering total cost, funding source, etc.
- This alternative is not capable of being done considering logistics. The following summarizes the criteria that are and are not met pertaining to logistics.

- This alternative is located within 30 minutes of Savannah/Hilton Head International Airport.
 - This alternative totals 631 acres of contiguous land which does not meet the minimum tract size requirement.
 - This alternative does not contain any land use restrictions that prohibit construction of an EVOEM assembly facility.
 - This alternative currently contains utility services or access to utility services can be extended to the site (water, sewer, electrical, gas, phone, cable, etc.).
 - This alternative is located adjacent to a major interstate and the primary access is located 2 miles from the interstate from Old River Road. The site does not afford rail access.
- This alternative can be reasonably obtained. The site is currently controlled by the Savannah Economic Development Authority.
 - This alternative cannot accommodate both the current and potential future expansion needs for the proposed assembly facility.
 - This alternative can be reasonably managed and does not contain restrictions precluding operation or management of the site for the intended use.
 - This alternative does not meet the basic project purpose which is to construct an EVOEM assembly facility.
 - This alternative does not meet the overall project purpose to provide an entitled site which complies with all siting criteria and can support an approximately 28MM square foot (sf) EVOEM assembly facility.

In summary, Off-Site Alternative 6 does not meet all site screening criteria and is therefore not a practicable alternative.

6.3.8 Off-Site Alternative 7: This alternative totals 1,490 acres located adjacent to and east of Old River Road and north of Interstate 16 within Effingham County. Based on review of aerial photography, habitats are typical for undeveloped property within Effingham County. The site contains clear-cut upland, managed pine plantation, forested slope wetland, and streams. Aerial imagery documents timber harvesting has occurred within several areas of the property within the past two to three years. The NWI, NHD and USGS maps depict 742.9 acres of wetland and 7,618 linear feet of stream. Portions of the property are located within the 100-year flood zone. Review of aerial photographs, U.S. Geological Survey topographic maps, National Wetlands Inventory maps, the Natural Resource Conservation Service Soil Survey and the U.S. Fish and Wildlife Service's Information, Planning, and Conservation System (IPaC) indicates this site does not contain any threatened or endangered species or habitat required to support any listed species. Review of Georgia's Natural Archaeological and Historic Resources GIS (GNAHRGIS) indicates the property does not contain any cultural or archaeological sites however historic sites are present to the north of the tract within the town of Meldrim. The following provides a summary of each criterion reviewed for this off-site alternative:

- This alternative is capable of being done considering total cost, funding source, etc.
- This alternative is not capable of being done considering logistics. The following summarizes the criteria that are and are not met pertaining to logistics.
 - This alternative is located within 30 minutes of Savannah/Hilton Head International Airport.
 - This alternative totals 1,490 acres of contiguous land which does not meet the minimum tract size requirement.
 - This alternative does not contain any land use restrictions that prohibit construction of an EVOEM assembly facility.

- This alternative currently contains utility services or access to utility services can be extended to the site (water, sewer, electrical, gas, phone, cable, etc.).
 - This alternative is located adjacent to a major interstate and access is provided to Interstate 16 from Old River Road. This site does afford rail access.
- This alternative can be reasonably obtained. The site is currently controlled by the Effingham County Development Authority.
 - This alternative cannot accommodate the current nor potential future expansion needs for the proposed assembly facility.
 - This alternative can be reasonably managed and does not contain restrictions precluding operation or management of the site for the intended use.
 - This alternative does not meet the basic project purpose which is to construct an EVOEM assembly facility.
 - This alternative does not meet the overall project purpose to provide an entitled site which complies with all siting criteria and can support an approximately 28MM square foot (sf) EVOEM assembly facility.

In summary, Off-Site Alternative 7 does not meet all site screening criteria and is therefore not a practicable alternative.

6.4 On-Site Configurations: In addition to considering off-site alternatives, on-site configurations were evaluated. The description of various components required to support and sustain the overall assembly facility operation provided in Section 5.0 above are applicable to all on-site configurations. Since each of these components must exist for the production of the vehicles, omitting the paint building or the fabrication building (as an example) to reduce the overall footprint is not feasible. However, a detailed review of the proposed site plan and shift, redesign, and/or downsize certain features of the facility were implemented for alternatives analysis. Specifically, four on-site configurations were drafted and studied to avoid or minimize impacts to wetlands and waters identified within the property.

6.4.1 Preferred On-Site Configuration: The preferred on-site configuration includes vehicle access from Highway 280 on the western portion of the tract south of the Interstate 16/Highway 280 interchange. The rail component for this configuration extends into the site from the existing rail line on the eastern property boundary. The assembly facility layout generally includes production to the east/west, railyard to the northeast and vehicle storage to the south. Because the applicants Preferred On-Site Configuration contains all the required components of the project, this alternative met the site screening criteria and is therefore a practicable alternative.

6.4.2 On-Site Configuration 1: The on-site configuration includes vehicle access from Highway 280 on the western portion of the tract south of the Interstate 16/Highway 280 interchange. The rail component for this configuration extends into the site from the existing rail line on the eastern property boundary north and extends in an east/west direction adjacent to Interstate 16. The assembly facility layout generally includes production to the east/west and vehicle storage to the south. Because On-Site Configuration 1 contains all the required components of the project, this alternative met the site screening criteria and is therefore a practicable alternative.

6.4.3 On-site Configuration 2: This on-site configuration includes vehicle access from Highway 280 on the western portion of the tract south of the Interstate 16/Highway 280 interchange. The rail component for this configuration extends into the site from the existing rail line on the eastern property boundary and is located in the center of the project area. The assembly facility layout generally includes production to the east/west. This configuration is similar to the preferred alternative but shifts the southern portion of the assembly facility further west. On-Site

Configuration 2 contains all the required components of the project, this alternative met the site screening criteria and is therefore a practicable alternative.

6.5 Alternatives Not Practicable or Reasonable: Following review of both off site alternatives and on-site configurations, a comparison of alternatives was completed to determine practicability and reasonability. Table 2 below summarizes a comparison of each alternative discussed above to the screening criteria for practicability and reasonableness.

Table 2. Summary of Alternative Site Practicability and Reasonability

Practicability/ Reasonability Screening Selection Criteria	Applicants Preferred Alt	Off-Site Alt 1	Off-Site Alt 2	Off-Site Alt 3	Off-Site Alt 4	Off-Site Alt 5	Off-Site Alt 6	Off-Site Alt 7	On-Site Alt 1	On-Site Alt 2	No Action
Capable of being done considering cost	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Capable of being done considering logistics	Yes	No	No	No	No	No	No	No	Yes	Yes	No
Property can be reasonably obtained	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Property can be reasonably expanded	Yes	No	No	Yes	Yes	No	No	No	Yes	Yes	No
Property can be reasonably managed	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Meets basic project purpose	Yes	Yes	No	Yes	No	No	No	No	Yes	Yes	No
Meets overall project purpose	Yes	No	No	No	No	No	No	No	Yes	Yes	No
Practicable (Y or N)	Yes	No	No	No	No	No	No	No	Yes	Yes	No

6.6 Review of Practicable Alternatives:

Following a determination of practicable alternatives using the “Practicability/Reasonability Screening Selection Criteria”, an analysis of practicable alternatives to identify the least environmentally damaging practicable alternative pursuant to 40 CFR 230.7(b)(1) was completed. The purpose of the below analysis is to ensure that “no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem”. The potential environmental impacts that would result from construction of the proposed assembly facility were evaluated. This evaluation was completed by considering environmental factors which could impact development of the site. The environmental factors included:

Environmental Factors:

- Stream Impacts (quantitative). The estimated linear footage of potential stream impact was evaluated for each practicable alternative.
- Stream Impacts (qualitative). The functional value of potential stream impact areas was evaluated for each practicable alternative. A low, medium, or high value was assigned using the *Savannah District's Standard Operating Procedure (SOP) For Compensatory Mitigation (Version 2.0) Coastal Plain Qualitative Stream Assessment Worksheet*.
- Wetland Impacts (quantitative). The estimated acreage of potential wetland impact was evaluated for each practicable alternative.

- Wetland Function (qualitative). The functional value of potential wetland impact areas was evaluated for each practicable alternative. *Savannah District's Standard Operating Procedure (SOP) For Compensatory Mitigation (Version 2.0) Non-Riverine Wetland Qualitative Stream Assessment Worksheet*.
- Impacts to Other Waters (quantitative). The acreage of open water impact for each site was considered during review of each practicable alternative.
- Other Waters Functions (qualitative). The functional value of any open water impact areas was evaluated for each practicable alternative. A low, medium, or high value was assigned based on habitat type and condition. Examples of high value would be lakes, impoundments, and/or features occurring naturally. Examples of low value would be man-made features which have not naturalized and provide little to no biological support (i.e. borrow pit).
- Federally Listed Threatened or Endangered Species. A preliminary assessment of each practicable alternative was conducted to determine the potential occurrence of animal and plants species (or their preferred habitats) currently listed as threatened or endangered by state and federal regulations [Federal Endangered Species Act of 1973 (16 USC 1531-1543)]. The U.S. Fish and Wildlife Service (USFWS) Information, Planning, and Conservation System (IPaC) database at <http://ecos.fws.gov/ipac/> database was reviewed to determine plant and animal species as endangered or threatened for each alternative.
- Cultural Resources. A preliminary assessment of cultural resources was conducted for each site by information publicly available on GNAHRGIS database. Potential impacts to sites listed or eligible for listing on the National Register of Historic Places was noted for each alternative.

Considering the assessment criteria above, only the three alternative on-site configurations were reviewed. The following provides a summary of each practicable alternative and associated environmental impacts.

6.6.1 Proposed Action/Preferred Alternative/On-site Configuration: A summary of environmental impacts associated with Proposed Action/Preferred Alternative/On-site Configuration is provided below.

- Stream Impacts (quantitative). Based on the location of aquatic resources and assembly facility design this on-site configuration requires 763 linear feet of intermittent stream impact.
- Stream Impacts (qualitative). An evaluation of each tributary (perennial, intermittent and ephemeral streams) and each specific impact was completed using the *Savannah District's Standard Operating Procedure (SOP) For Compensatory Mitigation (Version 2.0) Coastal Plain Qualitative Stream Assessment Worksheet*. Based on this assessment and by assessing the five functions (hydrology, hydraulics, geomorphology, chemistry and biology), the stream qualitative functional capacity score was determined to be moderate.
- Wetland Impacts (quantitative). Based on the location of aquatic resources and assembly facility design, this on-site configuration requires 222.34 acres of wetland impact.
- Wetland Function (qualitative). An evaluation of each wetland and each specific impact was completed using the *Savannah District's Standard Operating Procedure (SOP) For Compensatory Mitigation (Version 2.0) Non-Riverine Wetland Qualitative Stream Assessment Worksheet*. Based on this assessment and by assessing the four functions (water storage, biogeochemical cycling, wetland community characteristic, and faunal habitat), the qualitative functional capacity score for all wetlands was determined to be moderate.

- Impacts to Other Waters (quantitative). This alternative requires impacts to 1.58 acres of man-made drainage ditch.
- Other Waters Functions (qualitative). The ditches consisted of a highly entrenched conveyance system that was constructed for stormwater management purposes. The functional value of this feature is low.
- Federally Listed Threatened or Endangered Species. An intensive threatened and endangered species survey has been completed within the project site. A completed copy of the report of findings is attached to this permit application package and no impacts to federally listed threatened or endangered species are anticipated.
- Cultural Resources. Brockington & Associates has completed a field survey for cultural resources and archeology and a draft report is currently being prepared for submittal to and review by the USACE and GADNR-HPD. Upon completion, a copy will be provided to the USACE for agency review. Based on review of GNAHRGIS database, the project will not impact sites listed on the NRHP.
- Stream Buffer Impact. The proposed project will require impacts to state waters and stream buffers. A stream buffer variance will be obtained from the GADNR-EPD prior to initiation of buffer impacts.

6.6.2 On-Site Configuration 1: A summary of environmental impacts associated with On-Site Configuration 1 is provided below.

- Stream Impacts (quantitative). Based on the location of aquatic resources and assembly facility design this on-site configuration requires 763 linear feet of intermittent stream impact.
- Stream Impacts (qualitative). An evaluation of each tributary (perennial, intermittent and ephemeral streams) and each specific impact was completed using the *Savannah District's Standard Operating Procedure (SOP) For Compensatory Mitigation (Version 2.0) Coastal Plain Qualitative Stream Assessment Worksheet*. Based on this assessment and by assessing the five functions (hydrology, hydraulics, geomorphology, chemistry and biology), the stream qualitative functional capacity score was determined to be moderate.
- Wetland Impacts (quantitative). Based on the location of aquatic resources and assembly facility design, this on-site configuration requires 249.14 acres of wetland impact.
- Wetland Function (qualitative). An evaluation of each wetland and each specific impact was completed using the *Savannah District's Standard Operating Procedure (SOP) For Compensatory Mitigation (Version 2.0) Non-Riverine Wetland Qualitative Stream Assessment Worksheet*. Based on this assessment and by assessing the four functions (water storage, biogeochemical cycling, wetland community characteristic, and faunal habitat), the qualitative functional capacity score for all wetlands was determined to be moderate.
- Impacts to Other Waters (quantitative). This alternative requires 6.51 acres of impact to a jurisdictional man-made open water pond and 1.58 acres of impact to man-made drainage ditch.
- Other Waters Functions (qualitative). The open water pond within the property is consists of deep open water aquatic habitat with herbaceous vegetation along the water's edge. The ditch consisted of a highly entrenched conveyance system that was constructed for stormwater management purposes. The functional value of both features is low.

- Federally Listed Threatened or Endangered Species. An intensive threatened and endangered species survey has been completed within the project site. A completed copy of the report of findings is attached to this permit application package and no impacts to federally listed threatened or endangered species are anticipated.
- Cultural Resources. Brockington & Associates has completed a field survey for cultural resources and archeology and a draft report is currently being prepared for submittal to and review by the USACE and GADNR-HPD. Upon completion, a copy will be provided to the USACE for agency review. Based on review of GNAHRGIS database, the project will not impact sites listed on the NRHP.
- Stream Buffer Impact. The proposed project will require impacts to state waters and stream buffers. A stream buffer variance will be obtained from the GADNR-EPD prior to initiation of buffer impacts.

6.6.3 On-Site Configuration 2: A summary of environmental impacts associated with On-Site Configuration 2 is provided below.

- Stream Impacts (quantitative). Based on the location of aquatic resources and assembly facility design this on-site configuration requires 763 linear feet of intermittent stream impact.
- Stream Impacts (qualitative). An evaluation of each tributary (perennial, intermittent and ephemeral streams) and each specific impact was completed using the *Savannah District's Standard Operating Procedure (SOP) For Compensatory Mitigation (Version 2.0) Coastal Plain Qualitative Stream Assessment Worksheet*. Based on this assessment and by assessing the five functions (hydrology, hydraulics, geomorphology, chemistry and biology), the stream qualitative functional capacity score was determined to be moderate.
- Wetland Impacts (quantitative). Based on the location of aquatic resources and assembly facility design, this on-site configuration requires 418.64 acres of wetland impact.
- Wetland Function (qualitative). An evaluation of each wetland and each specific impact was completed using the *Savannah District's Standard Operating Procedure (SOP) For Compensatory Mitigation (Version 2.0) Non-Riverine Wetland Qualitative Stream Assessment Worksheet*. Based on this assessment and by assessing the four functions (water storage, biogeochemical cycling, wetland community characteristic, and faunal habitat), the qualitative functional capacity score for all wetlands was determined to be moderate.
- Impacts to Other Waters (quantitative). This alternative requires 6.51 acres of impact to a jurisdictional man-made open water pond and 1.58 acres of impact to man-made drainage ditch.
- Other Waters Functions (qualitative). The open water pond within the property is consists of deep open water aquatic habitat with herbaceous vegetation along the water's edge. The ditch consisted of a highly entrenched conveyance system that was constructed for stormwater management purposes. The functional value of both features is low.
- Federally Listed Threatened or Endangered Species. An intensive threatened and endangered species survey has been completed within the project site. A completed copy of the report of findings is attached to this permit application package and no impacts to federally listed threatened or endangered species are anticipated.
- Cultural Resources. Brockington & Associates has completed a field survey for cultural resources and archeology and a draft report is currently being prepared for submittal to and review by the USACE

and GADNR-HPD. Upon completion, a copy will be provided to the USACE for agency review. Based on review of GNAHRGIS database, the project will not impact sites listed on the NRHP.

- Stream Buffer Impact. The proposed project will require impacts to state waters and stream buffers. A stream buffer variance will be obtained from the GADNR-EPD prior to initiation of buffer impacts.

6.6.4 Summary of Practicable Alternatives Analysis: When comparing the practicable alternatives, the Preferred Alternative requires less wetland and open water impact than alternative sites and when considering environmental impacts, the Preferred Alternative represents the least environmentally damaging. Table 3 provides a summary of the practicable alternatives and the values for each factor.

Table 3. Summary of Least Environmentally Damaging Practicable Alternative Assessment

FACTORS	Preferred Alternative & Configuration	On-Site Conf 1	On-Site Conf 2
Environmental Factors			
Stream Impacts (Linear Feet)	763	763	763
Functional Value of Impacted Stream	Moderate	Moderate	Moderate
Wetland Impacts (Acres)	220.76	249.14	418.64
Functional Value of Impacted Wetland	Moderate	Moderate	Moderate
Impacts to Other Waters (Acres)	1.58	6.51	6.51
Functional Value of Impacted Other Waters	Low	Low	Low
Federal Endangered Species Impact	No	No	No
Cultural Resources Impact	No	No	No
LEDPA	Yes	No	No

In summary, the design team considered a variety of alternatives which would avoid and minimize impacts to wetlands to the greatest extent practicable while satisfying the overall project purpose. Through a comprehensive analysis of both off-site alternatives and on-site configurations, the design team has been able to reduce the overall environmental impacts and demonstrate that the proposed site and design is the least environmentally damaging practicable alternative.

7.0 THREATENED AND ENDANGERED SPECIES:

The project area was assessed in consideration of the Endangered Species Act of 1973. Pedestrian surveys were conducted to identify protected individuals and/or potential habitat for protected individuals within the study area on numerous occasions; during February and March 2015, May 2018, and May 2022. Species-specific surveys were conducted for the species with a preferred habitat similar to those found within the study area. Table 4 depicts federally protected species listed in the study area that have potential ranges within Bryan County, Georgia based on the Information for Planning and Consultation (IPaC) database query. This table also provides biological determinations based on the effects that a potential EVOEM development would have on each of these species. Section II-A of this document provides a detailed description of those listed species that have preferred habitat found within the study area.

Table 4. Known Occurrences and Biological Determination for Protected Species Listed in Bryan County

Class	Scientific Name	Common Name	IPaC Trust Resources List	Legal Status*		Habitat Present	Species Present	Biological Determination
				Federal	State			
Amphibians	Ambystoma cingulatum	Frosted flatwoods salamander	Yes	T	T	Yes	No	No Impact
Birds	Laterallus jamaicensis	Eastern Black Rail	Yes	T	T	None	No	No impact
	Mycteria americana	Wood Stock	Yes	T	T	Yes	No	NLAA
Reptiles	Drymarchon couperi	Eastern Indigo Snake	Yes	T	T	Preferred	None observed	NLAA
	Gopherus polyphemus	Gopher Tortoise	Yes	C	T	Preferred	Yes	NLAA
Insects	Danaus plexippus	Monarch Butterfly	Yes	C	N/A	None	No	No impact

At no time during the survey was a species listed as threatened or endangered by current federal regulations observed. It was determined that marginal habitat was present in the study area that could potentially harbor flatwoods salamanders, wood stork, indigo snakes, and gopher tortoise. Site-specific studies were conducted for these species, and only gopher tortoises are known to inhabit the study area. The applicant has undertaken a voluntary relocation effort for the gopher tortoises. Gopher tortoises were relocated through a coordination effort with the GADNR to Fort Stewart. Thus, the proposed development within this study area will not adversely affect any species listed as federally threatened or endangered in Bryan County, Georgia. A complete copy of the May 2022 report is provided in Appendix G.

8.0 CULTURAL RESOURCES:

Brockington & Associates completed a Phase I survey for portions of the project area in 2015 and 2018. A survey for the remaining area within the project site, not included in the past survey efforts, has been initiated. Following completion of the field survey, a complete report including a NHRP eligible resource assessment of effects, will be submitted to the USACE and GADNR-HPD for review and concurrence. A copy of the previous survey documentation is provided in Appendix H.

9.0 STORM WATER MANAGEMENT

A preliminary stormwater management plan has been designed by Thomas & Hutton (consulting engineer), and although this plan has not yet been finalized, preliminary plan includes construction of stormwater ponds designed to accommodate the stormwater volume associated with development of the site. The final plan will meet any and all stormwater management requirements of the local authorities.

10.0 COMPENSATORY MITIGATION

The proposed project requires impacts to 221.36 acres jurisdictional wetland, 1.58 acres of ditch and 763 linear feet of stream. As documented in the attached mitigation credit calculations (Appendix F), the project will require 1,328.24 legacy (166.03 2018 SOP) wetland mitigation credits to offset jurisdictional wetland impacts and 4,120.20 legacy (572.25 2018 SOP) stream credits to offset stream impacts. As compensatory mitigation, the applicant is proposing to purchase the 4,120.20 legacy stream credits from Yam Grandy Mitigation Bank and satisfy the 1,328.24 legacy (166.08 2018 SOP) wetland mitigation credit requirement through the Savannah District In-Lieu Fee Program.

11.0 CONCLUSION

GDEcD and the JDA are proposing the development of an approximately 2,541.25-acre tract located adjacent to and east of Highway 280 and adjacent to and south of Interstate 16 within Bryan County, Georgia for an EVOEM assembly facility. Assembly facility layout was dictated by a variety of design considerations including topography, aquatic resources, the advanced principles of innovative production of electric vehicles, as well as logistics and

operational requirements for material flow and positioning during the production process. As depicted in the attached permit drawings, the proposed site plan includes development of 2,009.9 acres within the 2,541.25-acre tract. The project requires 194.07 acres of wetland impact and 763 linear feet of intermittent stream impact for general site development and access roads, 1.58 acres of ditch impact for general site development and access roads, and 27.29 acres of wetland impact for rail access. As compensatory mitigation, the applicant is proposing to purchase the 4,120.20 legacy stream credits from Yam Grandy Mitigation Bank and satisfy the 1,328.24 legacy (166.03 2018 SOP) wetland mitigation credit requirement through the Savannah District In-Lieu Fee Program. This project has been determined to be the least environmentally damaging practicable alternative and unavoidable wetland and stream impacts will be offset through purchase of mitigation credits. Best management practices will be employed during site development to further minimize impacts within the project area.



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APPENDIX A:
CESAS Form 19

JOINT APPLICATION
 FOR
 A DEPARTMENT OF THE ARMY, CORPS OF ENGINEERS PERMIT,
 STATE OF GEORGIA MARSHLAND PROTECTION PERMIT,
 REVOCABLE LICENSE AGREEMENT
 AND REQUEST FOR
 WATER QUALITY CERTIFICATION
 AS APPLICABLE

INSTRUCTIONS FOR SUBMITTING APPLICATION:

Every Applicant is Responsible to Complete The Permit Application and Submit as Follows: One copy each of application, location map, drawings, copy of deed and any other supporting information to addresses 1, 2, and 3 below. If water quality certification is required, send only application, location map and drawing to address No. 4.

1. For Department of the Army Permit, mail to: Commander, U.S. Army Engineer District, Savannah ATTN: CESAS-OP-F, P.O. Box 889, Savannah, Georgia 31402-0889. Phone (912)652-5347 and/or toll free, Nationwide 1-800-448-2402.

2. For State Permit - State of Georgia (six coastal counties only) mail to: Habitat Management Program, Coastal Resources Division, Georgia Department of Natural Resources, 1 Conservation Way, Brunswick, Georgia 31523. Phone (912) 264-7218.

3. For Revocable License - State of Georgia (six coastal counties plus Effingham, Long, Wayne, Brantley and Charlton counties only) - Request must have State of Georgia's assent or a waiver authorizing the use of State owned lands. All applications for dock permits in the coastal counties, or for docks located in tidally influenced waters in the counties listed above need to be submitted to Real Estate Unit. In addition to instructions above, you must send two signed form letters regarding revocable license agreement to: Ecological Services Coastal Resources Division, Georgia Department of Natural Resources, 1 Conservation Way, Brunswick, Georgia 31523. Phone (912) 264-7218.

4. For Water Quality Certification State of Georgia, mail to: Water Protection Branch, Environmental Protection Division, Georgia Department of Natural Resources, 4220 International Parkway, Suite 101, Atlanta, Georgia 30354 (404) 675-1631.

The application must be signed by the person authorized to undertake the proposed activity. The applicant must be the owner of the property or be the lessee or have the authority to perform the activity requested. Evidence of the above may be furnished by copy of the deed or other instrument as may be appropriate. The application may be signed by a duly authorized agent if accompanied by a statement from the applicant designating the agent. See item 6, page 2.

1. Application No. _____

2. Date

3. For Official Use Only _____

4. Name and address of applicant.

Georgia Department of Economic Development
 Attn: Mr. Pat Wilson - Commissioner
 Technology Square, 75 5th Street N.W. Suite 1200
 Atlanta, Georgia 30308
 1-404-962-4000

Savannah Harbor-Interstate 16 Joint
 Development Authority
 Attn: Mr. Hugh "Trip" Tollison - Secretary
 906 Drayton Street
 Savannah, Georgia 31401
 912.447.8450

5. Location where the proposed activity exists or will occur.

Lat. 31.164165° Long. -81.450411°

<u>Bryan</u>		
County	Military District	In City or Town
<u>Ellabell</u>		
Near City or Town	Subdivision	Lot No.
		<u>Georgia</u>
Lot Size	Approximate Elevation of Lot	State
		<u>Black Creek</u>
Name of Waterway	Name of Nearest Creek, River, Sound, Bay or Hammock	

Note: Items 14 and 15 are to be completed if you want to bulkhead, dredge or fill.

14. Description of operation: (If feasible, this information should be shown on the drawing).

A. Purpose of excavation or fill Construction of EVOEM Manufacturing Facility

- 1. Access channel : length _____ depth _____ width _____
- 2. Boat basin : length _____ depth _____ width _____
- 3. Fill area : see attached length _____ depth _____ width _____
- 4. Other: Excavation Area: length _____ depth _____ width _____

B. 1.If bulkhead, give dimensions N/A

2.Type of bulkhead construction (material) N/A

Backfill required: Yes _____ No _____ Cubic yards _____

Where obtained _____

C. Excavated material :

1.Cubic yards N/A

2.Type of material N/A

15.Type of construction equipment to be used Mechanized earth-moving/construction equipment

A. Does the area to be excavated include any wetland? Yes _____ No X

B. Does the disposal area contain any wetland? Yes _____ No X Project does not include construction of dredge disposal site.

C. Location of disposal area N/A

D. Maintenance dredging, estimated amounts, frequency, and disposal sites to be utilized: N/A

E. Will dredged material be entrapped or encased? N/A

F. Will wetlands be crossed in transporting equipment to project site? N/A

G. Present rate of shoreline erosion (if known) N/A

16. WATER QUALITY CERTIFICATION: In some cases, Federal law requires that a Water Quality Certification from the State of Georgia be obtained prior to issuance of a Federal license or permit. Applicability of this requirement to any specific project is determined by the permitting Federal agency. The information requested below is generally sufficient for the Georgia Environmental Protection Division to issue such a certification if required. Any item which is not applicable to a specific project should be so marked. Additional information will be requested if needed.

A. Please submit the following:

- 1. A plan showing the location and size of any facility, existing or proposed, for handling any sanitary or industrial waste waters generally on your property.
- 2. A plan of the existing or proposed project and your adjacent property for which permits are being requested.
- 3. A plan showing the location of all points where petro-chemical products (gasoline, oils, cleaners) used and stored. Any above-ground storage areas must be diked, and there should be no storm drain catch basins within the diked areas. All valving arrangements on any petro-chemical transfer lines should be shown.
- 4. A contingency plan delineating action to be taken by you in the event of spillage of petro-chemical products or other materials from your operation.
- 5. Plan and profile drawings showing limits of areas to be dredged, areas to be used for placement of spoil, locations of any dikes to be constructed showing locations of any

weir(s), and typical cross sections of the dikes.

B. Please provide the following statements:

1. A statement that all activities will be performed in a manner to minimize turbidity in the stream.
2. A statement that there will be no oils or other pollutants released from the proposed activities which will reach the stream.
3. A statement that all work performed during construction will be done in a manner to prevent interference with any legitimate water uses.

17. Application is hereby made for a permit or permits to authorize the activities described herein, Water Quality Certification from the Georgia Environmental Protection Division is also requested if needed. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities.

Pat Wilson

Signature of Applicant/Date

Hugh "Tripp" Tollison

Signature of Applicant/Date

18. U.S.C. Section 1001 provides that: Whoever, in any matter within the jurisdiction of any department or agency of the United States, knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious, or fraudulent statements or representations, or makes or uses false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined no more than \$10,000 or imprisoned not more than 5 years or both.

PRIVACY ACT NOTICE

The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act and Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972. These laws require permits authorizing structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Information provided will be used in evaluating the application for a permit. Information in the application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary, however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed nor can a permit be issued.

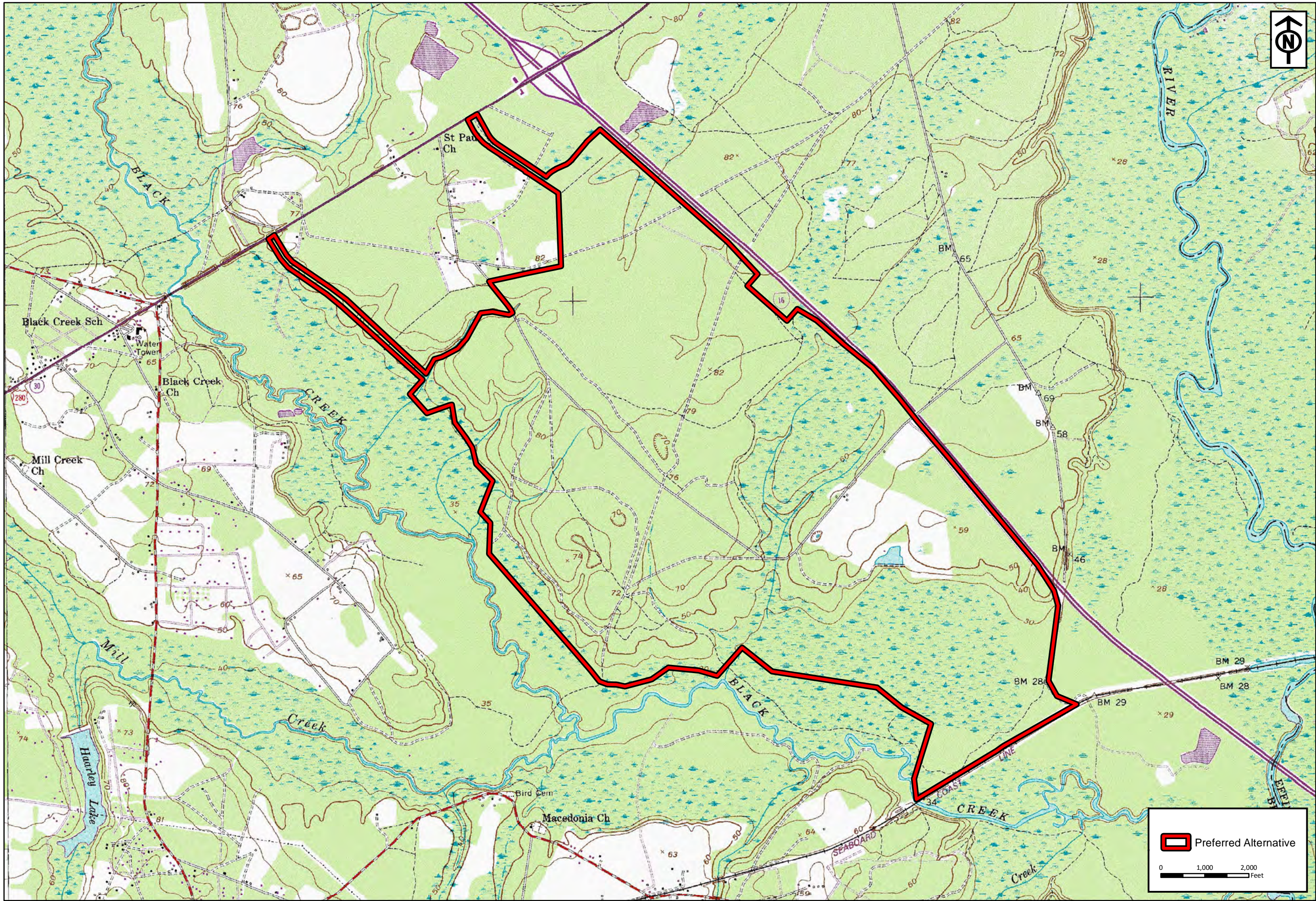
SUPPORTING REMARKS:

See Attached.



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APPENDIX B: Figures/Site Maps



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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898

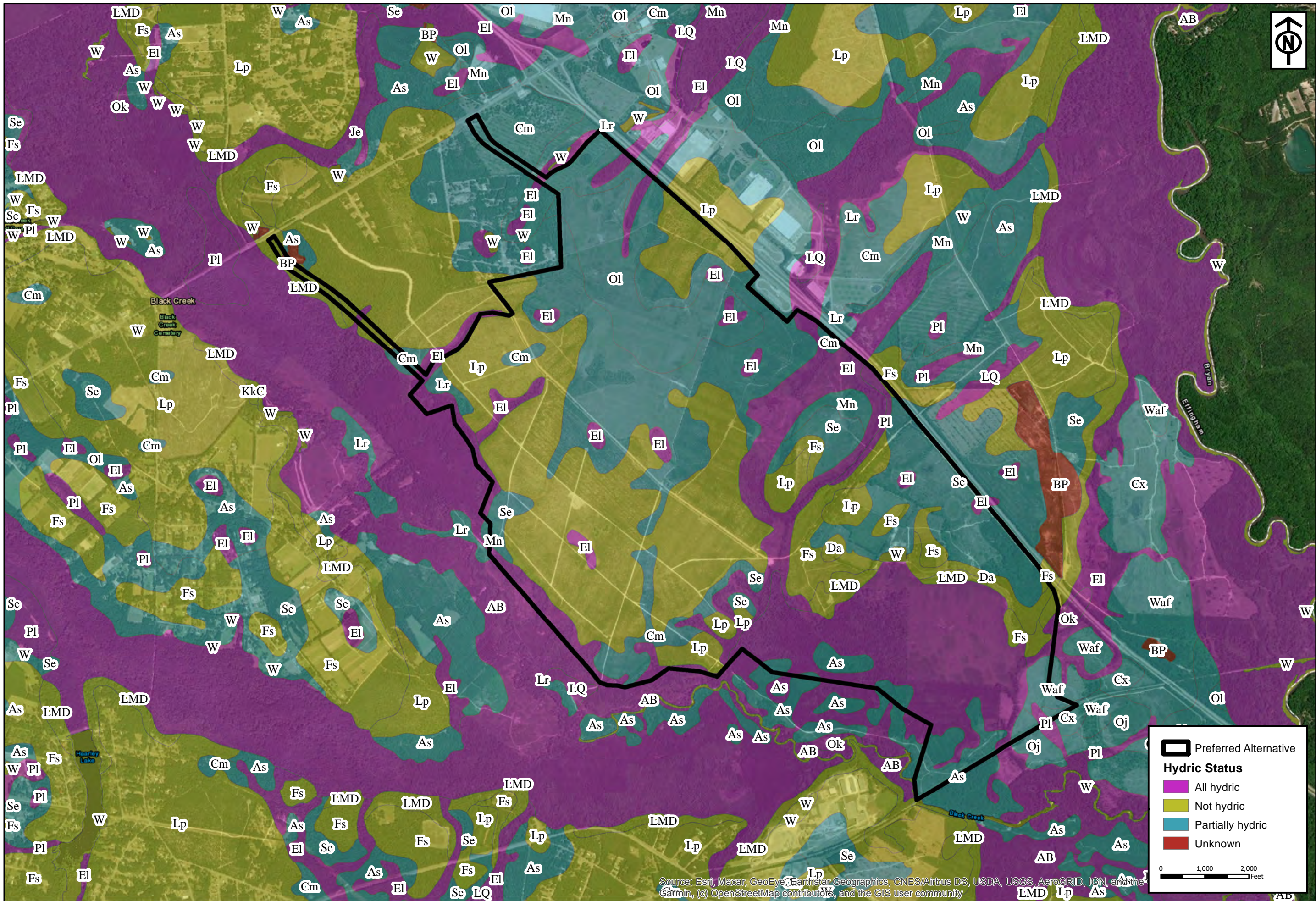


USGS Topographic Survey
Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

**Applicant's Preferred
Alternative**
Bryan County, Georgia

RLC Project No.:	14-225.7
Figure No.:	2
Prepared By:	RP
Sketch Date:	5/13/2022
Map Scale:	1 inch = 2,000 feet

Source(s): 2018 NAD Ortho Aerial, Chatham County



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the
 Garmin, (c) OpenStreetMap contributors, and the GIS user community

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 41 Park of Commerce Way, Ste 101
 Savannah, GA, 31405
 tel 912.443.5896 fax 912.443.5898



USDA Soil Survey

Prepared For: GDEC& Savannah Harbor-
 Interstate 16 Corridor Joint Development Authority

**Applicant's Preferred
 Alternative**

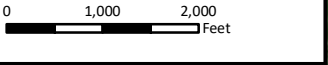
Bryan County, Georgia

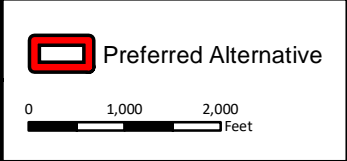
RLC Project No.:	14-225.7
Figure No.:	3
Prepared By:	RP
Sketch Date:	5/13/2022
Map Scale:	1 inch = 2,000 feet

Preferred Alternative

Hydric Status

- All hydric
- Not hydric
- Partially hydric
- Unknown





RLC Project No.: 14-225.7
 Figure No.: 5
 Prepared By: RP
 Sketch Date: 5/13/2022
 Map Scale : 1 inch = 2,000 feet

Applicant's Preferred Alternative
 Bryan County, Georgia

2019 Color Ortho Photograph
 Prepared For: GDECD & Savannah Harbor-
 Interstate 16 Corridor Joint Development Authority



RESOURCE+LAND CONSULTANTS
 41 Park of Commerce Way, Ste 101
 Savannah, GA, 31405
 tel 912.443.5896 fax 912.443.5898



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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



**1999 Color Infrared
Photograph**
Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

**Applicant's Preferred
Alternative**
Bryan County, Georgia

RLC Project No.:	14-225.7
Figure No.:	6
Prepared By:	RP
Sketch Date:	5/13/2022
Map Scale :	1 inch = 2,000 feet

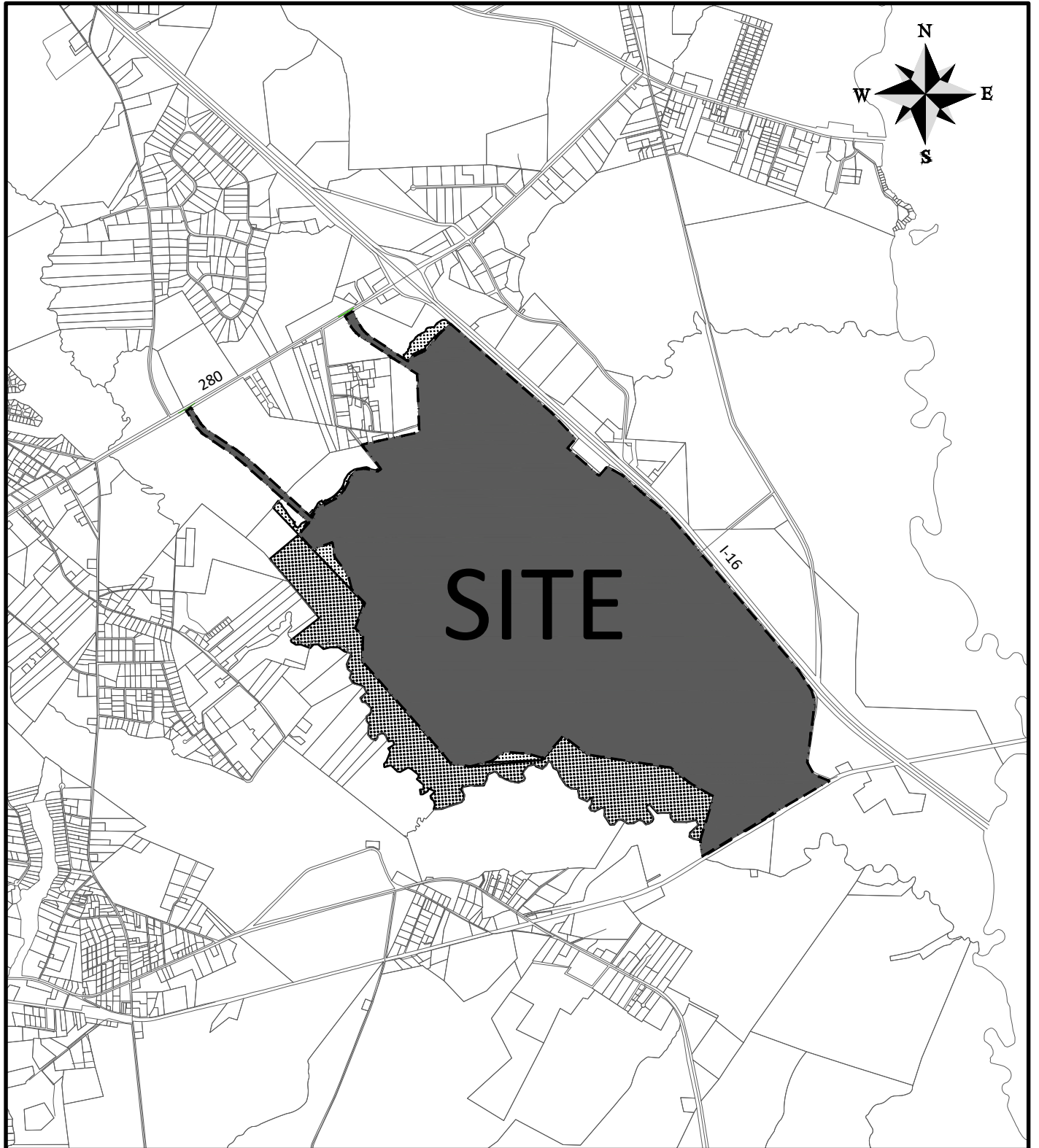
Preferred Alternative

0 1,000 2,000 Feet



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APPENDIX C: Permit Drawings



BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
LOCATION MAP

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

SHEET: 1 OF 18
SCALE: 1" = 4000'




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LEGEND

ACREAGE SUMMARY TABLE

	TOTAL PROJECT ACREAGE	2,541.25 AC
	TOTAL JURISDICTIONAL WETLAND AREA	625.98 AC.
	TOTAL NON-JURISDICTIONAL WETLAND AREA	29.32 AC.
	TOTAL FRESHWATER POND AREA	6.51 AC.
	TOTAL STREAM LENGTH	763 LF
	TOTAL DUG CONVEYANCE	1.58 AC
	TOTAL UPLAND AREA	1,877.86 AC.

WETLAND IMPACTS

JURISDICTIONAL WETLANDS IMPACTS

	RAIL ROAD IMPACT	27.29 AC.
	SITE IMPACT	194.07 AC.
	DUG CONVEYANCE IMPACT	1.58 AC.

TOTAL JURISDICTIONAL WETLAND IMPACTS	222.34 AC.
--------------------------------------	------------

	STREAM IMPACT	763 LF
---	---------------	--------

NON-JURISDICTIONAL WETLANDS IMPACTS

	SITE IMPACT	29.32 AC.
---	-------------	-----------

TOTAL NON-JURISDICTIONAL WETLAND IMPACTS	29.32 AC.
--	-----------

BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:

LEGEND

CLIENT:

SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

LOCATION: BRYAN COUNTY, GEORGIA

DATE: MAY 11, 2022

JOB NUMBER: J - 25503

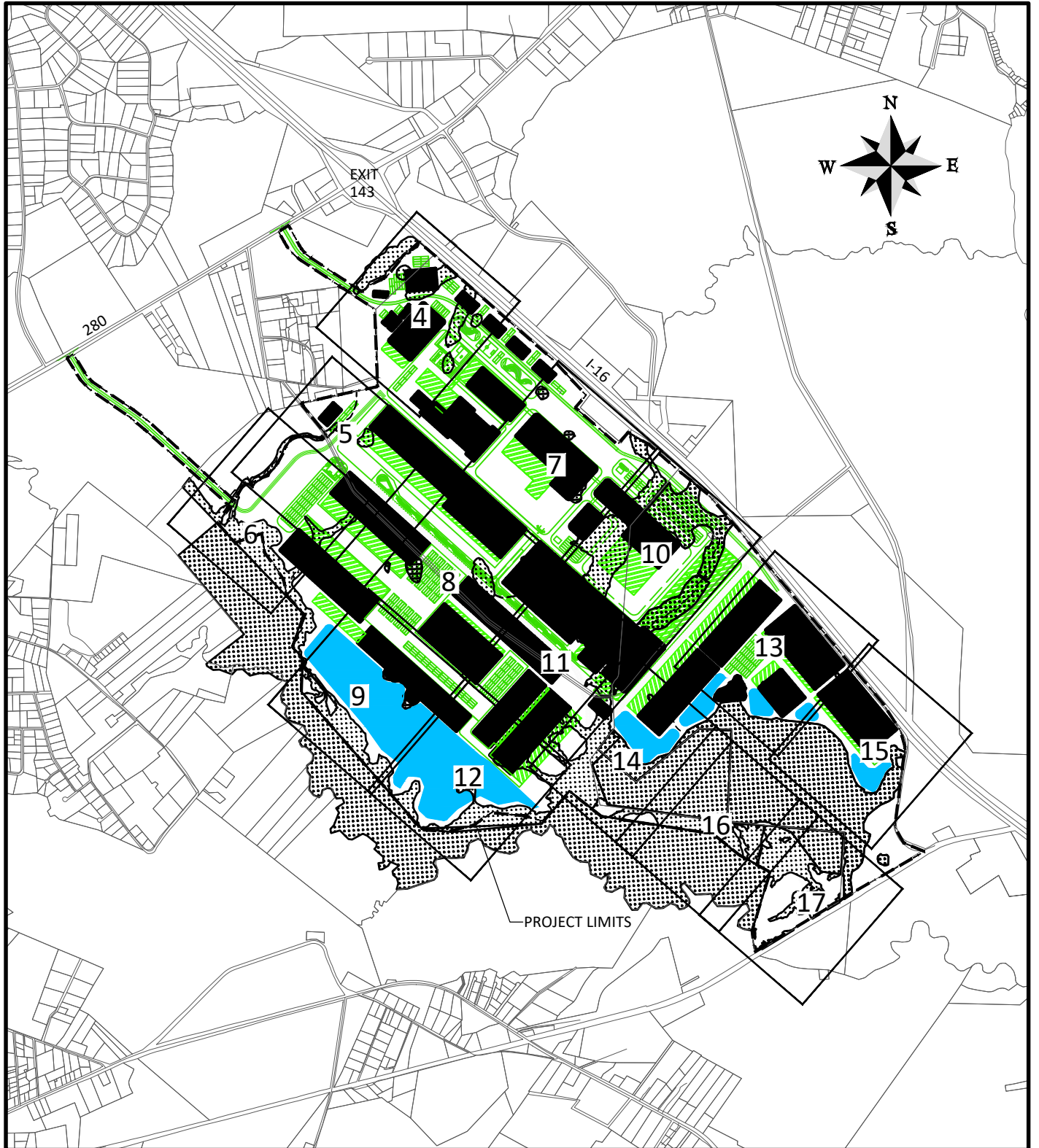
SHEET: 2 OF 18

SCALE: N.T.S.



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BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
SHEET INDEX

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

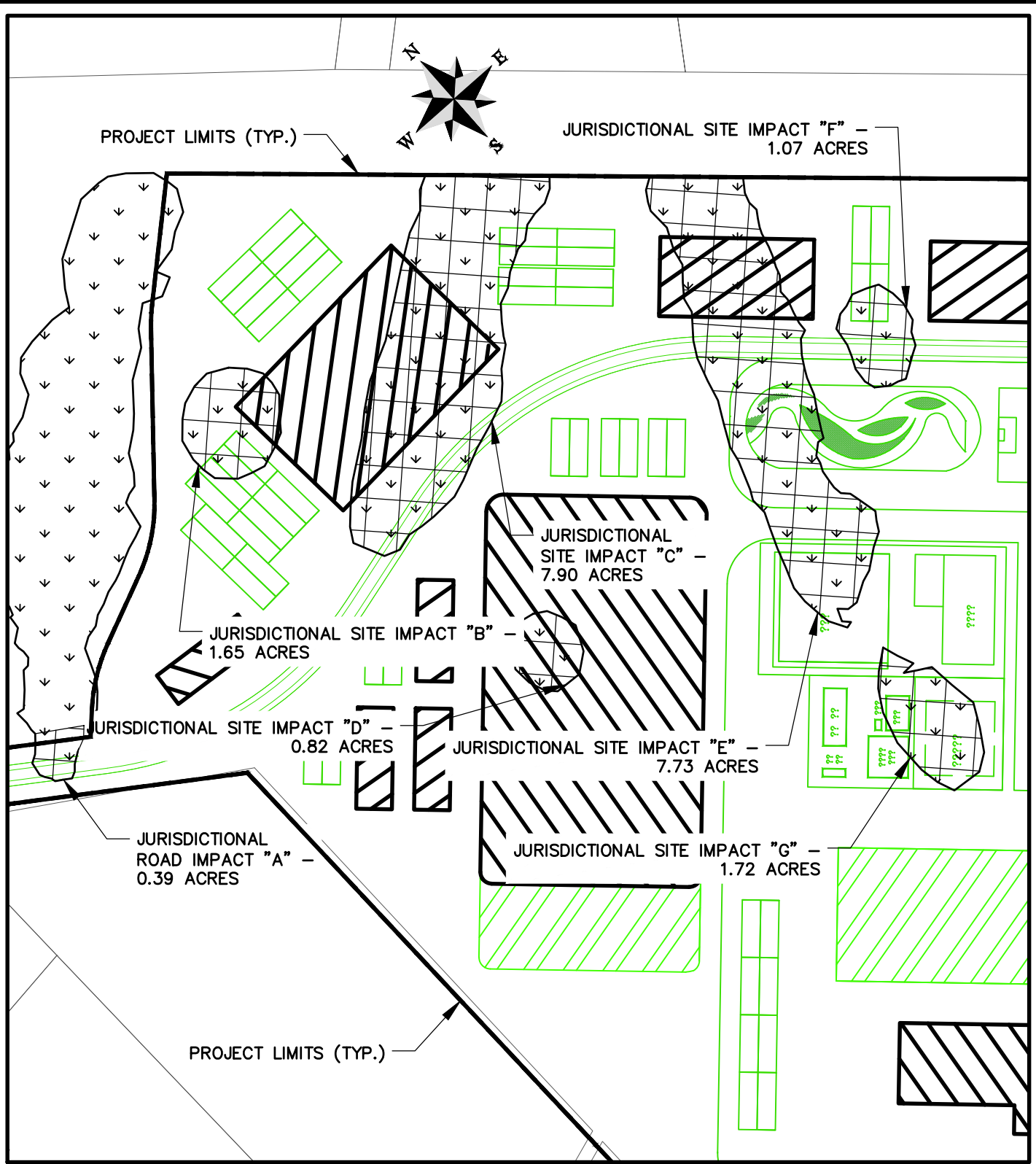
SHEET: 3 OF 18
SCALE: 1" = 3000'



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Z:\25503\25503.0000\Engineering\Drawings\Wetland_Permit Drawings\25503 - Wetland Impacts (BCEDS).dwg - Mar 31, 2015 - 9:24:01 AM



BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

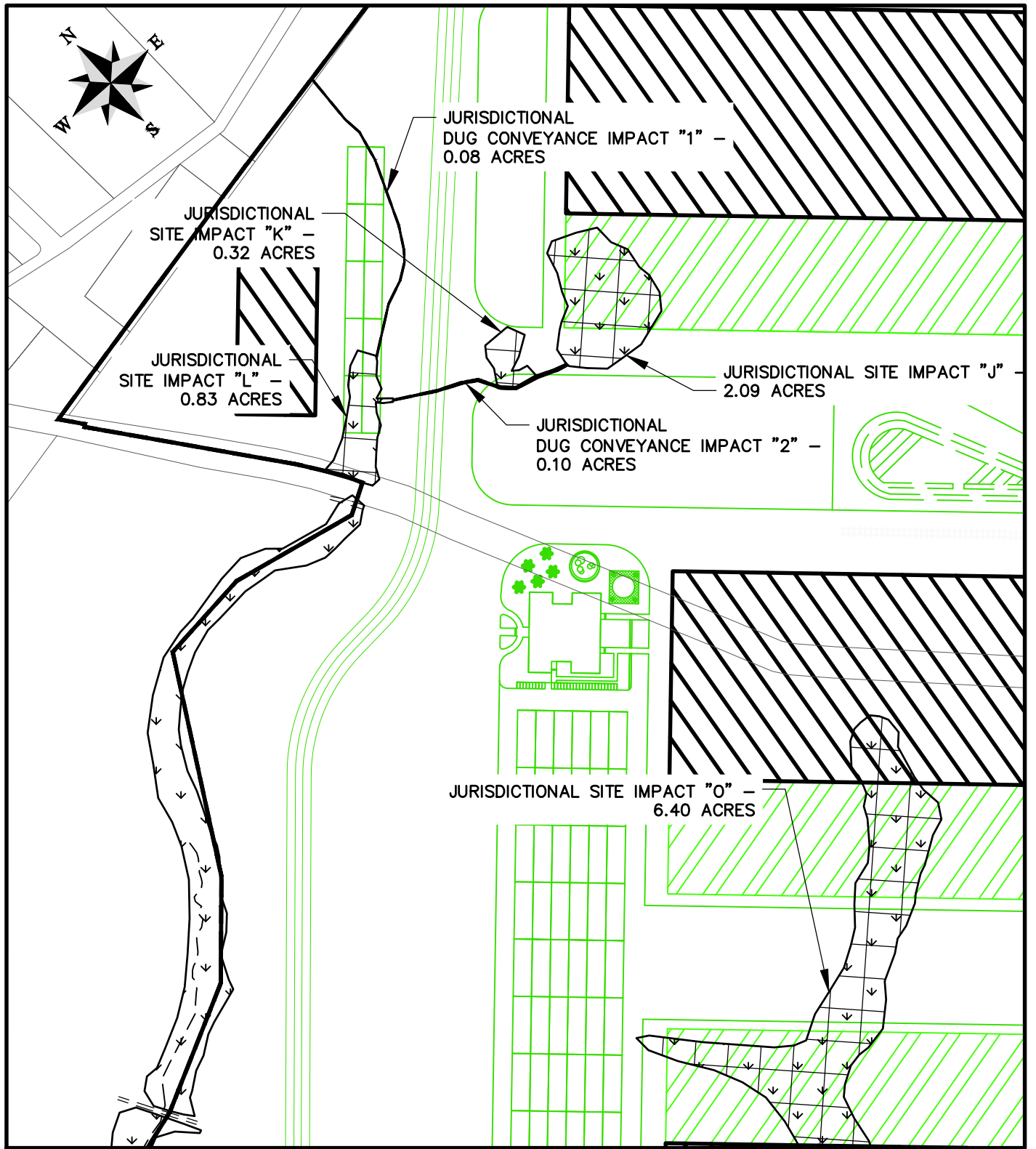
LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

SHEET: 4 OF 18
SCALE: 1" = 400'

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BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

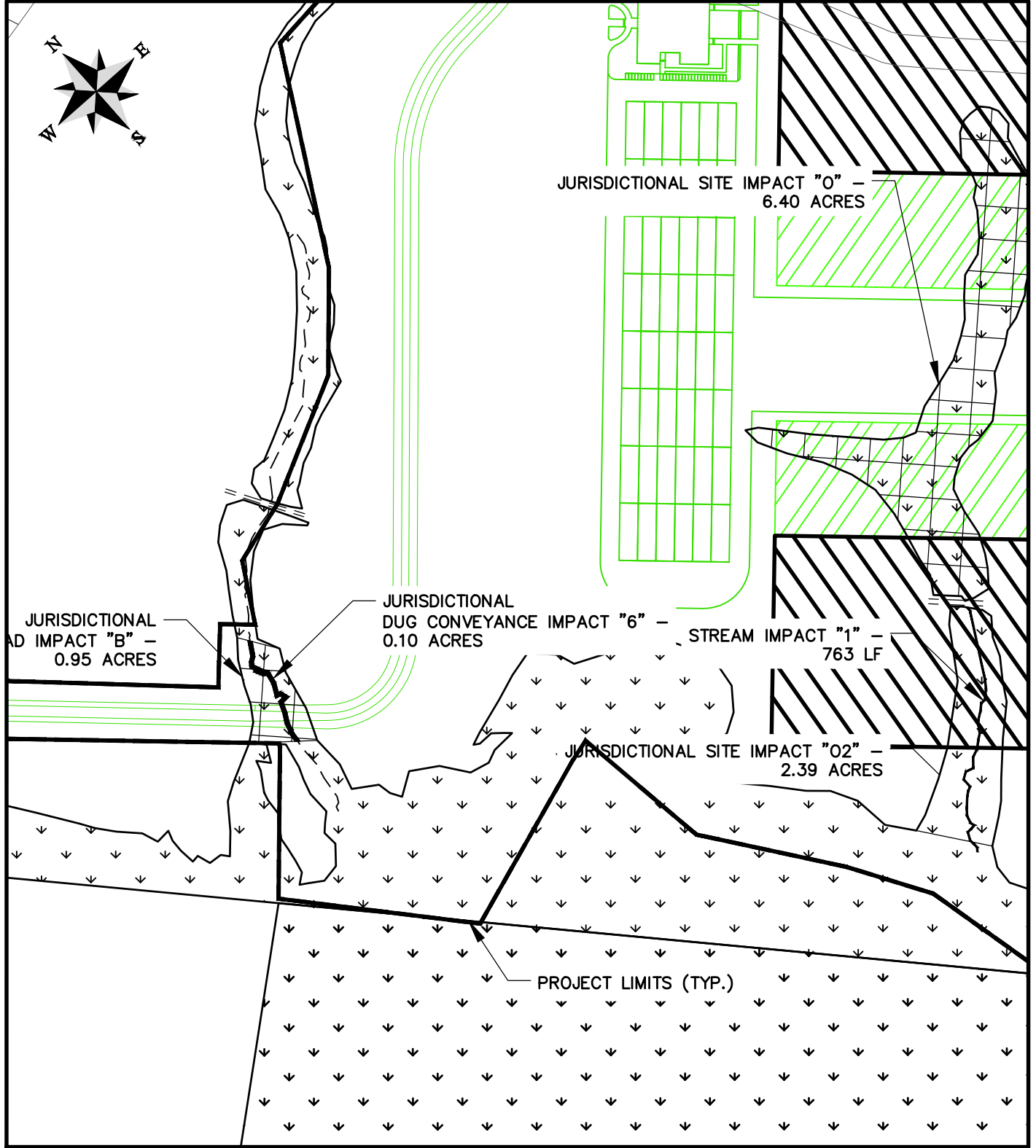
LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

SHEET: 5 OF 18
SCALE: 1" = 400'



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BRYAN COUNTY OEM SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

LOCATION: BRYAN COUNTY, GEORGIA
DATE: MARCH 31, 2015
JOB NUMBER: J - 25503

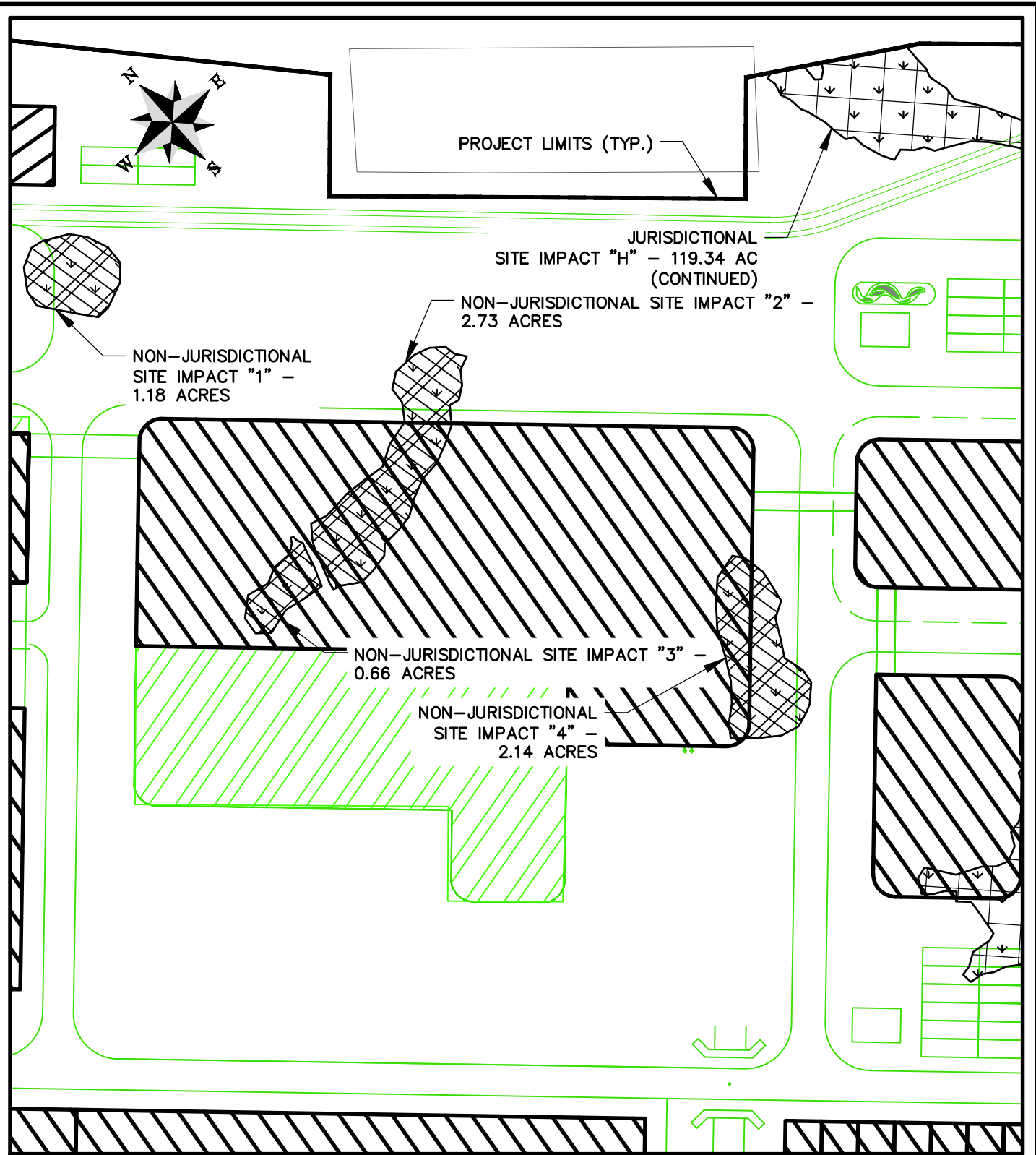
SHEET: 6 OF 14
SCALE: 1" = 400'



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BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

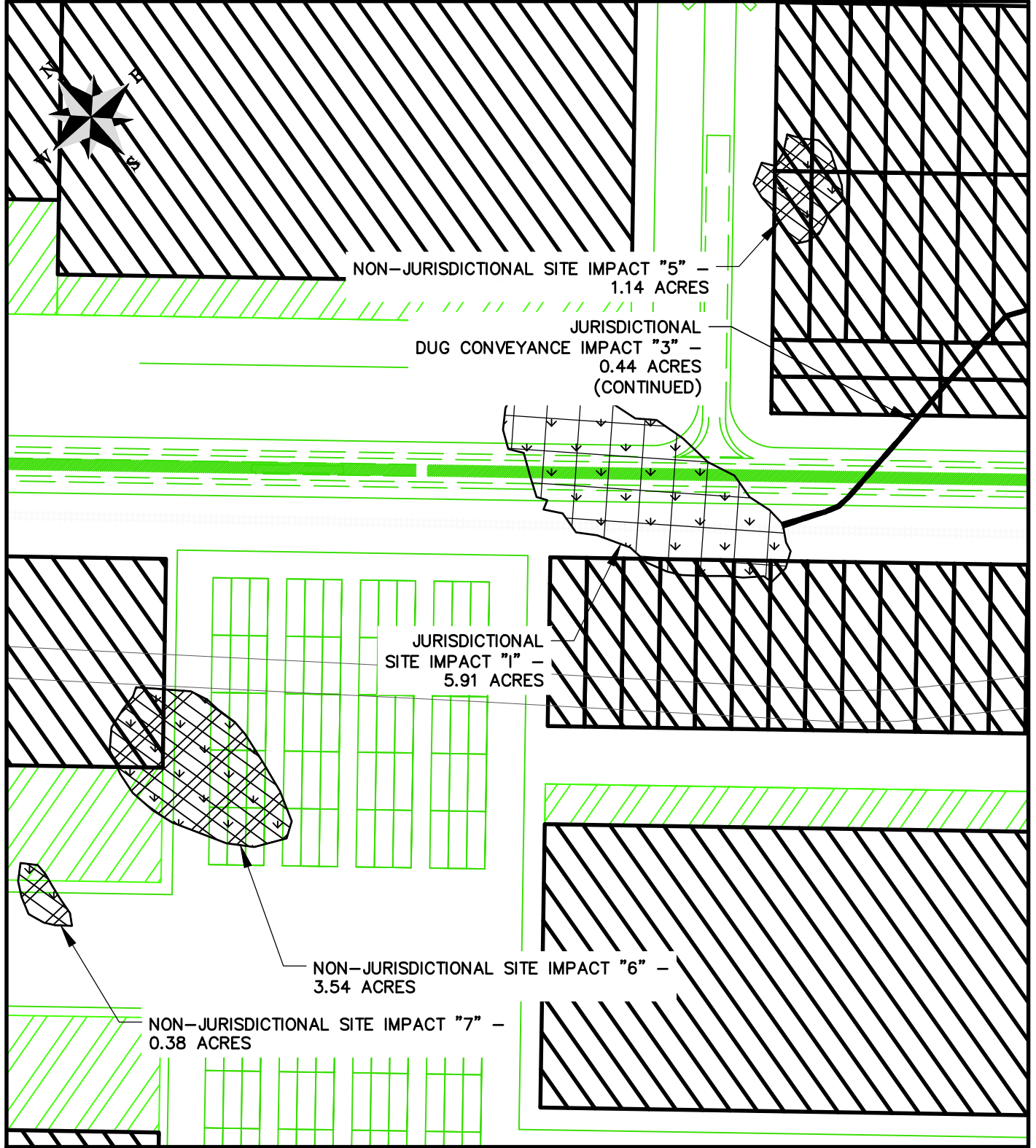
LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

SHEET: 7 OF 18
SCALE: 1" = 400'

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BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

LOCATION: BRAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

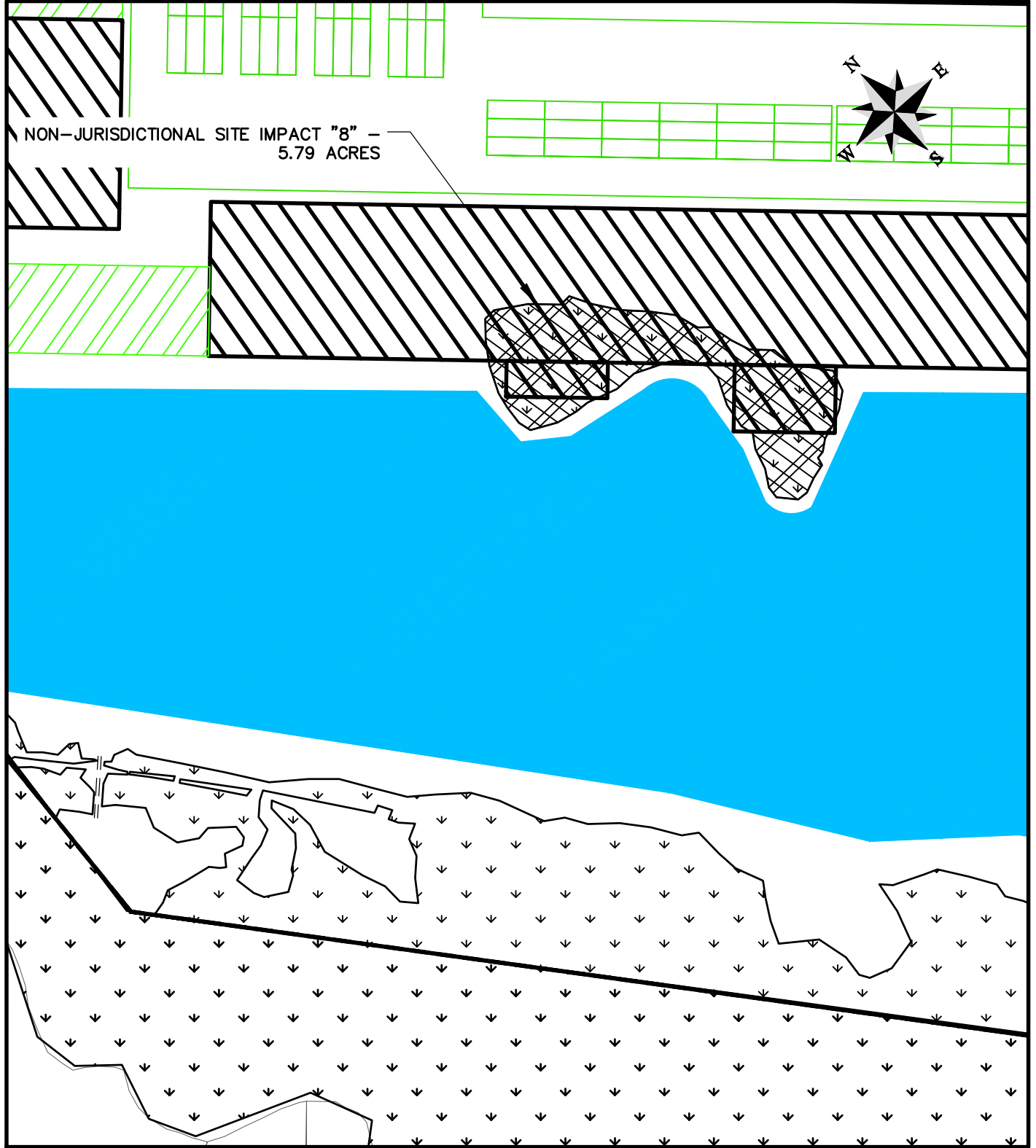
SHEET: 8 OF 18
SCALE: 1" = 400'



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BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

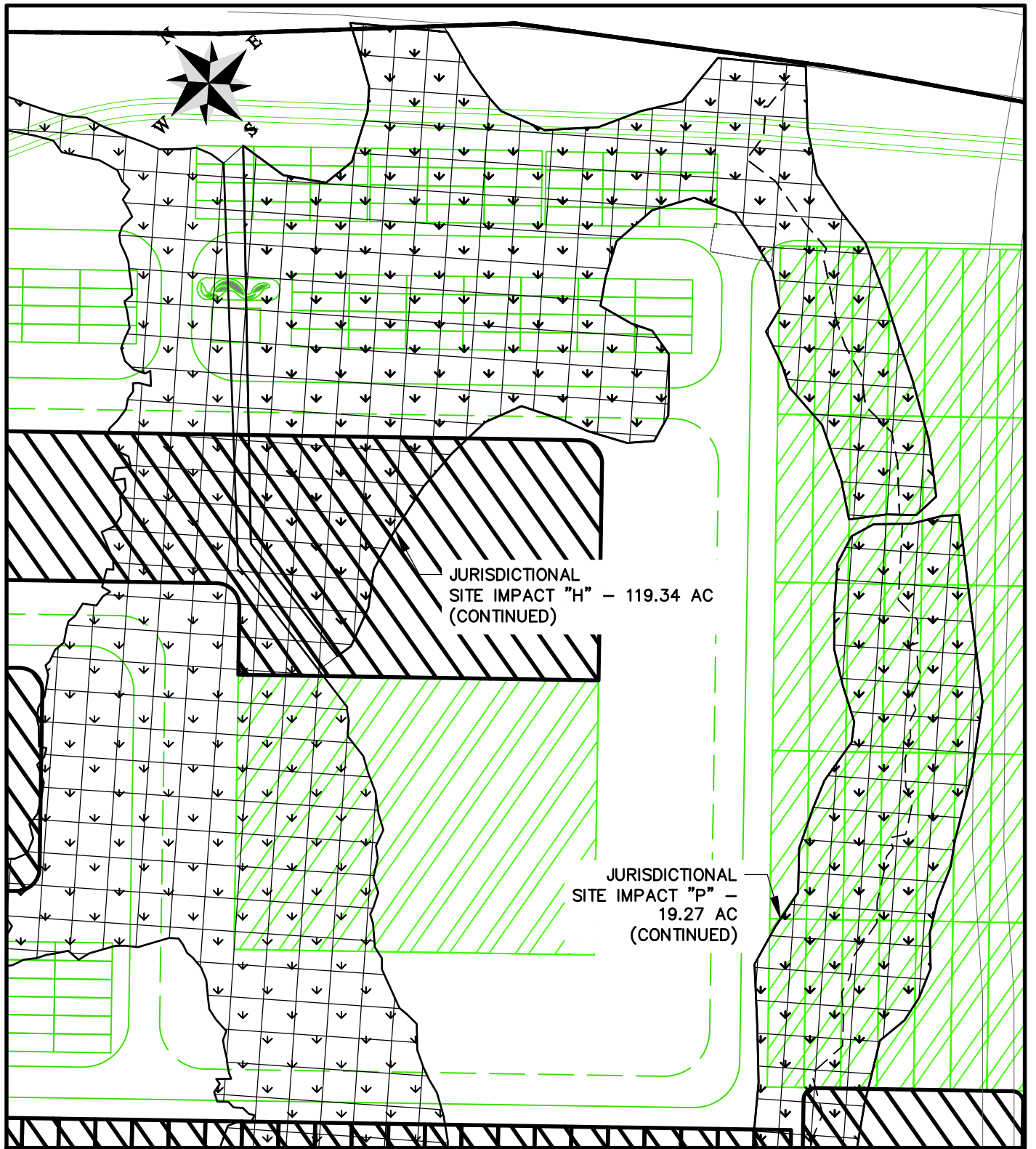
LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

SHEET: 9 OF 18
SCALE: 1" = 400'

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BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

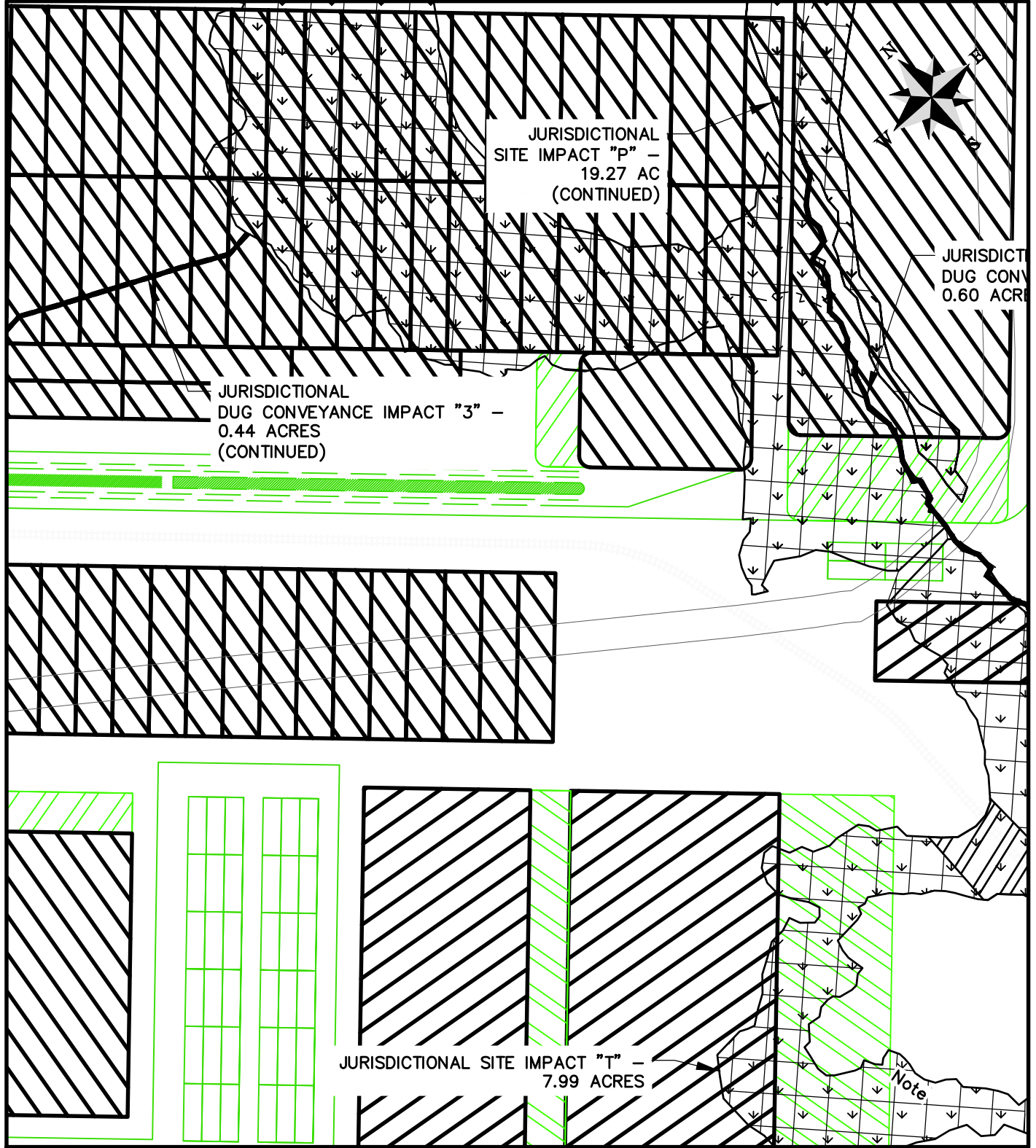
LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

SHEET: 10 OF 18
SCALE: 1" = 400'

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BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

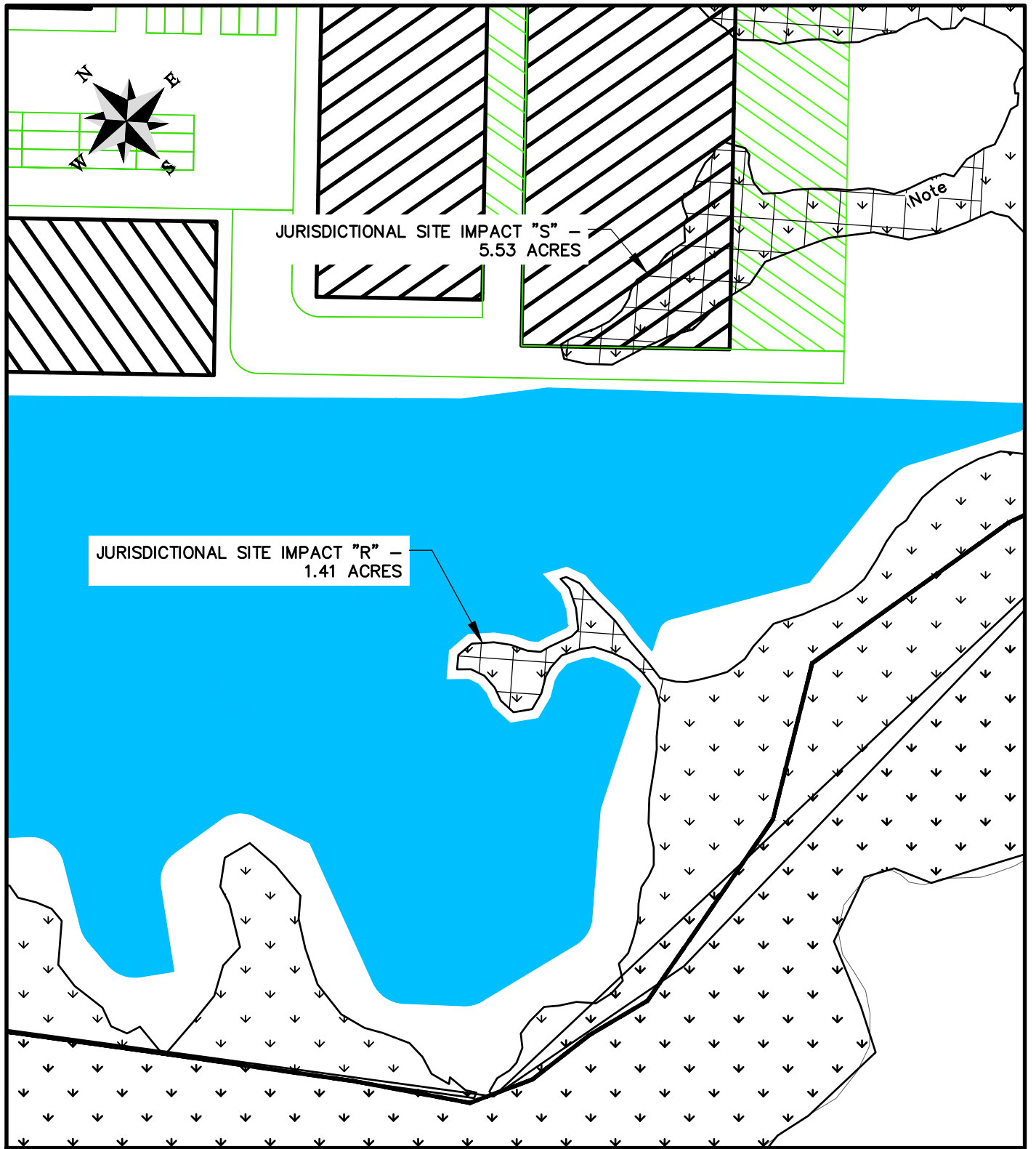
LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

SHEET: 11 OF 18
SCALE: 1" = 400'



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BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

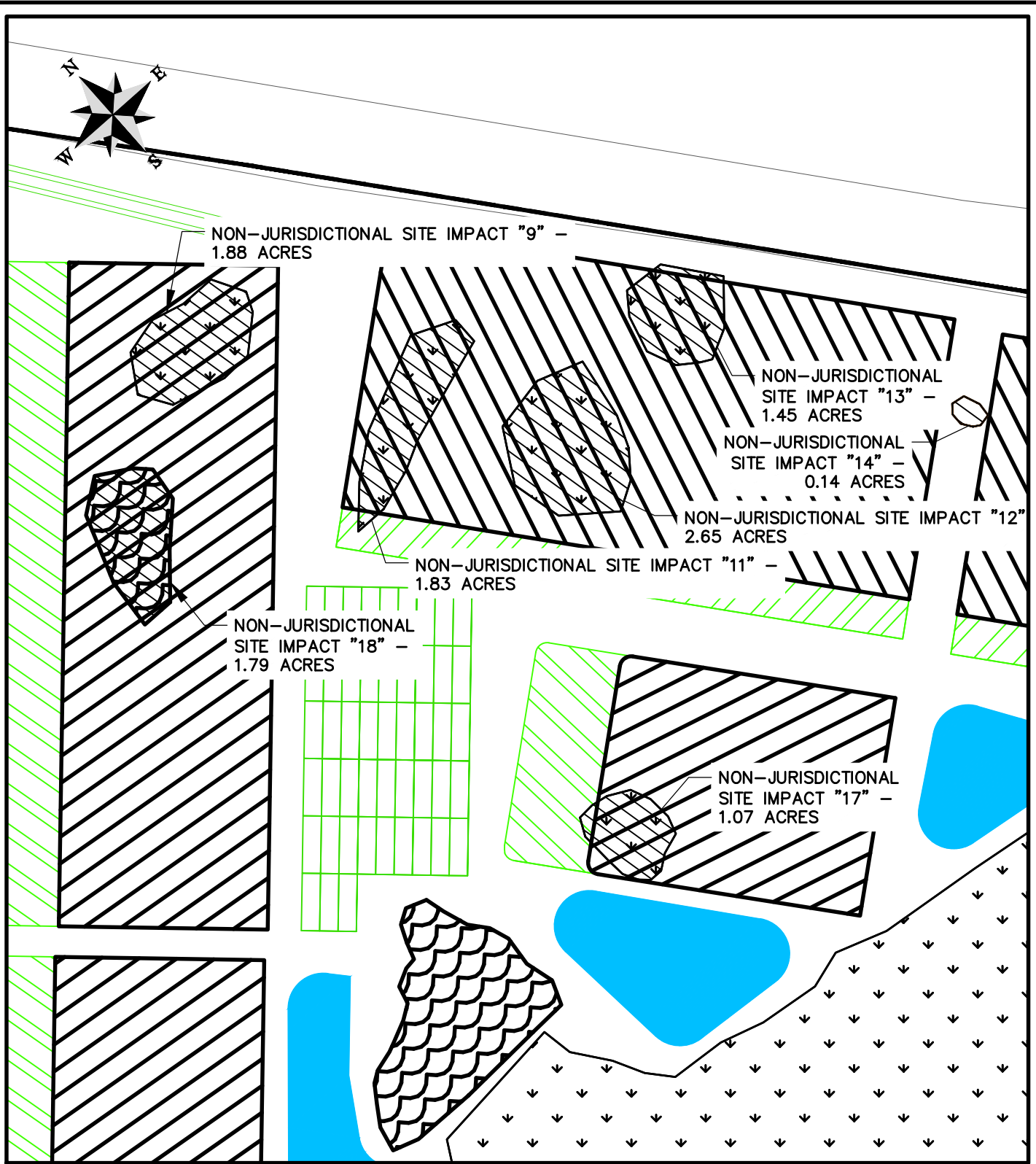
LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

SHEET: 12 OF 18
SCALE: 1" = 400'

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BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

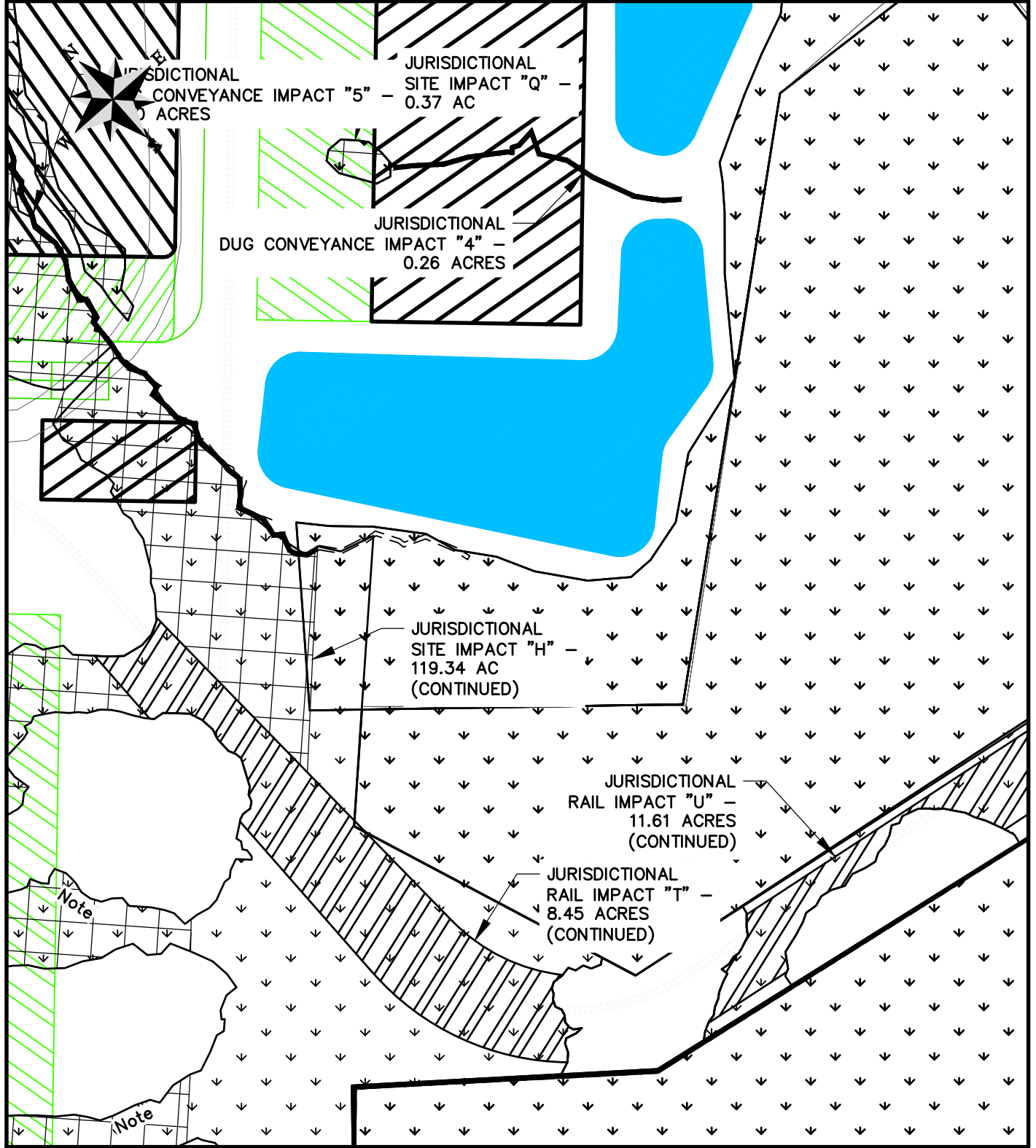
LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

SHEET: 13 OF 18
SCALE: 1" = 400'

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BRYAN COUNTY MEGA SITE

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WETLAND PERMIT

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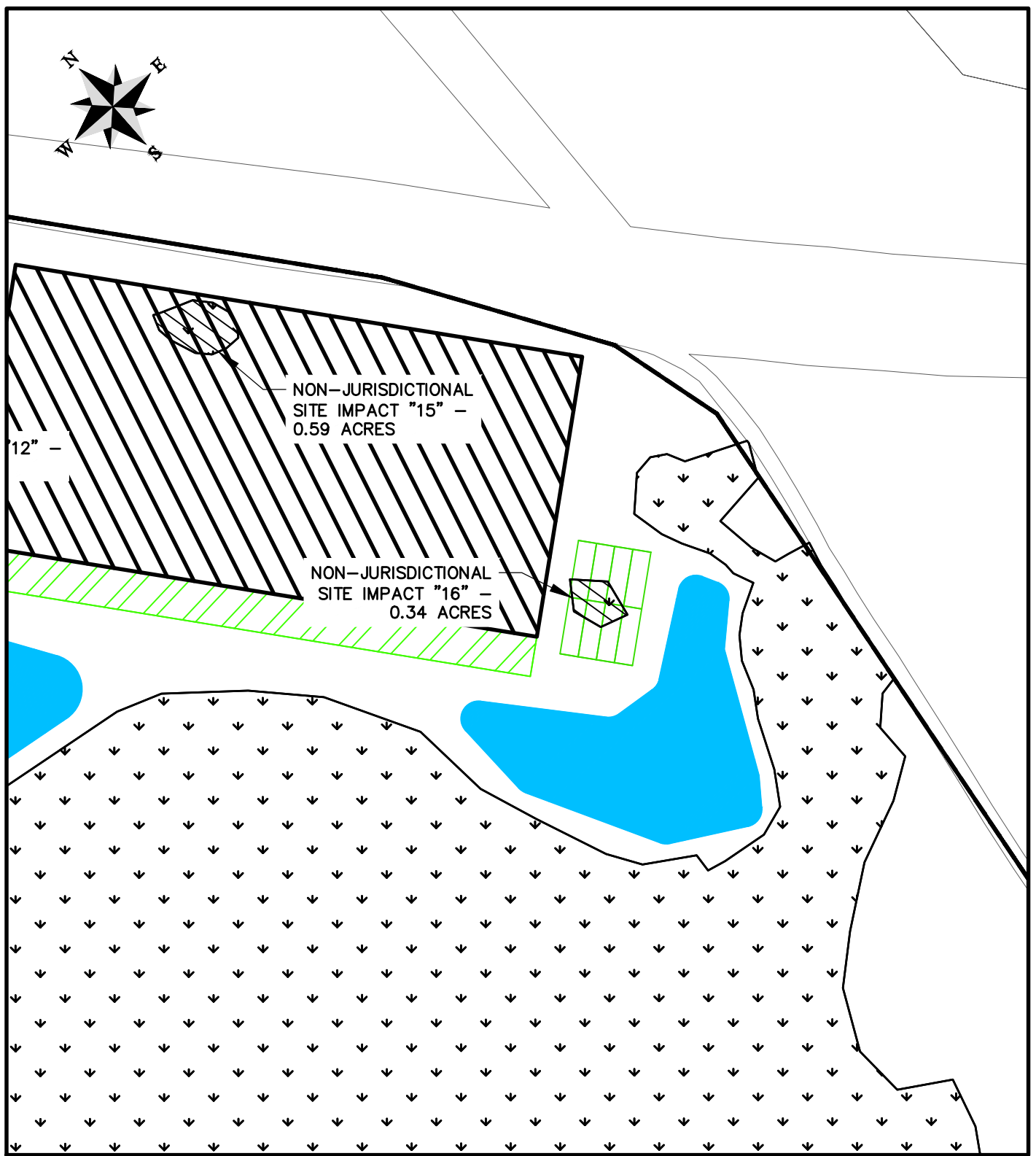
LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

SHEET: 14 OF 18
SCALE: 1" = 400'



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BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

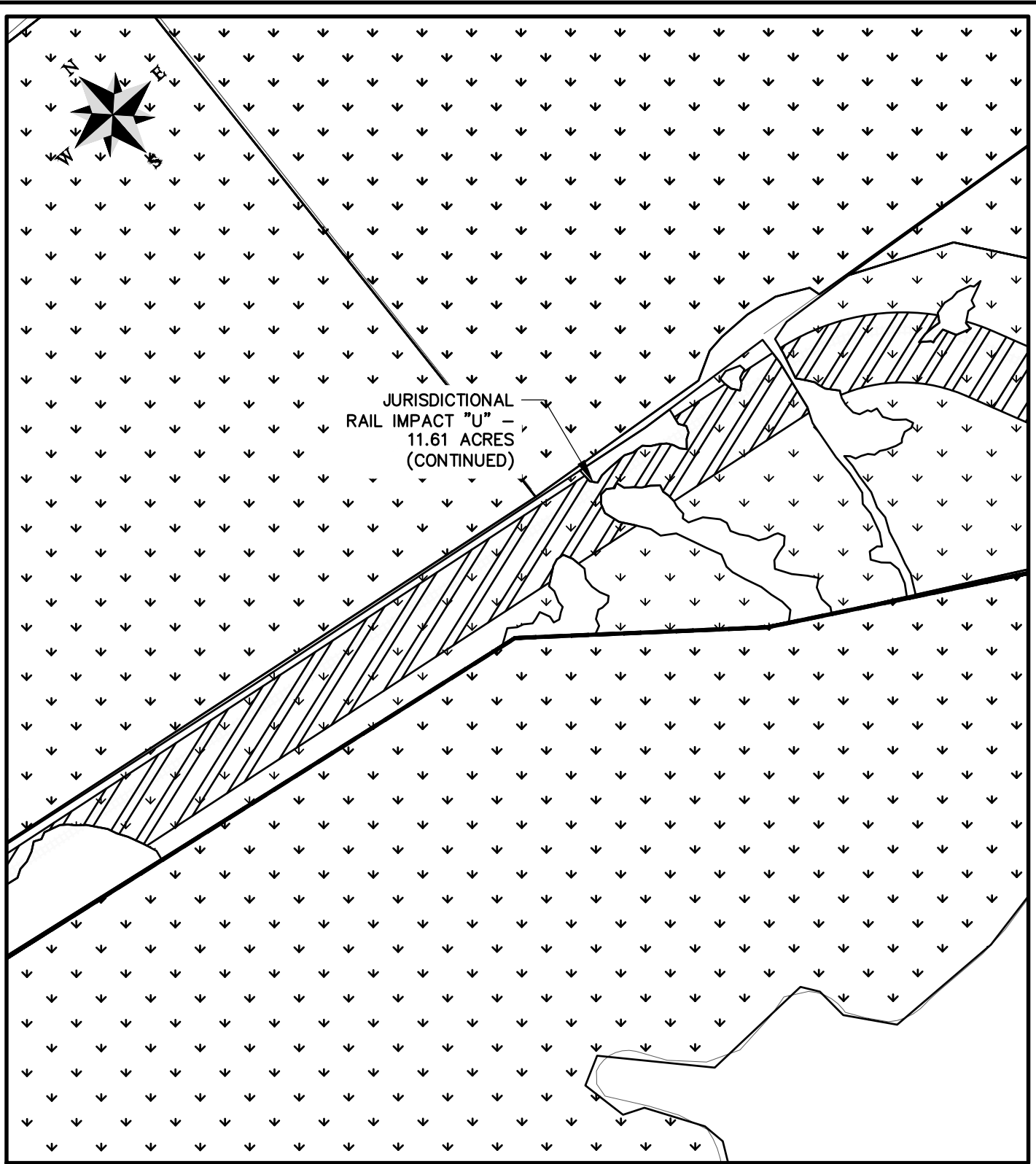
LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

SHEET: 15 OF 18
SCALE: 1" = 400'

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BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

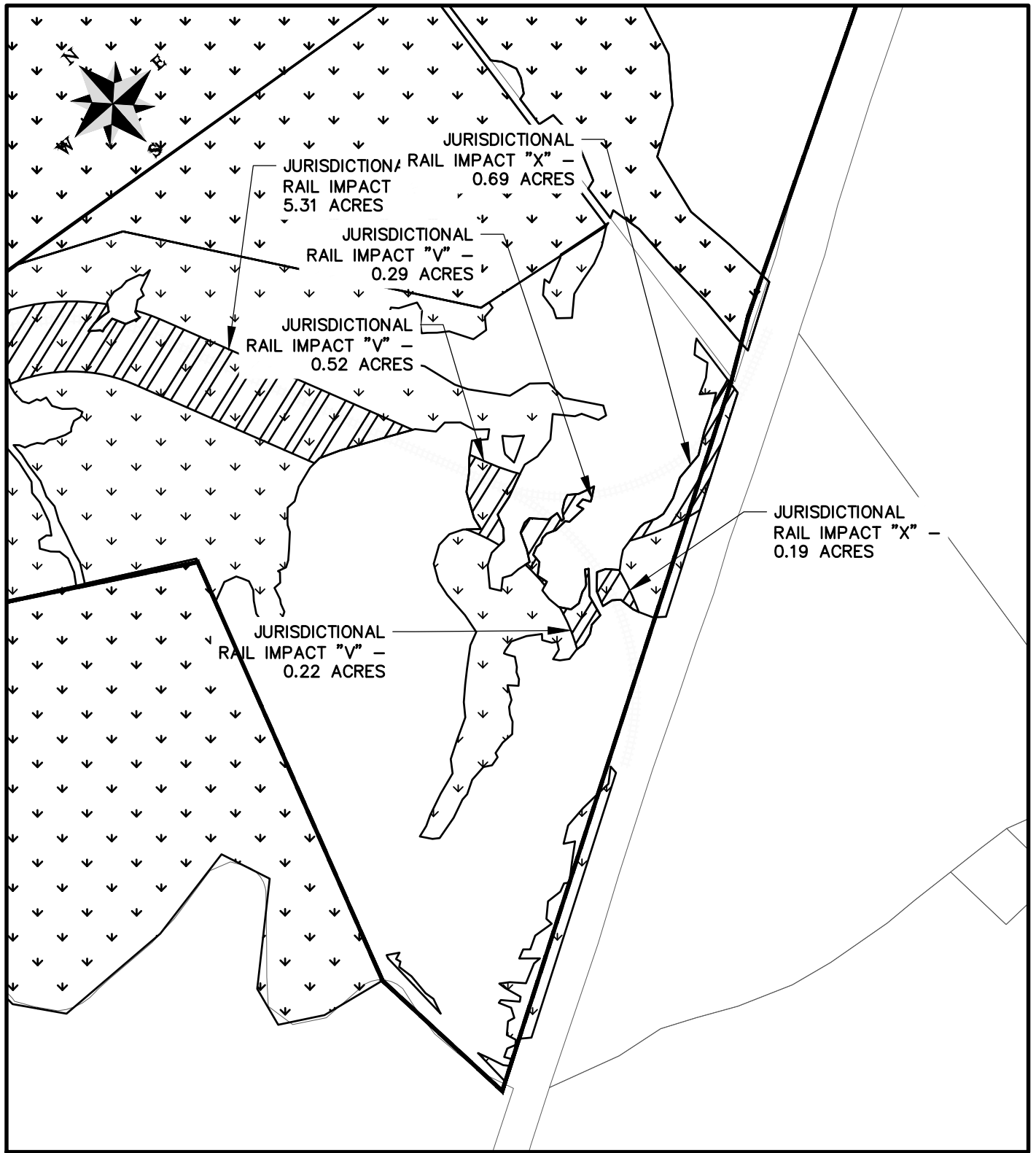
LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

SHEET: 16 OF 18
SCALE: 1" = 400'

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BRYAN COUNTY MEGA SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

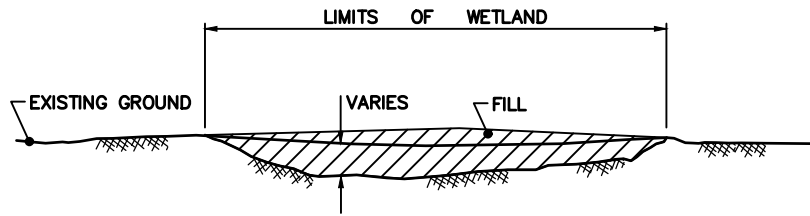
LOCATION: BRYAN COUNTY, GEORGIA
DATE: MAY 11, 2022
JOB NUMBER: J - 25503

SHEET: 17 OF 18
SCALE: 1" = 400'



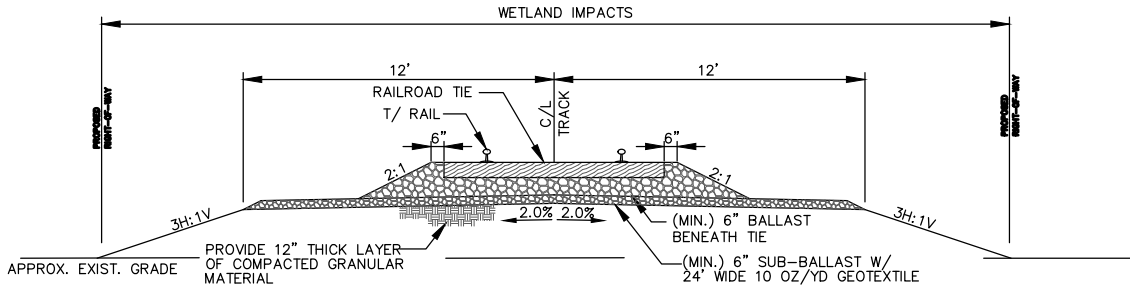
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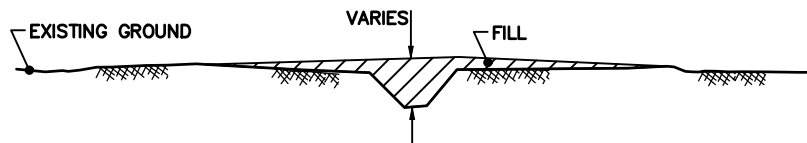
WETLAND FILL SECTION

NOT TO SCALE



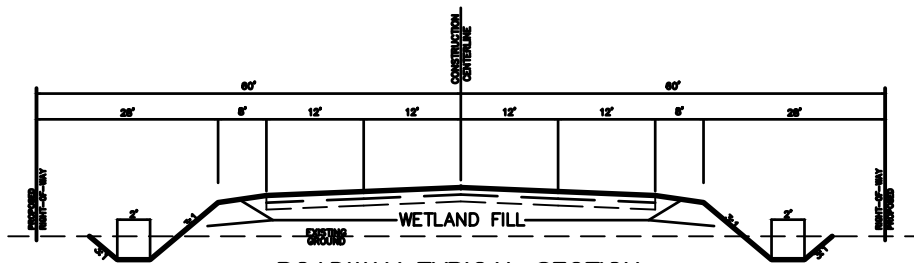
TYPICAL SECTION THRU RAIL SPUR

SCALE: NTS



STREAM/DUG CONVEYANCE FILL SECTION

NOT TO SCALE



ROADWAY TYPICAL SECTION

NOT TO SCALE

BRYAN COUNTY OEM SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

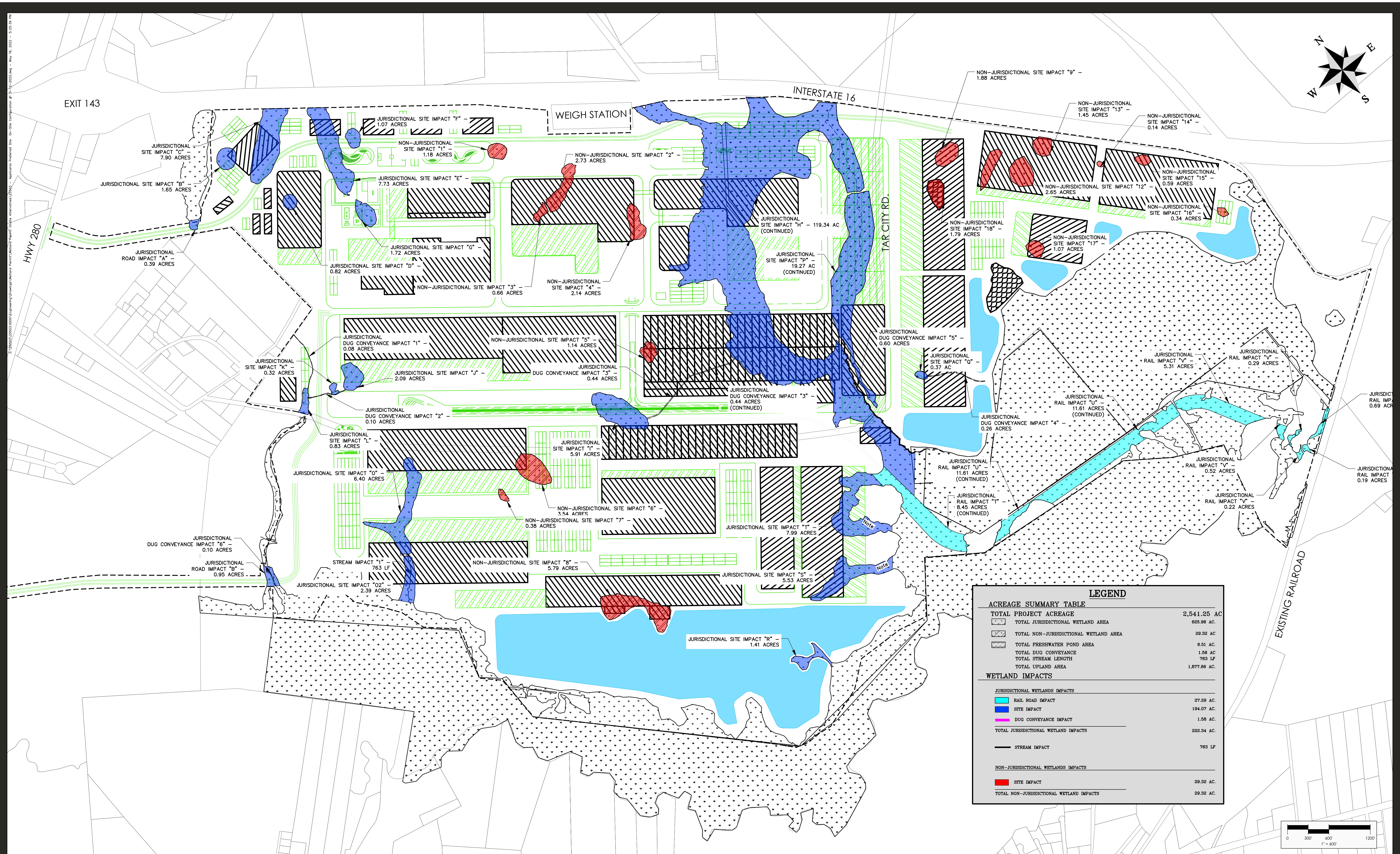
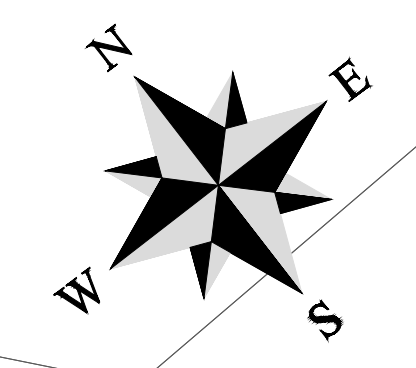
LOCATION: BRYAN COUNTY, GEORGIA
DATE: MARCH 31, 2015
JOB NUMBER: J - 25503

SHEET: 14 OF 14
SCALE: N.T.S.

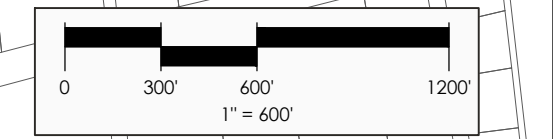
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ACREAGE SUMMARY TABLE	
TOTAL PROJECT ACREAGE	2,541.25 AC
TOTAL JURISDICTIONAL WETLAND AREA	625.98 AC
TOTAL NON-JURISDICTIONAL WETLAND AREA	29.32 AC
TOTAL FRESHWATER POND AREA	6.51 AC
TOTAL DUG CONVEYANCE	1.56 AC
TOTAL STREAM LENGTH	783 LF
TOTAL UPLAND AREA	1,677.86 AC
WETLAND IMPACTS	
JURISDICTIONAL WETLANDS IMPACTS	
RAIL ROAD IMPACT	27.29 AC
SITE IMPACT	194.07 AC
DUG CONVEYANCE IMPACT	1.56 AC
TOTAL JURISDICTIONAL WETLAND IMPACTS	222.92 AC
STREAM IMPACT	783 LF
NON-JURISDICTIONAL WETLANDS IMPACTS	
SITE IMPACT	29.32 AC
TOTAL NON-JURISDICTIONAL WETLAND IMPACTS	29.32 AC



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APPLICANTS PREFERRED SITE / ON-SITE CONFIGURATION #1
 BRYAN COUNTY, GEORGIA
 MAY 16, 2022

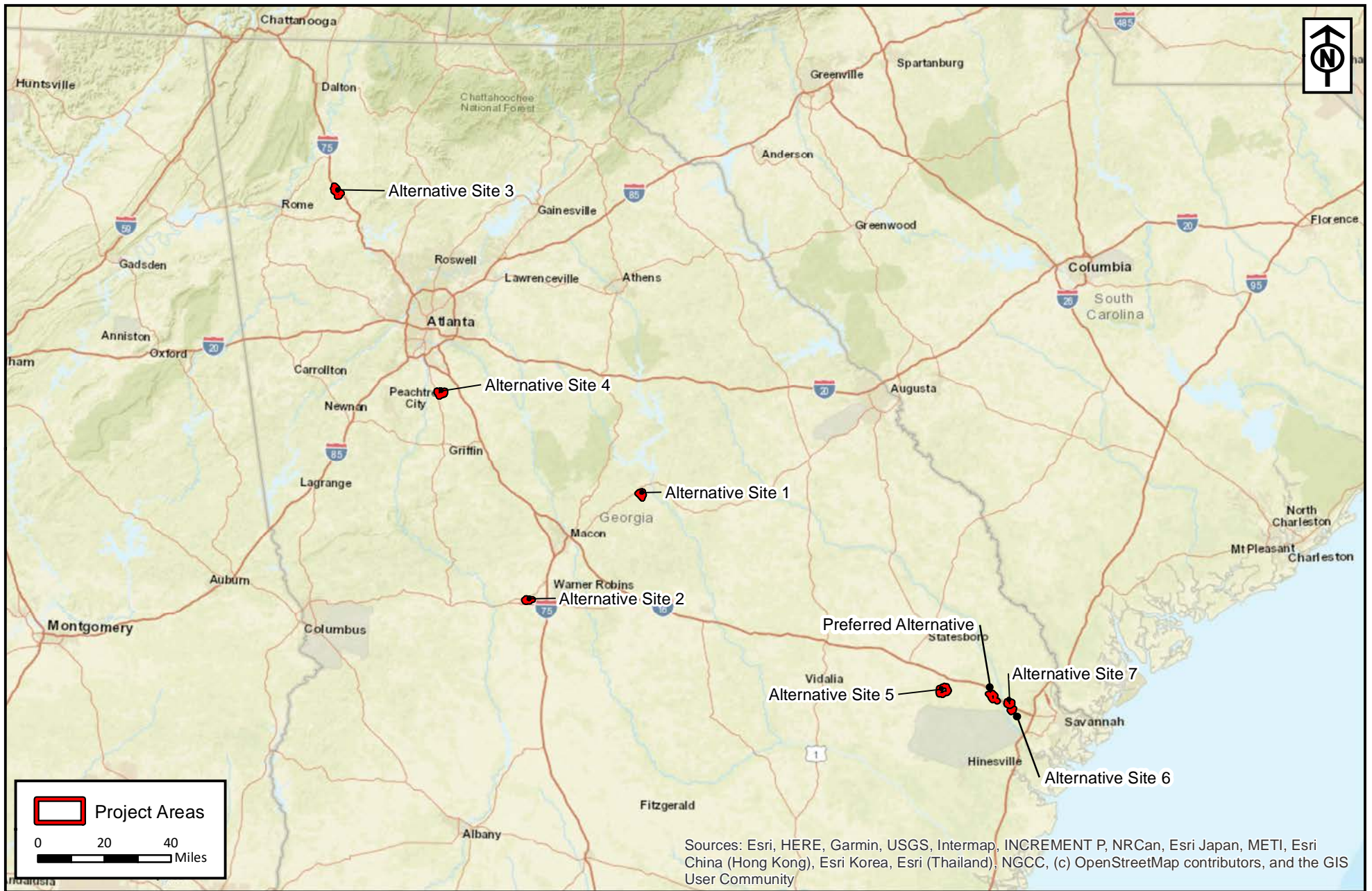
**Savannah Harbor-Interstate 16 Corridor
 Joint Development Authority**
 BRYAN • BULLOCH • CHATHAM • EFFINGHAM

This illustrates a general plan of the development which is for discussion purposes only. Does not limit or bind the owner and is subject to change and position locations are for illustrative purposes only and are subject to an accurate survey and property description. The producer assumes no legal responsibility for the appreciation or depreciation of any premises, commercial or otherwise, by reason of their inclusion or exclusion from this map. The information contained in this map is subject to change with out notice and is for illustrative purposes only. Unit counts shown above are approximate and may change. Values were provided by outside sources and have not been



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APPENDIX D: Off-Site Alternatives



RLC Project No.:	14-225.7
Figure No.:	1
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 40 miles

Alternative Sites

Baldwin, Bartow, Bryan, Clayton, Peach, Bulloch, Effingham, and Chatham County, Georgia

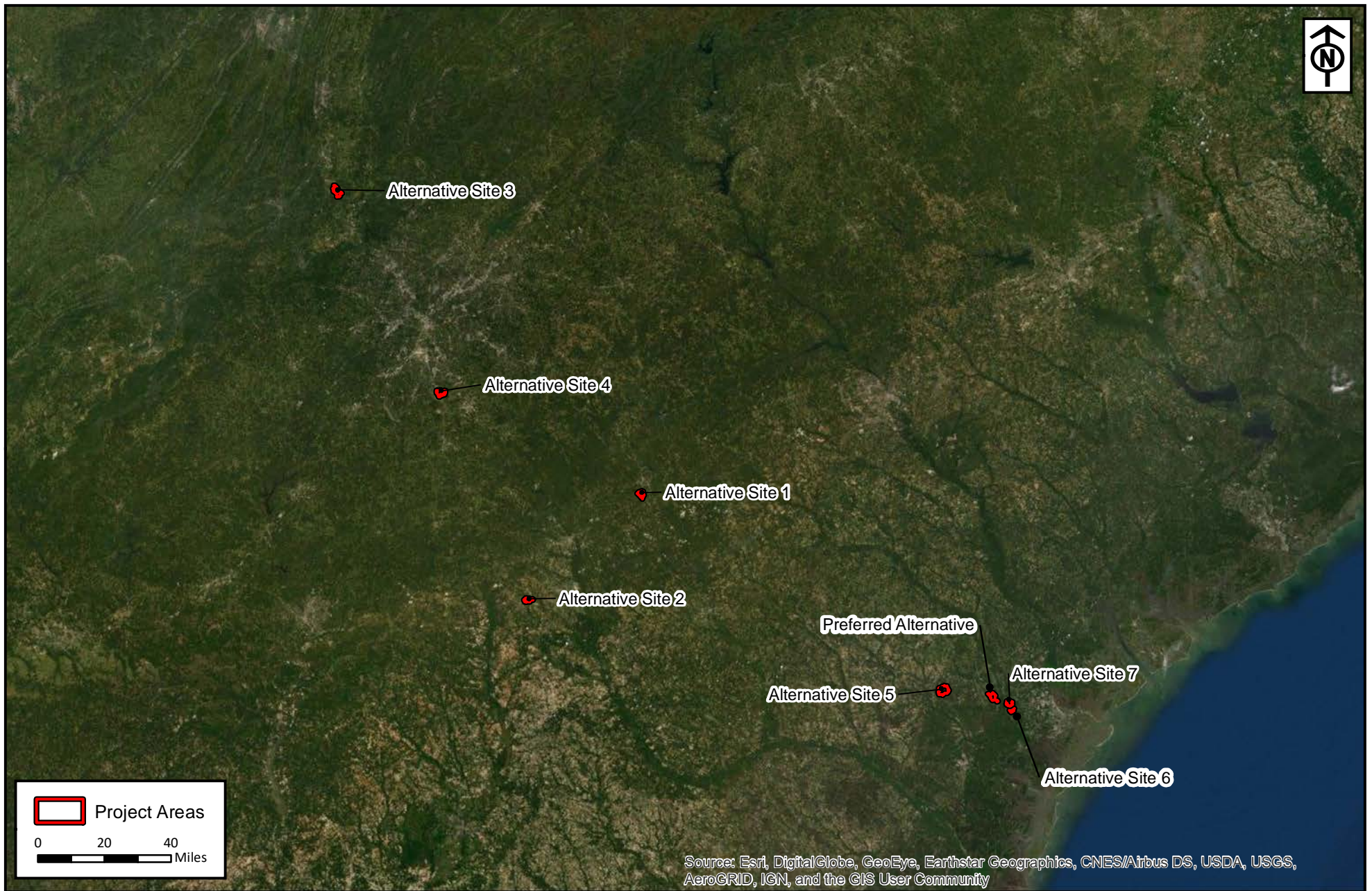
Project Location Map

Prepared For: GDEC & Savannah Harbor-Interstate 16 Corridor Joint Development Authority



RESOURCE+LAND CONSULTANTS

41 Park of Commerce Way, Ste 101
Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	2
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 40 miles

Alternative Sites
Baldwin, Bartow, Bryan, Clayton, Peach, Bulloch,
Effingham, and Chatham County, Georgia

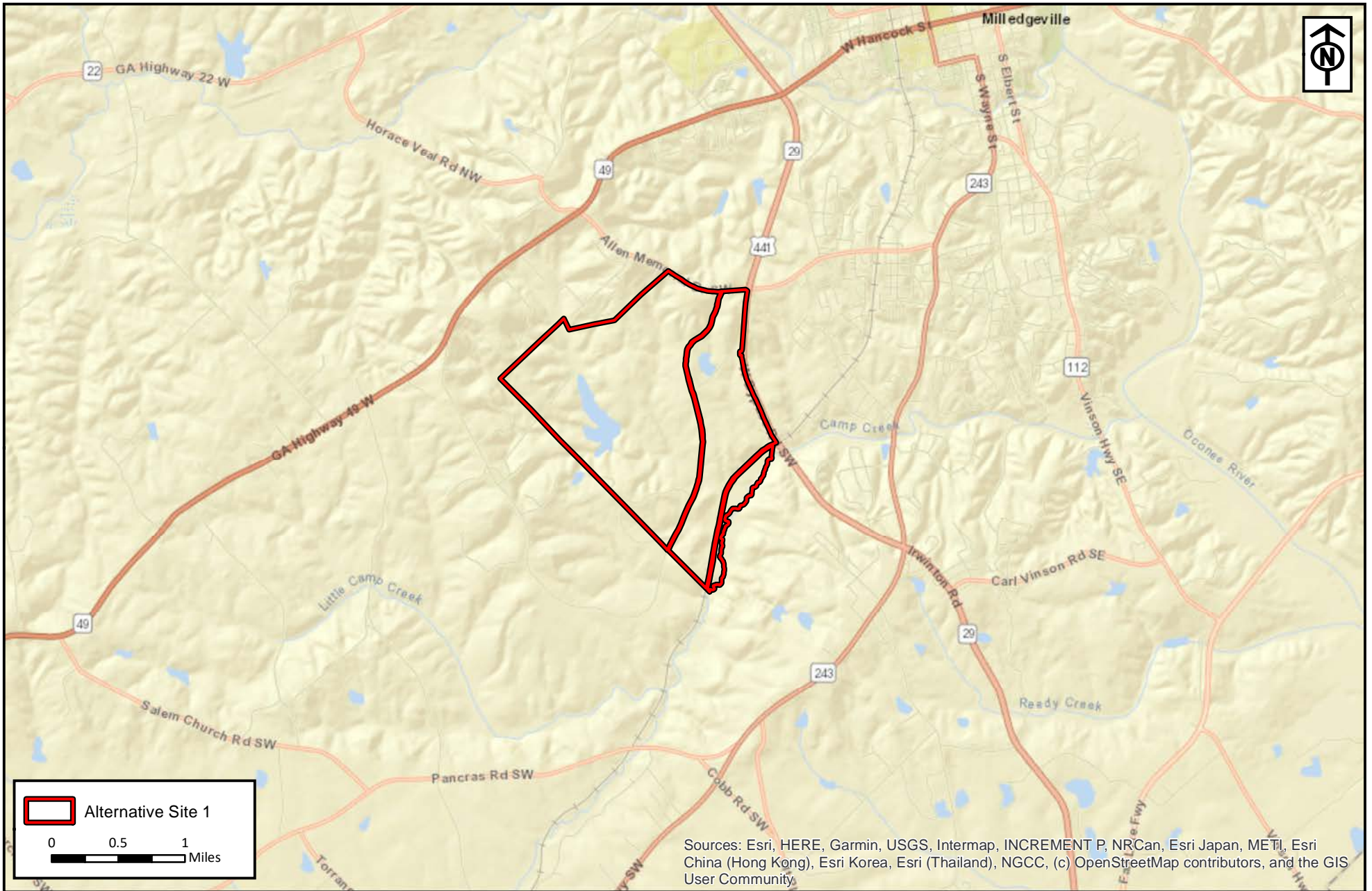
2021 Ortho Aerial
Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

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	tel 912.443.5896 fax 912.443.5898




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Off-Site Alternative 1



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community.

 Alternative Site 1

0 0.5 1 Miles

RLC Project No.:	14-225.7
Figure No.:	1
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 1 miles

Alternative Site 1

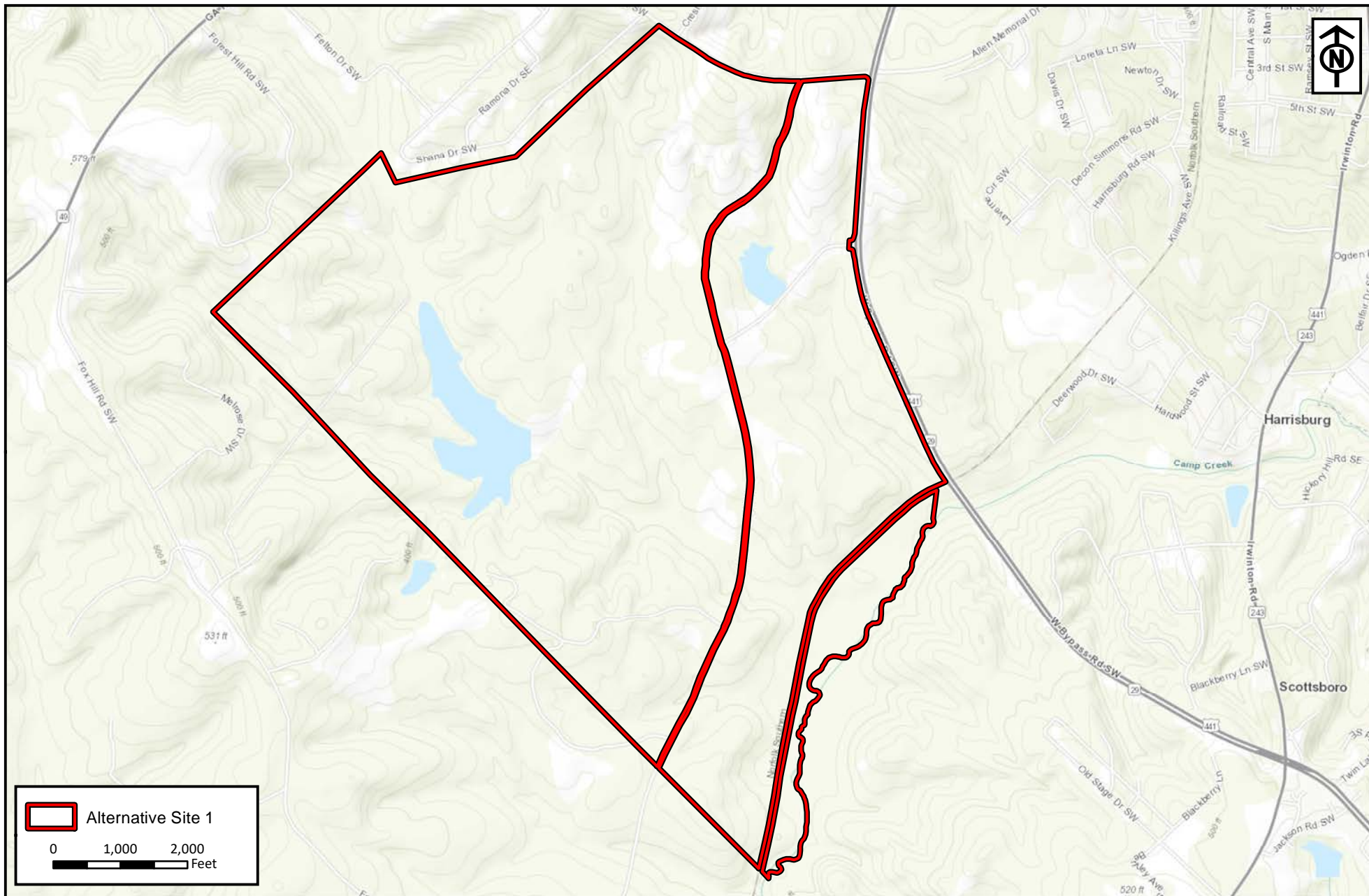
Baldwin County, Georgia

Project Location Map

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

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RLC Project No.:	14-225.7
Figure No.:	2
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,000 feet

Alternative Site 1

Baldwin County, Georgia

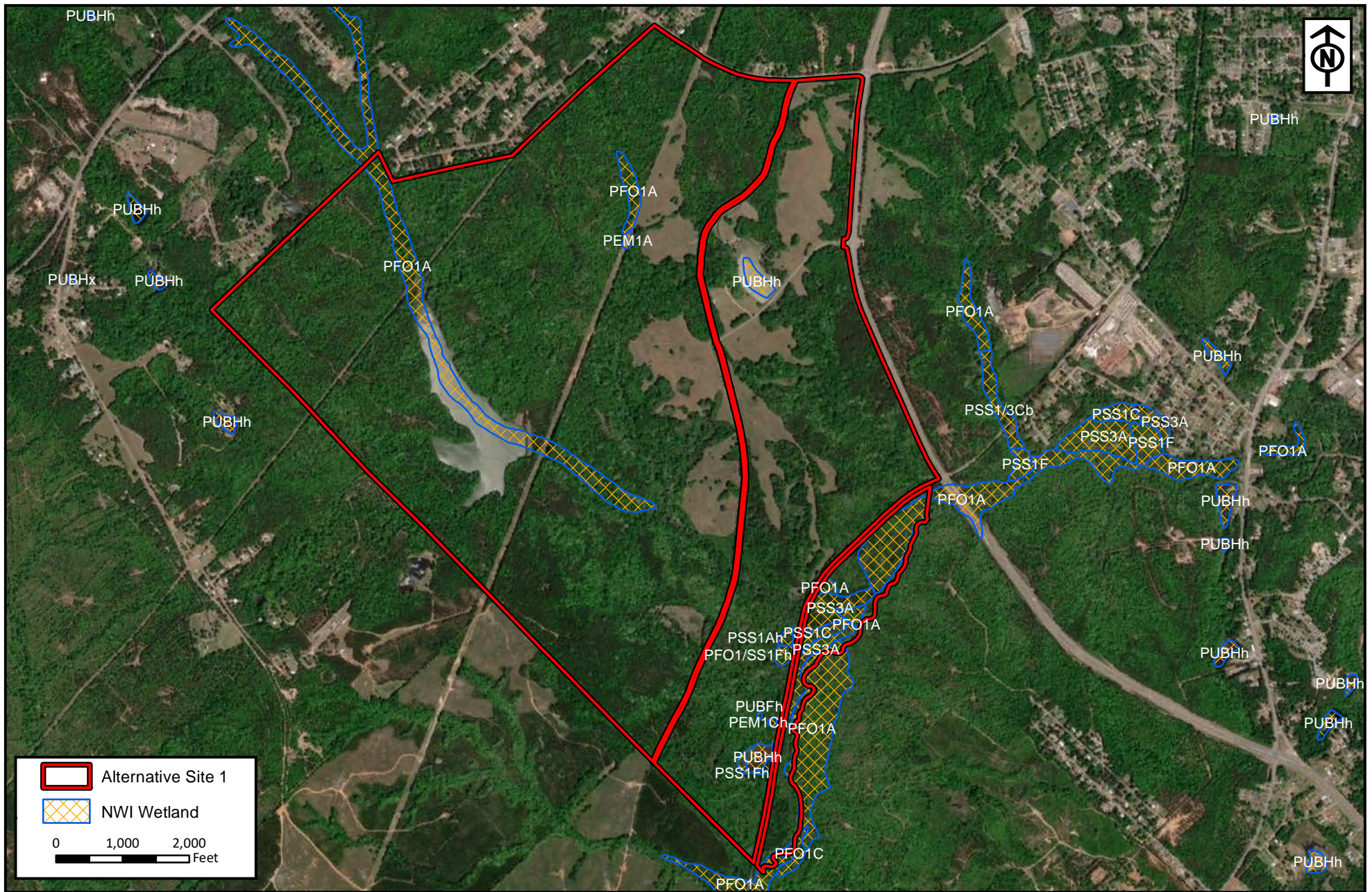
Topographic Map

Prepared For: GDEC & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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RLC Project No.:	14-225.7
Figure No.:	4
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,000 feet

Alternative Site 1

Baldwin County, Georgia

National Wetlands Inventory


Prepared For: GDEcD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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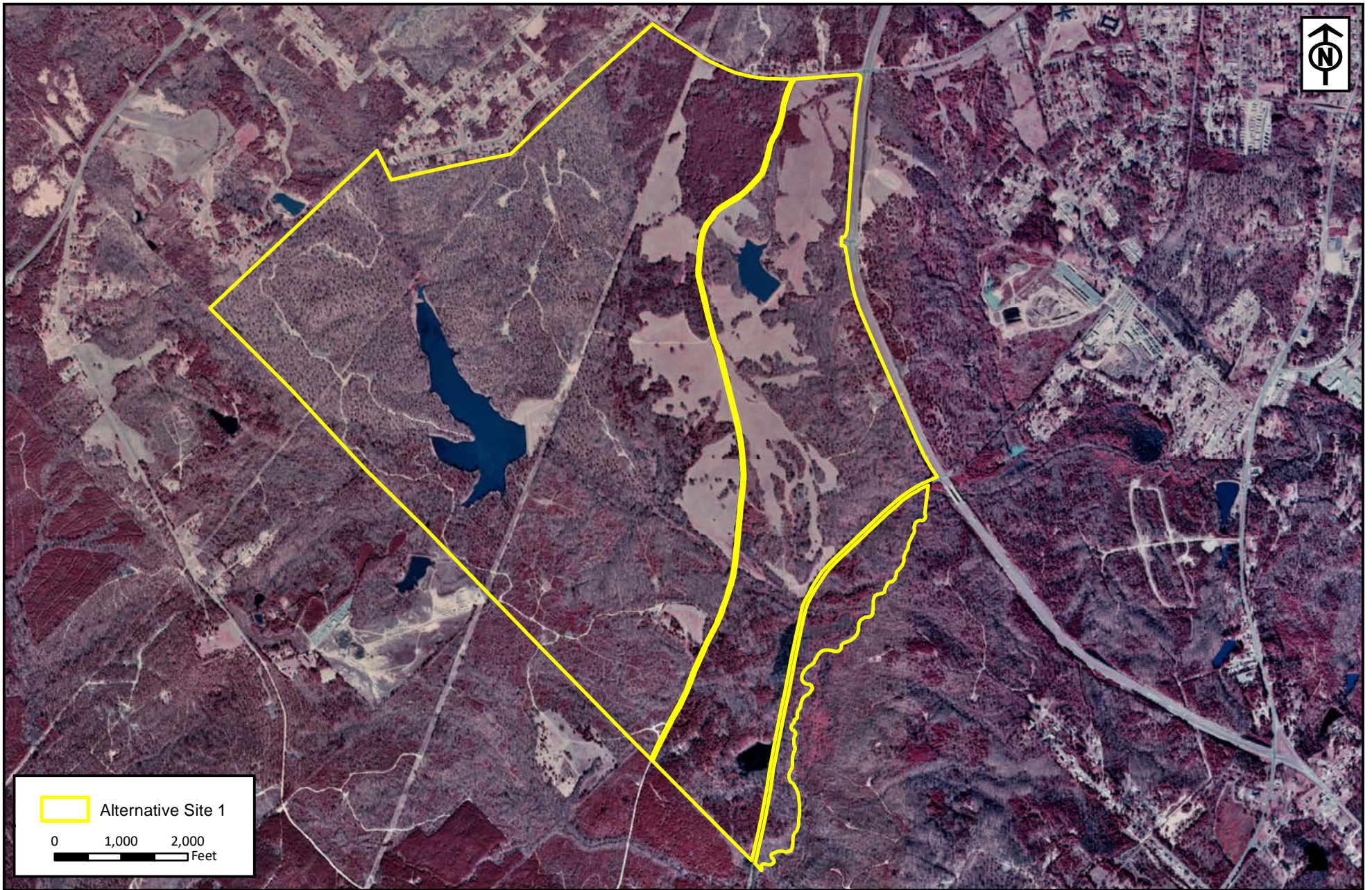
 Alternative Site 1
 0 1,000 2,000
 Feet

RLC Project No.:	14-225.7
Figure No.:	5
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,000 feet

Alternative Site 1
 Baldwin County, Georgia

2021 Ortho Aerial
 Prepared For: GDECD & Savannah Harbor-
 Interstate 16 Corridor Joint Development Authority


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 Savannah, GA 31405
 tel 912.443.5896 fax 912.443.5898



Alternative Site 1
 0 1,000 2,000
 Feet

RLC Project No.:	14-225.7
Figure No.:	6
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,000 feet

Alternative Site 1
 Baldwin County, Georgia

1999 Color-Infrared Imagery
 Prepared For: GDECD & Savannah Harbor-
 Interstate 16 Corridor Joint Development Authority

	RESOURCE+LAND CONSULTANTS
	<small>41 Park of Commerce Way, Ste 101 Savannah, GA 31405 tel 912.443.5896 fax 912.443.5898</small>

GNAHRGIS Map





United States Department of the Interior



FISH AND WILDLIFE SERVICE
Georgia Ecological Services Field Office
355 East Hancock Avenue
Room 320
Athens, GA 30601-2523
Phone: (706) 613-9493 Fax: (706) 613-6059

In Reply Refer To:

May 14, 2022

Project Code: 2022-0042815

Project Name: Bryan County Mega Site Off-Site Alternative 1

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Thank you for your request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act (MBTA) as amended (16 USC 701-715), Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Bald and Golden Eagle Protection Act (BGEPA) as amended (16 USC 668-668c). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area and to recommend some conservation measures that can be included in your project design if you determine those species or designated critical habitat may be affected by your proposed project.

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency, project proponent, or their designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally listed threatened or endangered fish or wildlife species without the appropriate permit. If you need additional information to assist in your effect determination, please contact the Service.

If you determine that your proposed action may affect federally listed species, please consult with the Service. Through the consultation process, we will analyze information contained in a biological assessment or equivalent document that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a Habitat Conservation Plan) may be necessary to exempt harm or harass federally listed threatened or endangered fish or wildlife species. For more information regarding formal consultation and HCPs, please see the Service's [Section 7 Consultation Library](#) and [Habitat Conservation Plans Library](#) Collections.

Action Area. The scope of federally listed species compliance not only includes direct effects, but also any indirect effects of project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations). The action area is the spatial extent of an action's direct and indirect modifications or impacts to the land, water, or air (50 CFR 402.02). Large projects may have effects to land, water, or air outside the immediate footprint of the project, and these areas should be included as part of the action area. Effects to land, water, or air outside of a project footprint could include things like lighting, dust, smoke, and noise. To obtain a complete list of species, the action area should be uploaded or drawn in IPaC rather than just the project footprint.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. An updated list may be requested through IPaC.

If you determine that your action may affect any federally listed species and would like technical assistance from our office, please send us a complete project review package (refer to Georgia Ecological Services' [Project Planning and Review](#) page for more details), including the following information (reference to these items can be found in 50 CFR§402.13 and 402.14):

1. A description of the proposed action, including any measures intended to avoid, minimize, or offset effects of the action. Consistent with the nature and scope of the proposed action, the description shall provide sufficient detail to assess the effects of the action on listed species and critical habitat, including:
 - The purpose of the action;
 - The duration and timing of the action;
 - The location of the action;
 - The specific components of the action and how they will be carried out;
 - Description of areas to be affected directly or indirectly by the action;
 - Maps, drawings, blueprints, or similar schematics of the action
 2. An updated Official Species List
-

3. Biological Assessments (may include habitat assessments and information on the presence of listed species in the action area);
4. Description of effects of the action on species in the action area and, if relevant, effect determinations for species and critical habitat;
5. Conservation measures and any other available information related to the nature and scope of the proposed action relevant to its effects on listed species or designated critical habitat (examples include: stormwater plans, management plans, erosion and sediment plans). Please see our [Georgia Planning and Consultation Tools](#) page for recommendations.

Please submit all consultation documents via email to gaes_assistance@fws.gov or by using IPaC, uploaded documents, and sharing the project with a specific Georgia Ecological Services staff member. If the project is on-going, documents can also be sent to the Georgia Ecological Services staff member currently working with you on your project. For Georgia Department of Transportation related projects, please work with the Office of Environmental Services ecologist to determine the appropriate USFWS transportation liaison.

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value. We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's [NWI program website](#) (<https://www.fws.gov/program/national-wetlands-inventory>) integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's [Migratory Birds Program](#) (<https://fws.gov/program/migratory-birds>). To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction. It can be found at the Service's [Migratory Birds Conservation Library Collection](#) (<https://fws.gov/library/collections/migratory-bird-conservation-documents>).

Information related to best practices and migratory birds can be found at the Service's [Avoiding and Minimizing Incidental Take of Migratory Birds Library Collection](#) (<https://fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>).

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to “disturb” eagles. Under the BGEPA, the Service may issue limited permits to incidentally “take” eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at the Service's [Bald and Golden Eagle Management Library Collection](https://fws.gov/library/collections/bald-and-golden-eagle-management) (https://fws.gov/library/collections/bald-and-golden-eagle-management).

NATIVE BATS

If your species list includes Indiana bat (*Myotis sodalis*) or northern long-eared bat (*M. septentrionalis*) and the project is expected to impact forested habitat that is appropriate for maternity colonies of these species, forest clearing should occur outside of the period when bats may be present. Federally listed bats could be actively present in forested landscapes from April 1 to October 15 of any year and have non-volant pups from May 15 to July 31 in any year. Non-volant pups are incapable of flight and are vulnerable to disturbance during that time.

Indiana, northern long-eared, and gray (*M. grisescens*) bats are all known to utilize bridges and culverts in Georgia. If your project includes maintenance, construction, or any other modification or demolition to transportation structures, a qualified individual should complete a survey of these structures for bats and submit your findings via the Georgia Bats in Bridges cell phone application, free on Apple and Android devices. Please include these findings in any biological assessment(s) or other documentation that is submitted to our office for technical assistance or consultation.

Additional information on bat avoidance and minimization can be found at Georgia Ecological Services' [Planning and Consultations Tools](#) and [Bat Conservation in Georgia](#) pages.

MONARCH BUTTERFLY

On December 20, 2020, the Service determined that listing the Monarch butterfly (*Danaus plexippus*) under the Endangered Species Act is warranted but precluded at this time by higher priority listing actions. With this finding, the monarch butterfly becomes a candidate for listing. The Service will review its status each year until we are able to begin developing a proposal to list the monarch.

As it is a candidate for listing, the Service welcomes conservation measures for this species. Recommended, and voluntary, conservation measures for projects in Georgia can be found at our [Monarch Conservation in Georgia](#) page.

STATE AGENCY COORDINATION

Additional information that addresses at-risk or high priority natural resources can be found in the State Wildlife Action Plan (https://georgiawildlife.com/WildlifeActionPlan), at Georgia Department of Natural Resources, Wildlife Resources Division Biodiversity Portal (https://

georgiawildlife.com/conservation/species-of-concern), Georgia's Natural, Archaeological, and Historic Resources GIS portal (<https://www.gnahrgis.org/gnahrgis/index.do>), and the [Georgia Ecological Services HUC10 Watershed Guidance](#) page.

Thank you for your concern for endangered and threatened species. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please email gaes_assistance@fws.gov and reference the project county and your Service Project Tracking Number.

This letter constitutes Georgia Ecological Services' general comments under the authority of the Endangered Species Act.

Attachment(s):

- Official Species List
 - Migratory Birds
 - Wetlands
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Georgia Ecological Services Field Office

355 East Hancock Avenue

Room 320

Athens, GA 30601-2523

(706) 613-9493

Project Summary

Project Code: 2022-0042815

Event Code: None

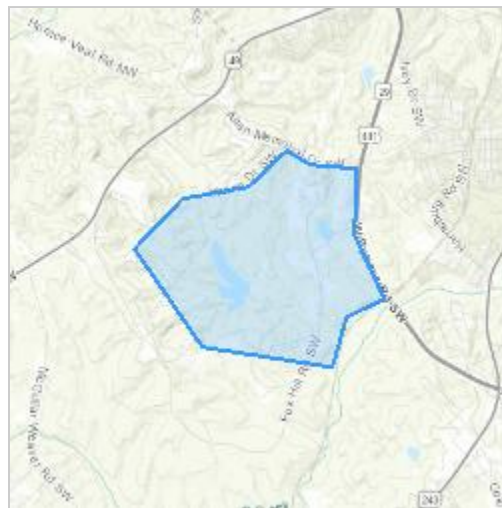
Project Name: Bryan County Mega Site Off-Site Alternative 1

Project Type: Commercial Development

Project Description: development

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@33.037737199999995,-83.26953120778144,14z>



Counties: Baldwin County, Georgia

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
American Chaffseed <i>Schwalbea americana</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1286	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\) list](#) or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort — no data

SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Rusty Blackbird
BCC - BCR

Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED.
PLEASE VISIT [HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML](https://www.fws.gov/wetlands/data/mapper.html) OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

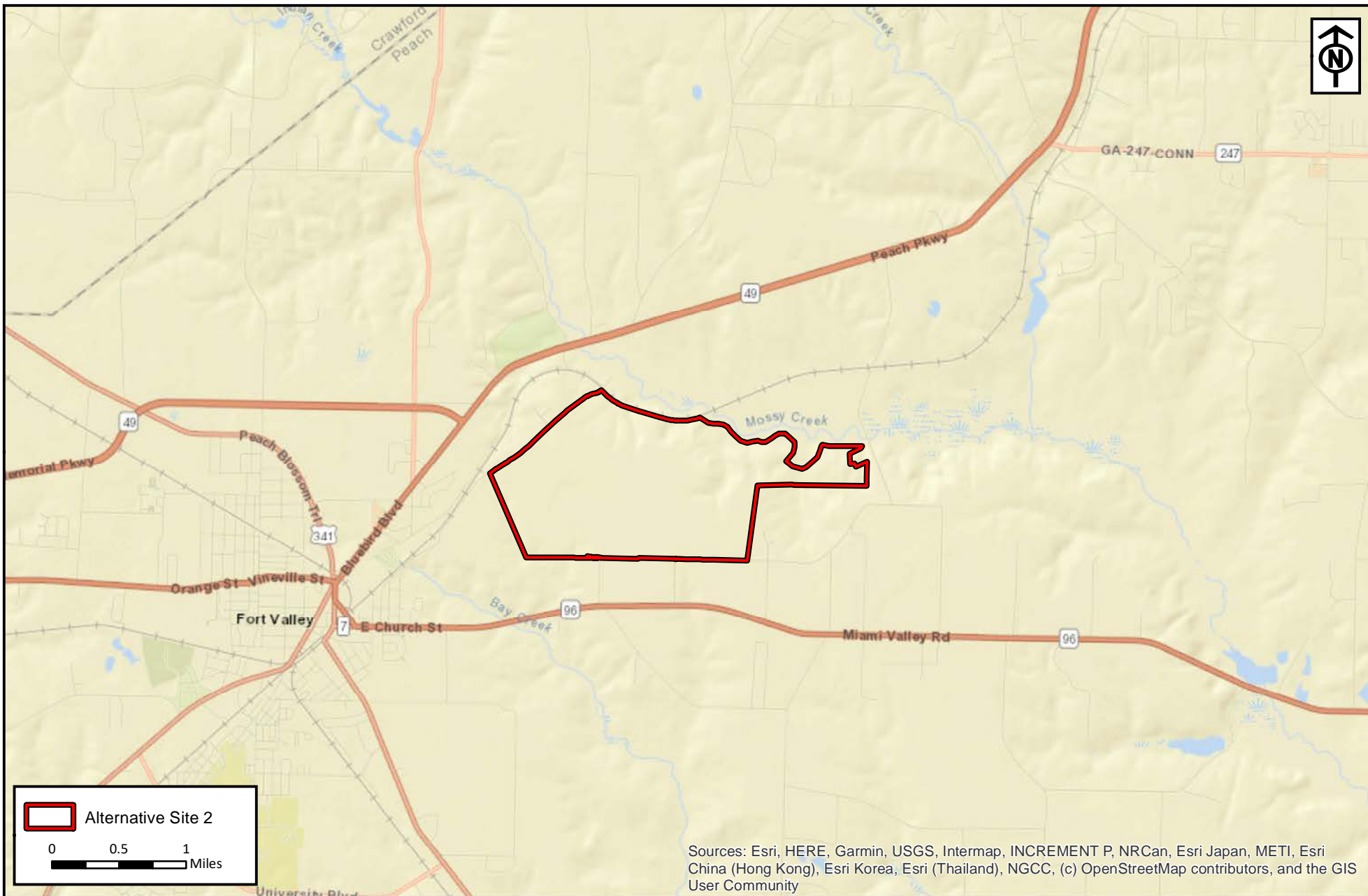
IPaC User Contact Information

Agency: RLC
Name: alton brown
Address: 41 park of commerce way, suite 303
Address Line 2: suite 101
City: Savannah
State: GA
Zip: 31405
Email: abrown@rlandc.com
Phone: 9124435896



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Off-Site Alternative 2



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

RLC Project No.:	14-225.7
Figure No.:	1
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 1 miles

Alternative Site 2

Peach County, Georgia

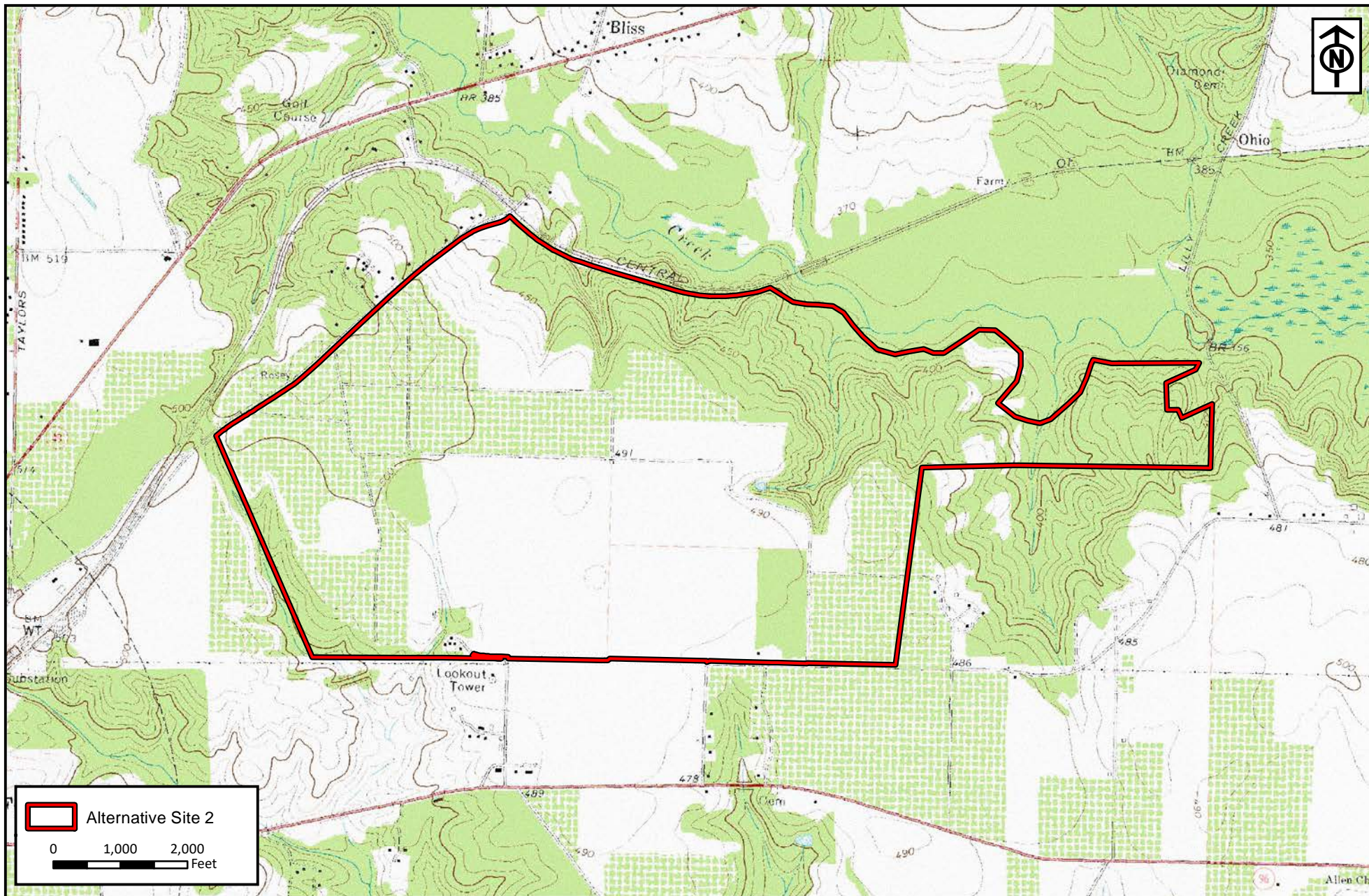
Project Location Map

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



RESOURCE+LAND CONSULTANTS

41 Park of Commerce Way, Ste 101
Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	2
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,000 feet

Alternative Site 2

Peach County, Georgia

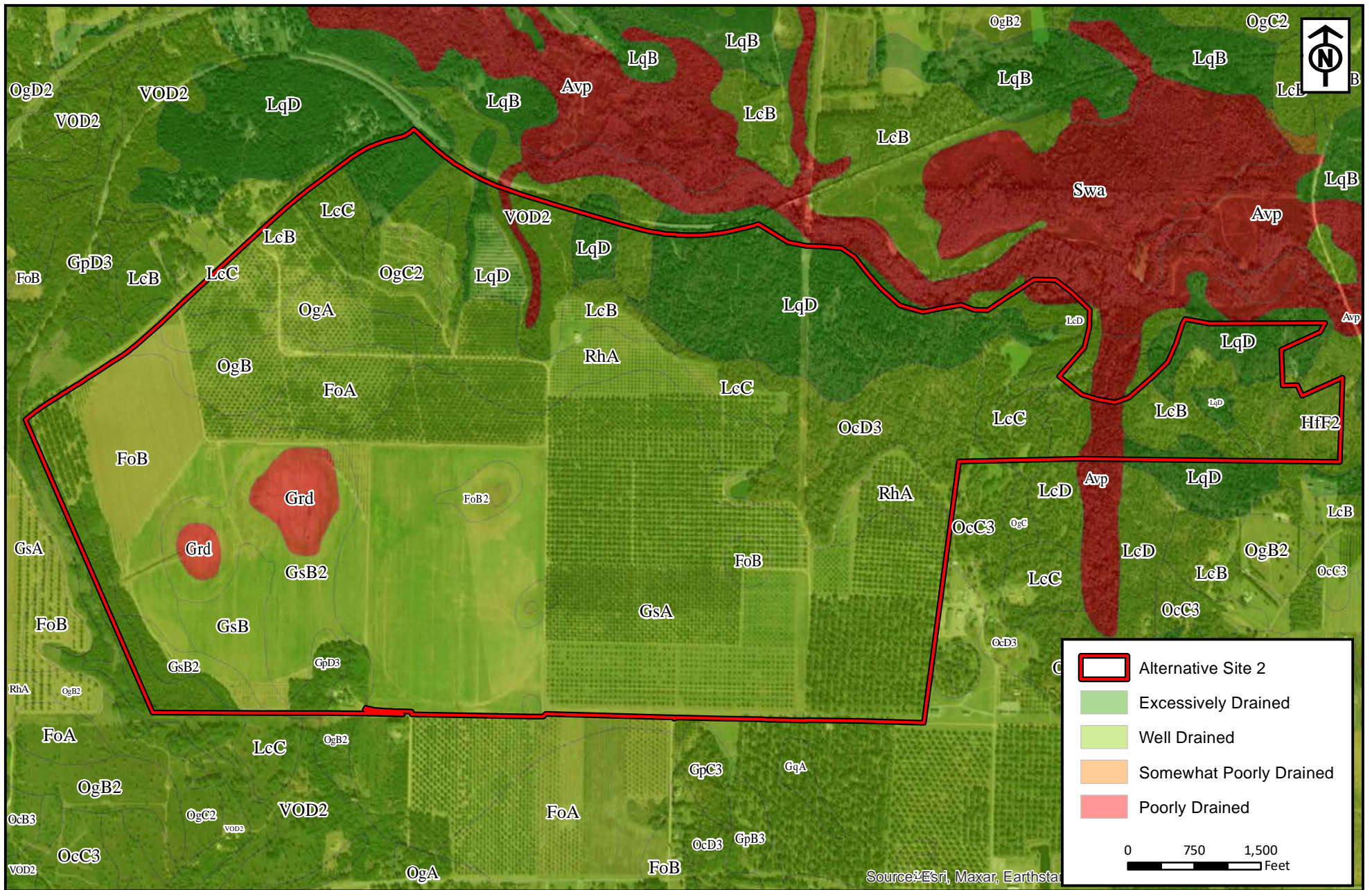
USGS Topographic Map

Prepared For: GDEC & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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RLC Project No.: 14-225.7
 Figure No.: 3
 Prepared By: JP
 Sketch Date: 5/11/2022
 Map Scale : 1 inch = 1,500 feet

Alternative Site 2

Peach County, Georgia

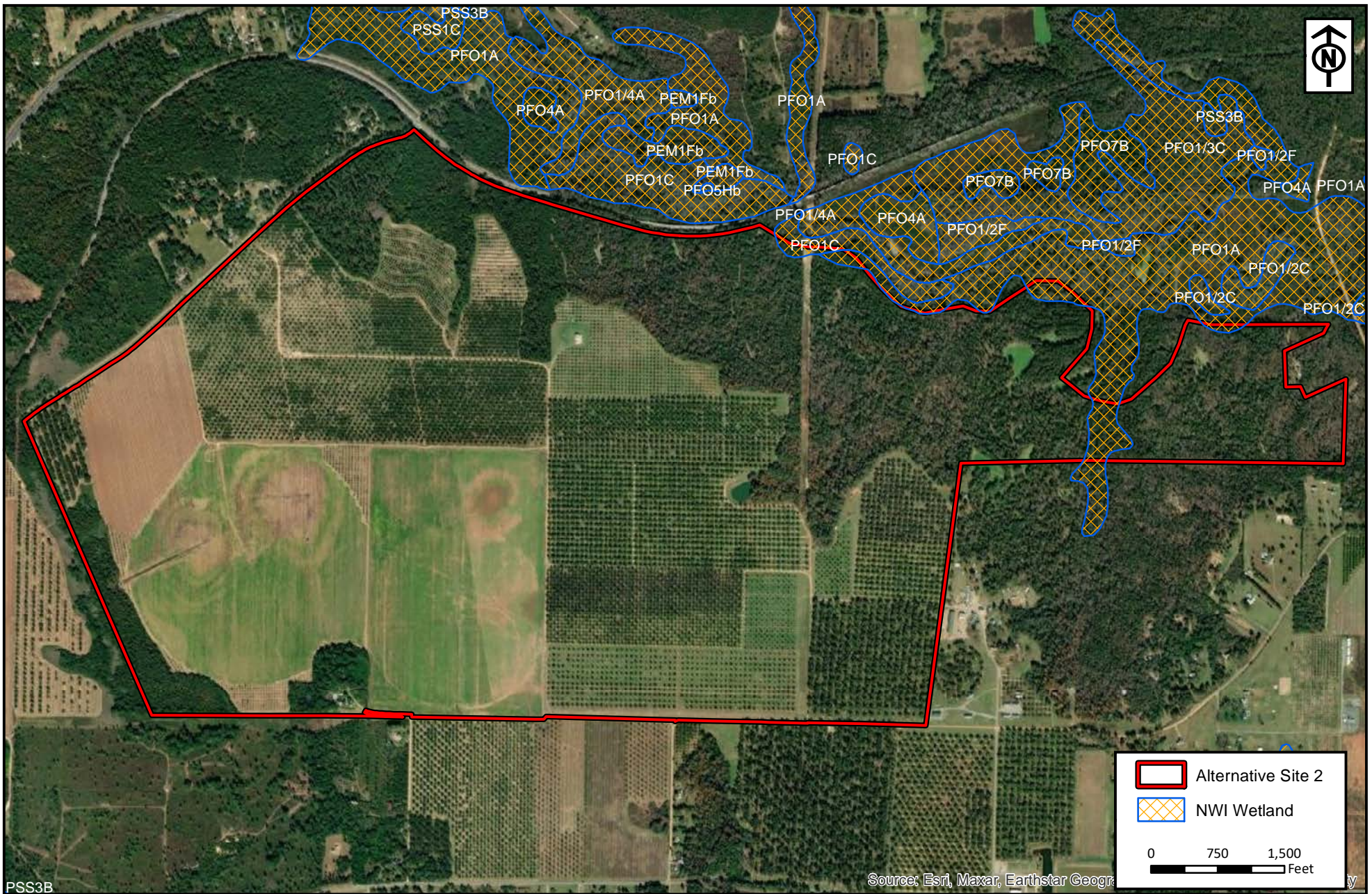
NRCS Soil Map

Prepared For: GDECD & Savannah Harbor-
 Interstate 16 Corridor Joint Development Authority



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RLC Project No.: 14-225.7
 Figure No.: 4
 Prepared By: JP
 Sketch Date: 5/11/2022
 Map Scale : 1 inch = 1,500 feet

Alternative Site 2

Peach County, Georgia

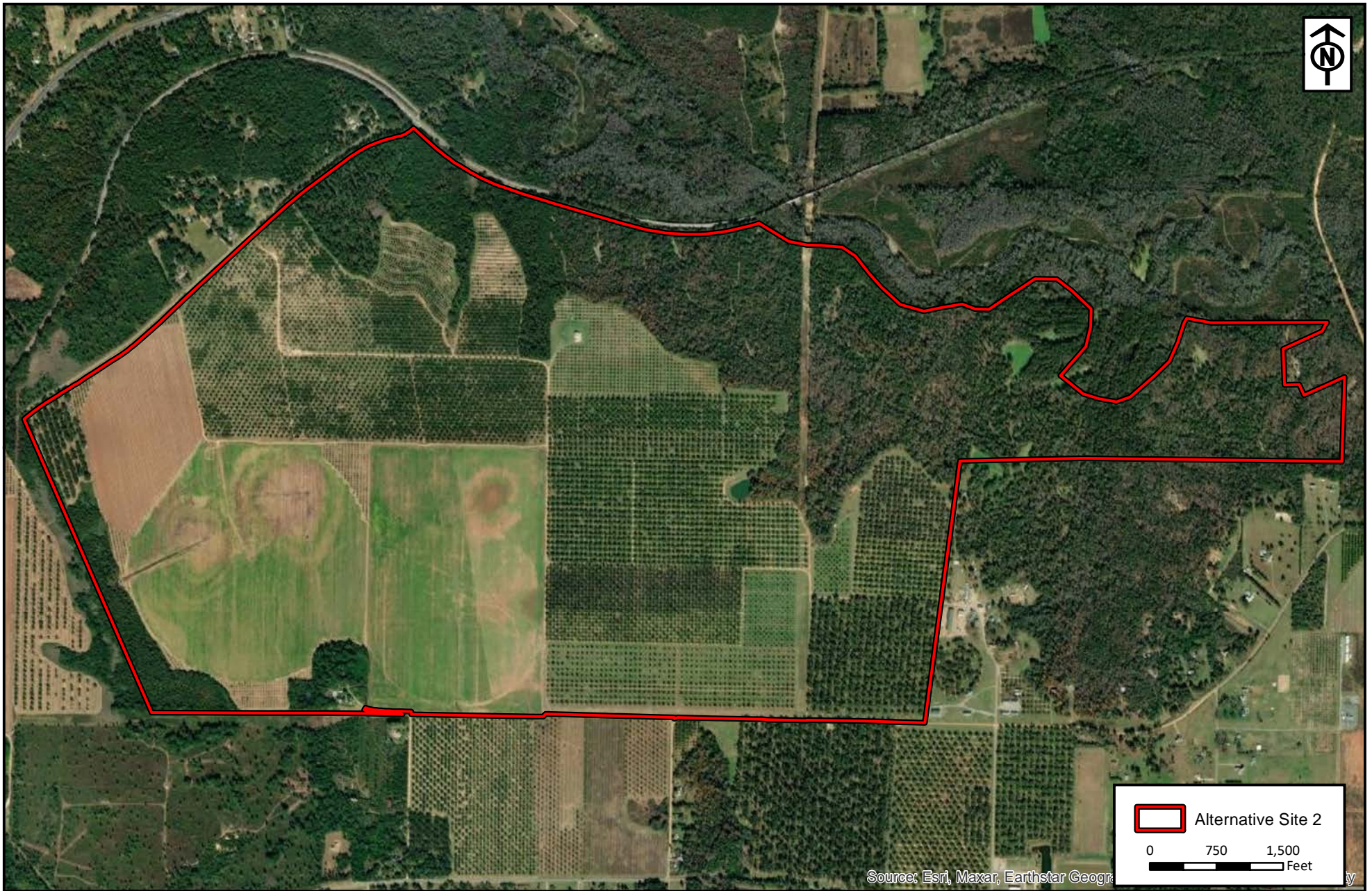
National Wetlands Inventory

Prepared For: GDECD & Savannah Harbor-
 Interstate 16 Corridor Joint Development Authority



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 tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	5
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 1,500 feet

Alternative Site 2

Peach County, Georgia

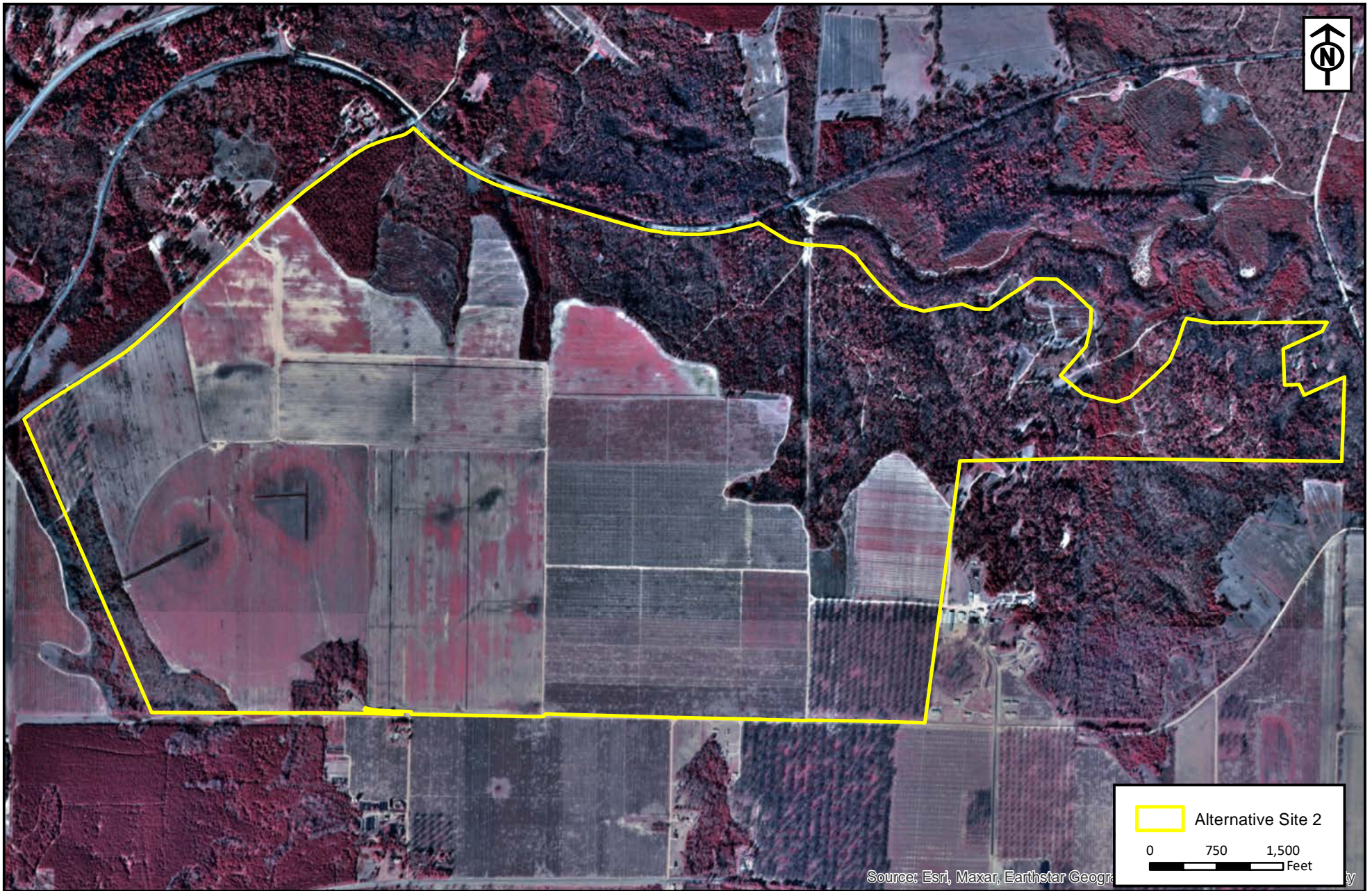
National Wetlands Inventory

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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RLC Project No.:	14-225.7
Figure No.:	6
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 1,500 feet

Alternative Site 2

Peach County, Georgia

1999 Color-Infrared Imagery

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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GNAHRGIS Map



Fine Needles
Country Club

Mossy Creek

Mile Creek

Bay Creek





United States Department of the Interior



FISH AND WILDLIFE SERVICE
Georgia Ecological Services Field Office
355 East Hancock Avenue
Room 320
Athens, GA 30601-2523
Phone: (706) 613-9493 Fax: (706) 613-6059

In Reply Refer To:

May 14, 2022

Project Code: 2022-0042814

Project Name: Bryan County Mega Site Off-Site Alternative 2

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Thank you for your request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act (MBTA) as amended (16 USC 701-715), Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Bald and Golden Eagle Protection Act (BGEPA) as amended (16 USC 668-668c). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area and to recommend some conservation measures that can be included in your project design if you determine those species or designated critical habitat may be affected by your proposed project.

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency, project proponent, or their designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally listed threatened or endangered fish or wildlife species without the appropriate permit. If you need additional information to assist in your effect determination, please contact the Service.

If you determine that your proposed action may affect federally listed species, please consult with the Service. Through the consultation process, we will analyze information contained in a biological assessment or equivalent document that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a Habitat Conservation Plan) may be necessary to exempt harm or harass federally listed threatened or endangered fish or wildlife species. For more information regarding formal consultation and HCPs, please see the Service's [Section 7 Consultation Library](#) and [Habitat Conservation Plans Library](#) Collections.

Action Area. The scope of federally listed species compliance not only includes direct effects, but also any indirect effects of project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations). The action area is the spatial extent of an action's direct and indirect modifications or impacts to the land, water, or air (50 CFR 402.02). Large projects may have effects to land, water, or air outside the immediate footprint of the project, and these areas should be included as part of the action area. Effects to land, water, or air outside of a project footprint could include things like lighting, dust, smoke, and noise. To obtain a complete list of species, the action area should be uploaded or drawn in IPaC rather than just the project footprint.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. An updated list may be requested through IPaC.

If you determine that your action may affect any federally listed species and would like technical assistance from our office, please send us a complete project review package (refer to Georgia Ecological Services' [Project Planning and Review](#) page for more details), including the following information (reference to these items can be found in 50 CFR§402.13 and 402.14):

1. A description of the proposed action, including any measures intended to avoid, minimize, or offset effects of the action. Consistent with the nature and scope of the proposed action, the description shall provide sufficient detail to assess the effects of the action on listed species and critical habitat, including:
 - The purpose of the action;
 - The duration and timing of the action;
 - The location of the action;
 - The specific components of the action and how they will be carried out;
 - Description of areas to be affected directly or indirectly by the action;
 - Maps, drawings, blueprints, or similar schematics of the action
 2. An updated Official Species List
-

3. Biological Assessments (may include habitat assessments and information on the presence of listed species in the action area);
4. Description of effects of the action on species in the action area and, if relevant, effect determinations for species and critical habitat;
5. Conservation measures and any other available information related to the nature and scope of the proposed action relevant to its effects on listed species or designated critical habitat (examples include: stormwater plans, management plans, erosion and sediment plans). Please see our [Georgia Planning and Consultation Tools](#) page for recommendations.

Please submit all consultation documents via email to gaes_assistance@fws.gov or by using IPaC, uploaded documents, and sharing the project with a specific Georgia Ecological Services staff member. If the project is on-going, documents can also be sent to the Georgia Ecological Services staff member currently working with you on your project. For Georgia Department of Transportation related projects, please work with the Office of Environmental Services ecologist to determine the appropriate USFWS transportation liaison.

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value. We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's [NWI program website](#) (<https://www.fws.gov/program/national-wetlands-inventory>) integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's [Migratory Birds Program](#) (<https://fws.gov/program/migratory-birds>). To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction. It can be found at the Service's [Migratory Birds Conservation Library Collection](#) (<https://fws.gov/library/collections/migratory-bird-conservation-documents>).

Information related to best practices and migratory birds can be found at the Service's [Avoiding and Minimizing Incidental Take of Migratory Birds Library Collection](#) (<https://fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>).

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to “disturb” eagles. Under the BGEPA, the Service may issue limited permits to incidentally “take” eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at the Service's [Bald and Golden Eagle Management Library Collection](https://fws.gov/library/collections/bald-and-golden-eagle-management) (<https://fws.gov/library/collections/bald-and-golden-eagle-management>).

NATIVE BATS

If your species list includes Indiana bat (*Myotis sodalis*) or northern long-eared bat (*M. septentrionalis*) and the project is expected to impact forested habitat that is appropriate for maternity colonies of these species, forest clearing should occur outside of the period when bats may be present. Federally listed bats could be actively present in forested landscapes from April 1 to October 15 of any year and have non-volant pups from May 15 to July 31 in any year. Non-volant pups are incapable of flight and are vulnerable to disturbance during that time.

Indiana, northern long-eared, and gray (*M. grisescens*) bats are all known to utilize bridges and culverts in Georgia. If your project includes maintenance, construction, or any other modification or demolition to transportation structures, a qualified individual should complete a survey of these structures for bats and submit your findings via the Georgia Bats in Bridges cell phone application, free on Apple and Android devices. Please include these findings in any biological assessment(s) or other documentation that is submitted to our office for technical assistance or consultation.

Additional information on bat avoidance and minimization can be found at Georgia Ecological Services' [Planning and Consultations Tools](#) and [Bat Conservation in Georgia](#) pages.

MONARCH BUTTERFLY

On December 20, 2020, the Service determined that listing the Monarch butterfly (*Danaus plexippus*) under the Endangered Species Act is warranted but precluded at this time by higher priority listing actions. With this finding, the monarch butterfly becomes a candidate for listing. The Service will review its status each year until we are able to begin developing a proposal to list the monarch.

As it is a candidate for listing, the Service welcomes conservation measures for this species. Recommended, and voluntary, conservation measures for projects in Georgia can be found at our [Monarch Conservation in Georgia](#) page.

STATE AGENCY COORDINATION

Additional information that addresses at-risk or high priority natural resources can be found in the State Wildlife Action Plan (<https://georgiawildlife.com/WildlifeActionPlan>), at Georgia Department of Natural Resources, Wildlife Resources Division Biodiversity Portal (<https://>

georgiawildlife.com/conservation/species-of-concern), Georgia's Natural, Archaeological, and Historic Resources GIS portal (<https://www.gnahrgis.org/gnahrgis/index.do>), and the [Georgia Ecological Services HUC10 Watershed Guidance](#) page.

Thank you for your concern for endangered and threatened species. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please email gaes_assistance@fws.gov and reference the project county and your Service Project Tracking Number.

This letter constitutes Georgia Ecological Services' general comments under the authority of the Endangered Species Act.

Attachment(s):

- Official Species List
 - Migratory Birds
 - Wetlands
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Georgia Ecological Services Field Office

355 East Hancock Avenue

Room 320

Athens, GA 30601-2523

(706) 613-9493

Project Summary

Project Code: 2022-0042814

Event Code: None

Project Name: Bryan County Mega Site Off-Site Alternative 2

Project Type: Commercial Development

Project Description: development

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@32.56591175,-83.84867616435555,14z>



Counties: Peach County, Georgia

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Reptiles

NAME	STATUS
Gopher Tortoise <i>Gopherus polyphemus</i> Population: eastern No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6994	Candidate

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Relict Trillium <i>Trillium reliquum</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8489	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\) list](#) or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Kestrel <i>Falco sparverius paulus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

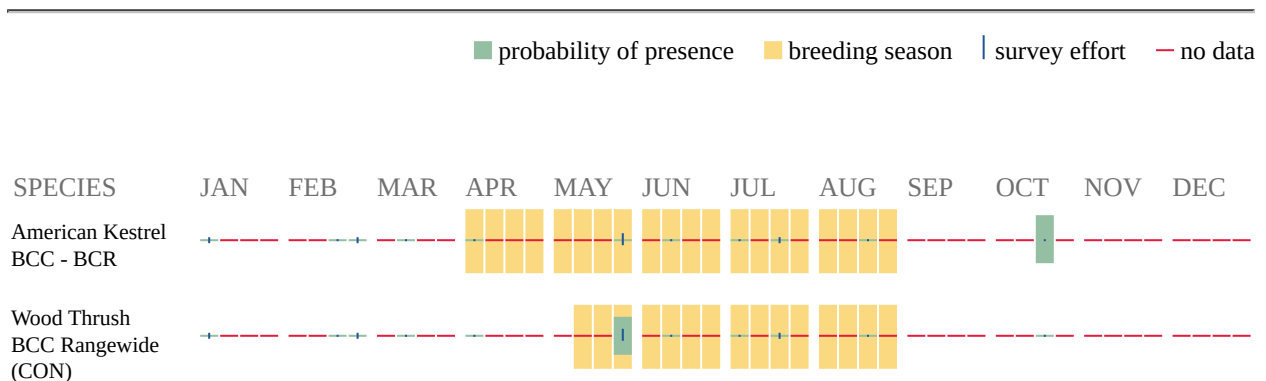
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#)

requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED.
PLEASE VISIT [HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML](https://www.fws.gov/wetlands/data/mapper.html) OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

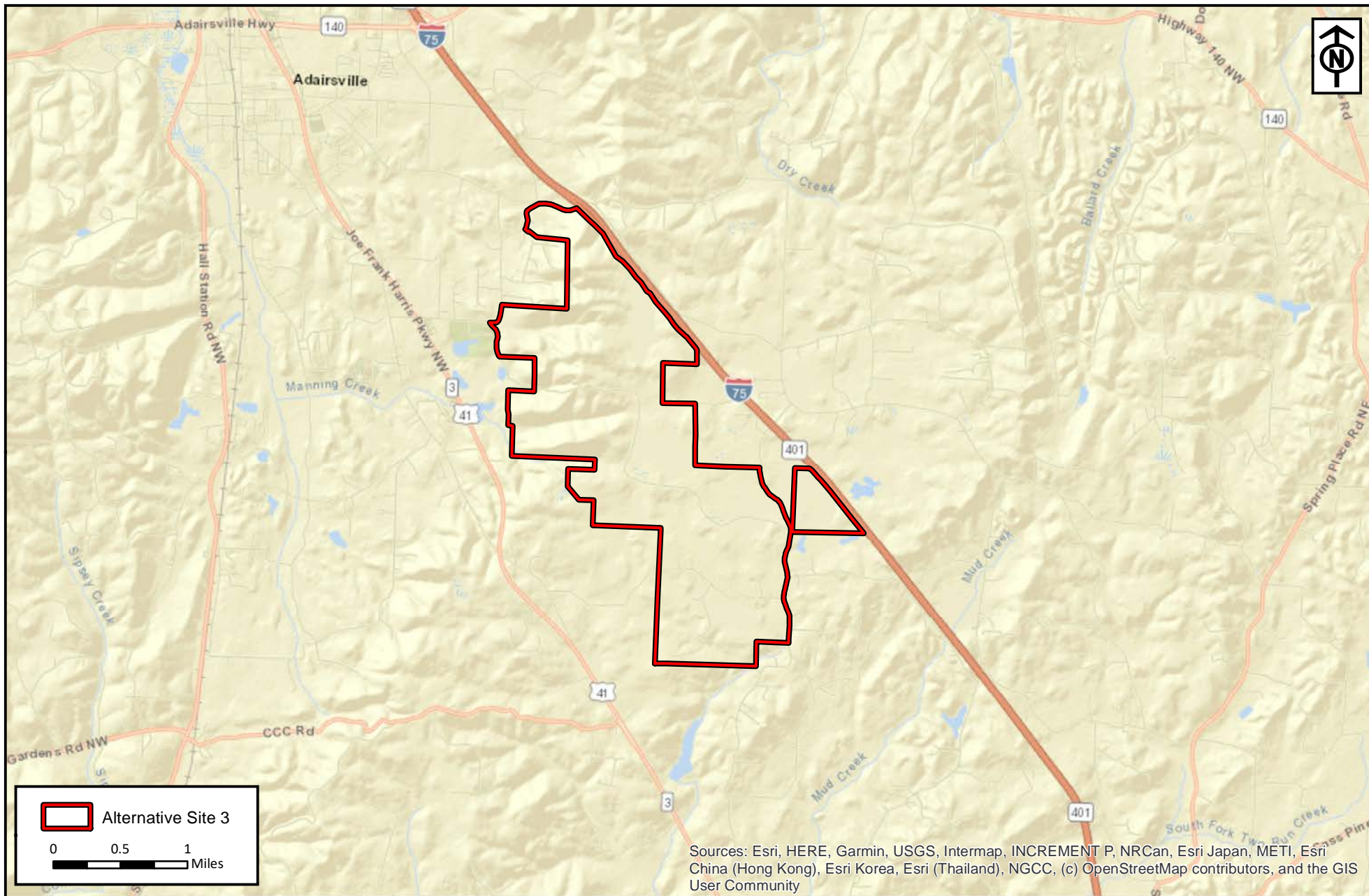
IPaC User Contact Information

Agency: RLC
Name: alton brown
Address: 41 park of commerce way, suite 303
Address Line 2: suite 101
City: Savannah
State: GA
Zip: 31405
Email: abrown@rlandc.com
Phone: 9124435896



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Off-Site Alternative 3



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

 Alternative Site 3

0 0.5 1 Miles



RLC Project No.:	14-225.7
Figure No.:	1
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 1 miles

Alternative Site 3

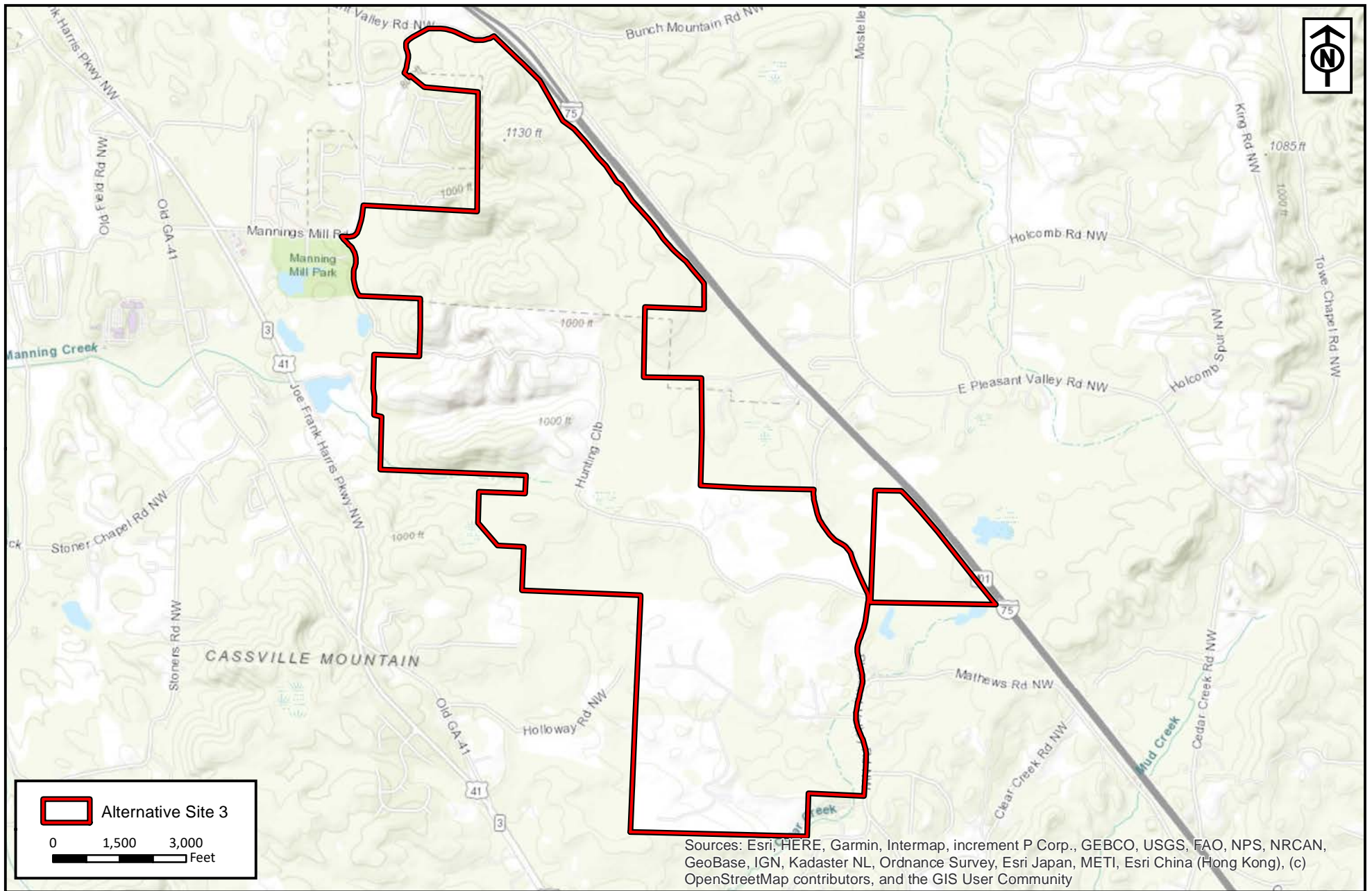
Bartow County, Georgia

Project Location Map

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

 **RESOURCE+LAND CONSULTANTS**

41 Park of Commerce Way, Ste 101
Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	2
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 3,000 feet

Alternative Site 3

Bartow County, Georgia

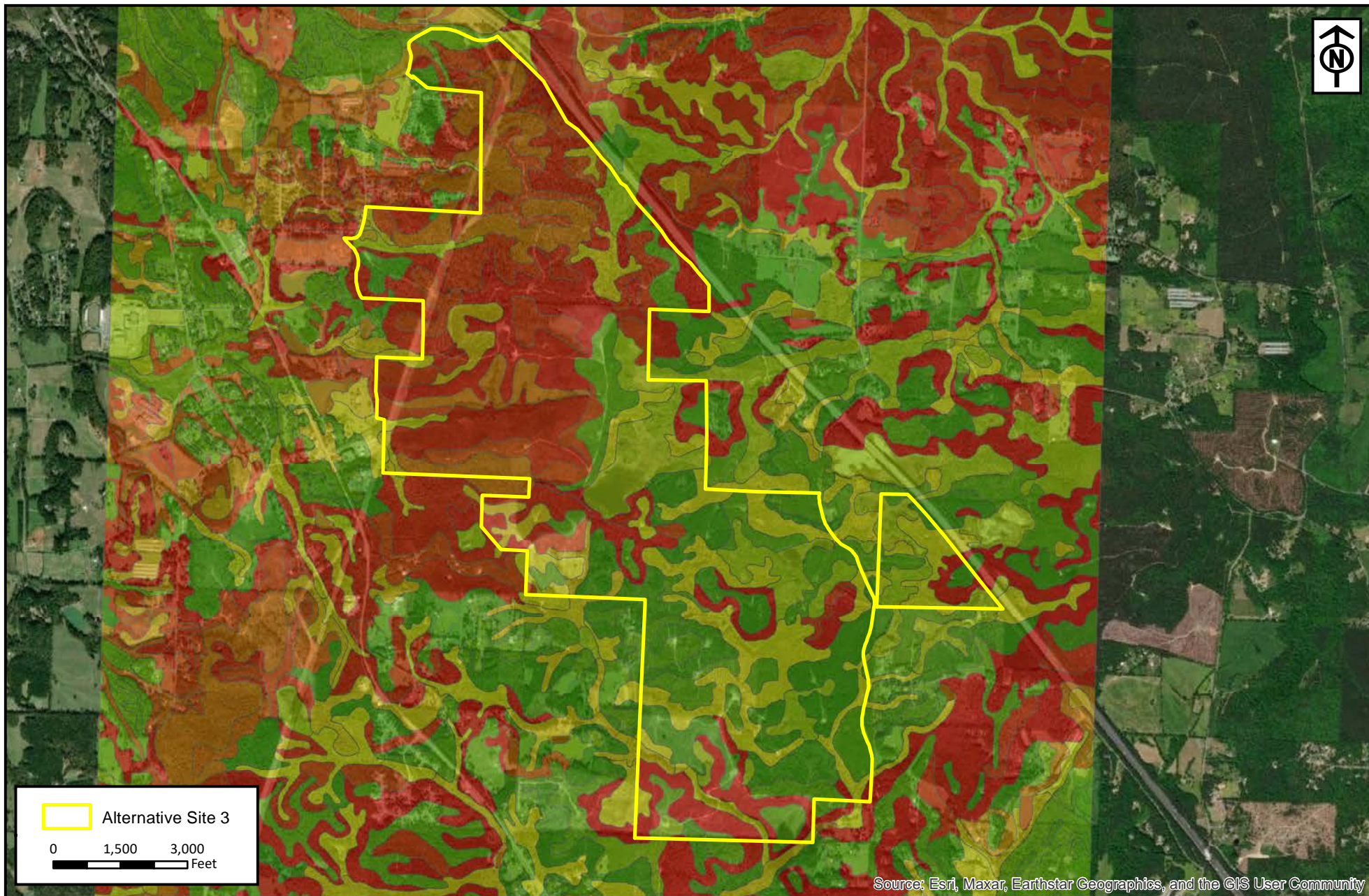
Topographic Map

Prepared For: GDEC & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	3
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 3,000 feet

Alternative Site 3

Bartow County, Georgia

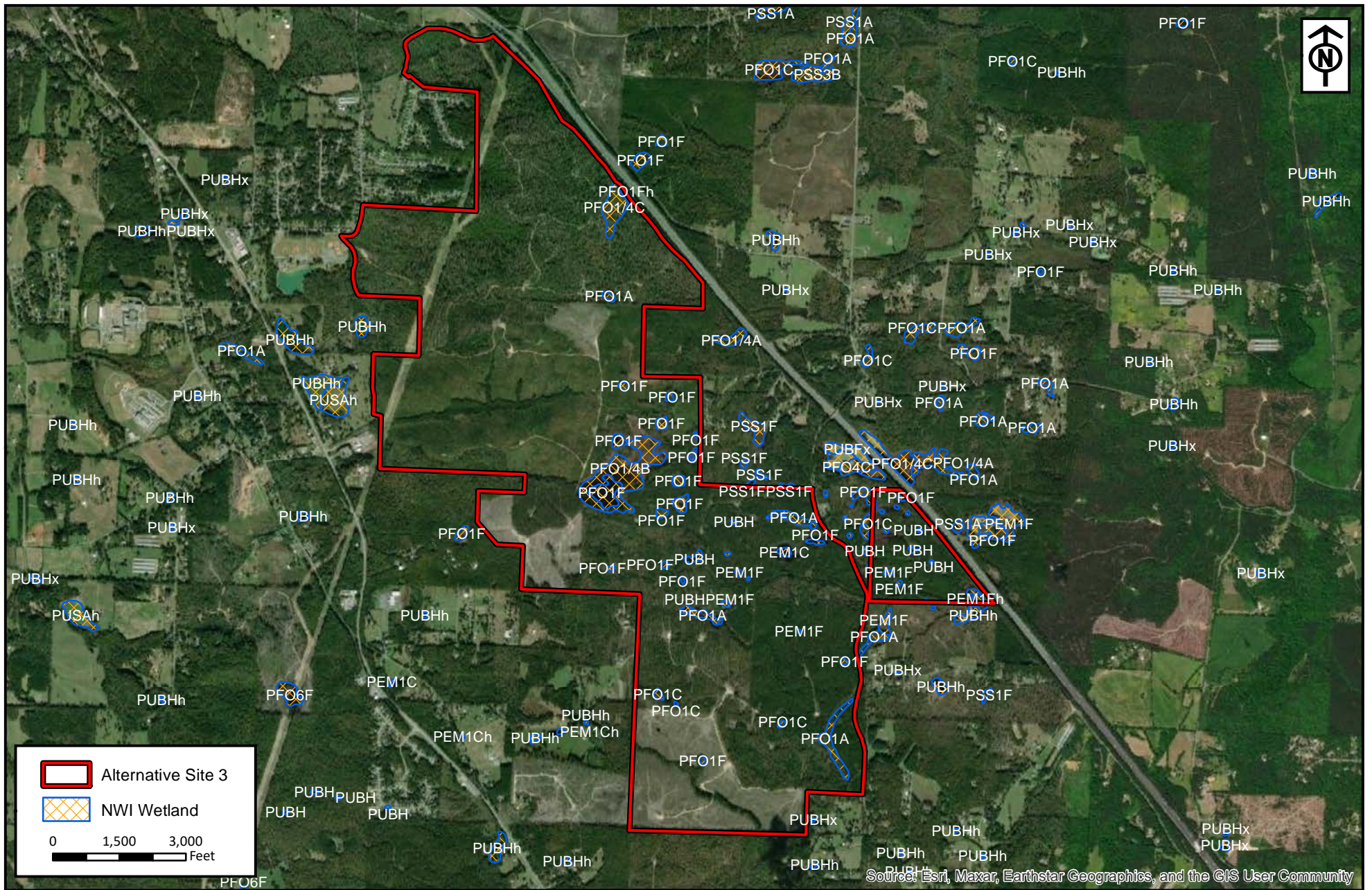
NRCS Soil Map

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898

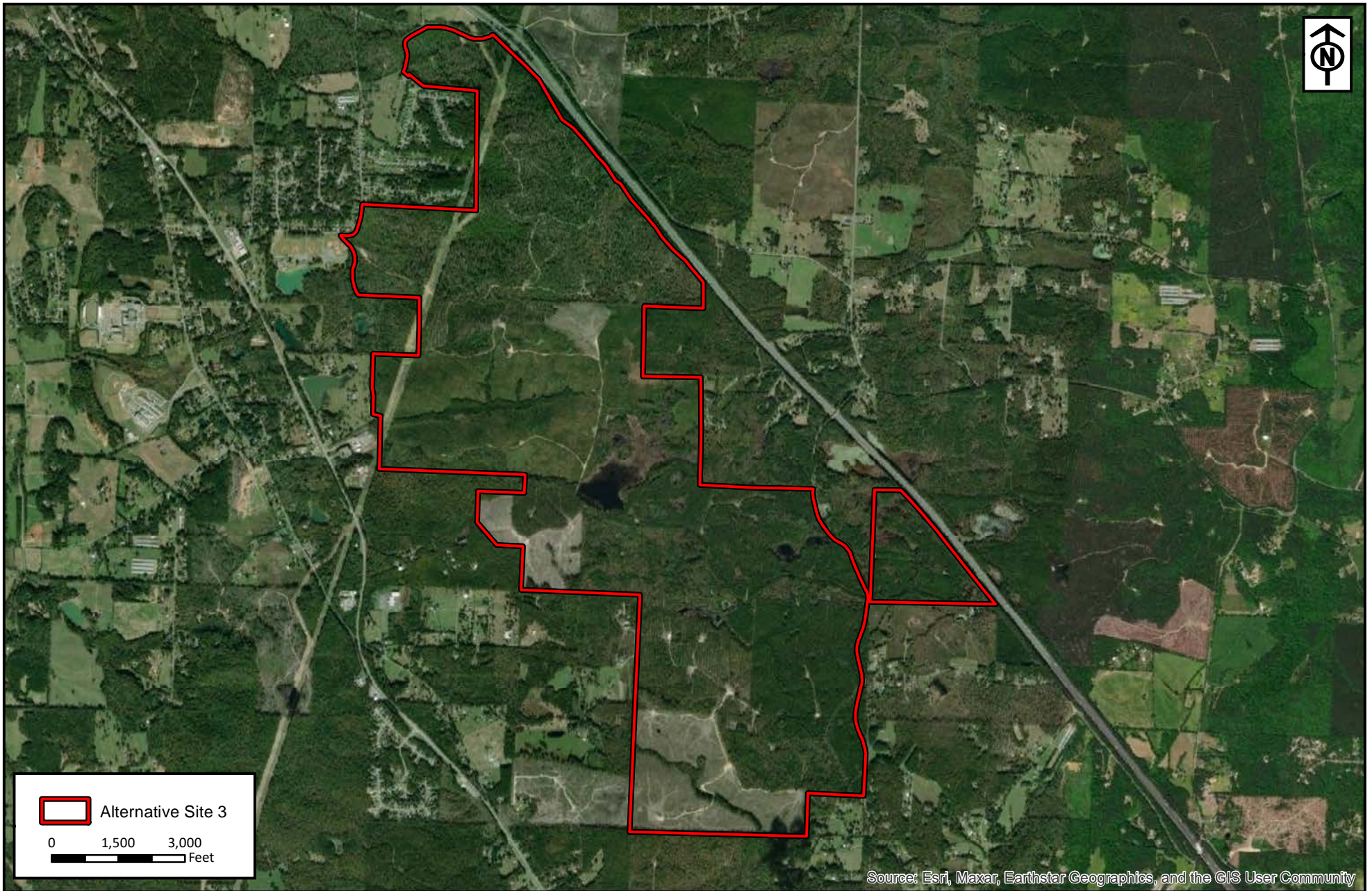


RLC Project No.:	14-225.7
Figure No.:	4
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 3,000 feet

Alternative Site 3
Bartow County, Georgia

National Wetlands Inventory
Prepared For: GDEcD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

RLC	RESOURCE+LAND CONSULTANTS
	41 Park of Commerce Way, Ste 101 Savannah, GA 31405
	tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	5
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 3,000 feet

Alternative Site 3

Bartow County, Georgia

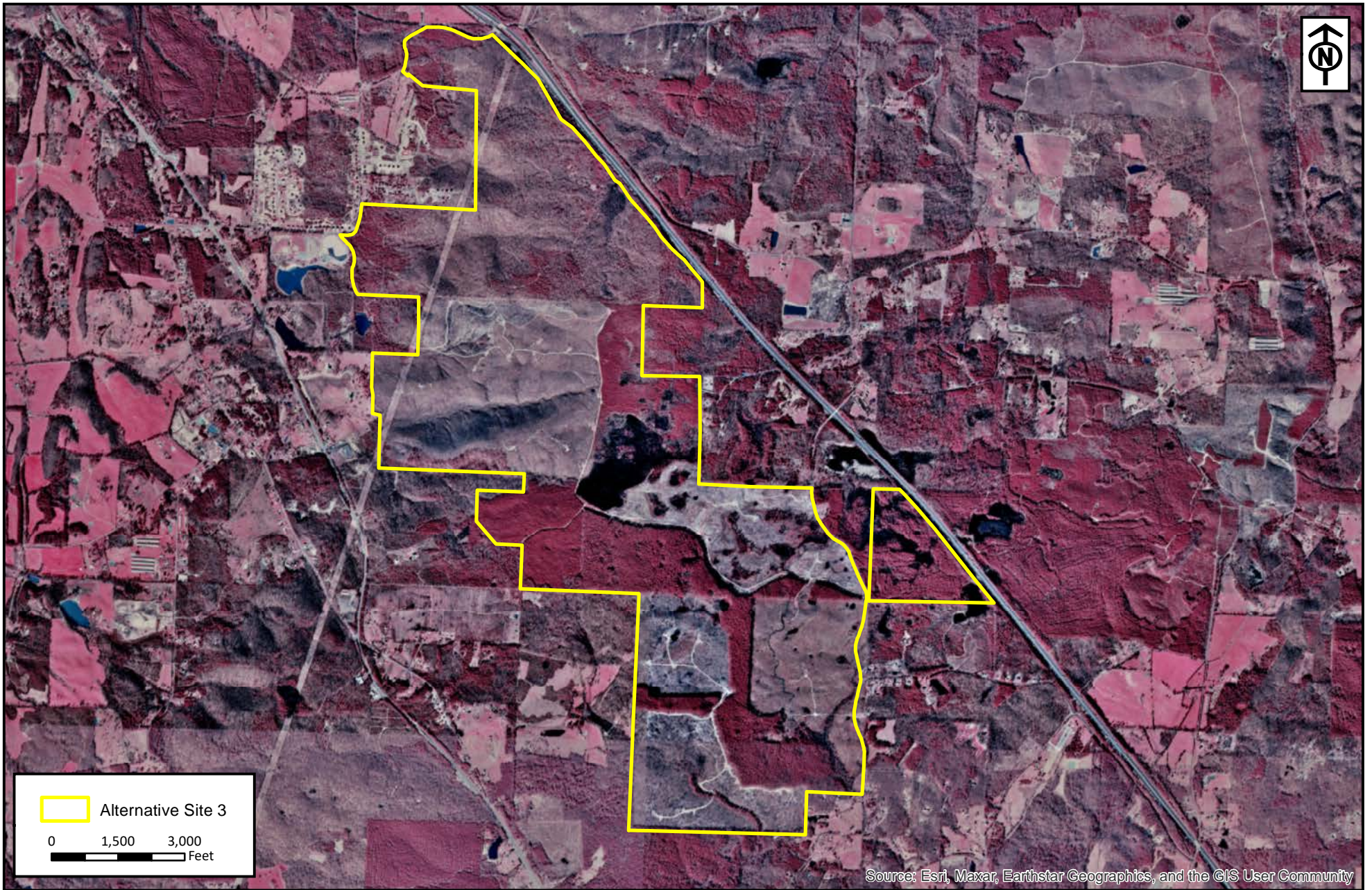
2017 Ortho Aerial

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Alternative Site 3
 0 1,500 3,000
 Feet

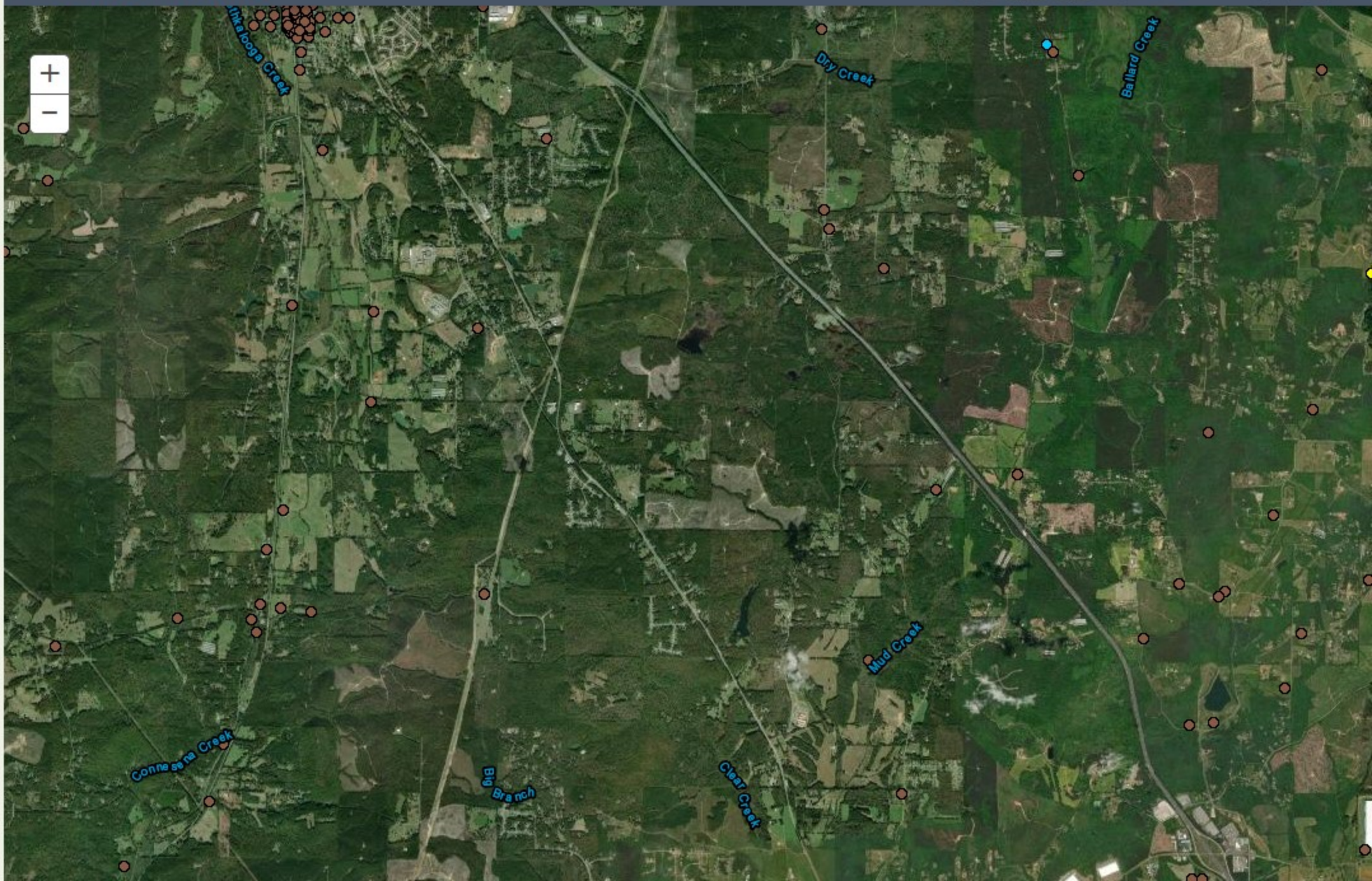
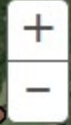
RLC Project No.:	14-225.7
Figure No.:	6
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 3,000 feet

Alternative Site 3
 Bartow County, Georgia

1999 Color-Infrared Imagery
 Prepared For: GDEcD & Savannah Harbor-
 Interstate 16 Corridor Joint Development Authority

	RESOURCE+LAND CONSULTANTS
	<small>41 Park of Commerce Way, Ste 101 Savannah, GA 31405 tel 912.443.5896 fax 912.443.5898</small>

GNAHRGIS Map





United States Department of the Interior



FISH AND WILDLIFE SERVICE
Georgia Ecological Services Field Office
355 East Hancock Avenue
Room 320
Athens, GA 30601-2523
Phone: (706) 613-9493 Fax: (706) 613-6059

In Reply Refer To:

May 14, 2022

Project Code: 2022-0042816

Project Name: Bryan County Mega Site Off-Site Alternative 3

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Thank you for your request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act (MBTA) as amended (16 USC 701-715), Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Bald and Golden Eagle Protection Act (BGEPA) as amended (16 USC 668-668c). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area and to recommend some conservation measures that can be included in your project design if you determine those species or designated critical habitat may be affected by your proposed project.

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency, project proponent, or their designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally listed threatened or endangered fish or wildlife species without the appropriate permit. If you need additional information to assist in your effect determination, please contact the Service.

If you determine that your proposed action may affect federally listed species, please consult with the Service. Through the consultation process, we will analyze information contained in a biological assessment or equivalent document that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a Habitat Conservation Plan) may be necessary to exempt harm or harass federally listed threatened or endangered fish or wildlife species. For more information regarding formal consultation and HCPs, please see the Service's [Section 7 Consultation Library](#) and [Habitat Conservation Plans Library](#) Collections.

Action Area. The scope of federally listed species compliance not only includes direct effects, but also any indirect effects of project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations). The action area is the spatial extent of an action's direct and indirect modifications or impacts to the land, water, or air (50 CFR 402.02). Large projects may have effects to land, water, or air outside the immediate footprint of the project, and these areas should be included as part of the action area. Effects to land, water, or air outside of a project footprint could include things like lighting, dust, smoke, and noise. To obtain a complete list of species, the action area should be uploaded or drawn in IPaC rather than just the project footprint.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. An updated list may be requested through IPaC.

If you determine that your action may affect any federally listed species and would like technical assistance from our office, please send us a complete project review package (refer to Georgia Ecological Services' [Project Planning and Review](#) page for more details), including the following information (reference to these items can be found in 50 CFR§402.13 and 402.14):

1. A description of the proposed action, including any measures intended to avoid, minimize, or offset effects of the action. Consistent with the nature and scope of the proposed action, the description shall provide sufficient detail to assess the effects of the action on listed species and critical habitat, including:
 - The purpose of the action;
 - The duration and timing of the action;
 - The location of the action;
 - The specific components of the action and how they will be carried out;
 - Description of areas to be affected directly or indirectly by the action;
 - Maps, drawings, blueprints, or similar schematics of the action
 2. An updated Official Species List
-

3. Biological Assessments (may include habitat assessments and information on the presence of listed species in the action area);
4. Description of effects of the action on species in the action area and, if relevant, effect determinations for species and critical habitat;
5. Conservation measures and any other available information related to the nature and scope of the proposed action relevant to its effects on listed species or designated critical habitat (examples include: stormwater plans, management plans, erosion and sediment plans). Please see our [Georgia Planning and Consultation Tools](#) page for recommendations.

Please submit all consultation documents via email to gaes_assistance@fws.gov or by using IPaC, uploaded documents, and sharing the project with a specific Georgia Ecological Services staff member. If the project is on-going, documents can also be sent to the Georgia Ecological Services staff member currently working with you on your project. For Georgia Department of Transportation related projects, please work with the Office of Environmental Services ecologist to determine the appropriate USFWS transportation liaison.

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value. We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's [NWI program website](#) (<https://www.fws.gov/program/national-wetlands-inventory>) integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's [Migratory Birds Program](#) (<https://fws.gov/program/migratory-birds>). To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction. It can be found at the Service's [Migratory Birds Conservation Library Collection](#) (<https://fws.gov/library/collections/migratory-bird-conservation-documents>).

Information related to best practices and migratory birds can be found at the Service's [Avoiding and Minimizing Incidental Take of Migratory Birds Library Collection](#) (<https://fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>).

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to “disturb” eagles. Under the BGEPA, the Service may issue limited permits to incidentally “take” eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at the Service's [Bald and Golden Eagle Management Library Collection](https://fws.gov/library/collections/bald-and-golden-eagle-management) (<https://fws.gov/library/collections/bald-and-golden-eagle-management>).

NATIVE BATS

If your species list includes Indiana bat (*Myotis sodalis*) or northern long-eared bat (*M. septentrionalis*) and the project is expected to impact forested habitat that is appropriate for maternity colonies of these species, forest clearing should occur outside of the period when bats may be present. Federally listed bats could be actively present in forested landscapes from April 1 to October 15 of any year and have non-volant pups from May 15 to July 31 in any year. Non-volant pups are incapable of flight and are vulnerable to disturbance during that time.

Indiana, northern long-eared, and gray (*M. grisescens*) bats are all known to utilize bridges and culverts in Georgia. If your project includes maintenance, construction, or any other modification or demolition to transportation structures, a qualified individual should complete a survey of these structures for bats and submit your findings via the Georgia Bats in Bridges cell phone application, free on Apple and Android devices. Please include these findings in any biological assessment(s) or other documentation that is submitted to our office for technical assistance or consultation.

Additional information on bat avoidance and minimization can be found at Georgia Ecological Services' [Planning and Consultations Tools](#) and [Bat Conservation in Georgia](#) pages.

MONARCH BUTTERFLY

On December 20, 2020, the Service determined that listing the Monarch butterfly (*Danaus plexippus*) under the Endangered Species Act is warranted but precluded at this time by higher priority listing actions. With this finding, the monarch butterfly becomes a candidate for listing. The Service will review its status each year until we are able to begin developing a proposal to list the monarch.

As it is a candidate for listing, the Service welcomes conservation measures for this species. Recommended, and voluntary, conservation measures for projects in Georgia can be found at our [Monarch Conservation in Georgia](#) page.

STATE AGENCY COORDINATION

Additional information that addresses at-risk or high priority natural resources can be found in the State Wildlife Action Plan (<https://georgiawildlife.com/WildlifeActionPlan>), at Georgia Department of Natural Resources, Wildlife Resources Division Biodiversity Portal (<https://>

georgiawildlife.com/conservation/species-of-concern), Georgia's Natural, Archaeological, and Historic Resources GIS portal (<https://www.gnahrgis.org/gnahrgis/index.do>), and the [Georgia Ecological Services HUC10 Watershed Guidance](#) page.

Thank you for your concern for endangered and threatened species. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please email gaes_assistance@fws.gov and reference the project county and your Service Project Tracking Number.

This letter constitutes Georgia Ecological Services' general comments under the authority of the Endangered Species Act.

Attachment(s):

- Official Species List
 - Migratory Birds
 - Wetlands
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Georgia Ecological Services Field Office

355 East Hancock Avenue

Room 320

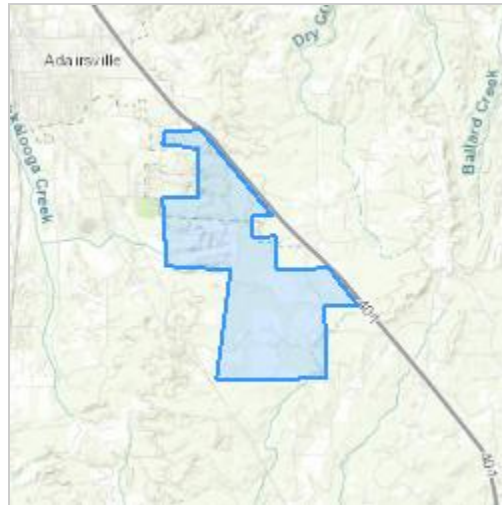
Athens, GA 30601-2523

(706) 613-9493

Project Summary

Project Code: 2022-0042816
Event Code: None
Project Name: Bryan County Mega Site Off-Site Alternative 3
Project Type: Commercial Development
Project Description: development
Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@34.3347543,-84.88601892722416,14z>



Counties: Bartow County, Georgia

Endangered Species Act Species

There is a total of 12 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Gray Bat <i>Myotis grisescens</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Clams

NAME	STATUS
Alabama Moccasinshell <i>Medionidus acutissimus</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7287	Threatened
Finelined Pocketbook <i>Lampsilis altilis</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1393	Threatened
Southern Clubshell <i>Pleurobema decisum</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6113	Endangered
Southern Pigtoe <i>Pleurobema georgianum</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1520	Endangered
Triangular Kidneyshell <i>Ptychobranthus greenii</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4396	Endangered

Snails

NAME	STATUS
Interrupted (=georgia) Rocksnail <i>Leptoxis foremani</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7019	Endangered

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
<p>Large-flowered Skullcap <i>Scutellaria montana</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4721</p>	Threatened
<p>Tennessee Yellow-eyed Grass <i>Xyris tennesseensis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6010</p>	Endangered
<p>White Fringeless Orchid <i>Platanthera integrilabia</i> Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1889</p>	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\)](#) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 31
Canada Warbler <i>Cardellina canadensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10

NAME	BREEDING SEASON
Kentucky Warbler <i>Oporornis formosus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prairie Warbler <i>Dendroica discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.

Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and

how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED.
PLEASE VISIT [HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML](https://www.fws.gov/wetlands/data/mapper.html) OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

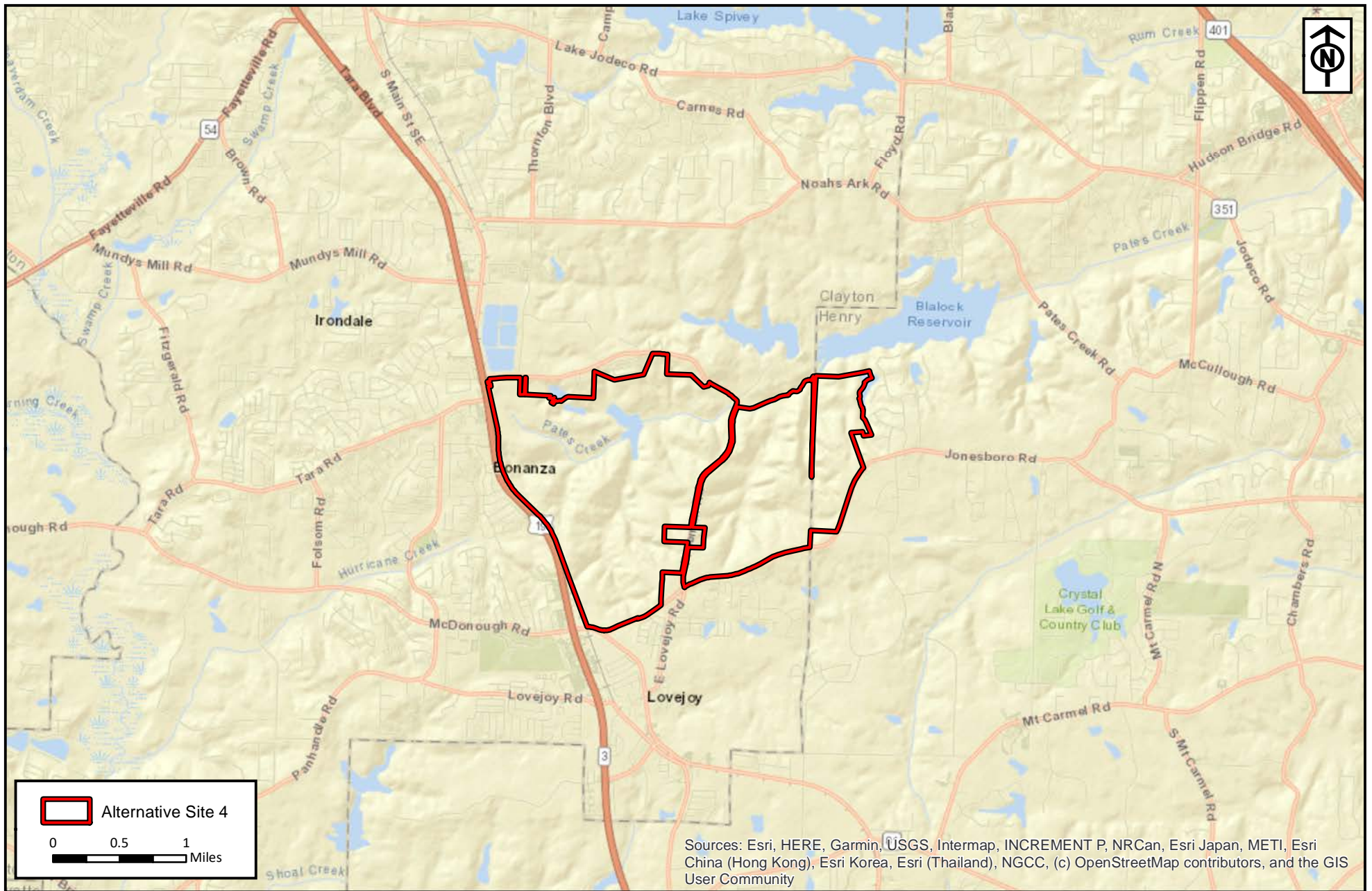
IPaC User Contact Information

Agency: RLC
Name: alton brown
Address: 41 park of commerce way, suite 303
Address Line 2: suite 101
City: Savannah
State: GA
Zip: 31405
Email: abrown@rlandc.com
Phone: 9124435896



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CONSULTANTS

Off-Site Alternative 4



RLC Project No.:	14-225.7
Figure No.:	1
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 1 miles

Alternative Site 4

Clayton County, Georgia

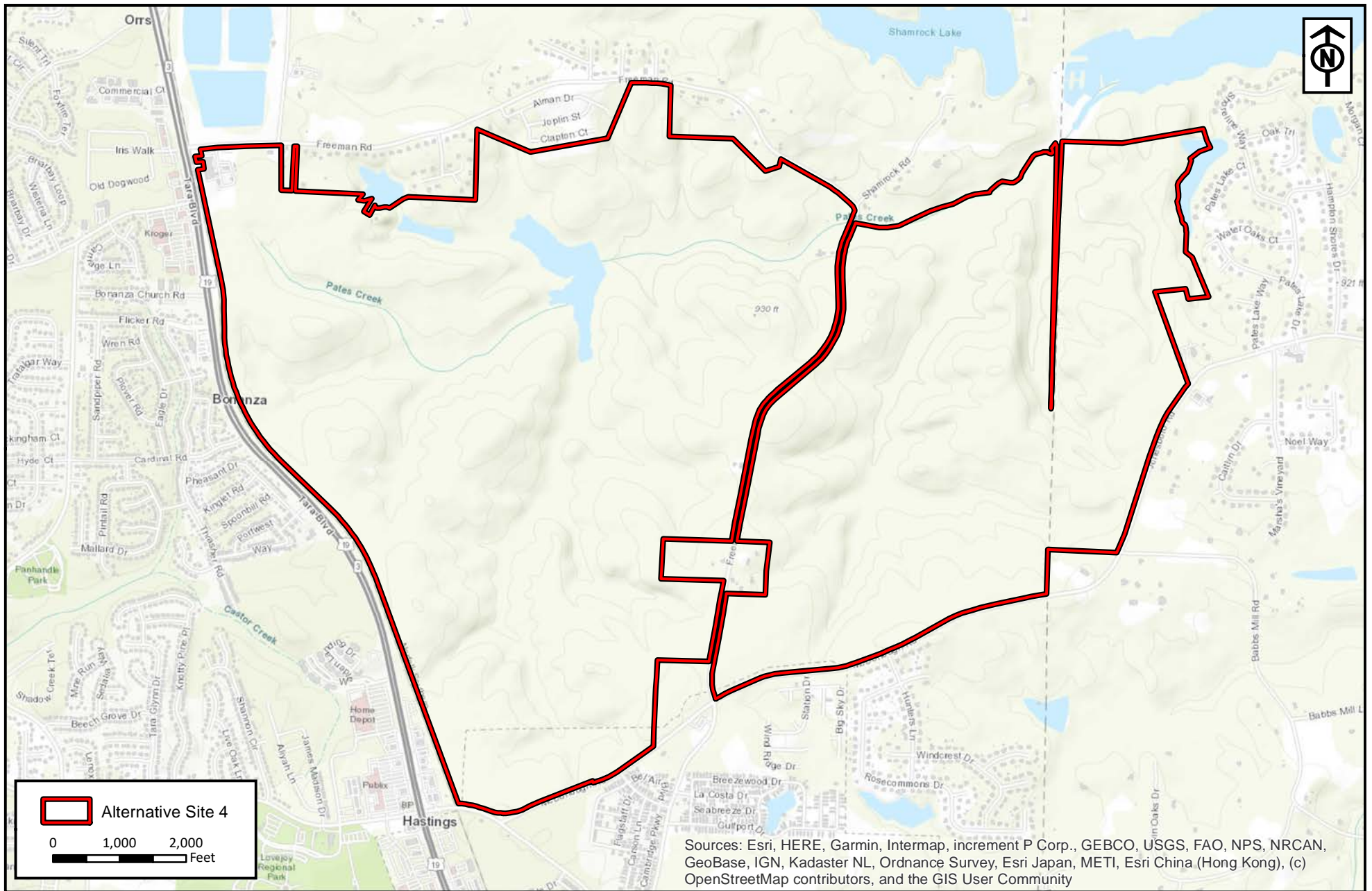
Project Location Map

Prepared For: GDECd & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



**RESOURCE+LAND
CONSULTANTS**

41 Park of Commerce Way, Ste 101
Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	2
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,000 feet

Alternative Site 4

Clayton County, Georgia

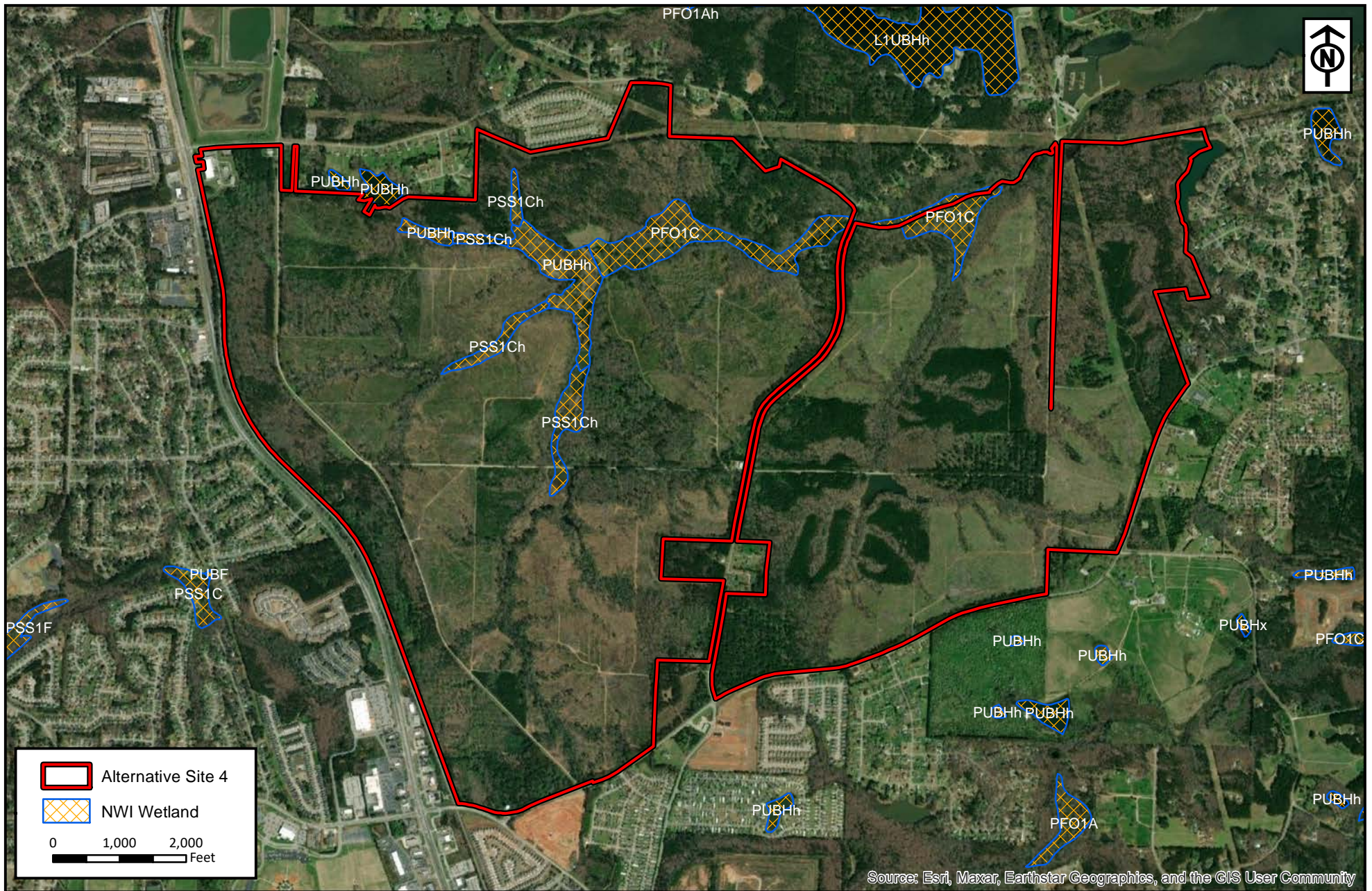
Topographic Map

Prepared For: GDEC & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	4
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,000 feet

Alternative Site 4

Clayton County, Georgia

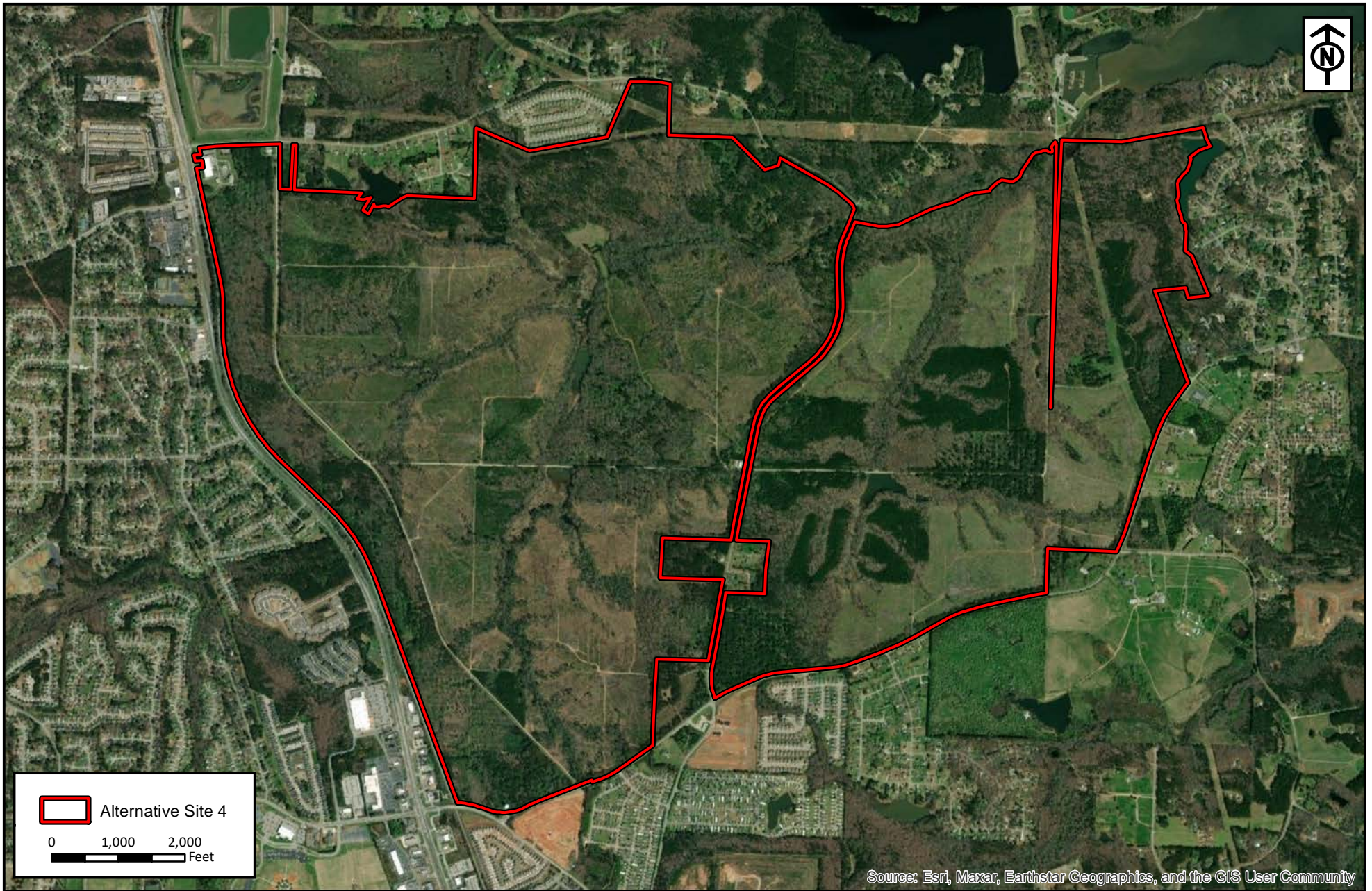
National Wetlands Inventory


Prepared For: GDEcD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



 Alternative Site 4

0 1,000 2,000
Feet

RLC Project No.:	14-225.7
Figure No.:	5
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,000 feet

Alternative Site 4

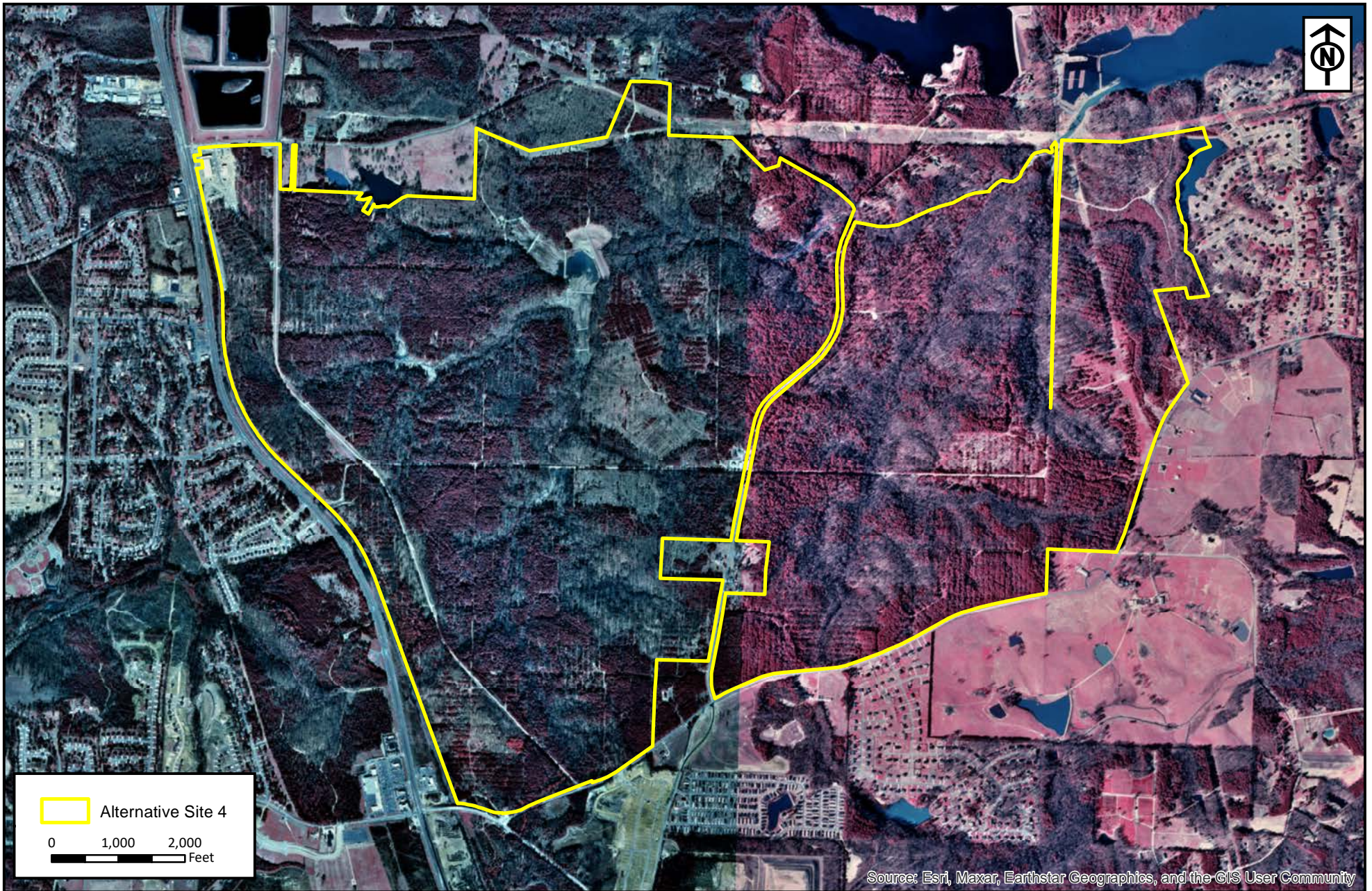
Clayton County, Georgia

2020 Ortho Aerial

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	6
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,000 feet

Alternative Site 4

Clayton County, Georgia

1999 Color-Infrared Imagery

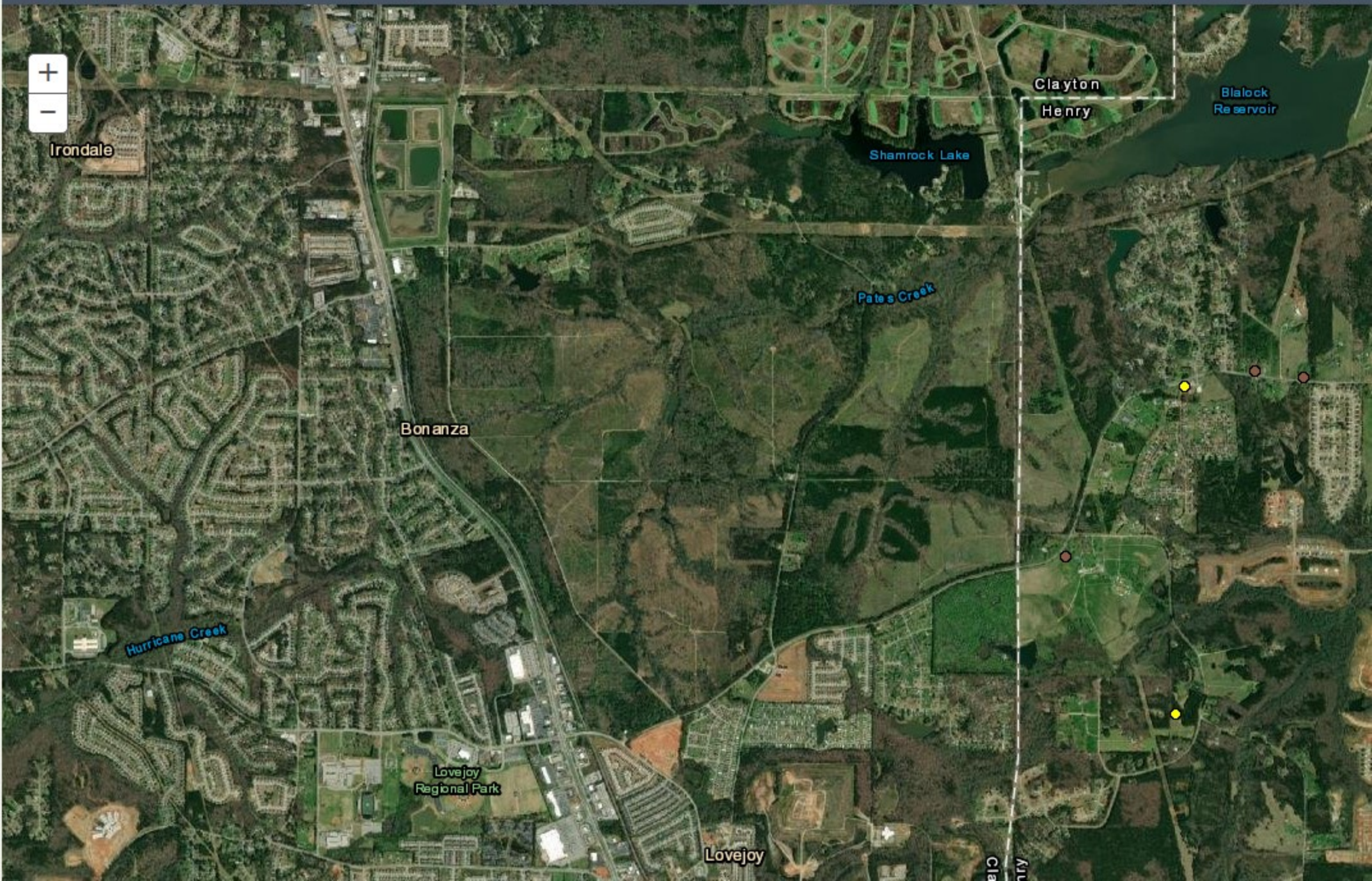
Prepared For: GDEcD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898

GNAHRGIS Map



Irondale

Bonanza

Hurricane Creek

Lovejoy Regional Park

Lovejoy

Pates Creek

Shamrock Lake

Clayton
Henry

Blalock Reservoir

Clayton
Henry



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Georgia Ecological Services Field Office
355 East Hancock Avenue
Room 320
Athens, GA 30601-2523
Phone: (706) 613-9493 Fax: (706) 613-6059

In Reply Refer To:

May 14, 2022

Project Code: 2022-0042818

Project Name: Bryan County Mega Site Off-Site Alternative 4

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Thank you for your request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act (MBTA) as amended (16 USC 701-715), Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Bald and Golden Eagle Protection Act (BGEPA) as amended (16 USC 668-668c). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area and to recommend some conservation measures that can be included in your project design if you determine those species or designated critical habitat may be affected by your proposed project.

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency, project proponent, or their designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally listed threatened or endangered fish or wildlife species without the appropriate permit. If you need additional information to assist in your effect determination, please contact the Service.

If you determine that your proposed action may affect federally listed species, please consult with the Service. Through the consultation process, we will analyze information contained in a biological assessment or equivalent document that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a Habitat Conservation Plan) may be necessary to exempt harm or harass federally listed threatened or endangered fish or wildlife species. For more information regarding formal consultation and HCPs, please see the Service's [Section 7 Consultation Library](#) and [Habitat Conservation Plans Library](#) Collections.

Action Area. The scope of federally listed species compliance not only includes direct effects, but also any indirect effects of project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations). The action area is the spatial extent of an action's direct and indirect modifications or impacts to the land, water, or air (50 CFR 402.02). Large projects may have effects to land, water, or air outside the immediate footprint of the project, and these areas should be included as part of the action area. Effects to land, water, or air outside of a project footprint could include things like lighting, dust, smoke, and noise. To obtain a complete list of species, the action area should be uploaded or drawn in IPaC rather than just the project footprint.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. An updated list may be requested through IPaC.

If you determine that your action may affect any federally listed species and would like technical assistance from our office, please send us a complete project review package (refer to Georgia Ecological Services' [Project Planning and Review](#) page for more details), including the following information (reference to these items can be found in 50 CFR§402.13 and 402.14):

1. A description of the proposed action, including any measures intended to avoid, minimize, or offset effects of the action. Consistent with the nature and scope of the proposed action, the description shall provide sufficient detail to assess the effects of the action on listed species and critical habitat, including:
 - The purpose of the action;
 - The duration and timing of the action;
 - The location of the action;
 - The specific components of the action and how they will be carried out;
 - Description of areas to be affected directly or indirectly by the action;
 - Maps, drawings, blueprints, or similar schematics of the action
 2. An updated Official Species List
-

3. Biological Assessments (may include habitat assessments and information on the presence of listed species in the action area);
4. Description of effects of the action on species in the action area and, if relevant, effect determinations for species and critical habitat;
5. Conservation measures and any other available information related to the nature and scope of the proposed action relevant to its effects on listed species or designated critical habitat (examples include: stormwater plans, management plans, erosion and sediment plans). Please see our [Georgia Planning and Consultation Tools](#) page for recommendations.

Please submit all consultation documents via email to gaes_assistance@fws.gov or by using IPaC, uploaded documents, and sharing the project with a specific Georgia Ecological Services staff member. If the project is on-going, documents can also be sent to the Georgia Ecological Services staff member currently working with you on your project. For Georgia Department of Transportation related projects, please work with the Office of Environmental Services ecologist to determine the appropriate USFWS transportation liaison.

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value. We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's [NWI program website](#) (<https://www.fws.gov/program/national-wetlands-inventory>) integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's [Migratory Birds Program](#) (<https://fws.gov/program/migratory-birds>). To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction. It can be found at the Service's [Migratory Birds Conservation Library Collection](#) (<https://fws.gov/library/collections/migratory-bird-conservation-documents>).

Information related to best practices and migratory birds can be found at the Service's [Avoiding and Minimizing Incidental Take of Migratory Birds Library Collection](#) (<https://fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>).

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to “disturb” eagles. Under the BGEPA, the Service may issue limited permits to incidentally “take” eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at the Service's [Bald and Golden Eagle Management Library Collection](https://fws.gov/library/collections/bald-and-golden-eagle-management) (<https://fws.gov/library/collections/bald-and-golden-eagle-management>).

NATIVE BATS

If your species list includes Indiana bat (*Myotis sodalis*) or northern long-eared bat (*M. septentrionalis*) and the project is expected to impact forested habitat that is appropriate for maternity colonies of these species, forest clearing should occur outside of the period when bats may be present. Federally listed bats could be actively present in forested landscapes from April 1 to October 15 of any year and have non-volant pups from May 15 to July 31 in any year. Non-volant pups are incapable of flight and are vulnerable to disturbance during that time.

Indiana, northern long-eared, and gray (*M. grisescens*) bats are all known to utilize bridges and culverts in Georgia. If your project includes maintenance, construction, or any other modification or demolition to transportation structures, a qualified individual should complete a survey of these structures for bats and submit your findings via the Georgia Bats in Bridges cell phone application, free on Apple and Android devices. Please include these findings in any biological assessment(s) or other documentation that is submitted to our office for technical assistance or consultation.

Additional information on bat avoidance and minimization can be found at Georgia Ecological Services' [Planning and Consultations Tools](#) and [Bat Conservation in Georgia](#) pages.

MONARCH BUTTERFLY

On December 20, 2020, the Service determined that listing the Monarch butterfly (*Danaus plexippus*) under the Endangered Species Act is warranted but precluded at this time by higher priority listing actions. With this finding, the monarch butterfly becomes a candidate for listing. The Service will review its status each year until we are able to begin developing a proposal to list the monarch.

As it is a candidate for listing, the Service welcomes conservation measures for this species. Recommended, and voluntary, conservation measures for projects in Georgia can be found at our [Monarch Conservation in Georgia](#) page.

STATE AGENCY COORDINATION

Additional information that addresses at-risk or high priority natural resources can be found in the State Wildlife Action Plan (<https://georgiawildlife.com/WildlifeActionPlan>), at Georgia Department of Natural Resources, Wildlife Resources Division Biodiversity Portal (<https://>

georgiawildlife.com/conservation/species-of-concern), Georgia's Natural, Archaeological, and Historic Resources GIS portal (<https://www.gnahrgis.org/gnahrgis/index.do>), and the [Georgia Ecological Services HUC10 Watershed Guidance](#) page.

Thank you for your concern for endangered and threatened species. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please email gaes_assistance@fws.gov and reference the project county and your Service Project Tracking Number.

This letter constitutes Georgia Ecological Services' general comments under the authority of the Endangered Species Act.

Attachment(s):

- Official Species List
 - Migratory Birds
 - Wetlands
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Georgia Ecological Services Field Office

355 East Hancock Avenue

Room 320

Athens, GA 30601-2523

(706) 613-9493

Project Summary

Project Code: 2022-0042818

Event Code: None

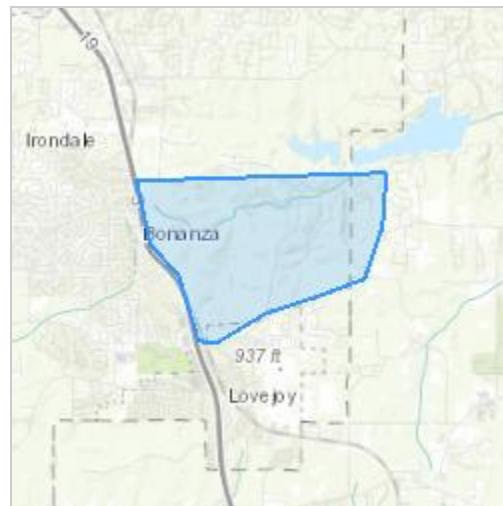
Project Name: Bryan County Mega Site Off-Site Alternative 4

Project Type: Commercial Development

Project Description: development

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@33.4626662,-84.31090627606117,14z>



Counties: Clayton and Henry counties, Georgia

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\) list](#) or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10

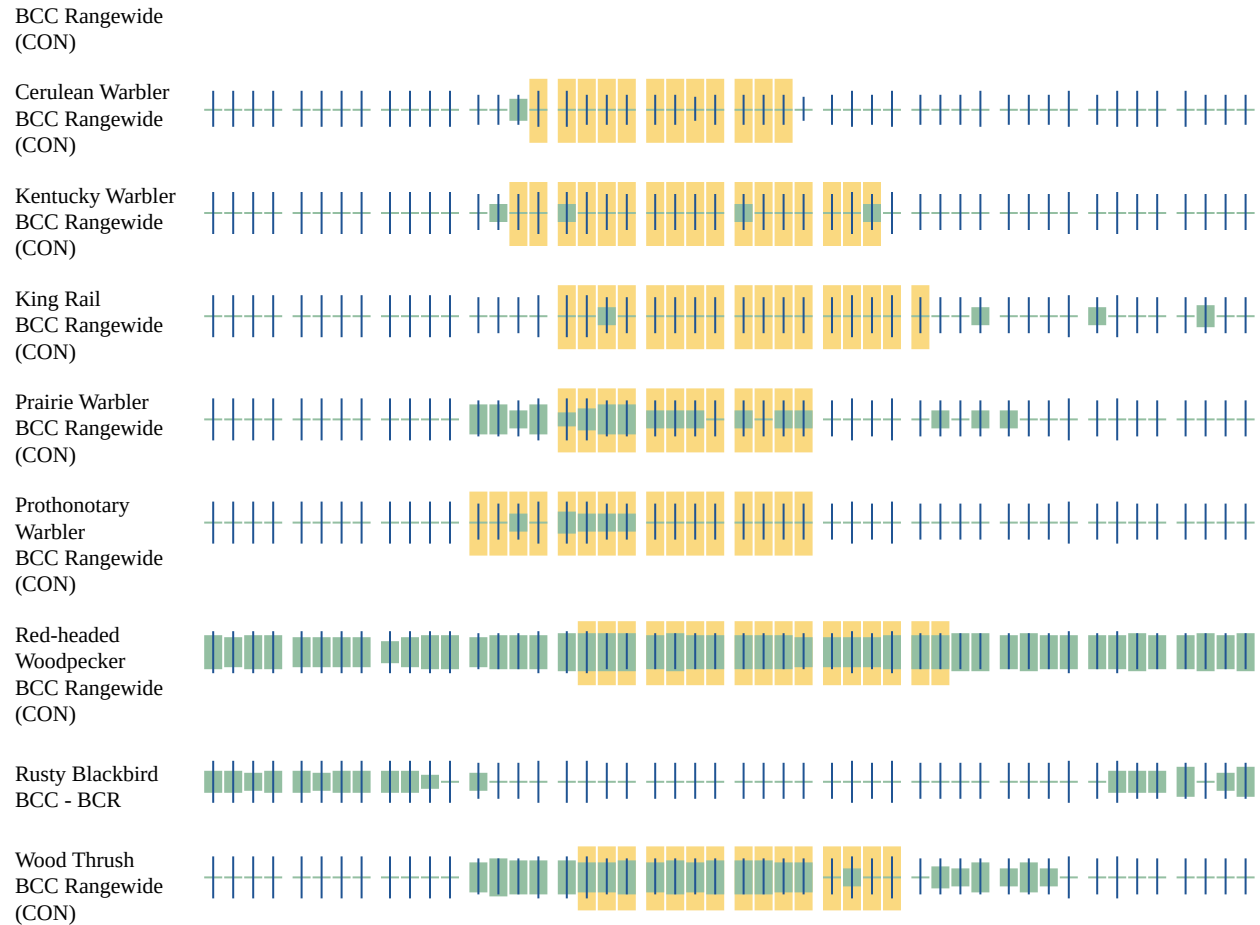
NAME	BREEDING SEASON
<p>Cerulean Warbler <i>Dendroica cerulea</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/2974</p>	Breeds Apr 28 to Jul 20
<p>Kentucky Warbler <i>Oporornis formosus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Apr 20 to Aug 20
<p>King Rail <i>Rallus elegans</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/8936</p>	Breeds May 1 to Sep 5
<p>Prairie Warbler <i>Dendroica discolor</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 1 to Jul 31
<p>Prothonotary Warbler <i>Protonotaria citrea</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Apr 1 to Jul 31
<p>Red-headed Woodpecker <i>Melanerpes erythrocephalus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 10 to Sep 10
<p>Rusty Blackbird <i>Euphagus carolinus</i></p> <p>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p>	Breeds elsewhere
<p>Wood Thrush <i>Hylocichla mustelina</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 10 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.



Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#)

may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
-

2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities,

should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT [HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML](https://www.fws.gov/wetlands/data/mapper.html) OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

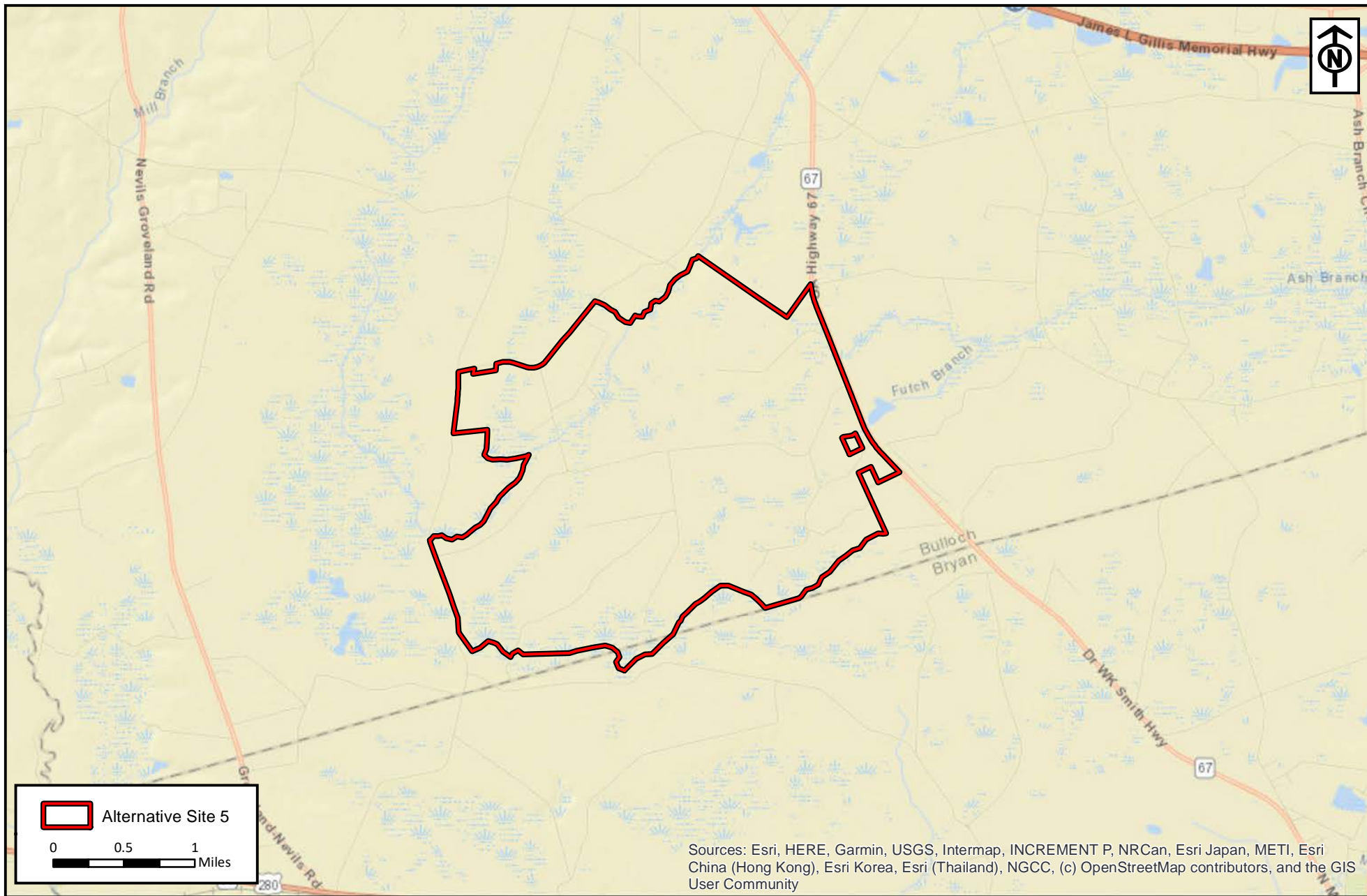
IPaC User Contact Information


Agency: RLC
Name: alton brown
Address: 41 park of commerce way, suite 303
Address Line 2: suite 101
City: Savannah
State: GA
Zip: 31405
Email: abrown@rlandc.com
Phone: 9124435896



RESOURCE+LAND
CONSULTANTS

Off-Site Alternative 5



 Alternative Site 5

0 0.5 1 Miles

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

RLC Project No.:	14-225.7
Figure No.:	1
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 1 miles

Alternative Site 5

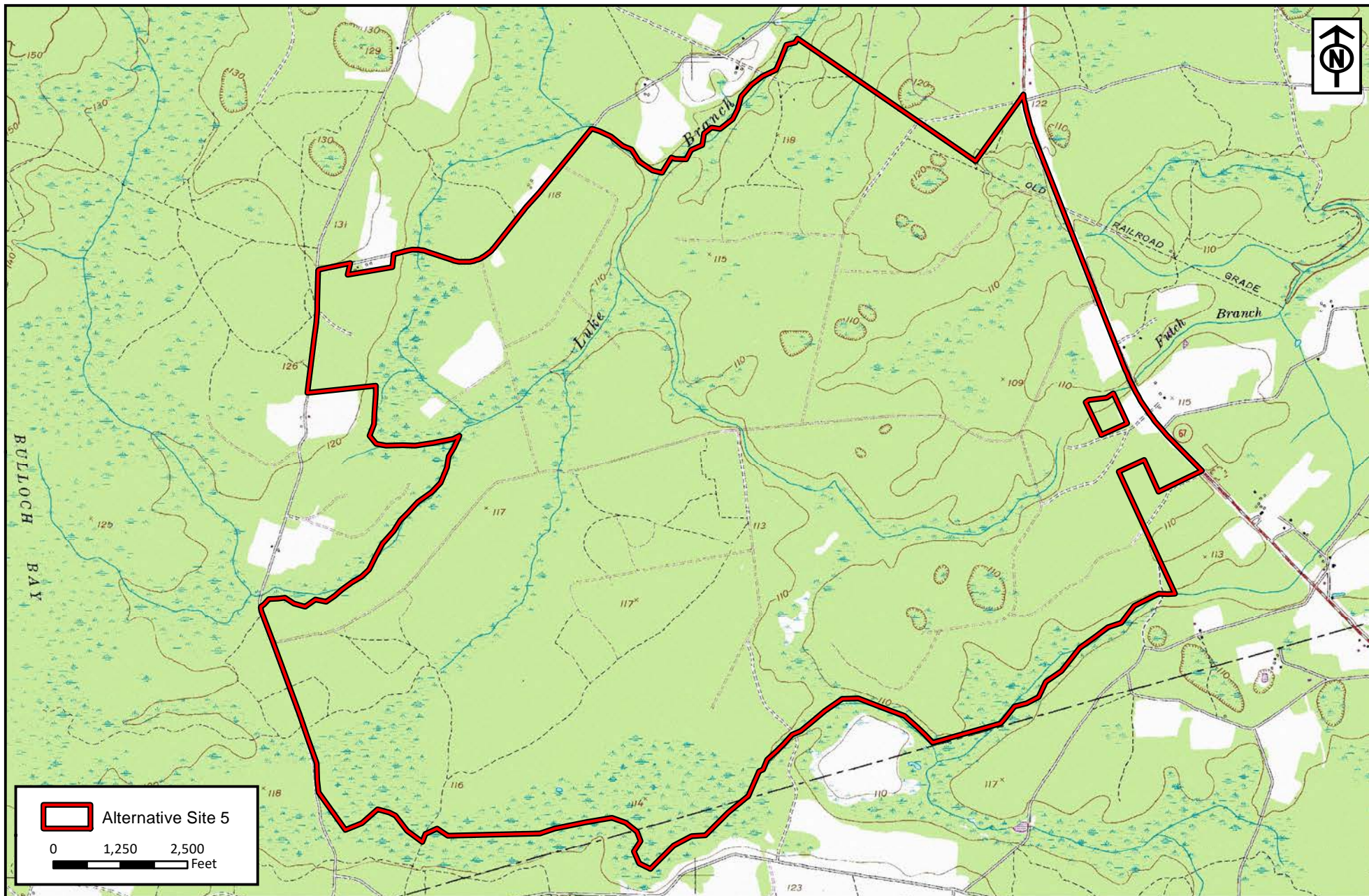
Bulloch County, Georgia

Project Location Map

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

 **RESOURCE+LAND CONSULTANTS**

41 Park of Commerce Way, Ste 101
Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	2
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,500 feet

Alternative Site 5

Bulloch County, Georgia

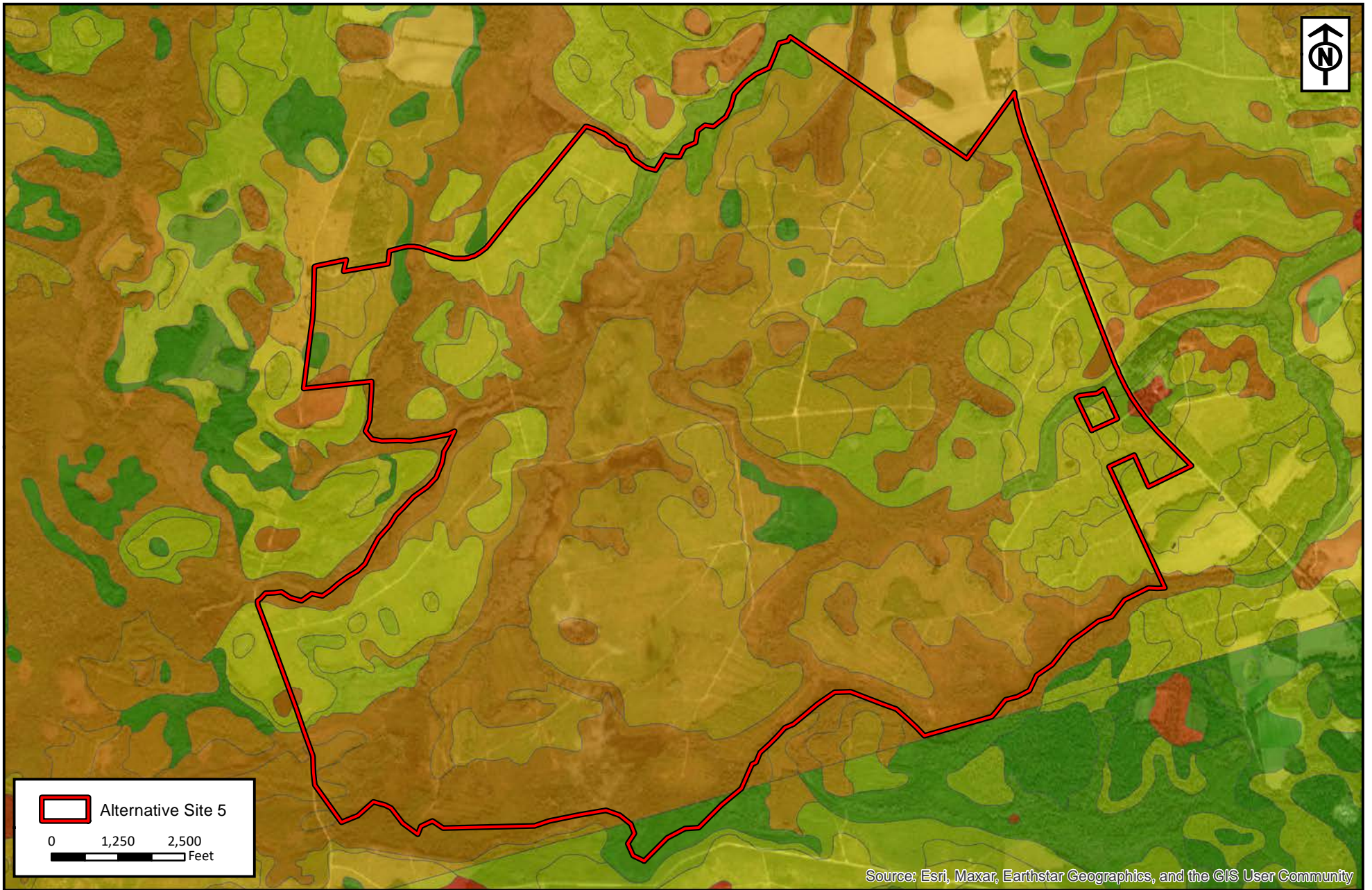
USGS Topographic Map

Prepared For: GDEC & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



Alternative Site 5
 0 1,250 2,500
 Feet


RLC Project No.:	14-225.7
Figure No.:	3
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,500 feet

Alternative Site 5
 Bulloch County, Georgia

NRCS Soil Map
 Prepared For: GDEcD & Savannah Harbor-
 Interstate 16 Corridor Joint Development Authority

	RESOURCE+LAND CONSULTANTS
	<small>41 Park of Commerce Way, Ste 101 Savannah, GA 31405 tel 912.443.5896 fax 912.443.5898</small>



 Alternative Site 5

0 1,250 2,500
Feet

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

RLC Project No.:	14-225.7
Figure No.:	5
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,500 feet

Alternative Site 5

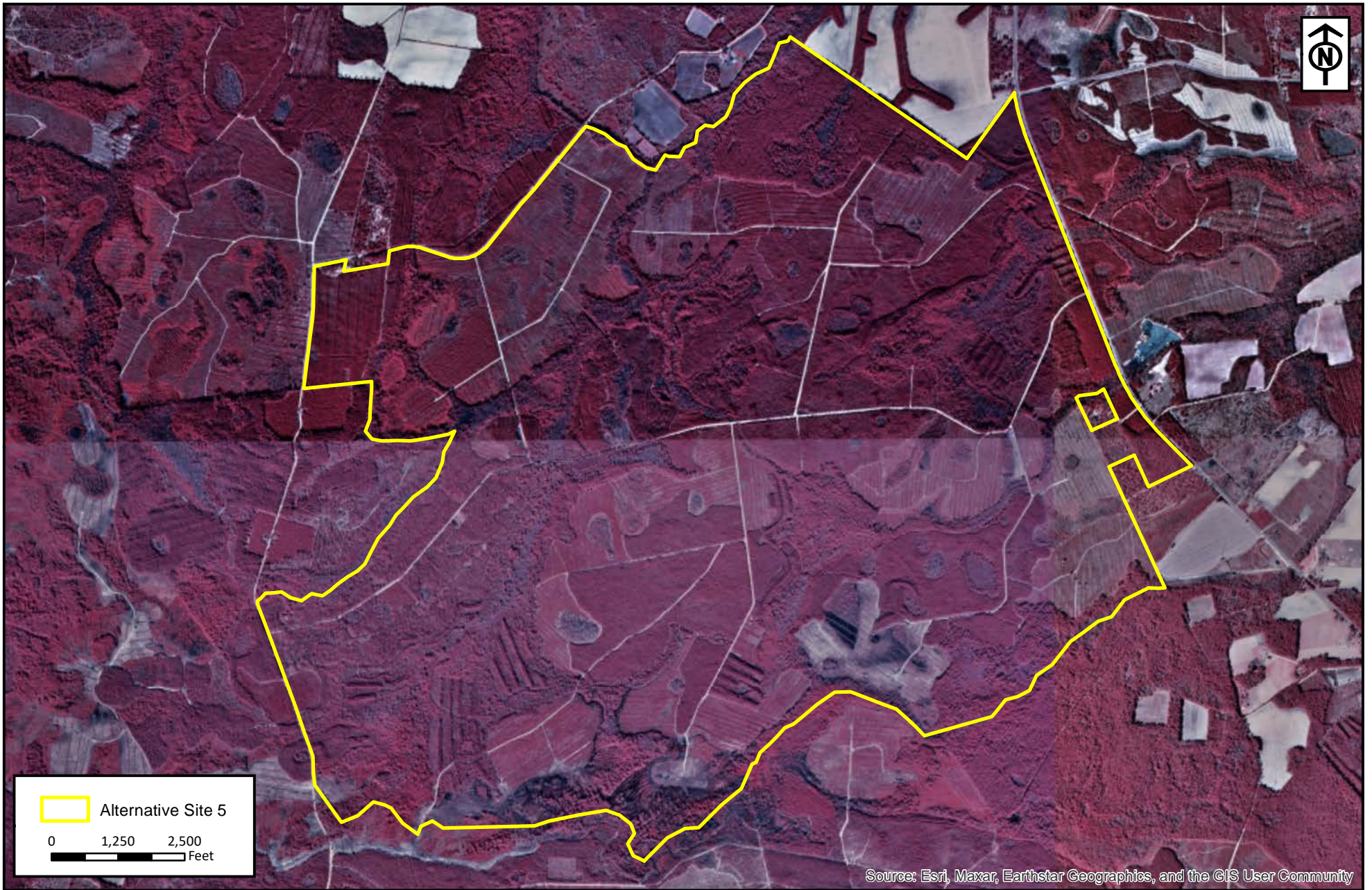
Bulloch County, Georgia

2020 Ortho Aerial

Prepared For: GDECd & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	6
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,500 feet

Alternative Site 5

Bulloch County, Georgia

1999 Color-Infrared Imagery

Prepared For: GDEcD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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CONSULTANTS

41 Park of Commerce Way, Ste 101
Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898

GNAHRGIS Map



Luke Swamp

Fulch Branch

Bulloch
Bryan



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Georgia Ecological Services Field Office
355 East Hancock Avenue
Room 320
Athens, GA 30601-2523
Phone: (706) 613-9493 Fax: (706) 613-6059

In Reply Refer To:

May 14, 2022

Project Code: 2022-0042813

Project Name: Bryan County Mega Site Off-Site Alternative 5

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Thank you for your request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act (MBTA) as amended (16 USC 701-715), Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Bald and Golden Eagle Protection Act (BGEPA) as amended (16 USC 668-668c). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area and to recommend some conservation measures that can be included in your project design if you determine those species or designated critical habitat may be affected by your proposed project.

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency, project proponent, or their designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally listed threatened or endangered fish or wildlife species without the appropriate permit. If you need additional information to assist in your effect determination, please contact the Service.

If you determine that your proposed action may affect federally listed species, please consult with the Service. Through the consultation process, we will analyze information contained in a biological assessment or equivalent document that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a Habitat Conservation Plan) may be necessary to exempt harm or harass federally listed threatened or endangered fish or wildlife species. For more information regarding formal consultation and HCPs, please see the Service's [Section 7 Consultation Library](#) and [Habitat Conservation Plans Library](#) Collections.

Action Area. The scope of federally listed species compliance not only includes direct effects, but also any indirect effects of project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations). The action area is the spatial extent of an action's direct and indirect modifications or impacts to the land, water, or air (50 CFR 402.02). Large projects may have effects to land, water, or air outside the immediate footprint of the project, and these areas should be included as part of the action area. Effects to land, water, or air outside of a project footprint could include things like lighting, dust, smoke, and noise. To obtain a complete list of species, the action area should be uploaded or drawn in IPaC rather than just the project footprint.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. An updated list may be requested through IPaC.

If you determine that your action may affect any federally listed species and would like technical assistance from our office, please send us a complete project review package (refer to Georgia Ecological Services' [Project Planning and Review](#) page for more details), including the following information (reference to these items can be found in 50 CFR§402.13 and 402.14):

1. A description of the proposed action, including any measures intended to avoid, minimize, or offset effects of the action. Consistent with the nature and scope of the proposed action, the description shall provide sufficient detail to assess the effects of the action on listed species and critical habitat, including:
 - The purpose of the action;
 - The duration and timing of the action;
 - The location of the action;
 - The specific components of the action and how they will be carried out;
 - Description of areas to be affected directly or indirectly by the action;
 - Maps, drawings, blueprints, or similar schematics of the action
 2. An updated Official Species List
-

3. Biological Assessments (may include habitat assessments and information on the presence of listed species in the action area);
4. Description of effects of the action on species in the action area and, if relevant, effect determinations for species and critical habitat;
5. Conservation measures and any other available information related to the nature and scope of the proposed action relevant to its effects on listed species or designated critical habitat (examples include: stormwater plans, management plans, erosion and sediment plans). Please see our [Georgia Planning and Consultation Tools](#) page for recommendations.

Please submit all consultation documents via email to gaes_assistance@fws.gov or by using IPaC, uploaded documents, and sharing the project with a specific Georgia Ecological Services staff member. If the project is on-going, documents can also be sent to the Georgia Ecological Services staff member currently working with you on your project. For Georgia Department of Transportation related projects, please work with the Office of Environmental Services ecologist to determine the appropriate USFWS transportation liaison.

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value. We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's [NWI program website](#) (<https://www.fws.gov/program/national-wetlands-inventory>) integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's [Migratory Birds Program](#) (<https://fws.gov/program/migratory-birds>). To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction. It can be found at the Service's [Migratory Birds Conservation Library Collection](#) (<https://fws.gov/library/collections/migratory-bird-conservation-documents>).

Information related to best practices and migratory birds can be found at the Service's [Avoiding and Minimizing Incidental Take of Migratory Birds Library Collection](#) (<https://fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>).

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to “disturb” eagles. Under the BGEPA, the Service may issue limited permits to incidentally “take” eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at the Service's [Bald and Golden Eagle Management Library Collection](https://fws.gov/library/collections/bald-and-golden-eagle-management) (<https://fws.gov/library/collections/bald-and-golden-eagle-management>).

NATIVE BATS

If your species list includes Indiana bat (*Myotis sodalis*) or northern long-eared bat (*M. septentrionalis*) and the project is expected to impact forested habitat that is appropriate for maternity colonies of these species, forest clearing should occur outside of the period when bats may be present. Federally listed bats could be actively present in forested landscapes from April 1 to October 15 of any year and have non-volant pups from May 15 to July 31 in any year. Non-volant pups are incapable of flight and are vulnerable to disturbance during that time.

Indiana, northern long-eared, and gray (*M. grisescens*) bats are all known to utilize bridges and culverts in Georgia. If your project includes maintenance, construction, or any other modification or demolition to transportation structures, a qualified individual should complete a survey of these structures for bats and submit your findings via the Georgia Bats in Bridges cell phone application, free on Apple and Android devices. Please include these findings in any biological assessment(s) or other documentation that is submitted to our office for technical assistance or consultation.

Additional information on bat avoidance and minimization can be found at Georgia Ecological Services' [Planning and Consultations Tools](#) and [Bat Conservation in Georgia](#) pages.

MONARCH BUTTERFLY

On December 20, 2020, the Service determined that listing the Monarch butterfly (*Danaus plexippus*) under the Endangered Species Act is warranted but precluded at this time by higher priority listing actions. With this finding, the monarch butterfly becomes a candidate for listing. The Service will review its status each year until we are able to begin developing a proposal to list the monarch.

As it is a candidate for listing, the Service welcomes conservation measures for this species. Recommended, and voluntary, conservation measures for projects in Georgia can be found at our [Monarch Conservation in Georgia](#) page.

STATE AGENCY COORDINATION

Additional information that addresses at-risk or high priority natural resources can be found in the State Wildlife Action Plan (<https://georgiawildlife.com/WildlifeActionPlan>), at Georgia Department of Natural Resources, Wildlife Resources Division Biodiversity Portal (<https://>

georgiawildlife.com/conservation/species-of-concern), Georgia's Natural, Archaeological, and Historic Resources GIS portal (<https://www.gnahrgis.org/gnahrgis/index.do>), and the [Georgia Ecological Services HUC10 Watershed Guidance](#) page.

Thank you for your concern for endangered and threatened species. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please email gaes_assistance@fws.gov and reference the project county and your Service Project Tracking Number.

This letter constitutes Georgia Ecological Services' general comments under the authority of the Endangered Species Act.

Attachment(s):

- Official Species List
 - Migratory Birds
 - Wetlands
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Georgia Ecological Services Field Office

355 East Hancock Avenue

Room 320

Athens, GA 30601-2523

(706) 613-9493

Project Summary

Project Code: 2022-0042813

Event Code: None

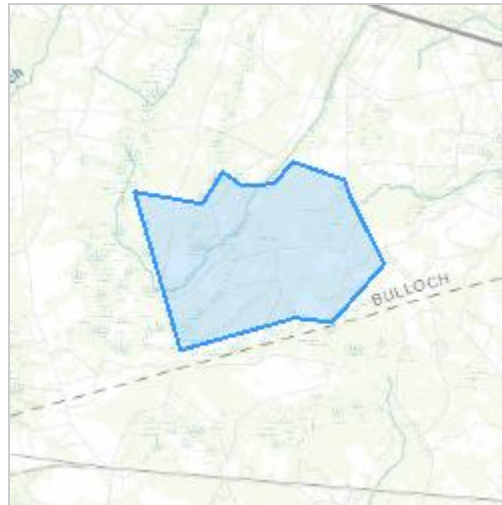
Project Name: Bryan County Mega Site Off-Site Alternative 5

Project Type: Commercial Development

Project Description: development

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@32.192901000000006,-81.7097513989733,14z>



Counties: Bulloch County, Georgia

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Reptiles

NAME	STATUS
Eastern Indigo Snake <i>Drymarchon corais couperi</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/646	Threatened
Gopher Tortoise <i>Gopherus polyphemus</i> Population: eastern No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6994	Candidate

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\) list](#) or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bachman's Sparrow <i>Aimophila aestivalis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6177	Breeds May 1 to Sep 30
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

NAME	BREEDING SEASON
Prairie Warbler <i>Dendroica discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler <i>Protonotaria citrea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Swallow-tailed Kite <i>Elanoides forficatus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8938	Breeds Mar 10 to Jun 30

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.

- The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and

how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT [HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML](https://www.fws.gov/wetlands/data/mapper.html) OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

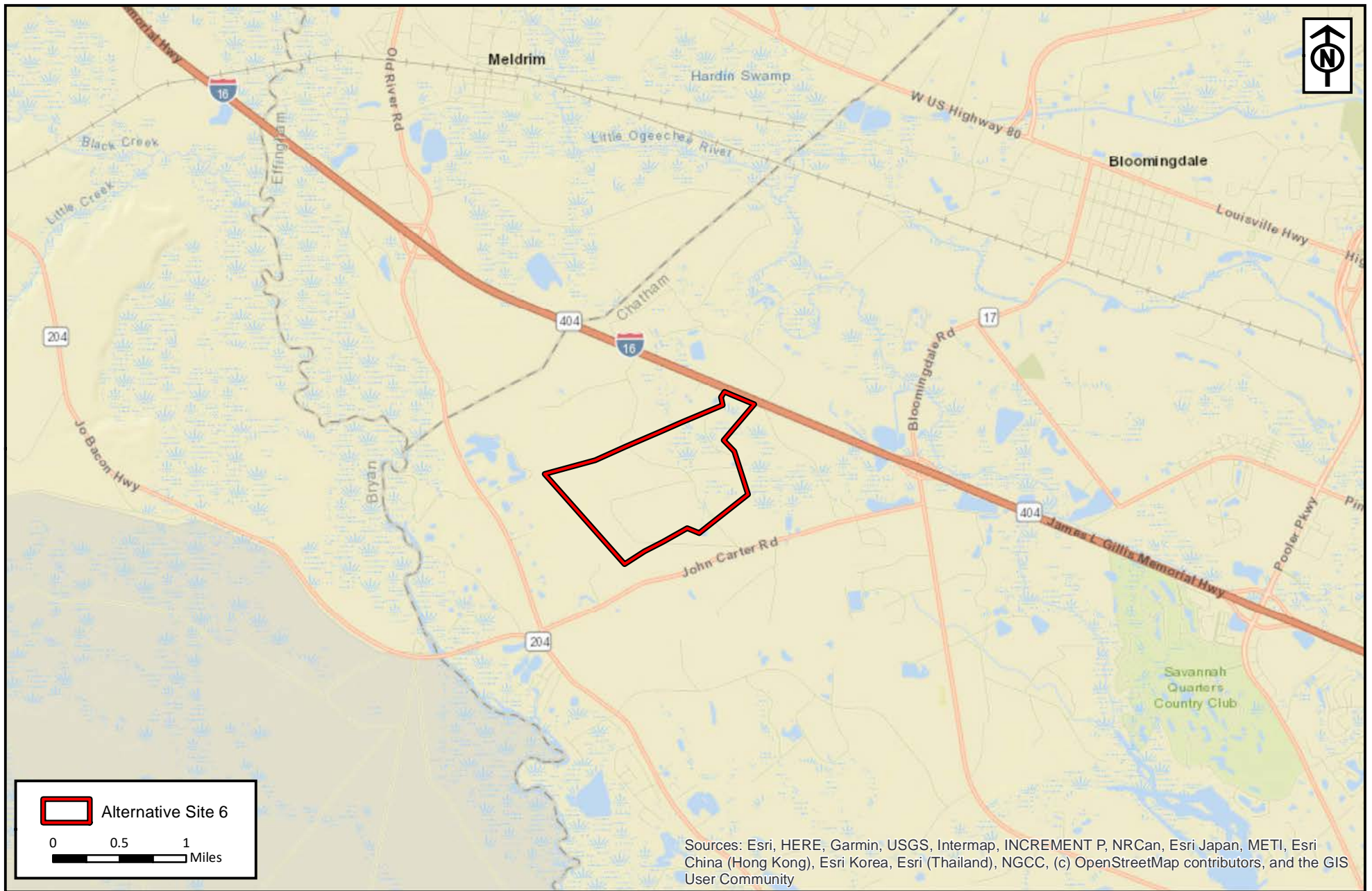
IPaC User Contact Information

Agency: RLC
Name: alton brown
Address: 41 park of commerce way, suite 303
Address Line 2: suite 101
City: Savannah
State: GA
Zip: 31405
Email: abrown@rlandc.com
Phone: 9124435896



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CONSULTANTS

Off-Site Alternative 6



RLC Project No.:	14-225.7
Figure No.:	1
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 1 miles

Alternative Site 6

Chatham County, Georgia

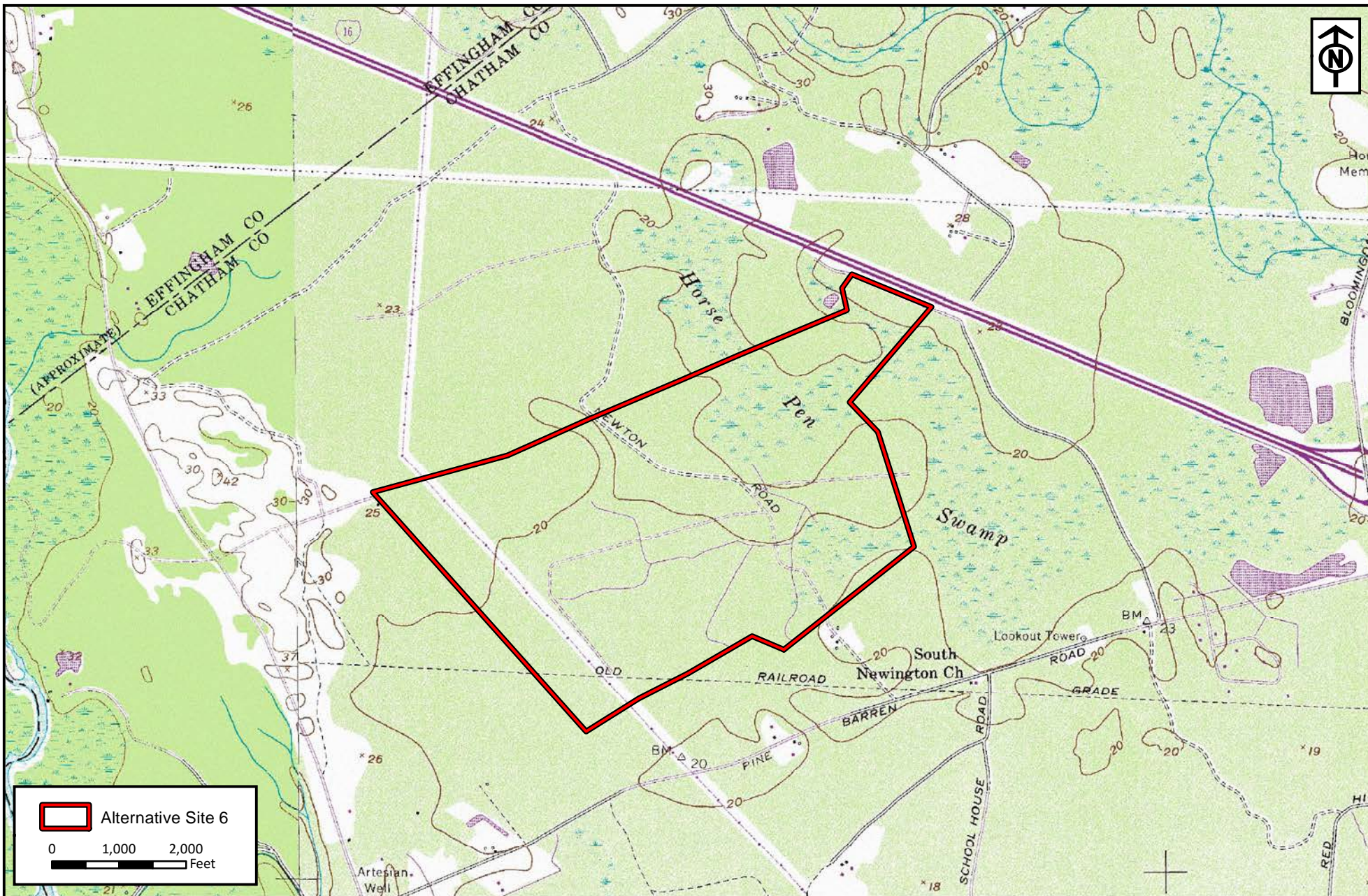
Project Location Map

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



RESOURCE+LAND
CONSULTANTS

41 Park of Commerce Way, Ste 101
Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	2
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,000 feet

Alternative Site 6

Chatham County, Georgia

USGS Topographic Map

Prepared For: GDecD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	3
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 1,250 feet

Alternative Site 6

Chatham County, Georgia

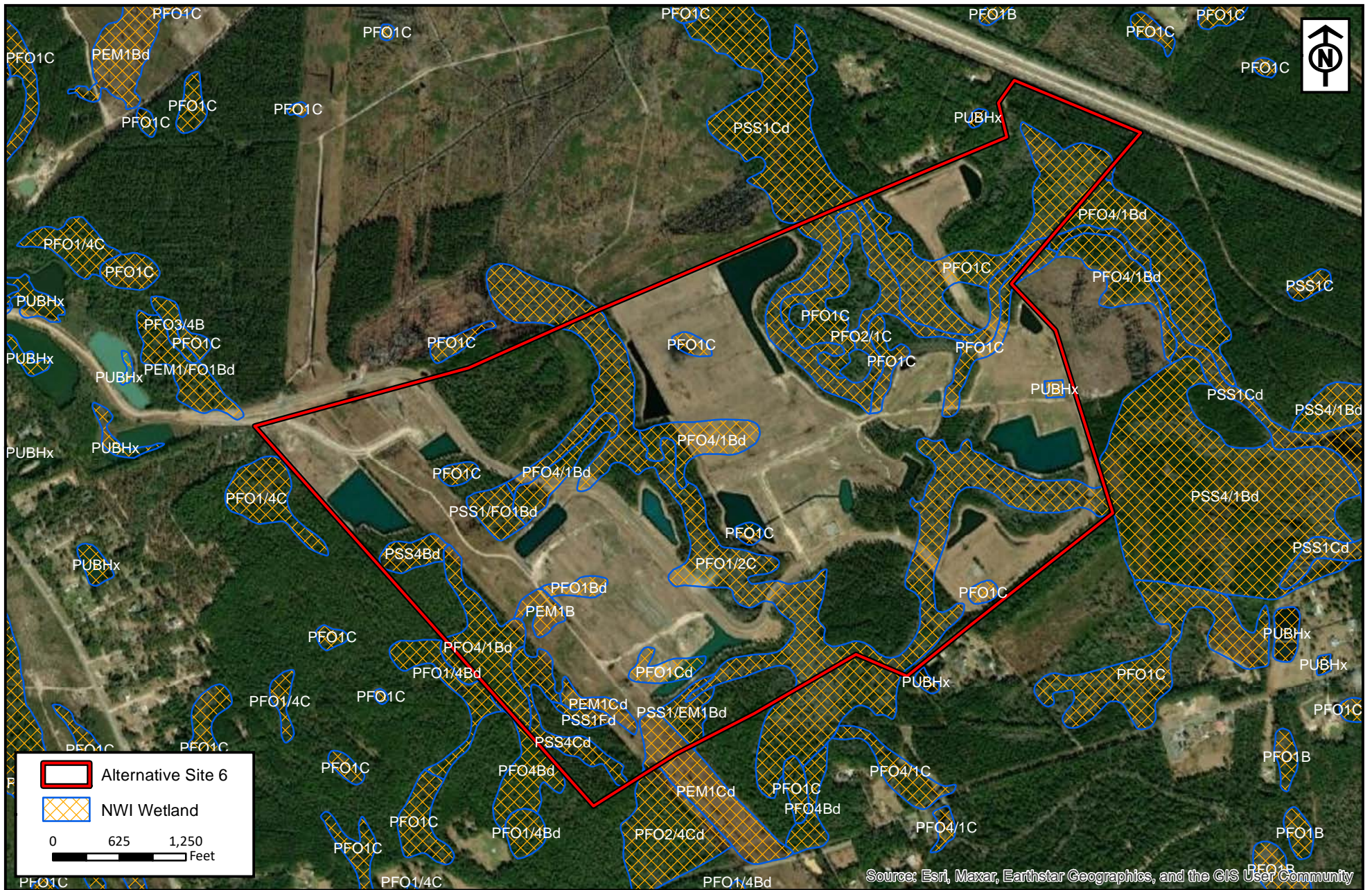
NRCS Soil Map

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	4
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 1,250 feet

Alternative Site 6

Chatham County, Georgia

National Wetlands Inventory


Prepared For: GDEcD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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Savannah, GA 31405
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 Alternative Site 6

0 625 1,250
Feet

RLC Project No.:	14-225.7
Figure No.:	5
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 1,250 feet

Alternative Site 6

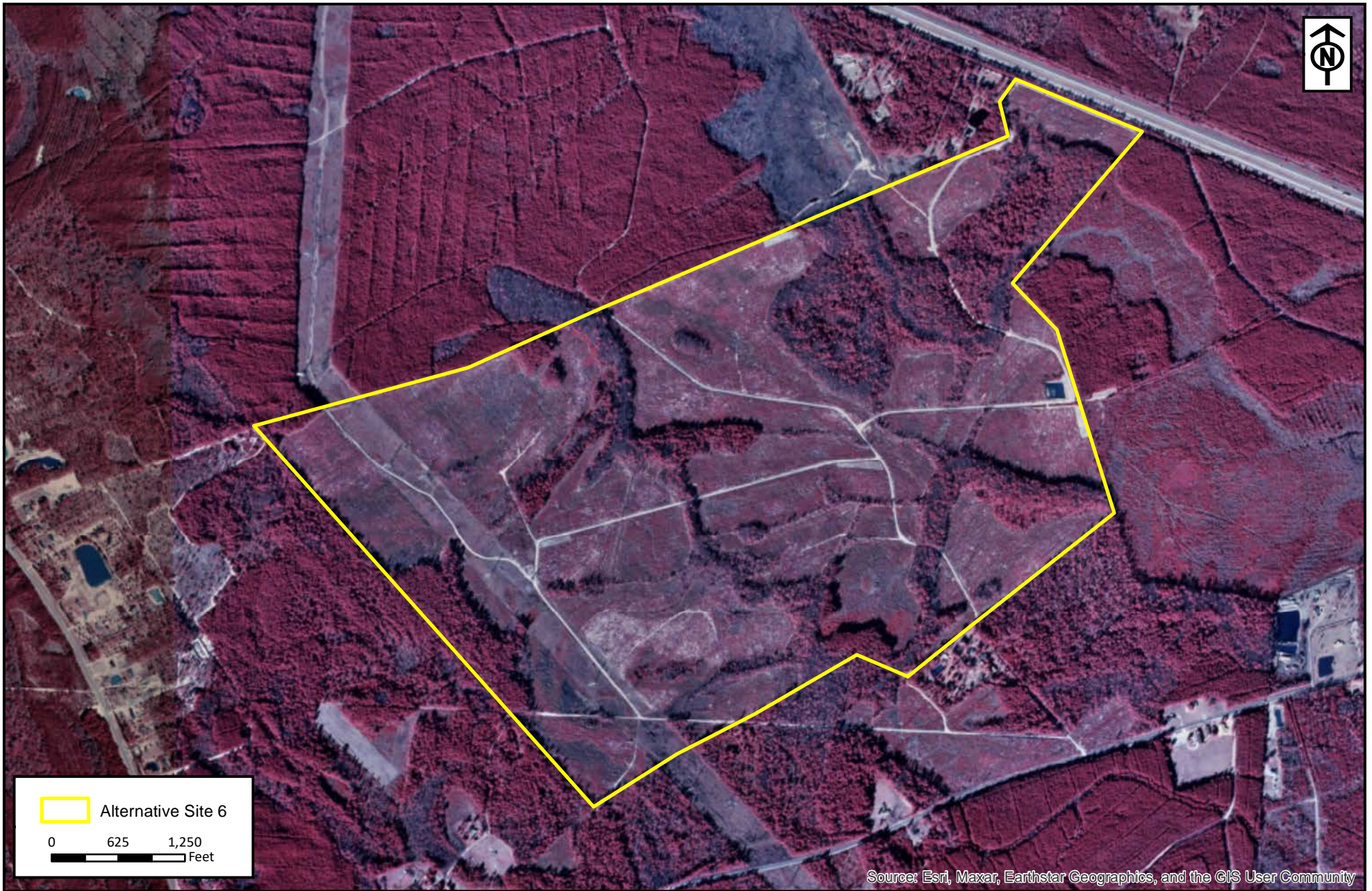
Chatham County, Georgia

2021 Ortho Aerial

Prepared For: GDECd & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

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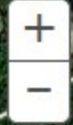
Alternative Site 6
 0 625 1,250
 Feet

RLC Project No.:	14-225.7
Figure No.:	6
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 1,250 feet

Alternative Site 6
 Chatham County, Georgia

1999 Color-Infrared Imagery
 Prepared For: GDECD & Savannah Harbor-
 Interstate 16 Corridor Joint Development Authority

	RESOURCE+LAND CONSULTANTS
	<small>41 Park of Commerce Way, Ste 101 Savannah, GA 31405</small>
	<small>tel 912.443.5896 fax 912.443.5898</small>



Sandy Bluff

Newton

Savannah

Horse Pen Swamp

Horse Pen Swamp

Savannah



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Georgia Ecological Services Field Office
355 East Hancock Avenue
Room 320
Athens, GA 30601-2523
Phone: (706) 613-9493 Fax: (706) 613-6059

In Reply Refer To:

May 14, 2022

Project Code: 2022-0042809

Project Name: Bryan County Mega Site Off-Site Alternative 6

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Thank you for your request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act (MBTA) as amended (16 USC 701-715), Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Bald and Golden Eagle Protection Act (BGEPA) as amended (16 USC 668-668c). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area and to recommend some conservation measures that can be included in your project design if you determine those species or designated critical habitat may be affected by your proposed project.

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency, project proponent, or their designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally listed threatened or endangered fish or wildlife species without the appropriate permit. If you need additional information to assist in your effect determination, please contact the Service.

If you determine that your proposed action may affect federally listed species, please consult with the Service. Through the consultation process, we will analyze information contained in a biological assessment or equivalent document that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a Habitat Conservation Plan) may be necessary to exempt harm or harass federally listed threatened or endangered fish or wildlife species. For more information regarding formal consultation and HCPs, please see the Service's [Section 7 Consultation Library](#) and [Habitat Conservation Plans Library](#) Collections.

Action Area. The scope of federally listed species compliance not only includes direct effects, but also any indirect effects of project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations). The action area is the spatial extent of an action's direct and indirect modifications or impacts to the land, water, or air (50 CFR 402.02). Large projects may have effects to land, water, or air outside the immediate footprint of the project, and these areas should be included as part of the action area. Effects to land, water, or air outside of a project footprint could include things like lighting, dust, smoke, and noise. To obtain a complete list of species, the action area should be uploaded or drawn in IPaC rather than just the project footprint.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. An updated list may be requested through IPaC.

If you determine that your action may affect any federally listed species and would like technical assistance from our office, please send us a complete project review package (refer to Georgia Ecological Services' [Project Planning and Review](#) page for more details), including the following information (reference to these items can be found in 50 CFR§402.13 and 402.14):

1. A description of the proposed action, including any measures intended to avoid, minimize, or offset effects of the action. Consistent with the nature and scope of the proposed action, the description shall provide sufficient detail to assess the effects of the action on listed species and critical habitat, including:
 - The purpose of the action;
 - The duration and timing of the action;
 - The location of the action;
 - The specific components of the action and how they will be carried out;
 - Description of areas to be affected directly or indirectly by the action;
 - Maps, drawings, blueprints, or similar schematics of the action
 2. An updated Official Species List
-

3. Biological Assessments (may include habitat assessments and information on the presence of listed species in the action area);
4. Description of effects of the action on species in the action area and, if relevant, effect determinations for species and critical habitat;
5. Conservation measures and any other available information related to the nature and scope of the proposed action relevant to its effects on listed species or designated critical habitat (examples include: stormwater plans, management plans, erosion and sediment plans). Please see our [Georgia Planning and Consultation Tools](#) page for recommendations.

Please submit all consultation documents via email to gaes_assistance@fws.gov or by using IPaC, uploaded documents, and sharing the project with a specific Georgia Ecological Services staff member. If the project is on-going, documents can also be sent to the Georgia Ecological Services staff member currently working with you on your project. For Georgia Department of Transportation related projects, please work with the Office of Environmental Services ecologist to determine the appropriate USFWS transportation liaison.

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value. We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's [NWI program website](#) (<https://www.fws.gov/program/national-wetlands-inventory>) integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's [Migratory Birds Program](#) (<https://fws.gov/program/migratory-birds>). To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction. It can be found at the Service's [Migratory Birds Conservation Library Collection](#) (<https://fws.gov/library/collections/migratory-bird-conservation-documents>).

Information related to best practices and migratory birds can be found at the Service's [Avoiding and Minimizing Incidental Take of Migratory Birds Library Collection](#) (<https://fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>).

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to “disturb” eagles. Under the BGEPA, the Service may issue limited permits to incidentally “take” eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at the Service's [Bald and Golden Eagle Management Library Collection](https://fws.gov/library/collections/bald-and-golden-eagle-management) (https://fws.gov/library/collections/bald-and-golden-eagle-management).

NATIVE BATS

If your species list includes Indiana bat (*Myotis sodalis*) or northern long-eared bat (*M. septentrionalis*) and the project is expected to impact forested habitat that is appropriate for maternity colonies of these species, forest clearing should occur outside of the period when bats may be present. Federally listed bats could be actively present in forested landscapes from April 1 to October 15 of any year and have non-volant pups from May 15 to July 31 in any year. Non-volant pups are incapable of flight and are vulnerable to disturbance during that time.

Indiana, northern long-eared, and gray (*M. grisescens*) bats are all known to utilize bridges and culverts in Georgia. If your project includes maintenance, construction, or any other modification or demolition to transportation structures, a qualified individual should complete a survey of these structures for bats and submit your findings via the Georgia Bats in Bridges cell phone application, free on Apple and Android devices. Please include these findings in any biological assessment(s) or other documentation that is submitted to our office for technical assistance or consultation.

Additional information on bat avoidance and minimization can be found at Georgia Ecological Services' [Planning and Consultations Tools](#) and [Bat Conservation in Georgia](#) pages.

MONARCH BUTTERFLY

On December 20, 2020, the Service determined that listing the Monarch butterfly (*Danaus plexippus*) under the Endangered Species Act is warranted but precluded at this time by higher priority listing actions. With this finding, the monarch butterfly becomes a candidate for listing. The Service will review its status each year until we are able to begin developing a proposal to list the monarch.

As it is a candidate for listing, the Service welcomes conservation measures for this species. Recommended, and voluntary, conservation measures for projects in Georgia can be found at our [Monarch Conservation in Georgia](#) page.

STATE AGENCY COORDINATION

Additional information that addresses at-risk or high priority natural resources can be found in the State Wildlife Action Plan (https://georgiawildlife.com/WildlifeActionPlan), at Georgia Department of Natural Resources, Wildlife Resources Division Biodiversity Portal (https://

georgiawildlife.com/conservation/species-of-concern), Georgia's Natural, Archaeological, and Historic Resources GIS portal (<https://www.gnahrgis.org/gnahrgis/index.do>), and the [Georgia Ecological Services HUC10 Watershed Guidance](#) page.

Thank you for your concern for endangered and threatened species. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please email gaes_assistance@fws.gov and reference the project county and your Service Project Tracking Number.

This letter constitutes Georgia Ecological Services' general comments under the authority of the Endangered Species Act.

Attachment(s):

- Official Species List
 - Migratory Birds
 - Marine Mammals
 - Wetlands
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Georgia Ecological Services Field Office

355 East Hancock Avenue

Room 320

Athens, GA 30601-2523

(706) 613-9493

Project Summary

Project Code: 2022-0042809
Event Code: None
Project Name: Bryan County Mega Site Off-Site Alternative 6
Project Type: Commercial Development
Project Description: development
Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@32.098754,-81.35504158544306,14z>



Counties: Chatham County, Georgia

Endangered Species Act Species

There is a total of 9 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
West Indian Manatee <i>Trichechus manatus</i> There is final critical habitat for this species. The location of the critical habitat is not available. <i>This species is also protected by the Marine Mammal Protection Act, and may have additional consultation requirements.</i> Species profile: https://ecos.fws.gov/ecp/species/4469	Threatened

Birds

NAME	STATUS
Eastern Black Rail <i>Laterallus jamaicensis ssp. jamaicensis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10477	Threatened
Red-cockaded Woodpecker <i>Picoides borealis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7614	Endangered
Wood Stork <i>Mycteria americana</i> Population: AL, FL, GA, MS, NC, SC No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8477	Threatened

Reptiles

NAME	STATUS
Eastern Indigo Snake <i>Drymarchon corais couperi</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/646	Threatened
Gopher Tortoise <i>Gopherus polyphemus</i> Population: eastern No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6994	Candidate

Amphibians

NAME	STATUS
Frosted Flatwoods Salamander <i>Ambystoma cingulatum</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4981	Threatened

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Pondberry <i>Lindera melissifolia</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1279	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\) list](#) or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Kestrel <i>Falco sparverius paulus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

NAME	BREEDING SEASON
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Swallow-tailed Kite <i>Elanoides forficatus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8938	Breeds Mar 10 to Jun 30

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

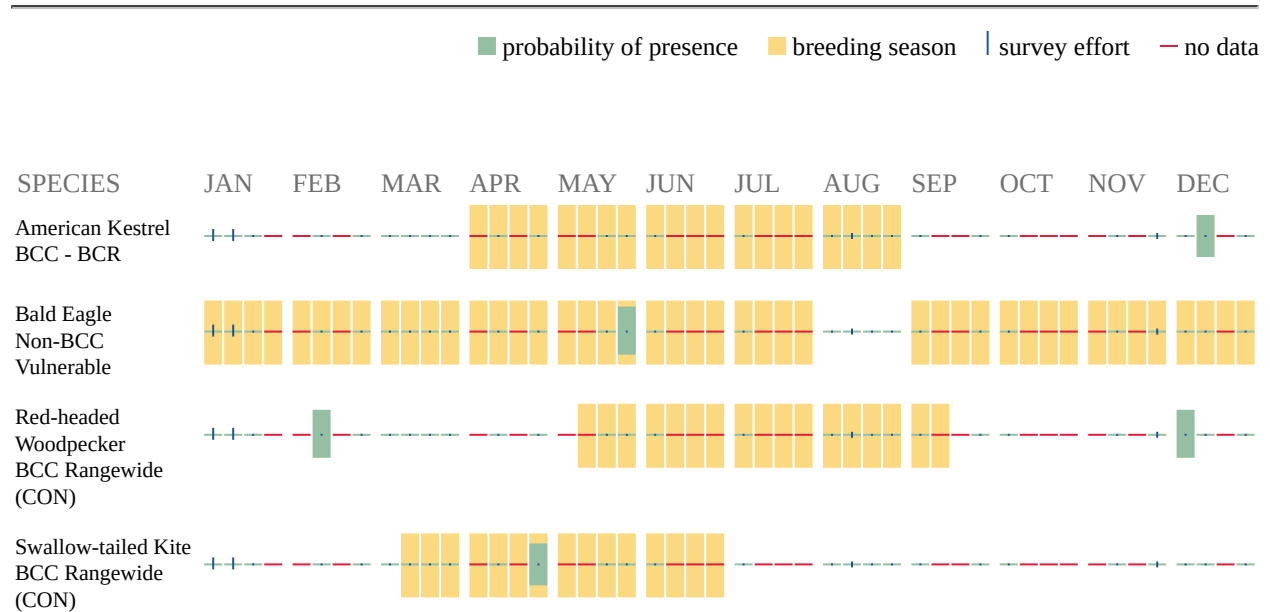
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very

helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of

certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Marine Mammals

Marine mammals are protected under the [Marine Mammal Protection Act](#). Some are also protected under the Endangered Species Act¹ and the Convention on International Trade in Endangered Species of Wild Fauna and Flora².

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries³ [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the [Marine Mammals](#) page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

-
1. The [Endangered Species Act](#) (ESA) of 1973.
 2. The [Convention on International Trade in Endangered Species of Wild Fauna and Flora](#) (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
 3. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

NAME

West Indian Manatee *Trichechus manatus*

Species profile: <https://ecos.fws.gov/ecp/species/4469>

Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT [HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML](https://www.fws.gov/wetlands/data/mapper.html) OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

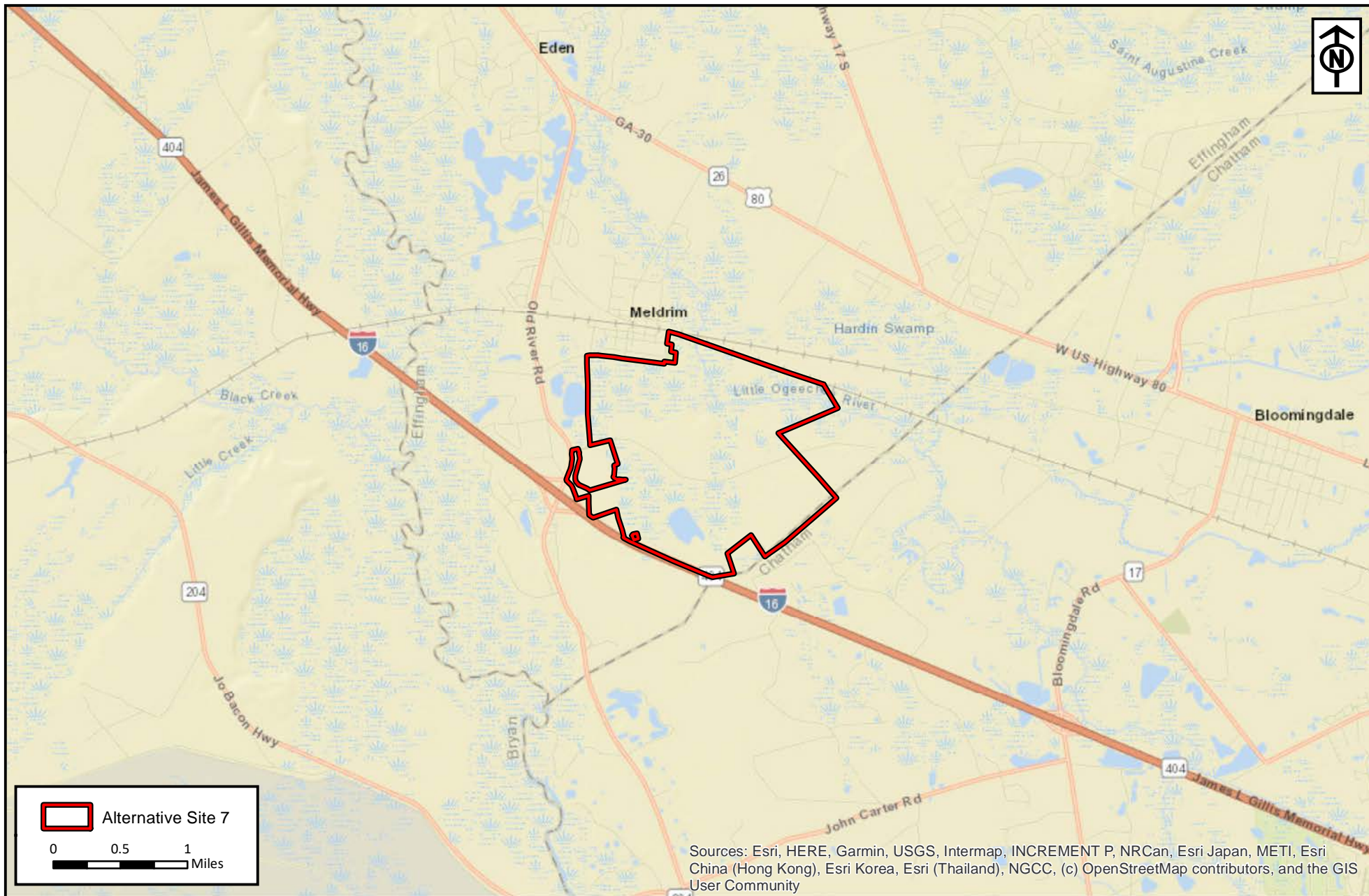
IPaC User Contact Information

Agency: RLC
Name: alton brown
Address: 41 park of commerce way, suite 303
Address Line 2: suite 101
City: Savannah
State: GA
Zip: 31405
Email: abrown@rlandc.com
Phone: 9124435896



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CONSULTANTS

Off-Site Alternative 7



RLC Project No.:	14-225.7
Figure No.:	1
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 1 miles

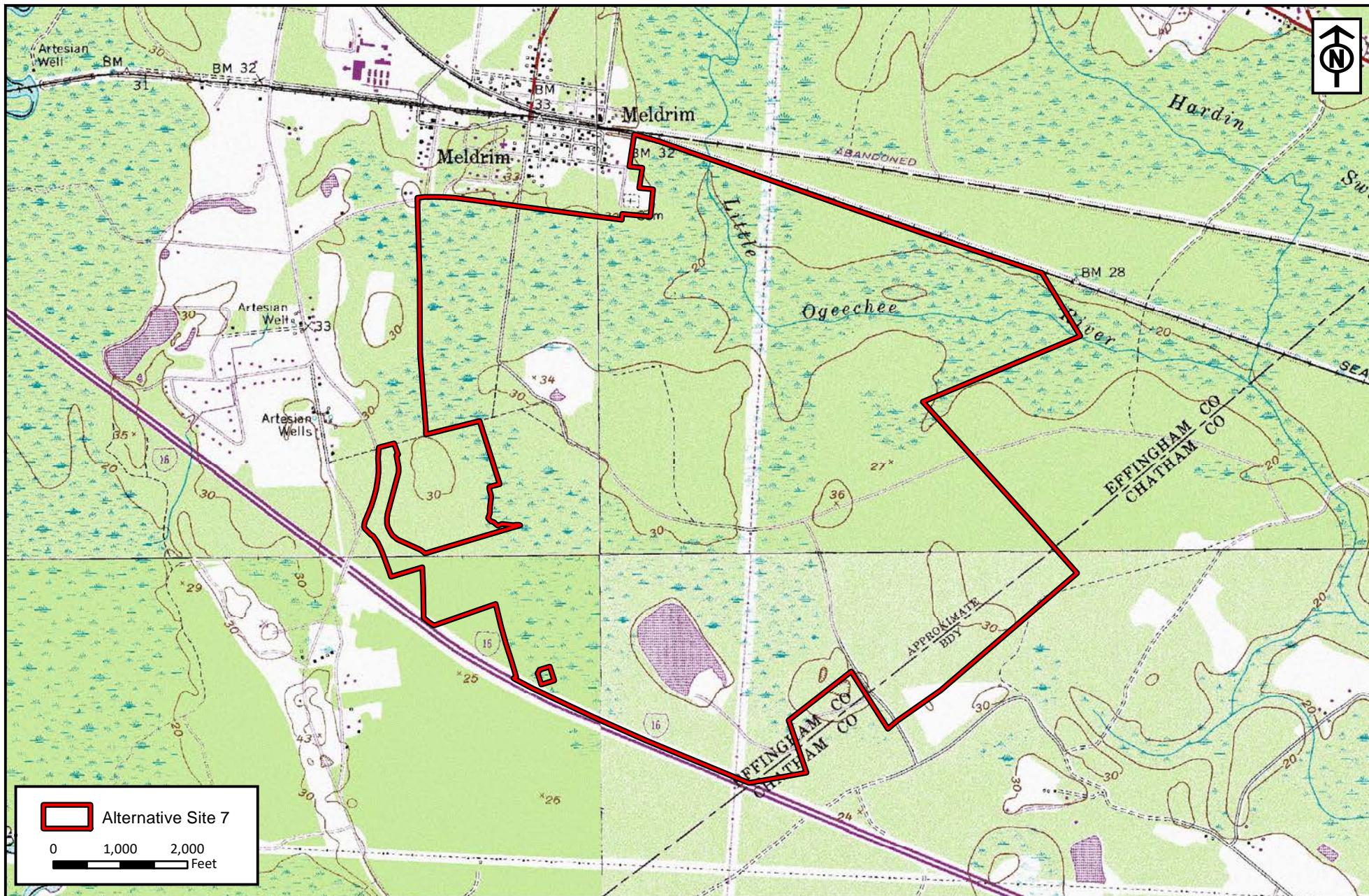
Alternative Site 7

Effingham County, Georgia

Project Location Map

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

RLC	RESOURCE+LAND CONSULTANTS
	41 Park of Commerce Way, Ste 101 Savannah, GA 31405
	tel 912.443.5896 fax 912.443.5898



RLC Project No.: 14-225.7
 Figure No.: 2
 Prepared By: JP
 Sketch Date: 5/11/2022
 Map Scale : 1 inch = 2,000 feet

Alternative Site 7

Effingham County, Georgia

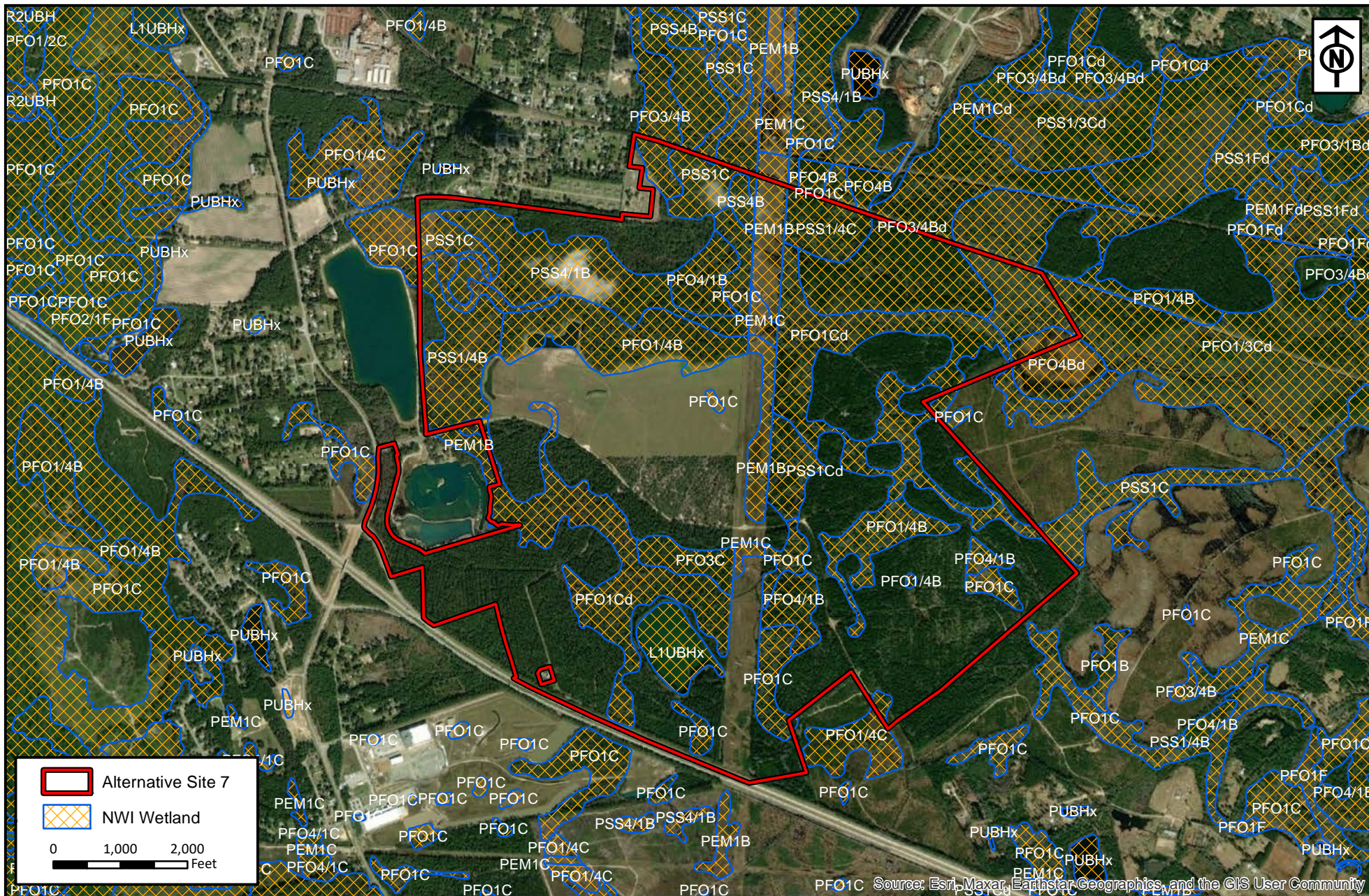
USGS Topographic Map

Prepared For: GDEC & Savannah Harbor-
 Interstate 16 Corridor Joint Development Authority



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 Savannah, GA 31405
 tel 912.443.5896 fax 912.443.5898



RLC Project No.:	14-225.7
Figure No.:	4
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,000 feet

Alternative Site 7

Effingham County, Georgia

National Wetlands Inventory


Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority



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Savannah, GA 31405
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 Alternative Site 7

0 1,000 2,000
Feet

RLC Project No.:	14-225.7
Figure No.:	5
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,000 feet

Alternative Site 7

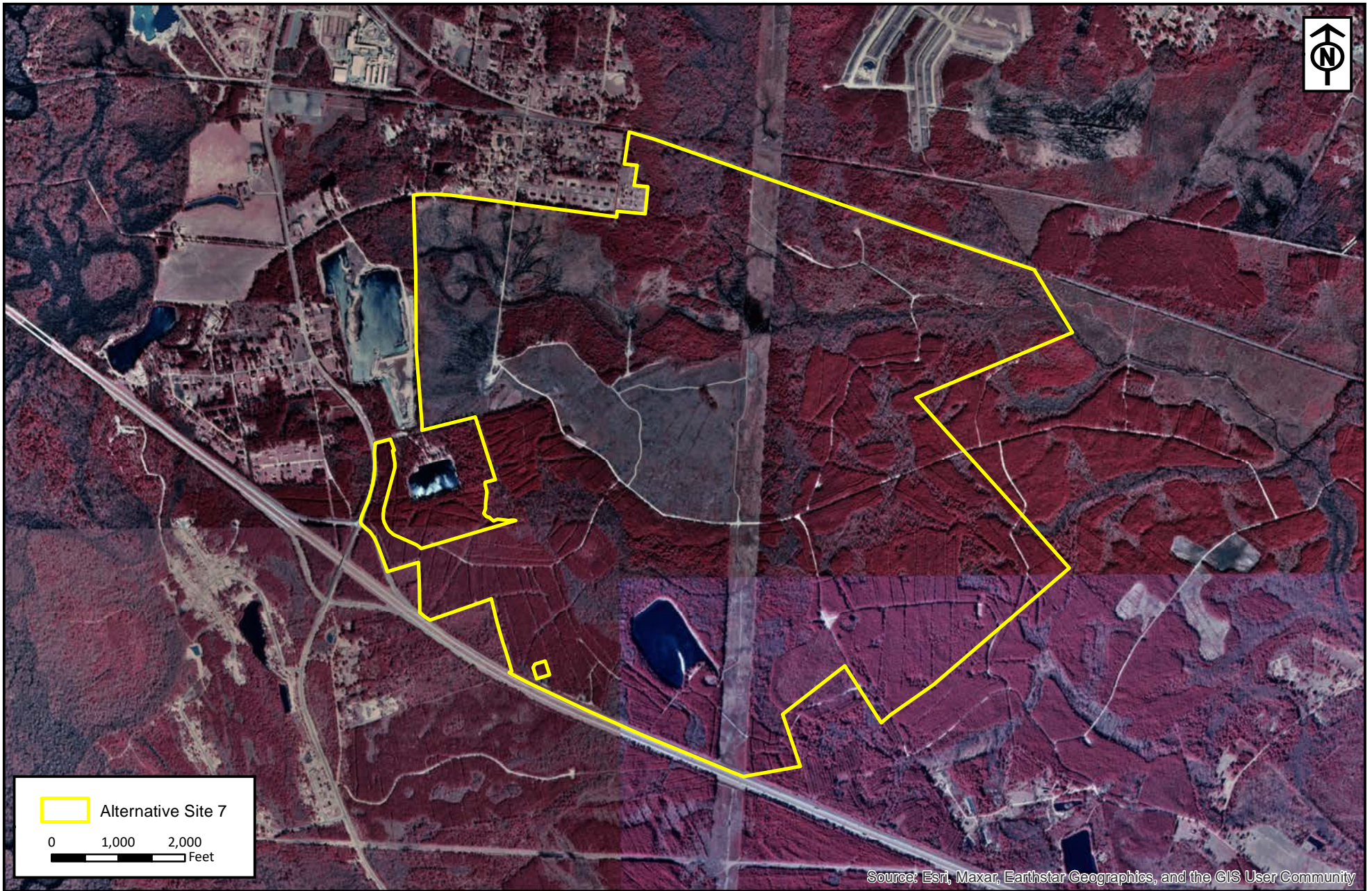
Effingham County, Georgia


2020 Ortho Aerial

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



 Alternative Site 7

0 1,000 2,000
Feet

RLC Project No.:	14-225.7
Figure No.:	6
Prepared By:	JP
Sketch Date:	5/11/2022
Map Scale :	1 inch = 2,000 feet

Alternative Site 7

Effingham County, Georgia

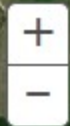
1999 Color-Infrared Imagery

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

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41 Park of Commerce Way, Ste 101
Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898

GNAHRGIS Map



Meldrim

Hardin Swamp

Little Ogeechee River

Effingham
Chatham

Effingham

Effingham
Chatham



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Georgia Ecological Services Field Office
355 East Hancock Avenue
Room 320
Athens, GA 30601-2523
Phone: (706) 613-9493 Fax: (706) 613-6059

In Reply Refer To:

May 14, 2022

Project Code: 2022-0042811

Project Name: Bryan County Mega Site Off-Site Alternative 7

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Thank you for your request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act (MBTA) as amended (16 USC 701-715), Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Bald and Golden Eagle Protection Act (BGEPA) as amended (16 USC 668-668c). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area and to recommend some conservation measures that can be included in your project design if you determine those species or designated critical habitat may be affected by your proposed project.

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency, project proponent, or their designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally listed threatened or endangered fish or wildlife species without the appropriate permit. If you need additional information to assist in your effect determination, please contact the Service.

If you determine that your proposed action may affect federally listed species, please consult with the Service. Through the consultation process, we will analyze information contained in a biological assessment or equivalent document that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a Habitat Conservation Plan) may be necessary to exempt harm or harass federally listed threatened or endangered fish or wildlife species. For more information regarding formal consultation and HCPs, please see the Service's [Section 7 Consultation Library](#) and [Habitat Conservation Plans Library](#) Collections.

Action Area. The scope of federally listed species compliance not only includes direct effects, but also any indirect effects of project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations). The action area is the spatial extent of an action's direct and indirect modifications or impacts to the land, water, or air (50 CFR 402.02). Large projects may have effects to land, water, or air outside the immediate footprint of the project, and these areas should be included as part of the action area. Effects to land, water, or air outside of a project footprint could include things like lighting, dust, smoke, and noise. To obtain a complete list of species, the action area should be uploaded or drawn in IPaC rather than just the project footprint.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. An updated list may be requested through IPaC.

If you determine that your action may affect any federally listed species and would like technical assistance from our office, please send us a complete project review package (refer to Georgia Ecological Services' [Project Planning and Review](#) page for more details), including the following information (reference to these items can be found in 50 CFR§402.13 and 402.14):

1. A description of the proposed action, including any measures intended to avoid, minimize, or offset effects of the action. Consistent with the nature and scope of the proposed action, the description shall provide sufficient detail to assess the effects of the action on listed species and critical habitat, including:
 - The purpose of the action;
 - The duration and timing of the action;
 - The location of the action;
 - The specific components of the action and how they will be carried out;
 - Description of areas to be affected directly or indirectly by the action;
 - Maps, drawings, blueprints, or similar schematics of the action
 2. An updated Official Species List
-

3. Biological Assessments (may include habitat assessments and information on the presence of listed species in the action area);
4. Description of effects of the action on species in the action area and, if relevant, effect determinations for species and critical habitat;
5. Conservation measures and any other available information related to the nature and scope of the proposed action relevant to its effects on listed species or designated critical habitat (examples include: stormwater plans, management plans, erosion and sediment plans). Please see our [Georgia Planning and Consultation Tools](#) page for recommendations.

Please submit all consultation documents via email to gaes_assistance@fws.gov or by using IPaC, uploaded documents, and sharing the project with a specific Georgia Ecological Services staff member. If the project is on-going, documents can also be sent to the Georgia Ecological Services staff member currently working with you on your project. For Georgia Department of Transportation related projects, please work with the Office of Environmental Services ecologist to determine the appropriate USFWS transportation liaison.

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value. We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's [NWI program website](#) (<https://www.fws.gov/program/national-wetlands-inventory>) integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's [Migratory Birds Program](#) (<https://fws.gov/program/migratory-birds>). To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction. It can be found at the Service's [Migratory Birds Conservation Library Collection](#) (<https://fws.gov/library/collections/migratory-bird-conservation-documents>).

Information related to best practices and migratory birds can be found at the Service's [Avoiding and Minimizing Incidental Take of Migratory Birds Library Collection](#) (<https://fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>).

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to “disturb” eagles. Under the BGEPA, the Service may issue limited permits to incidentally “take” eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at the Service's [Bald and Golden Eagle Management Library Collection](https://fws.gov/library/collections/bald-and-golden-eagle-management) (<https://fws.gov/library/collections/bald-and-golden-eagle-management>).

NATIVE BATS

If your species list includes Indiana bat (*Myotis sodalis*) or northern long-eared bat (*M. septentrionalis*) and the project is expected to impact forested habitat that is appropriate for maternity colonies of these species, forest clearing should occur outside of the period when bats may be present. Federally listed bats could be actively present in forested landscapes from April 1 to October 15 of any year and have non-volant pups from May 15 to July 31 in any year. Non-volant pups are incapable of flight and are vulnerable to disturbance during that time.

Indiana, northern long-eared, and gray (*M. grisescens*) bats are all known to utilize bridges and culverts in Georgia. If your project includes maintenance, construction, or any other modification or demolition to transportation structures, a qualified individual should complete a survey of these structures for bats and submit your findings via the Georgia Bats in Bridges cell phone application, free on Apple and Android devices. Please include these findings in any biological assessment(s) or other documentation that is submitted to our office for technical assistance or consultation.

Additional information on bat avoidance and minimization can be found at Georgia Ecological Services' [Planning and Consultations Tools](#) and [Bat Conservation in Georgia](#) pages.

MONARCH BUTTERFLY

On December 20, 2020, the Service determined that listing the Monarch butterfly (*Danaus plexippus*) under the Endangered Species Act is warranted but precluded at this time by higher priority listing actions. With this finding, the monarch butterfly becomes a candidate for listing. The Service will review its status each year until we are able to begin developing a proposal to list the monarch.

As it is a candidate for listing, the Service welcomes conservation measures for this species. Recommended, and voluntary, conservation measures for projects in Georgia can be found at our [Monarch Conservation in Georgia](#) page.

STATE AGENCY COORDINATION

Additional information that addresses at-risk or high priority natural resources can be found in the State Wildlife Action Plan (<https://georgiawildlife.com/WildlifeActionPlan>), at Georgia Department of Natural Resources, Wildlife Resources Division Biodiversity Portal (<https://>

georgiawildlife.com/conservation/species-of-concern), Georgia's Natural, Archaeological, and Historic Resources GIS portal (<https://www.gnahrgis.org/gnahrgis/index.do>), and the [Georgia Ecological Services HUC10 Watershed Guidance](#) page.

Thank you for your concern for endangered and threatened species. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please email gaes_assistance@fws.gov and reference the project county and your Service Project Tracking Number.

This letter constitutes Georgia Ecological Services' general comments under the authority of the Endangered Species Act.

Attachment(s):

- Official Species List
 - Migratory Birds
 - Wetlands
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Georgia Ecological Services Field Office

355 East Hancock Avenue

Room 320

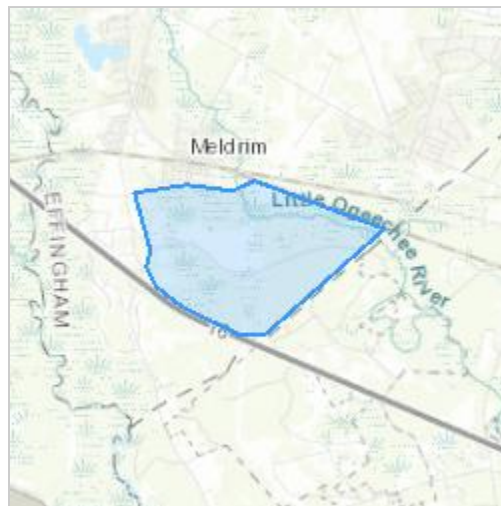
Athens, GA 30601-2523

(706) 613-9493

Project Summary

Project Code: 2022-0042811
Event Code: None
Project Name: Bryan County Mega Site Off-Site Alternative 7
Project Type: Commercial Development
Project Description: development
Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@32.128051400000004,-81.36687331717667,14z>



Counties: Effingham County, Georgia

Endangered Species Act Species

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Reptiles

NAME	STATUS
Eastern Indigo Snake <i>Drymarchon corais couperi</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/646	Threatened
Gopher Tortoise <i>Gopherus polyphemus</i> Population: eastern No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6994	Candidate

Amphibians

NAME	STATUS
Frosted Flatwoods Salamander <i>Ambystoma cingulatum</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4981	Threatened

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Pondberry <i>Lindera melissifolia</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1279	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\) list](#) or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Kestrel <i>Falco sparverius paulus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

NAME	BREEDING SEASON
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Swallow-tailed Kite <i>Elanoides forficatus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8938	Breeds Mar 10 to Jun 30

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

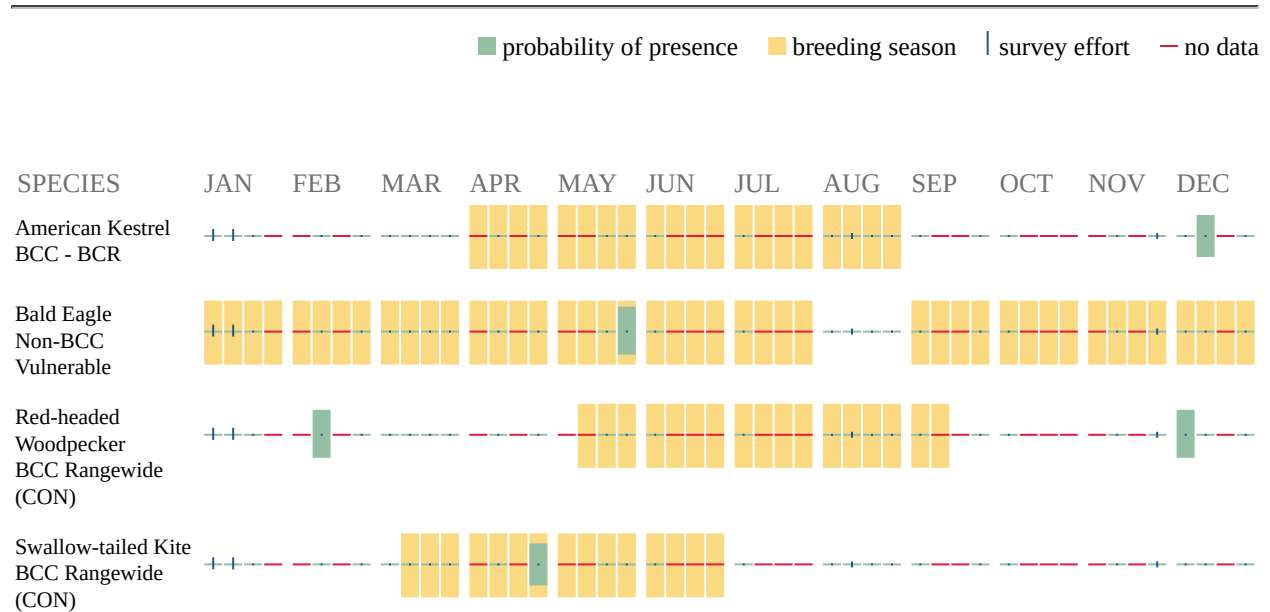
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very

helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of

certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT [HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML](https://www.fws.gov/wetlands/data/mapper.html) OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

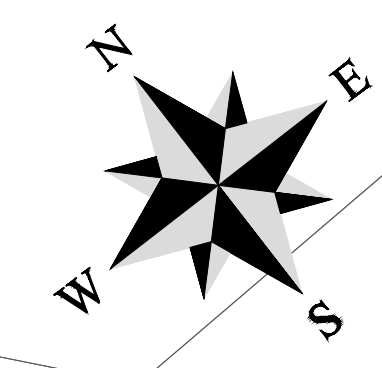
IPaC User Contact Information

Agency: RLC
Name: alton brown
Address: 41 park of commerce way, suite 303
Address Line 2: suite 101
City: Savannah
State: GA
Zip: 31405
Email: abrown@rlandc.com
Phone: 9124435896



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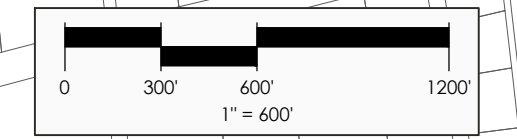
APPENDIX E: On-Site Configurations



ON SITE CONFIGURATION #1
TOTAL PROJECT AREA: 2,541.25 AC.

- NON-JURISDICTIONAL WETLAND IMPACT - ± 29.32 AC.
- JURISDICTION WETLAND IMPACTS - ± 418.64 AC.
- TOTAL WETLAND IMPACTS - ± 447.96 AC.

- FRESH WATER IMPACT - ± 6.51 AC.
- STREAM IMPACTS - ± 763 LF.

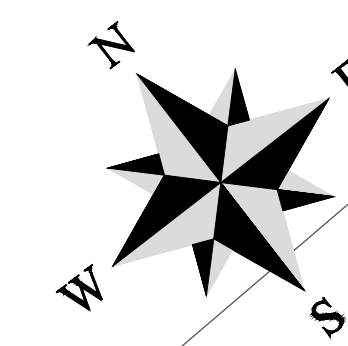


THOMAS & HUTTON
 50 PARK OF COMMERCE WAY • PO BOX 2727
 SAVANNAH, GA 31402-2727 • 912.234.5300
 www.thomasandhutton.com

ON-SITE CONFIGURATION #1
BRYAN COUNTY, GEORGIA
 MAY 16, 2022

Savannah Harbor-Interstate 16 Corridor
Joint Development Authority
 BRYAN • BULLOCH • CHATHAM • EFFINGHAM

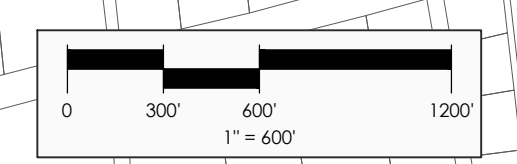
This illustrates a general plan of the development which is for discussion purposes only. Does not limit or bind the owner and is subject to change and position locations are for illustrative purposes only and are subject to an accurate survey and property description. The producer assumes no legal responsibility for the appreciation or depreciation of any premises, commercial or otherwise, by reason of their inclusion or exclusion from this map. The information contained in this map is subject to change with out notice and is for illustrative purposes only. Unit counts shown above are approximate and may change. Values were provided by outside sources and have not been



ON SITE CONFIGURATION #2
TOTAL PROJECT AREA: 2,541.25 AC.

- NON-JURISDICTIONAL WETLAND IMPACT - : 29.32 AC.
- JURISDICTION WETLAND IMPACTS - : 249.14 AC.
- TOTAL WETLAND IMPACTS - : 278.46 AC.

- FRESH WATER IMPACT - : 6.31 AC.
- STREAM IMPACTS - : 763 LF.



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ONSITE CONFIGURATION #2
BRYAN COUNTY, GEORGIA
 MAY 11, 2022

Savannah Harbor-Interstate 16 Corridor
Joint Development Authority
 BRYAN • BULLOCH • CHATHAM • EFFINGHAM

This map illustrates a general plan of the development which is for discussion purposes only. Does not limit or bind the owner and is subject to change and position locations are for illustrative purposes only and are subject to an accurate survey and property description. The producer assumes no legal responsibility for the appreciation or depreciation of any premises, commercial or otherwise, by reason of their inclusion or exclusion from this map. The information contained in this map is subject to change with out notice and is for illustrative purposes only. Unit counts shown above are approximate and may change. Values were provided by outside sources and have not been



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APPENDIX F: Compensatory Mitigation Calculations

Impact Type	Habitat Type	Acreage	Functional Value	Legacy Credit Requirement
Road	Slope	0.39	Moderate	2.34
Road	Slope	0.95	Moderate	5.7
Site	Depressional	1.65	Moderate	9.9
Site	Slope	7.9	Moderate	47.4
Site	Depressional	0.82	Moderate	4.92
Site	Slope	7.73	Moderate	46.38
Site	Depressional	1.07	Moderate	6.42
Site	Depressional	1.72	Moderate	10.32
Site	Slope	119.34	Moderate	716.04
Site	Depressional	5.91	Moderate	35.46
Site	Depressional	2.09	Moderate	12.54
Site	Depressional	0.32	Moderate	1.92
Site	Depressional	0.83	Moderate	4.98
Site	Slope	6.4	Moderate	38.4
Site	Slope	19.27	Moderate	115.62
Site	Depressional	0.37	Moderate	2.22
Site	Slope	1.41	Moderate	8.46
Site	Slope	5.53	Moderate	33.18
Site	Slope	7.99	Moderate	47.94
Site	Slope	2.39	Moderate	14.34
Rail	Slope	11.61	Moderate	69.66
Rail	Slope	5.31	Moderate	31.86
Rail	Slope	0.29	Moderate	1.74
Rail	Slope	0.52	Moderate	3.12
Rail	Slope	0.22	Moderate	1.32
Rail	Slope	0.69	Moderate	4.14
Rail	Slope	0.19	Moderate	1.14
Rail	Slope	8.45	Moderate	50.7
	Total	221.36		1328.24

Impact Type	Habitat Type	Linear Feet	Functional Value	Legacy Credit Requirement
Site	Intermittent	763	Moderate	4,120.20

NON-RIVERINE WETLAND QUALITATIVE ASSESSMENT

Project Name:	Bryan County Mega Site
Impact Wetland Name:	Site Impacts: C,E,H,O,O2,P,R,S,T
Wetland Type:	Slope
WAA Center Coordinates:	N/A
Date:	5/13/2022

Water Storage -1

Answer	Questions
Yes	Are there above grade fills or structures obstructing hydrologic flows into or out of the wetland, or are there drainage structures, ditches, or man-made impoundments within 100 feet of the assessment area and within the catchment that are hydrologically affecting the wetland? (Y/N)
No	Is the contributing drainage basin at least 50 percent forested? (Y/N)
FUNCTION SCORE	Low

BioGeoChemical Cycling - 2

Answer	Questions
Yes	Is there large woody debris (LWD) in the wetland? (Y/N)
Yes	Has the vegetative community been adversely altered within the last 20 years? (Y/N)
FUNCTION SCORE	Moderate

Maintain Characteristic Wetland Community - 3

Answer	Questions
Yes	Has the vegetative community been adversely altered within the last 20 years? (Y/N)
No	Is there greater than 10 percent invasive cover (i.e., cumulative absolute cover across all strata)? (Y/N)
FUNCTION SCORE	Moderate

Maintain Faunal Habitat - 4

Answer	Questions
Yes	Has the vegetative community been adversely altered within the last 20 years? (Y/N)
Yes	Is there woody debris in the wetland? (Y/N)
No	Is the contributing drainage basin at least 50 percent forested? (Y/N)
FUNCTION SCORE	Low

WETLAND QUALITATIVE FUNCTIONAL CAPACITY SCORE	Moderate
--	-----------------

Legend

Green Cell = User must manually input information.
Orange Cells = User must select the choice from the drop-down list.
Grey Cells = The calculation of these cells is automated.
Dark Grey Cells = These cells do not require input. The corresponding value is populated from the user input to a previous question.

NON-RIVERINE WETLAND QUALITATIVE ASSESSMENT

Project Name:	Bryan County Mega Site
Impact Wetland Name:	Site Impacts: B,D,F,G,I,J,K,L,Q
Wetland Type:	Depression
WAA Center Coordinates:	N/A
Date:	5/13/2022

Water Storage -1

Answer	Questions
Yes	Are there above grade fills or structures obstructing hydrologic flows into or out of the wetland, or are there drainage structures, ditches, or man-made impoundments within 100 feet of the assessment area and within the catchment that are hydrologically affecting the wetland? (Y/N)
No	Is the contributing drainage basin at least 50 percent forested? (Y/N)
FUNCTION SCORE	Low

BioGeoChemical Cycling - 2

Answer	Questions
Yes	Is there large woody debris (LWD) in the wetland? (Y/N)
Yes	Has the vegetative community been adversely altered within the last 20 years? (Y/N)
FUNCTION SCORE	Moderate

Maintain Characteristic Wetland Community - 3

Answer	Questions
Yes	Has the vegetative community been adversely altered within the last 20 years? (Y/N)
No	Is there greater than 10 percent invasive cover (i.e., cumulative absolute cover across all strata)? (Y/N)
FUNCTION SCORE	Moderate

Maintain Faunal Habitat - 4

Answer	Questions
Yes	Has the vegetative community been adversely altered within the last 20 years? (Y/N)
Yes	Is there woody debris in the wetland? (Y/N)
No	Is the contributing drainage basin at least 50 percent forested? (Y/N)
FUNCTION SCORE	Low

WETLAND QUALITATIVE FUNCTIONAL CAPACITY SCORE	Moderate
--	-----------------

Legend

Green Cell = User must manually input information.
Orange Cells = User must select the choice from the drop-down list.
Grey Cells = The calculation of these cells is automated.
Dark Grey Cells = These cells do not require input. The corresponding value is populated from the user input to a previous question.

NON-RIVERINE WETLAND QUALITATIVE ASSESSMENT

Project Name:	Bryan County Mega Site
Impact Wetland Name:	Road Impacts: A,B
Wetland Type:	Slope
WAA Center Coordinates:	N/A
Date:	5/13/2022

Water Storage -1

Answer	Questions
Yes	Are there above grade fills or structures obstructing hydrologic flows into or out of the wetland, or are there drainage structures, ditches, or man-made impoundments within 100 feet of the assessment area and within the catchment that are hydrologically affecting the wetland? (Y/N)
No	Is the contributing drainage basin at least 50 percent forested? (Y/N)
FUNCTION SCORE	Low

BioGeoChemical Cycling - 2

Answer	Questions
Yes	Is there large woody debris (LWD) in the wetland? (Y/N)
Yes	Has the vegetative community been adversely altered within the last 20 years? (Y/N)
FUNCTION SCORE	Moderate

Maintain Characteristic Wetland Community - 3

Answer	Questions
Yes	Has the vegetative community been adversely altered within the last 20 years? (Y/N)
No	Is there greater than 10 percent invasive cover (i.e., cumulative absolute cover across all strata)? (Y/N)
FUNCTION SCORE	Moderate

Maintain Faunal Habitat - 4

Answer	Questions
Yes	Has the vegetative community been adversely altered within the last 20 years? (Y/N)
Yes	Is there woody debris in the wetland? (Y/N)
No	Is the contributing drainage basin at least 50 percent forested? (Y/N)
FUNCTION SCORE	Low

WETLAND QUALITATIVE FUNCTIONAL CAPACITY SCORE

Moderate

Legend

- Green Cell = User must manually input information.
- Orange Cells = User must select the choice from the drop-down list.
- Grey Cells = The calculation of these cells is automated.
- Dark Grey Cells = These cells do not require input. The corresponding value is populated from the user input to a previous question.

NON-RIVERINE WETLAND QUALITATIVE ASSESSMENT

Project Name:	Bryan County Mega Site
Impact Wetland Name:	Rail Impacts: U,V,X,T
Wetland Type:	Slope
WAA Center Coordinates:	N/A
Date:	5/13/2022

Water Storage -1

Answer	Questions
Yes	Are there above grade fills or structures obstructing hydrologic flows into or out of the wetland, or are there drainage structures, ditches, or man-made impoundments within 100 feet of the assessment area and within the catchment that are hydrologically affecting the wetland? (Y/N)
No	Is the contributing drainage basin at least 50 percent forested? (Y/N)
FUNCTION SCORE	Low

BioGeoChemical Cycling - 2

Answer	Questions
Yes	Is there large woody debris (LWD) in the wetland? (Y/N)
Yes	Has the vegetative community been adversely altered within the last 20 years? (Y/N)
FUNCTION SCORE	Moderate

Maintain Characteristic Wetland Community - 3

Answer	Questions
Yes	Has the vegetative community been adversely altered within the last 20 years? (Y/N)
No	Is there greater than 10 percent invasive cover (i.e., cumulative absolute cover across all strata)? (Y/N)
FUNCTION SCORE	Moderate

Maintain Faunal Habitat - 4

Answer	Questions
Yes	Has the vegetative community been adversely altered within the last 20 years? (Y/N)
Yes	Is there woody debris in the wetland? (Y/N)
No	Is the contributing drainage basin at least 50 percent forested? (Y/N)
FUNCTION SCORE	Low

WETLAND QUALITATIVE FUNCTIONAL CAPACITY SCORE	Moderate
--	-----------------

Legend

Green Cell = User must manually input information.
Orange Cells = User must select the choice from the drop-down list.
Grey Cells = The calculation of these cells is automated.
Dark Grey Cells = These cells do not require input. The corresponding value is populated from the user input to a previous question.

Qualitative Worksheet Summary For Wetland Adverse Impacts

Worksheet Number	Name of Wetland	Wetland Type	Acres of Impact (ac.)	Impact Duration	2018 Credits	Legacy Credits
1	Road Impact A, B	Slope Wetlands	1.34	Permanent/Reoccurring	1.01	8.08
2	Site Depressional Wet B, D, F, G, I, J, K, L, Q	Depressional/Flat Wetlands	14.78	Permanent/Reoccurring	11.09	88.72
3	Site Slope Wetlands C, E, H, O, P, R, S, T, O2	Slope Wetlands	177.96	Permanent/Reoccurring	133.47	1067.76
4	Rail Slope Wetlands U,V, X, V, T	Slope Wetlands	27.28	Permanent/Reoccurring	20.46	163.68
5			0.00	Choose Duration	Credits Owed	Legacy Credits Owed
6			0.00	Choose Duration	Credits Owed	Legacy Credits Owed
7			0.00	Choose Duration	Credits Owed	Legacy Credits Owed
8			0.00	Choose Duration	Credits Owed	Legacy Credits Owed
9			0.00	Choose Duration	Credits Owed	Legacy Credits Owed
10			0.00	Choose Duration	Credits Owed	Legacy Credits Owed

Summary of Credits Owed

Wetland Type	Acres of Impact (ac.)	2018 Credits	Legacy Credits
Freshwater Tidal Wetlands	0.00	0.00	0.00
Saltwater Tidal Wetlands	0.00	0.00	0.00
Riverine/Lacustrine Fringe Wetlands	0.00	0.00	0.00
Slope Wetlands	206.58	154.94	1239.52
Depressional/Flat Wetlands	14.78	11.09	88.72
Open Water/Ditch/Canal	0.00	0.00	0.00

Worksheet 1: Qualitative Worksheet for Wetland Adverse Impacts

Project Name:	Bryan County Mega Site
Impact Wetland Name:	Road Impact A, B
Acres of Impact (Acres):	1.34
Wetland Type:	Slope Wetlands
Date:	May 13, 2022

Impact Factors

	Index Description	Index Value
1. Wetland Qualitative Functional Capacity Score (<u>WQFC</u>)	Moderate	0.75
2. Impact Category Description (<u>Impact Category</u>)	Discharge of Fill	1.00
3. Product of WQFC and Impact (<u>WQFC Impact</u>) =		0.75
4. Duration of Impact (<u>Duration</u>)	Permanent/Reoccurring	1.00
5. Product of WQFC Impact and Duration (<u>Total WQFC Impact</u>) =		0.75
6. Product of Total WQFC Impact and Acres (<u>Total 2018 Wetland Credits Owed</u>) =		1.01
7. Conversion of Total 2018 Wetland Credits to Legacy Credits (<u>Legacy Wetland Credits Owed</u>) =		8.08

Legend

- Green Cells = User must manually input information.
- Orange Cells = User must select the index choice from the drop-down list.
- Grey Cells = The calculation of these cells is automated.

Worksheet 2: Qualitative Worksheet for Wetland Adverse Impacts

Project Name:	Bryan County Mega Site
Impact Wetland Name:	Site Depressional Wet B, D, F, G, I, J, K, L, Q
Acres of Impact (Acres):	14.78
Wetland Type:	Depressional/Flat Wetlands
Date:	May 13, 2022

Impact Factors

	Index Description	Index Value
1. Wetland Qualitative Functional Capacity Score (<u>WQFC</u>)	Moderate	0.75
2. Impact Category Description (<u>Impact Category</u>)	Discharge of Fill	1.00
3. Product of WQFC and Impact (<u>WQFC Impact</u>) =		0.75
4. Duration of Impact (<u>Duration</u>)	Permanent/Reoccurring	1.00
5. Product of WQFC Impact and Duration (<u>Total WQFC Impact</u>) =		0.75
6. Product of Total WQFC Impact and Acres (<u>Total 2018 Wetland Credits Owed</u>) =		11.09
7. Conversion of Total 2018 Wetland Credits to Legacy Credits (<u>Legacy Wetland Credits Owed</u>) =		88.72

Legend

- Green Cells = User must manually input information.
- Orange Cells = User must select the index choice from the drop-down list.
- Grey Cells = The calculation of these cells is automated.

Worksheet 3: Qualitative Worksheet for Wetland Adverse Impacts

Project Name:	Bryan County Mega Site
Impact Wetland Name:	Site Slope Wetlands C, E, H, O, P, R, S, T, O2
Acres of Impact (Acres):	177.96
Wetland Type:	Slope Wetlands
Date:	May 13, 2022

Impact Factors

	Index Description	Index Value
1. Wetland Qualitative Functional Capacity Score (<u>WQFC</u>)	Moderate	0.75
2. Impact Category Description (<u>Impact Category</u>)	Discharge of Fill	1.00
3. Product of WQFC and Impact (<u>WQFC Impact</u>) =		0.75
4. Duration of Impact (<u>Duration</u>)	Permanent/Reoccurring	1.00
5. Product of WQFC Impact and Duration (<u>Total WQFC Impact</u>) =		0.75
6. Product of Total WQFC Impact and Acres (<u>Total 2018 Wetland Credits Owed</u>) =		133.47
7. Conversion of Total 2018 Wetland Credits to Legacy Credits (<u>Legacy Wetland Credits Owed</u>) =		1,067.76

Legend

Green Cells = User must manually input information.
 Orange Cells = User must select the index choice from the drop-down list.
 Grey Cells = The calculation of these cells is automated.

Worksheet 4: Qualitative Worksheet for Wetland Adverse Impacts

Project Name:	Bryan County Mega Site
Impact Wetland Name:	Rail Slope Wetlands U,V, X, V, T
Acres of Impact (Acres):	27.28
Wetland Type:	Slope Wetlands
Date:	May 13, 2022

Impact Factors

	Index Description	Index Value
1. Wetland Qualitative Functional Capacity Score (<u>WQFC</u>)	Moderate	0.75
2. Impact Category Description (<u>Impact Category</u>)	Discharge of Fill	1.00
3. Product of WQFC and Impact (<u>WQFC Impact</u>) =		0.75
4. Duration of Impact (<u>Duration</u>)	Permanent/Reoccurring	1.00
5. Product of WQFC Impact and Duration (<u>Total WQFC Impact</u>) =		0.75
6. Product of Total WQFC Impact and Acres (<u>Total 2018 Wetland Credits Owed</u>) =		20.46
7. Conversion of Total 2018 Wetland Credits to Legacy Credits (<u>Legacy Wetland Credits Owed</u>) =		163.68

Legend

- Green Cells = User must manually input information.
- Orange Cells = User must select the index choice from the drop-down list.
- Grey Cells = The calculation of these cells is automated.

COASTAL PLAIN QUALITATIVE STREAM ASSESSMENT

Project Name:	Bryan County Mega Site		
Impact Reach Name:	Intermittent Stream		
Stream Type:	Non-Perennial		
Catchment Size (in Acres):	125.00	Sq. Mi.:	0.20
SAR Center Coordinates:			
Date:	5/13/2022		

Hydrology - 1

Value	Questions
Yes	The surface and groundwater hydrology of the assessment reach are free of upstream catchment impairments (e.g., diversions, stormwater management structures, wastewater facilities, agricultural ditches)? (Y/N)
Yes	Is the contributing drainage basin of the assessment reach at least 50 percent forested? (Y/N)
FUNCTION SCORE	High

Hydraulics - 2

Value	Questions
No	Is the assessment reach connected to it's floodplain at bankfull event? (Y/N)
Yes	Are there headcuts in the assessment reach? (Y/N)
Yes	Has the assessment reach been previously straightened? (Y/N)
FUNCTION SCORE	Low

Geomorphology - 3

Value	Questions
No	Does the assessment reach have bedform diversity (i.e., the presence of riffle/pool or step/pool complexes)? (Y/N)
Yes	Is there high bank erosion present throughout the assessment reach? (Y/N)
No	Is there large woody debris (LWD) in the assessment reach? (Y/N)
Yes	Is there a woody riparian buffer (i.e., 25 feet in width) adjacent to both sides of the assessment reach? (Y/N)
FUNCTION SCORE	Low

Chemistry - 4

Value	Questions
Yes	Is the contributing drainage basin of the assessment reach at least 50 percent of the forested? (Y/N)
No	Is the assessment reach designated as an impaired water on the most recent 303(D)/305(b) list?
FUNCTION SCORE	High

Biology - 5

Value	Questions
No	Is there habitat diversity in the assessment reach (i.e., at least 3 of the following: riffles, pools, steps, overhangs, leaf packs, woody debris)?
Yes	Is the contributing drainage basin of the assessment reach at least 50 percent of the forested? (Y/N)
SUM	Moderate

STREAM QUALITATIVE FUNCTIONAL CAPACITY SCORE	Moderate
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Legend

- Green Cell = User must manually input information.
- Orange Cells = User must select the index choice from the drop-down list.
- Grey Cells = The calculation of these cells is automated.
- Dark Grey Cells = These cells do not require input. The corresponding index value is populated from the user input to a previous question.

Worksheet 1: Qualitative Worksheet for Stream Adverse Impacts

Project Name:	Bryan County Mega Site
Impact Reach Name:	Intermittent Stream
Linear Feet of Impact (<i>Feet</i>):	763
Stream Type:	Non-Perennial Streams
Non-Perennial Flow Regime:	Intermittent
Date:	May 13, 2022

Impact Factors

	<u>Index Description</u>	<u>Index Value</u>
1. Stream Qualitative Functional Capacity Score (<i>SQFC</i>)	Moderate	0.75
2. Type of Impact (<i>Impact</i>)	Discharge of Dredge Material	1.00
3. Product of SQFC and Impact (<i>SQFC Impact</i>) =		0.75
4. Duration of Impact (<i>Duration</i>)	Permanent/Reoccurring	1.00
5. Product of SQFC Impact and Duration (<i>Total SQFC Impact</i>) =		0.75
6. Product of Total SQFC Impact and Linear Feet (<i>Total 2018 Stream Credits Owed</i>) ¹ =		572.25
7. Conversion of Total 2018 Stream Credits to Legacy Credits (<i>Legacy Stream Credits Owed</i>) ^{2,3} =		4,120.20

Green Cells = User must manually input information.
 Orange Cells = User must select the index choice from the drop-down list.
 Grey Cells = The calculation of these cells is automated.

¹Total 2018 Stream Credits Owed are prorated to 50% for Non-Perennial Streams with Ephemeral Flow.
²Legacy Stream Credits Owed are prorated to 60% for Non-Perennial Streams with Intermittent Flow.
³Legacy Stream Credits Owed are prorated to 60% for Non-Perennial Streams with Ephemeral Flow.



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APPENDIX G:
Threatened & Endangered Species Documentation,
IPaC Database & Edges Information

May 2022

Bryan County Mega-Site Threatened & Endangered Species Survey

Prepared For:

Georgia Department of Economic Development

&

Savannah Harbor-Interstate 16 Corridor Joint Development Authority



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Appendix C – 2018 USFWS Concurrence

PROJECT OVERVIEW

A. Introduction

Protected species assessments for the ±2,541.2-acre Bryan County Mega-site were conducted by Resource & Land Consultants (RLC) between February and March of 2015, May of 2018, and May 2022. The project site is located south of Interstate 16, east of GA Highway 280, near Black Creek, in Bryan County, Georgia (32.159357°, -81.456570; Figure 1). RLC conducted these assessments to determine the potential for the occurrence of animal and plant species currently listed as threatened or endangered in Bryan County by federal regulations.

B. Need and Purpose

The Georgia Department of Economic Development (“GDEcD”) and the Savannah Harbor-Interstate 16 Corridor Joint Development Authority (“JDA”) identified the subject property as a potential site for construction of a large-scale manufacturing facility. The size of the proposed facility would necessitate impacts to waters of the U.S., thus requiring Department of the Army authorization to fill and/or dredge waters of the U.S. regulated under Section 404 of the Clean Water Act. Subsequently, coordination with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act is required.

C. Project Description

The project area is currently owned by the State of Georgia and is managed for timber production. As of the date of this report, no areas within the project boundary have been developed. The May 2022 threatened and endangered species assessment was conducted to provide updated species, habitat, and ecological information necessary to allow GDEcD and the JDA to make informed decisions about development of the property.

The JDA coordinated with and received concurrence from the USFWS for threatened and endangered species within the previously permitted ±1,904-acre Original Equipment Manufacturing (OEM) site that there is no reasonable certainty of presence of threatened or endangered species within the site. The USFWS further recommended that the State listed gopher tortoise (*Gopherus polyphemus*) should be relocated prior to development.

D. Survey Methodology

Prior to conducting the field survey, RLC reviewed available state and federal records to determine if any listed species were known to occur within and/or in the general vicinity of the project area. Available resources such as aerial photographs, U.S. Geological Survey topographic maps, National Wetlands Inventory Maps, and Natural Resource Conservation Service Soil Survey were examined in an effort to complete a preliminary determination of existing habitats prior to the field visit. In addition to the available resources, supplemental information from the RLC 2014 and 2018 T&E reports were reviewed. Once this information was assessed, RLC conducted a pedestrian review of the project site to document the available habitats on site and the potential for listed species to inhabit them. The age and species composition of existing habitats were recorded, photographs were taken to document the current condition of the site and vegetative community, and habitat types were identified.

A review of the U.S. Fish and Wildlife Service’s (US-FWS) Information, Planning, and Conservation System (IPaC, Appendix A) was conducted to identify species that are known to occur in Bryan County. During preliminary review of available data and pedestrian surveys within the project area, it was determined that the study area contains habitats suitable for the eastern indigo snake (*Drymarchon corais couperi*), frosted flatwoods salamander (*Ambystoma cingulatum*), striped newt (*Notophthalmus perstriatus*), and gopher tortoise (*Gopherus polyphemus*). In 2015, the JDA contracted consulting herpetologist Mr. John Palis to conduct species specific surveys for the above referenced amphibians and reptiles.

E. Habitats and Land Use Areas

The subject property has been intensively managed for timber production. It contains wetland and upland habitats typical for Bryan County and the coastal plain of Georgia. Based on our field observations, the project area contains the following habitat types:

- Managed Pine Plantation: The property consists of intensively managed pine plantation consisting of both upland and wetland. The stand age for this habitat varies across the site from recently planted to 20 years old and species composition is dictated by topography, soils and hydrology (i.e. upland pine plantation and wetland pine plantation). A general summary of species composition is as follows:
 - Upland Pine Plantation: loblolly pine (*Pinus taeda*), live oak (*Quercus virginiana*), sweetgum (*Liquidambar styraciflua*), wax myrtle (*Myrica cerifera*), blackberry (*Rubus argutus*), fetterbush (*Lyonia lucida*), broomsedge (*Andropogon virginicus*), saw palmetto (*Serenoa repens*), bracken fern (*Pteridium aquilinum*), yellow jessamine (*Gelsenium sempervirens*), and poison Ivy (*Toxicodendron radicans*).
 - Wetland Pine Plantation: slash pine, loblolly pine, red maple (*Acer rubrum*), sweetgum, water oak (*Quercus nigra*), willow oak (*Quercus phellos*), wax myrtle, swamp titi (*Cyrilla racemiflora*), fetterbush, greenbrier (*Smilax laurifolia*), blackberry, gaint Cane (*Arundinaria gigantea*), black-stem chainfern (*Woodwardia virginica*), netted chainfern (*Woodwardia areolata*), and poison ivy.

- Slope Wetlands: This habitat consists of slope wetland areas generally located along the perimeter of the site. Portions of this habitat have been recently timbered and are naturally regenerating with a variety of tree, shrub and herbaceous species. Other areas contain a relatively mature canopy with a dense understory of shrub species. Species compositions include water oak, red maple, red bay, sweetgum, black gum (*Nyssa biflora*), bald cypress (*Taxodium distichum*), wax myrtle, fetterbush, titi, sphagnum moss (*Sphagnum* spp.), poison ivy, blackstem chainfern, greenbrier, blackberry, and netted chainfern.

- Depressional Wetland: The study area contains numerous isolated forested wetlands. These areas generally consist of isolated wetlands with a mature overstory and varying degrees of shrub and herbaceous cover: slash pine, red maple, red bay, sweetgum, black gum, bald cypress, fetterbush, wax myrtle, titi, sphagnum moss, poison ivy, blackstem chainfern, greenbrier, blackberry, and netted chainfern.

- Intermittent Streams: The intermittent streams are located in the central portions of the forested wetland systems on the southwestern portion of the project area. These streams average approximately three feet in width and twelve inches in depth. The streams lack vegetation, consist of sand and mud beds, and the banks are varying heights. These streams appear to have been impacted by past land management activities, such as being excavated and incised.

- Man-Made Pond: Several small open water ponds are located on the eastern portion of the property which consists of a deep open water habitat with herbaceous vegetation along the water's edge. These areas were created through a combination of excavation and dam construction.

- Open Field: The open fields consist of herbaceous vegetation and while these areas may have been used for agricultural purposes in the past, today these fields are used for recreational purposes.

- Man-Made Ditches: Approximately 1.21 acres of man-made ditch is present within the property. This habitat is defined by bed and bank of the feature with little to no vegetation present. The ditches were presumably constructed for silvicultural purposes and extend through several wetland areas across the site.

- Existing Road: Jernigan Road is a county-maintained dirt road which extends west to east through the center of the property.

Table 1: Habitat Summary

Habitat Type	Area (ac)
Depressional Wetlands	38.5
Existing Road	19.4
Managed Pine Plantation	1836.8
Man-made Pond	6.5
Open Field	93.8
Slope Wetlands	546.2
Total	2541.2

- Soil types as mapped by the USDA Natural Resource Conservation Service: Soil types found within the study area includes Albany, Angelina and Bibb, Chipley, Craven, Dothan, Ellabelle, Fuquay, Lakeland, Leon, Lucy, Mascotte, Ocilla, Ogeechee, Olustee, Pelham, Stilson, and Wahee series. Soils are depicted on the attached NRCS Soils Survey (Figure 3).

II. FEDERALLY PROTECTED RESOURCES

The project area was assessed in consideration of the Endangered Species Act of 1973. Pedestrian surveys were conducted to identify protected individuals and/or potential habitat for protected individuals within the study area on numerous occasions; during February and March 2015, May 2018, and May 2022. Species-specific surveys were conducted for the species with a preferred habitat similar to those found within the study area. Table 2 depicts federally protected species listed in the study area that have potential ranges within Bryan County, Georgia. This table also provides biological determinations based on the effects that a potential industrial development would have on each of these species. Section II-A of this document provides a detailed description of those listed species that have habitat preferences which are found within the study area.

Table 2- Known Occurrences and Biological Determination for Protected Species Listed in Bryan County

Class	Scientific Name	Common Name	IPaC Trust Resources List	Legal Status*		Habitat Present	Species Present	Biological Determination
				Federal	State			
Amphibians	Ambystoma cingulatum	Frosted flatwoods salamander	Yes	T	T	Yes	No	No Impact
Birds	Laterallus jamaicensis	Eastern Black Rail	Yes	T	T	None	No	No impact
	Mycteria americana	Wood Stock	Yes	T	T	Yes	No	NLAA
Reptiles	Drymarchon couperi	Eastern Indigo Snake	Yes	T	T	Preferred	None observed	NLAA
	Gopherus polyphemus	Gopher Tortoise	Yes	C	T	Preferred	Yes	NLAA
Insects	Danaus plexippus	Monarch Butterfly	Yes	C	N/A	None	No	No impact

A. Federally Threatened and Endangered Species

The following provides detailed information for federally listed species within Bryan County, Georgia that have potential habitat within the study area:

Eastern Black Rail (*Laterallus jamaicensis*):

The Eastern black rail is a small bird living in salt and freshwater marshes in portions of the United States, Central America, and South America. Males and females are similar in size and adults are generally pale to blackish-gray, with a small blackish bill and bright red eyes. Eastern black rail habitat can be tidally or non-tidally influenced, and range in salinity from salt to brackish to fresh. Tidal height and volume vary greatly between the Atlantic and Gulf coasts and therefore contribute to differences in salt marsh cover plants in the bird's habitat. Diet includes Insects, snails, seeds, etc. Loss of habitat is the main threat to this species; however, where habitat is projected numbers are likely stable.

The project site does not contain freshwater marshes nor tidal marshes. Neither this species nor habitat required to support this species is present within the project site. Thus, the proposed project will have no effect on the eastern black rail.

Wood Stork (*Mycteria americana*):

The wood stork was listed endangered by the USFWS on 28 February 1984 (Federal Register 49 (4):7332-7335). It is listed as endangered under both its state and federal status. Wood storks use freshwater and estuarine wetlands as feeding, nesting, and roosting sites, and annual population fluctuations are closely related to the year-to-year differences in the quality and quantity of suitable habitat. The overall decline in wood stork numbers is attributed to the loss or degradation of essential wetland habitat primarily in southern Florida. The adult is a large bird 33-45 inches tall and 58-71 inches in wingspan. Males typically weigh 5.5-7.3 lbs; females weigh 4.4-6.2 lbs. They appear all white on the ground, with blackish-gray legs and pink feet. In flight, the trailing edge of the wings is black. The head is dark brown with a bald, black face, and the thick down curved bill is dusky yellow. Juvenile birds are a duller version of the adult, generally browner on the neck, and with a paler bill. They nest colonially with up to twenty-five nests in one tree. Breeding once a year, a female lays 3-5 eggs in the typical clutch. The eggs are incubated 27-32 days by both sexes.

Although the project site contains freshwater wetland systems which could provide limited wood stork feeding habitat, neither this species nor nesting habitats were observed. Therefore, the project may affect but is not likely to adversely affect this species.

Eastern indigo snake (*Drymarchon corais couperi*):

Average adult size is 60-74 in; the record is 103.5 in. Adults are large and thick bodied. The body is glossy black and in sunlight has iridescent blue highlights. The chin and throat are reddish or white, and the color may extend down the body. The belly is cloudy orange and blue-gray. The scales on its back are smooth, but some individuals may possess some scales that are partially keeled. There are 17 dorsal scale rows at midbody. The pupil is round. Juveniles are black-bodied with narrow whitish blue bands.

Eastern indigo snakes primarily occur in sandhill habitats in northern Florida and southern Georgia. Preferred habitat includes pine and scrubby flatwoods, pine rocklands, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats. They need a mosaic of habitats to complete their annual life cycle. In the northern range of their territory, they require sheltered retreats from winter cold and desiccating conditions and often coexist with gopher tortoises inside their burrows. In wetter habitats that lack gopher tortoises, they may take shelter in hollowed root channels, hollow logs, or the burrows of rodents, armadillo, or land crabs.

The project area contains sandhill habitat typically associated with the indigo snake and both active and abandoned gopher tortoise burrows were observed. According to USFWS, the nearest documented occurrence of this species was approximately 1 mile to the northeast (+/-30 years ago), and approximately 5 miles to the southeast, presumably

on Fort Stewart. Surveys for indigo snakes were conducted on February 23, 2015, and March 12th, 13th, 18th, 19th, 20th, and 26th 2015. Temperatures were ideal for the initial survey in February, with preceding nighttime temperatures in the 20's followed by daytime temperatures in the mid to upper 60's and mid 70's. The pedestrian surveys were conducted to look for individual specimens, tracks within burrows and aprons, and shed skins near gopher tortoise burrows. No evidence of the presence of indigo snakes was observed during this study.

Indigo snake surveys and USFWS concurrence was completed in the late 1990's/early 2000's during 404 Permit development of the Pembroke Bryan County Industrial Park and in the mid 2000's for the northern portion of this study area (north of Road) also known as the Samwilka Tract. The Pembroke Bryan County Industrial Park study noted the presence of over 50 burrows but neither evidence of nor any sightings of the indigo snake were documented. USFWS provided a "no effect" concurrence for that project and development of the site proceeded. During the study for the Samwilka Tract, it was reported that 1506 observations of 142 gopher tortoise burrows in various states of activity failed to yield any evidence of the presence of indigo snakes. Subsequently, via letter of May 20, 2008 (USFWS #08-FA-0973), it was determined that the presence of indigo snakes on the subject property were unlikely and acknowledged the relocation of the existing gopher tortoises north of Jernigan Road to Fort Stewart Army Base. Additionally, as stated in an email from the USFWS dated 7/18/2018, Mr. Bill Wikoff stated "Although the last major site surveys for the eastern indigo snake were performed in 2015, there is no reasonable certainty of presence of the eastern indigo snake or any other federally listed species on the property now."

Considering the past survey efforts which have occurred immediately adjacent to and within the vicinity of the project area impacts and because no evidence or sightings of the indigo snake were recorded during this survey, impacts to this protected species are not anticipated. While the wetlands on the study area have the potential to be used by the indigo snake during warmer portions of the year, and the presence of a remnant population of gopher tortoise could provide winter refuge, the past and present use of the property for industrial timber production and the lack of previous occurrences likely precludes their existence on the study area. Thus, the proposed project is not likely to adversely impact eastern indigo snakes.

Frosted Flatwoods Salamander (*Ambystoma cingulatum*)

The frosted flatwoods salamander is a small (up to 76mm snout-vent length, 135 total length; Palis unpublished data), black salamander with gray to grayish dorsal markings that forms a netted pattern. Flatwoods salamanders prefer mesic longleaf pine flatwoods/wiregrass terrestrial habitats with open understory. Breeding ponds consist of isolated ephemeral wetlands that range in size from 0.2 to 9.5 ha and 0.5 m deep or less (Palis, unpublished data). Adult flatwoods move to breeding ponds in between October and January and deposit eggs in leaf litter along the margins of the wetlands. Water levels typically rise during the winter months, thus inundating the eggs. As larvae hatch, they hide among the vegetation within the wetland margins during the day and may suspend in open water during the night (J. Palis, pers. Obs.)

The subject property contains numerous isolated ephemeral wetlands that could be suitable for breeding purposes. However, the study area has been subject to intense industrial forestry activities for many decades, and the terrestrial habitat is not conducive to the species. The JDA employed John Palis to conduct an intensive survey of the study area between March 23 and March 28, 2015. Mr. Palis employed trapping and dip-netting techniques in suitable breeding ponds during this time and did not encounter any individuals. Based upon the results of this study, the presence of the flatwoods salamander within the project site is not likely and therefore the proposed development will not affect this species.

B. Federal Candidate Species

Gopher tortoise (*Gopherus polyphemus*):

The official state reptile of Georgia, the gopher tortoise, is a relatively large terrestrial turtle, obtaining a maximum carapace length of 15 inches, though averaging 9-11 inches. Its oblong carapace is unkeeled and domed, somewhat flattened, and brown or gray in color. Distinctive growth annuli are evident in juveniles and young adults, usually becoming obscured later in life. The yellowish plastron is hingeless and has conspicuous elongated gular scutes (especially long on males). With the exception of the yellowish limb sockets, the scaly skin of adults is typically dark

gray. Perhaps the most characteristic features of gopher tortoises are the elephantine hind limbs and the flattened, shovel-like forelimbs. The head is wide and rounded, with a pair of seasonally swollen mental glands on the chin. Hatchlings have yellowish skin, as well as yellow-centered scutes, both of which gradually darken with age. Males have slightly concave plastrons.

Along with sandy soil for burrowing, sunlight availability and abundant herbaceous vegetation are key habitat requirements for this reptile. Gopher tortoises are a characteristic species of the rapidly disappearing longleaf pine and wiregrass community, which includes sandhills, dry flatwoods, and turkey oak scrub. Historically, this community was represented by an open-canopied forest that allowed abundant sunlight penetration and conditions favorable for a rich growth of herbaceous vegetation. Unfortunately, very little of this naturally occurring habitat still exists; therefore, many tortoises have been forced into artificial habitats, such as roadsides and old fields, that retain the three key requirements.

The study area has been managed for industrial pine production for many decades, and as a result the existing vegetation has been manipulated for row pines. Within the last few years, pines from a large portion of the study area have been harvested, and as a result these areas are open and generally devoid of vegetation except for pine seedlings. Older age classes of pines remaining on site exhibit a dense understory devoid of significant sunlight and associated herbaceous vegetation.

In 2008, the portion of the study area north of Jernigan Road was the subject of a tortoise relocation effort that was coordinated with the USFWS. Prior to the relocation, a survey was conducted for indigo snakes, the results of which yielded no evidence of their existence on site. The tortoises were subsequently relocated to Fort Stewart. Gopher tortoises were relocated from the site in May 2022 in accordance with the applicants Georgia Department of Natural Resources (GDNR) Scientific Collecting Permit.

Monarch Butterfly (*Danaus plexippus*):

The monarch butterfly adults have a wingspan of 8.6 – 12.4 cm. The dorsal side of the male is bright orange with wide black borders and thin black veins; a small black androconial scent patch is centered on each hindwing. The dorsal side of the female is orange-brown with wide black borders and blurred black veins. Both sexes have white spots on borders and apex.

Breeding habitat must contain milkweeds although adults can be found in a variety of sunny, open spaces, both natural and undisturbed. These include but are not limited to fields, meadows, urban and suburban parks and gardens, managed corridors, roadsides, agricultural areas (and dunes particularly for fall migrants along the coast).

No unique or critical habitat is present within the site. Therefore, the project will have no effect on the monarch butterfly.

C. Critical Habitat

No Critical Habitats exist within the study area.

D. Bald and Golden Eagles

The Bald and Golden Eagle Protection Act of 1940 provides protection for the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds. Adult bald eagles are easily recognized by their familiar dark brown body and contrasting white head and tail. The bill, eyes, legs, and feet are yellow. Immature birds vary slightly in appearance depending on their age. They are generally dark brown with varying light patches, and the eyes and bill are dark. Full adult plumage is not attained until sexual maturity at about 5 years of age. The total length ranges from 30-43 in, the wingspread from 72-98 in, and weigh from 8-12 lbs. Females are noticeably larger than males and the average size of both sexes increases with latitude such that birds nesting in the northern states and Canada are significantly larger than birds nesting in southern states. Although there appears to be a continuous size gradient and no real genetic differences nor distinct breeding ranges, southern eagles are considered to be of the subspecies *H. l. leucocephalus*.

Juvenile bald eagles and non-nesting adults can be seen throughout Georgia but known nesting activity is concentrated mostly along the coast and near major rivers, wetlands, and reservoirs in the southern and central parts of the state. Bald eagles almost always nest near open water. The coastal area, including the barrier islands, marsh islands, and nearby mainland, has always provided good eagle nesting habitat historically and still supports the greatest population density. However, construction of reservoirs such as Seminole, Walter F. George, Oconee, Allatoona, Carters, Clarks Hill, Nottley and West Point, has increased suitable inland nesting habitat. Bald eagles prefer isolated sites for nesting but are adapting to the presence of human disturbance in some areas. The nest is usually in a large, open-topped pine near open water, often on high ground if available. Occasionally cypress trees are used.

USFWS removed the bald eagle from being threatened under the Endangered Species Act on August 8, 2007 and in May 2007 published the National Bald Eagle Management Guidelines to assist the public in understanding protections afforded to and prohibitions related to the bald eagle under the act, the Migratory Bird Treaty Act, and the Lacey Act. The Eagle Guidelines prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Eagle Guidelines defines "take" as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. The Eagle Guidelines define "disturb" as: to agitate or bother a bald or golden eagle to the degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, causing injury, death, or nest abandonment. In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

Based on annual nest survey data collected by the GADNR-WRD, the study area does not contain an eagle nest, and no individuals or nests were observed within the survey area during the field investigation. The proposed project would not result in a "take," as defined under the Bald and Golden Eagle Protection Act.

E. Migratory Birds

The Migratory Bird Treaty Act and the Executive Order 13186 on the Responsibility of Federal Agencies to Protect Migratory Birds require the protection of migratory birds and their habitats. As directed under Executive Order 13186, in furtherance of the Migratory Bird Treaty Act, actions must be taken to avoid or minimize impacts to migratory bird resources and to prevent or abate the detrimental alteration of the environment for the benefit of migratory birds, as practicable. The Migratory Bird Treaty Act protects over 1,500 migratory bird species in the U.S and its territories. Notable exclusions include house sparrow, starling, feral pigeon, and resident game birds such as pheasant, grouse, quail, dove, and wild turkey. The Migratory Bird Treaty Act decrees that all migratory birds and their parts (including eggs, nests, and feathers) are fully protected.

No unique habitat or extraordinary resources will be affected by any proposed development within the project area. Therefore, the project will have little to no impact on migratory birds or their habitats.

F. Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act of 1996 mandates the identification of Essential Fish Habitat for managed species, as well as measures to conserve and enhance fish habitat. The Magnuson-Stevens Act requires cooperation among the National Marine Fisheries, fishing participants, and federal and state agencies. Essential fish habitat for federally managed fish species are defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The Magnuson-Stevens Act established Regional Fishery Management Councils to identify essential fish habitat. Federal agencies must consult with the appropriate council on any action that may adversely impact a designated essential fish habitat. In Georgia, essential fish habitat can be found in the following counties: Camden, Glynn, McIntosh, Liberty, Bryan, and Chatham.

No habitat areas of particular concern and no essential fish habitat areas protected under the Magnuson-Stevens Act were identified within the study area.

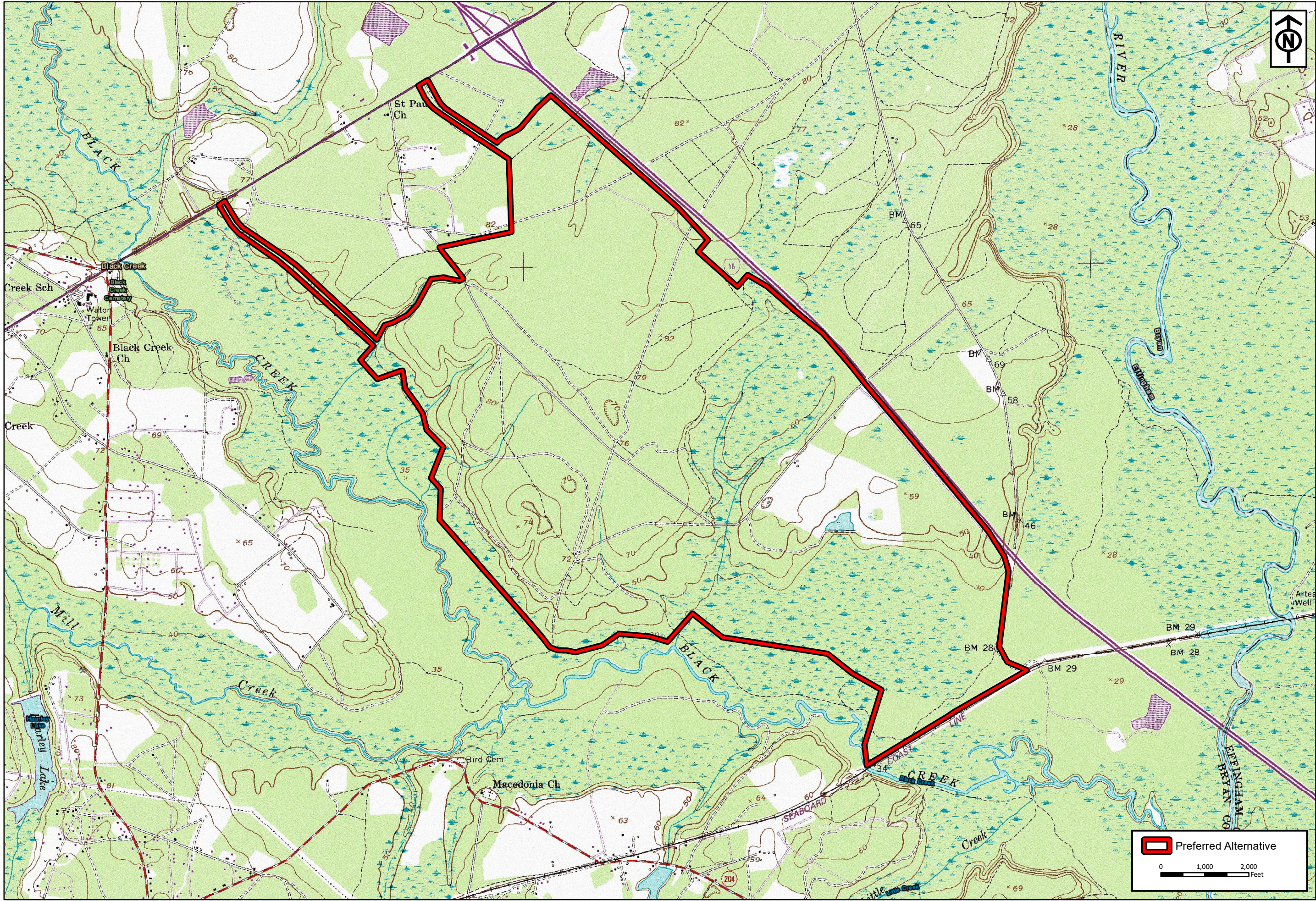
III. Conclusion

In February and March 2015, May 2018, and May 2022 RLC completed a Threatened and Endangered Species Assessment for the ±2,540.7-acre mega-site study area located in Bryan County, Georgia. At no time during the survey was a species listed as threatened or endangered by current federal regulations observed. It was determined that marginal habitat was present in the study area that could potentially harbor flatwoods salamanders, wood stork, indigo snakes, and gopher tortoise. Site-specific studies were conducted for these species, and only gopher tortoises are known to inhabit the study area. The applicant has undertaken a voluntary relocation effort for the gopher tortoises. Gopher tortoises were relocated through a coordination effort with the GDNR to Fort Stewart. Thus, the proposed development within this study area will not adversely affect any species listed as federally threatened or endangered in Bryan County, Georgia.



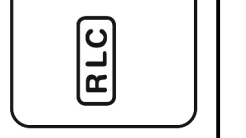
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CONSULTANTS

APPENDIX A: Figures



Preferred Alternative
 0 1,000 2,000 Feet

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 41 Park of Commerce Way, Ste 101
 Savannah, GA, 31405
 tel 912.443.5896 fax 912.443.5898

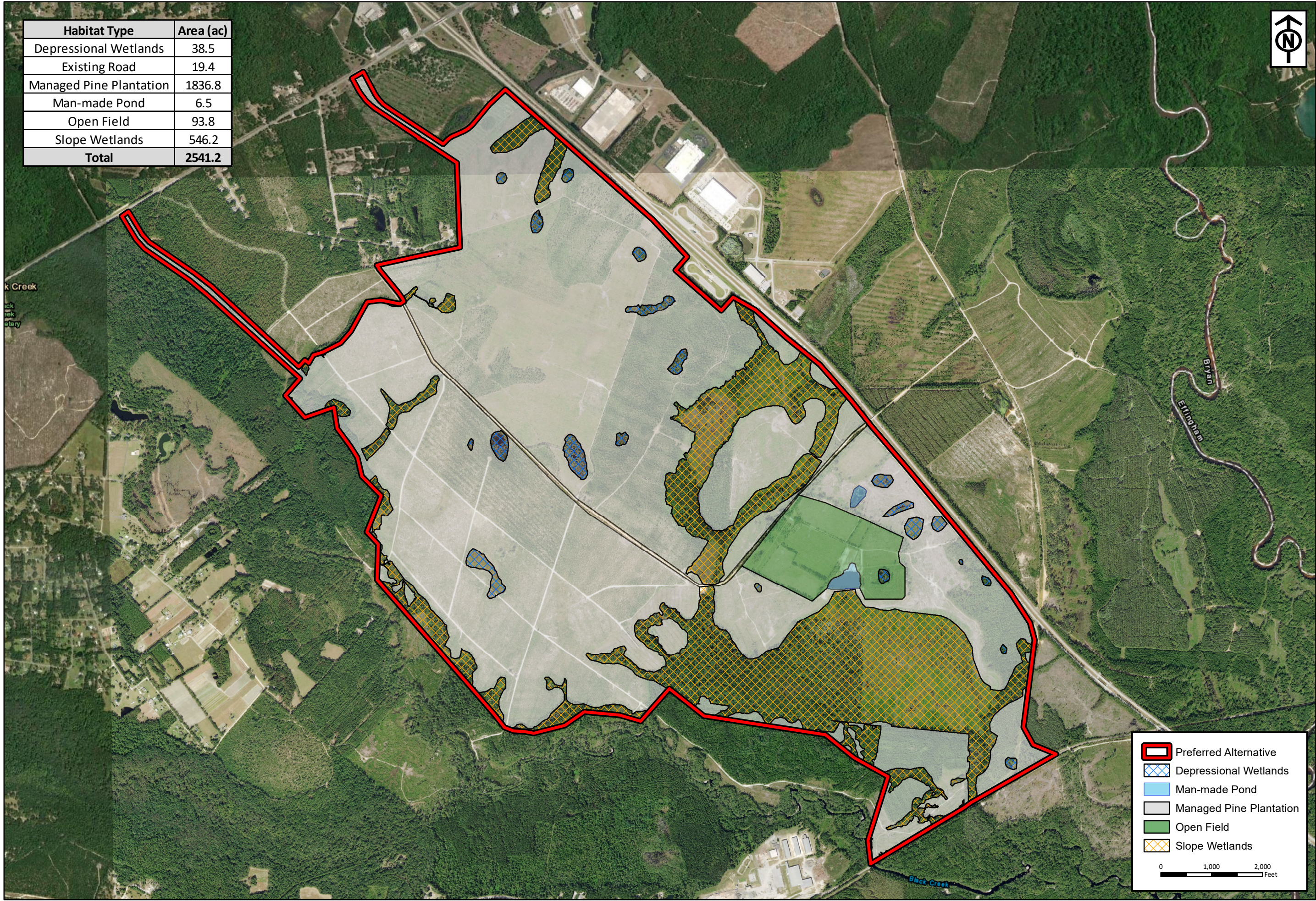


USGS Topographic Survey
 Prepared For: GDECD & Savannah Harbor-
 Interstate 16 Corridor Joint Development Authority

Bryan County Mega Site
 Bryan County, Georgia

RLC Project No.: 14-225.7
 Figure No.: 1
 Prepared By: RP
 Sketch Date: 5/13/2022
 Map Scale: 1 inch = 2,000 feet

Habitat Type	Area (ac)
Depressional Wetlands	38.5
Existing Road	19.4
Managed Pine Plantation	1836.8
Man-made Pond	6.5
Open Field	93.8
Slope Wetlands	546.2
Total	2541.2

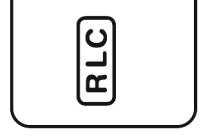


	Preferred Alternative
	Depressional Wetlands
	Man-made Pond
	Managed Pine Plantation
	Open Field
	Slope Wetlands

0 1,000 2,000 Feet

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Savannah, GA, 31405
tel 912.443.5896 fax 912.443.5898



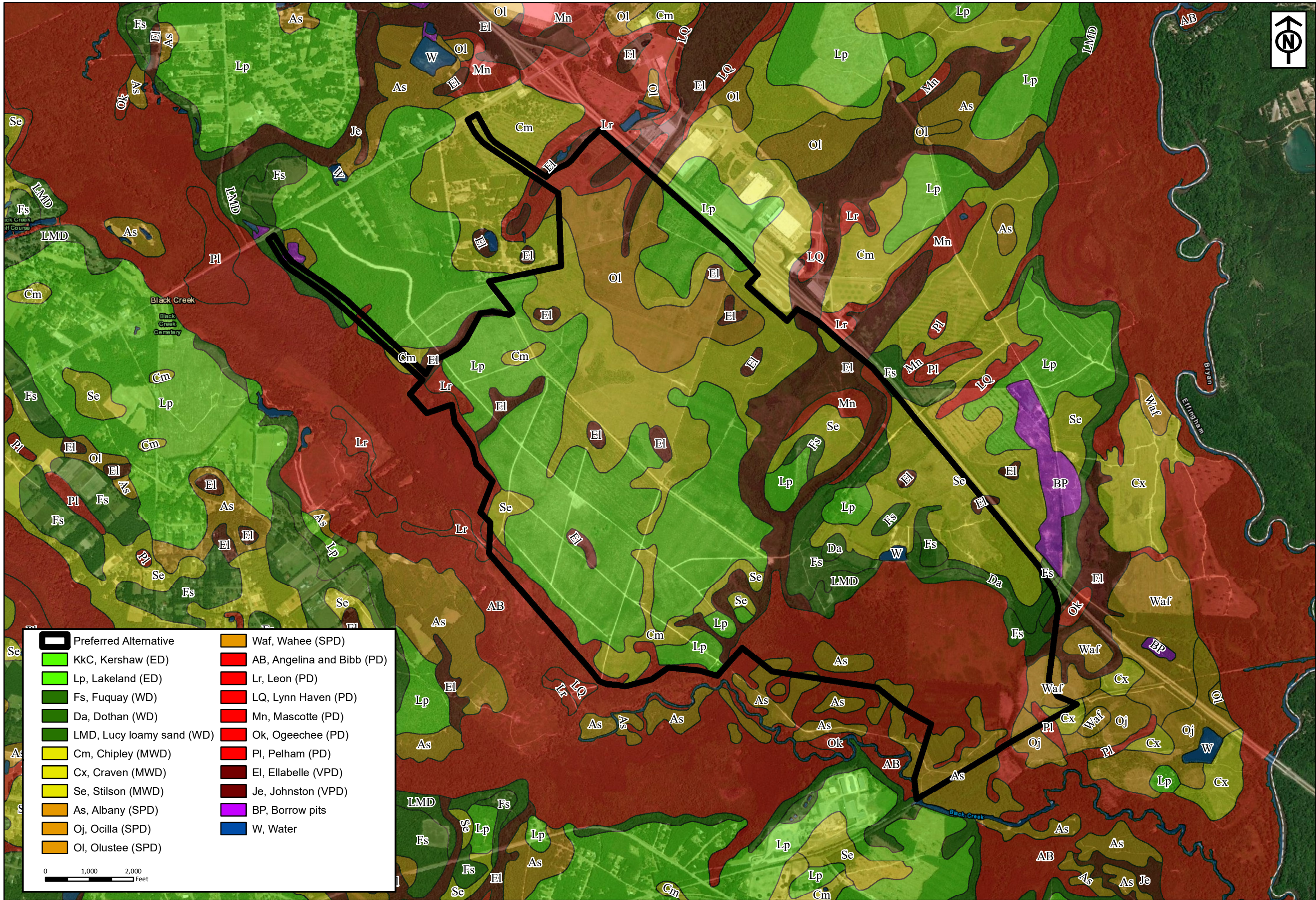
2022 Habitat Exhibit

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

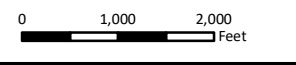
Bryan County Mega Site

Bryan County, Georgia

RLC Project No.: 14-225.7
Figure No.: 2
Prepared By: RP
Sketch Date: 5/13/2022
Map Scale: 1 inch = 1,730 feet



	Preferred Alternative		Waf, Wahee (SPD)
	KkC, Kershaw (ED)		AB, Angelina and Bibb (PD)
	Lp, Lakeland (ED)		Lr, Leon (PD)
	Fs, Fuquay (WD)		LQ, Lynn Haven (PD)
	Da, Dothan (WD)		Mn, Mascotte (PD)
	LMD, Lucy loamy sand (WD)		Ok, Ogeechee (PD)
	Cm, Chipley (MWD)		PI, Pelham (PD)
	Cx, Craven (MWD)		EI, Ellabelle (VPD)
	Se, Stilson (MWD)		Je, Johnston (VPD)
	As, Albany (SPD)		BP, Borrow pits
	Oj, Ocilla (SPD)		W, Water
	Ol, Olustee (SPD)		



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USDA Soil Survey

Prepared For: GDECD & Savannah Harbor-
Interstate 16 Corridor Joint Development Authority

Bryan County Mega Site

Bryan County, Georgia

RLC Project No.:	14-225.7
Figure No.:	3
Prepared By:	RP
Sketch Date:	5/13/2022
Map Scale:	1 inch = 2,000 feet

Y:\2014 Projects\14-225.7 Trip Tolson Project EA\Permitting\Off-Site Alternatives\Preferred Site Bryan County\TBE_3 soils.md

Source(s): 2018 NMP Ortho Aerial, Chatham County




 Project Area

 Photo Location

0 1,250 2,500
Feet

RLC Project No.:	14-225.7
Figure No.:	4
Prepared By:	Mg
Sketch Date:	5/13/2022
Map Scale :	1 inch = 2,500 feet

Bryan County Mega Site
Bryan County, Georgia

Photo Location
Prepared For: JDA

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CONSULTANTS**
41 Park of Commerce Way, Ste 101
Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



Photo 1: Managed Pine



Photo 2: Slope Wetlands



Photo 3: Depressional Wetland



Photo 4: Intermittent Stream

RLC Project No.:	14-225.7
Figure No.:	5
Prepared By:	Mg
Photo Date:	5/12/2022
Exhibit Date:	5/13/2022

Bryan County OEM
Bryan County, Georgia

Site Photographs

Prepared For: GADEC & Savannah Harbor-Interstate 16
Corridor JDA



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Photo 5: Man-Made Pond



Photo 6: Open Field



Photo 7: Man-Made Ditch



Photo 8: Existing Road

RLC Project No.:	14-225.7
Figure No.:	6
Prepared By:	Mg
Photo Date:	5/12/2022
Exhibit Date:	5/13/2022

Bryan County OEM
Bryan County, Georgia

Site Photographs

Prepared For: GADEC & Savannah Harbor-Interstate 16
Corridor JDA



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Savannah, GA 31405
tel 912.443.5896 fax 912.443.5898



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APPENDIX B:
U.S. Fish and Wildlife Service, Trust Resource List (IPaC)



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Georgia Ecological Services Field Office
355 East Hancock Avenue
Room 320
Athens, GA 30601-2523
Phone: (706) 613-9493 Fax: (706) 613-6059

In Reply Refer To:
Project Code: 2022-0042432
Project Name: Bryan County Mega Site

May 13, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Thank you for your request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act (MBTA) as amended (16 USC 701-715), Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Bald and Golden Eagle Protection Act (BGEPA) as amended (16 USC 668-668c). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area and to recommend some conservation measures that can be included in your project design if you determine those species or designated critical habitat may be affected by your proposed project.

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency, project proponent, or their designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally listed threatened or endangered fish or wildlife species without the appropriate permit. If you need additional information to assist in your effect determination, please contact the Service.

If you determine that your proposed action may affect federally listed species, please consult with the Service. Through the consultation process, we will analyze information contained in a biological assessment or equivalent document that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a Habitat Conservation Plan) may be necessary to exempt harm or harass federally listed threatened or endangered fish or wildlife species. For more information regarding formal consultation and HCPs, please see the Service's [Section 7 Consultation Library](#) and [Habitat Conservation Plans Library](#) Collections.

Action Area. The scope of federally listed species compliance not only includes direct effects, but also any indirect effects of project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations). The action area is the spatial extent of an action's direct and indirect modifications or impacts to the land, water, or air (50 CFR 402.02). Large projects may have effects to land, water, or air outside the immediate footprint of the project, and these areas should be included as part of the action area. Effects to land, water, or air outside of a project footprint could include things like lighting, dust, smoke, and noise. To obtain a complete list of species, the action area should be uploaded or drawn in IPaC rather than just the project footprint.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. An updated list may be requested through IPaC.

If you determine that your action may affect any federally listed species and would like technical assistance from our office, please send us a complete project review package (refer to Georgia Ecological Services' [Project Planning and Review](#) page for more details), including the following information (reference to these items can be found in 50 CFR§402.13 and 402.14):

1. A description of the proposed action, including any measures intended to avoid, minimize, or offset effects of the action. Consistent with the nature and scope of the proposed action, the description shall provide sufficient detail to assess the effects of the action on listed species and critical habitat, including:
 - The purpose of the action;
 - The duration and timing of the action;
 - The location of the action;
 - The specific components of the action and how they will be carried out;
 - Description of areas to be affected directly or indirectly by the action;
 - Maps, drawings, blueprints, or similar schematics of the action
 2. An updated Official Species List
-

3. Biological Assessments (may include habitat assessments and information on the presence of listed species in the action area);
4. Description of effects of the action on species in the action area and, if relevant, effect determinations for species and critical habitat;
5. Conservation measures and any other available information related to the nature and scope of the proposed action relevant to its effects on listed species or designated critical habitat (examples include: stormwater plans, management plans, erosion and sediment plans). Please see our [Georgia Planning and Consultation Tools](#) page for recommendations.

Please submit all consultation documents via email to gaes_assistance@fws.gov or by using IPaC, uploaded documents, and sharing the project with a specific Georgia Ecological Services staff member. If the project is on-going, documents can also be sent to the Georgia Ecological Services staff member currently working with you on your project. For Georgia Department of Transportation related projects, please work with the Office of Environmental Services ecologist to determine the appropriate USFWS transportation liaison.

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value. We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's [NWI program website](#) (<https://www.fws.gov/program/national-wetlands-inventory>) integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's [Migratory Birds Program](#) (<https://fws.gov/program/migratory-birds>). To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction. It can be found at the Service's [Migratory Birds Conservation Library Collection](#) (<https://fws.gov/library/collections/migratory-bird-conservation-documents>).

Information related to best practices and migratory birds can be found at the Service's [Avoiding and Minimizing Incidental Take of Migratory Birds Library Collection](#) (<https://fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>).

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to “disturb” eagles. Under the BGEPA, the Service may issue limited permits to incidentally “take” eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at the Service's [Bald and Golden Eagle Management Library Collection](https://fws.gov/library/collections/bald-and-golden-eagle-management) (<https://fws.gov/library/collections/bald-and-golden-eagle-management>).

NATIVE BATS

If your species list includes Indiana bat (*Myotis sodalis*) or northern long-eared bat (*M. septentrionalis*) and the project is expected to impact forested habitat that is appropriate for maternity colonies of these species, forest clearing should occur outside of the period when bats may be present. Federally listed bats could be actively present in forested landscapes from April 1 to October 15 of any year and have non-volant pups from May 15 to July 31 in any year. Non-volant pups are incapable of flight and are vulnerable to disturbance during that time.

Indiana, northern long-eared, and gray (*M. grisescens*) bats are all known to utilize bridges and culverts in Georgia. If your project includes maintenance, construction, or any other modification or demolition to transportation structures, a qualified individual should complete a survey of these structures for bats and submit your findings via the Georgia Bats in Bridges cell phone application, free on Apple and Android devices. Please include these findings in any biological assessment(s) or other documentation that is submitted to our office for technical assistance or consultation.

Additional information on bat avoidance and minimization can be found at Georgia Ecological Services' [Planning and Consultations Tools](#) and [Bat Conservation in Georgia](#) pages.

MONARCH BUTTERFLY

On December 20, 2020, the Service determined that listing the Monarch butterfly (*Danaus plexippus*) under the Endangered Species Act is warranted but precluded at this time by higher priority listing actions. With this finding, the monarch butterfly becomes a candidate for listing. The Service will review its status each year until we are able to begin developing a proposal to list the monarch.

As it is a candidate for listing, the Service welcomes conservation measures for this species. Recommended, and voluntary, conservation measures for projects in Georgia can be found at our [Monarch Conservation in Georgia](#) page.

STATE AGENCY COORDINATION

Additional information that addresses at-risk or high priority natural resources can be found in the State Wildlife Action Plan (<https://georgiawildlife.com/WildlifeActionPlan>), at Georgia Department of Natural Resources, Wildlife Resources Division Biodiversity Portal (<https://>

georgiawildlife.com/conservation/species-of-concern), Georgia's Natural, Archaeological, and Historic Resources GIS portal (<https://www.gnahrgis.org/gnahrgis/index.do>), and the [Georgia Ecological Services HUC10 Watershed Guidance](#) page.

Thank you for your concern for endangered and threatened species. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please email gaes_assistance@fws.gov and reference the project county and your Service Project Tracking Number.

This letter constitutes Georgia Ecological Services' general comments under the authority of the Endangered Species Act.

Attachment(s):

- Official Species List
 - Migratory Birds
 - Wetlands
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Georgia Ecological Services Field Office

355 East Hancock Avenue

Room 320

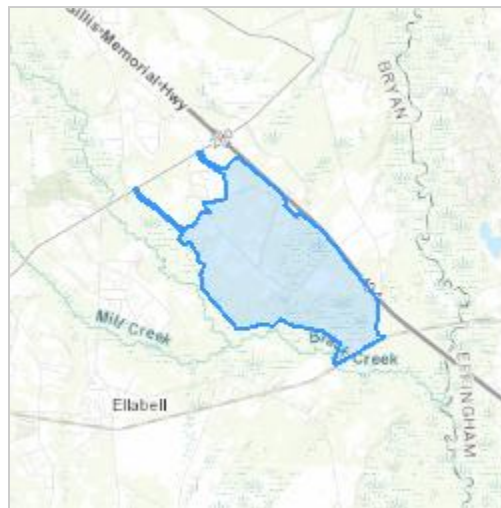
Athens, GA 30601-2523

(706) 613-9493

Project Summary

Project Code: 2022-0042432
Event Code: None
Project Name: Bryan County Mega Site
Project Type: New Constr - Above Ground
Project Description: Industrial Development
Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@32.15736135,-81.44832533942544,14z>



Counties: Bryan County, Georgia

Endangered Species Act Species

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Eastern Black Rail <i>Laterallus jamaicensis ssp. jamaicensis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10477	Threatened
Wood Stork <i>Mycteria americana</i> Population: AL, FL, GA, MS, NC, SC No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8477	Threatened

Reptiles

NAME	STATUS
Eastern Indigo Snake <i>Drymarchon corais couperi</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/646	Threatened
Gopher Tortoise <i>Gopherus polyphemus</i> Population: eastern No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6994	Candidate

Amphibians

NAME	STATUS
Frosted Flatwoods Salamander <i>Ambystoma cingulatum</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4981	Threatened

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

MIGRATORY BIRD INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical](#)

[Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED.
PLEASE VISIT [HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML](https://www.fws.gov/wetlands/data/mapper.html) OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

IPaC User Contact Information

Agency: Resource & Land Consultants
Name: Russell Parr
Address: 41 Park of Commerce Way
Address Line 2: Suite 101
City: Savannah
State: GA
Zip: 31405
Email: rparr@rlandc.com
Phone: 9124435896



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APPENDIX C: 2018 USFWS Concurrence



[EXTERNAL] RE: [Non-DoD Source] SAS-2015-00235 OEM site

Wise, Sarah E CIV USARMY CESAS (USA) <Sarah.E.Wise@usace.army.mil>
To: "Wikoff, Bill" <bill_wikoff@fws.gov>
Cc: Donald Imm <donauld_imm@fws.gov>

Tue, Jan 29, 2019 at 9:08 AM

Don/Bill,

Attached is our Section 7 consultation request for the Bryan County OEM site. Based on comments received from the Service during the JPN comment period as well as the use of the EDGES, the Corps has determined that the proposed project may affect, but is not likely to adversely affect, the Eastern Indigo snake, gopher tortoise, red cockaded woodpecker and the wood stork. If you have any questions, please call or email me. Thanks!

V/R

Sarah E. Wise
Team Lead, Coastal Plain Field
Regulatory Branch
U.S. Army Corps of Engineers



U. S. Fish and Wildlife Service
RG Stephens, Jr. Federal Building
355 E. Hancock Ave., Rm 320, Box 7
Athens, GA 30601 ; 706-613-9493

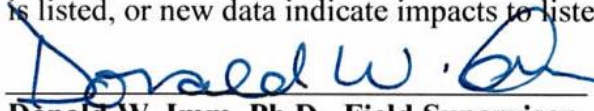
FWS Log No.

2018-0823

100 West Oglethorpe Avenue
Savannah, Georgia 31401-36
912-652-5550 (desk)
912-652-5995 (fax)

Based on information provided, we concur with your determination that the project is not likely to adversely affect federally-listed species. No further ESA Section 7 action is required, unless the project changes, a new species is listed, or new data indicate impacts to listed species may occur.

Thank you in advance for com
<http://corpsmapu.usace.army.mil>
comments and appreciate you


Donald W. Imm, Ph.D., Field Supervisor

January 29, 2019

Date

-----Original Message-----

From: Wikoff, Bill [mailto:bill_wikoff@fws.gov]
Sent: Wednesday, July 18, 2018 10:06 AM
To: Wise, Sarah E CIV USARMY CESAS (US) <Sarah.E.Wise@usace.army.mil>
Cc: Donald Imm <donauld_imm@fws.gov>
Subject: [Non-DoD Source] SAS-2015-00235 OEM site

Sarah,

The Corps requests information from the USFWS on whether any species listed or proposed for listing may be present in the area of the proposed project, SAS-2015-00235, to construct an Original Equipment Manufacturing (OEM) facility.

The consultant for the project, Resource & Land Consultants' (RLC) submitted substantial site information to the Corps as part of the Section 404 permit application. The information includes reports for the site that address all species that our IPaC (Information Planning and Conservation) system lists as occurring in the county. In 2015 RLC conducted surveys of the majority of the current site and John Palis conducted a site habitat assessment. These investigations covered 1,904 acres of the 1,944 acre site. The present site is generally the same 1,904 acres, with approximately 100 of those acres dropped and approximately 150 new adjacent acres added. These new acres were surveyed for species and reported on in the current site report. The project site has been referred to by several names through the years; Thor, Peach, Mega-site, and currently OEM project site.

John Palis' 2015 report summary states: 'Although the possibility of a waif eastern indigo snake passing through the property cannot be ruled out, the likelihood of a population of eastern indigo snakes inhabiting the fragmented and altered landscape that surrounds and includes the Bryan County Mega Site is low. Summary - Due to decades of on-site pine silviculture, development on surrounding properties, and the proximity of well-traversed roads, the Bryan County Mega Site is currently very unlikely to be inhabited by populations of frosted flatwoods salamanders, striped newts, gopher frogs, or eastern indigo snakes.'

The other 2015 survey and the 2018 survey of the newly added ~150 acres support Palis' conclusions. Although the last

major site surveys for the eastern indigo snake were performed in 2015, there is no reasonable certainty of presence of the eastern indigo snake or any other federally listed species on the property now.

Recommendation:

I recommend that all gopher tortoises be relocated off the property. This should be done through coordination with John Jensen of the GADNR. The property should be thoroughly surveyed to be sure all gopher tortoise burrows are located for relocation. Relocation should occur in warm weather months when snakes are less likely to inhabit tortoise burrows. Burrows that tortoises are captured from should be scoped before considered them empty and collapsing them.

Please contact me with any questions or further discussion about this project.

Bill Wikoff fish and wildlife biologist

bill_wikoff@fws.gov <mailto:bill_wikoff@fws.gov> U.S. Fish and Wildlife Service Ecological Services - Coastal Georgia
Sub Office
4980 Wildlife Drive, NE
Townsend, Georgia 31331
912-832-8739 ext.5, 912-832-8744 fax

NOTE: This email correspondence and any attachments to and from this sender is subject to the Freedom of Information Act (FOIA) and may be disclosed to third parties.

 **Bryan County OEM USFWS Section 7 Consultation.pdf**
96K



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APPENDIX H: Cultural & Archaeological Resources Documentation



Layer List

- Oldest Structure (40 -49 years)
- Oldest Structure (To 50 years)
- Historic Resources
- Historic Resources
- Archaeological Sites
- Professional User**
- Archaeological Project Areas
- Site Areas
- Project Areas
- National Register Listed
- District**
- Boundaries
- US Congressional Districts
- County Districts



HISTORIC PRESERVATION DIVISION

MARK WILLIAMS
COMMISSIONER

DR. DAVID CRASS
DIVISION DIRECTOR

October 4, 2018

Kimberly L. Garvey
Deputy Chief, Regulatory Branch
Savannah District, Corps of Engineers
100 West Oglethorpe Avenue
Savannah, Georgia 31401-3604
Attn: Sarah Wise, Project Manager

**RE: SAS 2015-00235: Construct Industrial Park, Highway 280, Ellabell
Bryan County, Georgia
HP-150402-001**

Dear Ms. Garvey:

The Historic Preservation Division (HPD) has reviewed the draft report entitled, *Phase I Intensive Cultural Resources Survey and Phase II Archaeological Testing for the 1,411.7-acre Bryan County OEM Site, Bryan County, Georgia*, prepared by Brockington and Associates, Inc. and dated August 2018. Our comments are offered to assist the US Army Corps of Engineers (USACE) in complying with the provisions of Section 106 of the National Historic Preservation Act (NHPA).

Based on the information contained in the report, HPD concurs that archaeological sites 9BN1586, 9BN1610, 9BN1611, 9BN1612, and 9BN1613 and historic resources 1 through 24, 26, and Groover Hill are not eligible for listing in the National Register of Historic Places (NRHP). Additionally, HPD concurs that historic resources 225086 and the Central of Georgia Rail Line are eligible for listing in the NRHP and within the proposed project's area of potential effect (APE). As submitted, HPD is unable to comment on the effects of the proposed undertaking on NRHP-eligible resources. HPD would like to note that an assessment of effects should include project plans and elevations, photographs from resources toward the project site with project indicators, and maps/aerials/photographs supporting statements made within the assessment.

HPD looks forward to receiving the assessment of effects for the proposed project and working with USACE as this project progresses. Please refer to project number **HP-150402-001** in any future correspondence regarding this project. If we may be of further assistance, please do not hesitate to contact me at jennifer.dixon@dnr.ga.gov or (770) 389-7851.

Sincerely,

Jennifer Dixon, MHP, LEED Green Associate
Program Manager
Environmental Review & Preservation Planning

Cc: Rodney Parker, USACE



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVENUE
SAVANNAH, GEORGIA 31401-3604

January 15, 2019

Regulatory Branch
SAS-2015-00235
HP-150402-001

Dr. David Crass, Division Director and Deputy State Historic Preservation Officer
Historic Preservation Division
Georgia Department of Natural Resources
Jewett Center for Historic Preservation
2610 GA Highway 155 SW
Stockbridge, Georgia 30281

Dear Dr. Crass:

This letter is in reference to the U.S. Army Corps of Engineers, Savannah District (Corps) permit application SAS-2015-00235, located near the intersection of Hwy 280 and Interstate 16, in Ellabell, Bryan County, Georgia (centered at approximately Latitude 32.1584, Longitude -81.4533). The project consists of development of a 1,411.7 acre Bryan County Original Equipment Manufacturer (OEM) site. Based upon previous consultation with your office, dated October 4, 2018, the Corps would like to provide updated information relating to our determination on adverse effects to the Central of Georgia Rail Line, which is eligible for listing in the National Register of Historic Places.

Based on the information provided by the applicant, we believe that the proposed action would constitute an adverse effect to a portion of the Central Georgia Rail Line. Resource 25, Central of Georgia Rail Line Corridor, is located on the extreme southeastern boundary of the project tract. We have determined that this rail line is eligible under Criterion A for its role in development of railroad towns in the early twentieth century and for its connection to the history of transportation in the region. It is also eligible under Criterion C due to the fact that the corridor embodies engineering at the turn of the century.

In accordance with 36 CFR Part 800.5(a) an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the property's integrity. A finding of Adverse Effect is anticipated for the Central of Georgia Rail Line. In the area of the resource, project implementation would consist of the construction of two new rail spurs, which will result in impacts to approximately 650 meters of rail line. Physical destruction of or damage to all or part of the property would extend into the resources boundary, which encompasses the

existing railroad right-of-way. The additional Rail Spurs would alter the linear quality of the rail bed, but it would not change the existing grade of the rail line. This construction activity related to the rail spurs would be limited to an approximately 650 meter section of the rail line. Based upon the proposed undertaking to create two rail spurs along existing Central of Georgia Rail Line, we do not believe that the undertaking would result in a change in the character of the property's use. However, we do identify that rail traffic would no longer continue unimpeded following project implementation.

In addition to direct impacts, the proposed action would result in the introduction of visual elements that diminish the integrity of the property's historic characteristics and features. The segment of railroad in the project area is surrounded predominately by either pine timber fields or dense woods, as it was historically. As such, the resource's setting is sufficiently intact and free of any notable modern intrusions. The project would introduce new Rail Spurs into this setting, which, due to their scale, are considered substantial interruptions to the continuity of the resource's historic view-shed.

The applicant and the Corps have developed methods which we believe ensure that the adverse effects to historic properties will be resolved. The Corps would like to present the following Special Condition language for your review:

a. Within 60 days of the date of permit issuance, the permittee shall submit a draft Mitigation Plan to the Corps for review and approval. The Plan shall include development of a Photographic Permanent Archival Record (PAR) and historic narrative documentation to resolve adverse effects to portions of the Central of Georgia Rail Line Corridor, identified in Figure XX. The historic narrative shall highlight the Central of Georgia Rail line, discussing its role in the development of railroad towns in early 20th century, connection to regional history of transportation, and early 20th century engineering. These documents shall follow the "Guidelines for Establishing a Photographic Permanent Archival Record," revised June 2014. The Corps will submit the draft plan to the Georgia State Historic Preservation Office (GASHPO) for review. The GASHPO shall have 30 days to provide comments to the Corps on the draft plan.

b. Within 180 days of receipt of written approval from the Corps of the above referenced Mitigation Plan, the permittee shall prepare and submit the draft PAR and historic narrative document to the Corps and GASHPO for review and comment. A final copy of the PAR document and narrative will be provided to SHPO and Georgia Railroad Museum for retention.

Overall, we believe that the development of these special permitting conditions, discussed herein, formalizes our attempt to resolve adverse effects to historic properties. Pursuant to 33 CFR § 325, Appendix C.4 (b), and subsequent headquarters memorandum dated January 31, 2007, the Corps requests your concurrence and comments within 30-calendar days from the date of this letter.

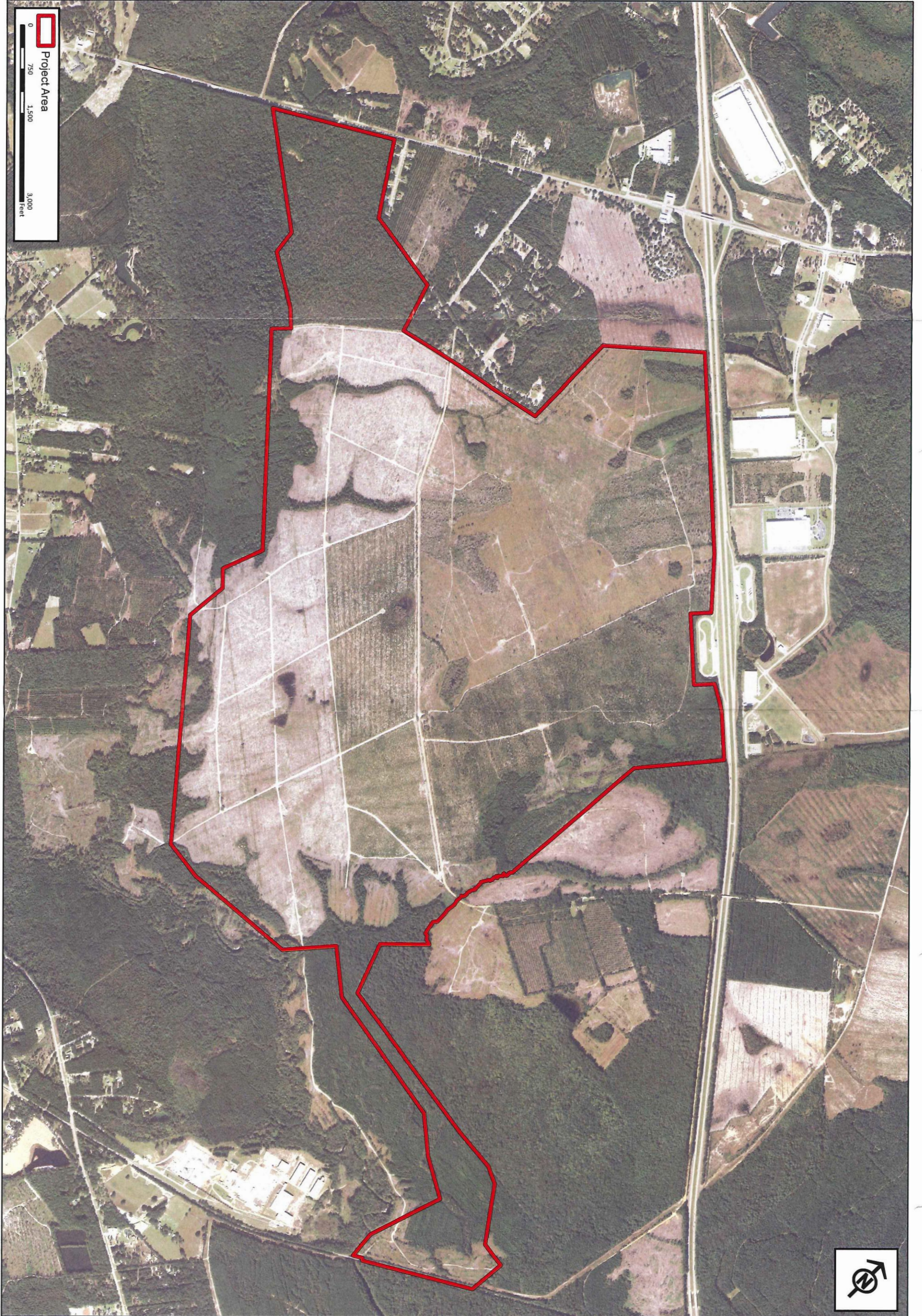
If you have any questions please contact Ms. Sarah Wise, Project Manager, Coastal Section, at 912-652-5550, or Mr. Rodney Parker, Archeologist, Regulatory Branch, at 912-652-5964.

Sincerely,

A handwritten signature in black ink, appearing to read "W. M. Rutlin". The signature is fluid and cursive, with the first name "W. M." and the last name "Rutlin" clearly distinguishable.

William M. Rutlin.
Chief, Coastal Section

Enclosures



RLC Project No.:	14-225.1
Figure No.:	3
Sketch Date:	6-1-2018
Prepared By:	MG
Map Scale :	1 inch = 1,500 feet

Bryan County OEM Site
Bryan County, Georgia

2015 Ortho Aerial Imagery
Prepared For: SHJDA

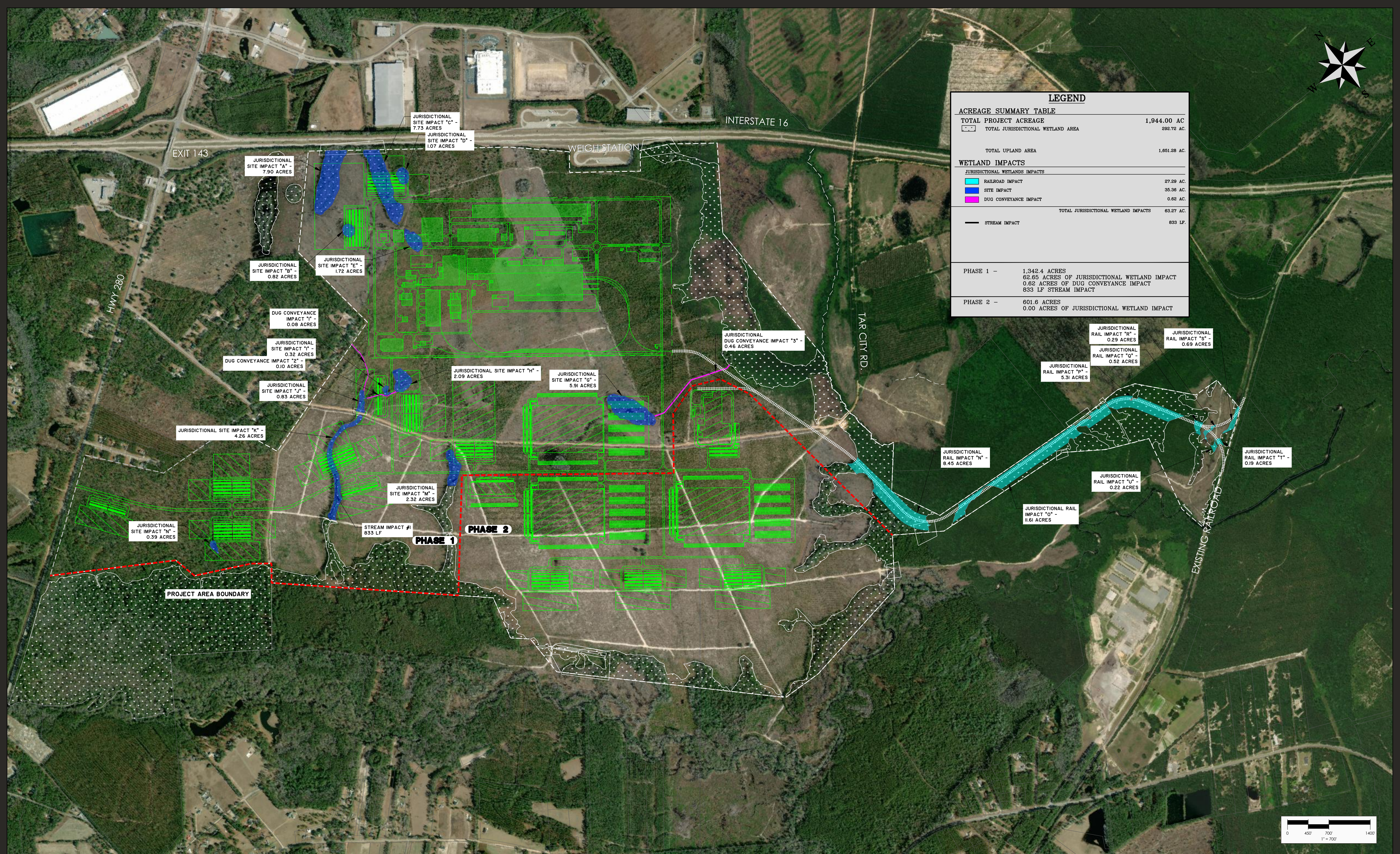
RLC

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41 Park of Commerce Way, Ste. 303
Savannah, Georgia 31405
912.443.5896 www.rlandc.com



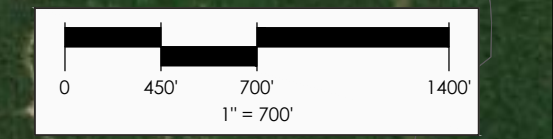
LEGEND	
ACREAGE SUMMARY TABLE	
TOTAL PROJECT ACREAGE	1,944.00 AC
TOTAL JURISDICTIONAL WETLAND AREA	292.72 AC
TOTAL UPLAND AREA	1,651.28 AC
WETLAND IMPACTS	
JURISDICTIONAL WETLANDS IMPACTS	
RAILROAD IMPACT	27.29 AC.
SITE IMPACT	35.36 AC.
DUG CONVEYANCE IMPACT	0.62 AC.
TOTAL JURISDICTIONAL WETLAND IMPACTS	
	63.27 AC.
STREAM IMPACT	833 LF.
PHASE 1 -	1,342.4 ACRES 62.65 ACRES OF JURISDICTIONAL WETLAND IMPACT 0.62 ACRES OF DUG CONVEYANCE IMPACT 833 LF STREAM IMPACT
PHASE 2 -	601.6 ACRES 0.00 ACRES OF JURISDICTIONAL WETLAND IMPACT



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 SAVANNAH, GA 31402-2727 • 912.234.5300
 www.thomasandhutton.com
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 CONSULTING ENGINEERS ARCHITECTS PLANNERS

SITE IMPACT MAP
BRYAN COUNTY, GEORGIA
 JUNE 27, 2019

Savannah Harbor-Interstate 16 Corridor
Joint Development Authority
 BRYAN • BULLOCH • CHATHAM • EFFINGHAM




This map illustrates a general plan of the development which is for discussion purposes only. Does not limit or bind the owner and is subject to change and position locations are for illustrative purposes only and are subject to an accurate survey and property description. The producer assumes no legal responsibility for the appreciation or depreciation of any premises, commercial or otherwise, by reason of their inclusion or exclusion from this map. The information contained in this map is subject to change with out notice and is for illustrative purposes only. Unit counts shown above are approximate and may change. Values were provided by outside sources and have not been verified.

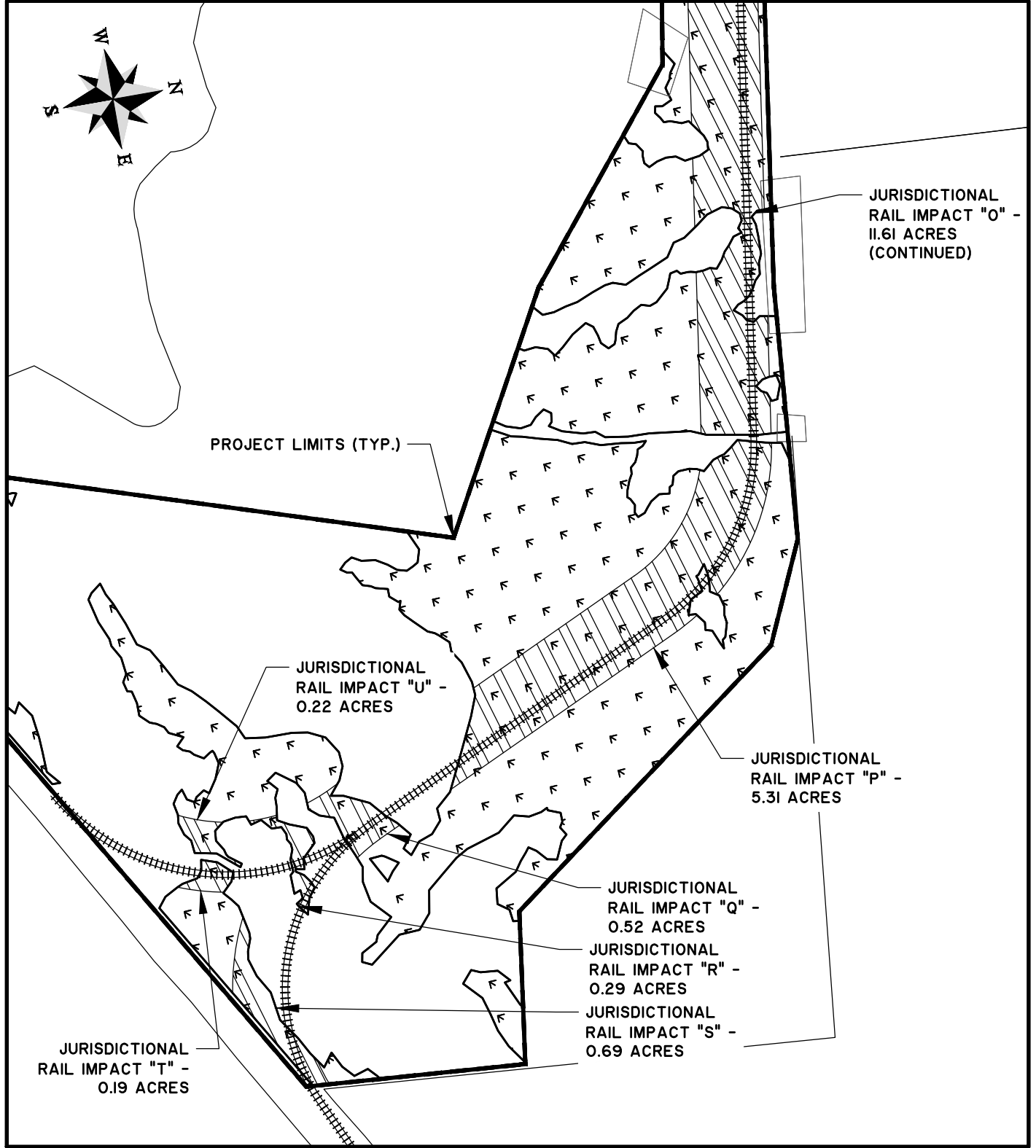
SAS 2015-00235, HP-150402-001

OEM Industrial Park Bryan County, Georgia

Legend

 Central of Georgia Railline which will be impacted





BRYAN COUNTY OEM SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

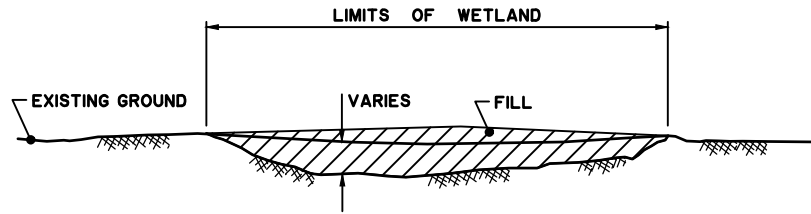
LOCATION: BRYAN COUNTY, GEORGIA
DATE: JUNE 6, 2018
JOB NUMBER: J - 25503

SHEET: 13 OF 14
SCALE: 1" = 400'



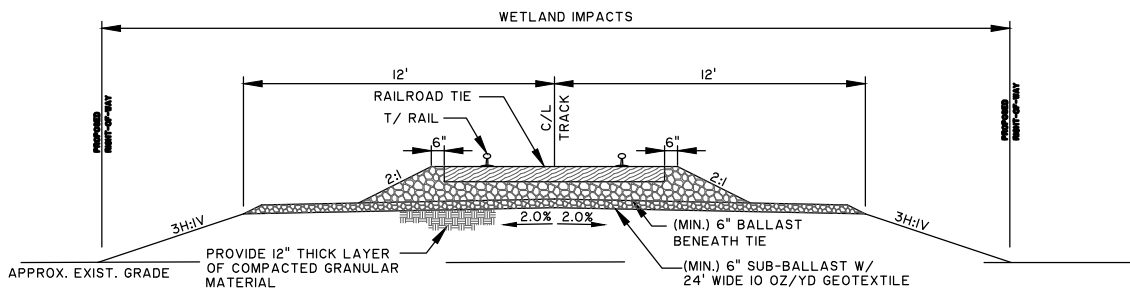
50 Park of Commerce Way
Savannah, GA 31405 • 912.234.5300

www.thomasandhutton.com



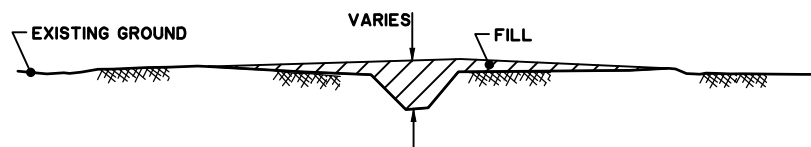
WETLAND FILL SECTION

NOT TO SCALE



TYPICAL SECTION THRU RAIL SPUR

SCALE: NTS



STREAM/DUG CONVEYANCE FILL SECTION

NOT TO SCALE

BRYAN COUNTY OEM SITE

PROPOSED ACTIVITY:
WETLAND PERMIT

CLIENT:
SAVANNAH HARBOR-INTERSTATE 16 CORRIDOR JOINT DEVELOPMENT AUTHORITY

LOCATION: BRYAN COUNTY, GEORGIA
DATE: JUNE 6, 2018
JOB NUMBER: J - 25503

SHEET: 14 OF 14
SCALE: N.T.S.

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Engineering | Surveying | Planning | GIS | Consulting

50 Park of Commerce Way
Savannah, GA 31405 • 912.234.5300

www.thomasandhutton.com

Phase I Intensive Cultural Resources Survey and Phase II Archaeological Testing for the 1,411.7-acre Bryan County OEM Site

Bryan County, Georgia



August 2018

Phase I Intensive Cultural Resources Survey and Phase II Archaeological Testing for the 1,411.7-acre Bryan County OEM Site

Bryan County, Georgia

Draft Report

August 2018

Prepared for:

Savannah Economic Development Authority
Savannah, Georgia

Prepared by:

Carolyn Rock, M.A., R.P.A.
Project Archaeologist

Mike Reynolds, M.A., R.P.A.
Project Historian

David M. Franz, M.S., R.P.A.
Archaeologist

and

Rachel Bragg, MHP
Historian

Under the Supervision of:



Alex Y. Sweeney, M.A., R.P.A.
Principal Investigator

Brockington and Associates, Inc.

Atlanta • Charleston • Jackson • Nashville • Savannah

Management Summary

Between March 9 and May 15, 2015, and between June 4 and 22, 2018, Brockington and Associates, Inc. (Brockington) completed Phase I cultural resources survey and Phase II testing for the 1,411.7-acre Bryan County Original Equipment Manufacturer (OEM) Site managed by the Savannah Economic Development Authority (SEDA). This tract is located south of the intersection of Interstate-16 (I-16) (GA-404) and US-280/25 (GA-30) in northwestern Bryan County. The cultural resources investigations were carried out for SEDA in partial fulfillment of guidelines established for Section 404 of the Clean Water Act permit. These investigations follow standards and guidelines that are in compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended).

The cultural resources survey includes both an archaeological and a historic architectural survey component. Archival research revealed no previously recorded archaeological sites and one previously recorded historic resource (Resource 225086, a ca. 1930 single-family dwelling) within the project Area of Potential Effects (APE). Archaeological field investigations consisted of 30-m-interval shovel testing and pedestrian survey within the entire 1,411.7-acre tract, as well as 1-by-1-m test unit excavations within selected archaeological sites. The architectural survey entailed a viewshed analysis of all potentially historic buildings, structures, and landscape features in the vicinity of the proposed project.

Our field investigations identified five newly recorded archaeological sites (9BN1586, 9BN1610, 9BN1611, 9BN1612, and 9BN1613), five archaeological isolated finds (Isolates 1 through 5), 26 newly recorded historic resources (Resources 1 through 26), and a revisit of the above-mentioned previously recorded historic resource.

The results of our archaeological investigations indicate that these archaeological sites and isolated finds are recommended not eligible for the NRHP. Further management considerations of these resources under Section 106 of the NHPA are not warranted.

The historic resources identified during the architectural survey include one late nineteenth-century single-family dwelling (Resource 1), 24 early to mid-twentieth-century single-family dwellings (Re-

sources 2 through 24, 26, and Resource 225086), and one late nineteenth- to twentieth-century railroad corridor (Resource 25). We recommend Resources 1 through 24 not eligible for the NRHP due to lack of significance associated with events, individuals, design, and/or potential to contribute to additional historical knowledge. We recommend the previously recorded Resource 225086 eligible for the NRHP under Criterion C since this ca. 1930s cross-gabled bungalow maintains integrity of design, workmanship, and setting. We also recommend the Central of Georgia Rail Line eligible for the NRHP under Criterion A for its connection with transportation and railroad towns, and under Criterion C for distinctive characteristics of engineering. However, for both these recommended NRHP-eligible resources, there are no anticipated adverse effects. Resource 225086 will not be affected by the project undertaking due to its distance from the tract as well as ample vegetation and non-historic development between the resource and proposed project activities. Any affect to Resource 25 (the railroad) will be consistent with the current industrial and commercial use and setting of the rail line and will not adversely affect the integrity or significance of the resource. Therefore, no further management consideration of architectural resources in the project APE are warranted.

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1.0 Introduction

Between March 9 and May 15, 2015, and between June 4 and 22, 2018, Brockington and Associates, Inc. (Brockington) completed Phase I cultural resources survey and Phase II testing for the 1,411.7-acre (571.3-hectare) Bryan County Original Equipment Manufacturer (OEM) Site managed by the Savannah Economic Development Authority (SEDA). This tract is located south of the intersection of Interstate-16 (I-16) (GA-404) and US-280/25 (GA-30) in northwestern Bryan County. The cultural resources investigations were carried out for SEDA in partial fulfillment of guidelines established for Section 404 of the Clean Water Act permit. These investigations follow standards and guidelines that are in compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) and its implementing regulations (36 CFR Part 800) by personnel qualified under the Secretary of the Interior's (SOI) Standards (36 CFR Part 61), as well as and in accordance with the standards set forth by the *Georgia Standards and Guidelines for Archaeological Surveys* (Georgia Council of Professional Archaeologists [GCPA] 2003) and National Register Bulletin 24, *Guidelines for Local Surveys: A Basis for Preservation Planning* (Parker 1985).

1.1 Project Scope and Effect

The 1,411.7-acre project tract is located approximately 3.5 miles north of Ellabell, and near the Black Creek/Groover Hill Community. The tract is bounded to the southeast by the Central of Georgia Railroad/Cuyler Road, other SEDA property, and private lands; to the southwest by other SEDA property; to the northwest by US-280/25 and the Groover Hill neighborhood; and to the northeast by I-16 and other SEDA property. A portion of Tar City Road passes through the project tract. For this project, the archaeological Area of Potential Effects (APE) is defined as the entire project tract, and the architectural resources APE is defined as the project tract as well as its immediate viewshed. Figures 1.1 and 1.2 present the project area location.

No properties within the APE are listed on the National Register of Historic Places (NRHP) or have been designated as National Historic Landmarks

(NHL). Prior to Brockington's previously recorded reconnaissance survey for the 2015 survey parcel (Franz 2015), the project tract had never been examined regarding the potential for containing significant cultural resources. To this end, the established project goals include the identification of all cultural resources located within the APE boundaries.

Brockington's examination of the 1,411.7-acre tract consists of two separate cultural resource survey and testing investigations, including one conducted in 2015 of a 1,161.4-acre parcel of the OEM Site, and the other conducted in 2018 of an adjacent 250.3-acre parcel of the OEM Site. The 1,161.4-acre parcel was examined in 2015 as due diligence for future federal permitting requirements, as development plans for this parcel were expected to fall under the purview of Section 106 of the NHPA via application for Section 404 of the Clean Water Act. Since that original 2015 project was cancelled and its associated completed report was not submitted to review agencies, we have updated the 2015 report results and incorporated them into this current report. In June 2018, an additional 250.3-acre parcel was investigated in partial fulfillment of guidelines established for Section 404 of the Clean Water Act permit. The current Section 404 permit application includes both the 250.3-acre parcel and the 1,161.4-acre parcel surveyed in 2015. The proposed undertaking at both parcels consists of industrial development that would include buildings, warehouses, supporting roads, a rail access/line, and parking areas. Proposed development will directly impact soils that will be mechanically graded, cut, and filled for the proposed project tract. Secondary impacts will occur primarily from the movement of heavy machinery in the project tract. Types of impacts may include removal and relocation of soils, clearing of vegetation, and filling activities.

The cultural resources survey includes both an archaeological and a historic architectural survey component. During the archaeological survey, shovel testing and pedestrian survey were conducted across the entire project tract. The architectural survey included a viewshed analysis of all potentially historic buildings or structures in the vicinity of the tract. Subsequent Phase II archaeological testing

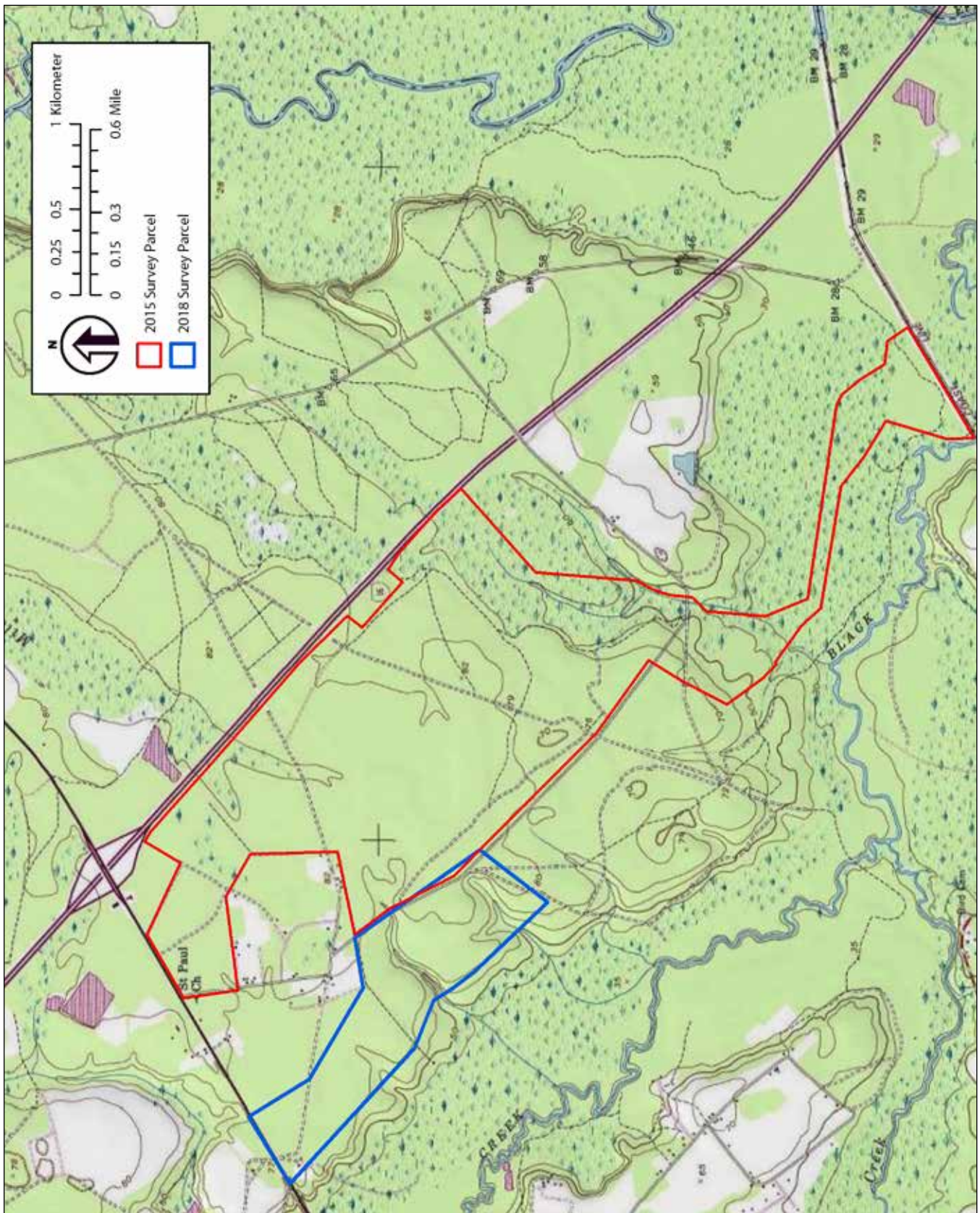


Figure 1.1 Project area location, Eden, GA (1976) US Geological Survey (USGS) topographic map.

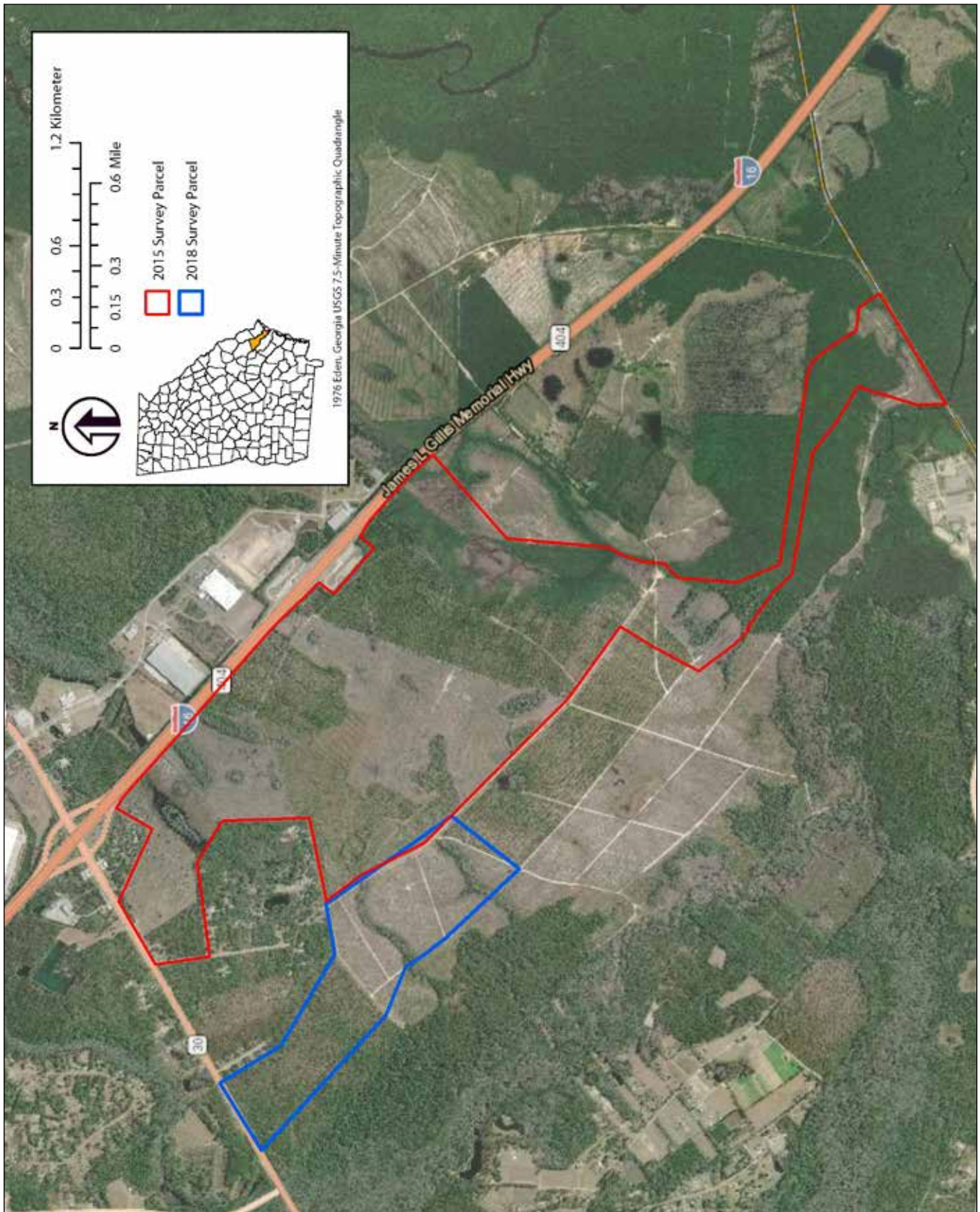


Figure 1.2 Aerial view of project area.

was conducted at four sites identified during survey to definitively evaluate their eligibility to the NRHP.

Our field investigations identified five archaeological sites (9BN1586, 9BN1610, 9BN1611, 9BN1612, and 9BN1613) and five isolated archaeological finds (Isolates 1 through 5). All of the archaeological resources are considered not eligible for the NRHP. The architectural resources survey identified one previously recorded resource (225086; BN-123) as well as 26 previously unrecorded resources (R1 to R26) within the project APE; only the previously recorded resource and the former Central of Georgia railroad corridor (Resource 25) are considered NRHP-eligible; however, the current undertaking will not have an adverse effect on either resource. Figure 1.3 presents the location of identified cultural resources in the project tract.

Following this introduction, Chapter 2 provides an overview of the cultural and environmental background of the project area. Chapter 3 describes the methods employed during the cultural resources survey. Chapter 4 provides the archaeological results of this investigation, and Chapter 5 provides the architectural results. Conclusions and recommendations are provided in Chapter 6. Appendices following the text include the artifact catalog for the 2015 investigations in Appendix A, the artifact catalog for the 2018 investigations in Appendix B, Georgia Archaeological Site File (GASF) forms in Appendix C, and resumes of the project principals in Appendix D.

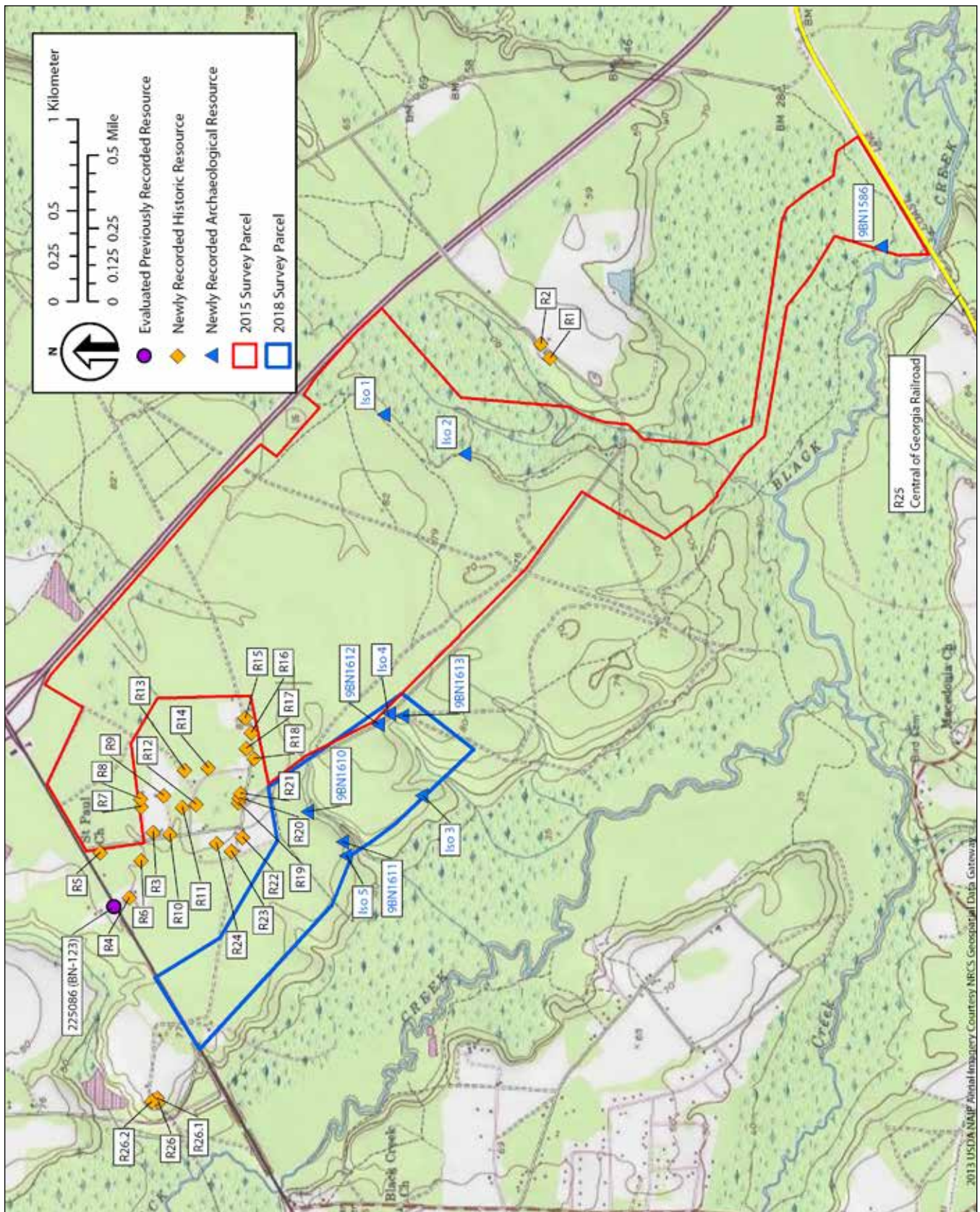


Figure 1.3 Project area location, Eden, GA (1976) USGS topographic map, showing identified cultural resources.

2.0 Environmental and Cultural Overview

Human adaptation in what we now know as Georgia has changed through time, as both the natural and cultural settings have changed. While the physical environment provides humans with the materials necessary for maintaining life, the combination of physical and cultural events and processes presents limitations and/or opportunities for exploitation and adaptation to any given region. This chapter presents a brief overview of the natural and cultural setting in the project area.

2.1 Environmental Review

2.1.1 Physiography and Topography

The project area is located in Bryan County, which is situated in the Barrier Island Sequence section of the Coastal Plain Province (Hodler and Schretter 1986:16-17). The Barrier Island Sequence is a complex of six shoreline deposit complexes representing the advance and retreat of former sea levels parallel to the present coastline in a steplike progression of decreasing elevations. Drainages in the area have only slight to moderate dissection allowing marshes to exist in poorly drained low areas. Elevations range from sea level to approximately 50 meters (m) (160 feet [ft]) above mean sea level (amsl). These Pleistocene deposits formed as sea level fluctuated during periods of continental glaciation. They are considered to represent specific geologic terraces, based roughly on range of elevation amsl (i.e., Holocene deposits). In ascending order (from coastline inland) these complexes are: Silver Bluff (1.5-4.6 m amsl), Princess Anne (4.6-7.6 m amsl), Pamlico (7.6-13.7 m amsl), Talbot (13.7-22.9 m amsl), Penholoway (22.9-30.5 m amsl), and Wicomico (30.5-48.8 m amsl). Topographically, these former shorelines are represented by parallel sequences of ridges (former barrier islands), pine flatwoods (former sea marshes), and stream swamps (old tidal waterways) (Hodler and Schretter 1986:27). The project tract is located in the pine flatwoods between the Pamlico and Talbot sequences exposed by the Late Pleistocene and thus making it available to the full range of human occupation in the region (cf. DePratter 1979b).

The primary drainage for the project area is the Ogeechee River. Black Creek lies up to one km south of the project tract and actually touches the south-

eastern corner of the tract at approximately one mile west of its confluence with the Ogeechee River (Figure 2.1; see Figure 1.1). Wetlands throughout the project area are drained by tributaries flowing generally southwest into Black Creek; several are culverted across Tar City Road. However, the largest Black Creek tributary in the tract meanders through the proposed railroad access corridor and is surrounded by extensive wetlands (Figure 2.2). In the main portion of the 2015 survey parcel, a series of drainage ditches, roughly parallel to Tar City Road, have been built to help drain the tract (Figure 2.3).

The northern three-fourths of the project tract are largely sand flats interspersed with drainages and low-lying areas. The southern tail of the tract, which is to be used for railroad access, is almost entirely low-lying floodplain along Black Creek. The 2018 parcel and a few areas along Interstate-16 and Tar City Road are better drained than the 2015 parcel. Vegetation within the project area is a mix of planted pines, mixed pine and hardwood, clear-cut areas, and wetlands. Much of this area has been planted and replanted with pines, leaving the ground surface disturbed by deep planting beds, uprooting and clearing. Only the northern half of the 2018 parcel contains mature hardwoods and pines rather than planted pines or cleared pine stands. Within the 2015 parcel, the pines were recently harvested and the ground surface was largely visible where not obscured by needles and clearing debris. Within the 2018 parcel, the pines were approximately three to four years old at the time of the field survey.

Brockington reviewed wetlands data from the US Fish and Wildlife Service (USFWS) for the project tract (Figure 2.4 and Table 2.1). Upland (U) areas that make up the bulk of the northern three-fourths of the tract would be the most likely to have been used in the past for settlement, while forests and seasonal wetlands may have been used as resource procurement locales. In addition, the area appears to have been used in the tar/turpentine industry in the past, and pine forested areas may likely have evidence of resin collection (e.g., Herty pots and gutters) or associated activities. Although much of the Uplands have been cleared recently, aerial views (see Figure 1.2) show some of the area to have been wooded in the recent past.



Figure 2.1 View of Black Creek in the southeastern corner of the project tract, looking southwest along railroad corridor.



Figure 2.2 General view of Black Creek tributary within proposed railroad access corridor.



Figure 2.3 General view of overgrown irrigation ditch northeast of Tar City Road.

2.1.2 Soils

Soil characteristics can also be a reflection of optimal locations for past human settlement, given factors such as drainage and slope. Areas that are level and dry, for example, are much more likely to have been utilized in either the prehistoric or historic eras as camps, farmsteads or other long-term settlements. The US Department of Agriculture (USDA) (USDA 2018; Wilkes et al. 1974) recognizes 12 different soil classifications within the project tract (Figure 2.5 and Table 2.2). With the exception of Angelina and Bibb (AB) frequently flooded soils, which are alluvial floodplain formations, all soils in the region are marine deposits.

AB soils make up approximately 12 percent of the subject property and incorporate wide floodplains in the western and eastern ends of the site above Black Creek. Because these floodplains are poorly drained and frequently flooded, they can be considered to be low probability for evidence of previous human settlements. Human activities in these areas would have been transitory, related to

occasional resource procurement, for example, and not long-term encampments.

In addition to the floodplains, other poorly drained areas include the drainages and depressions themselves, characterized by Ellabelle loamy sand (El), or Pelham loamy sand (Pl). Collectively, these sandy marine soils make up about 13 percent of the project area, surrounding the various small tributaries of Black Creek flowing south-south east across the parcel.

Sandy flats (Albany fine sand [As], Chipley fine sand [Cm], Leon fine sand [Lr], Mascotte sand [Mn], and Olustee fine sand [Ol]) can be considered low to moderate for containing archaeological sites based on drainage. Together these account for roughly 30 percent of the project area with about half (Cm) being dry enough for at least temporary settlement.

The flats typically exist between the drainages or floodplains and the upland rises or prominent interfluvial terraces such as Fuquay loamy sand (Fs), Lakeland sand (Lp), and Stilson loamy sand (Se). These well-drained and generally flat uplands, about

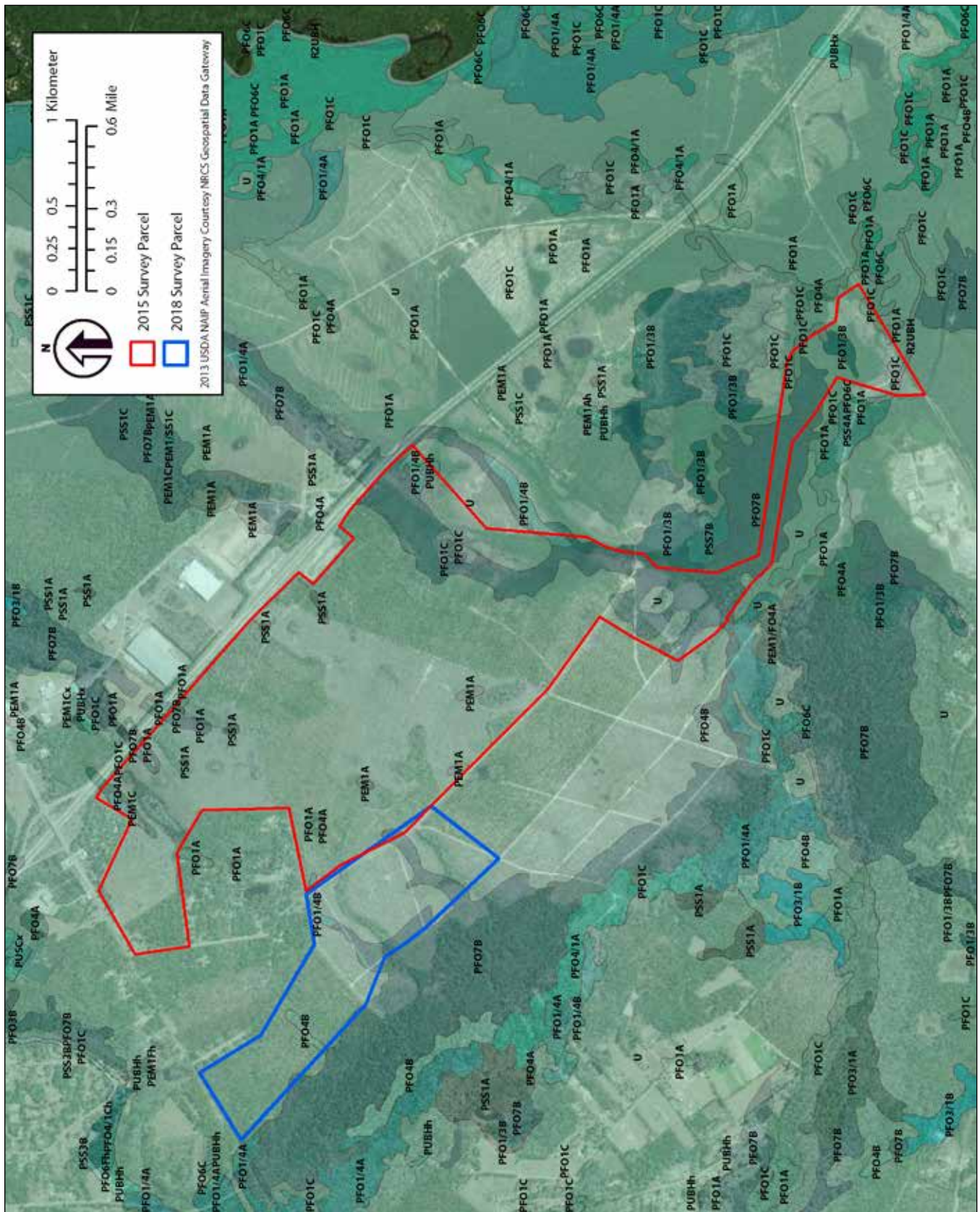


Figure 2.4 USFWS wetlands inventory data for the project tract.

Table 2.1 USFWS wetlands codes for the project tract.

Code	System	Subsystem	Class	Subclass
PEM1A	Palustrine (P)	Emergent (EM)	Persistent (1)	Temporarily Flooded (A)
PEM1C	Palustrine (P)	Emergent (EM)	Persistent (1)	Seasonally Flooded (C)
PFO1/3B	Palustrine (P)	Forested (FO)	Broad Leaved Deciduous/Broad leafed Evergreen (1/3)	Saturated (B)
PFO1/4B	Palustrine (P)	Forested (FO)	Broad Leaved Deciduous/Needle Leaved Evergreen (1/4)	Saturated (B)
PFO1A	Palustrine (P)	Forested (FO)	Broad Leaved Deciduous (1)	Temporarily Flooded (A)
PFO1C	Palustrine (P)	Forested (FO)	Broad Leaved Deciduous (1)	Seasonally Flooded (C)
PFO4A	Palustrine (P)	Forested (FO)	Needle Leaved Evergreen (4)	Temporarily Flooded (A)
PFO4B	Palustrine (P)	Forested (FO)	Needle Leaved Evergreen (4)	Saturated (B)
PFO7B	Palustrine (P)	Forested (FO)	Indeterminate Evergreen (7)	Saturated (B)
PSS1A	Palustrine (P)	Scrub-Shrub (SS)	Broad Leaved Deciduous (1)	Temporarily Flooded (A)
PSS7B	Palustrine (P)	Scrub-Shrub (SS)	Indeterminate Evergreen (7)	Saturated (B)
R2UBH	Riverine (R)	Lower Perennial (2U)	Unconsolidated Bottom (UB)	Permanently Flooded (H)
U	Upland (U)			

45 percent of the site, can be considered amenable to human habitation and therefore have a high probability for historic or prehistoric settlement.

As stated above, the project tract has been subjected to silvicultural activities since the mid-twentieth century. General procedures used in tree farming in the Southeast are described in detail below. Silviculture practices can have severe effects on soils and their archaeological deposits and have been extensively documented (see Eubanks et al. 1993; Eubanks et al. 1994; Eubanks and Poplin 1995; Gardner et al. 2009; Joseph et al. 2004; Kanaski et al. 2001; Stephenson and Snow 1993). Stephenson and Snow (1993:60) posit plowing up to 45 cm deep in the preparation of bedding rows for pine seedlings. Silvicultural tracts are re-bedded every 20-30 years, causing repeated disturbance to the natural stratigraphy. Where bedding rows are not required on uplands, the vegetation is sheared and the ground surface raked with heavy machinery.

Timber planting in the tract involves three processes. Initially, areas are prepared (bedded) for planting. Previously wooded areas are mechanically chopped and/or raked with implements pulled behind bulldozers to break up and remove stumps from the former trees. Then, the area is disked (with harrow blades that are 81 centimeters [cm] in diameter) and plowed to create raised beds. Seedlings are inserted into the raised furrows. Chemical treat-

ments to the young trees are conducted by air (for fertilizers) and from tractors (for pesticides). After 15 years, the timber can be harvested. Clear cutting with mechanical removal of the harvested trees by skidders and large trucks is employed throughout the harvested areas. Once harvested, areas again are subjected to the bedding and planting activities outlined above.

These activities result in severe disruption to the upper 0.6-1.0 m of soil present in any affected area. Most archaeological deposits are located at this same depth from the ground surface. Thus, these activities can disturb or completely destroy any archaeological deposits that may be present.

The potential for timbering activities to affect historic properties, particularly archaeological sites, varies with the amount of ground disturbance associated with the activity (Figures 2.6 through 2.10). The actual planting of seedlings usually results in very little disturbance to the ground surface. Disturbances most often occur during the preparation of an area to receive seedlings. Removal of stumps, roots, or incidental vegetation is accomplished most effectively with one of several devices towed by large caterpillar tractors. These large heavy rollers have 30-50 cm steel blades that penetrate the ground, breaking up roots, stumps, and debris. The actual movement of the tractor rarely affects more than the upper 20-30 cm since these vehicles generally gener-

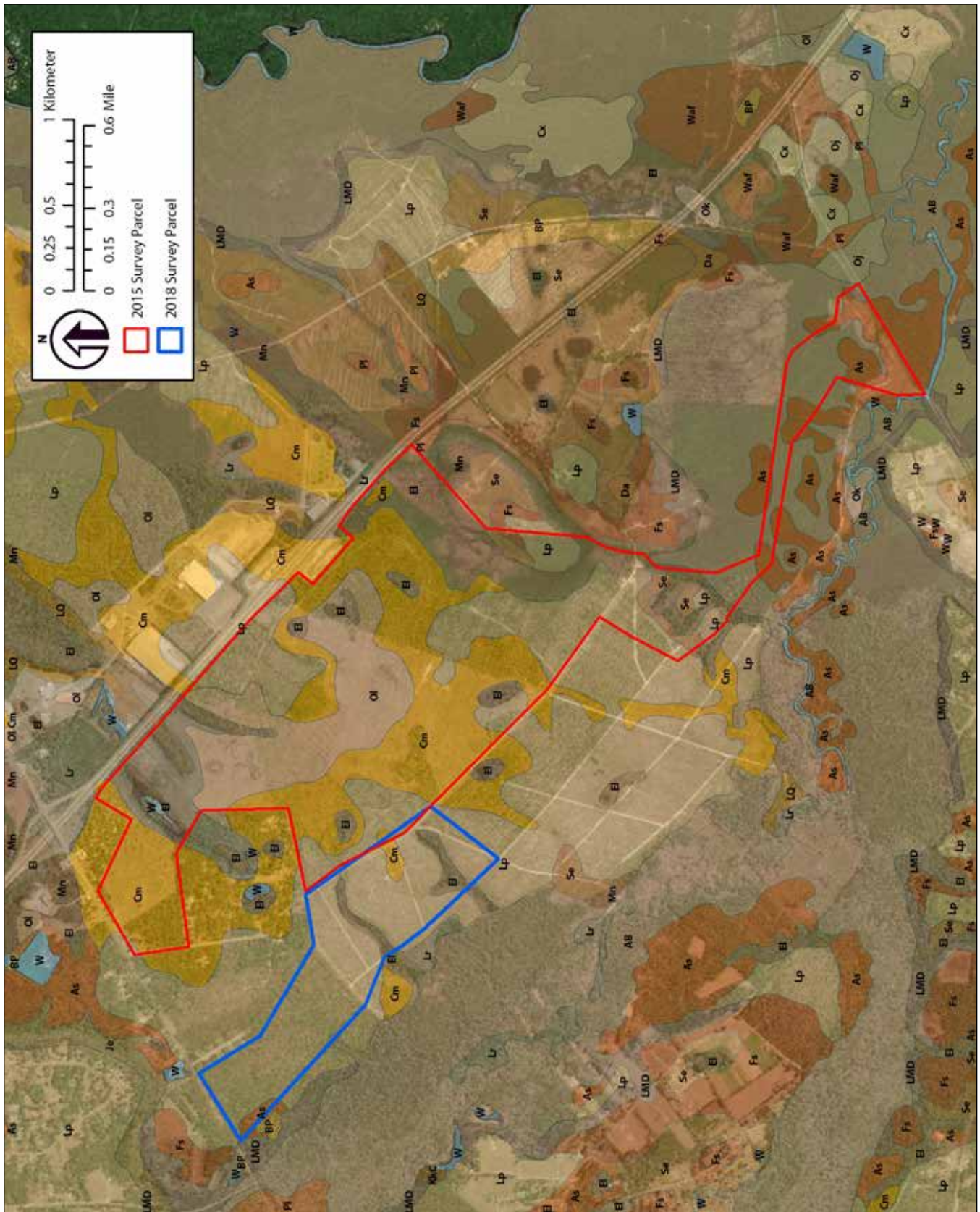


Figure 2.5 USDA soil survey data for the project tract.

Table 2.2 USDA soil data for the project tract, with probability for undocumented archaeological sites.

Symbol	Map Unit Name	Landform	Parent Material	Drainage Class	Probability
AB	Angelina and Bibb soils, frequently flooded	Floodplains	Alluvium	Poorly drained	Low
As	Albany fine sand	Flats	Marine deposits	Somewhat poorly drained	Low
Cm	Chipley fine sand	Flats	Marine deposits	Moderately well drained	Moderate
EI	Ellabelle loamy sand	Depressions, drainageways	Marine deposits	Very poorly drained	Low
Fs	Fuquay loamy sand	Interfluves	Marine deposits	Well drained	High
Lp	Lakeland sand	Rises	Marine deposits	Excessively drained	High
Lr	Leon fine sand	Flats	Marine deposits	Poorly drained	Low
Mn	Mascotte sand	Flats	Marine deposits	Poorly drained	Low
OI	Olustee fine sand	Flats	Marine deposits	Somewhat poorly drained	Moderate
PI	Pelham loamy sand	Depressions, drainageways, flats	Marine deposits	Poorly drained	Low
Se	Stilson loamy sand	Rises	Marine deposits	Moderately well drained	High
W	Water	N/A	N/A	N/A	Low

ate less ground pressure than wheeled vehicles, such as trucks.

Caterpillar tractors will penetrate deeply below the ground surface only where soils are very soft or wet. The chopping blades penetrate very deeply, affecting soil horizons well below the ground surface. Artifacts may be crushed, broken, or displaced. The upper soil horizons are mixed, creating a deep Ap horizon as well as blurring distinctions between episodes of site formation. These are the basic archaeological and pedological materials that archaeologists employ to gather significant information from a site.

Brockington and Associates Inc. has conducted a number of surveys and site assessments on timberlands in Georgia, South Carolina, and North Carolina (Bailey and Poplin 1997; Bridgman and Hendrix 2001; Bridgman et al. 2000; Eubanks et al. 1993; Eubanks and Poplin 1995; Fletcher and Harvey 1999a, 1999b; Fletcher et al. 1999; Giliberti and Jordan 1999; McMakin and Bailey 1997; Pecorelli and Harvey 1999; Poplin et al. 1999). Observed effects included disruption of the stratigraphic integrity of cultural deposits, mixed assemblages, fragmentation of artifacts, and secondary deposition.

2.1.3 Climate

The eastern Georgia Coastal Plain lies in a warm, temperate, subtropical climate zone (Hodler and Schretter 1986:44-45). Climate along the Georgia coast is moderate with hot summers and cool winters. Annual rainfall averages around 124.5 cm (49 inches) and temperatures average around 20°C (68 F°), with a range from the low 50s (degrees F) in January to the middle 80s in July. Winter low temperatures will occasionally fall to near 3°C (37°F) but infrequently below freezing. Fewer than 30 days per year result in temperatures of less than 0°C (32°F). Summer and late fall humidity is high, often between 70-80 percent in the afternoon. Winter and early spring humidity is on the whole much lower. The last frost generally occurs around March 1, and the first frost is expected after November 20, and snowfall is rare. The long growing season and lack of frost contributed to the development of a long history of intensive agriculture.

Frequency of rainfall is fairly consistent through most of the year but increases during the spring and summer months. Generally, tropical storms supply over half of the coastal rainfall between the months of June and September. During the late summer, hurricanes become fairly common. Although Coastal Georgia has historically been less frequently assailed by these storms than South Carolina and Florida, they have contributed to success or failure of entire seasons of crops.



Figure 2.6 Recently cut logging road between two pine bedding rows, looking northeast along drainage toward I-16.



Figure 2.7 General view of planted pines on rise along Tar City Road; bedding rows are typically less severe in the upland areas.



Figure 2.8 General view of planted pines in upland south of Tar City Road.



Figure 2.9 General view of typical clearing disturbances in project area.



Figure 2.10 View of recently cleared areas, looking northeast toward I-16; pedestalled hardwoods give an indication of the extent of soil disturbance.

2.1.4 Paleoenvironment

Profound changes in climate and dependent biophysical aspects of the environment over the last 20,000 years have been documented in the southern Piedmont and northern coastal Plain. Major changes include a general warming trend, melting of the large ice sheets of the Wisconsin glaciation, and an associated rise in sea level. With an increase of as much as 100 m (328 ft), the change in sea level was dramatic along the Atlantic coast (Brooks et al. 1979). Approximately 12,000 years ago, (the time of the first documented presence of human groups in the region), the ocean was located approximately 80 to 161 kilometers (km) (50 to 100 miles) east of its present position. During the last 5,000 years, there has apparently been a 400 to 500 year cycle of sea level fluctuations of about 2 m (7 ft) (Brooks et al. 1979; Colquhoun et al. 1981).

The general warming trend that led to melting of glacial ice and a rise in sea level, also greatly affected vegetation communities in the southeast. During the late Wisconsin glacial period and until about 12,000 years ago, boreal forest dominated by pine and spruce covered most of the southeast. Approximately 10,000 years ago, a modern, somewhat xeric forest developed and covered much of the southeastern United States (Kuchler 1964; Wharton 1978). As the climate continued to warm, increased moisture augmented the northward advance of the oak-hickory forest (Delcourt 1979). In a study by Sheehan et al. (1985), palynological evidence suggests that spruce, pine, fir, and hemlock rapidly decreased in growth between 9,000 and 4,000 years ago.

During the mid-Holocene, much of the world experienced a general warming trend referred to as the Hypsithermal or Altithermal. In some parts of the world, warmer temperatures were accompanied by increased precipitation, while other parts of the world, such as the Great Plains, experienced drier than present conditions. Current research suggests that the southeastern United States experienced a more monsoonal climate, with highly seasonal precipitation patterns. The oak-hickory to southern pine forests of the coastal Plain were replaced with a dominant southern pine vegetative cover; a condition that remained intact through the rest of prehistory (Delcourt and Delcourt 1987; Wharton 1978:12).

From 4,000 years BP to the present, slight cooling and limited increases in precipitation may have been responsible for subtle changes in lowland vegetation. The upland vegetation of the Southeast was characterized by a thinning of the deciduous forests (Delcourt and Delcourt 1987). The oak-hickory forests appear to have decreased in area and density and were slowly invaded or replaced by several conifer varieties. Hickory and gums were generally less prominent, with alder and ragweed increasing in representation in the palynological record (Delcourt 1979; Sheehan et al. 1985). Forest thinning was likely derived from an increase in human-related land use (i.e., timbering, farming). Similarly, the importance and overall increase in pine species in the forests during this time would have depended on several factors, including fire, land clearing, and soil erosion (Plummer 1975; Sheldon 1983). Since that time, the general climatic trend in the Southeast has been toward slightly cooler and moister conditions. As a result, the present southern mixed hardwood forest as defined by Quarterman and Keever (1962) was established.

Early European explorers reported large pure stands of yellow (longleaf) pine in the Coastal Plain. Recently, these stands have been replaced by slash pines (*Pinus elliottii*), particularly in low lying areas, where planted slash pine dominates nearly 90 percent of the Pleistocene pine flatwoods (Wharton 1989: 195).

2.1.5 Modern Flora and Fauna

The Georgia coast is part of the Southern Temperate Deciduous Forest and contains three environmental zones: the oak-hickory forest, the pine barrens, and the magnolia and maritime forest (Shelford 1963). The topography of the coast consists of a series of relic marsh systems, beach ridges, barrier islands, and mesic hammocks. Many of the high land mesic hammocks are surrounded by freshwater swamps or salt water marshes.

Larson (1958) has defined four environmental areas within the coastal zone; the strand, the lagoon and marsh section, the delta section, and the interior coastal zone. The strand consists of the beach and dune system. Due to the somewhat limited plant and animal resources, these areas tend to have a low potential for prehistoric occupations. The lagoon and marsh section is represented by areas contain-

ing marsh, tidal streams, high ground, and lagoons. Unlike the strand, the lagoon and marsh section is home to a diverse array of both plant and animal species and is considered a high potential area for prehistoric occupation sites. The interior coastal zone is composed of remnant lagoon and marsh areas that are no longer affected by tidal influence. The water source for these swamps is supplied primarily by rainwater. The delta consists of lowlands frequently inundated by brackish waters from nearby rivers. Cypress and gum dominate these slightly brackish swamps.

The forest community within this area is composed of live oak, water oak, pignut hickory, red cedar, southern magnolia, and red bay. Much of the project area, outside of low-lying wetlands, has been previously logged and replanted with pine. The pine bedding rows have severely impacted the project corridor, particularly on terraces above the major drainages, where additional sheet wash erosion has pedestaled the bedding rows, often as much as a meter above surrounding soils. Areas between bedding rows indicated disturbed or mixed soil contexts, often devoid of topsoil. Water-tolerant vegetation includes smooth cordgrass, needlerush, giant cutgrass, saltgrass, and sea oxeye. The diverse array of plant species within the marsh is essential for depositing nutrients into the tidal streams and attracting a variety of economically valuable species into the area. These low marshes become a feeding ground for fish, mussels, crabs, otters, and raccoons. Large game animals such as white-tail deer and bobcat can be found in the high-ground mesic hammocks located within the marshes. Such an abundance of natural resources presented an ideal habitat for exploitation by aboriginal populations. Vegetative communities encountered during field survey was varied and predominantly consisted of open pasture, planted pines, pine and hardwood forests, and wetland thicket, briers, and cypress trees.

Modern fauna of the Coastal Marine Flatlands are summarized by Wharton (1989) and include diverse species of mammals, birds, fish, reptiles, and amphibians. In all likelihood, a wider variety of fauna were available for exploitation during the prehistoric and early historic habitation of this area. Common fauna include white-tailed deer, Virginia opossum, pine voles, field mice, short-tailed shrews, gray and

fox squirrels, and raccoon. Less common mammals include the cotton mouse, cottontail rabbit, and nine-banded armadillo (Laerm et al. 1981). Birds of possible food value include doves, quail, turkey, geese and a variety of ducks, wading birds, and shore birds. Fish found in nearby creeks and rivers include bluegill, black crappie, largemouth bass, catfish, yellow sucker, gars, eel, and minnows. A wide variety of snakes, including the king snake, rat snake, corn snake, southern hognose, coachwhip, pine snake, copperhead, and the pygmy and diamondback rattlesnakes are in evidence. Faunal species encountered during this project were typical of those expected within the pine flatwoods of the region.

2.2 Cultural Overview

As it is presently understood, human occupation and its associated cultural environment spans at least 12,000 years in the Southeast. This 12,000-year span is divided into a number of developmental stages. Each stage is characterized by its own settlement patterns, subsistence strategies, technology, and diagnostic artifacts and is divided into distinctive, temporal periods. Remnants of these temporal periods are left in the form of archaeological deposits. A brief discussion of the cultural history of the region is presented below. Results of comparable investigations in the region (e.g., Bailey et al. 1997; Bailey and Poplin 1997; Fletcher et al. 2003; McMakin and Bailey 1997; Rock et al. 2013; Smith and Elliott 1985a) are provided for comparison within the discussion of each period.

2.2.1 Prehistoric Period

The prehistoric occupation of the southeastern United States can be described best in terms of changes in fundamental social systemics. During much of the past, prehistoric cultures maintained a lifestyle that focused on the acquisition of locally available wild resources (hunting and gathering). The extant food and other basic resource procurement technology of the earliest eras favored small, mobile social groups that practiced migratory, or nomadic, lifestyles. During times of economic stress, secondary resources could be relied upon, along with increased mobilization and trade with neighboring groups, in order to supplement the diet.

Archaeologists tend to refer to cultural divisions by the manner in which prehistoric people acquired food and maintained social relationships. Further divisions are based on spatial distributions of ceramic or lithic artifact types. The cultural periods most associated with an intensive hunter-gatherer lifestyle are the Paleoindian (12,000 - 8000 BC) and the Archaic (8000 - 1000 BC). These periods are further subdivided into categories based on the particular resource procurement strategies, their inter-group relations, and the projectile point typologies that have been developed through the years. The following discussions summarize findings of previous archaeological research in the region. The discussions focus on the Georgia Coastal Plain, and emphasize technological change, settlement patterns, and site choice throughout the prehistoric era.

Increased sedentism was probably a factor leading to higher rates of reproductive fertility, and subsequent population increases. Through increased sedentism and larger populations in conjunction with strong political organization and trade relationships, social diversity eventually increased. Evidence of differential access to exotic trade goods and the social demands of craft specialization are ways in which the archaeological record reveals the development of social diversity. A system evolved in which more complex societies participated in regional interaction and developed centers of political influence (Anderson 1994; Barker and Pauketat 1992; Marshall 1987; Muller 1997; Rogers and Smith 1995). In the Southeast, the periods in which these characteristics developed and reached their greatest degree of complexity are usually identified as the Woodland (1000 BC-AD 900) and the Mississippian (AD 900-1600). Each period is subdivided further based on particular pottery typologies and the presence/absence of public or symbolic architecture, usually identified as Early, Middle or Late subperiods.

Paleoindian Period (12,000- 8000 BC)

Definite human occupation of the southeastern United States began during the Paleoindian Period. The beginning of the period occurred during the late Pleistocene, which featured low sea levels and extended shorelines (Anderson et al. 1990). The glacial conditions of the late Pleistocene epoch characterize the early portions of the Paleoindian period,

but the more temperate conditions of the early Holocene prevail by the end of the period. Based on data from several sites in western North America, Paleoindians are seen primarily as nomadic hunters. The association of Paleoindian-stage artifacts with the remains of extinct fauna led early researchers to believe that Ice Age megafauna were the focus of Paleoindian subsistence, but more recently this view has changed. Although megafauna were certainly exploited, wild plant foods and smaller game were probably a significant part of the Paleoindian subsistence strategy.

Native Americans responded to this environment by living in central camps or villages and periodically visiting temporary camps to gather resources (Anderson et al. 1990). This adaptation, referred to as a "collector" or "logistical" strategy, warranted tool assemblages tailored for extended resource procurement (Anderson et al. 1990). Over most of North America, the material remains of the Paleoindian stage include a distinctive tool assemblage. The Paleoindian stage in the Southeast is characterized by isolated finds of fluted lanceolate projectile points and associated hearths or ephemeral features. The fluted lanceolate projectile points average 7.6 cm in length and exhibit parallel or slightly convex sides, concave bases, and a distinctive narrow, vertical flake (a flute) removed from each face of the blade. Other somewhat less distinctive features of Paleoindian lithic assemblages include bifacially flaked knives, endscrapers, burins, and graters (Griffin 1967; Kelly 1938; O'Steen et al. 1986).

Perhaps the greatest source of information regarding the Paleoindian stage in the Southeast, specifically Georgia, has come from the distribution and variety of projectile points dating to this time. The wide range of projectile point forms allows the Paleoindian stage to be divided into three periods: Early, Middle, and Late or Transitional. The Early Paleoindian period features large, fluted, Clovis-like projectile points (Anderson et al. 1990). Smaller variant forms of this basic design can be placed in either the Early or Middle Paleoindian period. The Middle Paleoindian period is characterized by unfluted lanceolate and fluted or unfluted broad blade forms. These include the Cumberland, Suwannee, and Simpson projectile point types (Anderson et al. 1990). The Late Paleoindian period features Dalton, Quad,

and Beaver Lake point types, which are smaller than previous forms. They feature ears, concave bases, and basal thinning. Evidence of tool resharpening, often to the point of exhaustion, is present in the serrated edges of Dalton projectile points (Anderson et al. 1990). Such evidence is not found during the earlier Paleoindian periods, suggesting that this activity is linked to the climatic changes that occurred at the end of the Paleoindian stage.

The distribution of Paleoindian projectile points in the Southeast suggests that large areas were not occupied by Native Americans during this stage (Anderson et al. 1990). Portions of the Georgia Coastal Plain do not appear to have been settled until the end of the Paleoindian stage and the beginning of the Archaic stage. Large numbers of Dalton projectile points located in the lower Southeast and in southern Georgia support this argument (Anderson et al. 1990). There are several theories for the lack of Early and Middle Paleoindian sites along the Georgia coast, including avoidance or minimal use, lack of quality lithic materials, and unfavorable environmental conditions (Anderson et al. 1990).

Very little substantial data concerning Paleoindian lifeways are known from the region. What is postulated tends to be adopted from the interpretations of more substantial remains from the Plains and western North America, since it is assumed that nomadic Pleistocene hunter-gatherers maintained a similar pattern of behavior regardless of region. Populations were sparse across most of Georgia. There are, however, some areas with concentrations of Late Paleoindian sites that indicate either a denser population or repeated seasonal reuse of local habitats. This may be especially true for the Oconee River region (Williams 1994:54, 2000:22-23). Other examples include the Theriault Site, a quarry in Burke County on the upper Coastal Plain (Brockington 1971) and the Taylor Hill Site, a stratified deposit near Augusta (Elliott and Doyon 1981). The Taylor Hill Site produced a high number and a variety of stratified stone tools and points, leading archaeologists to interpret the location as a Paleoindian and Archaic residential or logistical camp (Anderson et al. 1990). Archaeological data from Fort Stewart (located less than three km south of the project tract) typifies the general extent of Paleoindian archaeological finds on the Lower Coastal Plain; archaeological surveys

of nearly 250,000 acres at Fort Stewart resulted in the identification of only six archaeological sites containing any Paleoindian artifacts. These materials are represented by a few lithics from the Late Paleoindian period (Rock et al. 2013).

Archaic Period (8000-1000 BC)

During the transition from sparse Paleoindian colonization to higher Archaic population densities, developments in technology mirrored the rise in populations. Large, heavy, lanceolate projectile points were gradually replaced by generally smaller, corner- or side-notched types (Anderson et al. 1990; Bullen 1975; Coe 1964; Whatley 1984, 2001). This reflected not only a change in technological innovation but a shift in focus to smaller prey species (as opposed to now-extinct Pleistocene megafauna). It was during the latter part of the Archaic stage that fiber-tempered ceramics (e.g., Stallings) were developed, indicating a push toward a more sedentary settlement strategy (Fairbanks 1942; Sassaman 1993; Williams and Thompson 1999:120-121).

Site localities during the periods of intensive hunting and gathering were selected primarily as a means to allow access to some necessary resource. For the most part, these resources were prey species, wild plants, and lithics. Natural barriers to movement prevented colonization in some instances. Groups were aggregated according to complex territorial arrangements that evolved early and probably shrank considerably as populations increased or seasonal rounds developed based on smaller prey species (Anderson and Joseph 1988; Anderson and Sassaman 1996).

One settlement strategy, initially posited by Anderson and Hanson (1988), suggests a seasonal round wherein migration occurred across both the Piedmont and Coastal Plain provinces. The pattern may have involved winter/spring use of the Coastal Plain and fall/summer use of the Piedmont. The agglomeration of sites near the fall line may in fact indicate a propensity for fording rivers where they are most shallow (north of the fall line) while maintaining such a seasonal round.

Early Archaic (8000–6000 BC). The Early Archaic is generally perceived as an adaptive response to the changing post-Pleistocene (Holocene) environment. This period is characterized by a gradual shift in subsistence strategies, with an increasing reliance on hunting small game and the procurement of wild plant foods (Elliott and Sassaman 1995). Relevant research by Chapman and Shea (1981) indicates that the exploitation of a broad range of local resources was achieved much earlier than previously thought. Chapman and Shea (1981) suggest that trends in settlement and subsistence practices throughout the Archaic can best be interpreted as the result of adaptive responses to a variety of cultural and environmental conditions. These factors influenced change within a number of distinct regional settings. While the general density of populations is thought to have increased during the Early Archaic period, there is evidence for the persistence of certain cultural traditions initiated during Paleoindian times. Specifically, the tendency toward the development of subregional technological traditions and the attachment of groups to particular places in the landscape are practices shared by Paleoindian and Early Archaic groups (Anderson 1990; Bridgman Sweeney 2013; Sassaman 2010).

The Early Archaic period is distinguished from the preceding Late Paleoindian period on the basis of the technological change from large, fluted projectile points to simpler, smaller, and more diverse point types. Archaeological remains diagnostic of this period include ovate, stemmed, and beveled quartz bifaces, corner- and side-notched projectile points, hafted endscrapers, and flaked stone adzes. Chert remained a popular lithic raw material, and diagnostic projectile points of this period include Hardaway, Dalton, Palmer, and Kirk (Coe 1964). In Georgia, the Big Sandy, Palmer-Kirk, Kirk Corner Notched, and Kirk Stemmed are among some of the new projectile point forms being made during this period. Wear patterns observed on these tools suggest that Native Americans used them to kill, butcher, and skin animals as well as shape wood (Stanyard n.d.). Very little is known about the Early Archaic period in the Georgia Coastal Plain. O'Steen's (1983) research in the Oconee River drainage in the Piedmont leads to general inferences concerning Early Archaic settlement and social organization that may

be applicable to the project region. She suggests a multilocational settlement system for the Early Archaic, focused on seasonal exploitation of faunal and floral resources and proximity to lithic raw materials. Primary site types consist of seasonally utilized, residential base camps, often located at tributary confluences, on high terraces, and at river shoal areas. Smaller, scattered resource extraction loci often were situated in a variety of ecological zones.

A regional analysis of Early Archaic social group dynamics revealed evidence for interactions among macroband territories throughout the Coastal Plain (Bridgman Sweeney 2013). Social boundaries apparently were relatively permeable, such that large-scale social networks promoted the development of distinct subregional technological traditions (i.e., point "types" known as Taylor, Bolen, and Big Sandy) within the Early Side-Notched Horizon. Early Archaic groups in the Savannah and Ogeechee River drainages evidently interacted most frequently with their contemporaries to the northeast, in the Santee-Cooper river drainages. According to this recent study, Early Archaic groups regularly practiced cross-drainage movement well beyond their basic economic needs, aggregating with neighboring groups at places such as the Ocmulgee River social boundary area in central Georgia (Bridgman Sweeney 2013).

Previous research in the area indicates that Early Archaic sites are relatively uncommon on the Coastal Plain (Elliott and Sassaman 1995). Typically, sites of this period consist of small scatters of artifacts located on eroded hilltops or on river terraces. There are several important Early Archaic sites located in the Savannah River Valley, including Rae's Creek and Phinizy Swamp (Anderson and Sassaman 1996). Rock hearths and pits are featured at these sites, as well as an abundance of chert tools and debitage. Data collected from these site excavations suggest an increase in activity and the use of a wide variety of resources by Native American groups (Anderson and Sassaman 1996). A recent archaeological site database for nearby Fort Stewart (Rock et al. 2013) listed 27 sites with Early Archaic components identified within a 250,000-acre surveyed area. The majority of Early Archaic sites were situated within one km (0.6 mi) of rivers or streams. Johnstone (2004:35-36) found this distribution

somewhat contradictory to Early Archaic settlement models observed along the Savannah River basin, where a balance of riverine and upland settlements is observed (Cabak et al. 1998; Daniel 2001; Gillam 2001). Daniel's (2001) notion of lithic tethering of Early Archaic people to chert outcrops also does not fit within the site distribution for Early Archaic settlement at Fort Stewart; the nearest known chert outcrops are more than 50 km away, in Burke and Screven Counties (Goad 1979).

Among other archaeological surveys on the Georgia Coastal Plain, Garrow (1984) recorded four small Early Archaic campsites in Screven County. Fish (1976) noted several multicomponent sites exhibiting Early Archaic occupations along Ebenezer Creek and its upper tributaries. Surveyors of the 720-hectare (ha) Fort Howard Paper Company Tract in Effingham County encountered only one site with a definable Early Archaic component (Smith and Elliott 1985a). Surveyors of the 2,040-ha Godley Tracts I and II, the 1,000-ha Savannah Quarters Tract, and the 520-ha Morgan Tract in Chatham County identified no definite Early Archaic sites (Bailey et al. 1997; Bailey and Poplin 1997; Fletcher et al. 2003; McMakin and Bailey 1997). Surveyors of the 507-ha Rice Hope Plantation Tract, also located in Chatham County, identified one site (9CH1052) with evidence of a possible Early Archaic occupation (Fletcher et al. 2004). A 2186-acre survey in Chatham County resulted in the recording of one site with a small Early Archaic component (Kratzer et al. 2000).

Middle Archaic (6000–4000 BC). The climatic changes that occurred during the Middle Archaic are thought to have influenced settlement, subsistence strategy, and technology (Dragoo 1975:11). Between 6000 and 4000 BC, the postglacial Altithermal brought a period of warmer and drier conditions. The temperate climate and abundant food resources provided optimal environmental zones suitable for exploitation by Middle Archaic populations (Elliott and Sassaman 1995). The Middle Archaic period appears to show an increase in more permanent settlement, particularly in the large river valleys. This is perhaps most indicative of the establishment of intraregional territories by discrete tribal, ethnic, or familial units. During this period one begins to see the characteristics of seasonality and continual

seasonal rounds within restricted territories. This is expanded in the Late Archaic period.

Three projectile point/knife types dominate the Middle Archaic. These point types include Stanly (triangular blade point with narrow, straight-sided, vertical stem), Morrow Mountain (isosceles triangle blade with contracting stem), and Guilford (lanceolate point with the widest point near the center) (Coe 1964:35-43). While quartz began to be widely used throughout the rest of Georgia, chert continued to be used on the coast due to its local availability (Stanyard n.d.). Other artifact types characteristic of this period are ground and polished stone tools (e.g., atlatl hooks, nutting stones, grinding stones and pestles, netsinkers), a variety of bone tools, flaking tools, and scrapers (Ford and Willey 1941:333; Griffin 1967:178; Stoltman 1978:715; White 1988:53).

Habitation sites during this period were located primarily on well-defined floodplains while temporary activity areas were often situated on upland ridges (Ford and Willey 1941; Griffin 1967). These sites are typically described as lithic scatters/hunting camps and often are composed of light to dense deposits of quartz and chert thinning flakes and tools. While the few recorded sites indicate little change in habitation location during the Early and Middle Archaic periods in southeastern Georgia, White (1988) suggests that Native American groups utilized a broadening range of resources.

Previous research in the project vicinity provides minimal data concerning settlement location. The Fort Stewart archeological site database lists 13 sites with an identified Middle Archaic component within a 250,000-acre surveyed area (Rock et al. 2013); twelve of these 13 sites have phases identified in the database that include Morrow Mountain projectile points. Investigations by Fish (1976:23) along Ebenezer Creek show an increase in site density, with some movement into the uplands away from creek valleys, during the Middle Archaic period. Surveyors of the 2,040-ha Godley Tracts identified one Middle Archaic site (9CH872) (Bailey and Poplin 1997; Hicks 1997; McMakin and Bailey 1997). Surveys in the 1,000-ha Savannah Quarters Tract, 520-acre Morgan Tract, and 507-ha Morgan Tract, as well as in a 2186-acre tract recorded no Middle Archaic sites (Bailey et al. 1997; Fletcher et al. 2003, 2004; Kratzer et al. 2000).

Late Archaic (4000–1000 BC). The Late Archaic is a time of considerable population growth, regional adaptation, and interregional exchange of raw materials (Griffin 1967:178-179). A greater reliance on riverine resources and the varied hunting of large and small game may have pushed Late Archaic populations toward long-term settlement within specific environmental zones (Dragoo 1975:12-13; Elliott and Sassaman 1995; Griffin 1967:180).

The primary development in the Late Archaic that distinguishes it from the preceding periods is the development of pottery. The Late Archaic is often divided into Preceramic and Ceramic phases. In the coastal region of Georgia, fiber-tempered pottery is often identified with the St. Simons phase occupation. St. Simons can be further divided into subphases St. Simons I and St. Simons II, which equate to Stallings subphases II and III, respectively, for the Georgia interior and for South Carolina. St. Simons I (Stallings II) ceramics feature fiber tempers and plain surface decorations. St. Simons II (Stallings III) ceramics feature surface decorations including incisions, punctations, and grooves (Stanyard n.d.). St. Simons and Stallings pottery occur as large, flat-bottomed, shallow bowls, with jars being a rare occurrence (Sassaman 1993:19). Construction technique is by pinched slabs, though coiling may have been added by the end of the period (Sassaman 1993:66-67).

Johnstone (2004:45) postulates that St. Simons/Stallings ceramics were likely used in the Fort Stewart, Georgia area no earlier than 2000 BC. The recovery of fiber-tempered ceramics with Refuge punctated and incised ceramics (described later during the Early Woodland) may indicate that both pottery types were produced simultaneously. Johnstone (2004:45) further speculates that St. Simons ceramics may have been produced as late as 600 BC, during the first half of the subsequent Early Woodland.

Late Archaic diagnostic lithic artifacts include Savannah River stemmed projectile points (a triangular blade with square shoulders and a vertical stem with straight or concave base [Coe 1964:44]), grooved axes, netsinkers, steatite vessels, bone and antler tools, and a variety of shell ornaments (Coe 1964:113; Griffin 1967:180). A smaller variant of the Savannah River point, the Otarre (Keel 1976), is thought to be associated with the later portion of the

Late Archaic period (Garrow 1984). Other projectile point types associated with this period include the Elora, Kiokee Creek, and Ledbetter, all of which exhibit the same general designs: triangular blades, straight or slightly contracting stems, and straight bases (Stanyard n.d.).

The subsistence systems did not change substantially between the Middle and Late Archaic subperiods, but it appears that settlement may have become increasingly sedentary. The development of fiber-tempered pottery may have been in response to the decrease in nomadic lifestyle or the prolonged occupation of preferred sites. The majority of Late Archaic sites on the Georgia coast are comprised of shell middens or shell rings, with few having non-shell contexts (Elliott and Sassaman 1995). The shell middens and shell rings are often located adjacent to major river or stream channels in the seaward areas of estuaries. It is theorized that shell midden sites represent strategically located base camps that provided access to both marine and terrestrial resources (Elliott and Sassaman 1995). In observing these coastal sites, it is clear that shellfish were an important resource to Native Americans living in the region. The level of their significance, however, remains somewhat unclear. Some archaeologists believe shellfish were a central part of the economy while others believe shellfish merely supplemented an already diverse marine diet enjoyed by Native American groups (Elliott and Sassaman 1995).

Determining the nature of the relationship between shell middens and shell rings has resulted in several different ideas. Jim Michie postulates that each shell midden site is associated with one or more shell rings that served as ceremonial centers or were the locations for other social activities (Elliott and Sassaman 1995). Michael Trinkley, on the other hand, believes shell rings, like shell middens, represent intensive occupation locations and served the same purpose as a base camp (Elliott and Sassaman 1995). Chester DePratter argues that the shell middens and rings represent separate, permanent settlements occupied by a small number of families (Elliott and Sassaman 1995).

It is generally accepted that shell rings were created through the accumulation and merging of individual household middens over time (Elliott and Sassaman 1995). The shell rings and middens

along the Georgia coast contain a variety of animal remains including fish, turtles, deer, raccoons, turkeys, rabbits, squirrels, and opossums. The most common plants found in shell middens and shell rings are hickory nutshells and acorns (Elliott and Sassaman 1995).

At the end of the Late Archaic period, shell midden locations shifted farther inland. At the same time, they became smaller and more dispersed (Elliott and Sassaman 1995). This change has been linked not only with a rise in sea level and estuary expansion, but also with a sociopolitical collapse that occurred throughout the region during the Late Archaic period (Elliott and Sassaman 1995).

It is inaccurate to consider changes in faunal procurement strategies or territorial boundaries between and within the Paleoindian and Archaic periods as resulting from a single factor, such as climate change. Rather, a complex web of individual yet interdependent factors influenced the path of social change among hunter-gatherers in the Southeast. The empirical study of Savannah River chiefdoms by Anderson (1994) is a detailed example of the ways in which very complex political and economic forces interact to manifest themselves in different ways. These later-period manifestations clearly have their roots in earlier hunter-gatherer societies.

Settlement density in the Georgia Coastal Plain appears to have increased during the Late Archaic, while settlement location continues to be somewhat variable. At Fort Stewart, 202 sites containing Late Archaic components have been recorded in a 250,000-acre area; this presence is more common than Middle Archaic (n=13) or Early Archaic (n=27) sites (Rock et al. 2013). Of the 202 Late Archaic sites, 195 contain fiber-tempered ceramics. Sites with diagnostic projectile point forms listed in the database include 23 sites with Savannah River projectile points and eight Otarre projectile points. Six of the sites contain steatite artifacts.

At other sites on the Georgia Coastal Plain, Fish's (1976:24) investigation along Ebenezer Creek found patterns similar to those of the Middle Archaic period. Garrow (1984) recorded 17 Late Archaic sites, six in the Coastal Marine Flatlands and 11 in the adjacent Vidalia Uplands. Five of six Late Archaic sites recorded on the Fort Howard Paper Company Tract in Effingham County were

located within the Dasher Creek drainage while the sixth site was found on the Mill Creek bluff (Smith and Elliott 1985a:138). Survey of the 2,040-hectare Godley Tract resulted in the identification of one ceramic Late Archaic site (9CH872) (Bailey and Poplin 1997; Hicks 1997; McMakin and Bailey 1997). Surveyors of the 507-hectare Rice Hope Plantation Tract identified one site (9CH1052) with evidence of a Late Archaic occupation (Fletcher et al. 2004). A survey of the 2186-acre tract containing Site 9CH919 resulted in the recording of four sites with Late Archaic components (Kratzer et al. 2000).

Woodland Period (1000 BC – AD 1150)

Early Woodland (1000–300 BC). The transition from Late Archaic to Early Woodland was marked by a gradual increase in population and sedentism and by the acquisition of a number of distinctive material and cultural traits. Early Woodland is correlated with increasing intra- and extra-regional trade (exemplified by more exotic items), developing social hierarchies, technological innovations in ceramics, and a presumed increase in political superstructures. Dwellings become more permanent, are situated in denser concentrations, and are extended as part of more continuous settlements. The trend increases throughout the Middle and Late Woodland with the addition of mound building and the extension of greater emphasis on sedentary agriculture. Technological advances in pottery manufacture became widespread during this period, resulting in increased efficiency and productivity of food processing and storage (Dragoo 1975:17; Griffin 1967:180; Steinen 1995; Stoltman 1978:715). Horticultural activities during the Early Woodland period focused on the domestication of different plants, such as chenopodium, sunflower, and amaranth.

A distinct break between Archaic and Woodland lithic artifact types is not always evident. Early Woodland artifact assemblages often contain stemmed (e.g., Swannanoa, Little Bear Creek) and triangular (Yadkin) projectile points (Coe 1964; Justice 1987). Early Woodland artifacts include ground stone manos and mortars, nutting stones, polished slate or copper spearheads, tubular stone pipes, and trade goods such as red ocher, mica, and shell (Ford and Willey 1941:337; Griffin 1967:183; Stoltman 1978:718).

In addition to lithic artifacts, increasing amounts of pottery appear on Early Woodland sites. Wares are characteristically thick and low-fired. Predominant vessel forms have flaring sidewalls, wide mouths, and flat to rounded bases (Griffin 1967:180; Stoltman 1978:717). In the coastal areas of Georgia, the Early Woodland period is represented by Refuge (sand-tempered ceramics exhibiting punctate, incised, dentate-stamped, and simple-stamped designs) and Deptford (coil-built vessels with simple, linear, and check stamping) ceramics. Refuge ceramics are usually tempered with sand or grit, although some may be tempered with grog (Stanyard n.d.). Smith et al. (1981:86) observe stylistic affinities between many Refuge motifs and those of the Late Archaic St. Simons and Stallings ceramics, suggesting a developmental connection. Deptford ceramics appear to represent a long period of settlement stability, beginning at approximately 500 BC and overlapping with Refuge wares. In the absence of radiocarbon dating, early Deptford is generally indistinguishable from Refuge III. Refuge Simple Stamped and Plain are not easily distinguished from Deptford Simple Stamped and Plain pottery (Smith et al. 1981:86).

Early Woodland settlement in the Coastal Plain apparently focused on utilization of floodplain areas and stream-based resources. Early Woodland sites were found throughout Ft. Stewart, often on bluffs above creeks and rivers (Grover and McKivergan 2001:23-24). Early Woodland and Middle Woodland components tended to blend together and were often identified at the same site. Of the 197 sites with Early Woodland components at Ft. Stewart, 189 sites contained Refuge ceramics, and 193 sites contained Deptford ceramics (Rock et al. 2013); Deptford ceramics could represent either Early or Middle Woodland (or both), depending on ceramic decoration. Smith and Elliott (1985a:138) indicate increases in overall site size and suggest a preference for site locations along Dasher Creek and the bluff overlooking Mill Creek throughout the Woodland period. Fish's (1976:24) results appear to concur with these locational preferences, based on mapped Early and Middle Woodland sites. Garrow (1984:49) recorded nine Early Woodland sites along the transmission corridor, predominantly in the Vidalia Uplands section. Numerous Early-Middle Woodland sites also were recorded on the upland

areas adjacent to small drainages on Delta Plantation in Jasper County, South Carolina (Poplin et al. 1990), northeast of the project area. Investigators of the 2,040-ha Godley Tracts identified two Early Woodland sites (Bailey and Poplin 1997; Hicks 1997; McMakin and Bailey 1997).

Middle Woodland (300 BC–AD 700). The Middle Woodland represents a time of population growth and increased cultural complexity. The Middle Woodland is characterized by increased site size and density, the appearance of large earthen mounds containing elaborately furnished graves, the emergence of agriculture, the development of ceremonialism, and a complex interregional trade network (Dragoo 1975:18-19; Griffin 1967:183; Steinen 1995; Stoltman 1978:717). Large villages and base camps were located on the interior Coastal Plain as well as the Atlantic coast (Stephenson et al. 2002). Middle Woodland period usually lived in large permanent villages. Nearby locations along the marsh edges and in interior lands were used for specific activities such as resource gathering and extraction (Stanyard n.d.). The similarities in settlement patterns, subsistence activities, and ceramic decorations suggest that coastal and inland sites regularly communicated and exchanged ideas and resources (Stanyard n.d.).

The lithic assemblages of the Middle Woodland period remain virtually unchanged from the Early Woodland. In the Coastal Plain, medium to large stemmed projectile points are still present (e.g., Baker's Creek, Stemmed Copena), as are larger triangular arrow points such as Copena and Yadkin (Cambron and Hulse 1975; Justice 1987). Stone artifacts also include stemmed knives, ground stone celts, and rough slate or shale hoes (Caldwell 1958:46; Ford and Willey 1941:337).

Specialized tools, utilized during this period in trade or as grave goods, included copper implements, deer bone awls, beaver and bear teeth, and exotic lithic material (Griffin 1967:183-186; Stoltman 1978:717-718). While Hopewell-influenced artifacts such as copper panpipes, earspools, cut mica, and platform pipes have been found in Middle Woodland components in northwest Georgia (Jeffries 1976), Smith and Elliott (1985a:11) cast doubt on the influence of this trade network on cultures of the Georgia Coastal Plain.

Middle Woodland ceramics in the Coastal Plain generally exhibit a continuation and refinement of previous forms and motifs. Deptford ceramics feature a variety of decorations including plain, linear check-stamped, check-stamped, simple-stamped, cord-marked, and zone-incised (Stanyard n.d.). Deptford simple- and check-stamped vessels are considered to be the material culture markers for this period. However, Garrow (1984:50) notes the presence of cord-marked sherds (designated Deptford cord-marked by DePratter [1979]) at a number of Middle Woodland sites. Deptford ceramics generally have a fine to medium sand temper and are primarily fashioned into cylindrical jar shapes (Stanyard n.d.). Smith et al. (1981:88) and Fish (1976) suggest the introduction of Wilmington wares (grog [ground sherd]-tempered, cord-marked) near the end of this period.

Milanich (1971) visualized Deptford settlements as occurring more permanently in coastal areas, with seasonal visits inland to exploit resources. Anderson (1985:45-49) interprets Deptford occupations conversely as having primary residences (villages and hamlets) located inland. These inland occupants would make seasonal visits to the coast to exploit aquatic resources. The identification of large Deptford residential camps along the Savannah River drainage suggests that Anderson's (1985) settlement model is perhaps more accurate than the one proposed by Milanich (1971) (Trinkley 1990).

Recent surveys in the Georgia Coastal Plain suggest overall population increases and variability in site selection for Middle Woodland settlement. Middle Woodland sites were very common at Ft. Stewart, often located on bluffs above creeks and rivers (Grover and McKivergan 2001:23-24). Early Woodland and Middle Woodland components are frequently found at the same site; the 197 sites with Early Woodland components and 193 with Middle Woodland components together comprise a total of 291 sites with Early and/or Middle Woodland materials (Rock et al. 2013). As noted above, Fish (1976) and Smith and Elliott (1985a) agree that preferences were shown for settlement in areas with easy access to floodplain and stream resources. Garrow (1984:51) documented 16 sites with Middle Woodland components; three were found in the Coastal Marine Flatlands, and 13 were recorded in

the Vidalia Uplands. Poplin et al. (1990) recorded Early-Middle Woodland sites on Delta Plantation, on the opposite bank of the Savannah River in South Carolina. Investigators of the 2,040-ha Godley Tracts identified two Middle Woodland sites (Bailey and Poplin 1997; Hicks 1997; McMakin and Bailey 1997). Surveyors of the 520-ha Morgan Tract identified one Middle Woodland site (Fletcher et al. 2003).

Late Woodland (AD 700-1150). The Late Woodland within the Georgia Coastal Plain has not been documented as extensively as preceding cultural periods. Described as a transitional phase, the Late Woodland generally represents a continuation and an expansion of previous lifeways (e.g., agriculture, village occupation, ceremonialism) (Dragoo 1975:19-20; Steinen 1995; White 1988:87). Despite the relative rarity of habitation sites directly attributable to the Late Woodland period (Caldwell 1958; Garrow 1975; Wauchope 1966), several sites (e.g., Kolomoki, Early County, Georgia) provide data on material culture, architecture, community planning, and subsistence (Sears 1956).

Due to similarities between Late Woodland and Mississippian cultures, a number of authors (e.g., Fish 1976; Hanson et al. 1981) group these two periods (as they occur in the Coastal Plain) together. At the end of the Woodland stage, the scattered populations living along the coast began to be colonized and acculturated by the chiefdom societies living farther north and west in the Etowah and Oconee river valleys (Stanyard n.d.). The subsequent social and economic changes mark the beginning of the Mississippian stage in the Georgia Coastal Zone.

The Late Woodland artifact assemblage, although poorly represented, is reasonably well documented. Medium, stemmed projectile points, similar to those associated with the Swift Creek site near Macon, Georgia (Wood et al. 1986), are typical, and small, straight-sided triangular points make their initial appearance (Justice 1987:224-225). Ground stone tools are more common than chipped tools, supporting the continued importance of plant food processing. Shell and bone were used to make a variety of tools including awls, picks, chisels, adzes, abraders, toggles, and ornaments (Stanyard n.d.).

The ceramic type most closely associated with the Late Woodland period in the Coastal Plain is

Wilmington Cord Marked. This grog-tempered ware developed late in the Middle Woodland but became dominant during the Late Woodland. Other typical Wilmington styles include fabric impression and simple stamping. The St. Catherines phase (AD 1000–1150) is often considered transitional to the subsequent Savannah phase of the Early Mississippian period (Smith et al. 1981:89; Williams and Shapiro 1990). Differentiated by clay (or fine grog) temper, St. Catherines vessels generally are cord-marked or net-impressed; however, plain and burnished plain types have been defined (Stanyard n.d.).

Sites with definitive Late Woodland components are not expected to be as common in the Coastal Plain relative to materials from other periods. At Fort Stewart, Late Woodland occupations appeared to diminish from the previous Early to Middle Woodland occupations. By 2013, a total of 102 archaeological sites containing Late Woodland components were identified at Fort Stewart (Rock et al. 2013). The database indicates that 51 sites contain Wilmington Phase ceramics and fifty-three sites contain St. Catherines ceramics. Three sites recovered Madison projectile points. Among other surveys on the Georgia Coastal Plain, Garrow (1984:51) recorded four Late Woodland sites (two in the Coastal Marine Flatlands and two in the Vidalia Uplands) during the transmission line survey in Burke, Screven, Effingham, Chatham, Bryan, Long, Liberty, McIntosh, and Glynn Counties. Two sites with Wilmington ceramics were recorded by Smith and Elliott's (1985a) survey in Effingham County. Smith and Elliott's (1985b) other survey near Skidaway Island identified eight sites, four of which contained Late Woodland components. Survey of the 2,040-ha Godley Tract resulted in the identification of one Late Woodland site (Bailey and Poplin 1997; Hicks 1997; McMakin and Bailey 1997).

Mississippian Period (AD 1150–1575)

The Mississippian Period is a time of permanent settlements, increased religious and social complexity, and greater dependency on agricultural practices. An elaborate and complex iconography became widespread throughout the Midwest and Southeast during this time (Dragoo 1975:20-21; Griffin 1967:189-190; Stoltman 1978:727). Throughout the Southeast, the most dramatic characteristics of this

stage were the construction of large fortified villages, and flat-topped earthen mounds utilized in political and religious functions. The structures also publicly enhanced the social status of political leaders. A vast number of sources focus on the development and collapse of regional polities (e.g., Anderson 1994; Barker and Pauketat 1992; Blitz 1993; Braley 1996; Byrd 1991; DePratter 1991; Hudson et al. 1985; Marshall 1987; Muller 1997; Rogers and Smith 1995; Schnell and Wright 1993; Smith 1990; Thomas 1993), primarily from a processual perspective, but with a heavy emphasis on social stratification (the formation of true social classes) and regional spatial organization. The conclusion of the Mississippian stage also encompasses the tremendous changes that occurred within Native American culture after European contact.

Mississippian settlements were located primarily along major streams or rivers on large alluvial floodplains that provided easily accessible fertile soils suitable for agricultural activities. Griffin (1967:189) suggests, "it was the gradual shift to a substantial dependence on agriculture that tied the societies to specific localities, emphasized territoriality and ownership of land."

The study of most importance to the area is that done by Anderson (1994) reflecting the nearby Savannah River Valley. He focuses on the "cycling" of political power in the region, with a postulation that changes in the organizational development of particular chiefdoms resulted from a number of primary motivating factors, including regional physiographic structures, climate, resource structure, agricultural/subsistence production, storage technology, tribute mobilization, prestige goods exchange, alliance networking, information flow, territorial boundary maintenance, population change, population movement, ritual institutions, authority structures, factional competition, and the nature of succession. Anderson (1994) addresses the development of chiefdoms in the region from the perspective of materialism and economic motivation, suffused with a strong socio-religious ideal perpetuated by the exchange of exotic prestige goods.

Artifact assemblages during this period become more complex. Pottery is more diversified than during previous cultural periods; there are clear functional differences in form and quality. Cooking

bowls and storage containers are the most common form, but polished and decorated vessels also are prevalent. Trade goods often include Coastal Plain shell, used in the manufacture of beads, drinking vessels, and elaborately decorated gorgets, as well as flint, copper, wood, and salt (Griffin 1967:189-191; Stoltman 1978:725-728). Fish (1976:19) lists a variety of small triangular (Caraway, Clements, Uwharrie) and pentagonal (Pee Dee) projectile points found on Mississippian sites in the Coastal Plain.

Mississippian ceramics common in southeastern Georgia are unique in their retention and refinement of a number of previously utilized decorative motifs and in their reintroduction of earlier designs. General agreement has been reached on a Mississippian ceramic sequence for the Georgia coast (Braley 1990; DePratter and Howard 1980; Smith et al. 1981).

Currently, the Savannah phase (AD 1150–1300) is accepted as the initial period of Mississippian occupation in the Georgia Coastal Plain and usually is divided into two phases. According to DePratter and Howard (1980:24), the Savannah I phase (AD 1150–1200) includes fine cord-marked, plain, and burnished plain surface treatments. While DePratter and Howard (1980) consider check stamping a marker for Savannah II (their sequence consists of three phases), Braley (1990:71) includes check stamping (on large jars) within Savannah I and suggests that plain carinated bowls were also produced. Savannah II (AD 1200–1300) is defined by the continuation of certain decorative motifs and the addition of complicated stamping (figure eights, figure nines, and bull's eyes [Caldwell and Waring 1939]), particularly on large jars (Braley 1990:71).

The Irene phase (AD 1300–1450) follows Savannah II and was defined at the type site (9CH1), near Savannah, during excavations in the late 1930s (Caldwell and McCann 1941). This phase is thought to represent the initial manifestation of the Lamar culture on the Georgia coast, and is called Climax Mississippian by Garrow (1984:52). The Irene phase represents the first clear archaeological manifestation of historically known tribal units (e.g., the Guale). An outgrowth of the traditional settlement pattern, many of the Irene sites located in coastal Georgia correspond to Spanish and French accounts of Guale Indian villages. Irene I (AD 1300–1350) ceramics are coarse sand/grit-tempered

and exhibit plain, burnished plain, and complicated stamped (variations on the filfot cross) surface treatments (DePratter and Howard 1980:24, 31). Braley (1990:71) lists large plain jars and reed punctate or noded rims as defining ceramic attributes. During Irene II (AD 1350–1450), incising is added as a surface treatment (bold on carinated bowls; scroll motifs on small jars), and appliquéd or segmented rim strips are seen on large jars.

Based on a number of recent analyses, Braley (1990:99-100) follows Larson (1958) in suggesting the use of the designation Pine Harbor phase (AD 1450–1575) to represent the last Mississippian/Lamar culture manifestation on the upper Georgia coast prior to European contact. Smith et al. (1981:91) describe Pine Harbor as “the temporal equivalent of Irene on the lower Georgia coast [except for] the presence of an additional ceramic type, McIntosh Incised.” Other ceramic attributes of this phase are, “large jars with reed-punctated applique rim strips... small jars with intricate incised motifs... bold incising... punctuation... carinated bowls with multiple-line incising” (Braley 1990:72).

Fort Stewart contains both Savannah and Irene phase Mississippian sites. Savannah-phase sites are fairly common while Irene sites are rare; 138 sites with Savannah ceramics have been recorded, while just 62 sites with Irene ceramics were documented (Rock et al. 2013). Johnstone (2004:52) observes that the Lewis Mound (9BN39) and Lewis Village (9BN133) sites represent the most significant Savannah occupation on Fort Stewart. These sites are located near the eastern boundary of the installation, south from the Canoochee River, and may have served as a ceremonial center for Early Mississippian groups in the area. Johnstone (2004:54) further states that the lack of Irene sites at Fort Stewart, compared to other phase sites, may be due to emigration out of the area during the Late Mississippian, east to the lower Savannah River or south to the mouth of the Altamaha River. Garrow's (1984:52) survey in Screven County recorded six Mississippian sites (equally divided between the Vidalia Upland and the Coastal Marine Flatlands) and one Climax Mississippian site (in the Coastal Marine Flatlands). Survey of the 2,040-ha Godley Tract resulted in the identification of one Mississippian site (Bailey and Poplin 1997; Hicks 1997; McMakin and Bailey 1997).

2.2.2 Protohistoric Period

This period encompasses the time after initial contact with Europeans, but before the loss of Native American political control over the region (AD 1540–1733). In southeastern Georgia, the beginning of this period is signaled by the DeSoto entrada; the period ends with the signing of the Treaty of Yamacraw Bluff (Savannah).

By the mid-1600s Georgia was inhabited by historically known tribal confederations (such as the Cherokee, Coosa, Creek, Ocute, Calusa, and Apalachee). These people did not normally construct mounds, as earlier Mississippian peoples had, and it appears that there was a trend away from increasing social stratification. There were well-established trade routes that linked individual regions with each other and with areas outside the Southeast, but the regional political dominance of specific population centers had changed.

Spanish explorers arrived in Georgia during the second half of the sixteenth century, setting up forts and Jesuit missions along the coast. The explorers traded extensively with the Native American groups they encountered and regularly investigated interior lands. Among the first groups the Spanish encountered were the Guale. The Guale inhabited the Lagoon and Marsh section of the coast and lived in dispersed settlements along major rivers (Thomas 1993).

Larson (1958) posited the Irene/Pine Harbor phase as representative of the culture of the Guale Indians at the time of initial contact with Spanish explorers and missionaries (approximately AD 1540–1600). As contact and settlement intensified, this group became more dependent on Spanish trade goods and began to associate themselves more closely with the expanding Spanish mission system. Increasing assimilation of European lifeways and decimation by European disease led to profound changes in aboriginal lifeways and material culture. It is likely that disease introduced by the Spanish, and later the English, was responsible for the elimination of a very large percentage of the population (Wood 1988) and perhaps the role of regional polities as it transformed the elaborate political structure of the region. Ongoing warfare between Native American ethnic groups served to further weaken Native American populations already reduced by the effects of warfare with Europeans in the area.

The introduction of new European material goods such as firearms and iron provided new tools of war to the Native American groups of the area. By the early seventeenth century, much of the population of coastal Georgia was transferred to mission sites located on barrier islands.

The Late Mississippian/Lamar culture recognized for the Georgia coastal area is the Altamaha/Sutherland Bluff phase (AD 1575–1700) (Braley 1990). Larson (1958) also associates this phase with the Guale during “the period of intensive contact after the establishment of the mission system and prior to its destruction by British raiders from the Carolinas” (Smith et al. 1981:91). Large bell-shaped jars and plates were produced and red firing was applied, probably in imitation of European forms and decoration. Loop-and-strap handles were introduced for the first time to the coastal area. Vessel decorations are primarily simple-, line-block-, or check-stamped; plain; or incised with bold or narrow lines. A minority are decorated with rectilinear complicated stamping (Braley 1990:72; DePratter and Howard 1980:31).

A number of Native American groups may have occupied the region during the early protohistoric era. According to Lanning (1971:9-10), the Timucucans (from the southern Georgia coast) replaced the Guale on parts of the Georgia coast during the seventeenth century. Swanton (1922) indicates that the Lower Creek and the Yuchi settled along the Lower Savannah River during the late seventeenth and early eighteenth centuries. Across the Savannah River in South Carolina, the Yamasee, Coosaw, Cusabo, Westo, and Savannah Indian groups held territory not yet claimed by the English or Spanish (Smith and Elliott 1985a:12). Most of what is now Georgia was inhabited during the late seventeenth and early eighteenth centuries by members of what became known as the Creek Confederacy (Swanton 1922).

During the early 1700s, major European and Native American powers in the Southeast continually shifted alliances, conspiring and warring against each other to further their short- and long-term economic positions (Braley 1996; Thomas 1993). In an apparent bid to take advantage of the power struggle between the English and the Spanish, the Creek sided with the Yamasee against the English at Charleston in the Yamasee War (1715–1717). Although the war

went well for the Native Americans initially, English reinforcements along with superior weapons allowed the South Carolinians to counterattack successfully, forcing the Yamasee and their allies to retreat to Florida and the West (Fretwell 1980:118). This allowed the Yuchi to move into the area and take over the lucrative deerskin trade for a time.

Apparently, other Native American groups achieved standing in the project region during the early eighteenth century. Soon after James Oglethorpe and his shipload of pioneer settlers landed at Yamacraw Bluff in February 1733, they were met by Chief Tomochichi of the Yamacraw Indians (Spalding 1977:19). This chief was instrumental in laying the groundwork for a treaty with the Lower Creek (the Treaty of Yamacraw Bluff in May 1733), which ceded the portion of Georgia containing the project area to the English settlers, despite continued trading visits and the presence of several smaller Native American groups to the north as late as 1750 (e.g., the Yuchi remained in villages along Ebenezer Creek and Brier Creek until 1763). This agreement ended Native American political control over the project region.

British actions in the Georgia coastal region included efforts to better defend British settlements from both Spanish and Native American attacks. As a result, several military installations were constructed south of Savannah, including Fort Argyle, which was constructed near the Ogeechee River in 1733.

Previous researchers have rarely found Contact-era Native American sites in the project region. Archaeologists with Southeastern Archaeological Services excavated an eighteenth-century trading post associated with Mary Musgrove, a woman of English and Creek descent, on the Savannah River in Savannah (Toner 2002). No sites from this period were encountered by Fish (1976), Garrow (1984), Smith and Elliott (1985a), Bailey and Poplin (1997), McMakin and Bailey (1997), Fletcher et al. (2003), Fletcher et al. (2004), or Kratzer et al. (2000). An examination of the archaeological database for Fort Stewart indicates only one archaeological site with post-contact Native American components identified within the installation (Rock et al. 2013). The lack of sites from this period is further supported by a 1597 account of a trek from the coastal Guale mission town of Tolomato to the interior province of Tama on the Oconee River by Fray Pedro de Cho-

zas. This journey would have likely passed through a portion of present-day Fort Stewart; the account describes the area as unoccupied (Johnstone 2004:55; Worth 1994:106).

2.2.3 Historic Period

Historians and archaeologists agree that Spanish explorers passed north of the project region during the early to middle sixteenth century (Clayton et al. 1993; DePratter et al. 1983; Hudson et al. 1984; Smith 1976). While exploratory expeditions led by Hernando DeSoto and Juan Pardo constituted the initial incursion of Europeans into the interior Southeast, Spanish influence over what would become Georgia was short-lived and limited to occasional trade with aboriginal populations.

English journeys into Native American lands of interior Georgia may have begun as early as the late-1600s. Representatives of the British colonial government ventured westward soon after the founding of Charles Town (now Charleston, South Carolina) in 1670, anxious to establish relationships with interior settlements for the purpose of expanding their commercial and political boundaries. To this end, visits to the interior region by Dr. Henry Woodward in 1674 (Milling 1969) and James Moore in 1690 (Mooney 1982) were oriented primarily toward establishment of trade and political alliance.

While permanent European settlement in Georgia officially began with Oglethorpe's landing at Yamacraw Bluff (now Savannah) in 1733, movement into more remote portions of the state did not occur until the late eighteenth century, including much of the region.

Concurrent with the arrival of the first Europeans, the Southeastern polities began to break up (Anderson 1994; Peebles 1986). It is difficult to determine if the change was resultant from the arrival of Europeans or was merely coincidental, but by the mid-1600s the region was inhabited by smaller populations of historically known tribal confederations (Cherokee, Chickasaw, Creek, and Choctaw). These cultures did not exhibit the same affinity for mound building or hyper-social stratification evidenced in the Mississippian societies. There were well established trade routes that linked all of the individual regions with each other and with areas outside the Southeast, but the regional political dominance

of specific population centers had changed. The Cherokees occupied an area covering the mountains of east Tennessee and north Georgia, and extending into the northeastern corner of Alabama. Occupying parts of Georgia and Alabama, the Creek nation was a loose confederation of perhaps as many as 17 separate tribes (Knight 1994; Swanton 1998). By the early seventeenth century, much of the population of coastal Georgia was transferred to mission sites located on barrier islands.

Colonial Georgia (1733 - 1783)

Georgia became a Trustee colony in 1733 under the direction of James Oglethorpe, one of a group of London philanthropists interested in settling a portion of the American colonies with the poor and disadvantaged of England (Coleman 1982:2-4). The location of this settlement was chosen by the Trustees in an effort to accomplish a number of goals. A settlement in this area (i.e., between Charleston and St. Augustine) would serve as a buffer between English and Spanish interests. The Trustees also hoped to produce a variety of semitropical exports including silk, wine, and spices to bolster the sagging economy. Finally, supporters of the colony urged development of strong trading ties with the natives in hopes of taking over this enterprise from the Spanish and French.

Oglethorpe and the Trustees also encouraged groups from across Europe as well as groups of other faiths (the charter excluded only Roman Catholics) to settle in the colony of Georgia. A group of Jewish families was allowed to settle in Savannah soon after its initial settlement (Spalding 1977:22). German Protestants settled at Bethany, and Quakers established a community at Wrightsborough, south of Augusta (Stokes 1982:124-125). Particularly noteworthy among those taking advantage of these offers was a group of German Lutherans who fled Salzburg to escape religious persecution. In 1736, after abandoning their original inland grant called Ebenezer, the Salzburger settlers the town of New Ebenezer, located northwest of Savannah on the Savannah River (Elliott 1988). According to Smith and Elliott (1985a:145), by 1740 these settlers had moved south along the Savannah River and Mill Creek and were farming the upland areas above the bluff.

While transportation throughout the region focused on the Savannah River and its tributaries, early

attempts were made to link settlements over land. In 1735, Oglethorpe ordered completion of a road linking Savannah and Augusta, previously completed to Ebenezer. Despite providing a more direct route between these cities (140 miles [225 km] by land as opposed to 210 miles [337.9 km] on the meandering Savannah River), river transportation remained dominant until after 1800 (Cooper 1960:30).

The Georgia colony developed and grew slowly. Although several grants were issued for lands near the Savannah River, few grantees made attempts to settle the holdings. The three-year Yamasee War had only just ended across the river in South Carolina's Beaufort District, and the area was still vulnerable to Native American and Spanish attack (Rowland 1987). Furthermore, initial limitations placed on landownership, labor, production, and trade by the Trustees delayed growth (Boorstin 1958:88-95). The 50-acre tracts originally granted to each family, and the prohibition against selling land or passing it on to any but the first male offspring, made continued survival on the inland pine barrens difficult, if not impossible. Life in the new colony of Georgia was extremely difficult; the unfamiliar and inhospitable climate resulted in disease, failed crops, and early death for many (Elliott 1990).

By 1750, the Trustees had repealed many of these restrictions and allowed industrious colonists to accumulate larger tracts of land. This paved the way for the establishment of plantations and the expansion of agricultural production. While slavery initially was prohibited, expansion of landholdings and the need for additional labor forced the Trustees to allow slaves into the colony after 1750. Failures to develop the silk industry led to diversification of crop production, introduction of rice agriculture, and the growth of timber exports. In 1752, due to financial difficulties and pressure from the king, the Trustees relinquished their charter and Georgia became a royal colony (Coleman 1982:11).

By the 1770s, Georgia was a major agricultural colony. Although the silk industry had failed, rice had become an exportable cash crop for the coastal regions and cotton was growing in importance on inland uplands. Indigo was grown along the Ogeechee River and on some of the Sea Islands. Instead of importing their food crops from South Carolina as they had done initially, Georgians were growing

their own corn, potatoes, and peas. Other exported products included lumber (in the form of shingles, boards, and barrel staves) and naval stores (i.e., pine resin-based turpentine, rosin, pitch, tar and other products used to build and maintain wooden boats) (Coleman 1982, 1991).

Georgia's entrance into the Revolutionary War is said to have begun with meetings held at Tondee's Tavern in Savannah, in 1774. In 1777, Georgia adopted its first official state constitution, a document that established a state assembly and created eight counties (Burke, Camden, Chatham, Effingham, Glynn, Liberty, Richmond, and Wilkes) to replace the original colonial parishes.

Between 1778 and 1781, many of the towns along the lower Savannah River were occupied by the British. Savannah was occupied immediately upon the initiation of hostilities, and used by the British as a base of operations in the Southern colonies through 1782. Two expeditions to capture Charleston, South Carolina, to the north were initiated from Savannah in 1778 and 1780. British troops moved into Ebenezer at the request of resident Tories and destroyed several mill dams to allow British ships access upriver (Campbell 1981:71). On March 3, 1779, the Battle of Brier Creek, a major defeat for the rebel forces, took place in what is now Screven County (Ashmore and Olmstead 1926). British occupation of Georgia ended with the British evacuation of Savannah in July 1782. The Treaty of Paris in 1783 signaled the end of hostilities and of British colonial rule.

Smith and Elliott (1985a) note definite settlement trends during the eighteenth century toward river and lake bluffs as reflected in sites discovered during their Fort Howard survey. In addition to these sites, Garrow (1984:57) recorded three sites dated to this period; one of these sites (in the Vidalia Uplands) may have been a single-family farmstead, while the other two (in the Coastal Marine Flatlands), appeared to represent "a more substantial settlement." The Savannah Valley was the focus of most settlement during this period. Large plantations, primarily producing rice, were established along the river's extensive marshes.

Early Statehood and the Antebellum Period (1783 - 1860)

The early history of the state of Georgia generally is marked by population increases and westward expansion. At the time George Washington became president, Georgia had an estimated population of 82,000, primarily concentrated along the coast and northward along the Savannah River (Figure 2.11). Over the next forty years, the state's population increased by over 500 percent, to 516,823, as more settlers moved in and the resident Indians were forced out. An increase in population was evidenced in this region during this period; however, the increase was not nearly as dramatic as in the state as a whole. In a comparison of population statistics 1790-1830 for the five coastal counties (Bryan, Chatham, Glynn, Liberty, and McIntosh) and three inland counties (Burke, Effingham, and Screven), white population decreased while black population (i.e., slaves) increased during the time period; throughout this period, whites were in the minority. For two of the three inland counties, whites remained the majority, but populations remained relatively stable. Garrow (1984) attributes these differences to variability in agricultural economy. Coastal plantation residents who focused on Sea Island cotton and rice found it necessary to maintain large slave labor pools, while inland farms with short staple cotton as a primary crop tended to be smaller, family-run operations with little use for slaves.

Population statistics and period maps for the late eighteenth through the early nineteenth century reflect shifts in agricultural methods that had a profound effect on settlement patterns across Georgia. Agricultural production prior to 1780 focused on coastal areas, where rice, Sea Island cotton, and indigo were the major cash crops, and the plantation system became firmly established. Rice production was developed as a profitable enterprise by the Salzburgers who utilized the swampy floodplains along the lower Savannah River. While rice was grown along the tidal swamps of the Savannah River; the expansive interior acreages were most likely left in pine forest that was harvested as needed for the operation of the plantations. Major settlements were undoubtedly focused on the river as well.

Expansion of existing coastal plantations, development of upland cotton varieties, and the inven-

tion of the cotton gin in the late eighteenth century all made movement into inland areas both practical and necessary. Upland cotton farms initially were relatively small, needing little if any slave labor. Over time, these holdings increased in size, with a parallel increase in slavery (Cooper 1960; DePratter and Howard 1980:44). Sixty percent of the upland plantations produced the more profitable, short staple cotton by 1820, and in 1825, Georgia led the world in cotton production, with 150,000 bales annually (Coleman 1982:39). This expansion of settlement was spurred by the headright system by which an individual could obtain 200 acres at no cost and 50 acres per dependent. Even with the headright system, the area remained sparsely populated.

Bryan County was created by the Georgia legislature in 1793 and was named for a Revolutionary War hero. Several planters moved into the Ogeechee River area in Southern Bryan County during this time, establishing large rice plantations that encompassed thousands of acres (Whitley et al. 2008). They were generally absentee owners who lived in the cities and relied on overseers for the day-to-day operations of the plantations. Hundreds of slaves per plantation were needed to tend and harvest the rice fields.

Despite the presence of a few large, wealthy rice plantations situated along the Ogeechee River, most white residents in Bryan County lived on small farms and cultivated cotton and indigo, along with subsistence crops, raised livestock and timbered pine forests (Sullivan 2000:54-56). During the antebellum period, the typical small farm in the region consisted of a family dwelling, barn, and several outbuildings, including slave quarters for those families that owned slaves. Despite the ownership of hundreds of slaves by the large rice planters, most slave holders in this area owned relatively few slaves. Some families may also have had a cotton gin, a grist mill, or a sawmill (Sullivan 2000:148).

Observations by White (1849) indicate a continuation of agricultural trends from the previous period and suggest the beginnings of industrial development in southeast Georgia. Lower coastal counties continued to produce rice, and Sea Island cotton, but began to substitute sugar cane for indigo as a cash crop. Subsistence crops included com, potatoes, apricots, and figs. Inland, production of short

staple cotton continued, rice and sugar cane were grown along the Savannah and Ogeechee Rivers, and subsistence crops included com, peas, potatoes, various fruits, and grain (e.g., rye and oats). Textile, rice, saw, and grist mills were concentrated around Savannah. Construction of the Central of Georgia Railroad, linking the expanding cotton belt with Georgia's major seaport, began at Savannah in 1836. The railroad was completed to Macon in 1843, after many delays (Boney 1977: 158).

By the middle nineteenth century, transportation systems statewide had begun developing. Public roads, following early Indian trails, were unimproved and often unmarked. Canal and railroad development in the 1840s and 1850s linked the area to markets. At the same time timbermen and turpentiners laid the first rails in Bryan County seeking access to the county's vast pine forests (Caldwell 2001:493).

Previous archaeological surveys provide information relevant to settlement in the project region during this period. Garrow (1984:62) recorded four domestic sites with late eighteenth/early nineteenth-century components, all located in the Coastal Marine Flatlands. Smith and Elliott (1985a: 145) recorded 15 house sites with components from this period on low upland ridges associated with the old Augusta Road. Bailey et al. (1997) recorded one house site from this period located near Quacco Road. The locations of these domestic sites suggest a movement of settlement away from the river and creek bluffs.

Civil War (1860-1865)

As in most areas of the South, the Civil War and its aftermath brought many hardships to Bryan County. Early in the war, when military action took place in states to the north and west of Georgia, the negative economic effects could already be seen in the area. As farmers became soldiers, crops were left in the fields, unharvested. Disruption of markets left cash in short supply. While several skirmishes took place in the county, this area of Georgia remained relatively unscathed by battle until near the end of the conflict.

The focus of attention in the Ogeechee Neck during the Civil War was Fort McAllister in eastern Bryan County, set in a sharp bend in the river just east of Hardwicke. Confederate troops built Fort

McAllister in attempts to keep Union troops from the Ogeechee River and the Bryan Neck area for an overland route to Savannah (Sullivan 2000:176). Federal forces made several attacks on Fort McAllister, beginning in 1862. The attacks in June and November 1862 and January, February, and March 1863 were unsuccessful. Fort McAllister did not fall to the Federals until December 1864, with troops under the command of General William T. Sherman. In the fall of 1864, Sherman began his infamous March to the Sea from Atlanta. Sherman's troops followed the Augusta-Savannah Road, and destroyed nearly everything in their path. Bryan County was heavily affected as several flanks of the Union Army began closing together along the Ogeechee River (Sullivan 2000:186). The Confederates at Fort McAllister surrendered on December 13, 1864. Savannah was captured on December 21, with little resistance from the inhabitants. Figure 2.12 provides a map of the region in 1865, showing the existing roads at the time.

The war ended nearly six months later. Defeat led to occupation by Federal troops and Reconstruction. In some areas where large plantations had dominated, freedom for the slaves meant an exodus of blacks from the county. This diminished the available labor pool and made large-scale farming less profitable than before the war.

Archaeological evidence for occupation during this period in the Coastal Marine Flatlands is available. While Smith and Elliott (1985a) do not observe this temporal distinction, mapped sites for the periods immediately preceding and following this period suggest continued movement into better drained areas, above and away from the Savannah River. Garrow (1984:65) recorded 24 domestic sites dating to the period 1830-1870. Four of these sites were located in the Vidalia Uplands, while the remaining 20 sites were found in the Coastal Marine Flatlands. Three possible homesites/artifact scatters from this period were recorded on relatively well drained areas in the Morgan Tract (Fletcher et al. 2003).

Postbellum Georgia (1870 -1930)

Following Reconstruction, the destroyed railroads were rebuilt and refurbished, and exportation of agricultural products again became an important part of the local economy. Specifically, cotton soon regained its position as the major cash crop, and

remained as such until the 1920s, when the boll weevil reached the area. Industrial growth centered on textiles followed at a slower rate and was focused around Savannah. Other industries that exhibited growth and were often seen in more rural areas included various grain milling operations, tanneries, distilleries, brick manufacture, and fertilizer manufacture. Unfortunately, continuation of cotton monoculture generally worked to the exclusion of developments in food production or industry, resulting in increased severity of the economic depressions that occurred in late 1870s, the middle 1890s, and the 1930s.

The loss of the slave labor force throughout the South, combined with severe financial setbacks suffered by the Southern states as the war's defeated party, necessitated changes in the overall economic system. Prunty (1955) attributes the development and growth of the tenant farm/sharecropper system after the Civil War to extensive changes in sources of labor and capital availability. The reorganization that occurred was primarily based on changes in the relationship between management and labor, and resulted in the broad dispersion of smaller, individual farmsteads (sharecroppers and tenant farmers) within the former boundaries of the plantation. Former slaves and non-landholding whites ultimately became a part of this new system wherein farmland was rented for cash or a share of the seasonal yield. Emancipation allowed some African Americans to migrate, but most did not have the money to restart their lives elsewhere or to buy land from their former owners. Many former slave owners managed to keep their lands after the war but had no forced labor to work it. These factors encouraged the development of the tenancy system (Cabak and Inkrot 1997:41; Kane and Keeton 1994).

Shifts in settlement related to plantation reorganization apparently occurred throughout the state. Prunty (1955) describes spatial differences between antebellum and postbellum plantation settlement patterns resulting from a movement away from the pre-war nucleated plantation village toward a more dispersed pattern of tenant farms having varying degrees of independence from the planter/landowner. According to Prunty (1955:470), the critical factor determining extent of settlement distribution was the control and ownership of working livestock, ag-

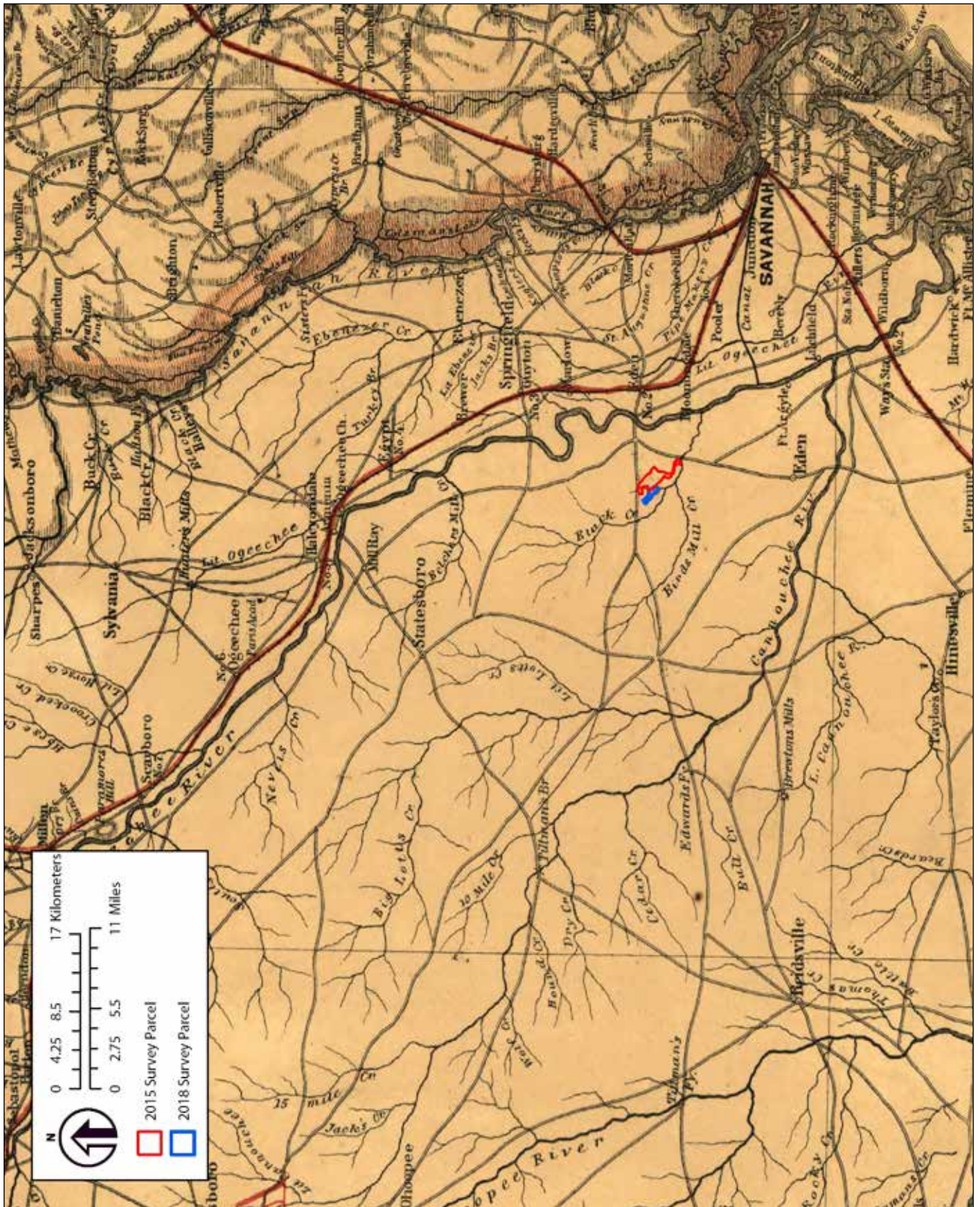


Figure 2.12 View of the project region in the mid-nineteenth century (US Coast Survey 1865).

ricultural implements, and housing. The nucleated form of settlement found on antebellum plantations continued to predominate until freedmen acquired:

1. freedom from direct control and continuous supervision;
2. their own homes in proximity to crop land at least functionally, if not nominally under their control; and
3. use and control of mules.

As these aspects of freedom were slowly realized, freed blacks were able to move away from the plantation village complex and occupy outlying corridors within the planter's holdings, forming what Prunty (1955:466) terms the "Post-Bellum Fragmented Occupance Form."

As the Industrial Revolution continued, European demand for American cotton grew. The South responded to this demand; it actually produced about 10,000,000 more bales of cotton in the four years preceding 1881 than it had during the 15 years immediately preceding the Civil War (Aycock 1981). Apparently, the tenant farm system was more efficient at producing cotton than was the slave labor system. The problem with tenancy was its creation of impoverished farmers, forced to mortgage future crops for present needs. In years when crops failed, these farmers went deeper into debt (Wynes 1977).

Naval stores production and farming were joined by livestocking as the major commercial activities in the area during the late 1800s. The railroads that came in 1889 enhanced all of these activities. Cotton was still "king" in most of the South, but the turpentine industry was more important in the study area during the early twentieth century.

The rapid development of the naval stores industry characterized the growth of the region from about 1880 until well after the turn of the twentieth century (Sullivan 2000:229). Postbellum Southerners used the turpentine industry as a quick way to recoup capital lost during the Civil War. Bryan County experienced an influx in population relating to the turpentine industry. Many stills were established in the area. By the last quarter of the nineteenth century, factors in Savannah and the Gulf ports controlled the trade. Savannah controlled the world price for naval stores from 1880 to 1950.

Ceramic pots, replacing boxes cut into trees, were introduced to the trade around 1908, and several other technical improvements lessened some of the exhaustive effects of the practice. These improvements notwithstanding, an estimated 130,000 acres of pine forest were consumed between 1810 and 1930 (Wilson and Ferris 1989:40, 752-753, 1428-1429). The warm climate and high-water table allow for rapid tree growth making the area ideally suited for the production of timber and its products (Wilkes et al. 1974:1).

Turpentine production and the naval stores industry in general were the economic mainstay for the region. In addition to turpentine, rosin, and other byproducts of the pine forest, the lumber industry was a significant commercial activity in the area. The turpentine farms and distilleries of the late 1800s each employed anywhere from 50 to 200 laborers, most of whom were African American. Many of these individuals were small subsistence farmers who supplemented their incomes during farming offseason with work in the timber and naval stores industries (Sullivan 2000:260).

In the twentieth century, new industries and crops began to take importance, including tobacco, which was first planted in 1919 in the wake of the destruction wrought by the boll weevil, and which replaced cotton as the main crop for the county in the 1930s (Groover 1987:91). Lumber also gained new importance in the late nineteenth and twentieth centuries as several local lumber companies, including the J.F. Browning Lumber Company and the Brunswick Lumber Company, were created before the consolidation of most of the local timber stands under Union Camp Corporation in the 1950s.

Railroad construction in Georgia began in the 1830s, but did not reach upper Bryan County until 1889, when the Savannah and Western Railroad was constructed. Towns such as Ellabell, Lanier, Pembroke, and Groveland grew up around the established depots (Caldwell 2001:453). The original Savannah & Western line between Meldrim and Lyons forms the southeastern boundary of the project tract. The Ellabell stop in this line lies 3.2 miles southwest of the project area (Storey 2015). From 1890 to 1896, this line was run by the Central of Georgia railroad. In 1896, Seaboard Air-Line Railway took over operation of the Meldrim to Lyons

line under a perpetual lease (Storey 2015). Today, the rail line is run by Georgia Central, a subsidiary of Genesee & Wyoming, Inc, according to the Georgia Department of Transportation Rail 2013-2014 Map (www.dot.ga.gov/IS/Rail).

The onset of World War II prompted the federal government to gain a strong foothold in the region. Camp Stewart was located on lands in Liberty, Bryan, Long, and Tattnall Counties, and was created as an anti-aircraft training and firing center. Like many World War II camps, the increase in population was dramatic, and by 1944, 50,000 troops were stationed at the camp. Camp Stewart was removed from active use after World War II but was reactivated in 1950 with the Korean War. It was granted permanent status as Fort Stewart in 1956 (Groover 1987:105-109). The current northern boundary of Fort Stewart is located just 2.3 miles south of the project area.

2.2.4 History of the Survey Tract

The project tract represents parts of two larger tracts owned by Butler Tract LLC, including a 318.17-acre tract immediately southeast of US 280 and a 1,463-acre tract located east of the smaller tract and south of Tar City Road.

318.7-acre Butler LLC Tract

According to deed and plat records, during late nineteenth century, the 318.17-acre tract was part of a larger 425-acre property owned by Mr. Zara P. Williams. At that time the tract extended southeast and northwest of what is now US 280. In November 1889, Mr. Williams sold the tract to Laura Jones (Bryan County Deed Book [BCDB] FF:69-70) and it became known as the Jones Farm. In February 1945, Laura Jones sold the 425-acre tract to her son Harmon J. Jones, Sr. (BCDB Z:498). By 1975, the tract had expanded to 525.92 acres and was owned by the wife of Harmon J. Jones, Sr., Clara Loretta Jones, who divided it into Tracts A, B, and C. Figure 2.13 is a 1975 plat of the property. By this time an additional 79.92 acres had been added to the property on the north side of US 280 (Bryan County Plat Book [BCPB] G:107). Tract C later became what is now part of the current project tract. In July 1975, Clara Loretta [D] Jones deeded 73.5 acres of the 318.17-acre tract to her daughter, Martha Ann Jones Drawdy (BCDB 4-G:221; BCPB G-2:32).

After the death of Clara Loretta Jones, the executors of her estate, Harmon J. Jones, Sr., Clara Juliette J. Frost, and Marth Ann Jones Drawdy, conveyed the remainder of the 318.17-acre tract (described as 318.28-acres) to Marth Ann Jones Drawdy (BCDB 240:88). In January 2017, Martha Ann Jones Drawdy sold all of the 318.17-acre Tract C to Butler Tract LLC (BCDB:1252:998). Currently there is a Ranch House on the property. According to tax records it was built in 1979, likely by Martha Ann Jones Drawdy. Currently, the entire tract is being used as a hunt club.

1,463-acre Butler LLC Tract

According to early twentieth century deeds and plats, the 1,463-acre Butler Tract was part of a larger 2,500-acre tract owned by H.W. Powers and Leila Butler Cox Powers. That tract extended from the Black Creek area north toward the present-day I-16. At that time, it was known as the Powers Place, but a portion of the land had earlier been part of the “Butler Place.” The 2,500-acre property included part of the current project tract.

In 1941, the Powers family sold the tract to Percy G. Judkins (BCDB 2-W:454), and in 1945 Mr. Judkins sold 2,826 acres of land to Samwilka, Inc. This included the 2,500-acre Butler/Powers Place and 326 acres to the east (BCDB 2-Z:489). This property included most of the project tract. Samwilka, Inc. leased much of the land to Union Bag and Paper Corporation (BCDB 2-Z:489). During this period much of the land consisted of pine plantations.

In April 1981, Samwilka, Inc. sold approximately 1,634 acres of the 2,826-acre property to Augusta M. Horsey, Sara M. McAlpin, and Elanor M. Montgomery (BCDB 5-D:299-304). This tract is located south of Tar City Road and includes a 149.2-acre portion of the 2018 survey area. In the 1980s most of the land still consisted of pine plantations.

Also in April 1981, Augusta M. Horsey, Sara M. McAlpin, and Elanor M. Montgomery sold the a 1,634-acre tract to Bradly Plywood Corp. (BCDB 5-D:305). In December 2012, Bradly Plywood Corp. made an inter-corporate transfer of 1,463-acres of the 1,634-acre tract to Butler Tract LLC. However, much of the land that is part of the project tract is still owned by Samwilka, Inc.

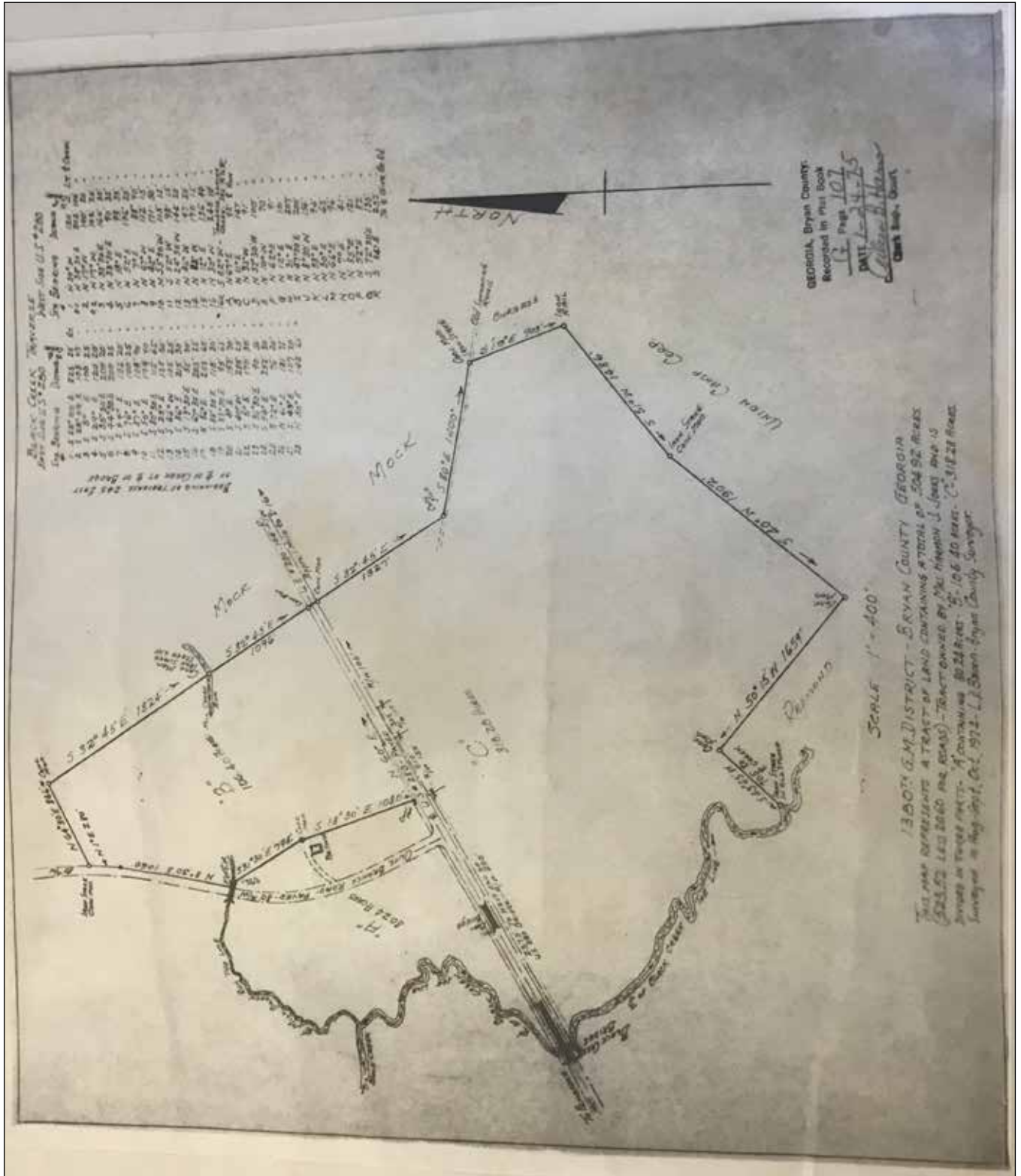


Figure 2.13 1975 plat of the Jones property (BCPB G:107) bisected by US 280 and also showing Olive Branch Road and Black Creek.

3.0 Methodology

The primary goals of the cultural resources investigation of the 1,411.7-acre Bryan County OEM Site project tract consist of:

- Identifying previously recorded cultural resources and past land-use patterns within and adjacent to the APE;
- Identifying previous cultural resource investigations conducted in the vicinity of the APE;
- Developing cultural contexts relevant to the project tract and vicinity;
- Conducting pedestrian surface and subsurface investigations (e.g., shovel tests) in disturbed and undisturbed portions of the project tract to identify archaeological resources;
- Inspection of the project viewshed to locate undocumented historic resources in the vicinity;
- Recording all evidence of cultural resources;
- Evaluating cultural resources with respect to NRHP eligibility criteria; and
- Developing recommendations for future management of these resources based on their significance.

3.1 Archival Research

From February 23 through March 6, 2015, prior to Phase I fieldwork, Brockington conducted background research and a site reconnaissance visit of the project tract and vicinity. As a result of this preliminary work, a Cultural Resources Overview report (Franz 2015) was submitted to SEDA. In June 2018, in advance of the 2018 survey, additional background review was conducted to expand the file search and examine any changes or updates to research databases. The purpose of this preliminary work was to:

- locate previously recorded archaeological sites and architectural resources on and near the project tract,
- identify properties listed on the NRHP,
- construct prehistoric and historic contexts, and

- determine the potential for recovering additional cultural resources during field survey.

Brockington's review consisted of an examination of archaeological site forms and architectural resource information sheets from previous surveys and other undertakings within one mi (1.6 km) of the project tract via records that are currently maintained by the Georgia Department of Natural Resources, Historic Preservation Division (HPD) in Atlanta, and the GASF at the University of Georgia, in Athens. Both datasets are also available through an online querying system; the Georgia Natural, Archaeological, and Historic Resources Geographic Information System (GNAHRGIS). The physical files at GASF were also checked for evidence of prior cultural resource investigations within the project tract. In addition, the architectural historian conducted archival research at local facilities to determine if any eligible or potentially eligible historic resources were located within the project's architectural APE. Architectural background investigations consisted of a review of current and historic maps and aerial photographs, county tax records, and an examination of all previously recorded architectural resources and surveys located within, or immediately adjacent to, the architectural APE. Recorded real estate deeds and plat maps were examined to determine the patterns of development within the APE. In addition, files were reviewed to determine whether NRHP listed architectural resources were located within the architectural APE. The project architectural historian also searched the Georgia specific repositories of Digital Library of Georgia, Georgia's Virtual Vault, Georgia's Living Places and Vanishing South Georgia for potential information on the project tract. As part of the initial overview, Brockington recommended that a full Phase I Cultural Resources survey be carried out within a defined APE for the property.

3.2 Architectural Field Methods

Architectural survey was conducted at the 2015 survey parcel during the week of March 30, 2015, and at the 2018 survey parcel during the week of June 4, 2018. The historian undertook both a windshield reconnaissance and an intensive survey of the project APE. The survey included a pedestrian inspection of individual properties that fell within the APE, and at least two high-resolution photographs were taken of each resource. Notes were taken as to construction method, design and alterations. Most work took place from public rights-of-way, although closer inspection was made of some properties if staff was granted permission by property owners. Construction dates and the age of resources were based on information from the Bryan County Tax Assessor, field observations, historic maps and occasionally local informants.

3.3 Archaeological Field Methods

All archaeological field investigations followed the standards and guidelines of the Georgia Council of Professional Archaeologists (GCPA) (2014) and were carried out by archaeologists who meet the SOI professional qualifications under 36 CFR Part 61.

3.3.1 Field Survey

The archaeological field technicians investigated the project tract through two basic techniques:

1. Shovel testing took place in areas which were undisturbed, relatively flat (< 10% grade), with no standing water, and with poor surface visibility (< 75%) (Figure 3.1).
2. Intensive walkover/surface inspection took place in areas which were disturbed, sloping (> 20% grade), with standing water (or just below the surface), or with good surface visibility (> 75%) (Figure 3.2).

Shovel tests are 30-cm (12-inch) diameter excavated test units placed at 30-m (100-ft) intervals in transects spaced at 30 m (100 ft). The shovel tests were excavated to a minimum of 10 cm (4 inches) into sterile soil (usually the E or B horizon). All soils are screened through one-quarter-inch mesh hardware cloth.

Pedestrian survey or intensive walkover consists of close scrutiny of the surface, if visibility is reason-

able, for signs of structures, features, or artifacts. This may occur due to the presence of flagged wetlands, as well as slope, or disturbance by roads or buildings. Notes include these observations, as well as the condition and probable origins of disturbed soils.

Where prehistoric or historic materials were encountered, additional short-interval shovel tests were excavated to delineate boundaries for each archaeological site or isolated find. Delineation shovel tests were excavated at 10-m (50-ft) intervals. Delineation thus established a 10-m buffer in four cardinal directions around the positive shovel tests. Each locus had an individual GPS datum plotted on project maps provided by the client as well as the corresponding USGS 7.5-minute quadrangles.

Site boundaries are generally established by the discontinuation of artifacts or features. When appropriate, arbitrary site boundaries were drawn in relation to particular landforms, such as when the site extends to a steep slope or waterway. For the purposes of this investigation, archaeological sites are defined on the basis of the “Georgia Standards and Guidelines for Archaeological Surveys” (GCPA 2014:1).

An archaeological site is a concentration of artifacts, ecofacts, or modifications to the landscape that are associated with past human activity and retain their context. An archaeological site must be at least 50 years old and is characterized by any of the following criteria:

- An area yielding three or more artifacts from the same broad cultural period (i.e., historic or prehistoric) on the surface within a 30-m radius;
- A shovel test that produces two or more artifacts from the same broad cultural period, as long as the artifacts cannot be fitted together (i.e., they are not two pieces of the same artifact);
- A shovel test that produces one artifact and at least one surface artifact from the same broad cultural period within a 20-m radius from that shovel test;
- An area with visible or historically recorded cultural features (e.g., shell midden, cemetery, rock shelter, chimney fall, brick walls, piers, earthwork, etc.).



Figure 3.1 Field technician James Page excavating shovel tests at Isolated Find 1.



Figure 3.2 Field technician Andee Zorn conducting a surface inspection of a logging road.

Isolated finds are generally small artifact scatters (n<3) and/or locations that have no utility of meaning for a research or other purpose. Deposits of cultural artifacts that have no integrity, such as those in road fill, stream gravels, or other situations where artifacts clearly are redeposited, also should be considered isolated finds. Isolated finds are generally assumed to be ineligible for inclusion in the NRHP; however, recording of these finds during survey included location and environmental data similar to that recorded for archaeological sites. Thus, when isolated materials appear within a test location, additional shovel tests are excavated in order to ascertain whether additional artifacts are in the immediate vicinity and constitute an archaeological site.

3.3.2 Archaeological Testing

If after archaeological survey the information recovered from each site was not sufficient to assess NRHP eligibility (as either eligible or not eligible), Brockington conducted Phase II testing to definitively evaluate the site. The number and the placement of 1-by-1-m test unit excavations required for evaluating each site was guided by the previous survey data.

Phase II field investigations at each site began with close scrutiny of the surface for signs of structures, features, or artifacts. Notes included these observations as well as the condition and probable origins of disturbed soils. Phase II test unit placements were measured from known points on the ground, and/or confirmed with a Garmin GPS using 3-m accuracy. Phase II test units were mapped with the GPS unit, using the southwest corner as a datum, and designated by standard test unit (TU) numbers (e.g., TU201).

Each test unit was hand-excavated in arbitrary 10-cm levels (within natural soil strata) to allow for vertical control of stratigraphic deposits (Figure 3.3). Each test unit was excavated until at least two 10-cm levels of sterile (i.e., without cultural material) subsoil had been reached. All fill soils were screened through one-quarter-inch hardware cloth. Excavation notes were recorded on standardized level forms, and at least one representative soil profile from each test unit was drawn to scale and photographed. Detailed notes were recorded on soil

condition, stratigraphy, Munsell color, and number of artifacts. Any features encountered were photographed, bisected, and drawn separately. Detailed notes were recorded for all features. Artifacts from each excavation level of each test unit were sorted into individual plastic bags and labeled according to site number, test unit, and excavation level. All test units were backfilled upon completion.

3.4 Laboratory Analysis and Curation

All recovered artifacts were transported to the Atlanta laboratory facilities of Brockington and Associates, Inc., where they were cleaned, cataloged, and analyzed. All field notes, photographs, project notes, and other information generated by this survey will be temporarily stored at the Atlanta facilities of Brockington and Associates, Inc. Following approval of the final report of investigations, these materials will be submitted to the University of Georgia, Laboratory of Archaeology in Athens for curation or another facility that meets the standards defined in 36 CFR Part 79, *Curation of Federally-Owned and Administered Archeological Collections; Final Rule*.

Distinct provenience numbers were assigned to each shovel test and surface collection:

- Provenience 1 designates general surface collections. Numbers after the decimal point designate subsequent surface collections, or trenches.
- Proveniences 2 to 200 designate Phase I shovel tests.
- Proveniences 201 to 400 designate one-by-one-m TUs done for Phase II testing purposes. Proveniences 401 to 600 designate Excavation Units (EUs) excavated as part of site mitigation (Phase III)
- Provenience numbers over 600 designate cultural features, regardless of Phase of investigation.

For all provenience numbers except 1, the numbers after the decimal point designate levels. Provenience X.0 is a surface collection at a shovel test or unit. X.1 designates level one, and X.2 designates level two. For example, 201.2 is TU201, Level 2. Flotation samples are designated by a 01 added



Figure 3.3 Archaeologist excavating TU202 (1-by-1-m unit) at 9BN1613.

after the level. For example, 201.201 is the flotation material from TU201, Level 2.

Within each provenience, artifacts were sorted by criteria such as material class, manufacture method, object form, and decoration. Each group of artifacts was counted and weighed, then bagged in 4-millimeter (mm) polyethylene self-sealing, archivally stable bags and assigned a catalog number. Weights were taken with an Ohaus CS-200 digital scale; for groups of artifacts weighing over 200 grams, a MyWeigh KD-7000 digital scale was used. Measurements were taken using Mitytoyo digital calipers. Archival paper tags that duplicate the bag and catalog information were placed in each individual bag. Fragile artifacts were packaged in Ethafoam sheets and placed in a hard polyethylene tub.

Diagnostic artifacts were labeled using a basecoat of clear or white Acryloid B72, a durable and non-yellowing acrylic polymer. When this was dry, the site number and provenience number were applied using black India ink with permanent pigment and a nib pen. A topcoat of clear Acryloid B72 was applied after the ink had dried. Labeling

of artifacts enables easy movement for analysis and photographic purposes and replacement to their corresponding provenience.

All artifact and provenience data were compiled into a database (Microsoft Access 2016). This is a relational database structured around two main bodies of information: provenience information and artifact information. The goal was to record as much information as possible about the recovered artifacts for present and future research. This includes, but is not limited to, function, artifact measurements, manufacture methods, maker's marks, images, and references. The advantage of using a relational database rather than a spreadsheet is the ability to query. This database was designed to retrieve data based on any criteria, whether excavation depth, material class, or artifact function. Microsoft Access also has the ability to store equations in a field, enabling the use of manufacture date calculations based on measurements and other statistical analysis.

3.4.1 Historic Artifacts

Historic-period artifacts were organized initially by provenience, and then separated into material categories (e.g., glass, ceramic, metal, plastic). The artifacts were then identified and sorted into 17 functional classes based on a system devised by South (1977). In addition, a “Miscellaneous” category was used for artifacts that could be identified by material type but were too small to be identified by functional type. Historic materials were dated based on known manufacturing range where possible; references used are noted in both the text and artifact catalog.

Historic ceramics are sorted by ware or clay type. Unglazed brick fragments are weighed and discarded. Portion and decoration are recorded for clay pipe fragments. Other ceramic wares are sorted by ware type, exterior surface decoration, and portion. Further information is obtained on product labels, maker’s marks, state of preservation, vessel form, closure type, and glaze color (specifically for stoneware). Dates can be obtained from the surface decoration, ware type, and maker’s marks.

Glass is sorted by manufacture method, surface decoration, and color. Portion, vessel form, product labels, maker’s marks, preservation state, and closure type are also annotated. For table glass, fluorescence color is observed beneath a shortwave UVP brand UVLS-26 EL Series ultraviolet lamp. Dates can be obtained based on manufacture method.

3.4.2 Prehistoric Artifacts

Prehistoric-period artifacts were organized initially by provenience and then separated into material categories (e.g., ceramic, lithic [flaked stone]). Diagnostic artifacts were identified according to published type descriptions and are referenced in the text and artifact catalog.

Collected stone artifacts were subjected to three types of analysis: morphological, technological, and functional. The goals of lithic analysis are:

- delimiting the spatial patterning of tool-manufacturing loci;
- discerning patterns in the use of expedient and formal tools;
- documenting differences and diachronic changes in lithic production technologies

among the cultural components represented at the site;

- modeling raw material procurement and use; and
- assigning formed hafted bifaces to established culturally or temporally diagnostic types for relative dating purposes.

Lithic Artifacts

The analysis of stone artifact morphology was conducted in three stages. First, all artifacts were sorted into three broad groups according to their method of production. Stone artifacts include chipped stone, ground stone, and miscellaneous stone artifacts. Chipped stone is defined as the products and by-products of the manufacture and maintenance of stone tools produced by percussion and/or pressure-flaking techniques. Artifacts assigned to this class must exhibit at least one of the following attributes: flake scars, striking platforms, or bulbs of force. Second, artifacts were sorted into one of four general classes: core, debitage (chipped stone waste products), implement (chipped stone and ground stone), and miscellaneous (raw material and fire-cracked rock).

Finally, formed artifacts were described and assigned to recognized stylistic types (e.g., Kirk projectile point) that are culturally or temporally diagnostic. Typological assignments were made based on several morphological attributes. The collected attribute data include measurements of artifact size, measurements of specific attribute elements, such as hafting elements and blades; specialized working element morphology; basal preparation; and the extent and position of flaking.

Raw Material Identification. The first consideration pertains to prehistoric procurement and use of lithic raw material. Based on categories of raw material, analysis attempts to delimit the spatial patterning of debitage and tools and their placement within a reduction sequence.

The goals of studying prehistorically utilized raw materials are twofold. First, the identification of raw material used within a prehistoric site allows the examination of a site’s relationship to the surrounding region by identifying usage patterns between local, intermediate, and non-local lithic resources.

Additionally, with a strong understanding of the spatial relationship between an archaeological site and lithic raw material sources, GIS modeling is used to increase understandings of native peoples' behavior in exploiting local and non-local lithic resources. Furthermore, variability and quality of the raw materials identified through archaeological survey or investigations is instructive for understanding the duration and intensity of site occupation (Andrefsky 1998).

Commonly, prehistoric groups in the Southeast used two primary raw material types for flaked stone tool production: chert and quartz. Chert is a silica-residue, compact cryptocrystalline or microcrystalline variety of quartz originating from a sedimentary context. Found within limestone deposits, chert is often a fine-grained material producing conchoidal fractures (Andrefsky 1998; Goad 1979). Chert varieties and appearances are quite varied across the Southeast. Quartz is defined as a macrocrystalline and cryptocrystalline silica; quartz is understood as a nearly pure form of the material (Jones 2006).

The project area is located within Georgia's Coastal Plain, which contains sporadic but widely-distributed chert deposits throughout the region. Sizeable outcroppings are located in southwestern Georgia, west of the Flint River, along the Fall Line, and on the southeastern Georgia coast along the Savannah River, below Augusta. In addition, residual nodules and boulders can be found along streams and ridges (Goad 1979). Coastal Plain chert is described as a Tertiary-age marine chert that ranges in coloration from a translucent caramel to an opaque, mottled white to buff material (Jones 2006). In many instances, this chert type is subjected to thermal alteration.

Lithic raw material and artifacts, found within an archaeological context, often maintain characteristics that coincide with lithic material that has been thermally altered. In the evaluation of possible heat-treated specimens, color change, thermal shock alteration, and improved flaking characteristics are all considered important diagnostic attributes (Domanski and Webb 2007). Visual inspection is often augmented by experimental thermal alteration studies conducted by Brockington and Associates on material maintained within our raw material collection.

Flake Debris Analysis. Debitage includes the by-products from the manufacturing and maintenance of flaked stone tools and consist of all pieces of lithic material that exhibit evidence (e.g., platforms and bulb of percussion) of intentional removal from a parent mass (e.g., core or biface) and display no evidence of having been used or intentionally re-touched; All recovereddebitage is size graded using a set of screens with graduated sizes of three-quarter-inch (25.4 mm), one-half-inch (12.7 mm), and one-quarter-inch (6.4 mm), and analyzed using the mass analysis technique as outlined by Ahler (1989).

In basic terms, once material is processed through a set of nested screens, each size category is sorted by raw material type. Next, these raw material groupings are further categorized bydebitage type (e.g., flakes, shatter). All identifieddebitage is then sorted according to primary, secondary, and tertiary flaking attributes. Brockington's laboratories use mass analysis techniques fordebitage studies allowing for the identification of general trends in raw material reduction, lithic tool production, and frequency of utilization throughout occupied periods. Mass analysis is efficient in developing large data sets that address site type and site usage and provides insights into potential lithic production strategy(s) used by inhabitants of the site.

Prehistoric Ceramic Artifacts

Prehistoric ceramics are first sorted by object form. Fired clay and daub are weighed. Portion and decoration are recorded for clay pipe fragments. Other ceramic wares are sorted by exterior surface decoration, temper, portion, and ceramic series name when possible. Further information is obtained on state of preservation and vessel form. Dates can be obtained from the surface decoration, temper, ceramic series name, and geographical area; Table 3.1 illustrates the approximate date and cultural periods for each of the defined cultural phases for the region, adapted primarily from Williams and Thompson's (1999) typologies.

As more data are acquired during future investigations in the region, the ceramic sequence presented above will be modified. However, sequences are not always discrete, and some phases overlap. As we assess the stratigraphic deposits and integrity of the archaeological site from this current

Table 3.1 Ceramic sequence for the Bryan County area.

Period	Phase	Exterior Decoration	Temper
Protohistoric 1575 - 1750 AD	Altamaha (1575 - 1750 AD)	plain , incised, check stamped, complicated stamped, burnished plain, red filmed, line block	typically sand, rarely shell or limestone
Mississippian 1150 - 1575 AD	Pine Harbor (1450 - 1575 AD)	plain, incised, complicated stamped, burnished plain	typically coarse to very coarse sand, rarely fine/medium sand
	Irene II (1350 - 1450 AD)	plain, incised, complicated stamped, burnished plain, applique rim strips	typically coarse to very coarse sand, rarely fine/medium sand
	Irene I (1300 - 1350 AD)	plain, complicated stamped, burnished plain	typically coarse to very coarse sand, rarely fine/medium sand
	Savannah II (1200 - 1300 AD)	plain, cord marked, burnished plain, check stamped, complicated stamped	sand
	Savannah I (1150 - 1200 AD)	plain, cord marked, burnished plain	sand
Late Woodland 700 - 1150 AD	St. Catherines (1000 - 1150 AD)	plain, cord marked, burnished plain, net impressed	small to medium grog
Middle Woodland 300 BC - 700 AD	Wilmington (600 - 1000 AD)	plain, cord marked, fabric impressed, brushed	large grog
	Deptford II (300 - 700 AD)	plain, simple stamped, check stamped, cord marked, complicated stamped	coarse to very coarse sand
	Deptford I (500 BC - 300 AD)	plain, simple stamped, check stamped, linear check stamped, cord marked	coarse to very coarse sand
Early Woodland 1000 - 300 BC	Refuge II (800 BC - 400 BC)	plain, simple stamped	coarse to very coarse sand or grog
	Refuge I (1000 - 800 BC)	punctate, dentate stamped, incised	coarse to very coarse sand or grog
Late Archaic 4000 - 1000 BC	St. Simons II (1700 - 600 BC)	plain, punctate, incised	fiber
	St. Simons I (2200 - 1700 BC)	plain	fiber

investigation, these cultural overlaps were among the factors considered. For instance, the recovery of St. Simons pottery within or slightly above the same stratigraphic level as Refuge pottery does not necessarily suggest disturbed or mixed vertical deposits. It is possible that these two series of pottery were produced within the same time period by the same or different contemporaneous groups.

3.5 Evaluation of NRHP Eligibility

Cultural resources are evaluated based on the criteria for eligibility to the NRHP as specified in Department of Interior Regulations (36 CFR Part 60: National Register of Historic Places). According to 36 CFR Part 60.4 (Criteria for Evaluation), sites can be defined as significant (i.e., eligible for the NRHP)

if they “possess integrity of location, design, setting, materials, workmanship, feeling, and association,” and if they:

- A. Are associated with events that have made a significant contribution to the broad pattern of history; or
- B. Are associated with the lives of persons significant in the past; or
- C. Embody distinctive characteristics of a type, period, or method of construction, or represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. Have yielded, or may be likely to yield, information important in prehistory or history.

Architectural resources within the architectural APE were evaluated for listing on the NRHP. As per 36 CFR Part 60.4, there are four broad evaluative criteria for determining the significance of a resource and its eligibility for the NRHP. The following are guidelines for determining whether a property is significant under the three criteria that usually apply to historic buildings and structures and another two criteria that may be less applicable (adapted from NPS 1997).

Event: Under Criterion A, the building or structure must be documented to have existed at the time of the event or pattern of events and to have been importantly associated with those events. The association must be conclusive and not tenuous and the documentation must be through accepted means of historical research. However, these resources are only eligible for listing on the NRHP if they are deemed significant.

Person: Under Criterion B, a building or structure must be associated with a person's productive life, reflecting the time when he or she achieved significance. Properties that pre- or post-date the individual's significant accomplishments are usually not eligible unless there are no other properties that might qualify. The documentation must be through accepted means of historical research such as written or oral history. Properties associated with an important individual should be compared with other properties associated with the same individual to determine which best represent the person's historic contributions.

Design/construction: Under Criterion C, properties are eligible for the NRHP if they are significant for their physical design or construction, including such elements as architecture, landscape architecture, engineering, and artwork. To qualify under this Criterion, a property must satisfy at least one of the following: "Embody the distinctive characteristics of a type, period, or method of construction." Under this requirement, the property must reflect the way it was conceived, designed, or fabricated by a people or culture in past periods of history. "Distinctive characteristics" are the physical features or traits that are repeatedly encountered in individual

types, periods, or methods of construction. "Type, period, and methods of construction" refer to the way certain properties are related to one another by cultural tradition or function, by dates of construction or style, or by choice or availability of materials and technology. "Represent the work of a master." A master is an individual who is generally recognized as "great" in a field, a craftsman of consummate skill, or an anonymous craftsman whose work is distinguishable from others by its characteristic style and quality. The property must express a particular phase in the development of the master's career, an aspect of his/her work, or a particular idea or theme in his/her craft. "Possess high artistic values." Under this requirement, a property is eligible if it articulates a particular concept of design such that it expresses an aesthetic ideal.

Additionally, under Criterion C, properties are eligible for the NRHP if they "Represent a significant and distinguishable entity whose components may lack individual distinction." This requirement refers to districts. A district may be composed of a variety of resources but derives its importance from constituting a unified entity. Its varied resources are consequently interrelated, conveying a visual sense of the overall historic environment or arrangement of historically or functionally related properties. As for individual buildings or structures, a district must be significant as well as identifiable, and must be important for historical, architectural, archaeological, engineering, or cultural values. Districts will usually achieve significance under the last requirement of Criterion C plus Criterion A, B, additional portions of Criterion C, or D. A district may have both features that lack individual distinction and individually distinctive features that are focal points. None of the components may be distinctive if the grouping is significant as a whole within its historical context. Most of the components however, must have integrity, as well as the district as a whole. The district can also contain noncontributing elements, the number depending on how the noncontributing elements affect the integrity of the district as a whole.

Information potential: Under Criterion D, resources may be eligible for the National Register if they have yielded, or may be likely to yield, information important in prehistory or history. Although most

often applied to archeological districts and sites, this Criterion can also apply to buildings, structures, and objects that contain important information. For these types of properties to be eligible, they themselves must be, or must have been, the principal source of the important information.

Exceptional Importance: Criteria Consideration G relates to properties achieving significance within the past fifty years and qualifies as eligible if it is of exceptional importance. Properties that have not reached fifty years of age are typically excluded from the National Register because they have not developed sufficient time to accrue historical perspective.

To assist in the primary object of this investigation, i.e., to provide NRHP eligibility assessments of buildings and structures within the architectural APE, several pertinent guidelines and studies were consulted. Materials used include the following:

- *How to Apply the National Register Criteria for Evaluation*, National Register Bulletin 15 (NPS 1997);
- *Guidelines for Local Surveys: A Basis for Preservation Planning*. National Register Bulletin 24. (Parker 1985);
- *House Types in Georgia*, Historic Preservation Division, Georgia Department of Natural Resource (<http://georgiashpo.org/sites/uploads/hpd/pdf/housetypes.pdf>);
- Messick, Denise P. *Tilling the Earth: Georgia's Historic Agricultural Heritage- A Context*, 2001. (http://georgiashpo.org/sites/uploads/hpd/pdf/tilling_the_earth.pdf); and
- McAlester, Virginia Savage. *A Field Guide to American Houses*. New York: Alfred A. Knopf, 2013.

Archaeological properties are usually evaluated relative to Criterion D. As locations of human activities that include physical remains of those activities, archaeological sites are potential sources of important information.

However, some archaeological sites, particularly those representing historic period occupation or use, can be considered eligible under Criterion A (if they are associated with specific important events

or trends in American history), under Criterion B (if they are associated with important people), or under Criterion C (if important structural elements are preserved) (NPS 1997; Townsend et al. 1993).

As indicated in 36 CFR Part 60.4(d), archaeological sites “that have yielded, or are likely to yield, information important in prehistory or history” can be eligible for the NRHP. The National Park Service defines two requirements for archaeological sites to be eligible under NRHP Criterion D (NPS 1997:21):

1. The site must have, or have had, information to contribute to our understanding of human history or prehistory, and
2. The information must be considered important.

The National Park Service provides clarification for the first requirement by stating that an archaeological site is eligible for the NRHP if that site “has been used as a source of data and contains more, as yet unretrieved data” (NPS 1997:21).

Regarding the second requirement, Glassow (1977) recommends careful consideration of specific site attributes (integrity, clarity, artifact frequency, and artifact diversity) in determining whether an archaeological site contains important information. Butler (1987:821) defines “important information” as the potential of an archaeological site to contribute to current “theoretical and substantive knowledge” of archaeology in the site’s regional setting. In other words, under Criterion D, importance or significance can be defined as research potential. The research potential of an archaeological site lacking architectural remains can be determined by demonstrating that the site retains relatively intact archaeological contexts, such as culturally or temporally diagnostic artifacts, intact features, discrete artifact clusters denoting activity areas, or preserved organic material associated with the site occupation. To be considered eligible, these data should be capable of addressing important research questions by testing hypotheses, supporting current scientific interpretations, or reconstructing cultural chronologies through using appropriate analytical methods.

Glassow (1977) indicates that aspects of integrity are also important in determining NRHP eligibility of archaeological sites. However, because “archaeological sites, in particular, do not exist to-

day exactly as they were formed” (NPS 1997:46) and information potential relies less on overall condition of the site; therefore location and association are the most important aspects of integrity for archaeological sites.

The National Register Bulletin 41 (Potter and Boland 1992) clarifies the processes for evaluating cemeteries and burial grounds for NRHP eligibility. In the past, cemeteries were generally not recommended eligible for the NRHP, but recent adjustments to the process have broadened the range of cemeteries that may be eligible. To be eligible under Criterion A, a cemetery must be “associated with events that have made a significant contribution to the broad patterns of our history”. The cemetery may be linked to a specific event, or to an important long-term trend.

Criterion B requires that the person or persons of the cemetery are of “outstanding” significance to the community, state, or nation. Most family and church cemeteries containing remains of early settlers and their descendants would not qualify under Criterion B.

4.0 Results of Archaeological Survey and Testing

4.1 Archival Research Results

4.1.1 Previously Recorded Reconnaissance Research for the Project Tract

In February 2015, prior to Phase I survey, Brockington archaeologist David Franz conducted archival research and field reconnaissance to assess the potential for the project area to contain undocumented cultural resources. Franz provided the SEDA with a detailed reconnaissance report (Franz 2015). We have updated Franz's (2015) results and added any current information that is associated with the defined project area. The following describes previously recorded archaeological sites and surveys, and historic maps. Previously recorded historic resources will be discussed in Chapter 5.

4.1.2 Previously Recorded Archaeological Sites

A review of maps at GASF revealed no previously recorded archaeological sites within the project tract, and one previously recorded archaeological site (9BN501) within a one-mile search radius of the tract (Figure 4.1).

Site 9BN501 represents the remains of a razed structure and associated artifacts dating to the late nineteenth or early twentieth century. This site was identified by Brockington (Fuller 2003) during a survey of the Ivanhoe transmission line for the Georgia Transmission Corporation. In addition to a rubble pile representing a former structure, the scatter of artifacts included tin turpentine pots indicating former industry in the region. Turpentine production in the project area is also suggested by the name of "Tar City" Road that runs east-to-west through the project tract.

In addition, one archaeological site is located just outside of the one-mile search radius. **Site 9BN266** is a small prehistoric artifact scatter identified by the Georgia Department of Transportation (GDOT) on a knoll 75 m west of the Ogeechee River. Information from the official Georgia Archaeological Site Form indicates that in addition to six chert flakes, the presence of both fiber- and grit-tempered pottery sherds suggests that deposits date from the Late Archaic through Mississippian periods. Phase II testing at this

site (Duff 2000) recovered an Early Archaic projectile point in addition to Late Archaic through Mississippian materials; however, testing results could not assess NRHP eligibility due to the continued presence of cultural material outside of the project's APE.

4.1.3 Previously Recorded Archaeological Surveys

One previously recorded archaeological survey was conducted within the APE of the project tract, and three previously recorded archaeological surveys were conducted within one mile of the tract (see Figure 4.1). Fuller's (2003) transmission corridor survey followed Cuyler Road south to the Central of Georgia Railroad, and continued along the Central of Georgia southwest across Black Creek, thus encompassing the southeastern boundary of the project APE. Within one mile of the project tract, GDOT conducted a 1974 archaeological survey along the I-16 corridor and identified no archaeological sites (Larson 1974). In 1976, GDOT conducted an archaeological survey along State Road 20 and did not identify any archaeological sites (Alston 1976). In 1996, GDOT conducted an archaeological survey in advance of road widening at five bridge locations along I-16 and identified 9BN266, which discussed in Section 4.1.2 (Duff 2000).

4.1.4 Historic Maps

Several historic maps of Bryan County were consulted to assess the possibility of historic sites within the project APE. The earliest identified maps that provided structural-level detail are USGS topographical quadrangles. The earliest 15-minute quadrangle for *Meldrim, GA* (1912) (Figure 4.2) shows the project tract was crossed by several unimproved roads, including precursors to many modern roads such as US 280, Pridgen Lane, and Tar City Road. In particular, a road leads through the project tract to a bridge across Black Creek. Three structures and two fields are shown along the road representing a farmstead in that location, which is outside of the project APE. There is also a settlement along the Central of Georgia (here, the Seaboard Air Line) Railroad at Cuyler. However, no structures are shown within the project tract; it should be noted that the 1912

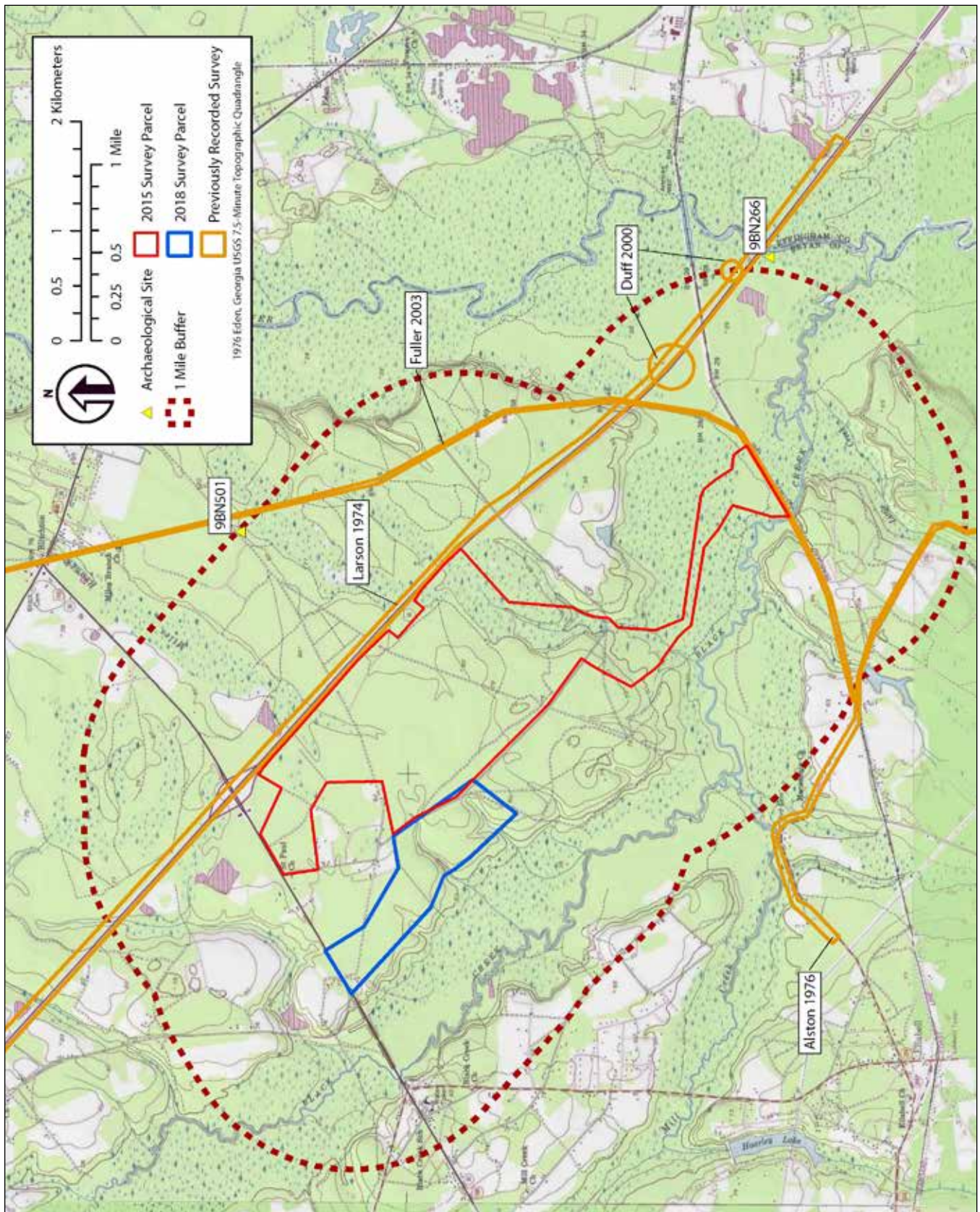


Figure 4.1 Location of previously recorded archaeological sites and surveys within one mile of the project area.

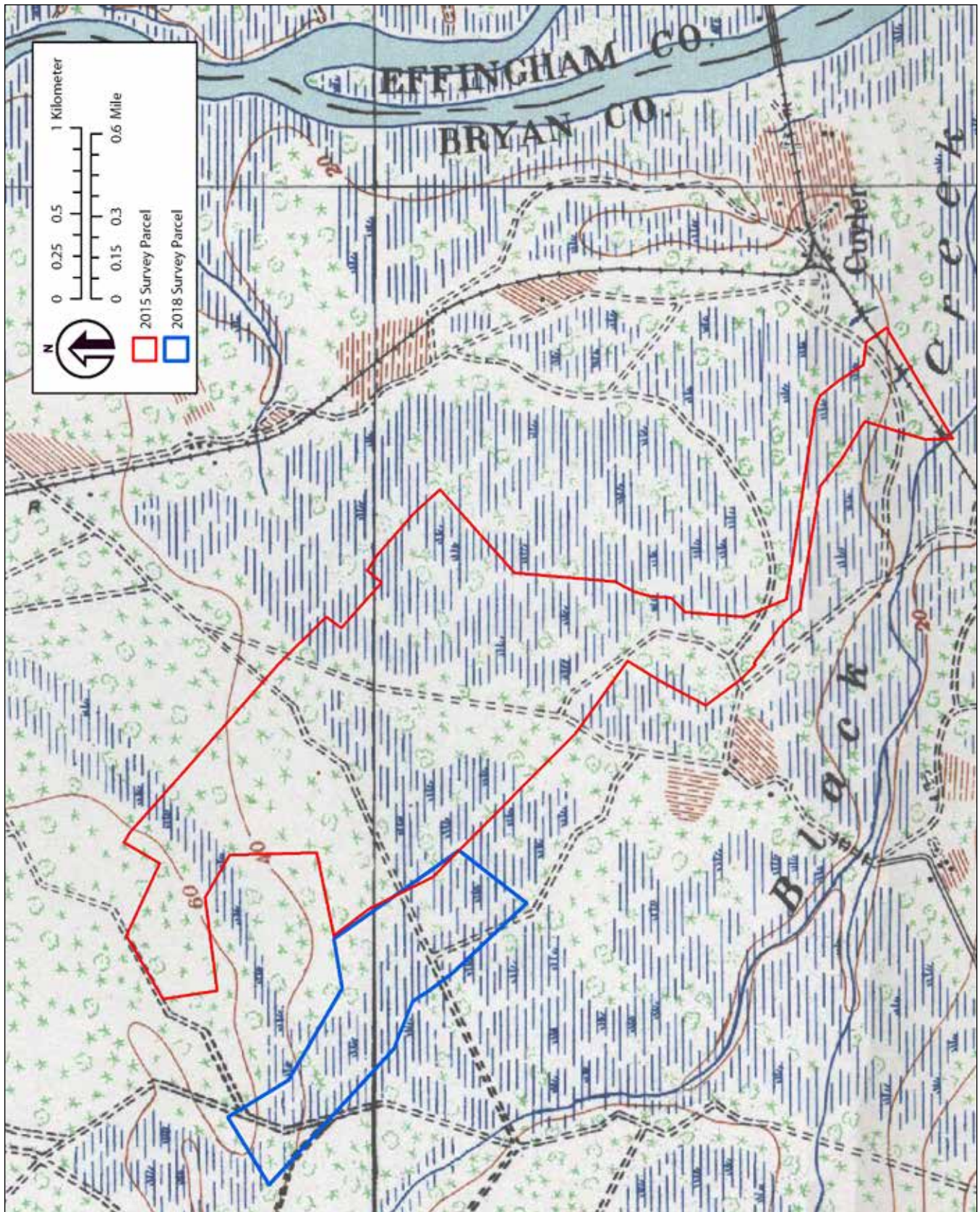


Figure 4.2 1912 Meldrim, GA USGS topographic map showing the project tract.

map depicts much of this parcel as wetland. The next USGS map reviewed, *Meldrim, GA* (1918) (Figure 4.3), does not show significant change within the tract, nor does the 1942 quadrangle (Figure 4.4).

The 1950 15-minute quadrangle for *Meldrim, GA* (Figure 4.5) begins to look much more like the modern configuration. The tract is depicted as drier, with wetlands now restricted to surrounding drainages. As there are largely no improvements to the property shown, it is assumed this reflects greater accuracy than previous maps, and not irrigation of the property, although a few areas of the project tract currently have drainage ditches. More roads and paths are distinguished, including Tar City Road. An improved road now runs to the farmstead near Black Creek. A second farmstead is shown on the north half of this road; this settlement still exists, though it is unclear whether a building somewhat distinct to the north along the road is an individual dwelling or part of the farm complex. The settlement at Cuyler is no longer shown in 1950; however, the still-extant Groover Hill neighborhood near US 280 is depicted and surrounded on three sides by the project tract. Three structures in the vicinity of the Groover Hill neighborhood on the 1950 map are located just within the tract.

The 1958 7.5-minute *Eden, GA* quadrangle (Figure 4.6), shows similar detail in terms of structures, settlements and wetlands; however, the farmstead near Black Creek is missing, and Tar City Road is shown as improved except for the spur towards Black Creek, which is now unimproved. The houses that were shown within the project tract on the 1950 map are actually located just outside the tract on this 1958 map. The most recent non-digital quad, the 1976 7.5-minute *Eden, GA* (see Figure 1.1), shows little change in the parcel since 1958.

4.1.5 Summary of Archival Research

Although there are few known archaeological sites in the area, this appears largely to stem from a lack of surveys. Only a small corridor of data (Fuller 2003) in the immediate vicinity is available for comparison. A considerable sized parcel, such as the project tract, could have a variety of low to high zones of probability for a variety of cultural resources.

Despite the lack of known sites, regional prehistory suggests that if intact archaeological sites are lo-

cated in the immediate vicinity, they would likely be found in upland areas adjacent to long-established wetlands; they might consist of small, isolated activity areas and zones of resource procurement; and they would not likely contain extensive habitation remains. In the case of the current survey area, these activity areas would likely be in the upland ridges adjacent to waterways.

Much of the project tract, particularly the southern one-fourth, is composed of wetlands and floodplains along Black Creek and its tributaries. In addition to the floodplains, other poorly drained areas include the drainages themselves, as well as numerous small depressions scattered throughout the tract. Because these areas are poorly drained and frequently flooded, they are considered to have low probability for evidence of previous human settlements. Human activities in these areas would have been transitory and related to occasional resource procurement rather than long-term encampments.

Sandy flats, which make up the bulk of the project tract, can be considered to have low to moderate probability for containing archaeological sites based on drainage and distance from permanent water sources; these flats range from poorly drained to moderately well-drained, and typically exist between the drainages or floodplains and the upland rises or prominent interfluvial terraces.

The well-drained and generally flat uplands are considered amenable to human habitation and have a high probability for historic settlement; if they are close to (within 100 meters of) a permanent water source, they would have a high probability for prehistoric settlement. A few areas surrounding the wetlands in the project tract fall into this category, but most of these rises lie along a slight bluff above Black Creek, south of the project. Thus, prehistoric camps would be situated in the well-drained upland areas, within fairly close proximity to water. Coastal Plain interior wetlands were likely key locations for resource exploitation in the past. Given investigations that have previously identified such resources, it is likely that sites might well be encountered on uplands that are adjacent to the wetlands near Black Creek, a major tributary to the Ogeechee River.

Additional factors can be considered for probability for historic archaeological and architectural resources, such as the proximity of transportation

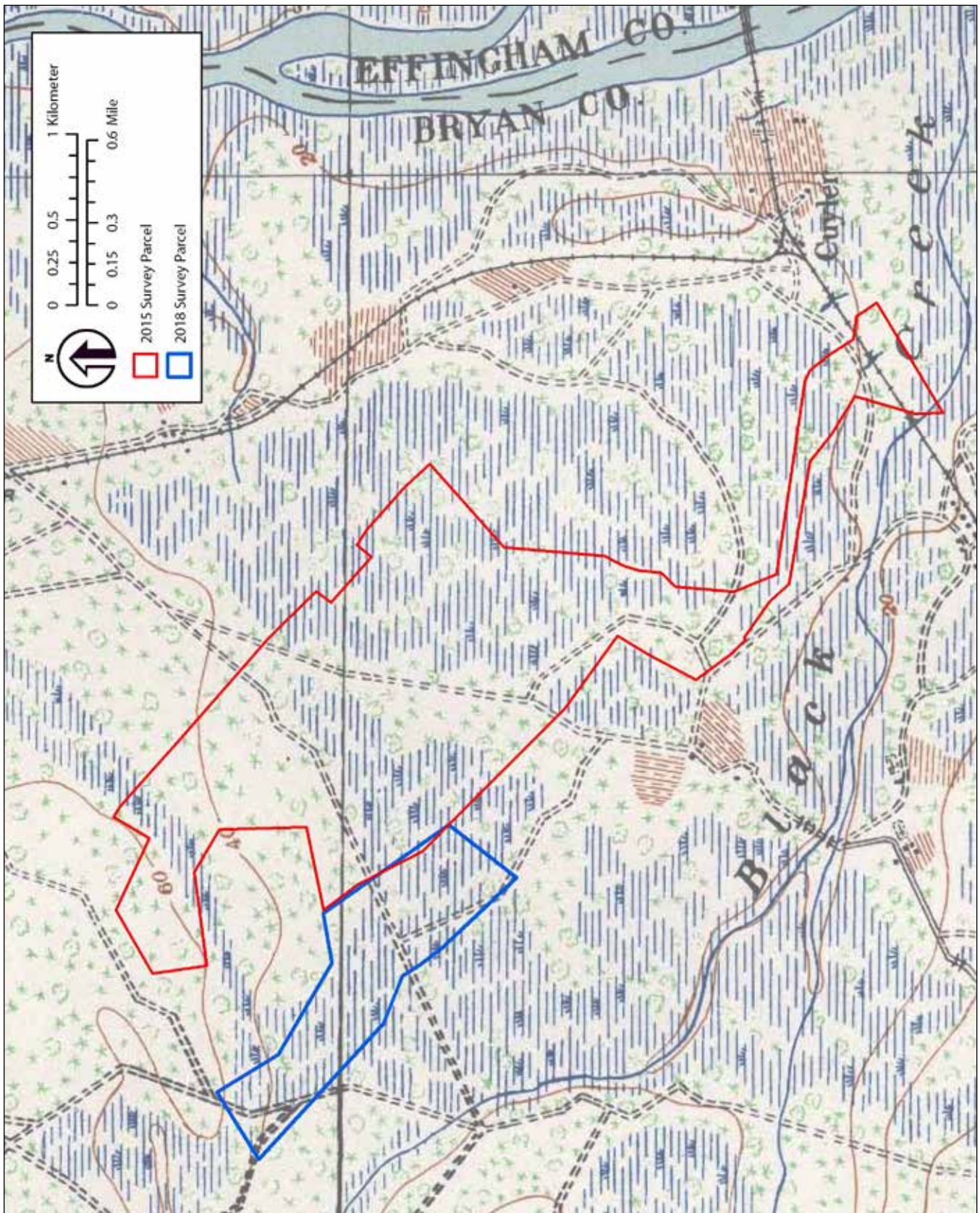


Figure 4.3 1918 Meldrim, GA USGS topographic map showing the project tract.

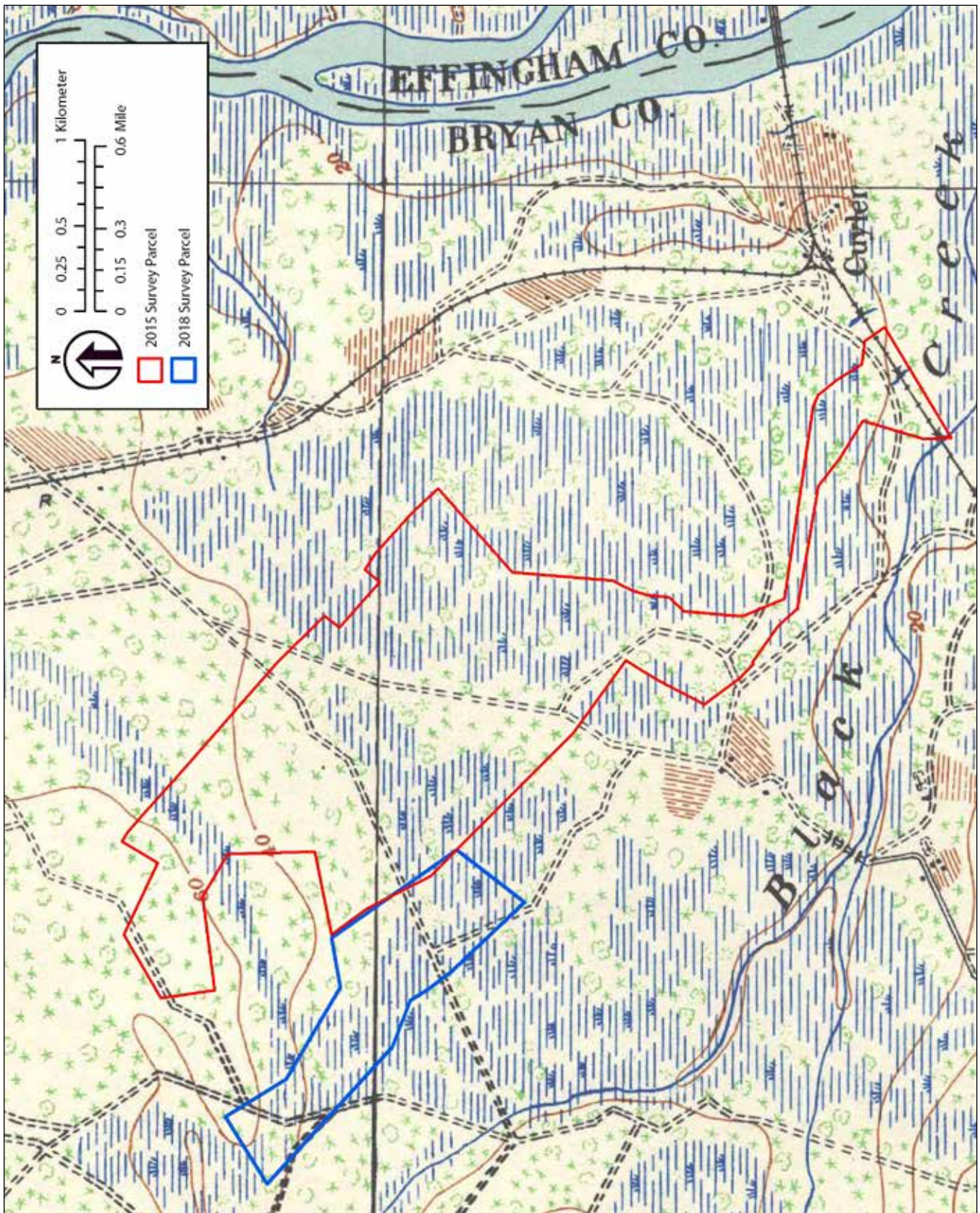


Figure 4.4 1942 Meldrim, GA USGS topographic map showing the project tract.

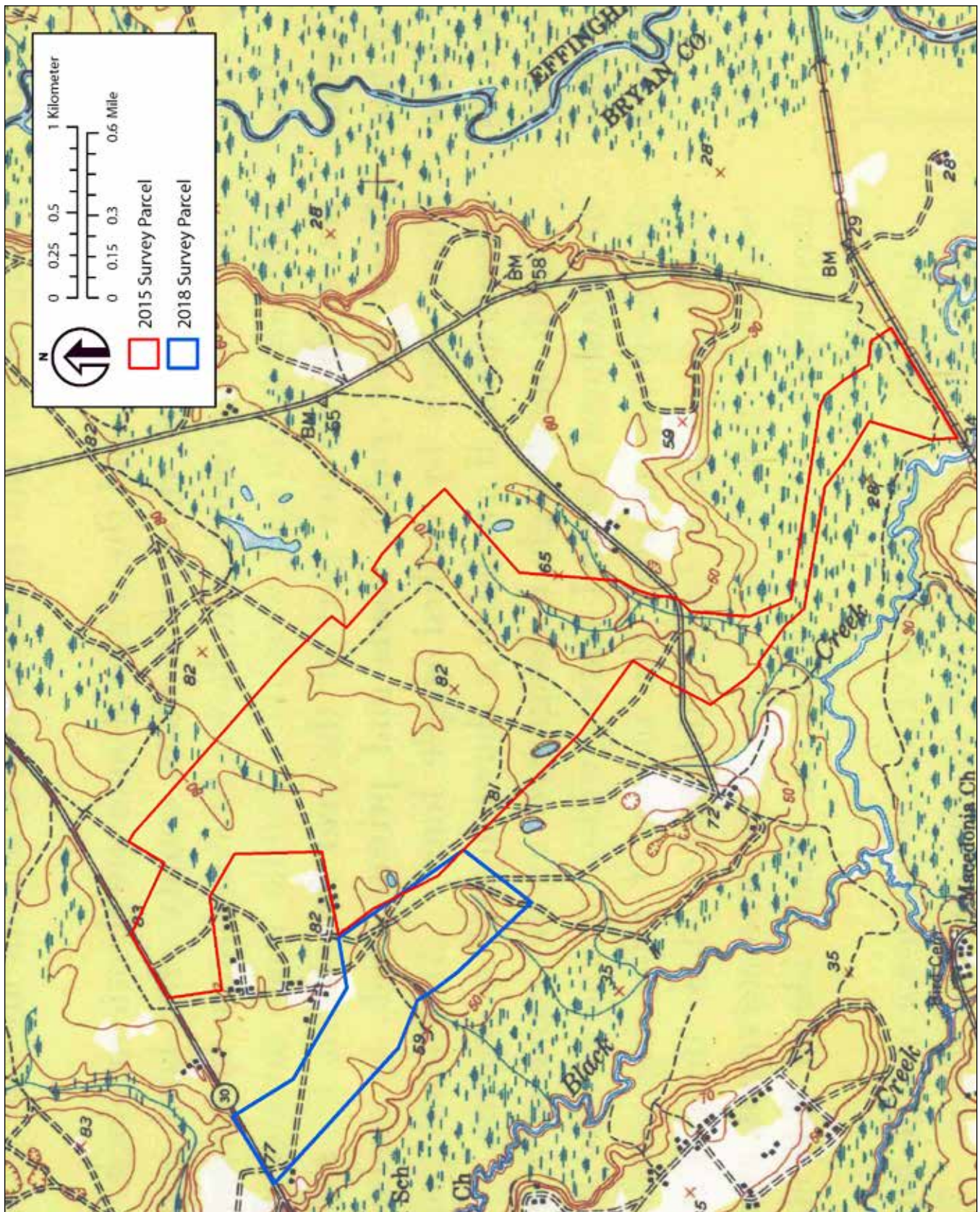


Figure 4.5 Melgrim, GA USGS topographic map showing the project tract.

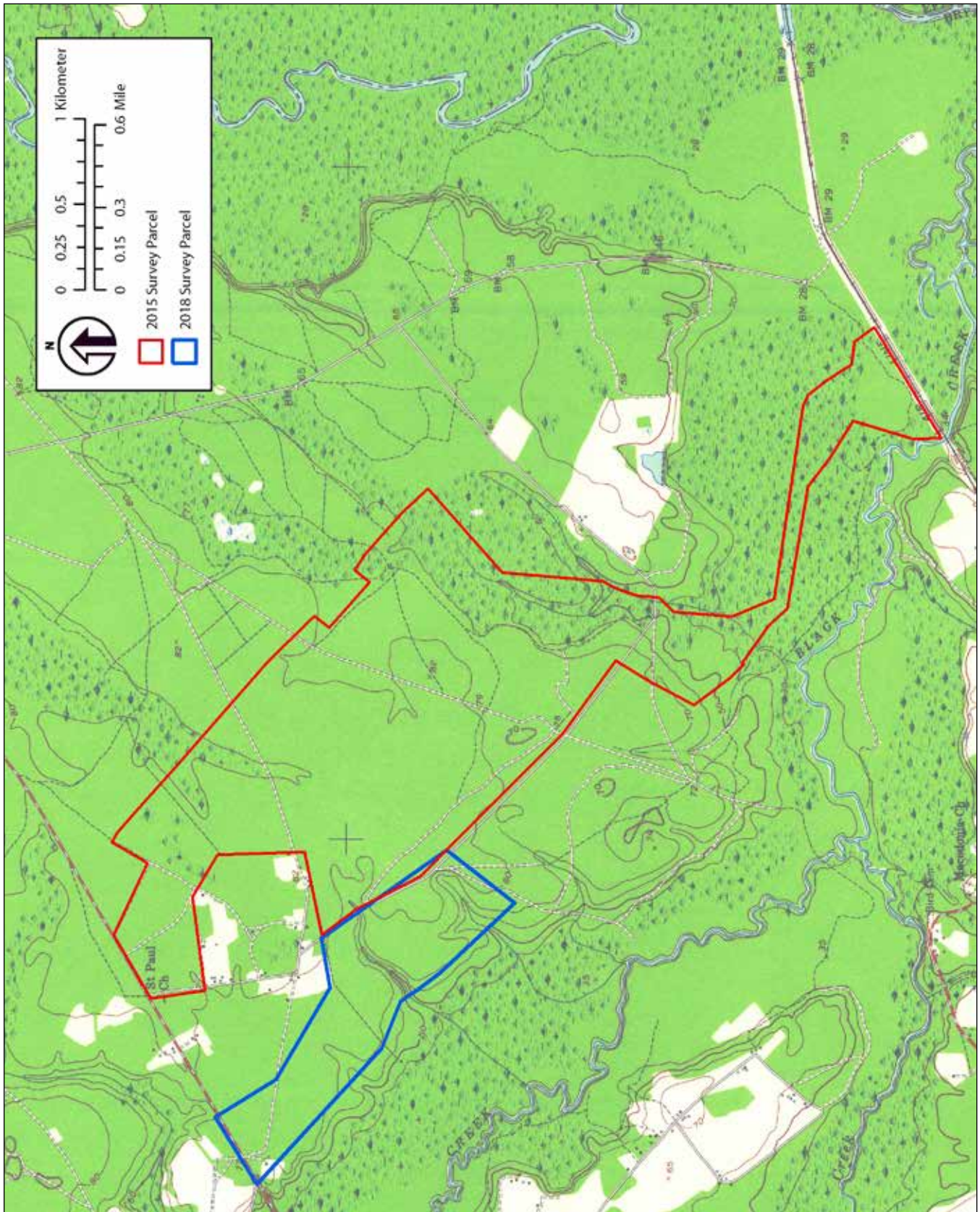


Figure 4.6 1958 Edens, GA USGS topographic map showing the project tract.

routes along the railroad near the old Cuyler settlement in the eastern extent of the property. The examination of early maps, in particular USGS topographical quadrangles, identified very few former structures within the project tract. Although the property is crisscrossed by unimproved roads from the earliest maps surveyed, it is likely that these reflected the use of the land for turpentine collection and later silviculture, as indicated by the planted pines. The project tract also has less extensive wetlands depicted on later maps. This was believed to be in part due to the increased level of map detail; however, as could be seen on aerial photos of the area and verified in the field, portions of the project tract have been drained by a series of ditches running parallel to Tar City Road.

Thus, historic evidence associated with the tar and turpentine industry, which dominated the northern reaches of Bryan County in the late nineteenth century, were expected to be located within the project tract. The network of roads appearing on the earliest maps suggests the area was used for some time. Local history supports that the property was used at least for turpentine collection, with the trail network facilitating this activity. Evidence of rice plantations that dominated the late eighteenth and early nineteenth centuries in southeastern Bryan County was not expected in this area, as this industry would have been concentrated further south along the Ogeechee River toward Bryan Neck, and would have been located between the marshes along the river and inland swamps.

4.2 Archaeological Survey and Testing Results

Archaeological survey of the project tract was undertaken utilizing the methodology previously described in Chapter 3. Investigation of the 2015 survey parcel was conducted March 9 through May 15, 2015, with a crew of up to 10 archaeologists. Investigation of the 2018 survey parcel was undertaken June 4 through June 15, 2018, with a crew of up to five archaeologists. As described in Chapter 3, archaeologists investigated the project tract through a combination of shovel testing and pedestrian survey (surface inspection). The methods were consistent with the State of Georgia professional standards

(GCPA 2014) and in compliance with the guidelines set forth in 36 CFR Part 800. Subsurface survey consisted of the hand excavation of 30-cm wide shovel tests placed at 30-m (100-ft) intervals along survey transects. All soil from shovel tests was screened with one-quarter-inch mesh hardware cloth for the recovery of archaeological materials.

Within the 2015 parcel, survey transects were traversed northeast (50°), approximately perpendicular to Tar City Road. GPS waypoint (WP) designations generated for each shovel test by the GIS software were also maintained for ease of report figure generation. Transects and shovel tests were defined alpha-numerically north to south and east to west.

Within the 2018 parcel, Brockington GIS personnel provided the project field director with pre-calculated GPS points for shovel tests placed on a 30-m interval grid oriented to true north and covering the entire parcel. Each archaeologist used a hand-held GPS unit calculated to 3-m accuracy to locate and excavate each shovel test.

Following initial survey shovel tests at 30-m intervals, additional delineation shovel tests were excavated at reduced 10-m (32-ft) increments surrounding positive (i.e., containing cultural material) shovel tests in four cardinal directions to identify additional cultural materials and/or delineate boundaries of a potential archaeological site. This was conducted until at least two sterile (i.e., devoid of cultural material) shovel tests were reached in all directions, creating a minimal 10-m buffer defining the site or isolated find area.

In this manner, a total of 6,344 possible shovel test locations were examined throughout the project tract, including 5,221 shovel test locations in the 2015 survey parcel and 1,123 shovel test locations in the 2018 survey parcel. Per GCPA (2014) guidelines, where surface visibility was adequate (in our case, greater than 75%) or soils were obviously disturbed, shovel test locations were subjected to close surface inspection only. At the time of the 2015 survey, planted pines were actively being cut and cleared throughout the tract. As a result, much of the 2015 parcel was clear of vegetation, outside of logging decks, and also heavily disturbed, with deeply cut bedding rows. Surface visibility was 80 to 100 percent within much of the recently cleared and/or heavily disturbed areas; these areas were

typically subjected to a close-surface inspection of the exposed Ap horizon for archaeological materials or features. In addition, some of the continually planted and maintained pine fields had little underbrush or surface vegetation and could be subject to surface inspection. Areas of un-maintained pine rows required shovel testing, as did hardwood areas and logging decks with thick loose brush and needles. Thus, a significant portion (n=1,079; 17.0%) of shovel test locations were on open sand flats cleared of vegetation and were subject to surface inspection only in order to identify artifacts or cultural features. In addition, 1,124 (17.7%) locations were found to be inundated and could not be excavated, though pedestrian survey was conducted throughout the wetlands. The 2018 parcel did not present substantial ground visibility or inundation at the time of survey; therefore, all shovel test locations within this parcel were subject to excavation. Figures 4.7a and 4.7b present all shovel test locations within the project tract.

Shovel testing revealed general soil profiles comparable to the expected soil series (see Section 2.1.2). A typical profile consisted of variants of sandy topsoil (A horizons) overlying sandy to clayey subsoils (B, E, or C horizons) at an average depth of 25 to 65 cm below the surface (cmb). Specific soil profiles are discussed below as part of archaeological site descriptions.

Archaeologists noted modern (<50 years old) debris such as dumped trash and construction materials in several locations throughout the project area, particularly along roads (Figure 4.8) and near the Groover Hill neighborhood (Figure 4.9). In addition, five isolated finds (Isolates 1 through 5) and five archaeological sites (9BN1586, 9BN1610, 9BN1611, 9BN1612, and 9BN1613) were identified. Four of the archaeological sites (9BN1586, 9BN1611, 9BN1612, and 9BN1613) were later tested to definitively determine NRHP eligibility. Figure 4.10 presents the location of all archaeological sites and isolated finds identified within the project tract.

4.2.1 Isolated Finds

Brockington archaeologists identified five isolated finds (Isolates 1 through 5) within the project tract. Each isolated find consists of one artifact, or a cluster of artifacts in disturbed context. A series of eight delineation shovel tests placed at 10-m intervals in cardinal directions from each isolated find failed to produce additional cultural material. These isolated finds have no potential to convey additional information on past occupation of the region and therefore are not eligible for the NRHP under Criterion D. Following is a description of each isolated find. See Figure 4.10 for their location.

Isolate 1 (UTM NAD27: Zone 17 458272 E/3558340 N) is a historic ceramic sherd found on the surface alongside a logging road. Specifically, the artifact is a piece of white-glazed stoneware, a Bristol type common throughout the late nineteenth and early twentieth century.

Isolate 2 (UTM NAD27: Zone 17 458056 E/3557895 N) is a Coastal Plain chert one-quarter-inch non-cortical bifacial reduction flake. It was identified within the top soil (A horizon) of a shovel test within an upland terrace on the wetland margins north of Tar City Road.

Isolate 3 (UTM NAD27: Zone 17 456182 E/3558129 N) is a Coastal Plain chert one-quarter-inch flake fragment identified within the top A/E horizon of a shovel test located within an upland terrace near an unnamed tributary of Black Creek.

Isolate 4 (UTM NAD27: Zone 17 456630 E/3558309 N) consists of three Coastal Plain chert lithic artifacts, including one retouched flake tool from within a shovel test located in disturbed context among pushpiles between two dirt roads, one pressure flake found on the dirt road surface, and one bifacial reduction flake also found on the road surface. The landscape vicinity of the isolated find consists of Tar City Road, which is an improved and maintained dirt road, ditches and pushpiles on both sides of the road, and the intersection of two additional dirt roads. The disturbed context clearly defines this cluster of three artifacts as an isolated find.

Isolate 5 (UTM NAD27: Zone 17 455850 E/3558548 N) is a prehistoric sand-tempered plain ceramic sherd identified within the top A/E horizon of a shovel test located on an upland terrace near an unnamed tributary of Black Creek.

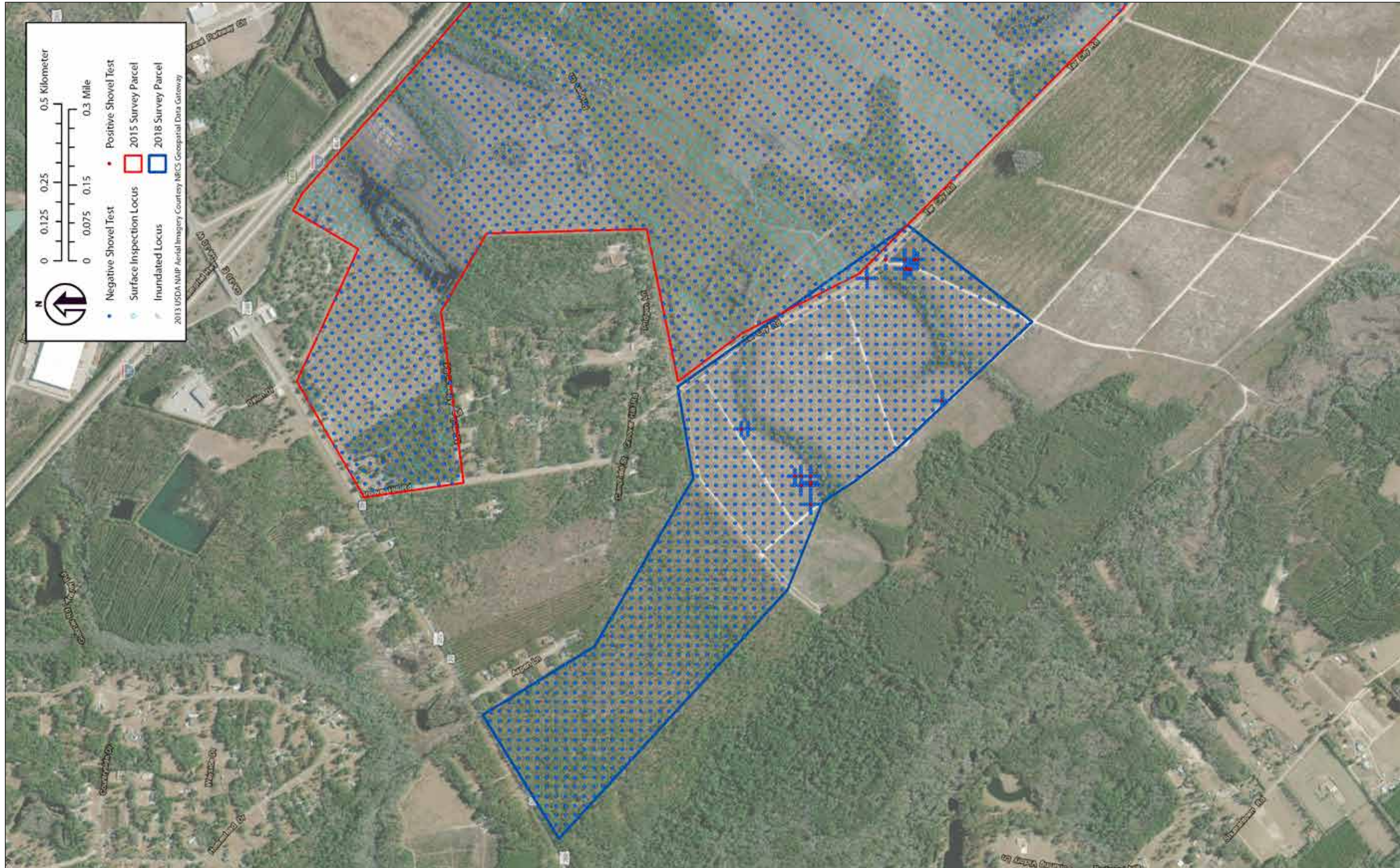


Figure 4.7a Shovel testing pattern within the project area, western portion.

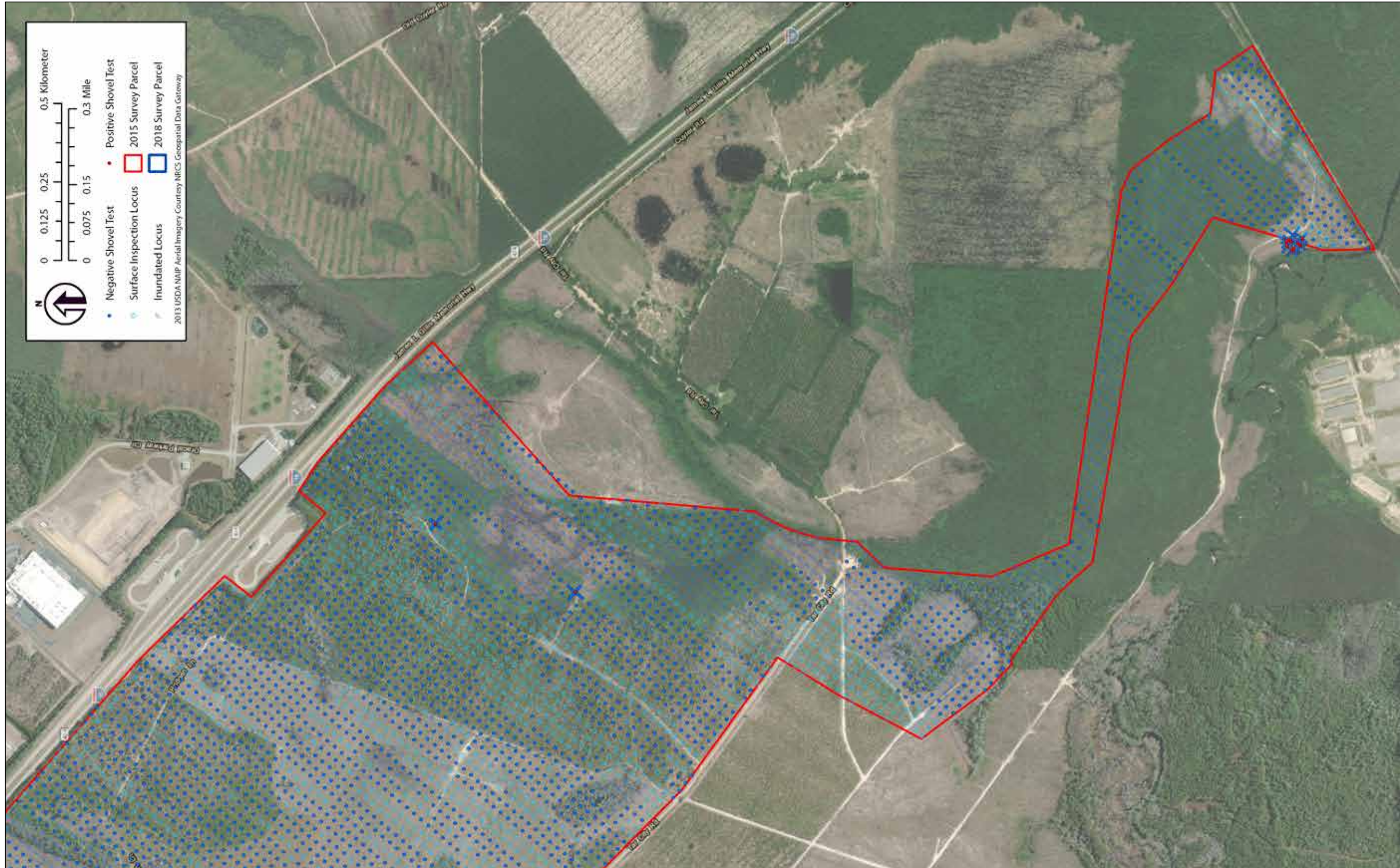


Figure 4.7b Shovel testing pattern within the project area, eastern portion.



Figure 4.8 View of trash dumps along logging road.



Figure 4.9 View of push piles and debris in woods surrounding Black Creek community.

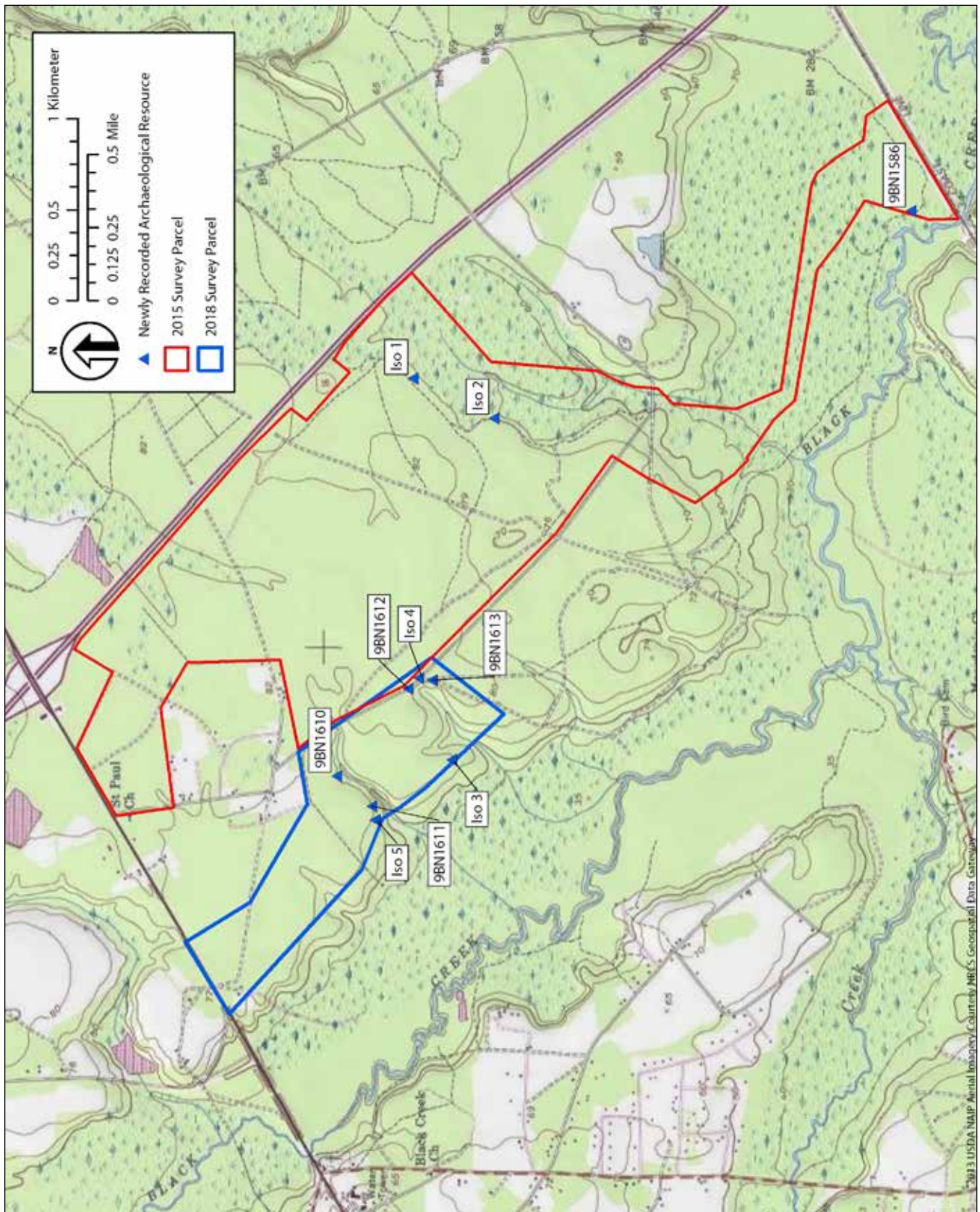


Figure 4.10 Newly recorded archaeological resources identified within the project tract.

4.2.2 Archaeological Sites

Investigators identified five archaeological sites during the field survey, including two multicomponent prehistoric/historic artifact scatters (9BN1586 and 9BN1613), one prehistoric artifact scatter (9BN1612), and two prehistoric lithic scatters (9BN1610 and 9BN1611).

Site 9BN1586

Field Site: Z8-1

UTM (NAD 27): Zone 17 0459193 E/ 3555609 N

Type: Multicomponent artifact scatter

Cultural Affiliation: Early/Middle Woodland;
Nineteenth-Twentieth Century

Setting: Terrace

Elevation: 9 m amsl

Nearest Water Source: Black Creek, 35 m southwest

Dimensions: 50-by-50 m

Area: 2,500 square m

NRHP Recommendation: Not Eligible

General Site Description. Site 9BN1586 is a 50-by-50-m multicomponent artifact scatter located at the southern end of the project tract. The site is situated on an upland terrace 30 m northeast of Black Creek. Vegetation consists of planted pines and sparse to moderate understory. Site 9BN1586 lies primarily between a dirt road and the Black Creek floodplain. Next to the road, a sinkhole was collapsed along the built-up sand roadbed and has been used by ATVs. A scatter of historic ceramics and glass was found in the road at the northwest end of the sinkhole. Approximately 50 m further down this road, a second trail leads to a fishing area on Black Creek at the railroad line crossing (see Figure 2.1). Figure 4.11 presents a plan map of 9BN1586, and Figure 4.12 shows a view of the site.

Survey Results. The site was first identified as a surface scatter of historic artifacts at a shovel test location (WP 658; Prov. 2.1) along the unimproved road that runs along the uplands parallel to Black Creek. A second shovel test (WP 659; Prov. 7.1) to the southwest contained prehistoric material. Surrounding these two shovel tests, an additional 48 shovel tests at 10-m intervals were excavated, some of which extend outside the project tract (Figures

4.13 and 4.14). The typical soil profile consists of mixed and unconsolidated soils remnant of the planting and logging process overlying truncated subsoils. Overall, the soil profile is consistent with the expected Albany fine sand profile, the soil pedon classified at this locale by the USDA; however, shovel testing left it unclear to what extent silviculture had disturbed the upper site deposits resulting in a mixed and unconsolidated A/E horizon (0-20 cmbs) overlying truncated, but intact, E horizon soils. The disturbed, mixed topsoil appeared to decrease in depth approaching the wetland to the south and is greatest within the pine rows closest to the road. Shovel tests closest to the wetlands appeared to have an intact Ap horizon. Artifacts appeared to be well distributed through the upper three soil strata (Ap, A/E, and E horizons). In total, four historic ceramic sherds, five pieces of glass, six prehistoric ceramic sherds, and 11 pieces of stone debitage from prehistoric tool making were identified (Table 4.1).

Historic ceramics include whiteware (n=2) and stoneware (n=2) sherds, three of which were recovered from the road surface, and a single sherd found in the A/E horizon of a shovel test (30W/30S; Prov. 9.1). These sherds are generally too small to facilitate much analysis. The two whiteware sherds include a blue transfer-printed fragment, and a small undecorated rim sherd. Whiteware ceramics are still produced today, making these artifacts not particularly diagnostic to time period. Similarly, the two white-glazed stoneware sherds are likely Bristol stoneware, a typically utilitarian pottery available since the 1830s (cf. Greer 1981).

The five pieces of glass include four fragments of container glass (one aqua, one colorless, and two amethyst pieces) and one fragment of tableglass. The amethyst pieces are diagnostic to between 1880 and 1915 (Munsey 1970:55). All glass was found on the surface or in the A/E horizon of shovel tests.

Prehistoric artifacts include six ceramics and 11 lithics, which were distributed throughout the A/E and E horizons of the shovel tests. The ceramics include one sand-tempered plain sherd, two grit-tempered plain sherds, and three residual sherds. The lithics are all debitage fragments. None of the prehistoric artifacts are diagnostic to any particular cultural association.

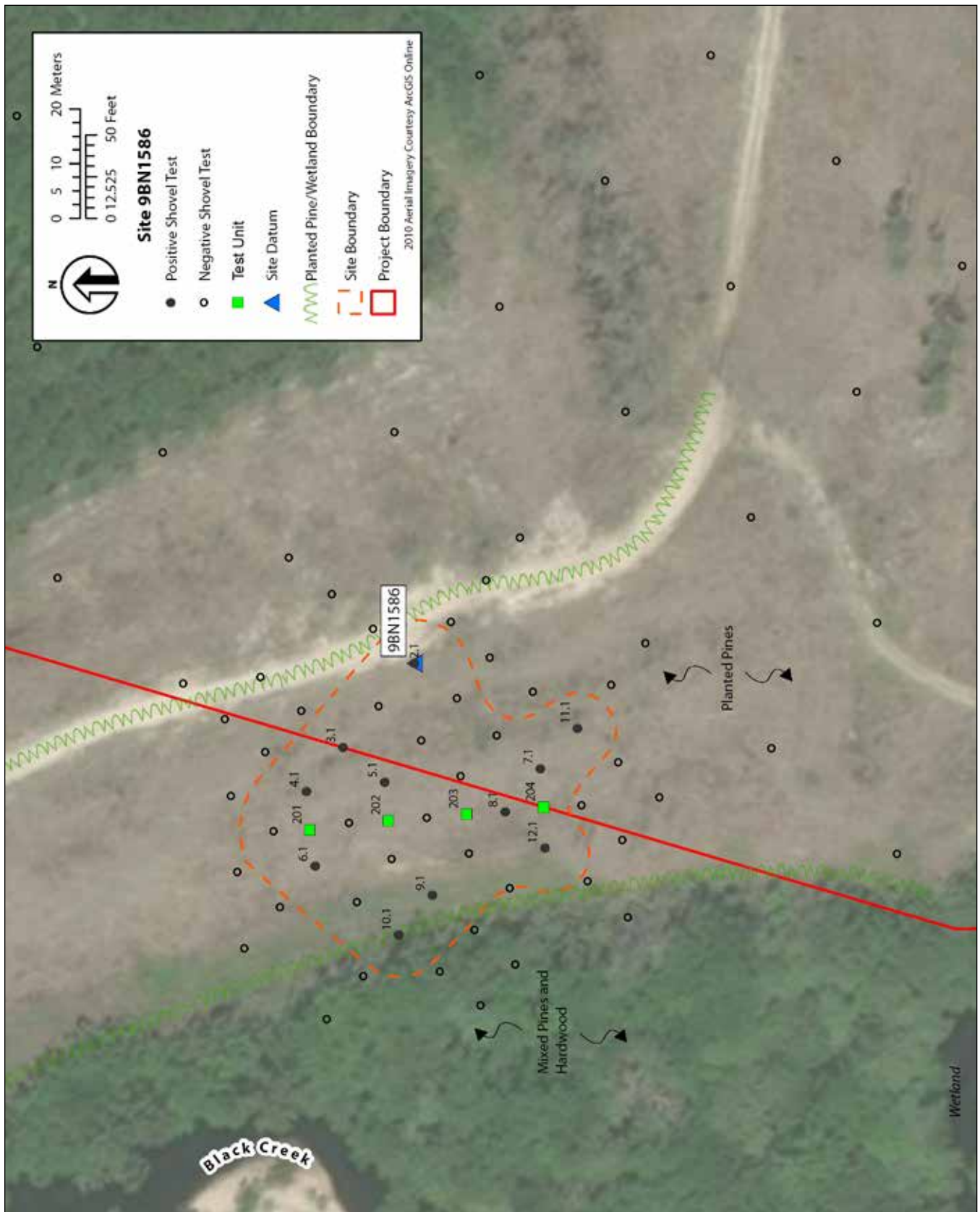


Figure 4.11 Site map detailing shovel testing of Site 9BN1586.



Figure 4.12 General view of Site 9BN1586, looking southeast along road and ATV trail through sinkhole.



Figure 4.13 General view of pine rows at Site 9BN1586, looking south from 40W/10S (Prov. 6.1).



Figure 4.14 Wetland surrounding Black Creek, looking south from 10W/40S (Prov. 12.1).

Table 4.1 Quantity of artifacts from Site 9BN1586 survey shovel tests. Highlighted artifacts are from the surface collection.

Material	Type	Description	Total
Ceramic	Stoneware	White glazed sherd	1
		White glazed, blue annular sherd	1
	Whiteware	Undecorated rim sherd	1
		Blue transfer-printed body sherd	1
Glass	Container	Aqua molded base shard	1
		Colorless body shard	1
		Solarized-amethyst body shard	1
		Solarized-amethyst body shard	1
	Tableglass	Pink body shard	1
Total Historic Artifacts			9
Ceramic	Fine/Medium Sand Temper	Plain body sherd	1
	Grit Temper	Plain body sherd	2
	Unidentified Temper	Residual sherd	3
Lithics	Coastal Plain Chert	1/2 inch flake fragment	1
		1/4 inch flake fragment	5
		1/4 inch non-cortical bifacial reduction flake	3
		1/4 inch non-cortical pressure flake	1
		Shatter	1
Total Prehistoric Artifacts			17

Phase II Testing. Based on the results of shovel testing, it was unclear how well preserved the cultural deposits were under recent silvicultural disturbances and the relative percentage of the site that was undisturbed. However, given that a significant portion of the artifact assemblage emanated from undisturbed subsoil horizons, we conducted Phase II testing consisting of a series of four 1-by-1-m test units (TU201-TU204). Of particular interest at 9BN1586 was the lack of diagnostic artifacts tying the site to a distinct prehistoric period, as well as concerns about the possible preservation state of cultural features, which would have bearing on the site's ultimate recommendation of NRHP eligibility. A secondary concern was regarding the stratigraphic distinction between historic and prehistoric strata, as well as the possibility for distinction between prehistoric strata of different phases.

Shovel testing had already given some indication of a horizontal separation of historic versus prehistoric site components, with only historic materials found in shovel tests along the eastern (swamp margin) and western (road) ends of the site, and the only prehistoric materials found in shovel tests were in the center of the site (Figures 4.15 and 4.16). However, no vertical distinction had been made. Regardless, the historic components were believed to be scattered, off-site trash dumping and not representative of an occupation at this location and thus not of research interest. It was decided to excavate a line of four 1-by-1-m test units (4 square m) north-south through the center of 9BN1586 to further evaluate the eligibility of the prehistoric component of the site. Figure 4.17 shows the location of the test units excavated during this investigation. Excavation data from each of these test units are briefly summarized below.

TU201 is located at the north end of the site, 35 m west and 5 m south (35W/5S) of the 0/0 m site datum (WP 658; Prov. 2.1) (see Figure 4.17). While the shovel test at 30W/0S (Prov. 4.1) had only a single bifacial reduction flake, the shovel test on the other side of TU201 (40W/10S; Prov. 6.1) had the densest amount of material from the shovel testing, with five ceramic sherds and two pieces of chert debitage.

Eight 10-cm levels were excavated in this test unit to a maximum depth of 80 cmbs. Soils from this test unit consisted of a mixed and unconsolidated topsoil

A/E horizon, composed of mottled 10YR 4/2 dark grayish brown Ap horizon loamy sand and 10YR 6/6 brownish yellow E1 horizon loamy sand to an average depth of 20 cmbs. This was underlain by an intact E1 horizon with heavy oxidized 10YR 5/4 yellowish brown mottling extending to 60 cmbs. Given the disturbance to the topsoil, root disturbances were confined to the E1 horizon. The E1 horizon was underlain by 10YR 7/3 very pale brown loamy sand substratum (E2 horizon). The A/E horizon contained a mix of historic and prehistoric materials with only prehistoric material found in the intact E1 horizon. The E2 horizon was sterile of cultural material. No cultural features were identified in TU201. Figure 4.18 shows a view of the south profile.

Of the 33 artifacts recovered from TU201, four were historic artifacts from the A/E horizon (0-20 cmbs); these included one brick fragment and three fragments of aqua glass (see Table 4.2). A total of 29 prehistoric artifacts were recovered, including 14 ceramic sherds and 15 lithic artifacts. The prehistoric pottery sherds were either plain sand tempered (n=6) or eroded friable sherds for which no distinguishing features could be noted (n=8). One of each of these types was found in the mixed A/E horizon, with the remainder distributed through the E1 horizon (20-60 cmbs). Two-thirds of the lithic assemblage (n=10) were chert flake fragments distributed throughout both horizons. Three bifacial reduction flakes were found in the first level of the A/E and last level of the E1 horizons. We also found two halves of a chert core and a translucent quartz flake fragment in the E1 horizon. The quartz debitage is one of only three non-chert lithic artifacts from the site; the core is the only non-debitage lithic artifact from the site.

TU202 is located in the center of the site 10 m southeast of TU201 (25W/15S) (see Figure 4.17). The closest positive shovel test to TU202 (20W/10S; Prov. 5.1) had contained only a single piece of chert shatter.

Thirteen 10-cm levels were excavated in this test unit to a maximum depth of 130 cmbs. Although two culturally sterile levels (30-50 cmbs) had been reached during excavation, as the E2 horizon had not been reached it was decided to continue this unit, with artifacts again occurring between 50-80 cmbs. As a secondary goal of the investigation was to identify discrete prehistoric strata, if they existed, it was later decided to continue the test unit even deeper.

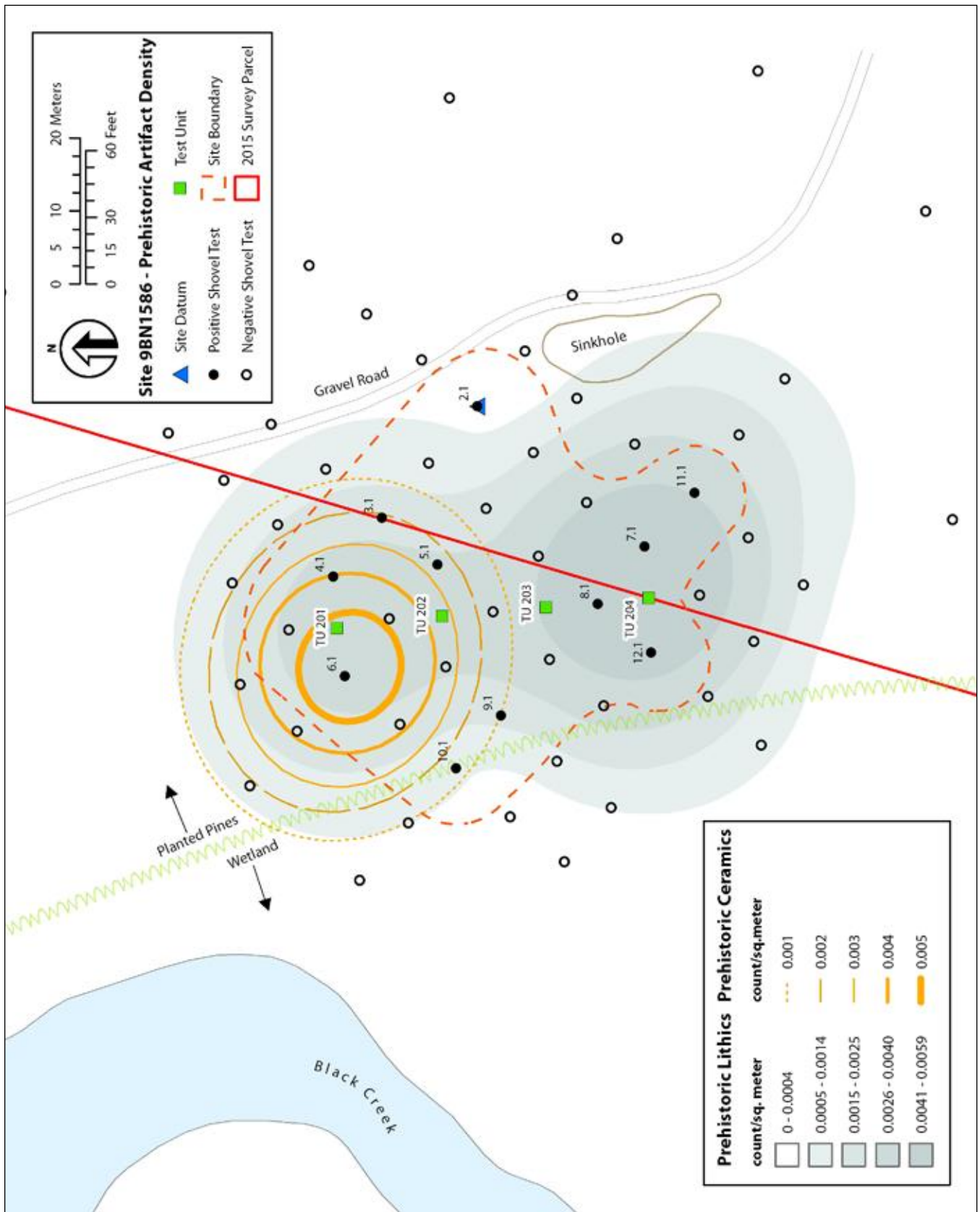


Figure 4.15 Distribution of prehistoric artifacts across Site 9BN1586 as determined by shovel testing survey.

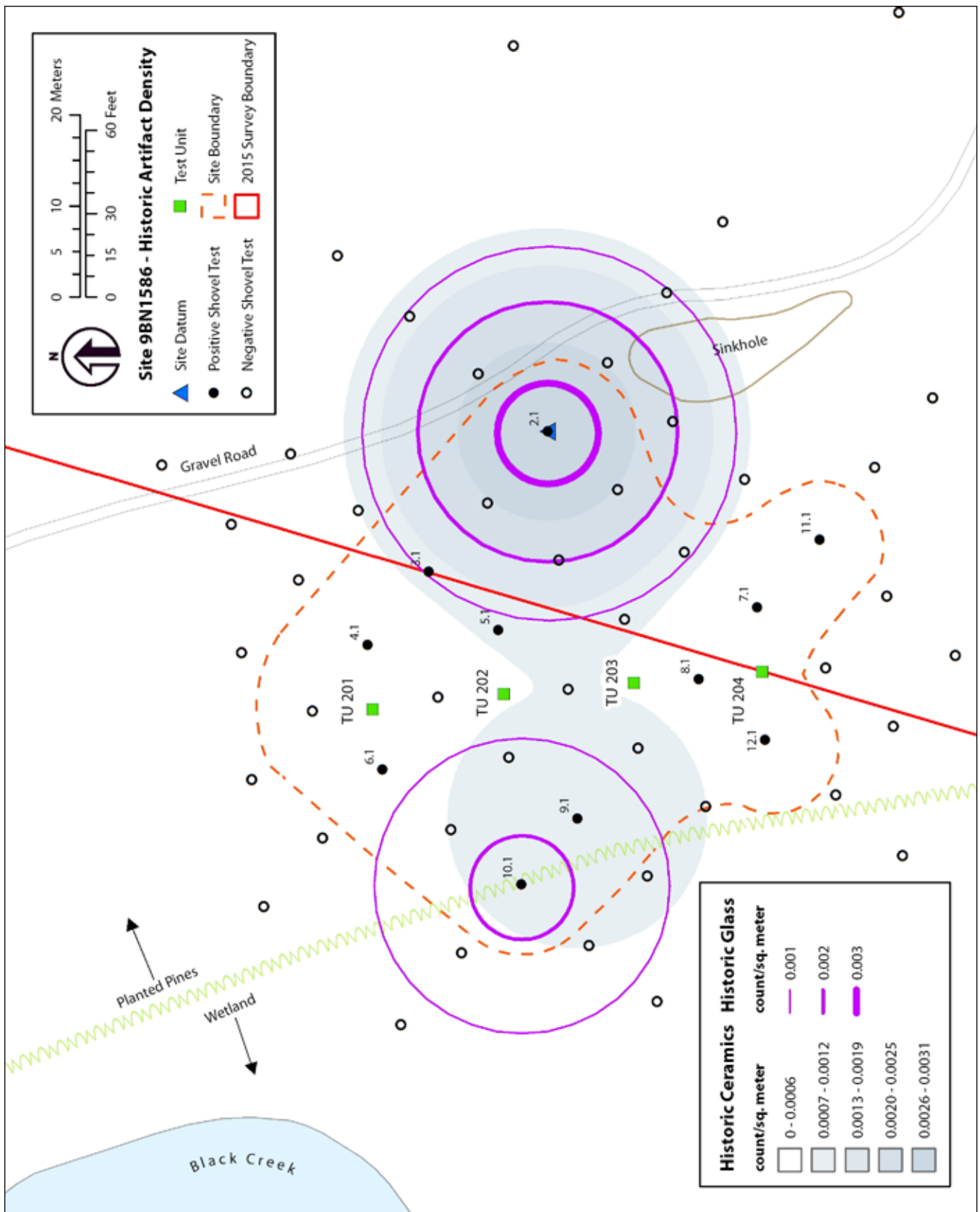


Figure 4.16 Distribution of historic artifacts across Site 9BN1586 as determined by shovel testing survey.

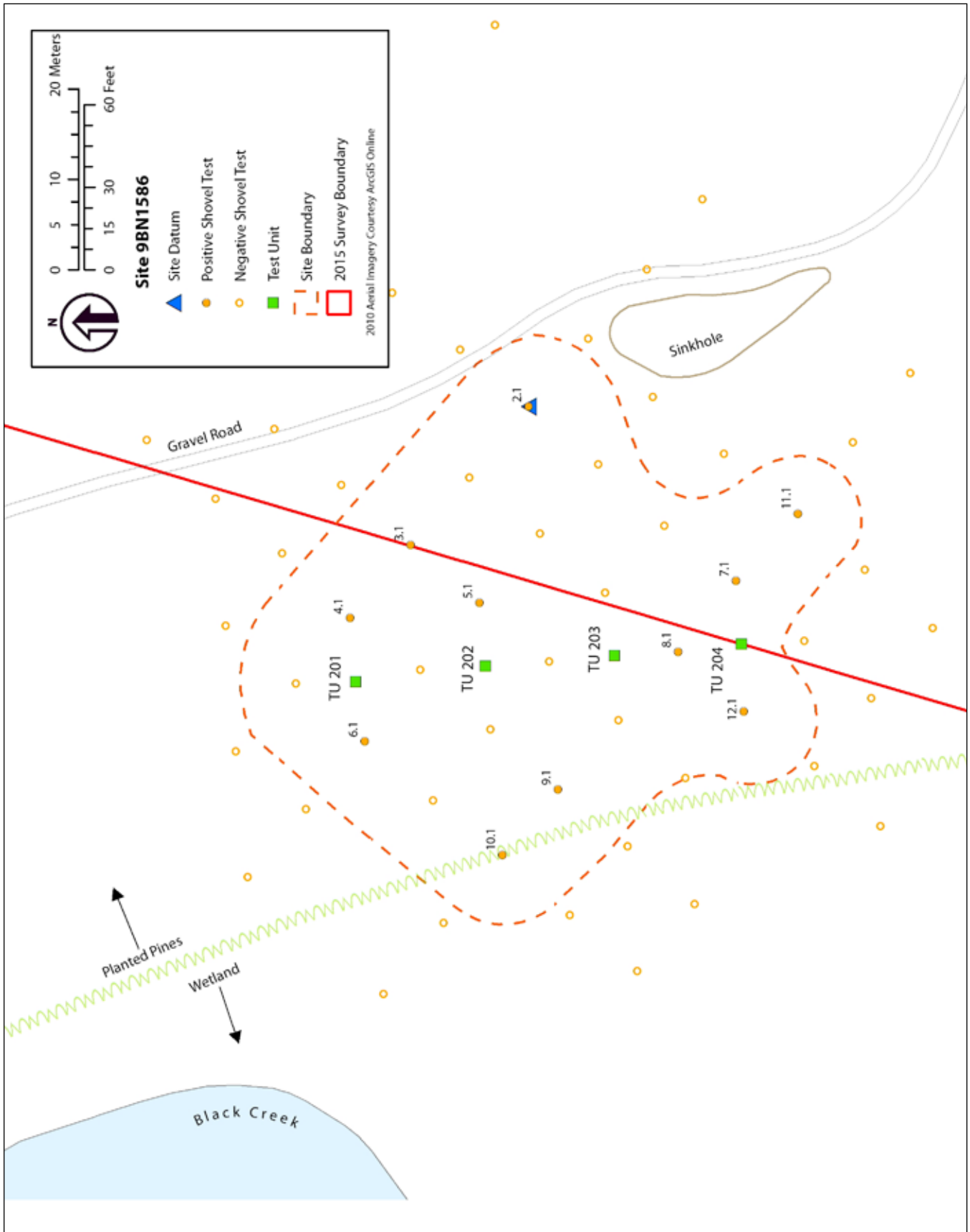
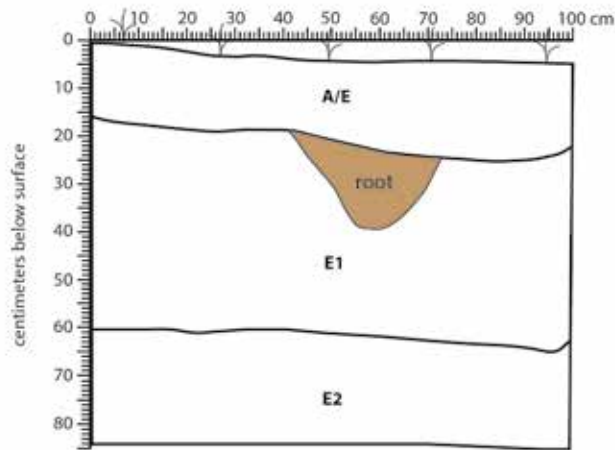


Figure 4.17 Location of excavated test units at Site 9BN1586.



- A/E.** Mottled 10YR 4/2 dark grayish brown loamy sand, and;
10YR 6/6 brownish yellow loamy sand
- E1.** 10YR 5/4 yellowish brown loamy sand
- E2.** 10YR 7/3 very pale brown sand

9BN1586
Test Unit 201
South Profile



Figure 4.18 9BN1586 TU201, south profile.

Table 4.2 Quantity of artifacts recovered by level from 9BN1586 TU201.

Material	Type	Description	TU 201						Total
			A/E horizon		E1 horizon				
			0-10 cm	10-20 cm	20-30 cm	30-40 cm	40-50 cm	50-60 cm	
Ceramic	Brick	Fragment (0.7 g)	1						1
Glass	Container	Aqua body shard	1	2					3
Total Historic Artifacts			2	2	0	0	0	0	4
Ceramic	Fine/Medium Sand Temper	Plain body sherd	1			2	2	1	6
	Unidentified Temper	Residual sherd		1	5			2	8
Lithics	Coastal Plain Chert	1/4-inch flake fragment	4	2	1	2		1	10
		1/4-inch non-cortical bifacial reduction flake	1					2	3
		Core (2 mendable halves)				1			1
	Translucent Quartz	1/4-inch flake fragment					1		1
Total Prehistoric Artifacts			6	3	6	5	3	6	29

Typically, excavation would have been discontinued in this case after two sterile levels (80-100 cmbs); TU202 was excavated to five sterile levels (80-130 cmbs), at which point the water table was reached.

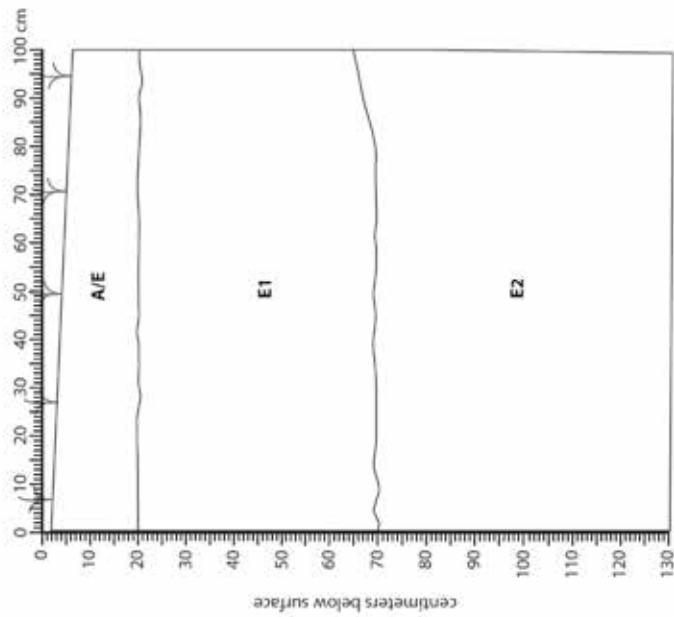
Soils in TU202 were similar to TU201. The upper A/E horizon (0-20 cmbs) was a mix of 2.5Y 6/3 light yellowish brown loamy sand (Ap horizon) and 10YR 7/6 yellow loamy sand (E1 horizon). The E1 horizon was mottled/oxidized 10YR 7/6 yellow and 10YR 6/4 light yellowish brown loamy sand, with root bioturbation. The E2 horizon, a very pale brown loamy fine sand, originated approximately 70 cmbs. Artifacts were recovered through the first level of the E2 horizon (80 cmbs), with mixed historic and prehistoric artifacts found only in the A/E horizon. No cultural features were identified in TU202. Figure 4.19 shows a view of the east profile.

A total of 25 artifacts (see Table 4.3) from TU202 included one amethyst glass fragment from the A/E horizon. Three diagnostic prehistoric sherds were also found in this horizon; these are grit-tempered Deptford Cord Marked sherds dating to the Early/Middle Woodland (1000 BC-AD 700) (Williams and Thompson 1999:36-40). We also recovered a plain sherd and two indeterminate stamped sherds from the first (0-10 cmbs) and last (70-80 cmbs) cultural levels, respectively. We found residual sherds (n=7) throughout the unit. As with TU201, the greatest number of lithic artifacts consisted of

fragmented chert flakes between 10-70 cmbs, along with a piece of chert shatter and core reduction and pressure flakes. One quartz bifacial reduction flake was also found between 70-80 cmbs.

TU203 is located southeast of TU202 at 15W/25S (see Figure 4.17). The closest shovel test (10W/30S; Prov. 8.1) contained a chert pressure flake and two chert flake fragments. Eight 10-cm levels were excavated in this test unit to a depth of 80 cm. Soils from this test unit consisted of a mottled A/E horizon of 10YR 4/2 brown (Ap horizon) and 10YR 6/3 pale brown (E1 horizon) loamy sand soil. This disturbance is much deeper in the northern half of the unit, extending approximately 40-50 cmbs, but averaging only 20 cm deep in the southern end. This disturbed horizon was underlain by the E1 horizon extending to 60-65 cm above a 10YR 7/2 light gray loamy sand E2 horizon. No cultural features were identified in TU203. Figure 4.20 shows a view of the west profile.

A total of 16 historic artifacts were recovered from the first 20 cm of the A/E horizon, including window glass (n=1), brick (n=4), and container or bottle glass (n=11) (see Table 4.4). Prehistoric artifacts (n=18) were all confined to the E1 horizon (20-60 cm). As with other units, these are largely (83.3%; n=15) chert flake fragments found in all E1 levels. The remaining artifacts are one plain sand tempered sherd and two bifacial reduction flakes.



- A/E.** Mottled 2.5Y 6/3 light yellowish brown loamy sand, and;
10YR 7/6 yellow loamy sand
- E1.** Mottled 10YR 7/6 yellow loamy sand, and;
10YR 6/4 light yellowish brown loamy sand
- E2.** 10YR 7/3 very pale brown loamy fine sand

9BN1586
Test Unit 202
East Profile



Figure 4.19 9BN1586 TU202, east profile.

Table 4.3 Quantity of artifacts recovered by level from 9BN1586 TU202.

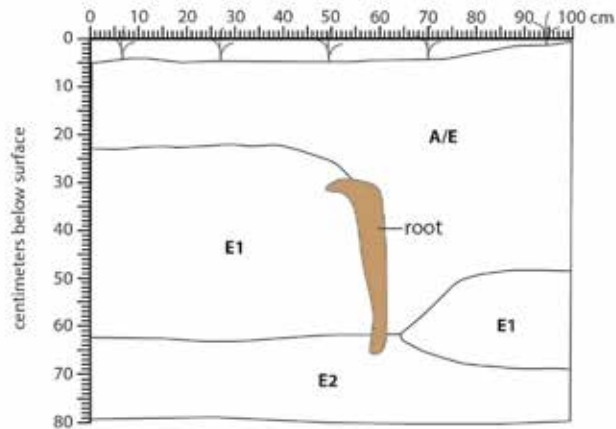
Material	Type	Description	TU 202								Total
			A/E horizon		E1 horizon					E2 horizon	
			0-10 cm	10-20 cm	20-30 cm	30-40 cm	40-50 cm	50-60 cm	60-70 cm	70-80 cm	
Glass	Container	Solarized-amethyst molded body shard		1							1
Total Historic Artifacts											1
Ceramic	Fine/Medium Sand Temper	Indeterminate stamped body sherd								2	2
		Plain body sherd	1								1
	Grit Temper	Deptford cord marked body sherd	1	2							3
	Unidentified Temper	Residual sherd	1	4	1					1	7
Lithics	Coastal Plain Chert	1/2-inch flake fragment		1					1		2
		1/4-inch flake fragment		1	1			1	2		5
		1/4-inch non-cortical core flake								1	1
		1/4-inch non-cortical pressure flake							1		1
		Shatter						1			1
	Translucent Quartz	1/4-inch non-cortical bifacial reduction flake								1	1
Total Prehistoric Artifacts			3	8	2	0	0	2	4	5	24

TU204 is located in the south portion of the site at 5W/35S (see Figure 4.17). As previously mentioned, the nearby shovel test at 20W/10S (Prov. 5.1) had contained only a single piece of chert shatter. A chert flake fragment was also found at 0W/30S (WP 659; Prov. 7.1), and three flakes were found to the southwest at 10W/40S (Prov. 12.1) along the swamp margin.

Seven levels were excavated in this test unit to a maximum depth of 70 cm. TU204 was overlain by a shallow (3-10 cmbs) Ap horizon; this 10YR 4/2 dark grayish brown loamy sand extends over the A/E horizon and may be a later, unmixed overburden deposit. The A/E horizon is comprised of mixed unconsolidated A horizon (10YR 5/2 light gray-

ish brown) and E horizon (10YR 6/3 pale brown) loamy sand to an average depth of 30 cmbs. Below this horizon, the E1 horizon is 10YR 6/3 pale brown loamy sand with oxidized 10YR 5/2 grayish brown mottling. The E2 horizon originates 52-58 cmbs and is a 10YR 6/4 light yellowish brown loamy sand. No cultural features were identified in TU204. Figure 4.21 shows a view of the south profile.

Twenty-five artifacts were found between 0-50 cmbs in this test unit, all of which are prehistoric (Table 4.5). The Ap horizon (0-10 cmbs) contained a residual pottery sherd, a chert flake fragment, and three bifacial reduction flakes. The A/E horizon (10-30 cmbs) contained a plain sand tempered sherd, a



A/E. 10YR 4/2 dark grayish brown sand
E1. 10YR 6/3 pale brown loamy sand
E2. 10YR 7/2 light gray loamy sand

9BN1586
Test Unit 203
West Profile



Figure 4.20 9BN1586 TU203, west profile.

Table 4.4 Quantity of artifacts recovered by level from 9BN1586 TU203.

Material	Type	Description	TU 203						Total
			A/E horizon		E1 horizon				
			0-10 cm	10-20 cm	20-30 cm	30-40 cm	40-50 cm	50-60 cm	
Ceramic	Brick	Fragment (9.9 g)	4						4
Glass	Container	Colorless body shard	4	2					6
		Light blue body shard		1					1
		Solarized-amethyst body shard	2						2
		Solarized-amethyst molded body shard		2					2
	Flat	Light blue window glass	1						1
Total Historic Artifacts			11	5	0	0	0	0	16
Ceramic	Fine/Medium Sand Temper	Plain rim sherd				1			1
Lithics	Coastal Plain Chert	1/2-inch cortical bifacial reduction flake			1				1
		1/4-inch cortical bifacial reduction flake						1	1
		1/4-inch flake fragment			2	5	3	5	15
Total Prehistoric Artifacts			0	0	3	6	3	6	18

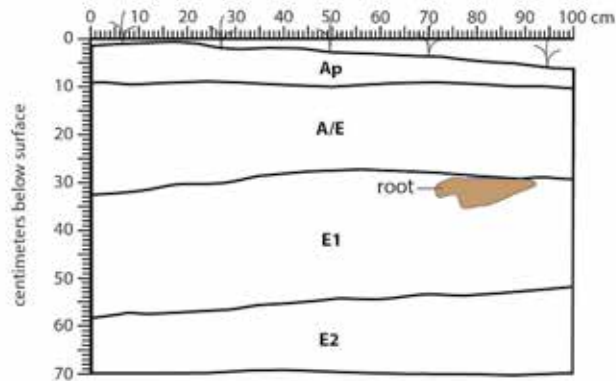
translucent quartz piece of shatter, and nine pieces of chert debitage (six flake fragments, one core reduction flake, one thinning flake and one piece of shatter). The E1 horizon contained eight artifacts including two Deptford sherds, cord marked and simple stamped. The six chert lithics include four flake fragments, a bifacial and a core reduction flake.

Artifact Discussion. We recovered a total of 144 artifacts from the excavation of four 1-by-1-m test units at 9BN1586. The assemblage includes 30 historic artifacts, 38 prehistoric pottery sherds, and 76 lithic artifacts. Historic materials were identified across a mixed A/E horizon (0-20 cmbs), comingled with prehistoric artifacts in TUs 201 and 202 (see Table 4.6). Prehistoric artifacts were found across all strata (0-80 cmbs), including both disturbed upper soils (Ap, A/E horizons) and undisturbed subsoils (E1, E2 horizons). Diagnostic Deptford prehistoric ceramics were found in both the A/E horizon (0-20 cmbs) and within the E1 horizon (40-50 cmbs) in TUs 202 and 204, respectively.

Historic Artifacts. Historic materials are in part an incidental component to 9BN1586 as they are considered to be likely dumped or discarded materials, mostly out of context along the roadside or mixed with prehistoric deposits. Figure 4.22 shows a sample of this material recovered from the shovel tests.

No historic ceramics were recovered from the test units. The only recovered historic ceramics (two whiteware and two stoneware pieces) were from the road surface (n=3) or from the A/E horizon of a single shovel test (n=1). As discussed, the two whiteware pieces include a blue transfer-printed piece and a small undecorated rim sherd. Whiteware, including transfer-printed wares, was first produced in the 1820s generally as tableware (Ramsay 1947:152-153); however, although diminished in popularity since the nineteenth century these ceramics are still produced today, making these artifacts not particularly diagnostic to time period. Similarly, the two white-glazed stoneware pieces are likely Bristol stoneware, a typically utilitarian pottery available since the 1830s (cf. Greer 1981).

Glass artifacts (n=21) were well distributed throughout the site with several pieces coming from



- Ap.** 10YR 4/2 dark grayish brown loamy sand
- A/E.** Mottled 10YR 5/2 grayish brown loamy sand, and;
10YR 6/3 pale brown loamy sand
- E1.** 10YR 6/3 pale brown loamy sand, mottled with;
10YR 5/2 grayish brown loamy sand
- E2.** 10YR 6/4 light yellowish brown loamy sand

9BN1586
Test Unit 204
South Profile



Figure 4.21 9BN1586 TU204, south profile.

Table 4.5 Quantity of artifacts recovered by level from 9BN1586 TU204.

Material	Type	Description	TU 204					Total
			Ap horizon	A/E horizon		E1 horizon		
			0-10 cm	10-20 cm	20-30 cm	30-40 cm	40-50 cm	
Ceramic	Fine/Medium Sand Temper	Plain body sherd			1			1
		Deptford simple stamped body sherd					1	1
	Grit Temper	Deptford cord marked body sherd					1	1
	Unknown Temper	Residual sherd	1					1
Lithics	Coastal Plain Chert	1/2-inch cortical core reduction flake				1		1
		1/2-inch flake fragment					1	1
		1/4-inch non-cortical bifacial reduction flake	3	1			1	5
		1/4-inch non-cortical core reduction flake			1			1
		1/4-inch non-cortical thinning flake		1				1
		1/4-inch flake fragment	1	1	5	1	2	10
		Shatter			1			1
	Translucent Quartz	Shatter		1				1
Total Prehistoric Artifacts			5	4	7	2	6	25

Table 4.6 Cultural horizons by stratum/level across excavated TUs at 9BN1586.

Depth	TU 201	TU 202	TU 203	TU 204	Key
0 cm		*		Ap	Historic
10 cm	A/E	A/E*	A/E		Mixed
20 cm				A/E	Prehistoric
30 cm	E1	E1	E1	E1*	Sterile
40 cm					Unexcavated
50 cm					
60 cm	E2		E2	E2	
70 cm					
80 cm					
90 cm					
100 cm		E2			* Deptford
110 cm					
120 cm					
130 cm					

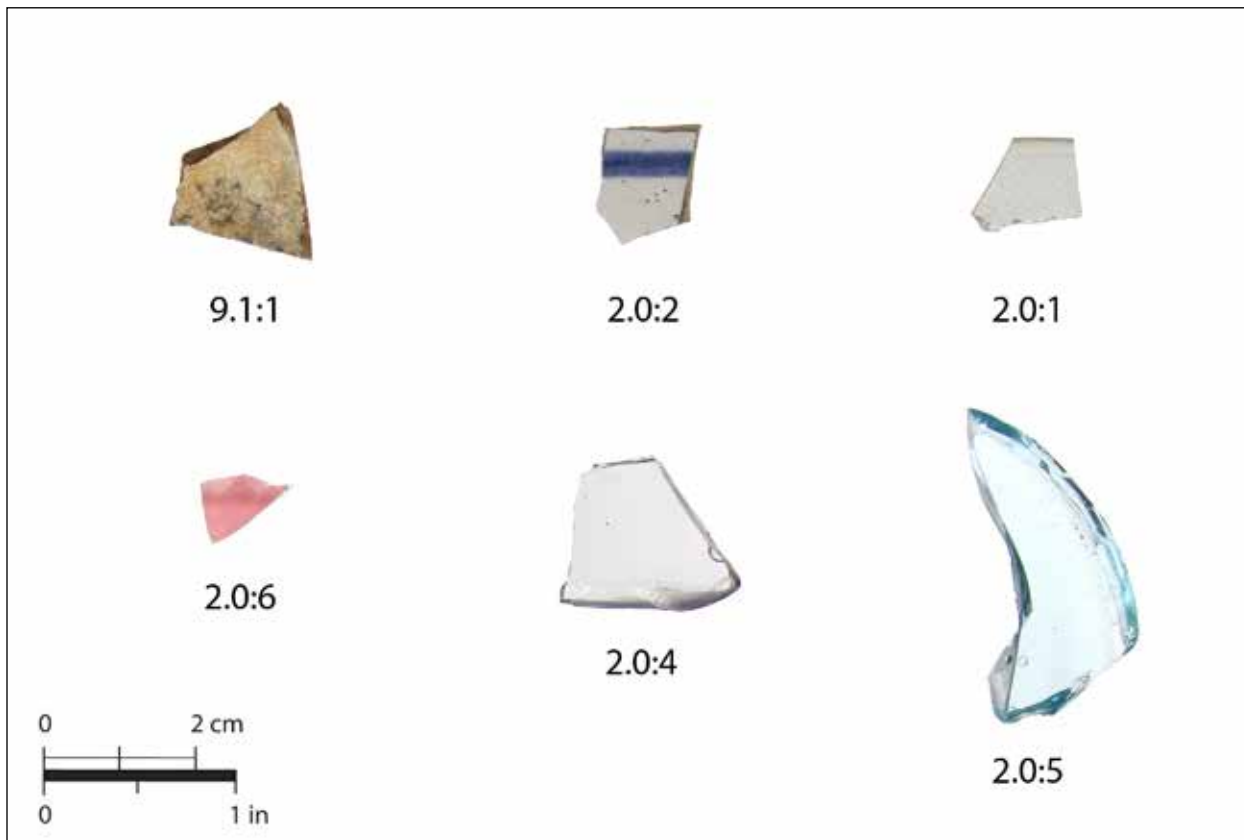


Figure 4.22 A sample of historic artifacts from 9BN1586: Blue Transfer Printed Whiteware Body (Prov. 9.1:1), Blue Annular White Glazed Stoneware Body (Prov. 2.0:2), Undecorated Whiteware Rim (Prov. 2.0:1), Colorless with Layered Pink Unidentified Form Tableglass (Prov. 2.0:6), Solarized Amethyst Container Glass Body (Prov. 2.0:4), Molded Aqua Container Glass Base (Prov. 2.0:5).

the road surface (n=3), a shovel test (40W/30S; Prov. 10.1) along the wetland edge (n=2), and three of four test units (n=16). All glass was found from 0-20 cm, at or below the ground surface. Seven pieces of solarized-amethyst glass were found well distributed between the road (n=1), shovel test 40W/30S (Prov. 10.1) (n=1), TU202 (n=1), and TU203 (n=4) and represent at least one molded container or bottle. These pieces are diagnostic in that the amethyst coloring agent allowing the bottle to solarize was only used between 1880 and 1915 (Munsey 1970:55). Other shards represent at least one colorless vessel (n=6), one molded aqua container (n=4), and one light blue container or bottle; glass vessels of these types have all been widely available since the late nineteenth century. Two additional pieces are layered pink tableglass and a piece of flat, likely window glass; however, these small, isolated fragments offer little analytical information.

Native American Ceramic Artifacts. Of the 38 prehistoric pottery sherds, one was found at the surface of a shovel test (20W/0S; Prov. 3.1), along with five from within the A/E horizon of a second shovel test (40W/10S; Prov. 6.1) during archaeological survey. The remaining 32 sherds were distributed throughout the topsoil and subsurface soil horizons of each of the TUs. Figure 4.23 shows a sample of the prehistoric ceramics recovered from 9BN1586.

Five of the 38 ceramic sherds are diagnostic to the Early to Middle Woodland Deptford phase (500 BC – AD 700). These are mostly cord-marked, grit-tempered sherds (n=4; 80%) from the A/E horizon of TU202 (0-20 cmbs; comingled with amethyst glass) and the E1 horizon of TU204 (40-50 cmbs); an additional simple stamped sherd with sand temper from the TU204 E1 horizon is also associated with this phase. Two indeterminate stamped sherds are in TU202 (70-80 cmbs) but could not be placed into this phase. A total of 31 untyped sherds include 12 unidentified or plain, and 19 residual fragments.

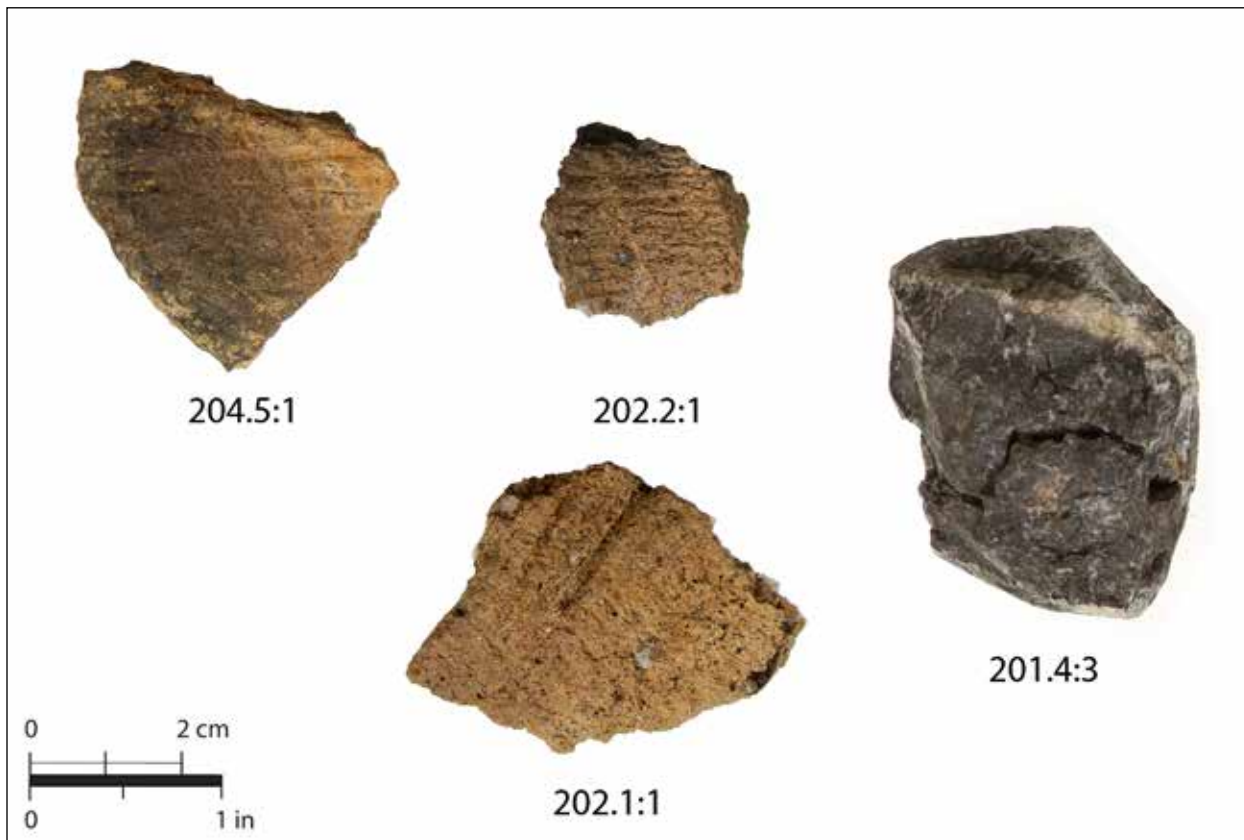


Figure 4.23 A sample of prehistoric artifacts from 9BN1586: Sand Tempered Simple Stamped Deptford Body Sherd (Prov. 204.5:1), Grit Tempered Cord Marked Deptford Body Sherd (Prov. 202.2:1), Grit Tempered Cord Marked Deptford Body Sherd (Prov. 202.1:1), Coastal Plain Chert Core (Prov. 201.4:3).

One of the plain sherds is a rim fragment (Prov. 202.4:2). All but one of the 12 plain sherds are sand tempered; Prov. 6.1:1 from shovel test 40W/10S is grit tempered.

All of these untyped sherds could be attributable to either the Deptford phase or the later Woodland or Mississippian periods. However, the bracketing of the Deptford finds from 0-20 cmbs (A/E horizon, TU202) and 40-50 cmbs (E1 horizon, TU204) suggest the material all comes from a single phase. The indeterminate stamped sherd from TU202 (70-80 cmbs) in the upper E2 horizon could conceivably be an earlier vessel from the lower horizon (i.e., Early Woodland Refuge [100-400 BC]). Alternatively, based on the sherd itself and disregarding its deeper context, the sherd could just as easily date to a later stamped Mississippian vessel (ca. AD 1150-1450). This E2 horizon was found to be sterile in all other shovel tests and test units excavated.

Lithic Artifacts. A total of 76 lithic artifacts were recovered from 9BN1586, including 11 from the archaeological survey and 65 from Phase II testing. All of the lithic artifacts are made from Coastal Plain chert, with the exception of three (3.9%) isolated translucent quartz artifacts from TU201, 202, and 204; all are pieces of debitage with the exception of Prov. 201.4.3, a single core from the E1 horizon (30-40 cm) in TU201 (See Figure 4.23).

The majority of the lithics are flake fragments (65.7%; n=50) for which a complete attribute analysis is not possible. However, 18 of the 73 (24.6%) chert lithics, including the core, show evidence of having been thermally altered, indicating they were likely knapped sometime after the Middle Archaic period. Given the co-occurrence of the material with pottery, this conclusion is otherwise self-evident.

The 26 typable pieces of debitage include four pieces of shatter (one of which is quartz [Prov. 204.2.4]), two core reduction flakes, and two cortical, early stage bifacial reduction flakes. These eight

pieces of debitage (30.8%), in addition to the core, represent the earlier stages of stone tool production. Notably, both the core and the core flake, from different proveniences, are thermally altered. The core and early stage material, particularly shatter, suggest that this raw material was available in the immediate area, as raw material would warrant initial reduction to more portable material.

Later stages of tool making (n=18; 69.2%) are represented by four non-cortical bifacial reduction flakes, as well as two pressure flakes and one thinning flake representing the refinement or sharpening of tools. Overall, this indicates an approximate 2:1 ratio in favor of late stage tool manufacture and maintenance. Of course, this ratio is larger with the elimination of shatter from the calculation (4:1), as in some cases this may be naturally occurring or a by-product of later activities, such as twentieth-century machine disturbances. The identification of pressure and trimming flakes also suggests final stage lithic tool production or on-site sharpening/maintenance. However, no stone tools were recovered from the site.

Interpretations and Discussion of 9BN1586. During our investigations at 9BN1586, ceramics diagnostic to the Early to Middle Woodland (Deptford) period were identified across a broad horizontal and vertical range encompassing most of the site. Additional pottery cannot be clearly attributed to this phase or others, and no diagnostic stone tools were identified. Historic artifacts can only be attributed generally to the nineteenth or twentieth century and, although demonstrative of the mixing of site deposits, are of a minor, incidental component at best. Prehistoric site deposits appear to average 62.5 cm deep across the units excavated.

A mixed and disturbed A/E horizon accounts for approximately one-third of the vertical extent of the site (an average 22.5 cm deep) and covers the entire horizontal extent of the site. Other than this obvious mixing of historic and prehistoric artifacts, the friable, non-diagnostic nature of most of this artifact assemblage offers few additional clues toward differentiation of different periods before or after the Deptford phase.

An examination of the overall site density from the four 1-by-1-m test units indicates that prehistoric

artifact density is relatively low (Table 4.7). On average, 9BN1586 yielded 24 artifacts per square meter (or 28 per cubic meter), with 96 artifacts recovered from the four 1-by-1-m units (3.6 cubic meter). This density is relatively uniform across the site. Survey data provides a slightly lower result: a total of 17 prehistoric artifacts from 11 positive 0.15-m diameter shovel tests (.07065 cubic meter each) produces an average density of about 21 artifacts per square meter. Total investigations average 23.9 artifacts per square meter (114 artifacts from 4.78 square meter excavated), which remains low for a site on the margins of a significant stream (cf. Franz et al. 2014).

The mix of small amounts of both early and late stage lithic debris without identifiable tools suggests that raw material collection and tool production or maintenance may have occurred at the site in a limited capacity. Further, the lack of cultural features and faunal/floral materials indicates poor preservation status for the site and suggests that little data on subsistence issues can be garnered from additional excavations.

As the creating of the disturbed topsoils (A/E and Ap horizons) through agriculture and silviculture have truncated the topsoil/subsoil interface at which cultural features such as pits, post-molds, or hearths are most likely to occur, it is not likely that many cultural features, if they existed, would be preserved in the archaeological record. Regardless, the low density of material suggests this site to be a short-term camp at best; few such features would be expected to have been created or preserved at such an ephemerally occupied locale, even if used repeatedly in this case.

Thus, the prehistoric component of Site 9BN1586 likely represents a short-term resource procurement camp, making use of the variety of wetland species of plants and animals surrounding Black Creek as well as the few lithic resources offered. The vertical extent of the deposits, all tentatively attributed to the Deptford phase, suggests that occupation may have occurred repeatedly throughout the Early/Middle Woodland period.

We previously suggested (see Section 4.1.5 above) that if intact archaeological sites were located in the project area, they would likely be found in uplands adjacent to established wetlands. These archaeological sites might consist of small isolated activity areas and zones of resource procurement,

Table 4.7 Summary of test unit data from 9BN1586.

Test Unit	Area (sq m)	Volume Excavated (cu m)	Prehistoric Artifact Count	Artifact Density	
				(per sq m)	(per cu m)
TU201	1.00	0.8	29	29.00	36.25
TU202	1.00	1.3	24	24.00	18.46
TU203	1.00	0.8	18	18.00	22.50
TU204	1.00	0.7	25	25.00	35.71
<i>Average</i>	<i>1.00</i>	<i>0.90</i>	<i>24.00</i>	<i>24.00</i>	<i>28.23</i>
Total	4.00	3.60	96.00	96.00	112.93

and that they would not likely contain extensive habitation remains. The finds at 9BN1586 likely represent a short-term camp for the procurement of wetland resources that would have provided a variety of natural resources.

Conversely, the historic component of 9BN1586 likely represents early twentieth-century off-site trash dumping away from dwellings and onto the surface of lower elevations such as hillsides or gullies. Historic map research has documented a farmstead further to the northwest along this same road, which may be the source of the refuse disposal.

The NRHP eligibility status for this site hinges upon evidence of stratigraphic and/or vertical separability of the material components, site activities, chronological variation, and/or the designation of cultural phases. Although the Deptford phase appears isolated to the E1 horizon with no obvious intrusions below the A/E horizon, an examination of the data recovered from Site 9BN1586 reveals that the overall quantity of artifacts is low and not centralized vertically or horizontally. The test units excavated provide a cross-section of the site and show a fairly uniform low concentration of small and friable prehistoric artifacts. The lack of faunal items such as bone and shell suggests that there is poor preservation at the site, indicating that a large dataset from which subsistence information could be gleaned is not present. At most, this site may have served as a short-term base camp reused throughout the early parts of the Woodland period.

The historic component of the site is confined largely to a surface scatter along the road and appears to be out of context. These materials are only broadly attributed to the relatively recent historic past. This material is of limited research potential to further any understanding of the historic period.

Additional investigations at 9BN1586 are unlikely to provide significant and substantial amounts of data that could be used to address pertinent research questions regarding the Woodland or other prehistoric or historic occupations in the region. We recommend 9BN1586 not eligible for the NRHP. Pending USACE and SHPO concurrence with these findings, no further management considerations of this site are warranted.

Site 9BN1610

Field Site: FS1

UTM (NAD 27): Zone 17 0456092 E/ 3558758 N

Type: Lithic scatter

Cultural Affiliation: Late Woodland/Mississippian

Setting: Terrace

Elevation: 21 m amsl

Nearest Water Source: unnamed tributary of Black Creek, 30 m southeast

Dimensions: 20-by-40 m

Area: 800 square m

NRHP Recommendation: Not Eligible

General Site Description. Site 9BN1610 is a 20-by-40-m prehistoric Late Woodland/Mississippian lithic scatter located in the 2018 survey parcel of the project tract. The site is situated on an upland terrace 30 m northwest of an unnamed tributary of Black Creek. This tributary had no running water at the time of our survey, though tributary soils (very poorly drained Ellabelle loamy sand) were saturated. Vegetation at the site consists of young planted pines and sparse understory. Ground visibility is approximately five percent. Figure 4.24 presents a plan map of 9BN1610, and Figure 4.25 shows a view of the site.



Figure 4.24 Site map detailing shovel testing of Site 9BN1610.



Figure 4.25 General view of Site 9BN1610, looking east; taller trees in background line the unnamed tributary.

Survey Results. The site was first identified by a surface find of one prehistoric chert flake near a negative shovel test location (shovel test 601; Prov. 1.0). Twelve additional shovel tests at 10-m intervals were excavated surrounding the surface find, only one of which contained additional prehistoric material. Excavated shovel tests typically exhibited soil profiles consisting of 10YR 7/3 very pale brown sand to 50 cmbs, underlain by 10YR 8/3 very pale brown sand. Overall, the soil profile is consistent with the expected excessively drained Lakeland sand profile, the soil pedon classified at this locale by the USDA; however, silviculture had disturbed the upper strata resulting in a mixed and unconsolidated A/E horizon (0-50 cmbs) overlying truncated, but intact, E horizon soils. In total, just two artifacts were identified at this site. One prehistoric Coastal Plain 1/4-inch chert flake was found on the ground surface and one prehistoric Late Woodland/Mississippian (AD 500 to 1500) triangular projectile point was recovered from a nearby shovel test at 0-20 cmbs in the mixed A/E horizon.

The triangular-shaped projectile point measures 25.7 mm long by 13.7 mm wide by 3.2 mm

thick. Charles and Moore (2018) have found that Late Woodland and Mississippian material cultures exhibit wide ranges of triangular point forms and sizes, even on the same site, and that it is generally not feasible to assign more particular cultural identities to these points without additional contextual evidence. Appendix A presents a photograph of this projectile point.

The recovery of archaeological materials at 9BN1610 is consistent with predictions posed in Section 4.1.5 for the likely location of small prehistoric sites on upland terraces near waterways. 9BN1610 is located on an upland terrace near a small tributary, which is an area predicted to have a moderate to high probability to contain archaeological sites. However, 9BN1610 does not appear to contain substantial cultural deposits related to the prehistoric occupation of the site. The very low number of recovered artifacts and the absence of features suggest that this site likely lacks substantial data to contribute to the prehistory of this region. The research potential for 9BN1610 is low. Therefore, our investigations did not identify potentially significant cultural deposits

at 9BN1610 as defined under Criterion D. We recommend 9BN1610 not eligible for the NRHP, and no further management considerations of this site are warranted.

Site 9BN1611

Field Site: FS2

UTM (NAD 27): Zone 17 0455927 E/ 3558566 N

Type: Artifact scatter

Cultural Affiliation: Unspecified prehistoric

Setting: Terrace

Elevation: 21 m amsl

Nearest Water Source: unnamed tributary of Black Creek, 30 m southeast

Dimensions: 50-by-70-m

Area: 3,500 square m

NRHP Recommendation: Not Eligible

General Site Description. Site 9BN1611 is a 50-by-70-m unspecified prehistoric artifact scatter located in the 2018 survey parcel of the project tract. The site is situated on an upland terrace 30 m northwest of an unnamed tributary of Black Creek. The tributary had no running water at the time of our survey, though its soils were saturated. Vegetation at the site consists of young planted pines and sparse understory. Ground visibility is approximately five percent. Figure 4.26 presents a plan map of 9BN1611, and Figure 4.27 shows a view of the site.

Survey Results. The site was first identified by the recovery of prehistoric lithic artifacts from four adjacent shovel tests. A total of 32 additional shovel tests were excavated at 10-m intervals surrounding the four original positive shovel tests; two of these 32 shovel tests contained additional prehistoric material. Excavated shovel tests typically exhibited soil profiles consisting of 10YR 5/2 grayish brown sand to 20 cmbs, underlain by 10YR 6/4 light yellowish-brown sand to 55 cmbs, and 10YR 8/4 very pale brown sand at 55+ cmbs. Overall, the soil profile is consistent with the expected excessively drained Lakeland sand profile, the soil pedon classified at this locale by the USDA; however, silviculture had disturbed the upper strata resulting in a mixed and unconsolidated A/E horizon (0-20 cmbs) overlying truncated, but intact, E horizon soils. In total, seven

prehistoric artifacts, all lithics, were identified within the six positive shovel tests. The artifacts were typically found within the A/E and E soil strata, between 0-50 cmbs. No features were identified.

All artifacts recovered were pieces of prehistoric lithic debitage from Coastal Plain chert. Two of the lithics were non-cortical bifacial reduction flakes and five were flake fragments. None of the artifacts were diagnostic to a particular prehistoric occupation. Table 4.8 lists the artifacts from shovel tests at 9BN1611, and a detailed listing of these artifacts collected by provenience is provided in Appendix B.

Phase II Testing. Based on our recovery of artifacts from between 0 and 50 cmbs, and recent silvicultural disturbances to approximately 20 cmbs, the preservation state of the cultural deposits was unclear. Few prehistoric sites in western Bryan County have been extensively investigated, and very little is known about prehistoric occupation in the eastern interior Coastal Plain of Georgia. We therefore conducted additional testing consisting of two 1-by-1-m units to examine stratigraphy and obtain a more comprehensive artifact sample to definitively evaluate the site in terms of NRHP eligibility.

Our test unit investigations consisted of one 1-by-1-m test unit located between two positive shovel tests in the southern half of the site, and one 1-by-1-m test unit located in the midst of three positive shovel tests in the northern half of the site. Figure 4.28 shows the location of the test units excavated during this investigation. Excavation data from each of these test units are briefly summarized below.

TU201 was located in the southern half of the site, 5 m east of the southwestern-most positive shovel test, and 4 m west of the adjacent positive shovel test (see Figure 4.28). These shovel tests contained two chert flake fragments. Nine 10-cm levels were excavated in the test unit to a maximum depth of 90 cmbs. Soils from TU201 consist of a mixed and unconsolidated topsoil A/E horizon, composed of mottled 10YR 5/2 grayish brown Ap horizon sand and 2.5Y 6/4 yellowish brown E1 horizon sand to an average depth of 20 cmbs. This was underlain by an intact E1 horizon of 10YR 6/3 pale brown sand extending to approximately 30 cmbs. The E1 horizon was underlain by an E2 horizon of 10YR 6/3 pale brown sand extending to 90 cmbs, whereupon

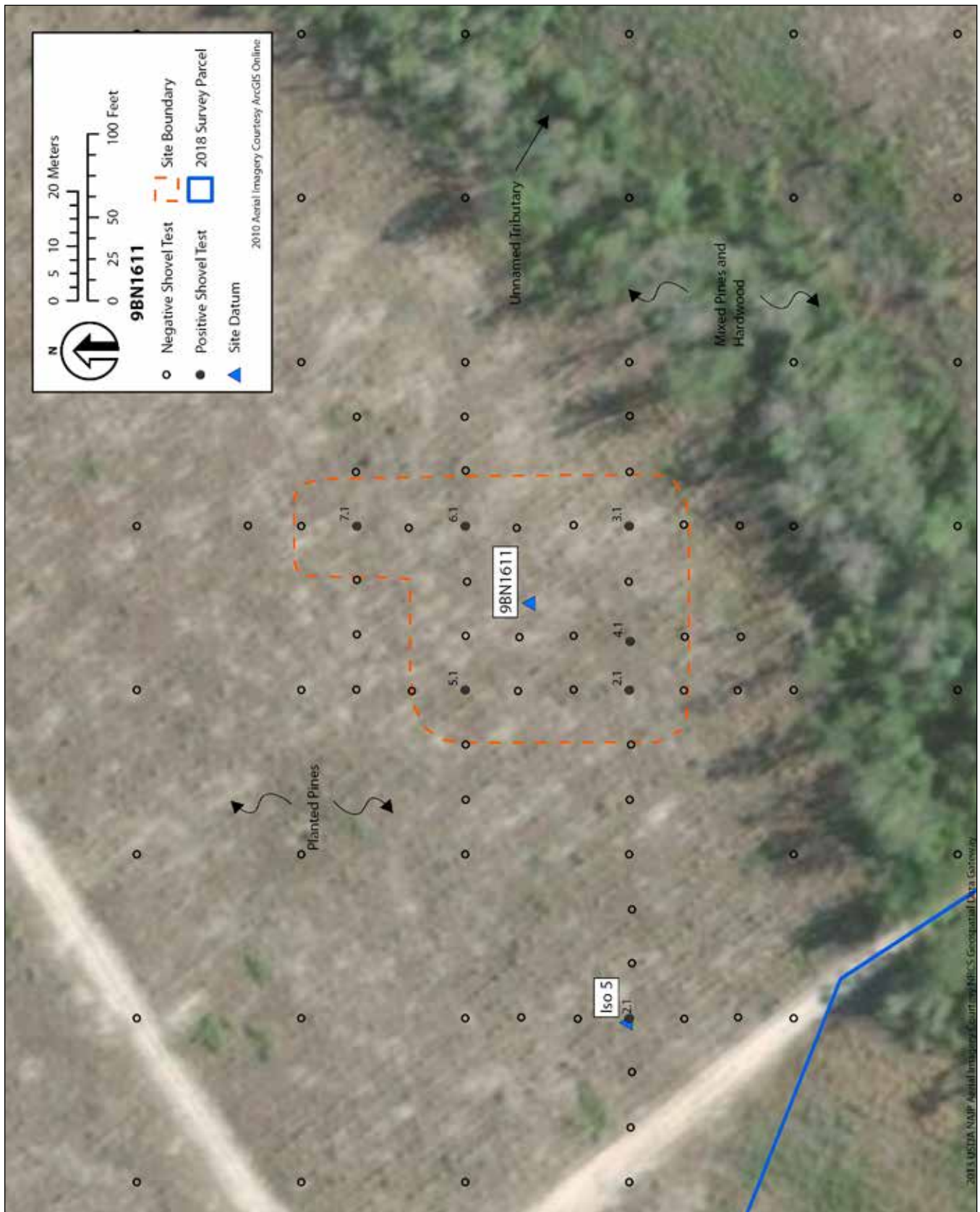


Figure 4.26 Site map detailing shovel testing of Site 9BN1611.



Figure 4.27 General view of Site 9BN1611, looking south; taller trees in background line the unnamed tributary.

Table 4.8 Quantity of artifacts from Site 9BN1611 shovel tests.

Material	Type	Description	Total
Prehistoric Lithics	Coastal Plain Chert	1/4 inch flake fragment	5
		1/4 inch non-cortical bifacial reduction flake	2
Total Artifacts			7

an E3 stratum of 10YR 7/3 very pale brown sand was encountered. The A/E, E1, and E2 horizons all contained prehistoric lithics. No other artifacts were recovered. The bottom 10 cm of the E2 horizon, as well as the E3 horizon, were sterile of cultural material. No cultural features were identified in TU201. Figure 4.29 shows a view of the east profile.

All 15 artifacts recovered from TU201 are pieces of non-diagnostic prehistoric lithic debitage. Two are flake fragments from the A/E horizon (0-20 cmbs) and the remainder were recovered from the E2 horizon (30-80 cmbs). No artifacts were recovered from the intervening E1 horizon at approximately 20-30 cmbs. Two-thirds of the lithic assemblage (n=10) are chert flake fragments distributed throughout both

the A/E and E2 horizons. The other five lithics are bifacial reduction flakes located within the top three levels of the E2 horizon (30-60 cmbs). Table 4.9 presents a list of the artifacts recovered from TU201.

TU202 is located 5 m north and west of a positive shovel test situated in the northeast corner of the site (see Figure 4.28). The surrounding positive shovel tests contained a bifacial reduction flake and two flake fragments. Eight 10-cm levels were excavated in the test unit to a maximum depth of 80 cmbs. Soils from this test unit consisted of a mixed and unconsolidated topsoil A/E horizon, composed of 10YR 5/2 grayish brown sand to an average depth of 20 cmbs. This was underlain by an intact E1 horizon of 10YR 7/4 very pale brown sand extending to

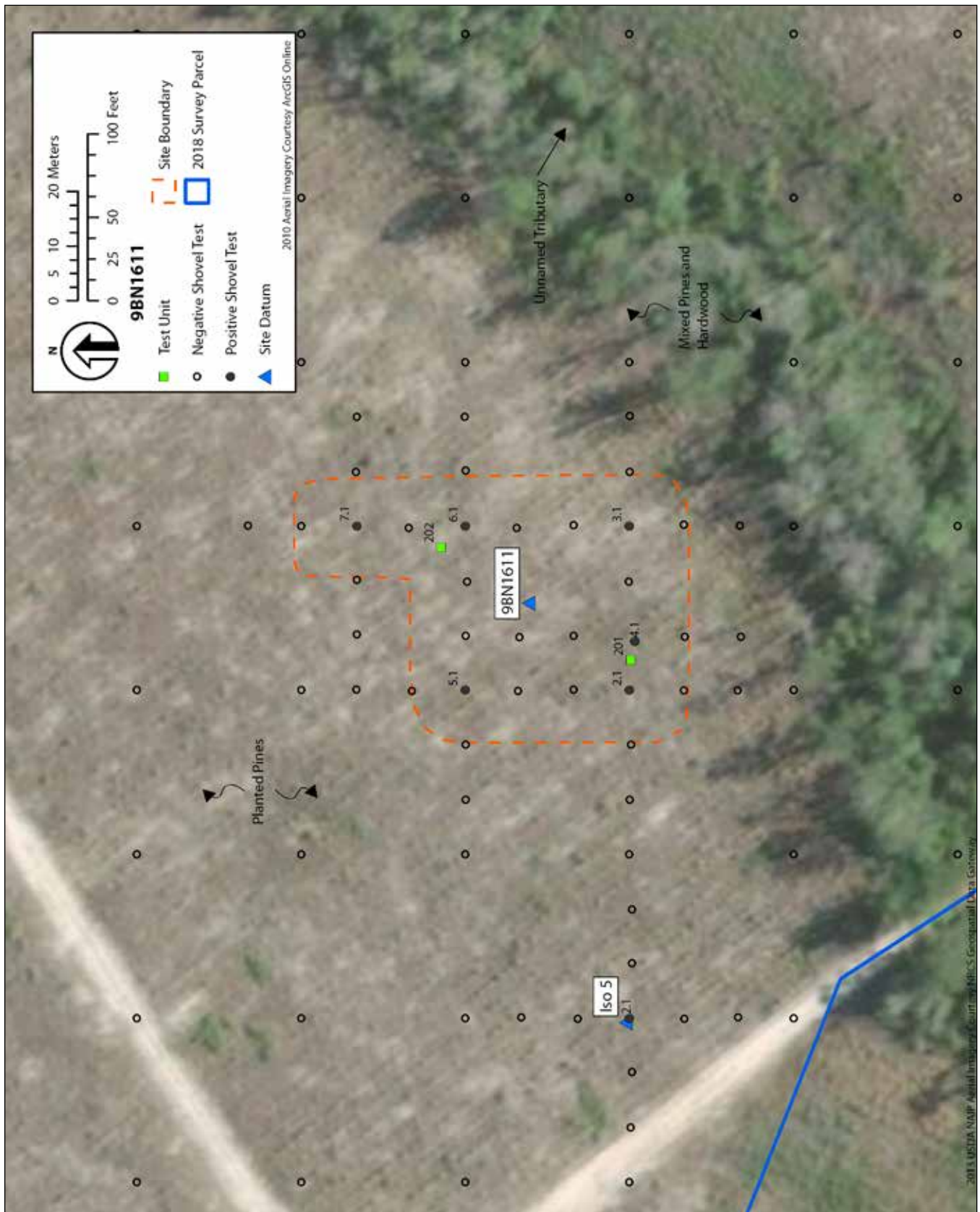
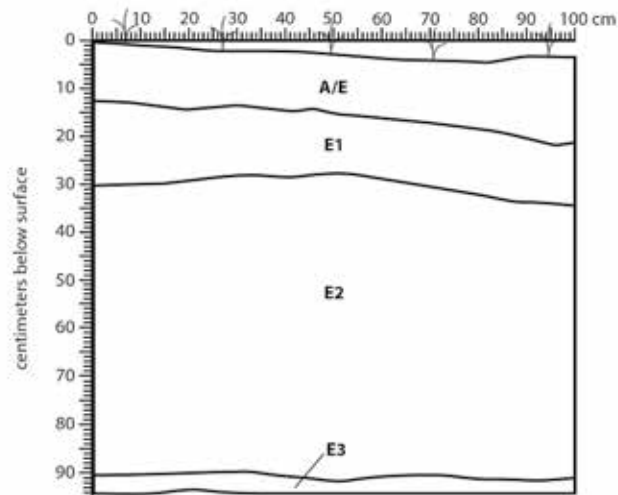


Figure 4.28 Location of excavated test units at Site 9BN1611.



- A/E.** 10YR 5/2 grayish brown sand, mottled with;
2.5Y 6/4 light yellowish brown sand
- E1.** 10YR 7/3 very pale brown sand
- E2.** 10YR 6/3 pale brown sand
- E3.** 10YR 7/3 very pale brown sand

**9BN1611
Test Unit 201
East Profile**



Figure 4.29 9BN1611 TU201, east profile.

Table 4.9 Quantity of artifacts recovered by level from TU201, 9BN1611.

Material	Type	Description	TU 201							Total	
			A/E horizon		E1 horizon	E2 horizon					
			0-10 cm	10-20 cm	20-30 cm	30-40 cm	40-50 cm	50-60 cm	60-70 cm		70-80 cm
Prehistoric Lithics	Coastal Plain Chert	1/2-inch flake fragment					1				1
		1/4-inch flake fragment	1	1			4	1	1	1	9
		1/2-inch non-cortical bifacial reduction flake					1				1
		1/4-inch non-cortical bifacial reduction flake				1	2	1			4
Total Prehistoric Artifacts			1	1	0	1	8	2	1	1	15

approximately 30 cmbs. The E1 horizon was underlain by an E2 stratum of 10YR 6/3 pale brown sand extending to 80 cmbs. The overlying A/E and E1 horizons were sterile of cultural material, but the E2 horizon contained prehistoric lithics at 30-40 cmbs and 60-70 cmbs. Other than one residual sherd found at 60-70 cmbs, the bottom four levels (40-80 cmbs) were sterile of cultural material. No cultural features were identified in TU202. Figure 4.30 shows a view of the east profile.

Only three artifacts were recovered from TU202, including one sand-tempered residual sherd (60-70 cmbs), one Coastal Plain chert flake fragment (30-40 cmbs), and one Coastal Plain chert non-cortical bifacial reduction flake (30-40 cmbs). All artifacts were found in the E2 horizon (30-70 cmbs). None of the artifacts are diagnostic to any particular temporal association. Table 4.10 presents a list of the artifacts recovered from TU202.

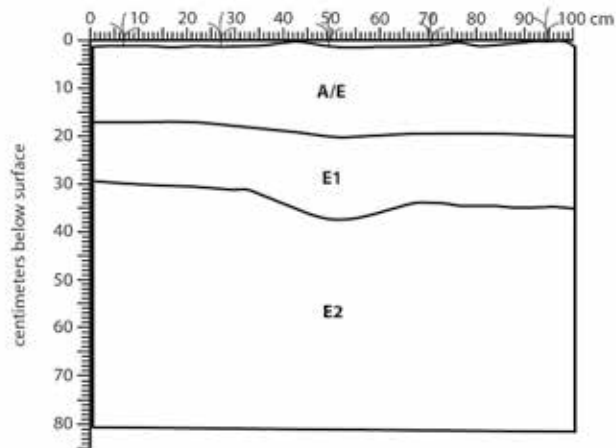
Artifact Discussion. A total of 18 artifacts, all prehistoric, were recovered from the excavation of two 1-by-1-m test units at 9BN1611. The assemblage includes one prehistoric pottery sherd and 17 lithic artifacts. The prehistoric artifacts were found within the disturbed upper soil (A/E horizon) of TU201 (n=2) and undisturbed subsoil (E2 horizon) of both units (n=16). Artifacts were not recovered from E1, the intervening horizon between A/E and E2.

The lithic artifacts are all Coastal Plain chert and all debitage, including six non-cortical bifacial

reduction flakes and 11 flake fragments. If combined with the seven lithics recovered during the archaeological survey, the total lithic assemblage consists of eight (33 percent) non-cortical bifacial reduction flakes and 16 (67 percent) flake fragments. The identification of only non-cortical bifacial reduction flakes suggests that late stages of tool-making or tool maintenance were emphasized at this site. Figure 4.31 presents a sample of artifacts from 9BN1611.

The single prehistoric pottery fragment is a sand-tempered residual sherd. This fragment does not represent any particular temporal association, though it characterizes a broad time spectrum that includes the prehistoric Woodland and Mississippian periods.

Interpretations and Discussion of 9BN1611. Our excavations at 9BN1611 recovered a low density of lithic debitage and only one ceramic sherd. Although most of the artifacts were recovered from undisturbed strata beneath the plowzone, none are diagnostic to any particular temporal association. The light density of lithic debitage scattered through eight 10-cm soil levels indicates that the site was likely occupied as a temporary camp or resource extraction station several times over many hundreds of years. Site deposits appear to average 49.4 cm deep across the units excavated. Due to the recovery of the sand-tempered sherd at significant depth (60-70 cmbs), we can infer that the site was likely occupied during the Woodland and/or Mississippian period.



- A/E. 10YR 5/2 grayish brown sand
- E1. 10YR 7/4 very pale brown sand
- E2. 10YR 6/3 pale brown sand

9BN1611
Test Unit 202
East Profile



Figure 4.30 9BN1611 TU202, east profile.

Table 4.10 Quantity of artifacts recovered by level from TU202, 9BN1611.

Material	Type	Description	TU 202							Total
			A/E horizon		E1 horizon	E2 horizon				
			0-10 cm	10-20 cm	20-30 cm	30-40 cm	40-50 cm	50-60 cm	60-70 cm	
Prehistoric Ceramics	Sand Tempered	Residual							1	1
Prehistoric Lithics	Coastal Plain Chert	1/4-inch flake fragment				1				1
		1/4-inch non-cortical bifacial reduction flake				1				1
Total Artifacts			0	0	0	2	0	0	1	3

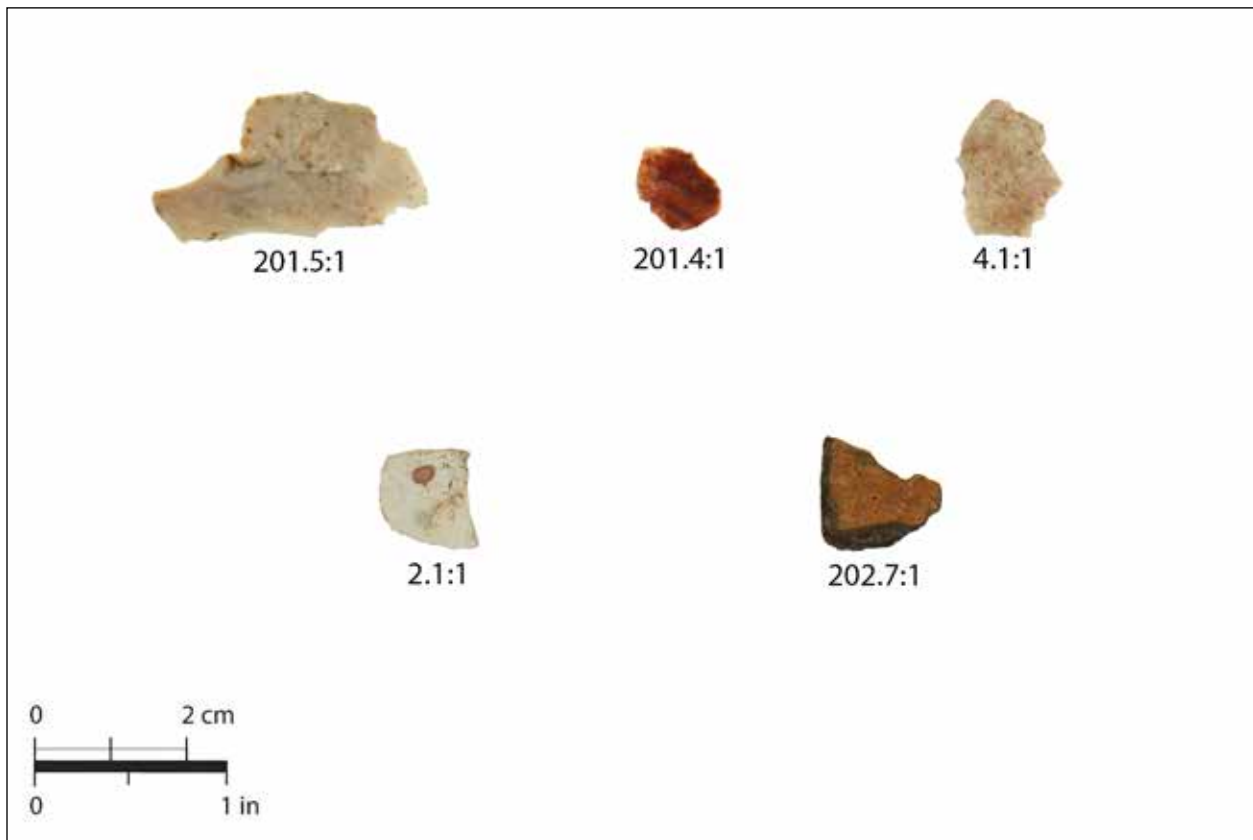


Figure 4.31 Representative artifacts recovered from 9BN1611; bifacial reduction flakes (201.5:1, 201.4:1), flake fragments (4.1:1, 2.1:1), residual sherd (202.7:1).

An examination of the overall site density from the two 1-by-1-m test units indicates that prehistoric artifact density is relatively low. On average, 9BN1611 yielded only nine artifacts per square meter (or 10.6 per cubic meter), with 18 artifacts recovered from the two 1-by-1-m units (1.7 cubic meter). The density is higher at the southern end of

the site at the location of TU201 (15 artifacts) than at the northern end at the location of TU202 (3 artifacts). These densities are quite low for a site on the margins of a stream (cf. Franz et al. 2014).

The recovery of only late stage lithic debris without identifiable tools suggests that tool maintenance was a more likely activity than was raw

material collection or tool production. Further, the lack of cultural features and faunal/floral materials indicates poor preservation for the site; this suggests that little data on subsistence issues can be garnered from additional excavations.

The low density of material suggests 9BN1611 to be a short-term camp or temporary procurement station, in which few features such as post holes or pits would be expected. The vertical extent of the deposits suggests that ephemeral occupation may have occurred repeatedly throughout the Woodland and/or Mississippian period. The site's location near a stream tributary indicates the procurement of wetland resources that would have provided a variety of natural resources.

The recovery of archaeological materials at 9BN1611 is consistent with predictions posed in Section 4.1.5 for the likely location of small prehistoric sites on upland terraces near waterways. This site is located on an upland terrace near a small tributary, which is an area predicted to have a moderate to high probability to contain archaeological sites.

The very low density of artifacts and lack of diagnostic materials or features indicates that additional investigations at 9BN1611 are unlikely to provide significant and substantial amounts of data that could be used to address pertinent research questions regarding prehistoric occupations in the region. We recommend 9BN1611 not eligible for the NRHP. Pending USACE and SHPO concurrence with these findings, no further management considerations of this site are warranted.

Site 9BN1612

Field Site: FS3

UTM (NAD 27): Zone 17 0456572 E/ 3558368 N

Type: Artifact scatter

Cultural Affiliation: Woodland/Mississippian

Setting: Terrace

Elevation: 24 m amsl

Nearest Water Source: unnamed tributary of Black Creek, 40 m south

Dimensions: 20-by-20 m

Area: 400 square m

NRHP Recommendation: Not Eligible

General Site Description. Site 9BN1612 is a 20-by-20-m prehistoric Woodland/Mississippian artifact scatter located in the 2018 survey parcel of the project tract. The site is situated on an upland terrace 40 m north of an unnamed tributary of Black Creek. The tributary had no running water at the time of our survey, though its soils were saturated. Vegetation at the site consists of young planted pines, a few immature hardwoods, and sparse understory. The site is located within a narrow strip of mixed planted pines and hardwoods between Tar City Road (a dirt road) and an unimproved logging road. Ground visibility is approximately five percent in the vegetated area, and 80 percent on the road shoulders. Figure 4.32 presents a plan map of 9BN1612, and Figure 4.33 shows a view of the site.

Survey Results. The site was first identified by the recovery of eight prehistoric artifacts from one shovel test (shovel test 259; Prov. 2.1). Eight additional shovel tests at 10-m intervals were excavated surrounding the positive shovel test, none of which contained additional prehistoric material. Excavated shovel tests typically exhibited soil profiles consisting of mottled 10YR 7/2 light gray and 10YR 6/2 light brownish gray sand to 20 cmbs, underlain by 10YR 7/4 very pale brown sand to 50 cmbs. Overall, the soil profile is consistent with the expected excessively drained Lakeland sand profile, the soil pedon classified at this locale by the USDA; however, silviculture had disturbed the upper strata resulting in a mixed and unconsolidated A/E horizon (0-20 cmbs) overlying truncated, but intact, E horizon soils. All eight identified artifacts were found within the A/E or E soil strata at between 0-35 cmbs. No features

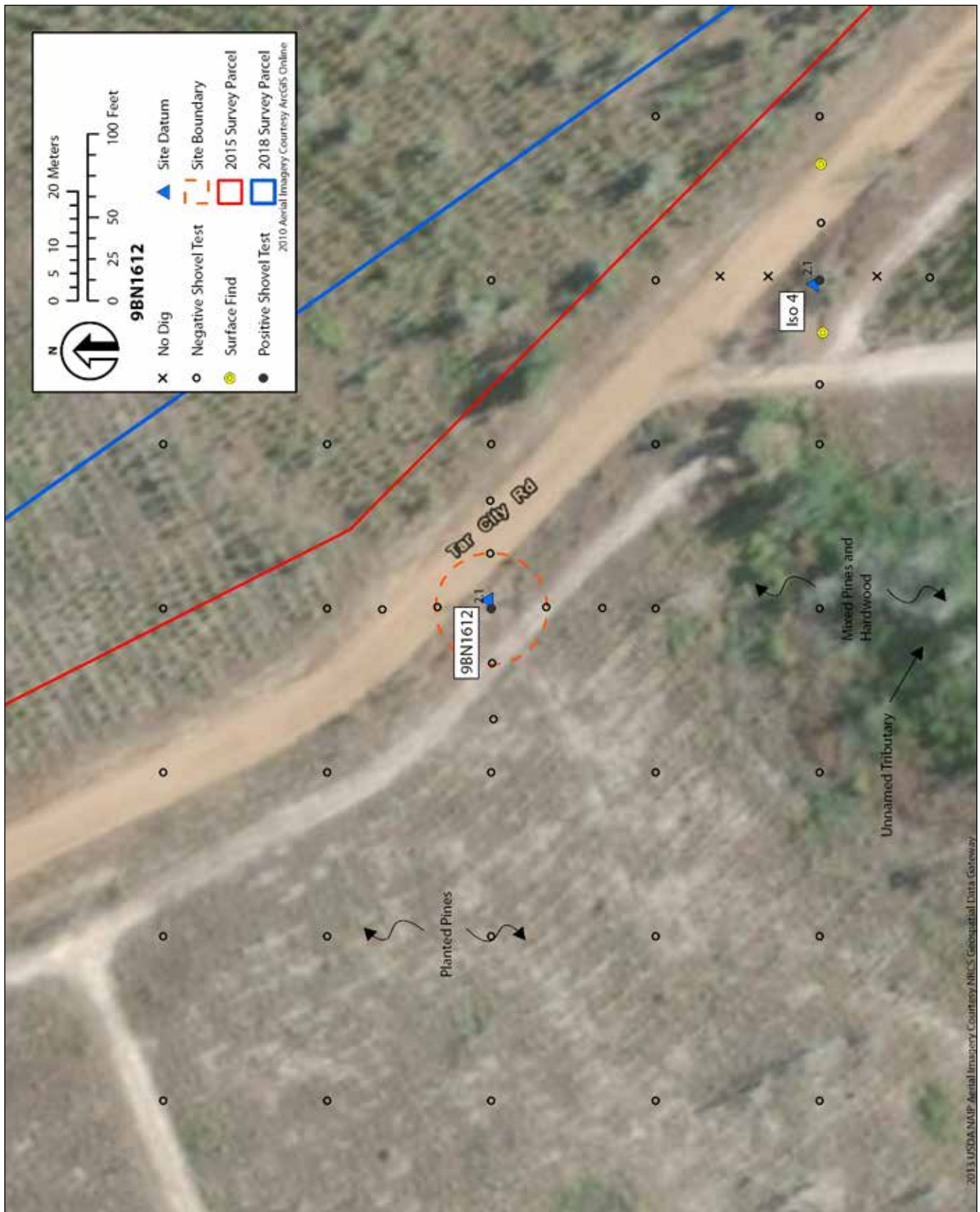


Figure 4.32 Site map detailing shovel testing and delineation of Site 9BN1612.



Figure 4.33 General view of Site 9BN1612, looking east.

were identified. Table 4.11 lists the artifacts from shovel tests at 9BN1612, and a detailed listing of these artifacts collected by provenience for this site is provided in Appendix A.

Of the eight artifacts recovered, three are prehistoric ceramic sherds and five are pieces of prehistoric lithic debitage. All three sherds are check-stamped, though specific cultural affiliation beyond Woodland/Mississippian could not be determined. Of the five lithics, three are of Coastal Plain chert, one is from an undetermined type of chert, and one is made of milky quartz. The debitage types include one non-cortical bifacial reduction flake, three flake fragments, and one piece of shatter. None of the lithics are diagnostic to any particular prehistoric occupation.

Phase II Testing. Based on our recovery of artifacts from between 0 and 35 cmbs, and recent silvicultural disturbances to approximately 20 cmbs, the preservation state of the cultural deposits was unclear. However, shovel testing yielded a relatively high density of prehistoric artifacts within a small area. We conducted further investigation by excavating one 1-by-

1-m unit to examine stratigraphy and obtain a more comprehensive artifact sample to definitively evaluate the site in terms of NRHP eligibility.

We excavated one 1-by-1-m test unit next to and west of the single positive shovel test containing eight prehistoric artifacts. Figure 4.34 shows the location of the test unit excavated during this investigation. Excavation data from this test unit is summarized below.

TU201 is located 4 m west of the single positive shovel test at the site (see Figure 4.34). This shovel test contained three prehistoric ceramic sherds and five pieces of lithic debitage at 0-35 cmbs. Five 10-cm levels were excavated in the test unit to a maximum depth of 50 cmbs. Soils from this test unit consisted of a top plowzone Ap horizon of 10YR 7/2 light gray sand to approximately 10 cmbs, underlain by a mixed and unconsolidated A/E horizon composed of mottled 10YR 7/2 light gray sand and 10YR 7/4 very pale brown sand to approximately 20 cmbs. Beneath the A/E horizon was an intact E1 horizon of 10YR 7/4 pale brown sand extending to approximately 50 cmbs. Only the E1 horizon contained cultural mate-

Table 4.11 Quantity of artifacts from Site 9BN1612 shovel tests.

Material	Type	Description	Total
Prehistoric Ceramic	Coarse Sand Temper	Check-stamped body sherd	3
Prehistoric Lithics	Coastal Plain Chert	3/4 inch flake fragment	1
		1/4 inch flake fragment	1
		1/4 inch non-cortical bifacial reduction flake	1
	Chert	1/4 inch flake fragment	1
	Milky Quartz	Shatter	1
Total Artifacts			8

rial. No cultural features were identified in TU201. Figure 4.35 shows a view of the east profile.

Only one artifact was recovered from TU201: a non-diagnostic prehistoric lithic Coastal Plain chert 1/4-inch flake fragment from Level 3 (20-30 cmbs) of the E1 horizon. No artifacts were recovered from the overlying Ap or A/E horizons, or from Levels 4 or 5 of the E1 horizon.

Artifact Discussion. Only one artifact, a Coastal Plain chert flake fragment, was recovered from the 1-by-1-m test unit at 9BN1612. This artifact was recovered from the E1 horizon. If combined with the eight artifacts recovered during the archaeological survey, the total assemblage consists of only six lithics and three ceramic sherds. As previously stated (see Table 4.11), all three sherds are check-stamped, though specific cultural affiliation beyond Woodland/Mississippian could not be determined. Of the six total lithics, four are of Coastal Plain chert, one is from an undetermined type of chert, and one is from milky quartz. The debitage types include one non-cortical bifacial reduction flake, four flake fragments, and one piece of shatter. None of the lithics are diagnostic to a particular prehistoric occupation. The identification of a non-cortical bifacial reduction flake and no cortical flakes suggests that late stages of tool-making or tool maintenance were emphasized at this site. Figure 4.36 presents a sample of artifacts from 9BN1612.

Interpretations and Discussion of 9BN1612. Our test unit excavation at 9BN1612 recovered only one Coastal Plain chert flake fragment and no ceramics. Although five additional pieces of lithic debitage and three prehistoric ceramic sherds were recovered from a nearby shovel test, none of these artifacts are

diagnostic to any specific temporal association. The very low count of artifacts indicates that the site was likely a temporary camp or resource extraction station. The recovery of sand-tempered check-stamped sherds suggest that the site was likely occupied at least in part during the Woodland and/or Mississippian period. The site's location near a stream tributary suggests a possible focus on a wetland that could have provided a variety of natural resources.

The recovery of only late stage lithic debris without identifiable tools suggests that tool maintenance was a more likely activity than was raw material collection or tool production. Further, the lack of cultural features and faunal/floral materials indicates poor preservation at the site, and suggests that little data on subsistence issues can be garnered from additional excavations.

The recovery of archaeological materials at 9BN1612 is consistent with predictions posed in Section 4.1.5 for the likely location of small prehistoric sites on upland terraces near waterways. This site is located on an upland terrace near a small tributary, which is an area predicted to have a moderate to high probability to contain archaeological sites.

The very low artifact counts and lack of diagnostic materials or features indicate that additional investigations at 9BN1612 are unlikely to provide significant and substantial amounts of data that could be used to address pertinent research questions regarding prehistoric occupations in the region. We recommend 9BN1612 not eligible for the NRHP. Pending USACE and SHPO concurrence with these findings, no further management considerations of this site are warranted.

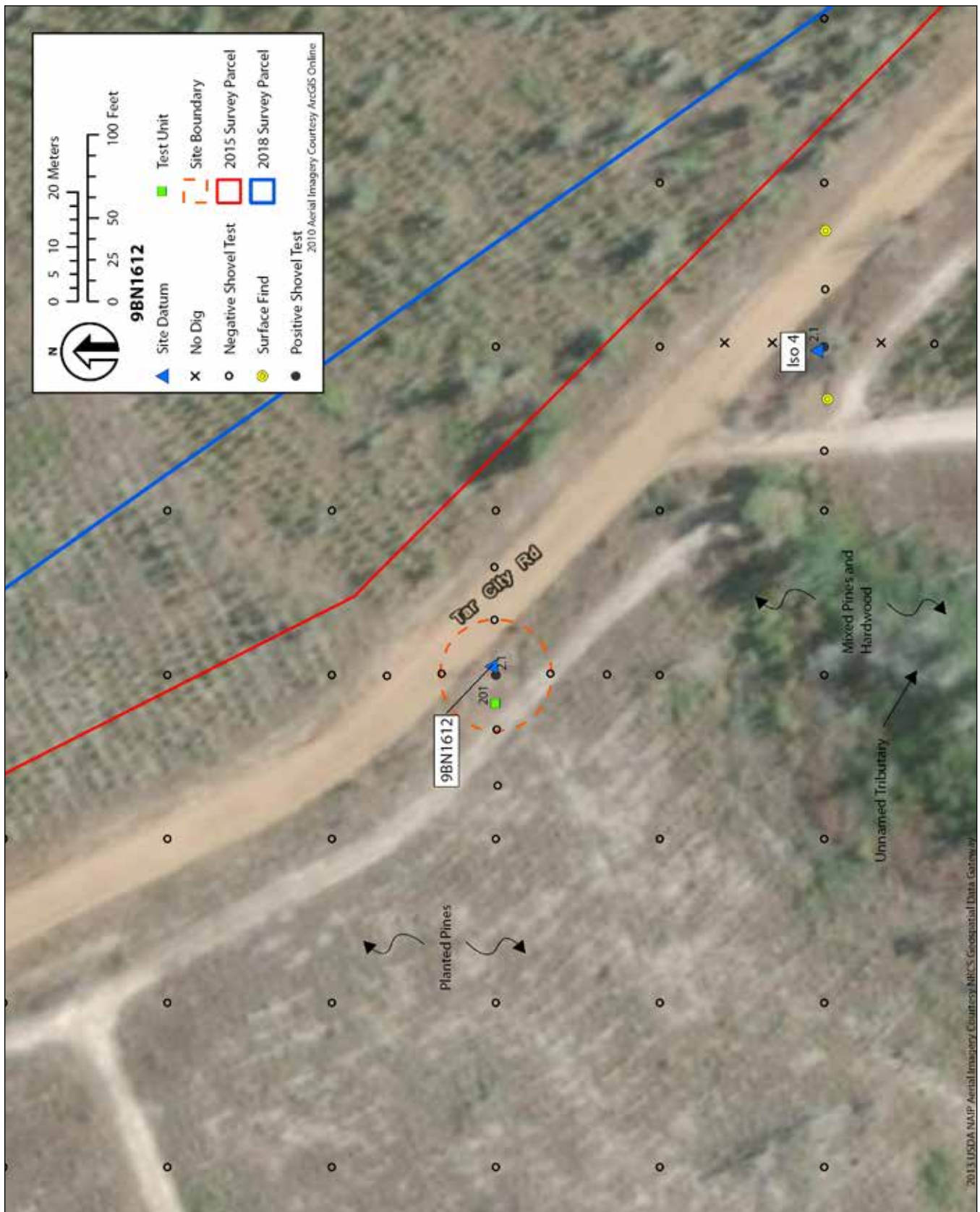
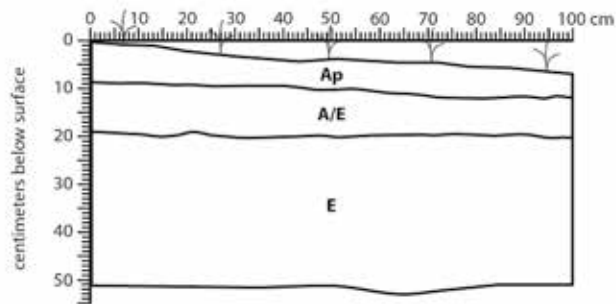


Figure 4.34 Location of excavated TU201 at Site 9BN1612.



- Ap.** 10YR 7/2 light gray sand
- A/E.** Mottled 10YR 7/2 light gray sand;
10YR 6/2 light brownish gray sand; and,
10YR 7/4 very pale brown sand
- E.** 10YR 7/4 very pale brown sand

**9BN1612
Test Unit 201
East Profile**



Figure 4.35 9BN1612 TU201, east profile.

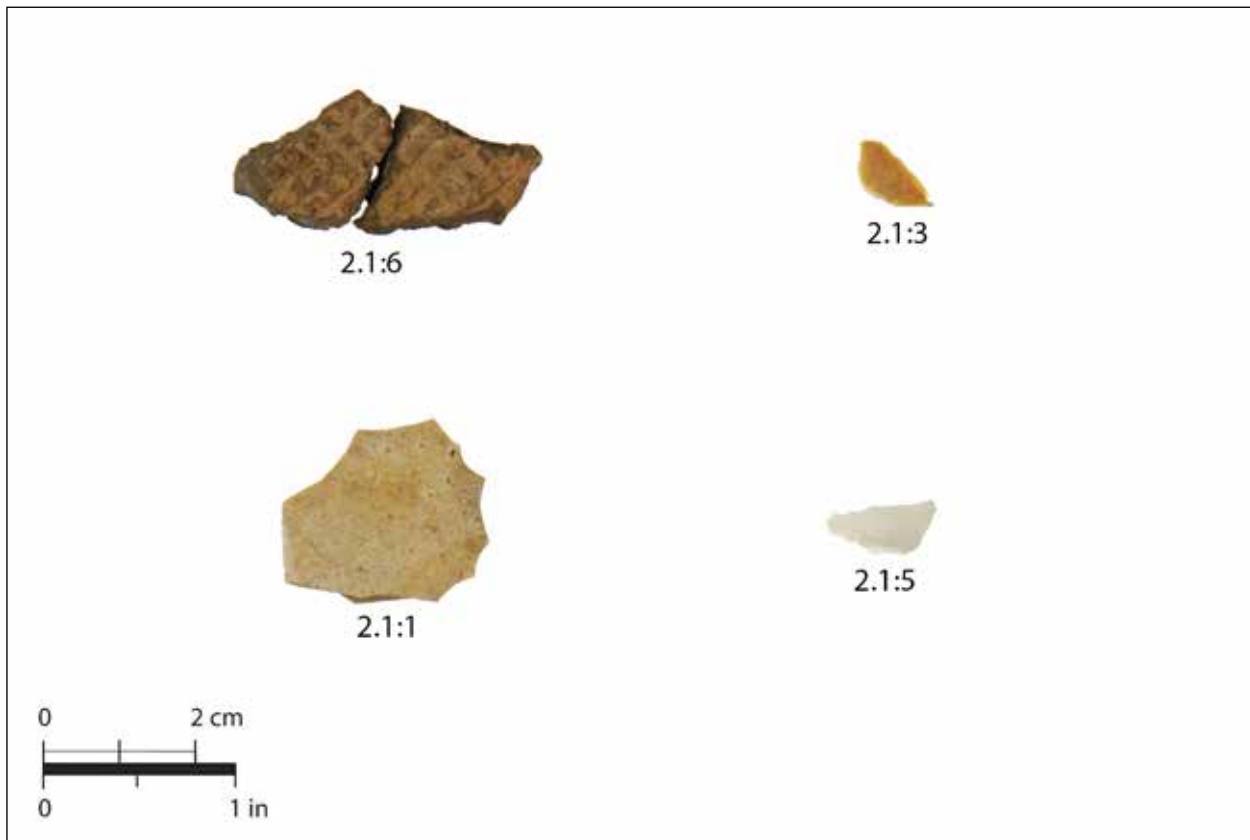


Figure 4.36 Representative artifacts recovered from 9BN1612; check stamped sherds (2.1:6), bifacial reduction flake (2.1:3), flake fragment (2.1:1), milky quartz shatter (2.1:5).

Site 9BN1613

Field Site: FS4

UTM (NAD 27): Zone 17 0456617 E/ 3558236 N

Type: Multicomponent artifact scatter

Cultural Affiliation: Late Woodland/Mississippian;
Nineteenth/Twentieth Century

Setting: Terrace

Elevation: 24 m amsl

Nearest Water Source: unnamed tributary of Black
Creek, 40 m west

Dimensions: 50-by-60 m

Area: 3,000 square m

NRHP Recommendation: Not Eligible

General Site Description. Site 9BN1613 is a 50-by-60-m multicomponent artifact scatter located in the 2018 survey parcel of the project tract. The site is situated on an upland terrace 40 m east of an unnamed tributary of Black Creek. The tributary had no running water at the time of our survey, though its soils were saturated. Vegetation at the site consists of young planted pines and sparse understory.

A dirt road running north to south bisects the site. Ground visibility is approximately five percent in the vegetated areas and 90 percent in the road and road shoulders. Figure 4.37 presents a plan map of 9BN1613, and Figure 4.38 shows a view of the site.

Fieldwork Results. The site was first identified by the recovery of prehistoric and historic artifacts from three shovel tests. Thirty-three additional shovel tests at 10-m intervals were excavated surrounding the positive shovel tests, three of which contained additional prehistoric and historic materials. Excavated shovel tests typically exhibited soil profiles consisting of 10YR 5/1 gray sand to 25 cmbs, underlain by 10YR 6/2 light brownish gray sand to 60 cmbs and 10YR 7/3 very pale brown sand below 60 cmbs. Overall, the soil profile is consistent with the expected excessively drained Lakeland sand profile, the soil pedon classified at this locale by the USDA; however, silviculture had disturbed the upper strata resulting in a mixed and unconsolidated A/E horizon (0-25 cmbs) and truncated, but intact,

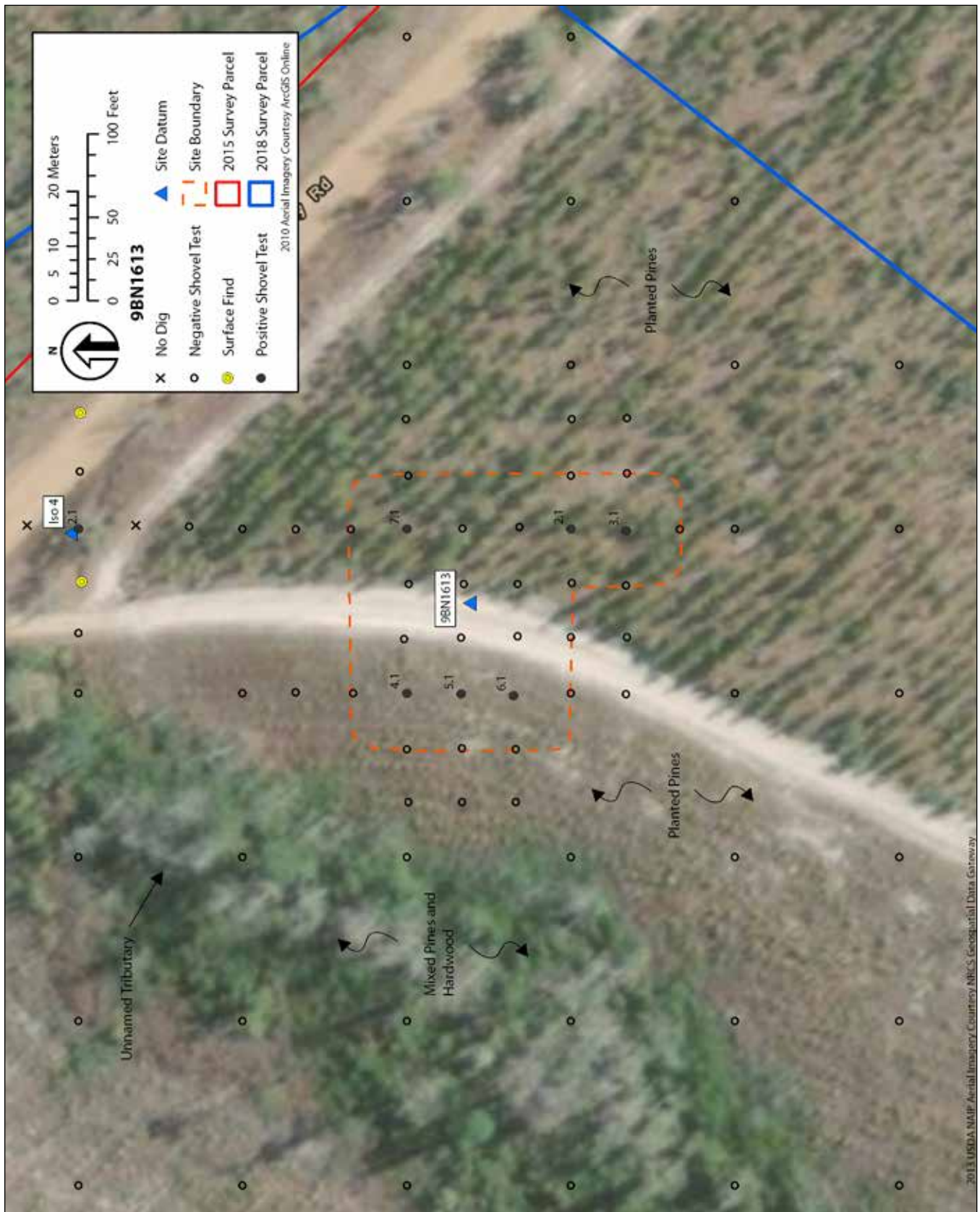


Figure 4.37 Site map detailing shovel testing and delineation of Site 9BN1613.



Figure 4.38 General view of Site 9BN1613, looking south along road.

E horizon soils. In total, 10 artifacts were identified, including two historic artifacts and eight prehistoric artifacts. Nine of the 10 artifacts were recovered from between 0-50 cmbs within the A/E and E soil strata of the six positive shovel tests, and one historic whiteware sherd was found on the surface near a shovel test. No features were identified. Table 4.12 lists the artifacts from shovel tests at 9BN1613, and a detailed listing of these artifacts collected by provenience for this site is provided in Appendix B.

The two historic artifacts recovered include one ironstone ceramic sherd and one hand-painted whiteware ceramic sherd. The ironstone fragment contained a partial makers mark, “The Potte...Co.,” “U.S.A.,” “East Liverpool Ohio”. The Potter’s Co-operative Company of East Liverpool, Ohio, was in operation from 1882 to 1925 (Gates and Ormerod 1982). The whiteware ceramic dates any time from the 1820s to the present day. Thus, the historic ceramics represent a broad time frame encompassing the nineteenth to twentieth century.

Of the eight prehistoric artifacts recovered, two are ceramic sherds and six are lithic artifacts. The ce-

ramics include one sand-tempered plain sherd and one sand-tempered residual sherd. Specific cultural affiliation beyond Woodland/Mississippian was not determined for these sherds. All six lithics are made of Coastal Plain chert. One of the lithic artifacts is a Late Woodland/Mississippian (AD 500 to 1500) triangular projectile point. The other five lithics are debitage, including three non-cortical bifacial reduction flakes, one non-cortical pressure flake, and one flake fragment.

The triangular-shaped projectile point measures 27.7 mm long by 3.0 mm thick; its width is not determined due to a broken base. Charles and Moore (2018) have found that Late Woodland and Mississippian material cultures exhibit wide ranges of triangular point forms and sizes, even on the same site, and that it is generally not feasible to assign more particular cultural identities to these points without additional contextual evidence. Appendix B presents a photograph of this projectile point.

Table 4.12 Quantity of artifacts from Site 9BN1613 shovel tests.

Material	Type	Description	Total
Historic Ceramic	Ironstone	White glazed, plain	1
	Whiteware	Hand-painted	1
Total Historic Artifacts			2
Prehistoric Ceramic	Fine/Medium Sand Temper	Plain body sherd	1
	Sand Temper	Residual sherd	1
Prehistoric Lithic	Coastal Plain Chert	Late Woodland/Mississippian triangular projectile point	1
		1/4 inch flake fragment	1
		1/4 inch non-cortical bifacial reduction flake	3
		1/4 inch non-cortical pressure flake	1
Total Prehistoric Artifacts			8

Phase II Testing. Based on our recovery of artifacts from between 0 and 50 cmbs, and recent silvicultural disturbances to approximately 25 cmbs, the preservation state of the cultural deposits was unclear. The historic component consisted of only one ceramic sherd found in a shovel test and one sherd found on the ground surface; we considered that these likely resulted from scattered off-site trash dumping and thus were not of research interest. The prehistoric component, consisting of ceramic sherds and lithics, was situated at least partly in undisturbed context beneath the plowzone. We therefore conducted additional testing by excavating two 1-by-1-m units to investigate the cultural context and search for diagnostic artifacts to definitively evaluate the site in terms of NRHP eligibility.

Shovel testing had revealed that prehistoric lithics were horizontally distributed fairly evenly across the site. We excavated one 1-by-1-m test unit between two positive shovel tests in the western half of the site, and one 1-by-1-m test unit between two positive shovel tests in the eastern half of the site. Figure 4.39 shows the location of the test units excavated during this investigation. Excavation data from each of these test units are summarized below.

TU201 was located in the eastern half of the site, 5 m north of the southeastern-most positive shovel test, between two positive shovel tests that contained two prehistoric ceramic sherds and one chert pressure flake (see Figure 4.39). Six 10-cm levels were excavated in this test unit to a maximum depth of 60 cmbs. Soils from this test unit consisted of a top Ap plowzone horizon of 10YR 6/1 gray sand, underlain by a second plowzone horizon containing bands of

10YR 6/3 pale brown sand alternating with bands of mottled 10YR 6/1 gray and 10YR 5/2 grayish brown sand. Beneath this second plowzone was a buried A horizon of 10YR 4/2 dark grayish brown sand to approximately 35 cmbs, underlain by an intact E horizon of 10YR 7/3 very pale brown sand. Figure 4.40 shows a view of the east profile.

Of the 30 artifacts recovered from TU201, 28 were historic artifacts, all from the Ap and A horizons (0-40 cmbs); these included two whiteware fragments, 16 pieces of container glass, two iron artifacts, one concrete fragment, and five pieces of plastic. Nine of the 16 glass fragments were from machine-made containers. Only two prehistoric artifacts were recovered from TU201, including one prehistoric lithic in the upper Ap horizon and one other prehistoric lithic in the lower intact E horizon. Table 4.13 presents a list of the artifacts recovered from TU201.

TU202 is located in the western half of the site 3 m north of the southwestern-most positive shovel test, between two positive shovel tests that contained two chert bifacial reduction flakes (see Figure 4.39). Seven 10-cm levels were excavated in this test unit to a maximum depth of 70 cmbs. Soils from this test unit consisted of a mixed and unconsolidated topsoil A/E horizon, composed of mottled 10YR 6/3 very pale brown sand and 10YR 7/2 light gray sand to an average depth of 20 cm. This was underlain by an intact E1 horizon of 10YR 6/3 very pale brown sand. The overlying A/E horizon was sterile of cultural material, but the E horizon contained prehistoric artifacts. No cultural features were identified in TU202. Figure 4.41 shows a view of the east profile.

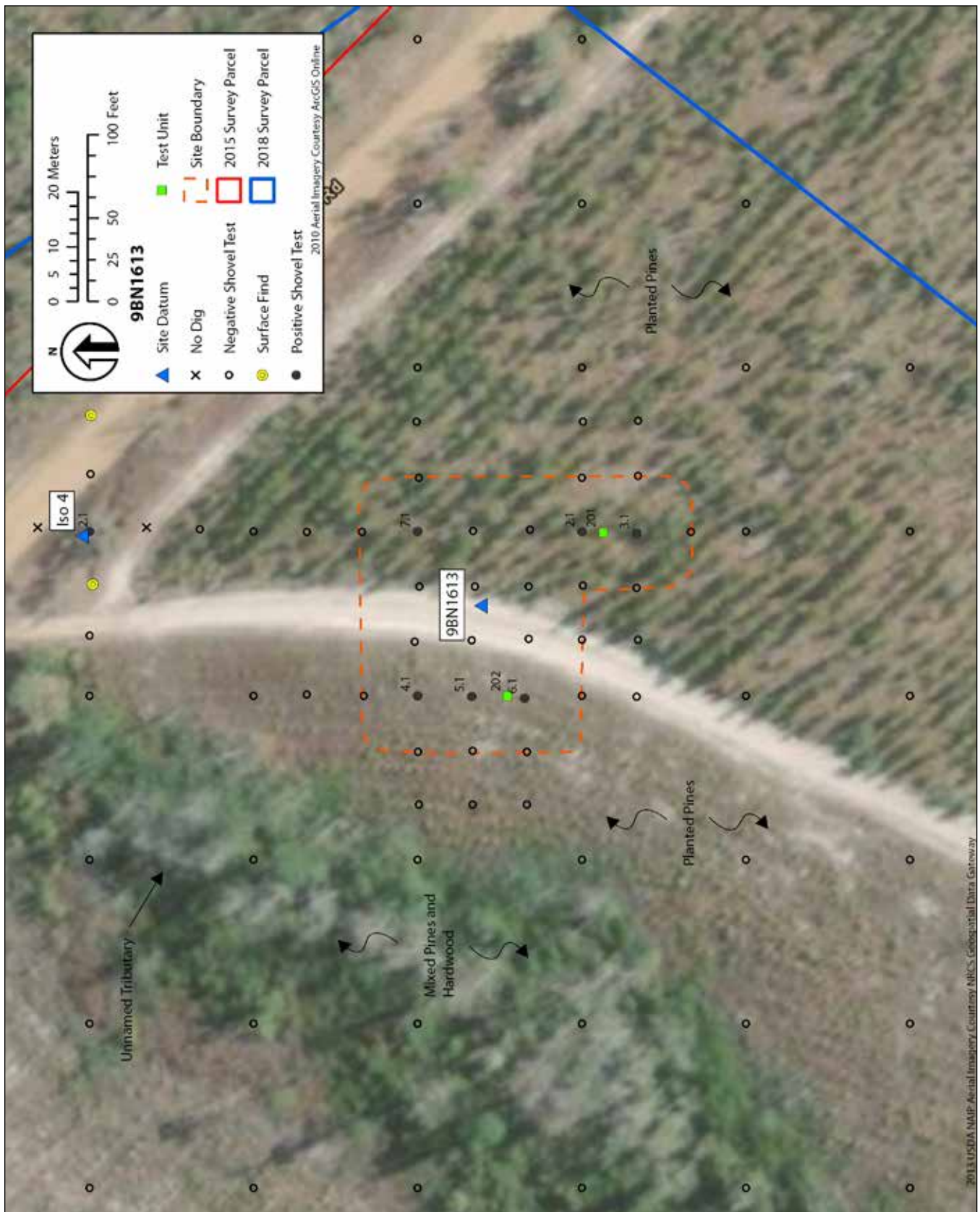
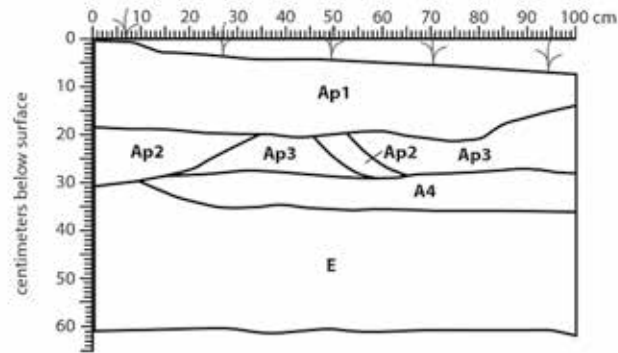


Figure 4.39 Location of excavated TUs at Site 9BN1613.



- Ap1.** 10YR 6/1 gray sand with small roots
- Ap2.** Mottled 10YR 6/1 gray sand, and;
10YR 5/2 grayish brown sand
- Ap3.** 10YR 6/3 pale brown sand
- A4.** 10YR 4/2 dark grayish brown sand
- E.** 10YR 7/3 very pale brown sand

**9BN1613
Test Unit 201
East Profile**



Figure 4.40 9BN1613 TU201, east profile.

Table 4.13 Quantity of artifacts recovered by level from TU201, 9BN1613.

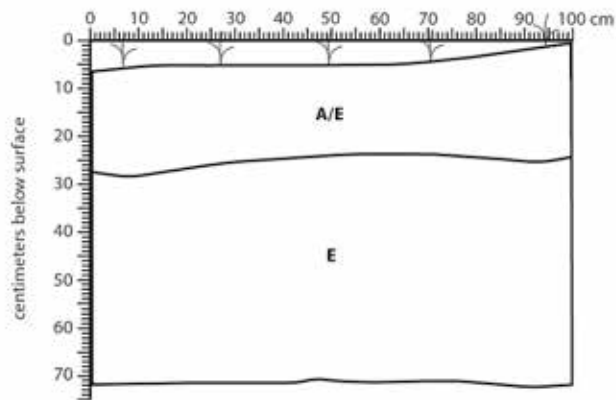
Material	Type	Description	TU 201					Total
			Ap1 horizon		Ap2/3 horizon	A4 horizon	E1 horizon	
			0-10 cm	10-20 cm	20-30 cm	30-40 cm	40-50 cm	
Ceramic	Whiteware	Plain body sherd			2	1		3
Glass	Container	Amber machine-made		1				1
		Colorless molded	1		1			2
		Colorless embossed			1			1
		Colorless machine-made	1	1	2	1		5
		Colorless	2	2				4
		Light green machine-made	1	2			3	
Metal	Iron	Washer		1				1
		Unidentified fragment		1		1		2
Other	Concrete	Fragment		1				1
	Plastic	Unidentified fragment	1		4			5
Total Historic Artifacts			6	9	10	3	0	28
Prehistoric Lithic	Coastal Plain Chert	1/4-inch flake fragment	1				1	2
Total Prehistoric Artifacts			1	0	0	0	1	2

Eight artifacts were recovered from TU202; all were from the intact E horizon, including one sand-tempered rectilinear complicated stamped sherd (30-40 cmbs), two residual sherds (40-50 cmbs), three Coastal Plain chert flake fragments (20-30 and 40-50 cmbs), and two Coastal Plain chert non-cortical bifacial reduction flakes (30-50 cmbs). None of the artifacts are diagnostic to any particular temporal association, though the three ceramic sherds could be assigned generally to the prehistoric Woodland/Mississippian period. Table 4.14 presents a list of the artifacts recovered from TU202.

Artifact Discussion. A total of 38 artifacts, including 28 historic artifacts and 10 prehistoric artifacts, were recovered from the excavation of two 1-by-1-m test units at 9BN1613 (see Tables 4.13 and 4.14). The historic artifacts were all found within the disturbed Ap and A horizon soils. Only one of the prehistoric artifacts was found within the disturbed Ap horizon soil, while the remainder were from the intact E horizon.

Historic Artifacts. Historic materials are in part an incidental component to 9BN1613, as they are likely dumped or discarded materials mostly out-of-context along the roadside or mixed with prehistoric deposits. Figure 4.42 shows a sample of this material.

The historic artifacts were all recovered from TU201 and include two whiteware ceramic fragments, 16 pieces of container glass, two iron artifacts, one concrete fragment, and five pieces of plastic. Whiteware was first produced in the 1820s generally as tableware (Ramsay 1947:152-153); however, although diminished in popularity since the nineteenth century these ceramics are still produced today, making these artifacts not particularly diagnostic to time period. Nine of the 16 glass fragments (including amber, colorless, and light green) were from machine-made containers, produced beginning around 1904. One of the containers has a label assigned to the Royal Crown Cola company. Royal Crown Cola was produced beginning approximately 1933. The iron artifacts included one washer and one unidentified fragment. The plastic fragments were likely manufactured after the 1940s when plastic production became common.



A/E. Mottled 10YR 6/3 pale brown sand, and;
10YR 7/2 light gray sand
E. 10YR 6/3 pale brown sand

9BN1613
Test Unit 202
East Profile



Figure 4.41 9BN1613 TU202, east profile.

Table 4.14 Quantity of artifacts recovered by level from TU202, 9BN1613.

Material	Type	Description	TU 202					Total
			A/E horizon		E horizon			
			0-10 cm	10-20 cm	20-30 cm	30-40 cm	40-50 cm	
Prehistoric Ceramic	Coarse Sand Temper	Rectilinear complicated stamped				1		1
	Sand Temper	Residual sherd					2	2
Prehistoric Lithic	Coastal Plain Chert	1/4-inch flake fragment			2		1	3
		1/4-inch non-cortical bifacial reduction flake				1	1	2
Total Artifacts			0	0	2	2	4	8

Two other historic artifacts were collected during the archaeological survey; these were one piece of whiteware and one piece of ironstone (see Table 4.12). As discussed previously, the ironstone had a makers mark from the Potter's Co-operative Company, indicating it had been manufactured between 1884 and 1925.

Prehistoric Artifacts. Of the 10 prehistoric artifacts from the test units, one was recovered from the Ap horizon of TU201, and the rest were found in the intact E horizon in both units. The 10 artifacts include three ceramics and seven lithics. Adding the eight prehistoric artifacts identified from the archaeological survey, we have identified five prehistoric ceramics and 13 lithic artifacts at 9BN1613. See Figure 4.42 for a sample of prehistoric artifacts.

The five ceramic sherds recovered from 9BN1613 include one sand tempered rectilinear complicated stamped sherd, one plain sherd, and three sand-tempered residual sherds. None of these ceramics are diagnostic to a specific temporal association. Only a general Woodland/Mississippian occupation can be indicated.

The 13 lithic artifacts recovered from 9BN1613 are all made from Coastal Plain chert. All are pieces of debitage except a Late Woodland/Mississippian triangular projectile point found by itself in a shovel test at 0-30 cmbs. (See Figure 4.42 and photo in Appendix B).

Half of the lithic debitage are flake fragments (46.2%; n=6) for which a complete attribute analysis is not possible. The six typable pieces of debitage

include five non-cortical bifacial reduction flakes and one non-cortical pressure flake, representing the refinement or sharpening of tools. Overall, this small assemblage suggests a heavy focus on tool maintenance and/or late stage manufacture.

Interpretations and Discussion of 9BN1613. Our investigations at 9BN1613 encountered a topsoil that sporadically contained a minor, incidental component of late nineteenth/twentieth century materials overlying an intact soil horizon generally at 20 to 60 cmbs that contained prehistoric ceramics and lithics. However, the ceramics could be attributed only to a very general Woodland/Mississippian period, and the triangular projectile point, found by itself in a shovel test, is associated with a broadly defined Late Woodland/Mississippian occupation. In addition, all other lithics are non-diagnostic debitage. Site deposits extended to 50 cmbs in TU201 and to 60 cmbs in TU202. An examination of the overall site density from test units indicates that prehistoric artifact density is relatively low. On average, 9BN1613 yielded five artifacts per square meter (or 9.1 per cubic meter), with just 10 artifacts recovered from the two 1-by-1-m units (1.1 cubic meter). This density is quite low for a site on the margins of a stream (cf. Franz et al. 2014).

The presence of late stage lithic debris and exclusion of early stage lithic debris suggests that late-stage tool production or maintenance rather than raw material collection or early stage tool production occurred at the site. Further, the lack of cultural features and faunal/floral materials indicates poor



Figure 4.42 Representative artifacts from 9BN1613; rectilinear complicated stamped rim (202.4:1), plain sherd (2.1:1), Late Woodland/Mississippian Triangular projectile point (7.1:1), bifacial reduction flake (5.1:1), pressure flake (3.1:1), flake fragment (4.1:1), ironstone with maker's mark (2.0:2), RC Cola bottle (201.1:2), light green bottle (201.2:3), amber bottle (201.2:1), colorless bottle (201.3:2), iron washer (201.2:6), plastic fragment (201.1:6).

preservation status for the site and suggests that little data on subsistence issues can be garnered from additional excavations.

The low density of material suggests this site to be a short-term camp at best; few features would be expected to have been created or preserved at such an ephemerally occupied locale, even if used repeatedly in this case.

We had previously suggested (see Section 4.1.5 above) that if intact archaeological sites were located in the project area, they would likely be found in uplands adjacent to established wetlands. These archaeological sites might consist of small, isolated activity areas and zones of resource procurement, and they would not likely contain extensive habitation remains. Thus, the prehistoric component of Site 9BN1613 likely represents a short-term resource procurement camp, making use of the variety of wetland species of plants and animals surrounding Black Creek tributaries. The vertical extent of the deposits suggests this may have occurred repeatedly for an unspecified period of time. Conversely, the historic component of 9BN1613 likely represents late nineteenth/ twentieth-century off-site trash dumping away from dwellings.

The very low density of artifacts and lack of features and temporally specific diagnostic materials indicates that additional investigations at 9BN1613 are unlikely to provide significant and substantial amounts of data that could be used to address pertinent research questions regarding prehistoric occupations in the region. We recommend 9BN1613 not eligible for the NRHP. Pending USACE and SHPO concurrence with these findings, no further management considerations of this site are warranted.

5.0 Results of Architectural Survey

5.1 Archival Research Results

Archival research revealed that no previously recorded historic architectural resources are located within the project tract, and seven previously recorded historic architectural resources are located within one mile (1.6 km) of the project tract. These seven resources were largely recorded by either Joshua L. Ward of the Georgia Historic Resources Survey in 2000, or a University of Georgia county-wide survey in 2009. While these resources appear in GNAHRGIS, none were evaluated for NRHP eligibility.

The seven resources are buildings dating from 1870 through 1944 (Figure 5.1 and Table 5.1). Four of the seven buildings are single-family homes. Of the other three buildings, Resource 1294 (BN-28) is a small frame structure listed as “road related” and appears to be associated with an auto lot. Resource 1302 is a school, and Resource 225084 (BN-121) is a church with associated cemetery. One of the single-family dwellings, Resource 225086 (BN-123), is the only previously recorded architectural resource located within 0.25 mile (0.4 km) of the project tract. After review during the current survey, we recommend Resource 225086 (BN-123) eligible for the NRHP. A full evaluation of this resource is provided in the field survey results section of this chapter (Section 5.2).

5.2 Architectural Field Survey Results

5.2.1 Overview

The architectural APE is defined by the boundaries of the project tract and its immediate viewshed, which varies from 0.25 to 0.5 mile. Architectural resources within the APE primarily include residential buildings and one church, although due to building deterioration and significant modifications, several resources’ functions could not be conclusively determined. The architectural APE is located in Ellabell, Georgia, southwest of Exit 152 (US-280) on I-16. The western portion of the APE includes the two-lane US-280, along with two non-historic service stations and a few residential structures. Other roadways in this portion of the APE include Groover Hill Road, Mitchell Road, Campfield Road,

Pridgen Lane, and the unpaved Tar City Road; each of these roads has limited residential development.

The main cluster of architectural resources is located within the northwest section of the architectural APE, but outside the project boundary. The southeast section of the APE is dominated by a rail line constructed in 1889 and currently operated by Georgia Central, a subsidiary of Genesee & Wyoming, Inc. Along this rail line, within and extending out of the southwest section of the APE, is a heavily industrialized area and rail yard. The town of Ellabell (outside of the APE) and the surrounding development began ca. 1890, with the rail stop located near modern-day Ellabell Loop Road and Indian Trail Road. There is no evident development pattern of historical or architectural significance within the architectural APE.

The eastern third of the project tract consists primarily of wetland hardwoods, while the western half of the small 250-acre 2018 survey parcel contains mixed pine and deciduous trees, as well as a ranch house built in 1979. The rest of the tract contains pine plantation. US-280 lies west of the project tract, while I-16 lies to the north and Black Creek and its wetlands are to the south. The Groover Hill neighborhood is located east of US-280 and between the 2015 and 2018 survey parcels.

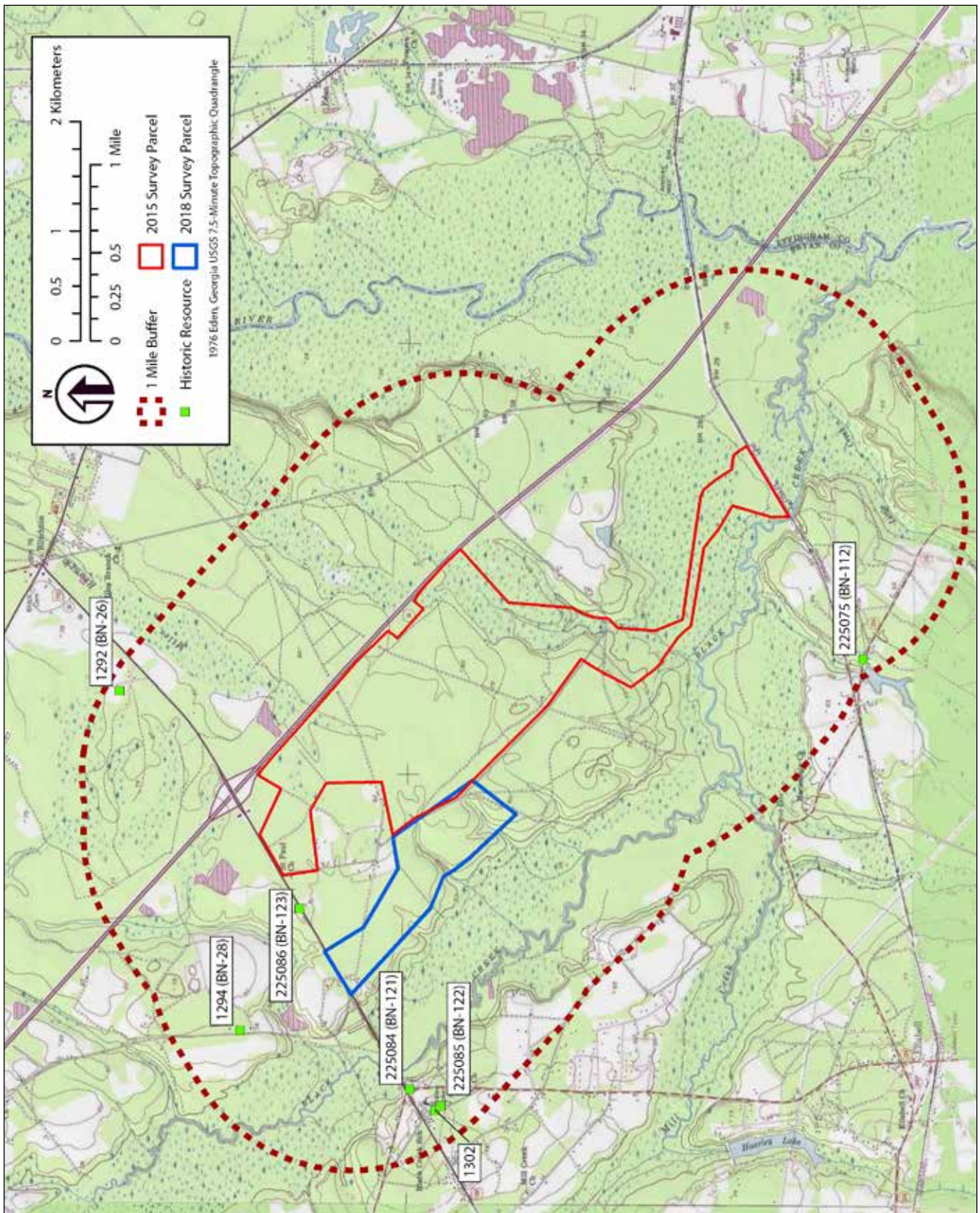


Figure 5.1 Previously recorded architectural resources within one mile (1.6 km) of the project tract.

Table 5.1 List of previously recorded architectural resources within one mile (1.6 km) of the project tract.

Resource	Site Type	Cultural Affiliation	Survey Reference	NRHP status
1292 (BN-26)	Single family House (Bungalow)	20th c. (1904)	GA Historic Resources Survey (Ward 2000)	Unknown
1294 (BN-28)	Building, Transportation Related (780 Olive Branch Road)	20th c. (1929)	GA Historic Resources Survey (Ward 2000)	Unknown
1302	Black Creek Consolidated School	20th c. (1936)	GA Historic Resources Survey (Ward 2000)	Unknown
225075 (BN-112)	Single family House (Central Hallway Cottage)	20th c. (1904)	"FindIt" (through UGA), Bryan County Historic Resources Survey (CO 2009)	Unknown
225084 (BN-121)	Lower Black Creek Primitive Baptist Church and Cemetery	19th c. (1870)	GA Historic Resources Survey (Ward 2000); "FindIt" (through UGA), Bryan County Historic Resources Survey (CO 2009)	Unknown
225085 (BN-122)	Single family House (Shotgun) (104 Church of God Road)	20th c. (1944)	"FindIt" (through UGA), Bryan County Historic Resources Survey (CO 2009)	Unknown
225086 (BN-123)	Single Dwelling (Bungalow) (10199 U.S. 280)	20th c. (1934)	"FindIt" (through UGA), Bryan County Historic Resources Survey (AEB 2009)	Eligible

5.2.2 Previously Surveyed Architectural Resources

Resource 225086, 10199 Hwy 280

Resource 225086 (BN-123) was previously surveyed by FindIt in 2009. The NAHRGIS form for the resource provided no NRHP eligibility recommendation. It was first visited and evaluated for NRHP eligibility during the 2015 architectural survey and was revisited during the 2018 survey. Resource 225086 is located at 10199 US-280 (Figures 5.1 and 5.2). This ca. 1930 cross-gabled bungalow has a metal raised seam roof with exposed rafter tails and four-over-one, wooden, double hung, sash windows. The front door has four lights over one panel. The foundation is not visible. The front gabled porch is supported by square wooden posts on brick piers. The single chimney is located along the roofline. The house is clad in wooden clapboard siding (Figure 5.3). The immediate setting of the house consists of grassed lawn, ornamental shrubs, several oak trees, and a storage shed behind the house (obscured by vegetation). The resource is located on a 140-acre tract, half of which consists of a natural wooded area of pines and deciduous trees. The other half of the tract consists of planted pines and two non-historic ponds.

NRHP Evaluation and Recommendation, Resource 225086. There are no known historical associations that would qualify Resource 225086 for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*). Resource 225086 and its adjoining landscape as designated by its tax parcel (030 008), is recommended as eligible for the NHRP under Criterion C (*architecture*). It maintains its integrity of design, workmanship, material, and setting, and is a good intact example of a cross-gabled bungalow from the early twentieth century.

Because there are no NRHP-contributing features on the majority of the 140-acre tract, the recommended NRHP boundary is a visual boundary containing 5.37 acres (see Figure 5.2). The boundary includes the house and surrounding yard. Although the resource is located within 0.25 mile of the project tract, it is approximately 963 feet (293 m) beyond the 2015 survey parcel boundary and 1,194 feet (363.9 m) from the 2018 survey parcel boundary. The area between the 2015 parcel and Resource 225086 is thickly wooded, and the area between the resource and the 2018 parcel consists of woods and a non-historic neighborhood. Due to distance, ample vegetation, and non-historic development,

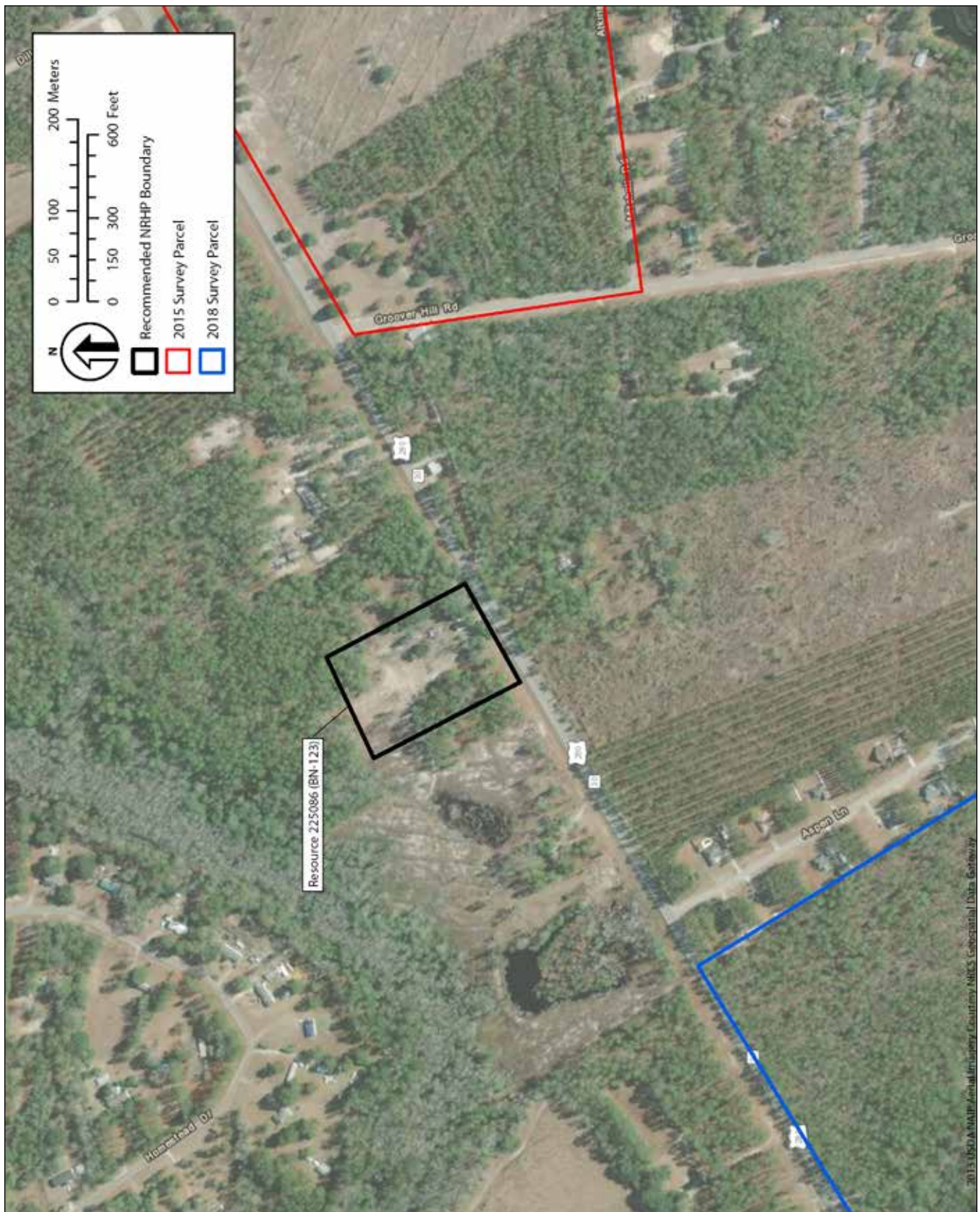


Figure 5.2 Resource 225086 visual boundary of 5.37 acres.



Figure 5.3 Resource 225086, east (front) elevation.

construction activities occurring within the project tract would not be visible from the resource. The undertaking does not have the potential to affect, physically or visually, any NRHP-qualifying features of this property. No further management consideration is recommended.

5.2.3 Newly Recorded Architectural Resources

During the architectural survey for the 1,161.4-acre 2015 survey parcel, 25 new resources were identified and evaluated for NRHP eligibility. In 2018 these resources were revisited and any changes were noted and photographed. In addition, the 2018 survey parcel was investigated. No resources were identified within this 250.3-acre 2018 survey parcel; however, one additional resource (Resource 26) was identified within 0.25 mile of the survey area. The cluster of homes along Groover Hill Road within the 2015 survey parcel was also evaluated for potential as an NRHP historic district, but the area lacks historical and architectural cohesiveness to be considered as a district. The Central of Georgia Rail Line corridor

(Resource 25) is recommended as eligible for listing on the NHRP. However, there are no anticipated adverse effects on any of the identified resources from the project undertaking. No further management considerations of these resources are warranted. Figure 5.4 provides a map of newly recorded resources within the APE. Table 5.2 provides a list of newly recorded resources.

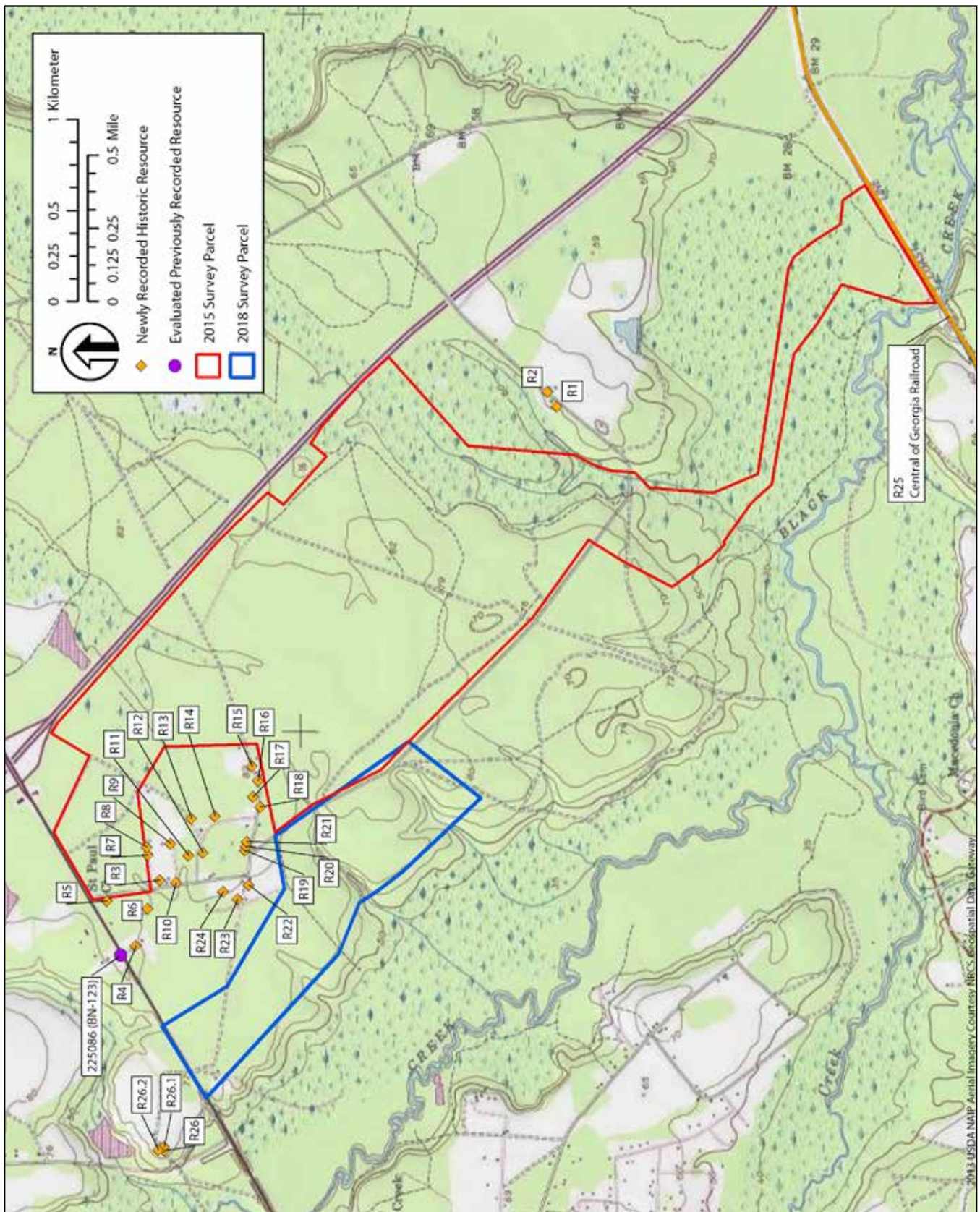


Figure 5.4 Topographic map (USGS Eden, GA 1976) of previously recorded and newly recorded resources within the APE.

Table 5.2 Newly recorded architectural resources within the APE.

Resource	Site Type	Location	NRHP Recommendation
Resource 1	Ca. 1890 front gable, single pen house	East of project tract	Not Eligible
Resource 2	1945 front gable bungalow	East of project tract	Not Eligible
Resources 3-24	Early to mid-20th c. Groover Hill Neighborhood	Groover Hill Road area	Not Eligible
Resource 25, Central of Georgia Rail Line Corridor	Late 19th to 20th c. railroad corridor	East of project tract	Eligible
Resource 26	Early to mid-20th c. Jones House and outbuildings	Olive Branch Road	Not Eligible

Resources 1 and 2

Resources 1 and 2 are on the same tax parcel (035 005) owned by the Elizabeth S. Martin Trust. The two resources are not associated; they are separated by over 100 meters and were constructed over 50 years apart. Resource 1 is a ca. 1890 front gabled, single pen, clapboard-clad building currently supported by preformed concrete footers. The raised seam metal roofing is a replacement material. There is no evidence of a chimney. The windows and doors are no longer extant. Based on its windows and door fenestration, the building may have been a commissary or store house (Figure 5.5). It is not associated with an extant farmhouse, main building, or extant agricultural landscape.

NRHP Evaluation and Recommendation, Resource 1. Resource 1 is recommended not eligible for the NRHP. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). It lacks integrity of setting, materials, design and workmanship due to the alteration of windows, door, foundation and landscape. It does not embody distinctive architectural characteristics of agricultural architecture or as a component of an agricultural landscape. Therefore, it does not qualify under Criterion C (*architecture*). There is no known potential to qualify the resource under Criterion D (*information potential*).

Resource 2 is a 1945 front-gabled bungalow. The roof is covered in raised seam, metal sheeting and features exposed rafter tails. The body of the house is clad in asbestos siding. The single chimney is on the exterior of the southern elevation. The house is constructed on brick piers. There is a side gabled

addition on the south elevation and a shed roofed addition on the rear eastern elevation (Figure 5.6). There is a modern barn to the south of the resource, currently used to house recreational vehicles.

NRHP Evaluation and Recommendation, Resource 2. Resource 2 is recommended not eligible for the NRHP. The cladding, windows, doors and additions have compromised the integrity of setting, material, design and workmanship. It does not embody the distinctive characteristics of its type or period. Therefore, it does not qualify under Criteria C (*architecture*). There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.5 Resource 1, northeast oblique.



Figure 5.6 Resource 2, south (front) elevation.

Groover Hill Road Neighborhood

This cluster of 22 residential buildings is located within the architectural APE, northwest of the 2015 survey parcel of the project tract; the buildings are scattered along Groover Hill Road, Mitchell Road, Campfield Road, and Pridgen Lane in Ellabell, Georgia (see Figure 5.4). Groover Hill Road, Mitchell Road, Campfield Road, and Pridgen Lane are publicly maintained paved roads located southeast of US-280, southwest of I-16, northeast of Black Creek, and north of Tar City Road.

For simplicity, this cluster will be referred to as the Groover Hill Road Neighborhood, although background research and the fieldwork revealed no evidence that this area was developed as a planned neighborhood. The majority of the modern property lines were established sporadically throughout 1909-1971, though a review of historic topographic maps and aerials indicate development largely occurred after 1960 (Figure 5.7).

Bryan County tax and deed records show no evidence of a planned neighborhood. However, the architecture and tax record construction dates suggest two waves of residential construction. The first wave of houses was constructed 1920-1940. These houses are generally bungalows, although there are several with a central hall form. A 1968 aerial photograph and 1950 and 1958 USGS topographic maps show few of these houses. It is possible some of these resources were moved to this location after 1968. The second wave of documented resources were constructed 1941-1965 and are occupied by African Americans. The resources in this wave are more varied in form. Other undocumented resources in the neighborhood are not yet 50 years old or are prebuilt model homes. Figure 5.8 depicts the resources associated with each wave.

The following includes a description and photograph of each individual resource within the Groover Hill Road Neighborhood (Resources 3-24). None of these resources within the Groover Hill Road Neighborhood are individually eligible for the NRHP. The NRHP evaluation and recommendation for the neighborhood as a district follows the resource descriptions.



Figure 5.7 A 1968 aerial photograph of the Groover Hill Road Neighborhood shows few houses.

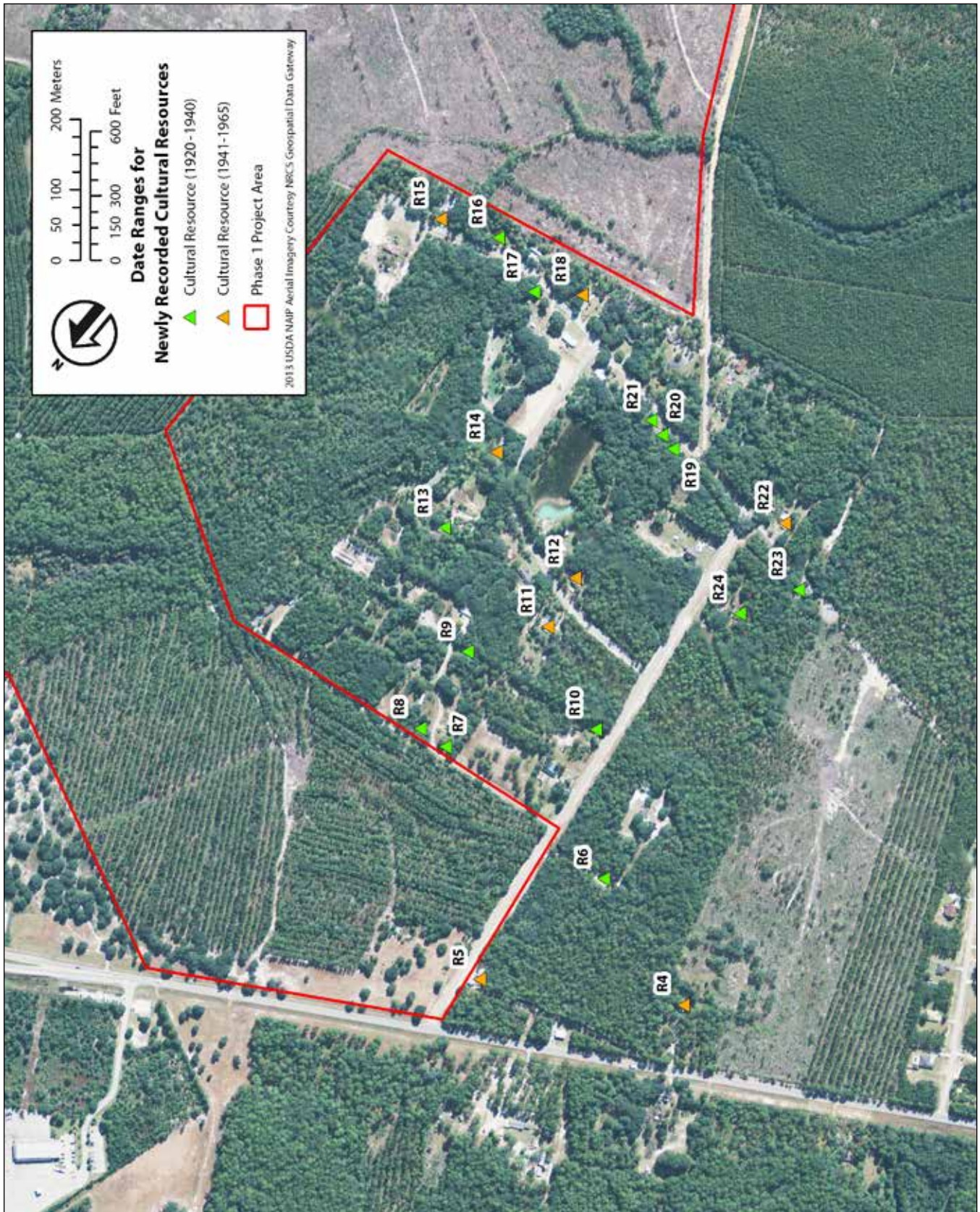


Figure 5.8 Resource building date ranges. The houses in the Groover Hill Road Neighborhood were constructed in two waves of development, as shown in the legend.

Resource 3, 245 Groover Hill Road. According to tax records, this bungalow was built in 1930 and improved in 1991. It has a concrete slab foundation, concrete masonry unit (CMU) walls and a front gable V-crimp metal roof. The house has a single wood front door with a 9-pane fixed window and a full front porch. The porch has a concrete slab foundation, a front gable-V-crimp metal roof with composite shingles in the gable, and wood post supports (Figure 5.9). The setting of the resource consists of grassed lawn, ornamental shrubs, and one ca. 1950 wood frame storage building. Alterations to the house include ca. 1970 aluminum frame double hung windows. On the south side elevation is a two-bay attached carport built in 1991. It has a concrete slab foundation, CMU walls, and a side gable V-crimp metal roof.

There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*). Due to non-historic alterations and a large carport addition, Resource 25

has lost integrity of design, materials, workmanship, feeling and association. The resource lacks distinctive architectural details of its time period and building type and is recommended not eligible for the NRHP under Criterion C (*architecture*).



Figure 5.9 Resource 3, west (front) elevation.

Resource 4, 10198 Hwy 280. This 1947 resource possesses no discernible academic type or style. It has a side gabled roof with a front projecting gable on the south side of the front elevation. The roof is clad in asphalt shingles and the house in vinyl siding. The engaged front porch is supported by square wooden posts on top of square brick piers. The house is constructed on a slab. The windows are four-over-one, wooden, double hung sash. The front door is not visible. There is a shed-roofed side addition on the north elevation (Figure 5.10).

The house is recommended not eligible for the NRHP under Criterion C because it does not embody the distinctive characteristics of its type or period. Additionally, it lacks integrity of setting, material, design and workmanship due to siding, roofing, and landscape alterations. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.10 Resource 4, west (front) elevation.

Resource 5, 245 Groover Hill Road. Resource 5 is the St. Paul AME Church, ca. 1950. It is constructed of CMUs with decorative buttresses. The front gabled roof is clad in raised seam metal sheeting. The windows are aluminum, horizontal, two-over-two, double hung sash. The front gabled porch has a vent in its surface and is supported by plain rounded columns on top of a raised concrete slab. There is a side-gabled CMU addition on the east elevation (Figure 5.11).

Resource 5 maintains its integrity of location, design, material and workmanship, but has compromised integrity of setting and feeling. The St. Paul AME Church is recommended not eligible for the NRHP under Criterion C because it does not embody the distinctive characteristics of its type, style or period; it is typical of rural religious building construction. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.11 Resource 5, east elevation.

Resource 6, 1826 Groover Hill Road. This ca. 1940 central hall house is clad with asphalt shingles on the roof and vinyl siding on the exterior walls. The porch is centered on the front elevation and is flanked by two paired windows. The original porch elements have been heavily altered or completely replaced. It is currently enclosed with screen and plywood, and the front door is a modern replacement. The windows are wooden, six-over-six, double hung sash. The foundation of the main building was not visible during survey; the porch sits on CMU piers (Figure 5.12).

The house is recommended not eligible for the NRHP under Criterion C because it does not embody the distinctive characteristics of its type or period. It also lacks integrity of material, design and workmanship due to alteration of the siding and porch, although it maintains integrity of setting and feeling. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.12 Resource 6, east (front) elevation (Bryan County Tax Assessor 2017).

Resource 7, No address, Mitchell Road. Resource 7 is the remnant of a ca. 1950 lateral gabled house. The roof is clad in raised seam metal sheeting. The exterior chimney is located on the north (front) elevation and is constructed of CMUs. The foundation is preformed concrete footers. Doors and windows are no longer extant (Figure 5.13).

The resource retains no distinctive architectural characteristics. This resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of design, material, workmanship, setting, and feeling because it is in ruinous condition. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.13 Resource 7, north (front) elevation.

Resource 8, No address, Mitchell Road. This is a ca. 1935 building that features a front gabled roof clad in raised seam, metal sheeting. The front shed-roofed porch is supported by rounded wooden posts. The siding is a mixture of plywood and shiplap. The one visible intact window is a wooden, four-pane, fixed-light. The front door is missing (Figure 5.14). The form and style of this building suggests it could have been used for commercial purposes, but because of its lack of materials and other architectural features, its original purpose is unknown.

The building lacks integrity of design, material, workmanship, and setting and is recommended not eligible for the NRHP under Criterion C. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.14 Resource 8, south (front) elevation.

Resource 9, No address, Mitchell Road. Resource 9 is a front gabled bungalow clad in vinyl siding. Although the construction date is likely ca. 1940, the 1968 aerial photograph does not show this resource. It was likely moved to its present location after that date. The roof is covered in raised seam, metal sheeting. There is a shed-roofed addition on the north elevation. The front porch is shed-roofed and supported by square wooden posts. The foundation of the main house was not visible during the survey. The windows are replacement, synthetic, twelve-over-twelve, double hung sash (Figure 5.15).

This resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of design, material, workmanship, setting, and feeling. It has no distinctive characteristics of its type, style, or period. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.15 Resource 9, east (front) elevation.

Resource 10, 303 Groover Hill Road. This 1936 central hall type house has a lateral roof clad in raised seam metal sheeting, portions of which are modern. The porch is centered on the front elevation and enclosed in modern boarding and screen. The only visible windows are on the side elevation and are synthetic, six-over-six or two-over-two, double hung sash. There is a rear shed-roofed addition. The single exterior brick chimney is on the north elevation. The visible portion of the foundation is CMU and the exterior of the house is covered in what appears to be non-original board-and-batten siding (Figure 5.16).

This resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of design, material, and workmanship. It lacks distinctive architectural details of its time period, type, or style. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.16 Resource 10, west (front) elevation.

Resource 11, 1000 Groover Hill Road. According to the home owner, Mr. Tony Singleton, Resource 11 was built about 1935 in Claxton, Georgia, and was moved to 1000 Grover Hill Road in 1978. It was substantially altered after the move. Resource 11 is a front-gabled bungalow with an asphalt-clad roof and an engaged front porch. The porch is supported by thin, rounded columns on a concrete slab. There is a side-gabled porch on the east elevation. There are two rear gabled additions. The house has wooden clapboard siding. There are three windows in the front gable. The central window is a horizontal aluminum two-over-two double hung sash. It is flanked by two six-over-one double hung sash windows. The windows in the front elevation have the same configuration, except the central window is one-over-one. Alterations to the house include the front and side porch, the two rear additions, and the siding (Figure 5.17).

torical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).

The resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of design, location, setting, workmanship, materials, and association. There are no known his-



Figure 5.17 Resource 11, south (front) elevation.

Resource 12, 993 Groover Hill Road. Mr. Tony Singleton, owner of Resource 11, noted that Resource 12 was owned by his brother, C.C. Singleton Jr., and that the house was moved to its present location in 1979. The relocated house is the single-story, lateral-gabled portion of the house, which was probably a hall-parlor type house. Mr. Singleton later constructed the two-story addition and clad both in wooden siding. The single story has a front porch that only covers the entrance way. It is supported by thin, round, metal poles. The two-story, front-gabled addition has projecting gables above the second story windows of the western elevation. The windows in the second story have rounded arches with a four-light fan above four-over-four double hung sashes. The foundation is CMU and the roof is clad in asphalt shingles (Figure 5.18).

The resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of workmanship, material, design, location, and setting. It has no distinctive characteristics of its type, style, or period. There are no known historical associations that would qualify the property

for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.18 Resource 12, north (front) elevation.

Resources 13 and 16, 910 Groover Hill Road. Resource 13 was not visible from the public right of way, but the Bryan County Georgia Board of Assessors provided the below image as one of two buildings on the tax parcel (0303 040). The second is Resource 16. From the image, Resource 13 has a lateral hipped roof covered in metal raised-seam sheets, and the building is in a state of deterioration. The front porch is no longer extant. The paired front windows are replacement, one-over-one, double hung sash. The foundation is no longer extant, and portions of the exterior weatherboard siding are missing (Figure 5.19).

The resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of material, workmanship, design, and setting. It possesses no distinctive characteristics of a particular type, style, or period of construction. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).

Resource 16 is located on the same tax parcel as Resource 13 (0303 040). It is a ca. 1935 front-gabled bungalow. It has a raised seam roof with exposed rafter tails. It is clad in a mixture of wooden siding: clapboard siding with vertical corner boards and vertical beadboard. One chimney is located in the eastern roof surface and the other on the exterior of the western elevation. The front-gabled porch is supported by squared wooden posts, and there is a square vent in the gable. The house and the porch are supported by brick piers. The windows are wooden, vertical, two-over-two double hung sash. There are two additions on the east elevation, one with a shed roof and one with a side gable. There is also a rear gabled addition on the south elevation (Figure 5.20).

The resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of material, workmanship, and design due to the alterations to the siding, windows, and front porch and the construction of large-scale visible additions. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.19 Resource 13, courtesy of Bryan County Georgia Board of Assessors.



Figure 5.20 Resource 16, northeast oblique.

Resource 14, 860 Groover Hill Road. The tax parcel data for Resource 14 (0303 017) identifies this property with a 1962 prebuilt mobile home. However, the parcel also includes a ca. 1930 house with a central hall and paired-front windows. It has no identified academic type or style. The foundation of the house is no longer extant, and it is supported by CMUs. The windows are wood framed but obscured by a blue tarp, along with the front door. There is a rear shed-roofed addition. The roof is clad in raised-seam metal sheets and the walls are vertical boarding on the main portion of the house and shiplap wooden siding on the rear extension (Figure 5.21).

The resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of material, workmanship, design, location, and setting due to alterations to the landscape, siding, windows, and foundation. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.21 Resource 14, southwest oblique.

Resource 15, 41 Pridgen Lane. This ca. 1960 resource is largely hidden by foliage, but it features a lateral gabled roof clad in raised-seam metal sheeting. The windows are metal one-over-one double hung sash. The front-gabled porch is supported by decorative vine-patterned, wrought iron posts. When asked about the house's history, the home owner stated that it was originally a prebuilt mobile home but that there were various additions (Figure 5.22).

The resource is recommended not eligible for the NRHP Criterion C because it lacks integrity of material, workmanship, and design. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.22 Resource 15, north (front) elevation.

Resource 17, 910 Groover Hill Road. Resource 17 is a front-gabled bungalow supported by a CMU foundation. Although the construction date is likely ca. 1930, the 1968 aerial photograph does not show this resource. It was likely moved to its present location after that date. It has a metal raised-seam roof with exposed rafter tails. The front door is a replacement with four panels. The windows are six-over-six and one-over-one double hung sash. There is a shed-roofed addition on the east elevation. The house is clad in a mixture of beadboard and plywood. In 2015, there was evidence of fire damage to the front-gabled porch. At the time it was supported by new wooden squared posts and railings. By 2018, the front porch had been removed (Figure 5.23).

The resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of material, workmanship, and design due to alterations to the siding, windows, and front porch. It has no distinctive characteristics of its type, style or period. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.23 Resource 17, southwest oblique (updated 2018).

Resource 18, 15 Pridgen Lane. Resource 18 is a ca. 1960 side-gabled bungalow. The roof is clad in metal raised-seam sheets. The windows are replacement synthetic six-over-six double hung sash. The siding is prefabricated vertical wooden sheeting. The foundation of the house is preformed concrete footers. There is a large porch with a shed roof on the front elevation that has been enclosed with screen and vertical wood siding (Figure 5.24).

The resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of material, workmanship, and design due to the alterations to the front porch, siding, and windows. It does not have distinctive architectural characteristics of its type or period. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.24 Resource 18, north (front) elevation.

Resource 19, 958 Groover Hill Road. Resource 19 is a front gabled bungalow. Although the construction date is likely ca. 1940, the 1968 aerial photograph does not show this resource. It was likely moved to its present location after that date. The roof is clad in metal raised-seam sheets. The windows are replacement synthetic one-over-one double hung sash. The door is a six panel non-historic replacement. The siding is wooden and vertical and not original to the house. The front-gabled porch is centered on the elevation and supported by wooden squared posts; the porch consists largely of replacement materials. The house foundation is obscured behind vinyl siding. There is a shed addition on both the east and west elevations (Figure 5.25).

The resource is recommended not eligible for NRHP under Criterion C because it lacks integrity of material, workmanship, and design due to the construction of additions and alterations to the siding, windows, and front porch. It does not have distinctive architectural characteristics of its type or period. There are no known historical associations that would qualify the property for NRHP eligibility

under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.25 Resource 19, south (front) elevation.

Resource 20, 958 Groover Hill Road. Resource 20 is a bungalow with a front-gabled roof clad in metal raised-seam sheets. Although the construction date is likely ca. 1930, the 1968 aerial photograph does not show this resource. It was likely moved to its present location after that date. The windows are replacement synthetic, horizontal, two-over-two double hung sash. The front gabled porch is centered on the elevation and is supported by wooden squared posts. The foundation is obscured by synthetic sheeting. The siding consists of replacement wooden clapboard siding with vertical corner boards. There is a rear gabled addition (Figure 5.26).

The resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of material, workmanship, and design due to alterations to windows, siding, and front porch. It does not have distinctive architectural characteristics of its type or period. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.26 Resource 20, southeast oblique.

Resource 21, 958 Groover Hill Road. Resource 21 is a single-pen house with a side-gabled roof clad in metal raised-seam sheets. Although the construction date is likely ca. 1920, the 1968 aerial photograph does not show this resource. It was likely moved to its present location after that date. The windows are wooden six-over-six, double hung sash. The siding consists of wooden clapboards. The eastern portion of the engaged front porch has been enclosed; the open portion is supported by squared wooden posts. The front door is wooden with four panels, and the foundation is CMU piers. There is a large rear shed-roofed addition clad in a combination of vinyl, plywood, and wooden shiplap siding (Figure 5.27).

The resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of material, workmanship, and design due to the large-scale rear addition and alterations to the front porch, siding, and foundation. It does not have distinctive architectural characteristics of its type or period. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.27 Resource 21, southeast oblique.

Resource 22, 35 Campfield Street. This resource is a ca. 1940 bungalow with a front-gabled V-crimp metal roof. There is an engaged front porch supported by wrought iron posts decorated with vine details. The windows are aluminum horizontal, two-over-two double hung sash. The siding is vinyl. The foundation was not visible during survey. There is a rear, hipped roof addition (Figure 5.28).

The resource is recommended not eligible for the NRHP because it lacks integrity of material, workmanship, and design due to alterations to the windows, siding, and porch materials. It does not have distinctive architectural characteristics of its type or period of construction. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.28 Resource 22, northeast oblique (Bryan County Tax Assessor 2017).

Resource 23, 84 Campfield Street. Resource 23 is a ca. 1940 front-gabled house with a roof clad in metal raised-seam sheets and no academic type or style. There are two shed-roofed additions that form wings on the east and west elevations. The house is clad in both wooden clapboard and shiplap siding. There is a CMU chimney on the exterior of the east elevation. Windows are aluminum horizontal, two-over-two double hung sash. The front-gabled porch is enclosed with screen and supported by squared wooden posts and railings; the majority of the porch materials appear to be replacements. The foundation was not visible during survey (Figure 5.29).

The resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of material, workmanship, and design due to large-scale additions and alterations to the windows, siding, and front porch. It does not have distinctive architectural characteristics of its type or period of construction. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.29 Resource 23, southeast oblique.

Resource 24, 432 Groover Hill Road. Resource 24 is not visible from the public right-of-way, but the Bryan County Georgia Board of Assessors provided the below image for the building on the tax parcel. This is a ca. 1930 front-gabled bungalow with a roof clad in metal raised-seam sheets. The front-gabled porch has been enclosed. Windows are four-over-four double hung sash. The siding appears to be raised-seam metal sheets, and the foundation has CMU piers. The resource is unoccupied and has some material deterioration (Figure 5.30).

The resource is recommended not eligible for the NRHP under Criterion C because it lacks integrity of material, workmanship, and design due to the irreversible porch enclosure and alterations to the siding and foundation. It does not have distinctive architectural characteristics of its type or period of construction. There are no known historical associations that would qualify the property for NRHP eligibility under Criteria A (*events*) or B (*people*). There is no known potential to qualify the resource under Criterion D (*information potential*).



Figure 5.30 Resource 24, front elevation.

NRHP Evaluation and Recommendation, Groover Hill Neighborhood. The Groover Hill Neighborhood was evaluated for potential eligibility as a NRHP historic district. There are no known associations with significant persons for the Groover Hill Neighborhood. Therefore, it was not evaluated under Criterion A (*event*) or Criterion B (*person*) of the NRHP. In addition, the properties are not likely to yield information important in prehistory or history. Therefore, the resources were not evaluated under Criterion D (*information potential*).

The neighborhood does not possess any unifying streetscapes or landscapes. The neighborhood buildings share few architectural characteristics. They share no overall form or style; however, the majority have roofs clad in raised-seam metal sheeting. In general, the resources retain integrity of location, although a few properties have been moved. The individual houses are without academic types or styles and generally lacking in architecturally distinct characteristics. Some properties are clearly undergoing renovation. Many have new windows, doors, foundations, or cladding. These alterations contribute to a general lack of integrity in material, design, workmanship, setting, and feeling. Many of the resources have lost integrity of design, materials, workmanship, and feeling due to significant alterations or neglect.

Property records indicate that the neighborhood was subdivided from a large land parcel over a period of more than 60 years. It does not appear that families stayed within the neighborhood multigenerationally. The neighborhood, evaluated as a district, fails to convey any sense of a significant unified entity that represents a particular type, style, or period of construction. There is no evident development pattern of historical or architectural significance within the neighborhood. The Groover Hill Road Neighborhood possesses no potential to be eligible for the NRHP as a historic district under Criterion C. In addition, the houses in Groover Hill lack sufficient architectural integrity to be individually eligible for the NRHP under Criterion C.

Resource 25, Central of Georgia Rail Line

Resource 25, the Central of Georgia Rail Line (presently Georgia Central) marks the extreme southeastern boundary of the project tract (Figure 5.31 and Figure 5.4). Railroad construction in Georgia began in the 1830s but did not reach upper Bryan County until 1889 when the Savannah and Western Railroad was constructed. Towns such as Ellabell, Lanier, Pembroke, and Groveland grew up around the established depots (Caldwell 2001:453). The original Savannah & Western line, between the towns of Meldrim and Lyons, ran along the soon-to-be Central of Georgia line. The Ellabell stop in this line lay 3.2 miles south of the project area (Storey 2015).

Construction of the Savannah & Western Railroad began in 1889. The Savannah & Western Railroad was a 400-mile portion of the Central of Georgia Railway when rail lines in the area were becoming standardized. The Central of Georgia Railway was established in 1833 as the Central Railroad and Canal Company, which eventually became Central Railroad and Bank Company of Georgia. From 1890 to 1896, this line was run by the Central of Georgia Railroad (Figure 5.32). In 1896, Seaboard Air-Line Railway took over operation of the Meldrim to Lyons line under a perpetual lease (Storey 2015). Today, the rail line is run by Georgia Central, a subsidiary of Genesee & Wyoming, Inc., according to the Georgia Department of Transportation Rail 2013-2014 Map (<http://www.dot.ga.gov/IS/Rail>).

NRHP Evaluation and Recommendation, Resource 25. This rail line is eligible for listing on the NRHP under Criterion A for its connection to the history of transportation and the development of railroad towns in the early twentieth century (1890-1920). This rail line is also eligible for listing under Criterion C because it embodies the distinctive characteristics of engineering at the turn of the twentieth century (1890-1920). There are no anticipated adverse effects from the undertaking. Any effect will be in keeping with the industrial and commercial use and setting of the rail line and will not adversely affect the integrity or significance of the resource. The setting of the rail line currently includes a large industrial complex 0.2 mile to the west of the project area. No further management consideration is recommended.



Figure 5.31 View of Central of Georgia (Georgia Central) rail line at Black Creek in the southeastern corner of the Phase 1 tract, looking southwest.

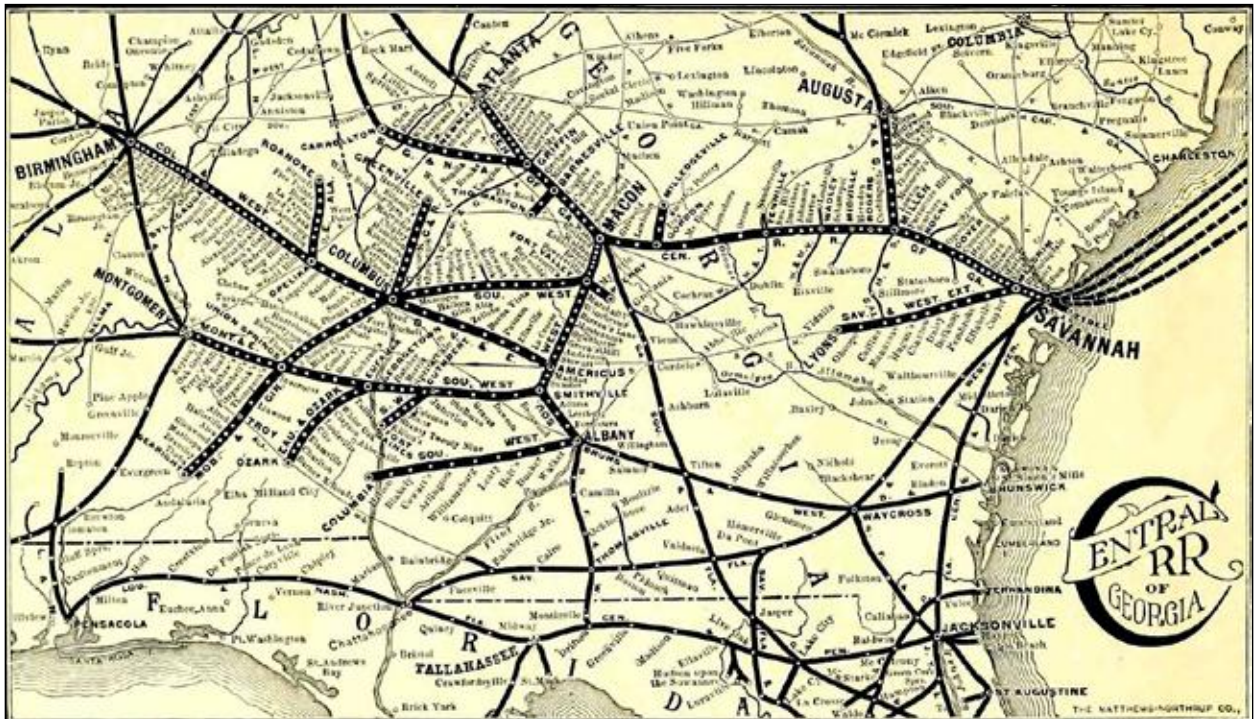


Figure 5.32 Resource 25, Central of Georgia System Map, 1895.

Resource 26

Resource 26 is a Linear Ranch House located in the project viewshed at 208 Olive Branch Road (see Figure 5.4). According to tax records, it was built in 1957. The property owner, Janice Jones, confirmed the construction date. Resource 26 sits on an 80.24-acre wooded tract that also contains two associated houses, Resources 26.1 and 26.2 (Figure 5.33). According to the property owner, the tract was once part of the Jones Farm.

Resource 26 has a concrete slab foundation, a wood frame, and a clip-gable asphalt shingle roof, one interior brick chimney, and a brick veneer. The house has a single-bay integral carport, a single front door, one hip-roof cluster on the south side elevation, and a hip-roof screened porch on the east rear elevation. Figures 5.34 through 5.36 are photographs of the resource. The immediate setting of the house consists of grassed lawn, ornamental shrubs, and two oaks trees. Northeast of the Ranch House are a Saddlebag house (R26.1) and a Double Pen House (R26.2) that the Jones family once occupied.

Alterations to the house include a ca. 1990 wood front door with a fixed oval window and sidelight, ca. 2010 aluminum frame, vinyl coated, double hung windows (see Figure 5.34), and a 2017 two-bay, shed-roof carport extension with wood post supports (see Figures 5.34 and 5.36). Due to these alterations and additions, the resource has lost integrity of design, materials, workmanship, feeling, and association.

Resource 26.1 is a ca. 1920 Saddlebag House that is currently used for storage. It has a brick pier foundation, a wood frame, a side-gable V-crimp metal roof, one interior ridgeline brick chimney, a ceramic stove flue, weatherboard siding, and a full front porch. The porch has a brick pier foundation, a wood plank floor, concrete steps, and a V-crimp metal shed roof with wood post supports. The house has wood frame, flat-headed, double hung windows with 6/6 pane configurations and two front door bays. However, only one raised panel wood door remains. (Figures 5.37 and 5.38). The immediate setting of the house consists of sparse grass and an oak tree.

On the rear of the house is a ca. 1930 addition. It has a brick pier foundation, a wood frame, weatherboard siding, and a V-crimp metal shed roof.

Alterations to the house include the removal of one front door, the removal of most of the windows, the loss of most window panes and muntins in the two surviving windows, and the loss of all but two porch supports and approximately one quarter of the wood porch floor and frame. The loss of the porch supports has caused the porch roof to sag in the center. In addition, much of the weatherboard siding on the north side elevation is missing. Due to these alterations, the resource has lost integrity of design, materials, workmanship, feeling, and association.

Resource 26.2 is a ca. 1910 Double Pen House. It has a brick pier foundation, a wood frame, a side-gable V-crimp metal roof, horizontal flushboard on the front elevation, and weatherboard siding on the side elevations. The house has two front door bays and wood frame, flat-headed, double hung windows with 6/6 pane configuration, and decorative wood pediments (Figures 5.39 through 5.41). The immediate setting of the house consists of underbrush and deciduous trees.

On the rear of the house is a ca. 1930 addition that contains a bathroom. It has a brick pier foundation, a wood frame, weatherboard siding, and a V-crimp metal shed roof. Alterations to the house include the removal of the two front doors, the loss of most window panes and muntins, the removal of the exterior side chimney, and the removal of the front porch (see Figures 5.39 and 5.41). Due to these alterations, the resource has lost integrity of design, materials, workmanship, feeling, and association.

NRHP Evaluation and Recommendation, Resource 26. There are no known significant historical events associated with the Resource 26 property. Therefore, the resource is recommended not eligible for the NRHP under Criterion A (*event*). Currently, Resource 26 and the associated houses (26.1 and 26.2) are located on an 80.24-acre tract of land that was once part of the Jones Farm. In the twentieth century, the Jones farm consisted of approximately 500 acres and included land in the project tract southeast of US-280, as well as land west of Olive Branch Road. However, the farm has been subdivided and the current Jones property (Resource 26) has reverted to woods. Much of the surrounding property, including the former Jones property in the project tract, has also reverted to woods. In addi-



Figure 5.34 Resource 26, west front elevation.



Figure 5.35 Resource 26, southwest oblique.



Figure 5.36 Resource 26, carport extension, northwest oblique.



Figure 5.37 Resource 26.1 west front elevation.



Figure 5.38 Resource 26.1 northwest oblique.



Figure 5.39 Resource 26.2, south front elevation.



Figure 5.40 Resource 26.2, southeast oblique.



Figure 5.41 Resource 26.2, southwest oblique.

tion, there are no extant agricultural buildings on the Resource 26 (Jones) property or on the project tract southeast of US-280. As a result, Resource 26 is not an operating farm and would not reflect one of the agricultural developmental periods as described in *Tilling the Earth: Georgia's Agricultural Heritage, a Context* (Messick et al. 2001). Therefore, the resource is recommended not eligible under Criterion A in the area of agriculture.

There are no known associations with significant persons for Resource 26. Therefore, it is recommended not eligible under Criterion B (*person*). Because the property is only located in the project viewshed, it was not surveyed for archaeological resources. Therefore, Resource 26 has an unknown NRHP eligibility under Criterion D (*information potential*).

The Resource 26 property was evaluated under Criterion C (*design/construction*). Resource 26 is in good condition but possesses only fair integrity. Resources 26.1 and 26.2 are in fair condition and possess only fair integrity. The resources retain integrity of location because they have not been moved. While Resource 26 retains its immediate setting, the agricultural setting of the resource has been lost because the farmland has reverted to woods. Due to non-historic alterations and addition to Resource 26 and the loss of many character-defining features on Resources 26.1 and 26.2, the houses have lost integrity of design, materials, workmanship, feeling, and association. As a result, the Resource 26 property has lost integrity under Criterion C and is recommended not eligible for the NRHP.

5.3 Architectural Survey Summary and Conclusions

Archival research found that Resource 225086 (BN-123) is the only previously recorded architectural resource located within 0.25 mile (0.4 km) of the project tract. Resource 225086 (BN123), a ca. 1930 bungalow, is recommended eligible for the NRHP.

During the 2015 and 2018 architectural surveys, 26 new resources were identified and evaluated for NRHP eligibility. Resource 1 is a ca. 1890 front-gabled single pen house, and Resource 2 is a 1945 front-gabled bungalow. Both resources are recommended not eligible for the NRHP. Twenty-two of the surveyed resources (Resources 3 through 24)

are houses in the Groover Hill Road Neighborhood. Groover Hill was evaluated for potential as a NRHP historic district but it lacks historical and architectural cohesiveness. Background research and fieldwork did not identify an evident development pattern of historical or architectural significance within the neighborhood. Therefore, the Groover Hill Road Neighborhood is recommended not eligible for the NRHP as a historic district, and the houses in Groover Hill Road Neighborhood lack sufficient architectural integrity to be individually eligible for the NRHP. Resource 25 is the Central of Georgia Rail Line corridor that is recommended as eligible for listing on the NRHP. Resource 26 is a group of three houses spanning construction dates of 1910 to 1957, but all lack integrity and are recommended not eligible for the NRHP.

Of the two resources recommended eligible for the NRHP (Resource 225086 [BN-123] and Resource 25), there are no anticipated adverse effects. Resource 225086 will not be affected by the project undertaking due to distance from the project tract as well as ample vegetation and non-historic development between the resource and proposed construction activities. Any affect to Resource 25 (the railroad) will be in keeping with the industrial and commercial use and setting of the rail line and will not adversely affect the integrity or significance of the resource. Therefore, no further management consideration of architectural resources in the project APE is warranted.

6.0 Summary and Management Recommendations

Between March 9 and May 15, 2015, and between June 4 and 22, 2018, Brockington completed Phase I cultural resources survey and Phase II testing for the 1,411.7-acre (571.3-hectare) Bryan County OEM Site managed by SEDA. This tract is located south of the intersection of I-16 (GA-404) and US-280/25 (GA-30) in northwestern Bryan County. Archival research conducted prior to field survey revealed no previously recorded archaeological sites and one previously recorded historic resource (Resource 225086, a ca. 1930 single-family dwelling) within the project APE.

The cultural resources field survey included both an archaeological and a historic architectural survey component. During the archaeological survey, 30-m-interval shovel testing and pedestrian survey were conducted within the entire 1,411.7-acre tract to identify archaeological resources. The subsequent Phase II testing stage of the archaeological investigation consisted of the excavation of 1-by-1-m test units at four of the five newly identified archaeological sites to definitively evaluate their NRHP eligibility. The architectural survey included a viewshed analysis of all potentially historic buildings, structures, and landscape features in the vicinity of the proposed project. Our field survey identified five newly recorded archaeological sites (9BN1586, 9BN1610, 9BN1611, 9BN1612, and 9BN1613), five archaeological isolated finds (Isolates 1 through 5), 26 newly recorded historic resources (Resources 1 through 26), and a revisit of the above-mentioned previously recorded historic resource.

6.1 Archaeological Resources

Identified archaeological resources include five isolated finds and five archaeological sites. The isolated finds consist of one historic ceramic (stoneware) fragment, as well as several non-diagnostic prehistoric artifacts. Isolated finds are generally considered not eligible for listing in the NRHP and will not be further considered here.

The archaeological sites include two multi-component historic/prehistoric artifact scatters (9BN1585 and 9BN1613), two prehistoric lithic scatters (9BN1610 and 9BN1611), and one prehis-

toric artifact scatter (9BN1612). Our investigations provided evidence for a prehistoric Deptford Phase (Early/Middle Woodland) occupation at 9BN1586, but less specific prehistoric cultural associations at 9BN1610 (Late Woodland/Mississippian), 9BN1611 (unspecified Woodland/Mississippian), 9BN1612 (unspecified Woodland/Mississippian), and 9BN1613 (Late Woodland/Mississippian). These sites represent prehistoric utilization of interior Coastal Plain resources located between the Ogeechee River and its tributary, Black Creek. However, no intensive habitation horizons were identified at any of these sites, and it is unlikely that any intact subsurface features are present. All sites are ephemeral scatters of pottery and/or lithic debris. At 9BN1586, a lithic core and a few cortical flakes indicated at least some initial manufacture of tools. However, the lithics at the other sites include only late reduction flakes suggesting a focus on tool maintenance and perhaps later stages of tool production. Coastal Plain chert was by far the predominant lithic raw material, as only a few pieces of quartz or unidentified chert were recovered. The behaviors represented are short-term (temporary camps or procurement stations), and by their very nature are not likely to produce large amounts of diverse material or features. The behaviors that produced these sites likely tended to leave few materials behind and they appear to be ephemeral incidents or activities, which in turn left few significant contextual clues for our understanding of prehistory or history. They have also been partly disturbed by natural and human-induced post-depositional processes, most notably the pine bedding within the tract. Therefore, none of the identified archaeological resources are recommended eligible for the NRHP, and neither do they warrant further management under Section 106 of the NHPA.

6.2 Historic Resources

The historic resources identified during the architectural survey include one late nineteenth-century single-family dwelling (Resource 1), 24 early to mid-twentieth-century single-family dwellings (Resources 2 through 24, 26, and Resource 225086), and one late nineteenth to twentieth-century railroad corridor (Resource 25). We recommend Resources 1 through 24 not eligible for the NRHP due to lack of significance associated with events, individuals, design, and/or potential to contribute to additional historical knowledge. We recommend the previously recorded Resource 225086 eligible for the NRHP under Criterion C since this ca. 1930s cross-gabled bungalow maintains integrity of design, workmanship, and setting. We also recommend the Central of Georgia Rail Line eligible for the NRHP under Criterion A for its connection with transportation and railroad towns, and under Criterion C for distinctive characteristics of engineering. However, for both these recommended NRHP-eligible resources, there are no anticipated adverse effects. Resource 225086 will not be affected by the project undertaking due to distance from the tract as well as ample vegetation and non-historic development between the resource and proposed construction activities. Any affect to Resource 25 (the railroad) will be consistent with the current industrial and commercial use and setting of the rail line and will not adversely affect the integrity or significance of the resource. Therefore, no further management consideration of architectural resources in the project APE are warranted.

6.3 Management Summary and Conclusions

During the current investigation, Brockington identified five archaeological sites (9BN1586, 9BN1610, 9BN1611, 9BN1612, and 9BN1613), five archaeological isolated finds (Isolated Finds 1 through 5), and 26 historic resources within the APE of the 1,411.7-acre OEM Site project tract. Additionally, one previously recorded historic resource (Resource 225086) was re-visited. We recommend all archaeological resources and 25 of the 27 historic resources not eligible for the NRHP. The two recommended NRHP-eligible historic resources are the Central of Georgia Railroad and Resource 225086. No ad-

verse effects to these resources are anticipated. The planned ground-disturbing activities within the proposed tract should be allowed to proceed without further consideration for the management of cultural resources. Pending review and concurrence on these recommendations by both the regulating federal agency (USACE) and the Georgia SHPO, this undertaking can proceed as planned.

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Appendix A

Artifact Catalog – 2015 Investigations

Artifact Catalog

Brockington and Associates, Inc. uses the following proveniencing system. Proveniences 2 to 200 designate shovel tests. Controlled surface collections and 50 by 50 cm units are also designated by this provenience range. Proveniences 201 to 400 designate 1 by 1 m units done for testing purposes. For all provenience numbers, the numbers after the decimal point designate levels. Provenience X.0 is a surface collection at a shovel test or unit. X .1 designates level one, and X.2 designates level two. For example, 203.5 is Test Unit 203, level 5.

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Site Number	Page Number
9BN1586	1
Field Site Z4-1	5
Field Site Z4-2	5

Site Number: 9BN1586

Catalog #	Count	Weight (in g)	Artifact Description	Ceramic Type	Temporal Range	Comments
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SITE NUMBER: 9BN1586

Provenience Number:	2 . 0	Area Z8, Transect R, Shovel Test 2, N0, E0, Surface				
1	1	1	Whiteware, Undecorated Rim		c1820+	
2	1	2.3	Stoneware, Blue Annular White Glazed Buff-Bodied Body			
3	1	0.6	Stoneware, White Glazed Buff-Bodied Body			
4	1	2.5	Solarized - Amethyst Glass Container Body		1880-1915	
5	1	7	Aqua Molded Glass Container Base			
6	1	0.4	Colorless with Layered Pink Unidentifiable Form Tableglass Body			

Provenience Number:	3 . 0	Area Z8, Transect R, Shovel Test 2, N0, W20, Surface				
1	1	4.1	Plain Body Sherd, Fine/Medium Sand Tempered			

Provenience Number:	4 . 1	Area Z8, Transect R, Shovel Test 2, S0, W30, 0-15 cmbs				
1	1	0.2	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			

Provenience Number:	5 . 1	Area Z8, Transect R, Shovel Test 2, S10, W20, 20-30 cmbs				
1	1	1.1	Coastal Plain Chert Shatter			

Provenience Number:	6 . 1	Area Z8, Transect R, Shovel Test 2, S10, W40, 0-22 cmbs				
1	2	12.7	Plain Body Sherd, Grit Tempered			Smoothed Interior
2	3	1.2	Residual Sherd			
3	1	0.1	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
4	1	0.3	Coastal Plain Chert 1/4 inch Flake Fragment			

Site Number: 9BN1586

<i>Catalog #</i>	<i>Count</i>	<i>Weight (in g)</i>	<i>Artifact Description</i>	<i>Ceramic Type</i>	<i>Temporal Range</i>	<i>Comments</i>
Provenience Number: 7 . 1 Area Z8, Transect R, Shovel Test 1, S30, E0, 20-30 cmbs						
1	1	0.4	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 8 . 1 Area Z8, Transect R, Shovel Test 1, S30, W10, 0-33 cmbs						
1	1	0.05	Coastal Plain Chert Non-Cortical 1/4 inch Pressure Flake			
2	1	0.05	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 9 . 1 Area Z8, Transect R, Shovel Test 1, S30, W30, 0-25 cmbs						
1	1	2.8	Whiteware, Blue Underglaze Transfer Printed Body		c1820+	
Provenience Number: 10 . 1 Area Z8, Transect R, Shovel Test 1, S30, W40, 0-30 cmbs						
1	1	1.1	Solarized - Amethyst Glass Container Body		1880-1915	
2	1	3.5	Colorless Glass Container Body			
Provenience Number: 11 . 1 Area Z8, Transect R, Shovel Test 1, S30, E10, 0-20 cmbs						
1	2	0.3	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 12 . 1 Area Z8, Transect R, Shovel Test 1, S40, W10, 18-20 cmbs						
1	1	1.6	Coastal Plain Chert 1/2 inch Flake Fragment			
2	1	0.4	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
Provenience Number: 201 . 1 Area Z8, Test Unit 201, Level 1, 0-10 cmbd						
1	1	5.6	Plain Body Sherd, Fine/Medium Sand Tempered			
2	1	0.1	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
3	3	0.8	Coastal Plain Chert 1/4 inch Flake Fragment			
4	1	0.5	Coastal Plain Chert 1/4 inch Flake Fragment			
5	1	0.7	Brick, Fragment			
6	1	2.1	Aqua Molded Glass Container Body			
Provenience Number: 201 . 2 Area Z8, Test Unit 201, Level 2, 10-20 cmbd						
1	1	2	Residual Sherd			
2	2	1	Coastal Plain Chert 1/4 inch Flake Fragment			
3	2	6.2	Aqua Molded Glass Container Body			
Provenience Number: 201 . 3 Area Z8, Test Unit 201, Level 3, 20-30 cmbd						
1	5	3.8	Residual Sherd			
2	1	0.2	Coastal Plain Chert 1/4 inch Flake Fragment			

Site Number: 9BN1586

<i>Catalog #</i>	<i>Count</i>	<i>Weight (in g)</i>	<i>Artifact Description</i>	<i>Ceramic Type</i>	<i>Temporal Range</i>	<i>Comments</i>
Provenience Number: 201 . 4 Area Z8, Test Unit 201, Level 4, 30-40 cmbd						
1	2	36	Plain Body Sherd, Fine/Medium Sand Tempered			
2	2	0.6	Coastal Plain Chert 1/4 inch Flake Fragment			
3	2	123.7	Coastal Plain Chert Core			Mend
Provenience Number: 201 . 5 Area Z8, Test Unit 201, Level 5, 40-50 cmbd						
1	2	4.2	Plain Body Sherd, Fine/Medium Sand Tempered			
2	1	0.2	Translucent Quartz 1/4 inch Flake Fragment			
Provenience Number: 201 . 6 Area Z8, Test Unit 201, Level 6, 50-60 cmbd						
1	1	5.7	Plain Body Sherd, Fine/Medium Sand Tempered			
2	2	2.8	Residual Sherd			
3	2	0.4	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
4	1	0.2	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 202 . 1 Area Z8, Test Unit 202, Level 1, 0-10 cmbd						
1	1	23.7	Cord Marked Body Sherd, Grit Tempered	Deptford	Early/Middle Woodland (1000 BC-700 AD)	
2	1	3.7	Plain Body Sherd, Fine/Medium Sand Tempered			
3	1	1	Residual Sherd			
Provenience Number: 202 . 2 Area Z8, Test Unit 202, Level 2, 10-20 cmbd						
1	2	12.7	Cord Marked Body Sherd, Grit Tempered	Deptford	Early/Middle Woodland (1000 BC-700 AD)	
2	4	7.1	Residual Sherd			
3	1	3.3	Coastal Plain Chert 1/2 inch Flake Fragment			
4	1	0.9	Coastal Plain Chert 1/4 inch Flake Fragment			
5	1	0.1	Solarized - Amethyst Molded Glass Container Body		1880-1915	
Provenience Number: 202 . 3 Area Z8, Test Unit 202, Level 3, 20-30 cmbd						
1	1	2.1	Residual Sherd			
2	1	0.05	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 202 . 6 Area Z8, Test Unit 202, Level 6, 50-60 cmbd						
1	1	0.2	Coastal Plain Chert 1/4 inch Flake Fragment			
2	1	10.5	Coastal Plain Chert Shatter			
Provenience Number: 202 . 7 Area Z8, Test Unit 202, Level 7, 60-70 cmbd						
1	1	4.1	Coastal Plain Chert 1/2 inch Flake Fragment			
2	2	0.6	Coastal Plain Chert 1/4 inch Flake Fragment			
3	1	0.05	Coastal Plain Chert Non-Cortical 1/4 inch Pressure Flake			

Site Number: 9BN1586

<i>Catalog #</i>	<i>Count</i>	<i>Weight (in g)</i>	<i>Artifact Description</i>	<i>Ceramic Type</i>	<i>Temporal Range</i>	<i>Comments</i>
Provenience Number: 202 . 8 Area Z8, Test Unit 202, Level 8, 70-80 cmbd, Bog Iron Sample						
1	2	6.2	Indeterminate Stamped Body Sherd, Fine/Medium Sand Tempered			Mend
2	1	1	Residual Sherd			
3	1	1.1	Coastal Plain Chert Non-Cortical Core Reduction 1/4 inch Flake			
4	1	0.6	Translucent Quartz Non-Cortical Bifacial Reduction 1/4 inch Flake			
5	1	163.4	Concretion/Bog Iron			Discarded
Provenience Number: 203 . 1 Area Z8, Test Unit 203, Level 1, 0-10 cmbd						
1	2	1.1	Solarized - Amethyst Glass Container Body		1880-1915	
2	4	1.8	Colorless Glass Container Body			
3	1	3.6	Light Blue Window Glass Fragment			
4	4	9.9	Brick, Fragment			
Provenience Number: 203 . 2 Area Z8, Test Unit 203, Level 2, 10-20 cmbd						
1	2	1.5	Solarized - Amethyst Molded Glass Container Body		1880-1915	
2	2	0.4	Colorless Glass Container Body			
3	1	0.2	Light Blue Glass Fragment			
Provenience Number: 203 . 3 Area Z8, Test Unit 203, Level 3, 20-30 cmbd						
1	1	3.9	Coastal Plain Chert Cortical Bifacial Reduction 1/2 inch Flake			
2	2	2.3	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 203 . 4 Area Z8, Test Unit 203, Level 4, 30-40 cmbd						
1	1	8.4	Plain Rim Sherd, Fine/Medium Sand Tempered			
2	5	1.4	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 203 . 5 Area Z8, Test Unit 203, Level 5, 40-50 cmbd						
1	3	0.9	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 203 . 6 Area Z8, Test Unit 203, Level 6, 50-60 cmbd						
1	1	0.7	Coastal Plain Chert Cortical Bifacial Reduction 1/4 inch Flake			
2	3	0.8	Coastal Plain Chert 1/4 inch Flake Fragment			
3	2	0.3	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 204 . 1 Area Z8, Test Unit 204, Level 1, 0-10 cmbd						
1	2	0.3	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
2	1	0.8	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
3	1	0.8	Coastal Plain Chert 1/4 inch Flake Fragment			

Site Number: 9BN1586

<i>Catalog #</i>	<i>Count</i>	<i>Weight (in g)</i>	<i>Artifact Description</i>	<i>Ceramic Type</i>	<i>Temporal Range</i>	<i>Comments</i>
Provenience Number: 204 . 2 Area Z8, Test Unit 204, Level 2, 10-20 cmbd						
1	1	0.2	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
2	1	0.4	Coastal Plain Chert Non-Cortical 1/4 inch Thinning Flake			
3	1	0.4	Coastal Plain Chert 1/4 inch Flake Fragment			
4	1	0.3	Translucent Quartz Shatter			
Provenience Number: 204 . 3 Area Z8, Test Unit 204, Level 3, 20-30 cmbd						
1	1	11.3	Plain Body Sherd, Fine/Medium Sand Tempered			
2	1	0.3	Coastal Plain Chert Non-Cortical Core Reduction 1/4 inch Flake			
3	4	2	Coastal Plain Chert 1/4 inch Flake Fragment			
4	1	0.1	Coastal Plain Chert 1/4 inch Flake Fragment			
5	1	1.1	Coastal Plain Chert Shatter			
Provenience Number: 204 . 4 Area Z8, Test Unit 204, Level 4, 30-40 cmbd						
1	1	1.9	Residual Sherd			
2	1	3.2	Coastal Plain Chert Cortical Core Reduction 1/2 inch Flake			
3	1	0.2	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 204 . 5 Area Z8, Test Unit 204, Level 5, 40-50 cmbd						
1	1	18	Simple Stamped Body Sherd, Fine/Medium Sand Tempered	Deptford	Early/Middle Woodland (1000 BC-700 AD)	
2	1	7.1	Cord Marked Body Sherd, Grit Tempered	Deptford	Early/Middle Woodland (1000 BC-700 AD)	
3	1	4.2	Coastal Plain Chert 1/2 inch Flake Fragment			
4	1	0.5	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
5	2	0.5	Coastal Plain Chert 1/4 inch Flake Fragment			

SITE NUMBER: Field Site Z4-1

Provenience Number: 2 . 0 Area Z4, Transect R, Shovel Test 39, Surface						
1	1	89.9	Stoneware, White Glazed Buff-Bodied Body			

SITE NUMBER: Field Site Z4-2

Provenience Number: 2 . 1 Area Z4, Transect V, Shovel Test 22, 0-20 cmbs						
1	1	0.5	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			

Appendix B

Artifact Catalog – 2018 Investigations

Artifact Catalog: 2018 Survey and Testing

Brockington and Associates, Inc. uses the following proveniencing system. Provenience 1 designates general surface collections. Numbers after the decimal point designate subsequent surface collections, or trenches. Proveniences 2 to 200 designate shovel tests. Controlled surface collections and 50 by 50 cm units are also designated by this provenience range. Proveniences 201 to 400 designate 1 by 1 m units done for testing purposes. For all provenience numbers except 1, the numbers after the decimal point designate levels. Provenience X.0 is a surface collection at a shovel test or unit. X.1 designates level one, and X.2 designates level two. For example, 201.2 is Test Unit 201, level 2.

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Site Number	Page Number	Site Number	Page Number
9BNI610	1	9BNI613	3
9BNI611	1	Isolates	5
9BNI612	3	Projectile Point Forms	6

Site Number: 9BNI610

Catalog # Count Weight (in g) Artifact Description

Lithic Type

Temporal Range

Comments

SITE NUMBER: 9BNI610

Provenience Number: 1. 0 Surface Collection, Close to ST 601

1 1 0.9 Chert 1/4 inch Flake Fragment

Provenience Number: 2. 1 Shovel Test, 0-20 cmbs, 20m N of "Close to ST 601"

1 1 0.8 Coastal Plain Chert Projectile Point Tool

Late Woodland/Mississippian Triangular

Late Woodland - Mississippian (ca 250 - 1750 BP)

SITE NUMBER: 9BNI611

Provenience Number: 2. 1 Shovel Test 382, 0-40 cmbs

1 1 0.4 Coastal Plain Chert 1/4 inch Flake Fragment

Provenience Number: 3. 1 Shovel Test 383, 20-50 cmbs

1 1 0.1 Coastal Plain Chert Non-Cortical Bifacial Reduction
1/4 inch Flake

2 1 0.05 Coastal Plain Chert 1/4 inch Flake Fragment

Provenience Number: 4. 1 Shovel Test 383, 20m West, 0-35 cmbs

1 1 0.8 Coastal Plain Chert 1/4 inch Flake Fragment

Provenience Number: 5. 1 Shovel Test 410, 0-35 cmbs

1 1 0.4 Coastal Plain Chert 1/4 inch Flake Fragment

Provenience Number: 6. 1 Shovel Test 411, 20-50 cmbs

1 1 0.05 Coastal Plain Chert 1/4 inch Flake Fragment

Site Number: 9BN1611

<i>Catalog #</i>	<i>Count</i>	<i>Weight (in g)</i>	<i>Artifact Description</i>	<i>Lithic Type</i>	<i>Temporal Range</i>	<i>Comments</i>
Provenience Number: 7 . 1 Shovel Test 411, 20m North, 0-45 cmbd						
1	1	0.3	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
Provenience Number: 201 . 1 Test Unit 201, Level 1, 0-10 cmbd						
1	1	0.05	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 201 . 2 Test Unit 201, Level 2, 10-20 cmbd						
1	1	0.5	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 201 . 4 Test Unit 201, Level 4, 30-40 cmbd						
1	1	0.3	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
Provenience Number: 201 . 5 Test Unit 201, Level 5, 40-50 cmbd						
1	1	5.3	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/2 inch Flake			
2	2	1	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
3	1	3.2	Coastal Plain Chert 1/2 inch Flake Fragment			
4	1	0.05	Coastal Plain Chert 1/4 inch Flake Fragment			
5	3	0.4	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 201 . 6 Test Unit 201, Level 6, 50-60 cmbd						
1	1	0.1	Coastal Plain Chert 1/4 inch Flake Fragment			
2	1	0.3	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
3	2	0.05	Charcoal			
Provenience Number: 201 . 7 Test Unit 201, Level 7, 60-70 cmbd						
1	1	0.3	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 201 . 8 Test Unit 201, Level 8, 70-80 cmbd						
1	1	0.05	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 202 . 4 Test Unit 202, Level 4, 30-40 cmbd						
1	1	0.05	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
2	1	0.05	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 202 . 7 Test Unit 202, Level 7, 60-70 cmbd						
1	1	1.6	Residual Sherd, Sand Tempered			

Site Number: 9BN1612

<i>Catalog #</i>	<i>Count</i>	<i>Weight (in g)</i>	<i>Artifact Description</i>	<i>Lithic Type</i>	<i>Temporal Range</i>	<i>Comments</i>
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SITE NUMBER: 9BN1612

<i>Provenience Number:</i>						
	2 . 1		Shovel Test 259, 0-35 cmbs			
1	1	4.6	Coastal Plain Chert 3/4 inch Flake Fragment			
2	1	0.2	Coastal Plain Chert 1/4 inch Flake Fragment			
3	1	0.2	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
4	1	0.05	Chert 1/4 inch Flake Fragment			
5	1	0.5	Milky Quartz Shatter			
6	3	8.2	Check Stamped Body Sherd, Coarse Sand Tempered			Mends

<i>Provenience Number:</i>						
	201 . 3		Test Unit 201, Level 3, 20-30 cmbd			
1	1	0.2	Coastal Plain Chert 1/4 inch Flake Fragment			

SITE NUMBER: 9BN1613

<i>Provenience Number:</i>						
	2 . 0		Shovel Test 142, Surface			
1	1	32.7	Whiteware, Underglaze Hand Painted Plate Rim to Base	c1820+		
2	1	54	Ironstone, Undecorated Hollowware Base	1815 - 1900		Partial maker's mark: "The Potte...Co." "U.S.A." "East Liverpool Ohio"

<i>Provenience Number:</i>						
	2 . 1		Shovel Test 142, 0-28 cmbs			
1	1	5.8	Plain Body Sherd, Fine/Medium Sand Tempered			
2	1	1.8	Residual Sherd, Sand Tempered			

<i>Provenience Number:</i>						
	3 . 1		Shovel Test 142, 10m South, 0-50 cmbs			
1	1	0.05	Coastal Plain Chert Non-Cortical 1/4 inch Pressure Flake			

<i>Provenience Number:</i>						
	4 . 1		Shovel Test 164, 0-25 cmbs			
1	1	0.4	Coastal Plain Chert 1/4 inch Flake Fragment			

<i>Provenience Number:</i>						
	5 . 1		Shovel Test 164, 10m South, 25-60 cmbs			
1	1	0.5	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			

<i>Provenience Number:</i>						
	6 . 1		Shovel Test 164, 20m South, 0-30 cmbs			
1	2	0.5	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			

<i>Provenience Number:</i>						
	7 . 1		Shovel Test 165, 0-30 cmbs			
1	1	0.8	Coastal Plain Chert Projectile Point Tool	Late Woodland/Mississippian Triangular	Late Woodland - Mississippian (ca 250 - 1750 BP)	

Site Number: 9BN1613

<i>Catalog #</i>	<i>Count</i>	<i>Weight (in g)</i>	<i>Artifact Description</i>	<i>Lithic Type</i>	<i>Temporal Range</i>	<i>Comments</i>
Provenience Number: 201 . 1 Test Unit 201, Level 1, 0-10 cmbd						
1	1	0.3	Coastal Plain Chert 1/4 inch Flake Fragment			
2	1	6.4	Light Green Machine-Made Glass Bottle Body		1933-	Partial label: "Cola - Caramel" RC Cola bottle
3	1	8.4	Colorless Machine-Made Glass Container Base		1904-	
4	1	12.4	Colorless Molded Glass Container Body			
5	2	5.4	Colorless Glass Container Body			
6	1	0.2	Plastic Unidentified Object Fragment			Blue
Provenience Number: 201 . 2 Test Unit 201, Level 2, 10-20 cmbd						
1	1	1.3	Amber Machine-Made Glass Bottle Base		1904-	
2	1	6.8	Light Green Machine-Made Glass Bottle Body		1904-	
3	1	3.5	Light Green Machine-Made Glass Bottle Neck		1904-	
4	1	3.5	Colorless Machine-Made Glass Container Body		1904-	
5	2	15.3	Colorless Glass Container Body			
6	1	4	Iron Washer			
7	1	0.05	Iron Unidentified Fragment			
8	1	3.1	Concrete Fragment			
Provenience Number: 201 . 3 Test Unit 201, Level 3, 20-30 cmbd						
1	2	0.9	Whiteware, Undecorated Body		c1820+	Mends
2	1	7.2	Colorless Machine-Made Glass Embossed Bottle Body		1904-	Floral decoration
3	2	15.2	Colorless Machine-Made Glass Container Body		1904-	Embossed lettering
4	1	2.7	Colorless Molded Glass Container Body			
5	2	0.05	Plastic Unidentified Object Fragment			White
6	2	0.05	Plastic Unidentified Object Fragment			Brown
Provenience Number: 201 . 4 Test Unit 201, Level 4, 30-40 cmbd						
1	1	2.1	Colorless Machine-Made Glass Container Base		1904-	
2	1	0.4	Whiteware, Undecorated Body		c1820+	
3	1	0.3	Iron Unidentified Fragment			
Provenience Number: 201 . 5 Test Unit 201, Level 5, 40-50 cmbd						
1	1	0.05	Coastal Plain Chert 1/4 inch Flake Fragment			
Provenience Number: 202 . 3 Test Unit 202, Level 3, 20-30 cmbd						
1	1	0.2	Coastal Plain Chert 1/4 inch Flake Fragment			
2	1	0.05	Coastal Plain Chert 1/4 inch Flake Fragment			

Site Number: 9BN1613

<i>Catalog #</i>	<i>Count</i>	<i>Weight (in g)</i>	<i>Artifact Description</i>	<i>Lithic Type</i>	<i>Temporal Range</i>	<i>Comments</i>
Provenience Number: 202 . 4 Test Unit 202, Level 4, 30-40 cmbd						
1	1	12.8	Rectilinear Complicated Stamped Notched Rim Sherd, Very Coarse Sand Tempered			
2	1	0.5	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			

Provenience Number: 202 . 5 Test Unit 202, Level 5, 40-50 cmbd						
1	1	0.05	Coastal Plain Chert 1/4 inch Flake Fragment			
2	1	0.1	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake			
3	2	3.3	Residual Sherd, Sand Tempered			

SITE NUMBER: ISO 3

Provenience Number: 2 . 1 Shovel Test 70, 0-30 cmbs						
1	1	0.2	Coastal Plain Chert 1/4 inch Flake Fragment			

SITE NUMBER: ISO 4

Provenience Number: 1 . 0 Surface Collection						
1	1	0.05	Coastal Plain Chert Non-Cortical 1/4 inch Pressure Flake			
2	1	0.2	Coastal Plain Chert Cortical Bifacial Reduction 1/4 inch Flake			

Provenience Number: 2 . 1 Shovel Test 213, 0-33 cmbs						
1	1	1.4	Coastal Plain Chert Retouched Flake Tool			

SITE NUMBER: ISO 5

Provenience Number: 2 . 1 Shovel Test 380, 0-40 cmbs						
1	1	12.6	Plain Body Sherd, Fine/Medium Sand Tempered			

Projectile Point/Hafted Biface Forms

Site Number: 9BN1610

Provenience #: 2 . 1

Catalog Number: 1

All measurements are in mm.

Complete Tool Length: 25.7

Complete Tool Width: 13.7

Complete Tool Thickness: 3.2

Haft Element Length: 0.0

Haft Element Width: 0.0

Haft Element Thickness: 0

Shoulder Length: 0

Lithic Type: Coastal Plain Chert

Point Type: Late Woodland/Mississippian Triangular

Period: Late Woodland - Mississippian (ca 250 - 1750 BP)

Remarks:



Actual Size/Scanned Image

Site Number: 9BN1613

Provenience #: 7 . 1

Catalog Number: 1

All measurements are in mm.

Complete Tool Length: 27.7

Complete Tool Width: 0.0

Complete Tool Thickness: 3.0

Haft Element Length: 0.0

Haft Element Width: 0.0

Haft Element Thickness: 0

Shoulder Length: 0

Lithic Type: Coastal Plain Chert

Point Type: Late Woodland/Mississippian Triangular

Period: Late Woodland - Mississippian (ca 250 - 1750 BP)

Remarks:



Actual Size/Scanned Image

Appendix C

Georgia Archaeological Site Forms

GEORGIA ARCHAEOLOGICAL SITE FORM

1990

Official Site Number: 9BN1586

Institutional Site Number: Z8-1 Site Name:

County: Bryan Map Name: Eden, GA USGS or USNOAA

UTM Zone: 17S UTM East: 0459180 UTM North: 3555593

Owner: Butler Tract LLC Address: PO Box 1408, Savannah, GA 31402

Site Length: 50 meters Width: 50 meters Elevation: +/- 9 meters

Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown

Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur

Standing Architecture: 1. Present 2. Absent

Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater

Midden: 1. Present 2. Absent 3. Unknown Features: 1. Present 2. Absent 3. Unknown

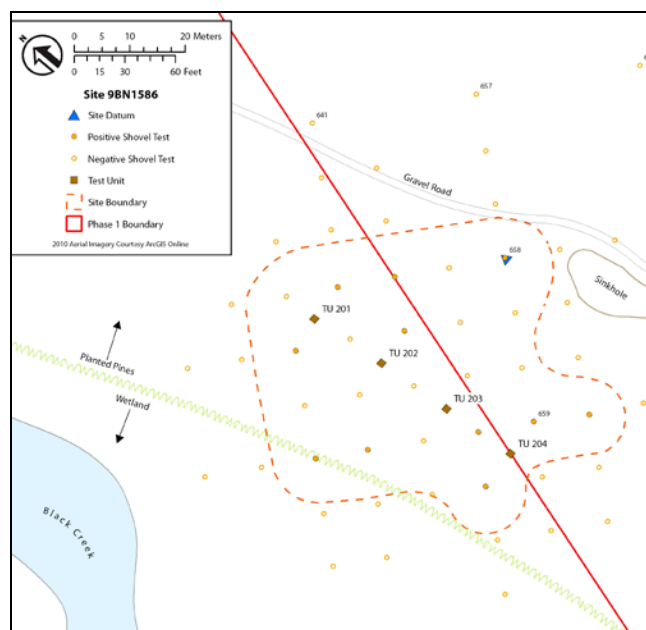
Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown

Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Multi-component scatter

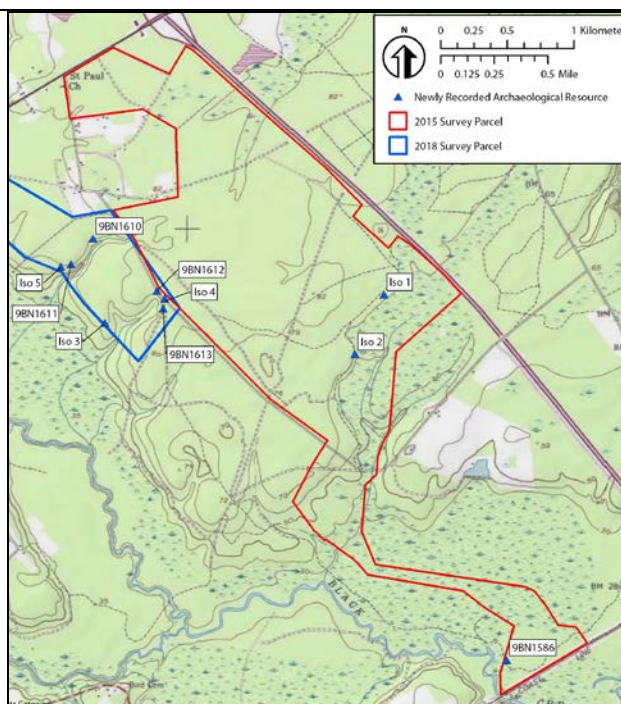
Topography (Ridge, Terrace, etc.): Terrace

Current Vegetation (Woods, Pasture, etc.): Planted pine

Additional information: 11/50 positive STs excavated at 10 m interval. 4 1-x-1 m Test Units Artifacts recovered 0-80 cm (A, A/E, or E horizon)



SKETCH MAP (Include sites, roads, streams, landmarks)



OFFICIAL MAP (Xerox of proper map)

State Site Number: 9BN1586 Institutional Site Number: Z8-1

Public Status: 1. National Historic Landmark 2. National Natural Landmark
3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible 2. Recommended Ineligible 3. Recommended Eligible
4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed 2. Cultivated 3. Eroded 4. Submerged
5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited
9. Graded 10. Razed

Preservation Prospects: 1. Safe 2. Endangered by: Future development of tract
3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: David M. Franz Affiliation: Brockington and Associates, Inc. Date: 3-31-2015

Report Title: Phase I Intensive Cultural Resources Survey and Phase II Archaeological Testing for the 1,411.7-acre Bryan County OEM Site, Bryan County, Georgia.

Other Reports: _____

Artifacts Collected: 19th-20th c. ceramics and glass; prehistoric quartz and chert debitage; sand-tempered pottery

Location of Collections: University of Georgia
Athens, Georgia

Location of Field Notes: University of Georgia
Athens, Georgia

Private Collections: _____

Name: _____ Address: _____

CULTURAL AFFINITY

Cultural Periods: Middle Woodland; 19th-20th c.

Phases: Deptford

FORM PREPARATION AND REVISION

Date	Name	Institutional Affiliation
<u>3-31-15</u>	<u>David M. Franz</u>	<u>Brockington and Associates, Inc.</u>
<u>7-28-18</u>	<u>Carolyn Rock</u>	<u>Brockington and Associates, Inc.</u>

GEORGIA ARCHAEOLOGICAL SITE FORM

1990

Official Site Number: 9BN1610

Institutional Site Number: FS 1 Site Name:

County: Bryan Map Name: Eden 1977 USGS or USNOAA

UTM Zone: 17N UTM East: 456092 UTM North: 3558758

Owner: Address:

Site Length: 40 meters Width: 20 meters Elevation: +- 21 meters

Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown

Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur

Standing Architecture: 1. Present 2. Absent

Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater

Midden: 1. Present 2. Absent 3. Unknown Features: 1. Present 2. Absent 3. Unknown

Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown

Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Lithic Scatter

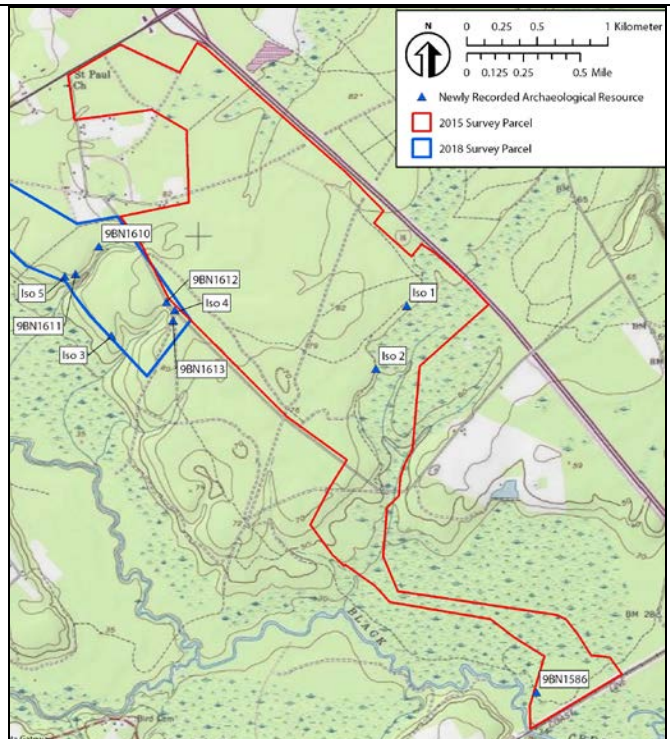
Topography (Ridge, Terrace, etc.): Terrace above intermittent drainage

Current Vegetation (Woods, Pasture, etc.): Young planted pines-Clearcut three years previously

Additional information:



SKETCH MAP (Include sites, roads, streams, landmarks)



OFFICIAL MAP (Xerox of proper map)

State Site Number: 9BN1610 Institutional Site Number: FS 1

Public Status: 1. National Historic Landmark 2. National Natural Landmark
3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible **2. Recommended Ineligible** 3. Recommended Eligible
4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed **2. Cultivated** **3. Eroded** 4. Submerged
5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited
9. Graded 10. Razed

Preservation Prospects: 1. Safe **2. Endangered by: Building Construction**
3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Carolyn Rock Affiliation: Brockington and Associates, Inc. Date: 7-28-2018

Report Title: Phase I Intensive Cultural Resources Survey and Phase II Archaeological Testing for the 1,411.7-acre
Bryan County OEM Site, Bryan County, Georgia.

Other Reports: _____

Artifacts Collected: Triangular PPK (Late Woodland/Mississippian (n=1), Chert Flake (n=1))

Location of Collections: University of Georgia
Athens, Georgia

Location of Field Notes: University of Georgia
Athens, Georgia

Private Collections: _____

Name: _____ Address: _____

CULTURAL AFFINITY

Cultural Periods: Late Woodland/Mississippian

Phases: _____

FORM PREPARATION AND REVISION

Date	Name	Institutional Affiliation
<u>6-18-18</u>	<u>James M. Page</u>	<u>Brockington and Associates, Inc.</u>
<u>7-28-18</u>	<u>Carolyn Rock</u>	<u>Brockington and Associates, Inc.</u>

GEORGIA ARCHAEOLOGICAL SITE FORM

1990

Official Site Number: 9BN1611

Institutional Site Number: FS 2 Site Name:

County: Bryan Map Name: Eden 1977 USGS or USNOAA

UTM Zone: 17N UTM East: 455927 UTM North: 3558566

Owner: Address:

Site Length: 70 meters Width: 50 meters Elevation: +- 21 meters

Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown

Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur

Standing Architecture: 1. Present 2. Absent

Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater

Midden: 1. Present 2. Absent 3. Unknown Features: 1. Present 2. Absent 3. Unknown

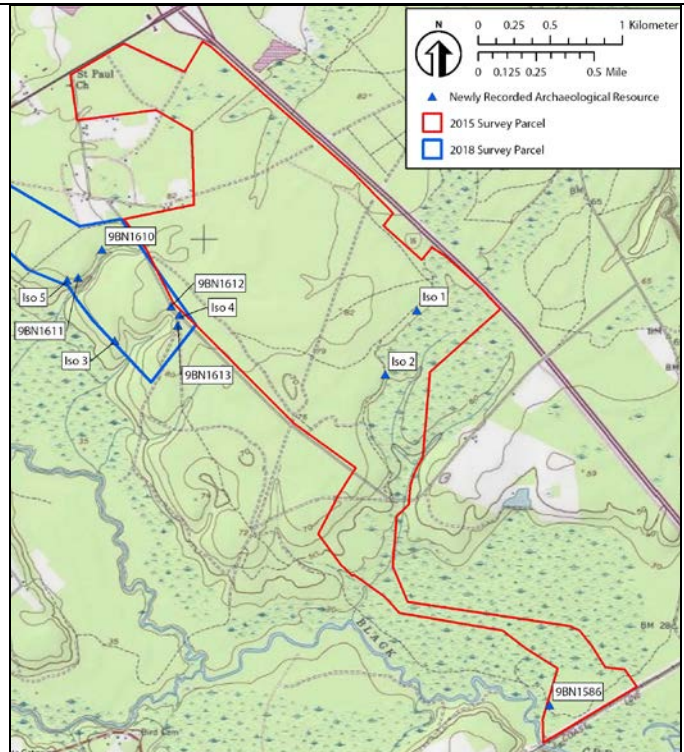
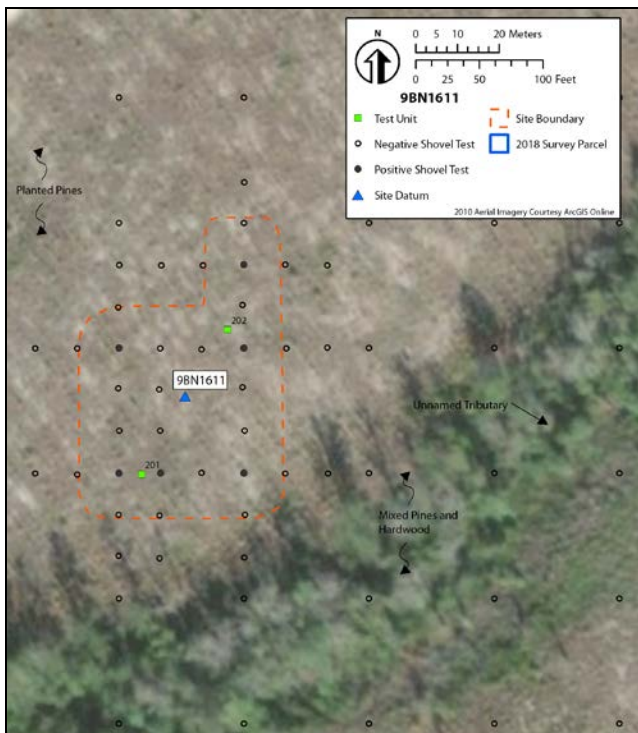
Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown

Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Lithic Scatter

Topography (Ridge, Terrace, etc.): Terrace above intermittent drainage

Current Vegetation (Woods, Pasture, etc.): Young planted pines-clearcut three years previously

Additional information: Phase I Survey & Phase II testing (2 1x1-m units); few artifact and no features.



SKETCH MAP (Include sites, roads, streams, landmarks)

OFFICIAL MAP (Xerox of proper map)

State Site Number: 9BN1611 Institutional Site Number: FS 2

Public Status: 1. National Historic Landmark 2. National Natural Landmark
3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible **2. Recommended Ineligible** 3. Recommended Eligible
4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed **2. Cultivated** **3. Eroded** 4. Submerged
5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited
9. Graded 10. Razed

Preservation Prospects: 1. Safe **2. Endangered by: Building Construction**
3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Carolyn Rock Affiliation: Brockington and Associates, Inc. Date: 7-28-2018

Report Title: Phase I Intensive Cultural Resources Survey and Phase II Archaeological Testing for the 1,411.7-acre
Bryan County OEM Site, Bryan County, Georgia.

Other Reports: _____

Artifacts Collected: Several Chert Flakes

Location of Collections: Brockington and Associates, Inc. (Temporary)
Athens, Georgia

Location of Field Notes: Brockington and Associates, Inc. (Temporary)
Athens, Georgia

Private Collections: _____

Name: _____ Address: _____

CULTURAL AFFINITY

Cultural Periods: Unknown Prehistoric

Phases: _____

FORM PREPARATION AND REVISION

Date	Name	Institutional Affiliation
<u>6-18-18</u>	<u>James M. Page</u>	<u>Brockington and Associates, Inc.</u>
<u>7-28-18</u>	<u>Carolyn Rock</u>	<u>Brockington and Associates, Inc.</u>

GEORGIA ARCHAEOLOGICAL SITE FORM

1990

Official Site Number: 9BN1612

Institutional Site Number: FS 3 Site Name:

County: Bryan Map Name: Eden 1977 USGS or USNOAA

UTM Zone: 17N UTM East: 456572 UTM North: 3558368

Owner: Address:

Site Length: 20 meters Width: 20 meters Elevation: +- 24 meters

Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown

Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur

Standing Architecture: 1. Present 2. Absent

Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater

Midden: 1. Present 2. Absent 3. Unknown Features: 1. Present 2. Absent 3. Unknown

Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown

Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Prehistoric Artifact Scatter

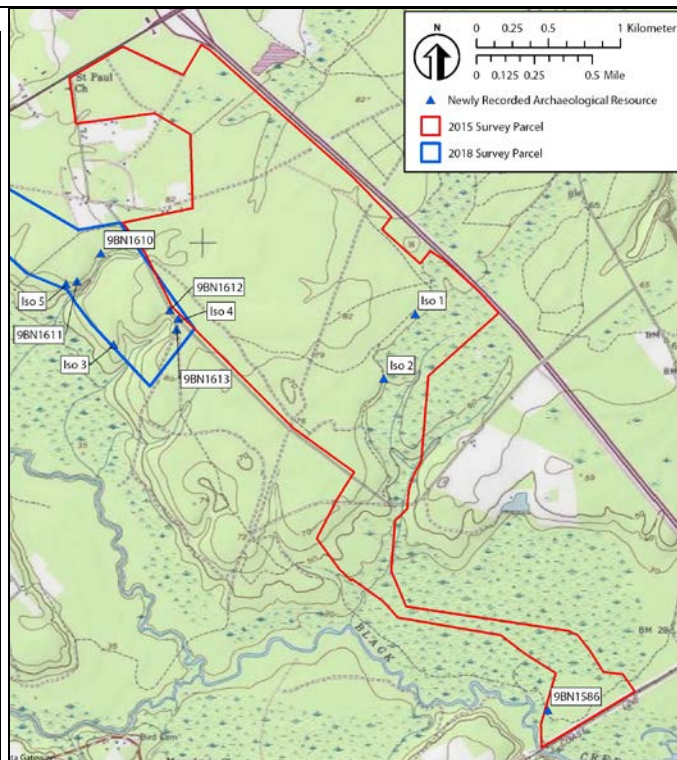
Topography (Ridge, Terrace, etc.): Terrace above an intermittent drainage

Current Vegetation (Woods, Pasture, etc.): Young planted pines-clearcut three years previously

Additional information: Phase I Survey & Phase II testing (one 1x1-m unit); few artifact and no features.



SKETCH MAP (Include sites, roads, streams, landmarks)



OFFICIAL MAP (Xerox of proper map)

State Site Number: 9BN1612 Institutional Site Number: FS 3

Public Status: 1. National Historic Landmark 2. National Natural Landmark
3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible **2. Recommended Ineligible** 3. Recommended Eligible
4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed **2. Cultivated** **3. Eroded** 4. Submerged
5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited
9. Graded 10. Razed

Preservation Prospects: 1. Safe **2. Endangered by: Building Construction**
3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Carolyn Rock Affiliation: Brockington and Associates, Inc. Date: 7-28-2018

Report Title: _____

Other Reports: _____

Artifacts Collected: Check-Stamped Sherds (n=3), Chert Flakes (n=3)

Location of Collections: University of Georgia
Athens, Georgia

Location of Field Notes: University of Georgia
Athens, Georgia

Private Collections: _____

Name: _____ Address: _____

CULTURAL AFFINITY

Cultural Periods: Unspecified Woodland/Mississippian

Phases: _____

FORM PREPARATION AND REVISION

Date	Name	Institutional Affiliation
<u>6-18-18</u>	<u>James M. Page</u>	<u>Brockington and Associates, Inc.</u>
<u>7-28-18</u>	<u>Carolyn Rock</u>	<u>Brockington and Associates, Inc.</u>

GEORGIA ARCHAEOLOGICAL SITE FORM

1990

Official Site Number: 9BN1613

Institutional Site Number: FS 4 Site Name:

County: Bryan Map Name: Eden 1977 USGS or USNOAA

UTM Zone: 17N UTM East: 456617 UTM North: 3558236

Owner: Address:

Site Length: 60 meters Width: 50 meters Elevation: +- 24 meters

Orientation: 1. N-S 2. E-W 3. NE-SW 4. NW-SE 5. Round 6. Unknown

Kind of Investigation: 1. Survey 2. Testing 3. Excavation 4. Documentary 5. Hearsay 6. Unknown 7. Amateur

Standing Architecture: 1. Present 2. Absent

Site Nature: 1. Plowzone 2. Subsurface 3. Both 4. Only Surface Known 5. Unknown 6. Underwater

Midden: 1. Present 2. Absent 3. Unknown Features: 1. Present 2. Absent 3. Unknown

Percent Disturbance: 1. None 2. Greater than 50 3. Less than 50 4. Unknown

Type of Site (Mill, Mound, Quarry, Lithic Scatter, etc.): Historic and Prehistoric Artifact Scatter

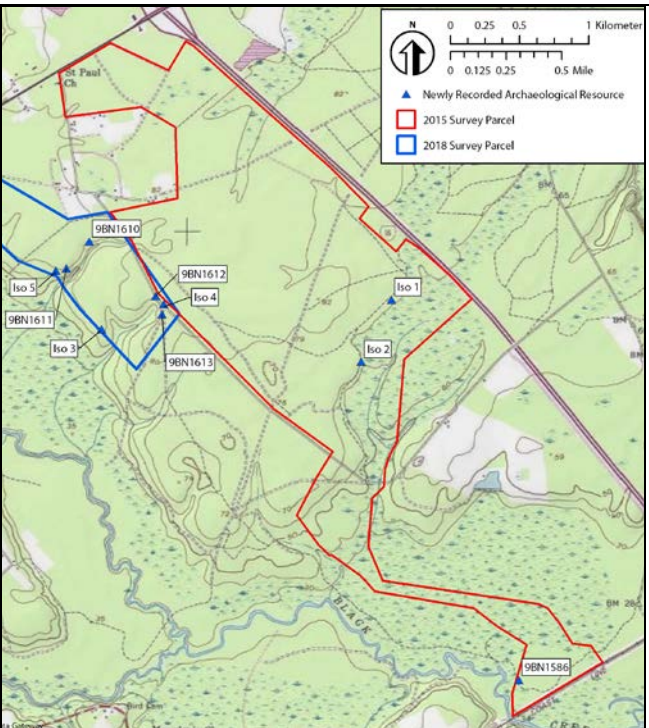
Topography (Ridge, Terrace, etc.): Terrace above an intermittent drainage

Current Vegetation (Woods, Pasture, etc.): Young planted pines-Clearcut three years hence

Additional information: Phase I Survey & Phase II testing (2 1x1-m units); few artifact and no features.



SKETCH MAP (Include sites, roads, streams, landmarks)



OFFICIAL MAP (Xerox of proper map)

State Site Number: 9BN1613 Institutional Site Number: FS 4

Public Status: 1. National Historic Landmark 2. National Natural Landmark
3. Georgia Register 4. Georgia Historic Trust 5. HABS 6. HAER

National Register Standing: 1. Determined Eligible **2. Recommended Ineligible** 3. Recommended Eligible
4. Nominated 5. Listed 6. Unknown 7. Removed

National Register Level of Significance: 1. Local 2. State 3. National

Preservation State (Select up to Two): 1. Undisturbed **2. Cultivated** **3. Eroded** 4. Submerged
5. Lake Flooded 6. Vandalized 7. Destroyed 8. Redeposited
9. Graded 10. Razed

Preservation Prospects: 1. Safe **2. Endangered by: Building Construction**
3. Unknown

RECORD OF INVESTIGATIONS

Supervisor: Carolyn Rock Affiliation: Brockington and Associates, Inc. Date: 7-28-2018

Report Title: Phase I Intensive Cultural Resources Survey and Phase II Archaeological Testing for the 1,411.7-acre Bryan County OEM Site, Bryan County, Georgia.

Other Reports: _____

Artifacts Collected: Whiteware, Ironstone, several chert flakes, broken Triangular Late Woodland/Mississippian PPK (n=1), plain sand-tempered sherds and one rectilinear complicated stamped sherd.

Location of Collections: University of Georgia
Athens, Georgia

Location of Field Notes: University of Georgia
Athens, Georgia

Private Collections: _____

Name: _____ Address: _____

CULTURAL AFFINITY

Cultural Periods: Late 19th to middle 20th Century and unspecified Late Woodland/Mississippian

Phases: _____

FORM PREPARATION AND REVISION

Date	Name	Institutional Affiliation
<u>6-18-18</u>	<u>James M. Page</u>	<u>Brockington and Associates, Inc.</u>
<u>7-28-18</u>	<u>Carolyn Rock</u>	<u>Brockington and Associates, Inc.</u>

Appendix D

Resumes of Key Personnel

ALEX Y. SWEENEY SAVANNAH OFFICE BRANCH MANAGER/PROJECT MANAGER/SENIOR ARCHAEOLOGIST

EDUCATION

M.A. in Anthropology (2003), University of South Carolina

B.S. in Anthropology (1997), Radford University

APPOINTMENTS/OFFICES

Georgia National Register of Historic Places Review Board Member (2014-present)

AREAS OF SPECIALIZATION

Contact and Post-Contact Studies

Historical Documentation

Integrated Cultural Resources Management Plans

Prehistoric and Historic Ceramic Analysis

Archaeological Spatial Analysis

Cultural Resources Impact Analysis

State Historic Preservation Office (SHPO) Consultation

PROFESSIONAL AND COMMITTEE MEMBERSHIPS

Register of Professional Archaeologists (RPA)

Conference Society for Georgia Archaeology

Society of American Military Engineers

Southeastern Archaeological Society of American Archaeology

Society of Historical Archaeology

AWARDS AND GRANTS

Sigma Xi, Scientific Research Society grant-in-aid of research recipient (2002)

Archaeological Society of South Carolina, Graduate student grant-in-aid recipient (2002)

PROFESSIONAL POSITIONS

Brockington and Associates, Inc.: Branch Manager, Project Manager, Senior Archaeologist (1997-present)

Georgia National Register of Historic Places: Review Board Member (2014-present)

SELECT PROJECTS, PUBLICATIONS, PRESENTATIONS AND EXPERIENCE

n.d. (in press) Author, *Cultural Continuity and Change: Archaeological Research at Yamasee Primary Towns in South Carolina*. Book chapter-The Yamasee Indians: From Florida to South Carolina.

2017 Project Manager, *Cowart's Landing Solar Facility Cultural Resources Survey, Bibb County, Georgia*. Prepared for Georgia Power Company, Atlanta, Georgia.

2017 Project Manager, *International Paper Treatment Facility Cultural Resources Survey and Archaeological Testing, Chatham County, Georgia*. Prepared for International Paper, Savannah, Georgia, and the Georgia State Historic Preservation Office.

2017 Project Manager, *Genuine Parts Expansion Cultural Resources Survey, Kent County, Michigan*. Prepared for Genuine Parts Company, Atlanta, Georgia.

2017 Program Manager, *Georgia Ports Authority Multimodal Connector Cultural Resources Survey, Chatham County, Georgia*. Prepared for Moffat & Nichol, Savannah, Georgia, and the Georgia State Historic Preservation Office.

- 2017 Project Manager, *Cultural Resources Survey of the 190-Acre Imerys Mine Expansion, Macon County Georgia*. Prepared for Imerys Primary Raw Material Sourcing, Andersonville, Georgia, and the Georgia State Historic Preservation Office.
- 2017 Program Manager, *Cultural Resources Survey of over 6500 Acres, Phase II Testing of Six Archaeological Sites, and Delineation of 18 Archaeological Sites at U.S. Army Garrison, Fort Stewart, Georgia*. Prepared for FS/HAAF Cultural Resource Management Specialist and the USACE, Savannah.
- 2016 Author, *The Yamasee Indians of Early Carolina*. Book chapter-Archaeology in South Carolina, Exploring the Hidden Heritage of the Palmetto State.
- 2016 Author, *Chibaryio! Navigating Cultural Resources Compliance on U.S. Military Installations in Japan*. Presentation presented at the Society of American Archaeology Conference, Orlando Florida.
- 2016 Project Manager, *Archaeological Inventory Survey of the Kanna Watershed, Kin-cho, Okinawa Prefecture, Japan*. Prepared for the United States Marine Corps, Base Camp Smedley D. Butler.
- 2016 Program Manager, *Phase I Archaeological Survey – Test Digs at Torii Station, Okinawa Prefecture, Japan*. Prepared for the Department of the Army, United States Army Garrison Okinawa, Directorate of Public Works, Torii Station, Japan, and the Yomitan Board of Education.
- 2016 Project Manager, *Integrated Cultural Resources Management Plan Update for USAG Okinawa Facilities*. Prepared for the Department of the Army, United States Army Garrison Okinawa, Directorate of Public Works, Torii Station, Japan.
- 2016 Project Manager, *Vogtle Transmission Line Site Condition Assessments, Burke County, Georgia*. Prepared for Georgia Power Company, Atlanta, Georgia.
- 2016 Project Manager, *Cadley Road GRAD Investigation, Warren County, Georgia*. Prepared for Resource and Land Consultants, Savannah, Georgia.
- 2016 Project Manager, *Cultural Resources Survey of 6.34 Acres of the Savannah State University Italian Club Tract, Chatham County, Georgia*. Prepared for Savannah State University, Georgia and the Georgia State Historic Preservation Office.
- 2016 Project Manager, *Cultural Resources Survey of 2.5 Acres of the Savannah State University Expansion Tract, Chatham County, Georgia*. Prepared for Savannah State University, Georgia and the Georgia State Historic Preservation Office.
- 2016 Program Manager, *Cultural Resources Data Recovery Excavations at Colonels Island, Glynn County, Georgia*. Prepared for the Georgia Ports Authority and the Georgia State Historic Preservation Office.
- 2015 Project Manager, *Cultural Asset Survey Data Recovery Excavations at One SATCOM Facility, Torii Station, Okinawa Prefecture, Japan*. Prepared for the Department of the Army, United States Army Garrison Okinawa, Directorate of Public Works, Torii Station, Japan and the Yomitan Board of Education.
- 2015 Project Manager, *Archaeological Testing for the 1st of the 1st /Special Forces Group Augmentation Facility, Yomitan-son, Okinawa Prefecture, Japan*. Prepared for the for the Department of the Army, United States Army Garrison Okinawa, Directorate of Public Works, Torii Station, Japan and the Yomitan Board of Education.
- 2015 Researcher for the *Historical Architectural Documentation of Significant Buildings and Structures on Multiple USAG Japan Facilities, Hiroshima, Kanagawa, and Tokyo Prefectures, Japan*. Prepared for the for the Department of the Army, United States Army Garrison Japan, Directorate of Public Works, Camp Zama, Japan.
- 2015 Project Manager, *Archaeological Survey of the 1st of the 1st /Special Forces Group Augmentation Facility, Yomitan-son, Okinawa Prefecture, Japan*. Prepared for the for the Department of the Army, United States Army Garrison Okinawa, Directorate of Public Works, Torii Station, Japan and the Yomitan Board of Education.
- 2015 Project Manager, *Cultural Resources Survey of the Red Bluff Plantation Tract, Jasper County, South Carolina*. Prepared for American Timberlands Company, Pawleys Island, South Carolina and the South Carolina State Historic Preservation Office.
- 2015 Project Manager, *AREP Solar Farms Project, Tattnall County, Georgia*. Prepared for Scatek Solar North America.
- 2015 Author, *The Yamasee Capitals of South Carolina: Archaeological Research at Pocotaligo and Altamaha Town*. Presentation presented at the Yamasee Indians: From Florida to South Carolina Conference.

- 2015 Program Manager, *Bryan County Industrial Tract, Bryan County, Georgia*. Prepared for the Georgia Board of Economic Development and the Georgia State Historic Preservation Office.
- 2015 Project Manager, *Integrated Cultural Resources Management Plan Update for North Dakota U.S. Army Reserve Centers*. Prepared for the 88th Regional Support and the North Dakota State Historic Preservation Office.
- 2015 Project Manager, *Integrated Cultural Resources Management Plan Update for South Dakota U.S. Army Reserve Centers*. Prepared for the 88th Regional Support and the South Dakota State Historic Preservation Office.
- 2015 Project Manager, *Integrated Cultural Resources Management Plan Update for Montana U.S. Army Reserve Centers*. Prepared for the 88th Regional Support and the Montana State Historic Preservation Office.
- 2015 Project Manager, *Integrated Cultural Resources Management Plan Update for Utah U.S. Army Reserve Centers*. Prepared for the 88th Regional Support and the Utah State Historic Preservation Office.
- 2014 Program Manager, *Inventory of Historic Structures and Traditional Cultural Properties/ Archaeological Inventory Survey Planning, Chatan-cho, Kadena-cho, Naba-shi, Uruma-shi, Yomitan-son, Okinawa Prefecture, Japan*. Prepared for the for the Department of the Army, United States Army Garrison Okinawa, Directorate of Public Works, Torii Station, Japan.
- 2014 Co-author and Senior Archaeologist, *Integrated Cultural Resources Management Plan Update for all USAG Japan DPW facilities, Kanagawa, Hiroshima, and Tokyo Prefectures*. Prepared for the Department of the Army, United States Army Garrison Japan, Directorate of Public Works, Camp Zama, Japan.
- 2014 Project Manager, *Cultural Resources Survey of Four U.S. Army Reserve Centers, Grand Traverse, Jackson, Kent, and Marquette Counties, Michigan*. Prepared for the 88th RSC and the Michigan State Historic Preservation Office.
- 2014 Project Manager, *ICRMP Update for Michigan U.S. Army Reserve Centers*. Prepared for the 88th RSC and the Michigan State Historic Preservation Office..
- 2013 Program Manager, *Archaeological Testing for two SATCOM Facilities, Torii Station, Okinawa Prefecture, Japan*. Prepared for the Department of the Army, United States Army Garrison Okinawa, Directorate of Public Works, Torii Station, Japan, and Yomitan Board of Education.
- 2013 Project Manager, *Cultural Resources Reconnaissance Assessment and Archival Research of 184 Acres on Hutchinson Island, Chatham County, Georgia*. Prepared for the Georgia Ports Authority.
- 2013 Project Manager, *Cultural Resources Survey of the SR119 Road Widening, Liberty County, Georgia*. Prepared for Thomas & Hutton Engineering and the Georgia State Historic Preservation Office.
- 2013 Co-author, *Perspectives on Yamasee Life: Excavations at Altamaha Town*. With Dr. Eric C. Poplin. Presentation at the Society for Early Americanists, Savannah, Georgia.
- 2013 Project Manager, *Cultural Resources Survey Assessment and Literature Review of the Savannah- Ogeechee Canal Pedestrian Trail, Chatham County, Georgia*. Prepared for Thomas and Hutton Engineering and Chatham County Department of Engineering.
- 2013 Project Manager, *Cultural Resources Survey of the Coastal Heritage Multi-Use Trail, Chatham County, Georgia*. Prepared for the Coastal Heritage Society and the Georgia State Historic Preservation Office.
- 2012 Project Manager, *Cultural Resources Survey of the Griffin Park Phase II Residential Development, Liberty County, Georgia*. Prepared for Dryden Enterprises, Inc. and the Georgia State Historic Preservation Office.
- 2012 Project Manager, *Cultural Resources Survey of the Boundary Street Improvements, Beaufort County, South Carolina*. Prepared for the City of Beaufort, Beaufort County, and the South Carolina Department of Transportation and the South Carolina State Historic Preservation Office.
- 2012 Project Manager, *Cultural Resources Reconnaissance Assessment of 321 Acres within the Phinizy Swamp Phase II Mitigation Bank, Richmond County, Georgia*. Prepared for Georgia for Resource and Land Consultants.
- 2012 Project Manager, *Cultural Resources Reconnaissance Assessment of 300 Acres within the Coleman Tract, Laurens County, Georgia*. Prepared for Resource and Land Consultants.
- 2012 Project Manager, *Cultural Resources Survey of the Truman Linear Park Trail, Chatham County, Georgia*. Prepared for Thomas and Hutton Engineering and the Chatham County Board of Commissioners and the Georgia State Historic Preservation Office.
- 2012 Project Manager, *Cultural Resources Reconnaissance Assessment of 479 acres within the Lucinda Bay Mitigation Bank, Effingham, County, Georgia*. Prepared for Resource and Land Consultants.

- 2011 Project Manager, *Cultural Resources Survey of Chatham County Mitigation Bank*. Prepared for the Chatham County Department of Engineering and the Georgia State Historic Preservation Office.
- 2011 Program Manager, *Cultural Resources Survey Located within the U.S. Army Garrison Fort Stewart and Hunter Army Airfield, Bryan, Chatham, and Liberty Counties, Georgia*. Prepared for the FS/HAAF Cultural Resource Management Specialist and the U.S. Army Corps of Engineers, Savannah District.
- 2011 Program Manager, *Cultural Resources Survey and Archaeological Testing at U.S. Army Garrison Fort Stewart, Bryan, Evans, Liberty, and Tattnall Counties, Georgia*. Prepared for the FS/HAAF Cultural Resource Management Specialist and the Army Environmental Command.
- 2011 Project Manager, *Section 110 Archaeological Survey of Selected Tracts Located at Lake Hartwell and Richard B. Russell Reservoirs, Multiple Counties in Georgia and South Carolina*. Prepared for the U.S. Army Corps of Engineers, St. Louis and Savannah Districts, the Georgia State Historic Preservation Office, and the South Carolina State Historic Preservation Office.
- 2010 Senior Archaeologist, *Inventory of Historic Structures and Traditional Cultural Properties/ Archaeological Inventory Survey Planning at USAG-Japan Facilities, Kanagawa, Tokyo, and Hiroshima Prefectures, Japan*. Prepared for the Department of the Army, United States Army Garrison Japan, Directorate of Public Works, Camp Zama, Japan.
- 2010 Project Manager, *Cultural Resources Survey of 414 Acres within the Fellsmere Farms Tract, Indian River County, Florida*. Prepared for the St. Johns River Water Management District in Palm Bay, Florida, and the Florida State Historic Preservation Office
- 2010 Project Manager, *Cultural Resources Survey of 1,500 Acres at U.S. Army Garrison Fort Stewart, Bryan and Liberty Counties, Georgia*. Prepared for the FS/HAAF Cultural Resource Management Specialist and the Army Environmental Command.
- 2010 Project Manager, *Cultural Resources Survey of 78 Acres and Phase II Archaeological Testing at U.S. Army Garrison Fort Stewart, Bryan and Evans Counties, Georgia*. Prepared for the FS/HAAF Cultural Resource Management Specialist and the Army Environmental Command.
- 2010 Program Manager, *Archaeological Testing of Ten Sites at U.S. Army Garrison Fort Stewart, Bryan and Liberty Counties, Georgia*. Prepared for the FS/HAAF CRMS and the Army Environmental Command.
- 2010 Program Manager, *Cultural Resources Survey of over 4,000 Acres at U.S. Army Garrison Fort Stewart, Bryan County, Georgia*. Prepared for the FS/HAAF CRMS and the Army Environmental Command.
- 2009 Project Manager, *Archaeological Testing of Site 9GN262 on the Jekyll Island Development Tract A, Glynn County, Georgia*. Prepared for the Jekyll Island Authority and the Georgia State Historic Preservation Office.
- 2009 Project Manager, *Archaeological Testing of Nine Sites at U.S. Army Garrison Fort Stewart, Bryan and Liberty Counties, Georgia*. Prepared for the FS/HAAF CRMS and the U.S. Army Corps of Engineers, Savannah District.
- 2009 Author, *Understanding the Yamasee Indians at Altamaha Town*. Presentation at the Society of American Archaeology Conference, Atlanta, Georgia.
- 2009 Author, *The Archaeology of Indian Slavers and Colonial Allies: Excavations at the Yamasee Capital of Altamaha Town*. Presentation at the Society of Historic Archaeology, Toronto, Canada.
- 2008 Project Manager, *Cultural Resources Survey of the Concrete Sand Mine Tract, Evans County, Georgia*. Prepared for Sligh Environmental and the Georgia State Historic Preservation Office.
- 2008 Project Manager, *Cultural Resources Survey of the Jekyll Island Development Tracts A and B, Glynn County, Georgia*. Prepared for the Jekyll Island Authority and the Georgia State Historic Preservation Office.
- 2008 Project Manager, *Cultural Resources Survey of the Oak Grove Tract, Chatham County, Georgia*. Prepared for Resource and Land Consultants and the Georgia State Historic Preservation Office.
- 2008 Project Manager, *Cultural Resources Survey of the Military Utilities Consolidation Corridor, Beaufort County, South Carolina*. Prepared for the Beaufort-Jasper Water & Sewer Authority, Okatie, South Carolina and the South Carolina State Historic Preservation Office.
- 2008 Project Manager, *Cultural Resources Survey and Testing of the Camak Prospect Tract, Warren County, Georgia*. Prepared for APAC Mid-South, Inc. and the Georgia State Historic Preservation Office.

- 2007 Project Manager, *North Marco Sewer Monitoring and Testing, Marco Island, Florida*. Prepared for the City of Marco, Florida.
- 2007 Project Manager, *Cultural Resources Survey and Evaluative Testing of the Fellsmere Farms Tract, Indian River County, Florida*. Prepared for the St. Johns River Water Management District in Palm Bay, Florida and the Florida State Historic Preservation Office.
- 2007 Project Manager, *Cultural Resources Survey and Evaluative Testing of the West Point Economic Development Tract, Troup County, Georgia*. Prepared for the Georgia Department of Economic Development and the Georgia State Historic Preservation Office.
- 2007 Project Manager, *Altamaha Town Data Recovery Excavations (38BU20/1206 and 38BU1605), Bluffton, Beaufort County, South Carolina*. Prepared for Heyward Point, Okatie, South Carolina and the South Carolina State Historic Preservation Office.
- 2006 Project Manager, *Cultural Resources Survey and Evaluative Testing of the Bridge Replacement along Road S-19 over the Little River, McCormick County, South Carolina*. Prepared for the South Carolina Department of Transportation and the South Carolina State Historic Preservation Office.
- 2006 Project Manager, *Cultural Resources Survey of the I-85 and I-985 HOV and SOV Expansion, Gwinnett and Barrow Counties, Georgia*. Prepared for the Georgia Department of Transportation and the Georgia State Historic Preservation Office.
- 2006 Project Manager, *Evaluative Testing of Five Archaeological Sites at Heyward Point, Beaufort County, South Carolina*. Prepared for Heyward Point LLC, Bluffton, South Carolina and the South Carolina State Historic Preservation Office.
- 2006 Project Manager, *Archaeological Resources Survey at James J. O'Rourke Memorial U.S. Army Reserve Center, Bay County, Michigan*. Prepared for the 88th Regional Readiness Command and the U.S. Army Corps of Engineers, Mobile District and the Michigan State Historic Preservation Office.
- 2006 Project Manager, *Cultural Resources Survey of 23 Bridge Replacements in South Carolina*. Prepared for the South Carolina Department of Transportation and the South Carolina State Historic Preservation Office.
- 2005 Project Manager, *Cultural Resources Survey at Camp Blanding Joint Training Facility, Starke, Florida*. Prepared for the US Army Corps of Engineers, Mobile District and the Florida State Historic Preservation Office.
- 2005 Project Manager, *Cultural Resources Survey at Sandford-R.L. Evans Florida Army National Guard Armory, Seminole County, Florida*. Prepared for the U.S. Army Corps of Engineers, Mobile District and the Florida State Historic Preservation Office.
- 2005 Project Manager, *Cultural Resources Survey at Tampa-Ft. Homer W. Hesterly Florida Army National Guard Armory, Hillsborough County, Florida*. Prepared for the U.S. Army Corps of Engineers, Mobile District and the Florida State Historic Preservation Office.
- 2005 Project Manager, *Cultural Resources Survey at Eustis Florida Army National Guard Armory, Lake County, Florida*. Prepared for the U.S. Army Corps of Engineers, Mobile District and the Florida State Historic Preservation Office.
- 2005 Project Manager, *Cultural Resources Survey at Clearwater-James Fred Campbell Jr. Florida Army National Guard Armory, Pinellas County, Florida*. Prepared for the U.S. Army Corps of Engineers, Mobile District and the Florida State Historic Preservation Office.
- 2005 Project Manager, *Cultural Resources Survey at Leesburg Florida Army National Guard Armory, Lake County, Florida*. Prepared for the U.S. Army Corps of Engineers, Mobile District and the Florida State Historic Preservation Office.
- 2005 Project Manager, *Cultural Resources Survey at Crestview Florida Army National Guard Armory, Okaloosa County, Florida*. Prepared for the U.S. Army Corps of Engineers, Mobile District and the Florida State Historic Preservation Office.
- 2005 Project Manager, *Cultural Resources Survey at Winter Haven Florida Army National Guard Armory, Polk County, Florida*. Prepared for the U.S. Army Corps of Engineers, Mobile District and the Florida State Historic Preservation Office.
- 2005 Author, *Identifying Pocatigo, an Upper Yamasee Town in Jasper County, South Carolina*. Presentation at the Southeastern Archaeological Conference, Columbia, South Carolina.

- 2004 Project Manager, *Cultural Resources Survey for the Proposed Lumber City Waste Water Treatment Plant, Telfair County, Georgia*. Prepared for the City of Lumber City, Georgia and the Georgia State Historic Preservation Office.
- 2004 Project Manager, *Cultural Resources Survey of the Proposed Expansion at the Mohawk Industrial Site, Gordon County, Georgia*. Prepared for the City of Calhoun, Georgia and the Georgia State Historic Preservation Office.
- 2003 Project Manager, *Palmetto Bluff Data Recovery (38BU1768), Bluffton, Beaufort County, South Carolina*. Prepared for Palmetto Bluff LLC, Bluffton, South Carolina and the South Carolina State Historic Preservation Office..
- 2003 Author, *Investigating Yamasee Identity: Archaeological Research at Pocotaligo*. Masters Thesis, University of South Carolina, Department of Anthropology.

CAROLYN ROCK
PROJECT MANAGER/SENIOR ARCHAEOLOGIST

EDUCATION

M.A. in Anthropology (1980), University of Georgia
B.A. in Psychology (Education Minor) (1974), University of Massachusetts

AREAS OF SPECIALIZATION

Cultural Resources Management & Section 106 Compliance
Archaeological Investigations
Coastal Environments
Zooarchaeology of the Southeast
Bioarchaeology

PROFESSIONAL AND SOCIETY MEMBERSHIPS

Register of Professional Archaeologists
Society for American Archaeology
Society for Georgia Archaeology (President 2006-2008)

PROFESSIONAL POSITIONS

Brockington and Associates, Inc.: Senior Archaeologist and Project Manager, (2016-present)
Brockington and Associates, Inc.: Archaeologist and Project Manager, (2007-2016)
Valdosta State University, Department of Sociology, Anthropology & Criminal Justice: Adjunct Instructor.
Classes taught: Southeastern Indians; Forensic Anthropology; Archaeological Techniques (Field Schools); Archaeology of Eastern North America; Public Archaeology; Indians of North America. (2003-2009).
Archaeological Consultant. Survey and data recovery projects, coastal Georgia. (2001-2006)
Archaeological Consultant. Principal Investigator under contract to the U.S. Navy, Kings Bay Naval Submarine Base, Georgia. (1984-1991).
University of Florida: Field director, Laboratory director, field lab director, zooarchaeology assistant, evaluative testing and data recovery projects, Kings Bay, Georgia. (1981-1983).

RECENT PROJECTS, PUBLICATIONS, PRESENTATIONS AND PRESENTATIONS

- 2017 Lead Zooarchaeologist, *Everglades Restoration Transition Plan Cultural Resources Investigation, Broward, Miami-Dade, and Monroe Counties, Florida* (in progress). Prepared for the U.S. Army Corps of Engineers, Louisville District.
- 2016 Project Manager/Senior Report Author, *Phase III Data Recovery Investigations at the Colonels Island Slave Settlement (9GN173), Glynn County, Georgia*. Prepared for Georgia Ports Authority.
- 2015 Report Author, *Integrated Cultural Resources Management Plan Update Idaho U.S. Army Reserve Centers*. Prepared for the 88th Regional Support Command.
- 2014 Project Manager and Report Author, *Phase II Evaluative Testing at Archaeological Site 9TE123, Terrell County, Georgia*. Prepared for Georgia Power Company.
- 2014 Project Manager and Report Author, *Phase I Archaeological Survey of the Pinkney Lugenbeel USARC, Boise, Ada County, Idaho*. Prepared for the 88th Regional Support Command.
- 2013 Project Manager and Report Author, *Phase I Cultural Resources Survey of the Proposed Florida Organic Aquaculture Facility Gas Line and Pressure Regulating Station, Indian River County, Florida*. Prepared for Florida Organic Aquaculture, LLC, Jupiter, Florida.
- 2013 Project Manager and Report Author, *Phase I Archaeological Survey of the Proposed Darien Sidewalks, Crosswalks, and Access TE IV Project, McIntosh County, Georgia*. Prepared for the Georgia Department of Transportation.
- 2013 Project Manager and Report Author, *Phase II Evaluative Testing at Site 9CH919, Chatham County, Georgia*. Prepared for Resource and Land Consultants, Savannah, Georgia.
- 2013 Project Manager and Report Author, *Phase I Archeological Survey at Fort Stewart Military Reservation and Phase II Archaeological Testing, Bryan Liberty, and Long Counties, Georgia*. Prepared for the U.S. Army Corps of Engineers, Savannah District.

- 2012 Archaeologist and Report Author, *Phase I Cultural Resources Survey for the Belles Ferry Dock Project, Savannah, Georgia*. Prepared for the Georgia Department of Transportation.
- 2013 Project Manager and Report Author, *Phase I and Phase II Archaeological Survey and Testing of the Barbour Island Distribution Line Corridor, McIntosh County, Georgia*. Prepared for Coastal Electric Cooperative, Midway, Georgia.
- 2012 Archaeologist and Report Author, *Phase I and II Cultural Resources Survey and Testing of 9400 Acres at Big Pasture, and 1880 Acres at Little Pasture, Camden County, Georgia*. Prepared for The Stratford Company, Dallas, Texas.
- 2011 Archaeologist and Report Author, *Phase I Cultural Resources Survey, Proposed Herbert Hoover Dike Widening, Reaches 1B, C, D, 2, and 3, Palm Beach, Hendry, and Glades Counties, Florida*. Prepared for the U.S. Army Corps of Engineers, Jacksonville District.
- 2011 Archaeologist and Report Author, *Geoarchaeological Testing Investigations of the North Columbia Quarry Tract, Richland County, South Carolina*. Prepared for Martin Marietta Materials, Inc., Columbia, South Carolina.
- 2009 Project Manager and Report Author, *Phase I Cultural Resources Survey of the Proposed Military Construction Project, Palm Beach County, Florida*. Prepared for the U.S. Army Corps of Engineers, Louisville District, and CH2M HILL, Denver, Colorado.
- 2009 Archaeologist and Report Author, *A Cultural Resources Class I Inventory for Eight Surface Tracts in Florida: Bay, Hillsborough, Lee, Monroe, Palm Beach, Polk and Walton Counties, Florida*. Prepared for the Bureau of Land Management, Jackson District, Mississippi.

MICHAEL REYNOLDS
HISTORIAN/ARCHAEOLOGIST

EDUCATION

M.A. in Heritage Preservation, Georgia State University
B.A. in Anthropology , Georgia State University

AREAS OF SPECIALIZATION

Architectural survey
Archival research
Archaeological survey and testing
Genealogical research
Cemetery survey, delineation, relocation

PROFESSIONAL SOCIETY MEMBERSHIP

Georgia Council of Professional Archaeologists
Georgia Municipal Cemetery Association
Society of Historical Archaeology
Society for Georgia Archaeology
Society of Architectural Historians
Georgia Trust for Historic Preservation

PROFESSIONAL POSITIONS

Architectural Historian, Brockington and Associates, (1999-present)
Archaeologist, Brockington and Associates, (1999-present)
Archaeological Technician, Brockington and Associates, (1990-1998)

SELECT PROJECTS, PUBLICATIONS, PRESENTATIONS AND EXPERIENCE

- 2016 Archaeologist, *Phase II Archaeological Testing of Site FS-2, Ramey Local Training Area (LTA) Tract, Aguadilla, Puerto Rico*. Prepared for the 81st Regional Support Command and the U.S. Army Corps of Engineers, Mobile District under contract with Tetra Tech, Inc.
- 2016 Archaeologist, *Phase I Archaeological Survey of Eight U.S. Army Reserve Centers in Puerto Rico*. Prepared for the 81st Regional Support Command and the U.S. Army Corps of Engineers, Mobile District under contract with Tetra Tech, Inc.
- 2016 Historian, *Architectural Survey of Four U.S. Army Reserve Centers in Puerto Rico*. Prepared for the 81st Regional Support Command and the U.S. Army Corps of Engineers, Mobile District under contract with Tetra Tech, Inc.
- 2016 Archaeologist, *Relocation of the Sudderth Family Cemetery, Gwinnett County, Georgia*. Prepared for the City of Buford, Georgia.
- 2016 Historian, *Architectural Survey and Assessment of Effects of the Rural Mount Property, Hamblen County, Tennessee*. Prepared for BDY Environmental, Nashville, Tennessee.
- 2016 Historian, *Union Bethel A.M.E. Church Cemetery Relocation Permit Application Permit, Clayton County, Georgia*. Prepared for Stephens Industries, LP, College Park, Georgia.
- 2016 Archaeologist and Historian, *Phase I Cultural Resources Survey of the 24-Mile UC Synergetic Pipeline Corridor, Franklin and Wake Counties, North Carolina*. Prepared for UC Synergetic, Mount Airy, North Carolina and SCANA Energy, Columbia, South Carolina.
- 2015 Archaeologist, *Relocation of the Sentell Cemetery, Sandy Springs, Georgia*. Prepared for the City of Sandy Springs, Georgia.
- 2015 Historian, *Phase I Cultural Resources Survey and Phase II Testing of 9FU565. Fulton County Airport-Brown Field Hangar Development Tract, Fulton County, Georgia*. Prepared for Michael Baker International and the Fulton County Airport Authority.
- 2014 Archaeologist and Historian, *Phase I Cultural Resources Survey for the Windsor Parkway at Roswell Road Intersection Improvements Project, Sandy Springs, Georgia*. Prepared for Michael Baker International and the City of Sandy Springs, Georgia.

- 2014 Archaeologist and Historian, *Phase I Cultural Resources Survey of the Hays Crossroads Weekend Training (WET) Site, Washington County, Tennessee*. Work performed for the U.S. Army Reserve.
- 2014 Archaeologist and Historian, *Cultural Resources Survey of the MSG Deoniso M. Claudio U.S. Army Reserve Center, Caguas, Puerto Rico*. Prepared for the U.S. Army Corps of Engineers, Louisville District and CH2M HILL Denver, Colorado
- 2014 Archaeologist and Historian, *Phase I Cultural Resources Survey of the Ramey Local Training Area (LTA) Tract Aguadilla, Puerto Rico*. Prepared for the: U.S. Army Corps of Engineers, Louisville District and CH2M HILL Denver, Colorado.
- 2013 Archaeologist, *Archaeological Survey of the Proposed Walther Boulevard Grade Separation, Gwinnett County, Georgia*. Prepared for Atkins North America.
- 2012 Historian, *Architectural Survey of the Heart of Georgia Railroad Corridor, Sumter, Crisp, and Webster Counties, Georgia*. Prepared for Crouch Engineering.
- 2012 Historian, *Context Development and Public Outreach Document Preparation for the Former Lorenzo Benn Youth Development Center, Fulton County, Georgia*. Prepared for the Georgia Army National Guard.
- 2012 Historian, *Assessment of Effects, Former Lorenzo Benn Youth Development Center, Fulton County, Georgia*. Prepared for Northwind, Inc. and the Georgia Army National Guard.
- 2012 Archaeologist and Historian, *Cultural Resources Survey Reevaluation of the Clairmont Road Sidewalks Corridor, DeKalb County, Georgia*. Prepared for Arcadis U.S. and the Georgia Department of Transportation.
- 2012 Historian, *Assessment of Effects, Eastman Bust Depot Rehabilitation, Eastman, Georgia*. Prepared for the Heat of Georgia Altamaha Regional Commission.
- 2011 Historian, *Assessment of Effects, Former Georgia School for the Blind, Macon RTI Tract, Macon, Georgia*. Prepared for Northwind, Inc. and the Georgia Army National Guard.
- 2011 Archaeologist, *Archaeological Survey for the Sylvester Georgia Streetscape Project (South Isabella Street and West Kelly Street)*. Prepared for TTL, Inc.
- 2011 Archaeologist and Historian, *Cultural Resources Survey of the Proposed State Industrial Access Road for the Wacker Industrial Park, Bradley County, Tennessee*. Prepared for Volkert and Associates, Inc., Chattanooga, Tennessee and the Tennessee Department of Transportation.
- 2010 Archaeologist and Historian, *Relocation of the Rambo Family Cemetery, Floyd County, Georgia*. Work performed for PBS&J, Atlanta, Georgia and the Georgia Department of Transportation
- 2010 Historian, *Architectural Survey State Industrial Access (SLA) Road From SR 308, Lauderdale Memorial Highway to Old Lower River Road, Bradley County, Tennessee*. Prepared for Volkert, Inc and the Tennessee Department of Transportation.
- 2010 Archaeologist, *Archaeological Survey State Industrial Access (SLA) Road From SR 308, Lauderdale Memorial Highway to Old Lower River Road*. Prepared for Volkert, Inc and the Tennessee Department of Transportation.
- 2010 Archaeologist and Historian, *Assessment of Effects: Alternative 3 Site for the Proposed Improvements to or Replacement of the Griffin-Spalding County Airport Spalding County, Georgia*. Prepared for the LPA Group, Inc., Atlanta, Georgia.
- 2010 Archaeologist and Historian, *Phase I Cultural Resources Survey of the Preferred Build Alternative Site for the Proposed Griffin-Spalding County Airport Spalding County, Georgia*. Prepared for the LPA Group, Inc., Atlanta, Georgia.
- 2010 Archaeologist and Historian, *Cultural Resources Survey of the SR 611 Improvements Corridor, Jackson County, Mississippi*. Prepared for Pritchett Engineering & Planning, LLC, Flowood, Mississippi.
- 2009 Archaeologist and Historian, *Cultural Resource Survey of the S64, Anderson Mill Road ,Bridge over the North Tyger River Replacement Project, Spartanburg County, South Carolina*. Prepared for SCDOT, Columbia, South Carolina.
- 2008 Archaeologist and Historian, *Cultural Resources Survey of the Ponce de Leon Avenue/ Scott Boulevard Sidewalks Corridor, DeKalb County, Georgia*. Prepared for ARCADIS, Atlanta, Georgia.
- 2008 Archaeologist and Historian, *Cultural Resources Survey of the Clairmont Road Sidewalks Corridor, DeKalb County, Georgia*. Prepared for ARCADIS, Atlanta, Georgia.
- 2008 Historian, *Riverside Cemetery Descendant Notification Plan and Cemetery Application Packet, Macon, Bibb County, Georgia*. Prepared for GDOT, Atlanta, Georgia.
- 2008 Archaeologist and Historian, *Cultural Resources Survey of the Aggregates USA-Macon East Tract, Jones County, Georgia*.

- 2008 Archaeologist and Historian, *Cultural Resources Survey of the Habersham County Airport Improvements Areas, Habersham County, Georgia*. Prepared for Michael Baker International, Norcross, Georgia.
- 2007 Archaeologist, *Archaeological Testing of Nine Sites, Granite Hill Tract, Hancock County, Georgia*.
- 2007 Archaeologist and Historian, *Cultural Resources Survey of the SR 56/College Street Corridor, Calhoun, Gordon County, Georgia*.
- 2007 Archaeologist and Historian, *Cultural Resources Survey of the Rinker-Macon West Tract, Jones County, Georgia*.
- 2007 *Cemetery Delineation, Mars Hill Cemetery, Dallas Georgia*.
- 2007 *Archival and Genealogical Research, Curtright Cemetery Relocation, Greene County, Georgia*.
- 2007 *Archaeological Testing of Eight Sites, Carey Station Tract, Greene County, Georgia*.
- 2006 *Architectural Survey of the West Point Economic Development Tract, Troup County, Georgia*.
- 2006 *Cemetery Relocation and Genealogical Research, West Point Economic Development Tract, Troup County, Georgia*.
- 2006 *Cultural Resources Survey of the West Point I-85 Interchange, Troup County, Georgia*.
- 2005 *Architectural Survey of the Sierra Lake Tract, Forsyth County, Georgia*.
- 2004 *Architectural Survey and Historical Background Report for the J.A. Jones Construction Company Brunswick Shipyard, Glynn County, Georgia*.
- 2003 *Architectural Resources Survey of the Dekalb-Peachtree Airport Study Area, Dekalb County, Georgia*.
- 2003 *Architectural Survey and Historical Background Report for the Anniston Army Depot, Anniston, Alabama*.
- 2002 *Architectural and Archaeological Surveys for the Georgia Department of Transportation Bridge Replacement Projects, Statewide*.



RESOURCE+LAND
CONSULTANTS

APPENDIX I: Adjacent Landowner Information

EVERETT EDWARD S LIVING TRUST DATED
JULY 20 2017
PO BOX 173
SIGNAL MOUNTAIN, TN 37377

MOCK WM B
10325 HWY 280 EAST
ELLABELL, GA 31308-0000

ATKINSON JAMES T
1659 TONI BRANCH ROAD
ELLABELL, GA 31308

GRIFFIN ANNIE A
251 HOMESTEAD DR
ELLABELL, GA 31308-0000

PRIDGEN JOHN HENRY J
15 PRIDGEN LANE
ELLABELL, GA 31308

DUKES KARLA MILLS
38 PRIDGEN LANE
ELLABELL, GA 31308

PRIDGEN JOSEPH
10 PRIDGEN LANE
ELLABELL, GA 31308-0000

WILLIAMS MAE FRANCES
P O BOX 151
ELLABELL, GA 31308-0000

JERNIGAN COLUMBUS JR
P O BOX 213
ELLABELL, GA 31308-0000

BRADSHAW YVONNE
630 WEST 40TH STREET
SAVANNAH, GA 31415-0000

DAVIS RUBY J
35 CAMPFIELD STREET
ELLABELL, GA 31308-0000

JONES EDDIE L III
4102 SUMPTER STREET
SAVANNAH, GA 31405

MOCK WILLIAM B & BROOKS JOHN S
509 JOHNSTON STREET
SAVANNAH, GA 31405

SHARPE KAREN RUTH
111 MIMOSA STREET
RICHMOND HILL, GA 31324

STAFFORD LISA M & STAFFORD TRACY
50 ASPEN LANE
ELLABELL, GA 31308

WILLIAMS REECE A & KELLY A
40 ASPEN LANE
BLACK CREEK, GA 31308

MILES GREGG M & JEANA M
30 ASPEN LANE
ELLABELL, GA 31308

JOHNSON JOSEPH E & ASHLEY S
20 ASPEN LANE
ELLABELL, GA 31308

BRAZZELL JOSEPH L & CECILE
10 ASPEN LANE
ELLABELL, GA 31308

PK WATER SYSTEMS, INC.
205 5TH STREET, BOX 411
MELDRIM, GA 31318

ASPHALT OPERATIONS, LLC
2365 AIMWELL ROAD
VIDALIA, GA 30474