May 11, 2021

Chatham County
Watershed Protection Department
Attn: Ms. Rachel Thorn, CPESC
80-A East Street
Pittsboro, NC 27312

Chatham County
Planning Department
Attn: Ms. Kimberly Tyson
80-A East Street
Pittsboro, NC 27312

Re: **Pyewacket Subdivision Environmental Impact Assessment Resubmittal**
Sage Project #2020.108

On behalf of Mr. Warren Mitchell, PE, please find the attached Revised Environmental Impact Assessment for the proposed +/-139.63-acre Pyewacket Subdivision located approximately 2.3 miles northeast of the intersection of Jones Ferry Road and Crawford Dairy Road in Chapel Hill, in Orange and Chatham Counties. This submittal serves as a response to comments received from your office on March 21, 2021.

If you have any questions, please contact me at (919) 559-1537 or sclark@sageecological.com.

Sincerely,

Sean Clark
Sage Ecological Services, Inc.

Kim Hamlin
Sage Ecological Services, Inc.

Attachments:
Pyewacket Subdivision Environmental Impact Assessment

# ENVIRONMENTAL IMPACT ASSESSMENT

## Pyewacket Subdivision
## Chatham County, North Carolina

**May 11, 2021**

Sage Project Number 2020.108

**Prepared for:**

Mr. Warren Mitchell
104 Amber Wood Run
Chapel Hill, NC 27516

**Submitted by:**

Sage Ecological Services, Inc.
3707 Swift Drive
Raleigh, NC 27606

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# EXECUTIVE SUMMARY

The purpose of this Environmental Impact Assessment (EIA) as required and outlined by the Chatham County Ordinance Section 6.2.B is to evaluate the potential environmental impacts associated with the proposed development of The Pyewacket Subdivision (Project/Site). This EIA was completed using public documents, field reconnaissance, and preliminary mapping etc. specifically for the Project.

The Pyewacket Subdivision is a proposed +/-139.63-acre conservation subdivision designed to meet the growing demand for residential housing in Chatham County while balancing the need to preserve large, continuous natural areas. The Project will include 93 residential homes on lots between 0.4 acre and 0.9 acre, and approximately 8,500 linear feet of roads. Proposed natural space provided is +/-46.63 acres and proposed open space is +/-15.08 acres. Total proposed conservation space is +/-61.71 acres, which is 48% of the total site area within Chatham County.

The likelihood of development of the Site is high due to its proximity to major thoroughfares and city centers. The proposed project will provide housing near Employment Centers in the northern part of the County and to nearby cities in southern Orange County. This conservation subdivision meets many goals stated in the Chatham County Land Use Plan (2017) while considering potential impacts to surrounding human, cultural, and environmental resources.

The EIA included a review of the potential direct, secondary, and cumulative impacts of the Project throughout the study area. Information from existing public documents and documents developed for the Project were used to cover each of the resource topics listed in Section 6.2.B of the Chatham County Subdivision Ordinance.

SECTION 1

# PROPOSED PROJECT DESCRIPTION AND NEED

## 1.1 General Site Location and Description

The Pyewacket Subdivision (Project/Site) is located approximately 2.3 miles northeast of the intersection of Jones Ferry Road and Crawford Dairy Road in Chapel Hill, in Orange & Chatham Counties, NC. The coordinates of 35.8639°N, 79.1501°W generally correspond to the center of the Site.

The Site is an assemblage of two adjacent parcels and is approximately 139.63 acres. The Site is wooded land that contains a canopy dominated by hardwood trees with interspersed pines. Thirteen jurisdictional streams and twelve riparian wetland areas were delineated on the Site. The wetlands and streams are subject to Chatham County and Orange County riparian buffers. Other than a utility easement that bisects the property from northwest to southeast, the Site is undeveloped. Land use in the vicinity of the Site consists of undeveloped, forested land, rural residential, agricultural and pastureland.

## 1.2 Project Description

The proposed project consists of the construction of a conservation subdivision to meet the demand for housing in this area of Chatham County. The Site is situated along Jones Ferry Road approximately 6.5 miles southwest of Chapel Hill. This area has been designated as a Conservation area per the Chatham County Future Land Use and Conservation Plan Map. The Draft Land Use Suitability Analysis rates the area as: Residential Suitability – Medium to High; Industrial Suitability – Low to Medium; Conservation Suitability – Medium; and Commercial Suitability – Low. The Pyewacket Subdivision Concept Plan (Site Plan) in Appendix B details the site plan for this project, including lot sizes and locations, roadways, conservation, natural, and open space, and community amenities.

The proposed project is a conservation subdivision that will preserve 48% of the Site in conservation space (50.8% total including the Orange County portion). Per the Chatham County Subdivision Regulations Section 7.7, "A maximum of 20% of the required Conservation Space shall be Open Space and a minimum of 80% of Conservation Space shall be Natural Space." Open space allows for amenities whereas natural space is unimproved land. A clubhouse and community garden area are proposed in the northeast corner of the Site. Approximately 32 parking spaces will be provided in one parking lot to service the amenities in this area.

Approximately 93 single-family homes with minimum lot areas of 0.4 acre are proposed. The maximum height of the residences will be approximately 2 ½ stories and the average home size will be +/-2,600 square feet. Lots will be cleared using mechanized clearing techniques once construction on the home is initiated. Lots will not be clear cut, and it is expected that some trees will remain on each lot. Standard earth moving equipment (bulldozers, backhoes, etc.) will be utilized for grading.

Lots will be served by two to three on-site community wells and will have individual on-site septic systems. The previous Concept Map depicted offsite primary and repair septic fields within natural areas. The revised site design does not propose septic fields in natural areas. A minimum corridor size of ten feet will be cleared to install these offsite septic systems. All septic areas will only require clearing and vegetation maintenance for the primary drain field. The repair fields will only be cleared and maintained if the primary septic systems fail and need to be replaced. The community wells, community water lines, and the well tank and pump will be owned and maintained by AQUA or a similar public utility. Any offsite septic systems will be private and will be inspected regularly by a consultant.

The Site will be developed in a single phase. Proposed land disturbance will occur for the construction of the lots, stormwater BMPs, and development roads. The approximate area of disturbance is 89 acres. Proposed stormwater BMPs include wet and dry detention ponds. The estimated post construction impervious surface is +/- 11%. No semi-pervious areas are proposed.

This project addresses multiple strategies outlined in the Chatham County Land Use Plan (LUP) (2017) including providing low density development, allowing residential development types that fit the character of the area, and encouraging agricultural friendly development.

SECTION 2

# ALTERNATIVES ANALYSIS

## 2.1 Site Selection and Design Alternatives

The Site is located along Jones Ferry Road, a major thoroughfare southwest of Chapel Hill, NC. This area experiences daily commuter traffic as well as traffic going to and from various recreational areas nearby. The Site has been evaluated by Piedmont Environmental Associates, PA (PEA) and contains suitable soils for individual underground septic systems (Appendix E).

An evaluation was performed by Soil & Environmental Consultants (S&EC) to determine the location and extent of wetlands, streams, and riparian buffers on the Site. A natural communities and potential protected species habitat survey was conducted by staff from the NC Natural Heritage Program (NCNHP). The site design incorporated the results of these environmental field studies to reduce and minimize impacts to existing natural resources on the Site by clustering the lots closer together and denoting areas best served by conservation measures. In addition to protected riparian buffers, undeveloped areas will remain forested or as conservation open space.

A conventional subdivision concept layout was also drafted for the Site (Appendix B). This design alternative only provided riparian buffer protection for the streams and wetlands onsite, and the proposed lots were spread throughout the entire Site. This concept also included additional stream and riparian buffer impacts to access upland areas.

The Site is located in a rural area determined by the Chatham County LUP. Land Use Policy Strategy 5.2 of the LUP recommends to, “encourage residential development types that fit the character” of the surrounding area.

## 2.2 No-Build Alternative

A no-build alternative was considered for the Site. Due to suitable site conditions, proximity to other commercial and residential sites, and the demand for residential housing in this area, the likelihood of the Site being developed is high. Additionally, the site is wooded with rocky soil so other uses such as agriculture are less feasible. According to the Chatham County LUP (2017), the Site is designated as “medium to high suitability” for residential development and “medium suitability” for conservation. The proposed impervious area of this project is approximately 11% and site development limits disturbance and clearing which reduces potential impact of the Site to downstream water quality. Other development may not utilize the Site as effectively as the proposed project.

SECTION 3

# EXISTING ENVIRONMENT AND PROJECT IMPACTS

## 3.1 Geography

The majority of the Site is forested and undeveloped. A natural gas easement runs northwest-southeast through the property. The topography of the Site ranges from a low point of +/- 520 feet above mean sea level (msl) in the northern portion of the Site, to a high point of +/- 620 feet msl in the center of the Site. The Site is within the piedmont region of North Carolina and geologically lies within the Carolina Slate Belt which is composed metamorphic rock. Figure 1 depicts the Site on the Bynum, NC, and US Geological Survey (USGS) topographical quadrangle sheet.

The Site drains to Meadow Branch and Wilkinson Creek which are within the Jordan Lake portion of the upper Cape Fear River Basin. The southeast portion of the Site along Wilkinson Creek lies within a FEMA Special Flood Hazard Area (Zone AE) as shown on Figure 6.

As previously mentioned, the Site is located along Jones Ferry Road which is a well-traveled thoroughfare between Chatham County and the Chapel Hill area of Orange County. Jones Ferry Road experiences daily commuter traffic as well as traffic going to and from various recreational areas nearby and is used as an alternate route to highway 15-501.

Final grading plans have not yet been completed; however, the site design utilizes the existing topography to minimize the amount of grading and fill required to construct the project. Proposed cut and fill total of approximately 60,000 cubic yards will be moved on-site to accomplish a balanced earthwork total. No pond or dam work is proposed for this project.

## 3.2 Soils and Prime Farmlands

According to the Chatham County Soil Survey (2006) the dominant soil on the Site is Wedowee sandy loam (Figures 2 and 7). According to the US Natural Resource Conservation Service (NRCS) Web Soil Survey, Wedowee sandy loam is typically found on interfluves and hillslopes on ridges. The NRCS describes the soil as a well-drained upland soil composed of saprolite derived from granite and gneiss and/or schist.

A Detailed Soil/Site Evaluation was conducted by Piedmont Environmental Associates, PA in December 2020 (Appendix E). Piedmont Environmental noted areas on the Site that were suitable for conventional depth wastewater systems and low-profile chamber depth wastewater systems. More details and a map of these suitable septic areas can be found in the attached report.

Although currently forested, the entirety of the Site is considered Prime Farmland, Farmland of Statewide Importance, or Prime Farmland if drained and either protected from flooding or not frequently flooded during the growing season (Figure 8). Little to no evidence of farming in the recent past is observed on the Site. The site design results in the loss of 88 acres of areas mapped as Farmland of Statewide Importance but does not result in the loss of active agriculture.

The stormwater management plan will consist of five stormwater basins located throughout the Site. The ponds are positioned so as to catch and temporarily store stormwater from all impervious surfaces as reasonably practicable prior to releasing it in close proximity to where surface waters exist on the Site. The stormwater basins will be designed to meet the requirements of Chatham County and the North Carolina Department of Water Quality. The proposed stormwater basins are depicted in the Site Plan.

A records review of the NC Department of Environmental Quality (NCDEQ) Division of Waste Management Site Locator tool indicates no documented contamination on the Site or on adjacent properties.

Potential minor soil contamination is possible as a result of fuel or hydraulic fluid spills during construction. Fueling areas for large equipment will be properly designed to contain any spills that occur. All potential contaminants generated during construction will be properly stored according to manufacturer instructions, and any spills or leakage will be reported to the appropriate authority as soon as feasible.

Soil contamination after construction could occur from overapplication of pesticides, herbicides, and fertilizers from residential homeowners. Small residential chemical and oil spills could also occur. Notice of these occurrences is dependent on self-reporting; however, any reported incidents will be handled as appropriate.

## 3.3 Land Use

Currently the Site is undeveloped and wooded. An underground gas line and easement exist on the Site and extends northwest to southeast roughly through the center of the Site. Evidence of abandoned dirt logging and/or farming roads traverse the Site. Figure 9 depicts the current land use and zoning of the Site and properties in the vicinity. The Site is zoned R-1 Residential for low to moderate density residential development within the residential-agricultural areas of the jurisdiction. The Orange County portion of the Site is zoned “Agricultural Residential.”

Surrounding land use within the vicinity of the Site consists of rural residential, undeveloped and forested land, land managed for timber production, agricultural land, and some commercial businesses. Zoning areas to the east include R-2 Residential.

The proposed project will meet multiple strategies and goals described in the Chatham County LUP (2017). The Land Use Policy Strategy (Section 5.2) encourages residential development types that fit the character of the surrounding

area. Conservation subdivisions and agricultural friendly subdivisions are expressly described as appropriate for Rural and Conservation Areas due to providing low density housing that promotes protection and preservation of adjacent natural and agricultural areas. The proposed project meets these goals by offering relatively large lots for each residence, preserving existing important natural areas on the Site, and by reducing impact on adjacent agricultural land.

The Utilities and Public Services Strategy (Section 1.1) supports well-designed, decentralized wastewater systems that meet land use goals. The project proposes an on-site community well system to provide water and individual on-site septic wastewater systems. A minimum of two and potentially three community wells are proposed for the Project to adequately supply the proposed development.

The entire Site is located in Residential District 1 (R1). Per the Chatham County Zoning Ordinance (April 2020), this area is primarily for low to moderate density residential development within the residential-agricultural areas of the jurisdiction. The proposed project meets this Zoning requirement as a Conservation Subdivision.

## 3.4 Wetlands

A stream, wetland, and riparian buffer delineation and evaluation was completed in December 2020, by S&EC. The Wetland Sketch Map in Appendix B provides additional information on the approximate location and extent of wetlands on the Site. As of the date of this document, the US Army Corps of Engineers (USACE), the NC Division of Water Resources (NCDWR) nor Chatham County staff have visited the Site to confirm the delineation or riparian buffer determinations. A site meeting with the USACE has been scheduled and a request for a jurisdictional determination has been made but has not yet been issued. Upon receipt, approvals confirming the field determinations will be provided as an addendum to this document.

Proposed impacts to wetlands will result from permanent fill necessary for a road crossing in the northern portion of the Site which allows access to Jones Ferry Road. No general lot fill is proposed within jurisdictional wetlands. Proposed impacts are below current thresholds requiring mitigation. Standard sediment and erosion control measures will be utilized to protect wetlands from runoff during construction. All temporary wetland impacts associated with the road crossing will be stabilized and protected after construction. The remaining wetlands on-site will remain forested and undisturbed. Permits from USACE and NCDWR will be obtained for proposed impacts to wetlands prior to construction.

## 3.5 Public Lands and Scenic, Recreational, and State Natural Areas

There are no NCDOT Bicycle Routes in the vicinity of the Site. There are no public lands or scenic, recreational, or state natural areas on the Site. The NC Natural Heritage Program (NCNHP) Database lists one natural area, Morgan

Ridge Natural Area, adjacent to the Site. The Morgan Ridge Natural Area is a dry basic oak-hickory forest located along the southern portion of the western boundary of the Site. Terrell's Mountain is another natural area located approximately 0.75 mile west of the Site and across Jones Ferry Road. The Triangle Land Conservancy owns the J. Logan and Elinor Moore Irvin Nature Preserve (Private) locate approximately 0.75-mile northeast of the Site. These properties are listed on the attached NCNHP Database Report in Appendix D and are depicted on the attached Figure 10.

The Morgan Ridge Natural Area was expanded to include portion of the Site. Currently, lots, septic areas, and roads are proposed in the northwestern, central, and southeastern portions of the natural area. A large portion of the natural area is proposed to be retained as conservation natural space in the southwestern corner of the Site. This area is adjacent to planned conservation space of the neighboring Morgan Ridge Subdivision Phase 2. While approximately 65% of the Morgan Ridge Natural Area is proposed for development, the remaining areas will be protected as conservation natural space and open space and will be contiguous with other forested areas adjacent to the Site. The previously proposed offsite septic areas adjacent to Lots 22-30 and Lots 20-21 have been removed. While the Morgan Ridge Natural Area will be subject to direct and indirect development pressure, the conservation subdivision will preserve more of this mature forest than a conventional subdivision. The development of the Site should have no adverse effect on public lands and scenic, recreational, and state natural areas.

## 3.6 Areas of Archaeological or Historical Value

A NC State Historic Preservation Office (NCSHPO) database review was performed prior to conducting fieldwork. No historic properties were noted on the Site in the database search. Seven historic properties are located within 1.0-mile of the Site boundary but are not adjacent to the Site. All seven properties are designated as Surveyed Only. Figure 4 depicts the historic properties within the vicinity of the Site.

A field survey for historic structures on the Site was performed by Sage on January 14, 2021. The remnants of a stone fireplace were observed on the east side of the gas easement just south of the recently logged area. Multiple old roadbeds were observed and followed to search for potential homesites and other structures. No other structures or remains of past structures were found on the Site.

Chatham County records indicate that the gravesite of William Morgan is located on the Site along the western boundary. The initial field survey complete by Sage on January 14, 2021 was unable to locate the gravesite. A follow up field survey was completed by members of the Chatham County Historical Society, Sage staff, and the developer on January 30, 2021. Six people traversed the site for approximately 3 hours. The area indicated by Chatham County records as well as the area surrounding the remnants of the stone chimney were focused on. A large portion of the central area of the Site was also thoroughly surveyed at this time, but no evidence of a grave was observed. E-mail correspondence detailing the January 30$^{th}$ field survey is attached in Appendix C.

An environmental review request was submitted to NCSHPO on February 2, 2021, to solicit a project review and comments on potential effects to historic properties with the development of the Site. NCSHPO recommended a comprehensive archaeological survey be conducted (Appendix C). A field review and archival research by New South Associates, Inc. was conducted in April 2021. The area surrounding the remnants of the stone chimney were determined not eligible for listing on the National Register of Historic Places. Field surveys for the William Morgan grave were not identified. A copy of the draft archaeological report is attached in Appendix C.

Archeological records are not typically included in the NCSHPO database and to date there is no publicly available comprehensive listing of archeological sites in North Carolina available from the Office of State Archeology (OSA). This agency compiles data on the state's legacy of artifacts through application of state and federal archaeology laws and regulations, and by maintaining inventories of site data and collections. Currently, two regulations may apply to the project if remains or artifacts are encountered during construction. These include the Unmarked Human Burial and Human Skeletal Remains Protection Act of NC (UHBHSR), and Section 106 of the National Historic Preservation Act (NHPA). If archaeological artifacts or remains are discovered on the Site during construction, appropriate personnel will immediately be contacted, and all work will cease until confirmation on proceeding with construction from proper authorities is received.

The proposed project should not have an adverse effect on any areas of archaeological or historical value. If the evidence of the grave or other historic sites is uncovered during construction, the project shall follow the regulations outlined in the UHBHSR and NHPA.

## 3.7 Air Quality

The project is anticipated to comply with the State Implementation Plans for achieving and maintaining National Ambient Air Quality Standards (NAAQS) for criteria pollutants. According to the USEPA website, as of November 30, 2020, the project area is not located in a non-attainment area for all-criteria pollutants.

During construction, impacts to air quality will be minimal from exhaust created by machinery used to clear and grade the Site for development. Once construction is completed, minor impacts to air quality will result from increased automobile activity as a result of development. Any odors released will be temporary and insignificant. A traffic study was not performed nor required for this project.

Parking will be provided for the clubhouse and community garden area. A single lot with up to 32 parking spaces is proposed.

In accordance with North Carolina Open Burning regulations, necessary burn permits will be obtained from the NC Department of Forestry or from Chatham County. Open burns not requiring an open burn permit will comply with the regulations set forth in 15A NCAC .02B .1903. Open burning will not occur on the Site when a "No Burn Ban" is

in effect for the area. Non-vegetative materials, such as household garbage, lumber, or any other synthetic materials, will not be burned.

The proposed project should not have a significant adverse impact on air quality during or after construction.

## 3.8 Noise Levels

Current noise levels generated from the Site are negligible, as the Site is undeveloped. Historically, noise levels generated on the Site were likely elevated during logging operations. Properties adjacent to the Site are utilized for rural residences, commercial businesses, and periodic logging. The Site is on Jones Ferry Road which has an average annual daily traffic (AADT) count between 2,400 and 3,400 vehicles (NC Department of Transportation (NCDOT, 2019). While noise levels generated from the Site will increase during construction and after development, impacts to the surrounding area will not be significant in relation to existing noise levels from adjacent sources.

## 3.9 Light Levels

Lighting is not required for the subdivision, though street lighting will likely be provided by Duke Energy. Light shields will be utilized to direct light on the street and reduce undesirable spillage. All lighting will comply with Section 13 of the Chatham County Zoning Ordinance. Artificial lighting for the project is not anticipated to have significant impacts to residents or wildlife.

## 3.10 Surface and Groundwater Resources

The Site drains to Meadow Branch and Wilkinson Creek in the Cape Fear River Basin [USGS Hydrologic Unit Codes (HUC) 030300020509 and 030300020701, respectively]. Meadow Branch and Wilkinson Creek are classified as class "Water Supply IV, Nutrient Sensitive Waters" (WS-IV; NSW). "WS-IV" waters are protected water supplies that are in generally moderately to highly developed watersheds. "NSW" is a supplemental classification which indicates waters that have to potential to exhibit high levels of nutrients and have more stringent regulations to better protect downstream water quality. Both Meadow Branch and Wilkinson Creek are tributaries to Jordan Lake. Regulations are in place for these tributaries to protect water quality in this important drinking water resource. Riparian buffer protections are applicable to the Site, and buffer determinations will be made by Chatham County staff. Thirteen streams were identified by S&EC as being present on the Site. The Wetland Sketch Map in Appendix B provides additional information on the identified surface waters. The proposed project will adhere to all applicable stream and wetland buffers.

Groundwater has not been tested on the Site. As stated in Section 3.2 above, there is no evidence of contamination on or adjacent to the Site per the database search or the field review. All groundwater is expected to move from higher to lower elevations. A community well system for drinking water is proposed. Appropriate permits will be obtained from the state and/or county prior to construction. New well construction will follow the guidelines and recommendations from the Environmental Health Division of Chatham County.

Sediment and erosion control measures will be utilized during construction and forested riparian buffers will be protected from clearing and grading to reduce impacts to surface waters on the Site. Five stormwater management BMPs are proposed to capture stormwater runoff from the impervious portions of the Site. These BMPs will continue to reduce pollutants and sediment entering surface waters from the Site after construction is completed.

Direct and indirect impacts to surface waters and groundwater resources will be minimized through site design and the implementation of on-site sediment and erosion control measures. As previously mentioned, access to Jones Ferry Road from the Site will require the crossing of two drainages that contains streams. The proposed impacts are below current thresholds requiring mitigation. The resulting surface water impacts of the road crossings will be minimized to the maximum extent practicable. The proposed project should not have adverse effects on surface and groundwater resources.

## 3.11 Fish and Aquatic Habitats

Aquatic habitats on the Site are provided by surface waters and wetlands. These habitats are important for aquatic as well as terrestrial species. A query of both NCDEQ fish community sampling and benthic data indicates one publicly documented sampling site approximately 3.25 miles to the southwest of the Site on Ferrels Creek, of which Meadow Creek is a tributary. The most recent benthos bioclassification was rated “Fair” (2012) and the fish community rating is “Good-Fair” (2018). Previous benthos ratings were also “Fair” and previous fish community ratings ranged from “Fair” to “Excellent.”

Figure 3 depicts the existing aquatic habitats on the Site. The Site Plan proposes a road crossing of two drainages that contain streams and a wetland area. The streams will be subject to riparian buffers. Appropriate sediment and erosion control measures will be utilized during construction of the road, and all temporary impact areas will be restored by reseeding and stabilization of disturbed areas. Permitting through USACE, Chatham County, Orange County, and NCDEQ will be acquired prior to any land disturbance. Although minor temporary impacts to aquatic habitats will occur during the construction of the road, long-tern impacts to fish and aquatic habitats will not result from the construction of the proposed project.

## 3.12 Wildlife and Natural Vegetation

Aside from the maintained/disturbed areas of the utility line, the natural community report completed by the NC Natural Heritage Program (NCNHP) on January 13, 2021 (Appendix D) identified two distinct community types as being present on the Site.

Dry Basic Oak-Hickory Forests are present in the central and northern portions of the Site. The communities contain canopy trees such as southern shagbark hickory (*Carya carolinae-septrionalis*), white oak (*Quercus alba*), post oak (*Quercus stellata*), black oak (*Quercus velutina*), Shumard oak (*Quercus shumardii*), and scarlet oak (*Quercus coccinea*). Understory species include eastern red-cedar (*Juniperus virginiana*), southern sugar maple (*Acer floridanum*), flowering dogwood (*Cornus florida*), and red maple (*Acer rubrum*). NCNHP estimated this community covers approximately 41 acres of the Site. The proposed Site Plan will preserve approximately 6.5 acres of the Dry Basin Oak-Hickory Forest.

Dry Oak-Hickory Forests are present in the central and southern portions of the Site. The overstory is dominated by white oak with occasional post oak, black oak, and scarlet oak. Understory species include American holly (*Ilex opaca*) and sweet gum (*Liquidambar styraciflua*). NCNHP estimated this community covers approximately 33 acres of the Site. The proposed Site Plan will preserve approximately 19 acres of Dry Oak-Hickory Forest.

Invasive species observed on the Site included Chinese privet, autumn olive, Japanese honeysuckle, and Nepalese browntop or Japanese stiltgrass. These invasive species were not dominant.

A previous field effort conducted by NCNHP staff on the adjacent parcel located to the southwest resulted in identification and delineation of the Morgan Ridge Natural Area described in Section 3.5. NCNHP staff concluded that this natural area should be expanded to include the high-quality natural communities on the Site. Conservation areas are proposed for the southwest portion of the Site to adjoin currently proposed conservation areas on the adjacent Morgan Ridge Subdivision Phase 2. While the corridors between the lot lines of the adjacent subdivisions are narrow, the lots are not expected to be clear cut.

Two online datasets were queried by Sage in order to assess known federally listed species in North Carolina. These included the NCNHP Data Explorer and the online US Fish & Wildlife Service (USFWS) Threatened and Endangered (T&E) Species for Chatham and Orange Counties, NC (Table 3). These were reviewed prior to conducting the fieldwork. Please note that the review did not include Federal Species of Concern, Candidate Species, or state listed species. According to the NCNHP Report dated January 8, 2021, no known elemental occurrences are documented on or within 1.0 mile of the Site.

**Table 3. USFWS Threatened & Endangered Species List for Chatham & Orange Counties, NC as of July 17, 2020**

| Common Name | Scientific name | Federal Status | Habitat Type | County |
|---|---|---|---|---|
| Bald eagle | *Haliaeetus leucocephalus* | BGPA[1] | Terrestrial | Chatham & Orange |
| Cape Fear Shiner[2] | *Notropis mekistocholas* | Endangered | Aquatic | Chatham & Orange |
| Dwarf wedgemussel[3] | *Alasmidonta heterodon* | Endangered | Aquatic | Orange |
| Red-cockaded Woodpecker | *Picoides borealis* | Endangered | Terrestrial | Chatham |
| Harperella[3] | *Ptilimnium nodosum* | Endangered | Terrestrial | Chatham |
| Michaux's sumac | *Rhus michauxii* | Endangered | Terrestrial | Orange |
| Smooth coneflower | *Echinacea laevigata* | Endangered | Terrestrial | Orange |

*1 – Bald and Golden Eagle Protection Act*
*2 – USFWS Range by Basin Map depicts Cape Fear shiner extending to the Site; habitat requirements include gravel, cobble, and boulder substrates; The species is known from tributaries and mainstreams of the Deep River and Cape Fear River in Chatham County.*
*3 – USFWS Range by Basin Map does not depict dwarf wedgemussel extending to the Site.*
*4 – Habitat requirements for this species include rocky riverbeds in the Piedmont, rocky or gravel shoals and sandbars, and along the margins of clear, swift-flowing stream sections.*

During the site assessment it was noted that the drainages present are small, containing first and second order streams, with a substrate which is comprised of a combination of silt, gravel, cobble, with some areas containing bedrock. The portion of Wilkinson Creek along the southern Site boundary is large enough to support Cape Fear shiner but not harperella. Therefore, habitat for harperella is not present on the Site. No known occurrences of Cape Fear shiner or harperella are within 1.0 of the Site. Although several large farm ponds are within 1.0 mile of the Site, the Site does not contain suitable nesting or foraging habitat for bald eagle. No suitable nesting or foraging habitat was found to be present for red-cockaded woodpecker.

A 200-ft riparian buffer was recommended by NCNHP for Wilkinson Creek and its tributaries to protect the Haw River Aquatic Habitat downstream of the Site. All streams on the Site are within proposed conservation open space, with some stream sections afforded well over the 200-ft recommended buffer protection. Chatham County riparian buffers are applicable to the remainder of the stream sections. Additionally, runoff from the Site will be treated in proposed stormwater ponds prior to being discharged.

Large portions of the Site have been historically managed for timber production and have been allowed to naturally regenerate. Chatham County and NCDWR riparian buffers will be applied to wetlands and streams on the Site. Many of these buffers will also be within larger conservation natural space or open space. Approximately 50.8% of the Site (including the conservation areas within Orange County) will be preserved as natural conservation area per the parameters set forth in the Conservation Subdivision Guidelines. As per the proposed site plan, approximately 87 acres of existing forest on the Site will be cleared for the proposed development which includes the approximately 15.08 acres of proposed open space. The proposed roads and storm basins will be cleared and constructed by a

grading contractor using mechanized clearing. Clearing on individual lots will only occur once a home is being constructed to avoid mass clearing. Although each lot and home layout will be different, it is expected that some trees will be left on each lot. Although some habitat loss will occur for larger wildlife species such as white-tail deer, fox, raccoon, opossum, squirrel, and birds these types of species will have the opportunity to migrate to remaining forested areas on and around the Site. Approximately 46.63 acres of the Site are to remain forested to provide suitable habitat for wildlife. The southwest portion of the Site is adjacent to conservation areas on the adjacent Morgan Ridge Subdivision Phase 2. Forested areas left undeveloped for conservation will provide habitat for these displaced species once construction is complete. Significant impacts to wildlife and habitat are not expected from the proposed project. The proposed project should not have an adverse effect on wildlife and natural vegetation.

## 3.13 Hazardous Materials

No hazardous materials will be permitted to be stored on the Site, however, potential incidents from minor accidental fuel spills are possible. Best management practices concerning the use of aboveground storage tanks containing heavy equipment fuels and containers such as hydraulic oil will be implemented during construction activities. Spills that may occur during construction will be immediately contained and cleaned by certified personnel. Sediment and erosion control devices, riparian buffers, and proposed SCMs will prevent any potential minor spills from being close to or entering surface waters. After construction, potential contamination sources will include personal vehicles and equipment and chemicals used for landscape maintenance. Any potential incidents are considered to be de minimus in nature and would be insignificant.

SECTION 4

# CONCLUSIONS

An Environmental Impact Assessment for the Pyewacket Subdivision was completed to identify potential environmental impacts the proposed project could have on the Site and surrounding land uses. Direct, indirect, and cumulative impacts were considered when developing the EIA and while designing the site plan. During construction of the Site, preventative measures will be taken to avoid and minimize impacts to the environment and adjacent properties. The project will meet multiple goals outlined in the Chatham County Land Use Plan, including promoting appropriate residential development for the area, integrating agricultural friendly development, and protecting and preserving natural areas.

SECTION 5

# REFERENCES


*Chatham County Comprehensive Plan*. 2017. Accessed November 6, 2020. https://www.chathamnc.org

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## APPENDIX A
# SITE PHOTOS

**Photo 1**: Gas easement near northern portion of the Site.

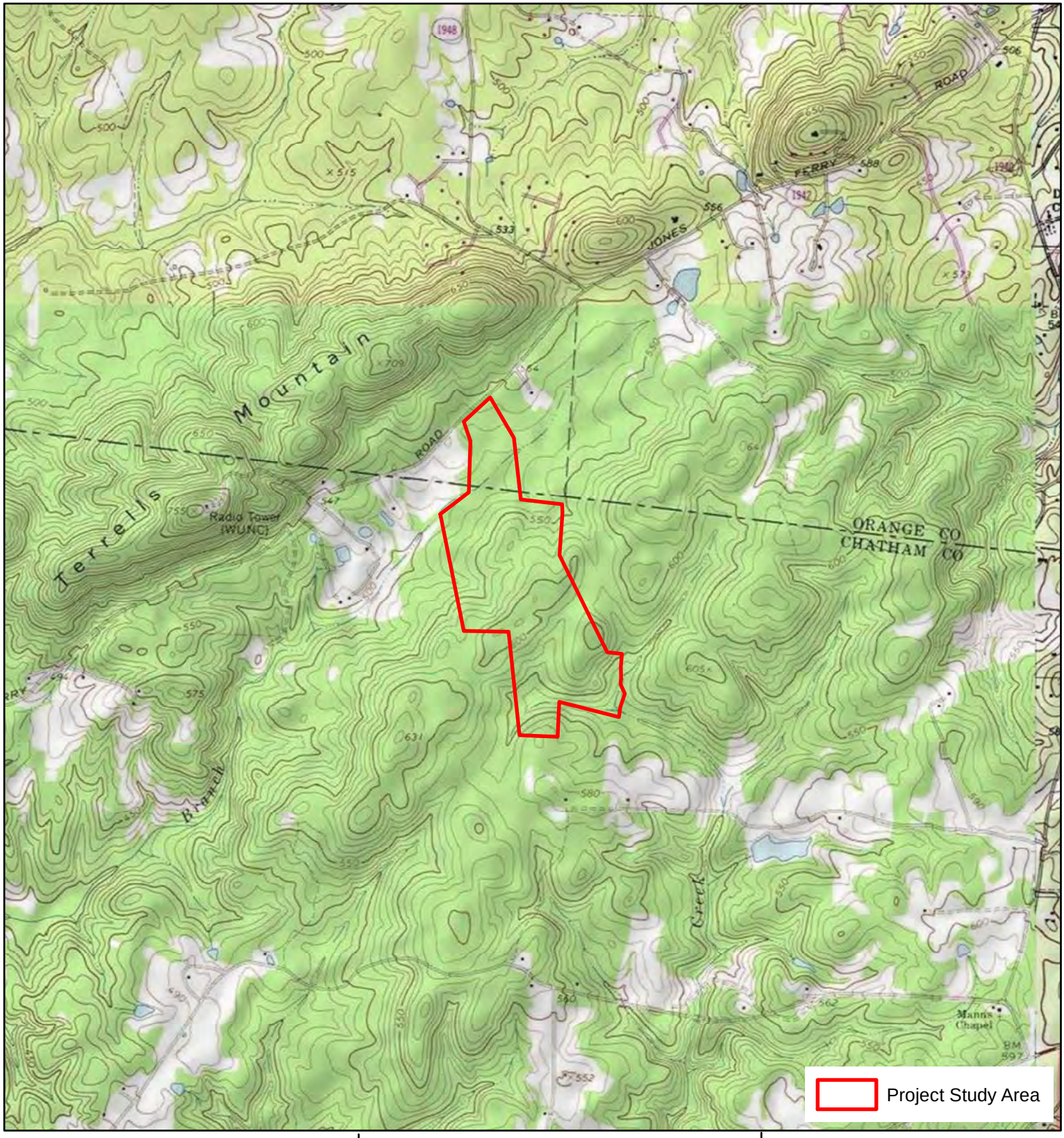
**Photo 2:** Dry Basic Oak-Hickory Forest.

**Photo 3**: Dry Oak-Hickory Forest.

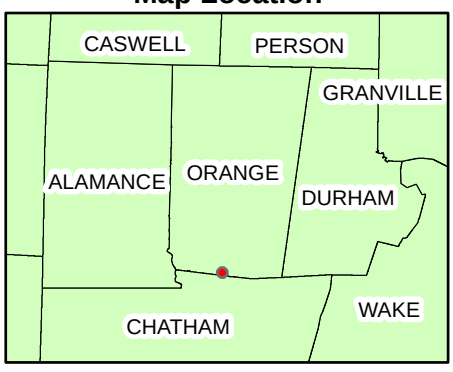
**Photo 4**: Looking east from gas easement toward recently logged area.

APPENDIX B

# FIGURES




**Map Location**




**USGS Topo Map**

Pyewacket Subdivision
Sage Project # 2020.108

Bynum, NC Quadrangle
USGS Topography, December 2013
Map Prepared by: Philip Beach
December 17, 2020

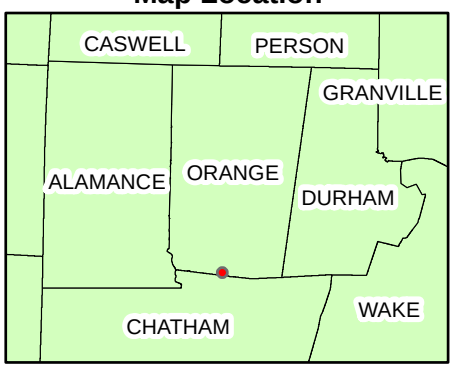
N

0 0.25 0.5 Miles

**Figure 1**

Sage Ecological Services, Inc.
Office: 919-335-6757
Cell: 919-559-1537


## Map Location




## Aerial Vicinity Map

Pyewacket Subdivision
Sage Project # 2020.108

Map Prepared by: Philip Beach
December 17, 2020

N

0 0.25 0.5 Miles

**Figure 2**

Sage Ecological Services, Inc.
Office: 919-335-6757
Cell: 919-559-1537

Note: For Orange County buffers, depending on slope value the buffer may be 65'

## Legend

- Orange/Chatham County Line
- Evaluation Area
- Potentially Jurisdictional Perennial Stream
- Potentially Jurisdictional Intermittent Stream
- Potentially Jurisdictional Ephemeral Stream
- Potentially Jurisdictional Linear Wetland
- Potentially Jurisdictional Wetland
- Potential 30' Chatham County Buffer
- Potential 50' Chatham County Buffer
- Potential 50' Orange County Buffer
- Potential 100' Chatham County Buffer
- 2' Orange County Contours
- 2' Chatham County Contours

99B TT PL
99A TT PL
G
W9
DP2
117A & 118A TT CH
S13
DP1
S16
S14
I
148A & 148B TT CH
J
G
S17
S15
LW3 - LW7
S10
W8
S12
88 TT CH
89 TT CH
C
65 TT PL
W11
W10
D
W12
K
S09
67 & 68 TT PL
98 TT CH
S12
170 & 174 TT PL
LW1 & LW2
L
S08
S11
160 TT 169
64A TT 64B
S07
168 TT 175
155A & 159B TT CH
W7
57A TT 57B
W6
48 & 56 TT PL
W5
S01
S02
S04
M
P
S06
S03
W4
35 & 47 TT CH
W1
W3
B
01 & 08 TT CH
S05
A
N
O
17 & 34 TT CH
29 & 30 TT CH
W2
09 & 16 TT CH

**Detailed Delineation of Waters of the US**
Suitable for Preliminary Planning Only

S&EC reserves the right to modify this map based on more fieldwork, and any other additional information. Approximations were mapped using topographic maps, air photos and ground truthing. If the site is going to be disturbed, S&EC's detailed delineation should be approved and permitted by the U.S. Army Corps of Engineers as required. If the user of this work desires an accurate map of the regulated features flagged by S&EC, they should retain a NC Registered Professional Land Surveyor to locate S&EC's flagging.

N

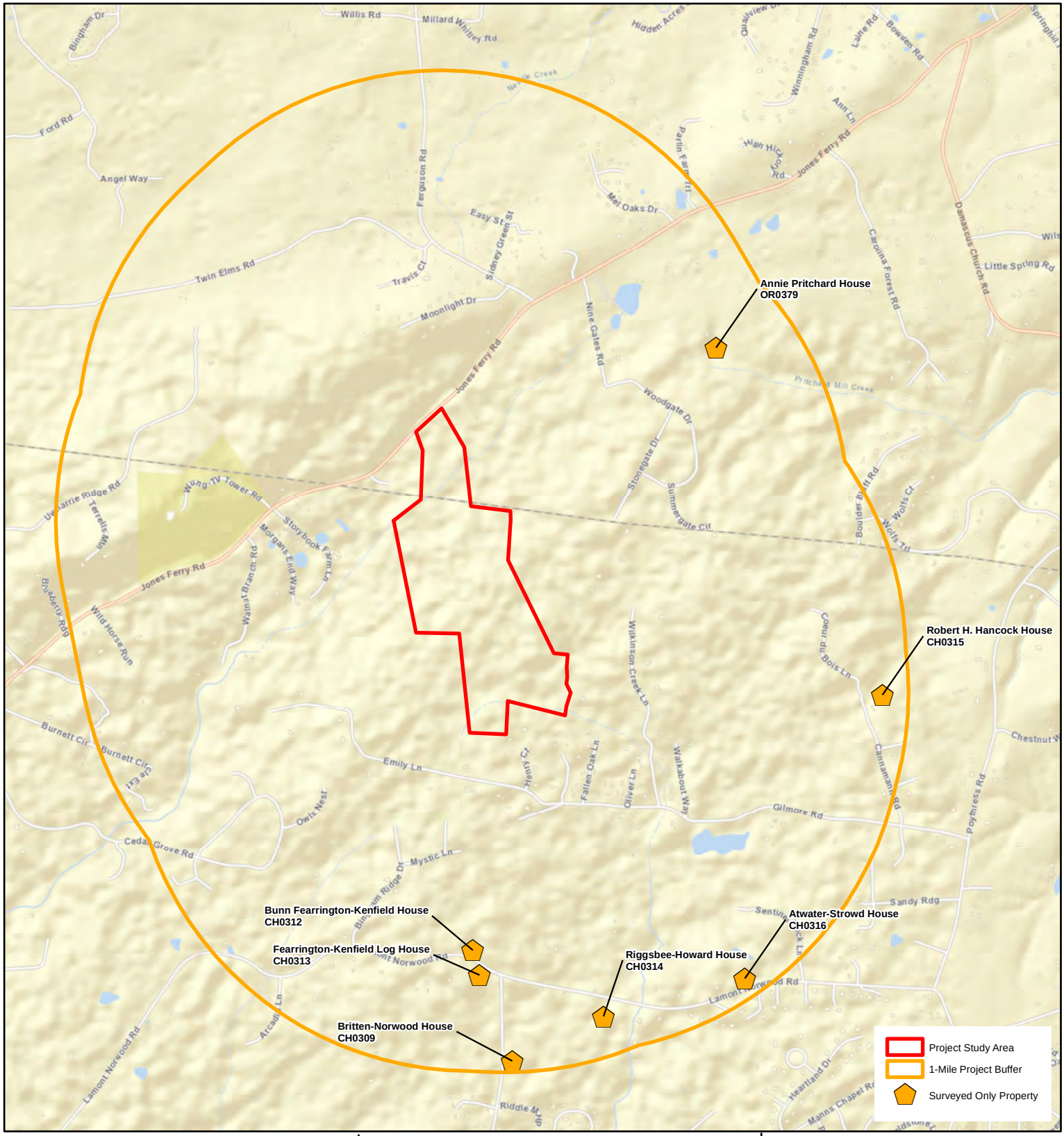
NC Center for Geographic Information & Analysis

# Wetland Sketch Map

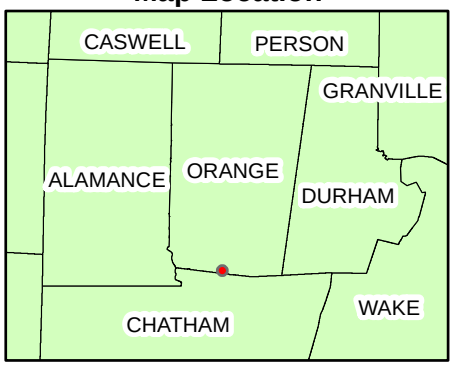
| | | |
|---|---|---|
| **Project No.** 14504.W1 | **Scale:** 1 = 200' | Jones Ferry<br>Merrit Property<br>Chatham & Orange County, NC |
| **Project Mgr.:** SB | 12/09/2020 | **Prepared by:** KM |

S&EC
Soil & Environmental Consultants, PA
8412 Falls of Neuse Road, Suite 104, Raleigh, NC 27615 • Phone: (919) 846-5900 • Fax: (919) 846-9467
sandec.com

0 200 400 800
Feet




## Map Location




## State Historic Properties Map

Pyewacket Subdivision
Sage Project # 2020.108

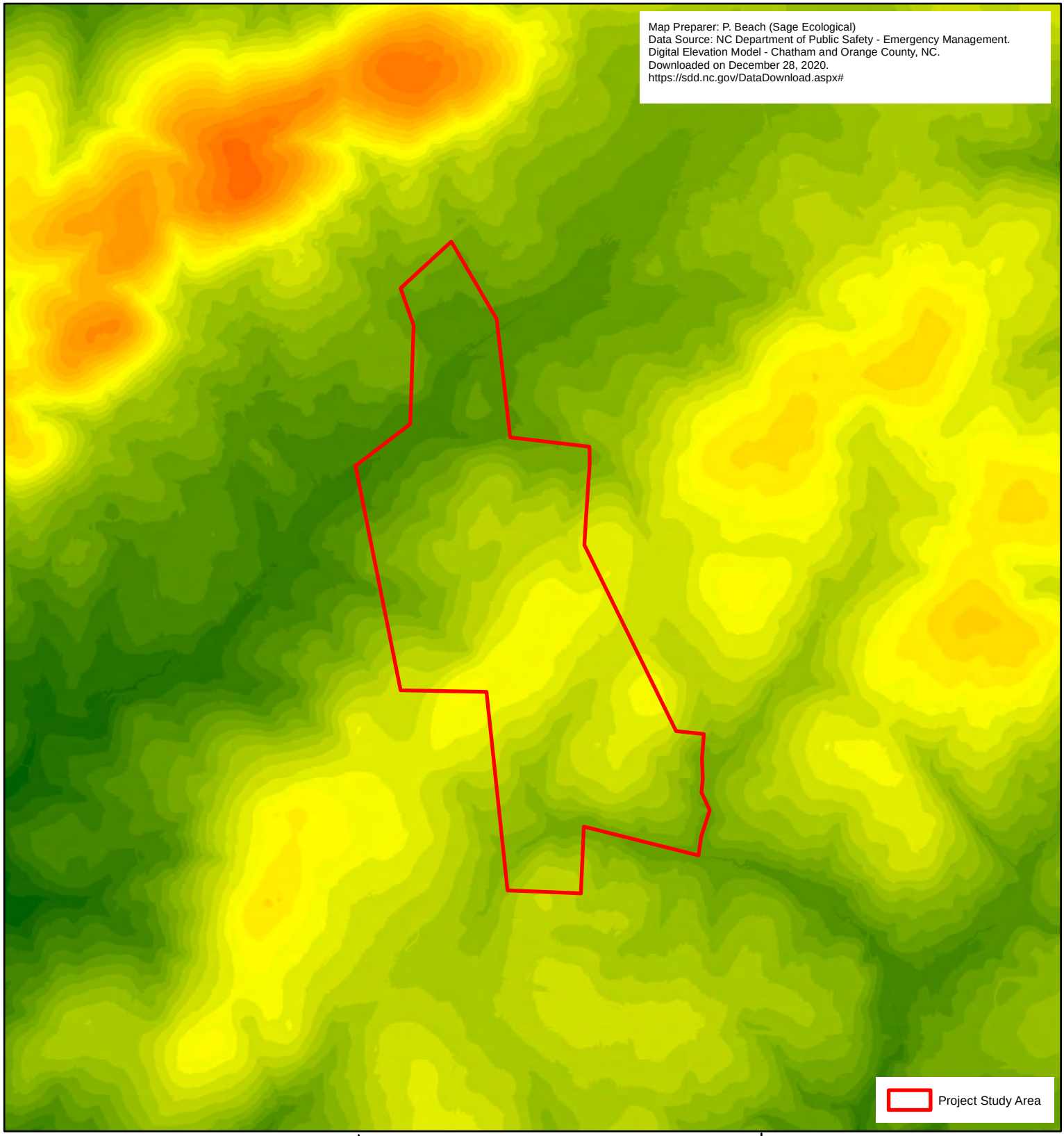
Data Source: NCSHPO GIS Shapefiles
Database Effective Date: October 6, 2020
Map Prepared by: Philip Beach
December 17, 2020

N

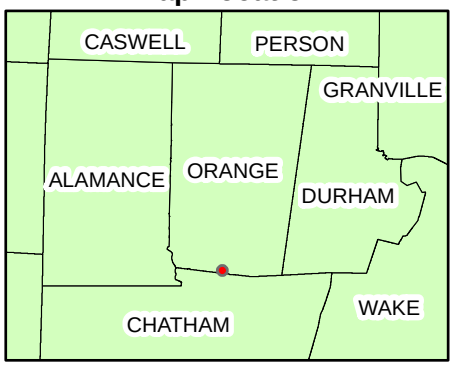
0 0.25 0.5 Miles

**Figure 4**

Sage Ecological Services, Inc.
Office: 919-335-6757
Cell: 919-559-1537




**Map Location**




**LIDAR DEM Map**

Pyewacket Subdivision
Sage Project # 2020.108

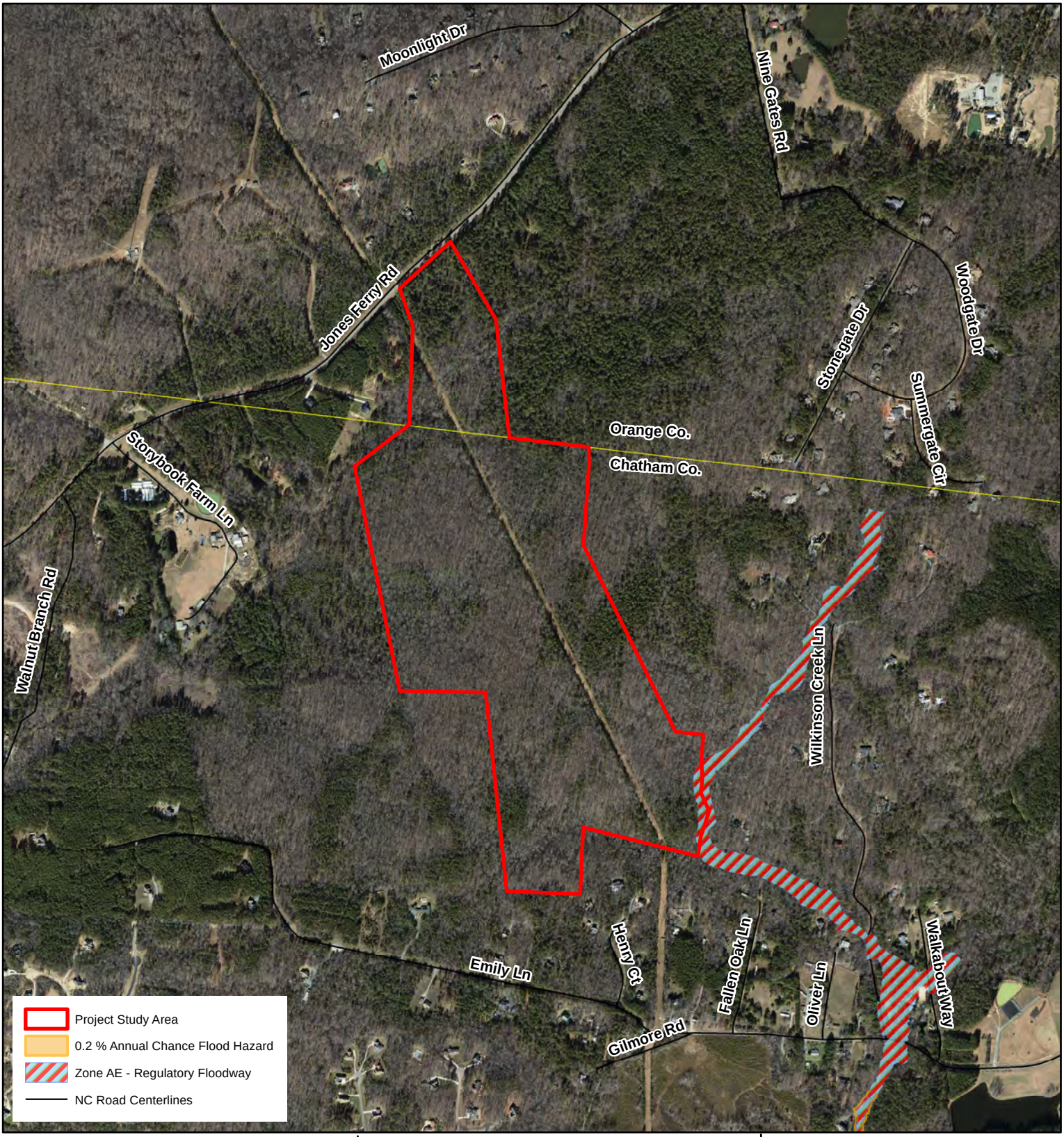
Map Prepared by: Philip Beach
December 28, 2020

N

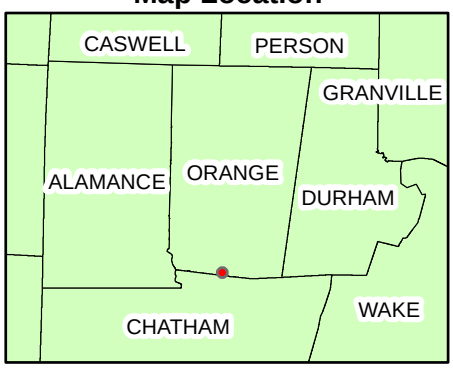
0 800 1,600 Feet

**Figure 5**

Sage Ecological Services, Inc.
Office: 919-335-6757
Cell: 919-559-1537




## Map Location




## FEMA Special Flood Hazard Areas

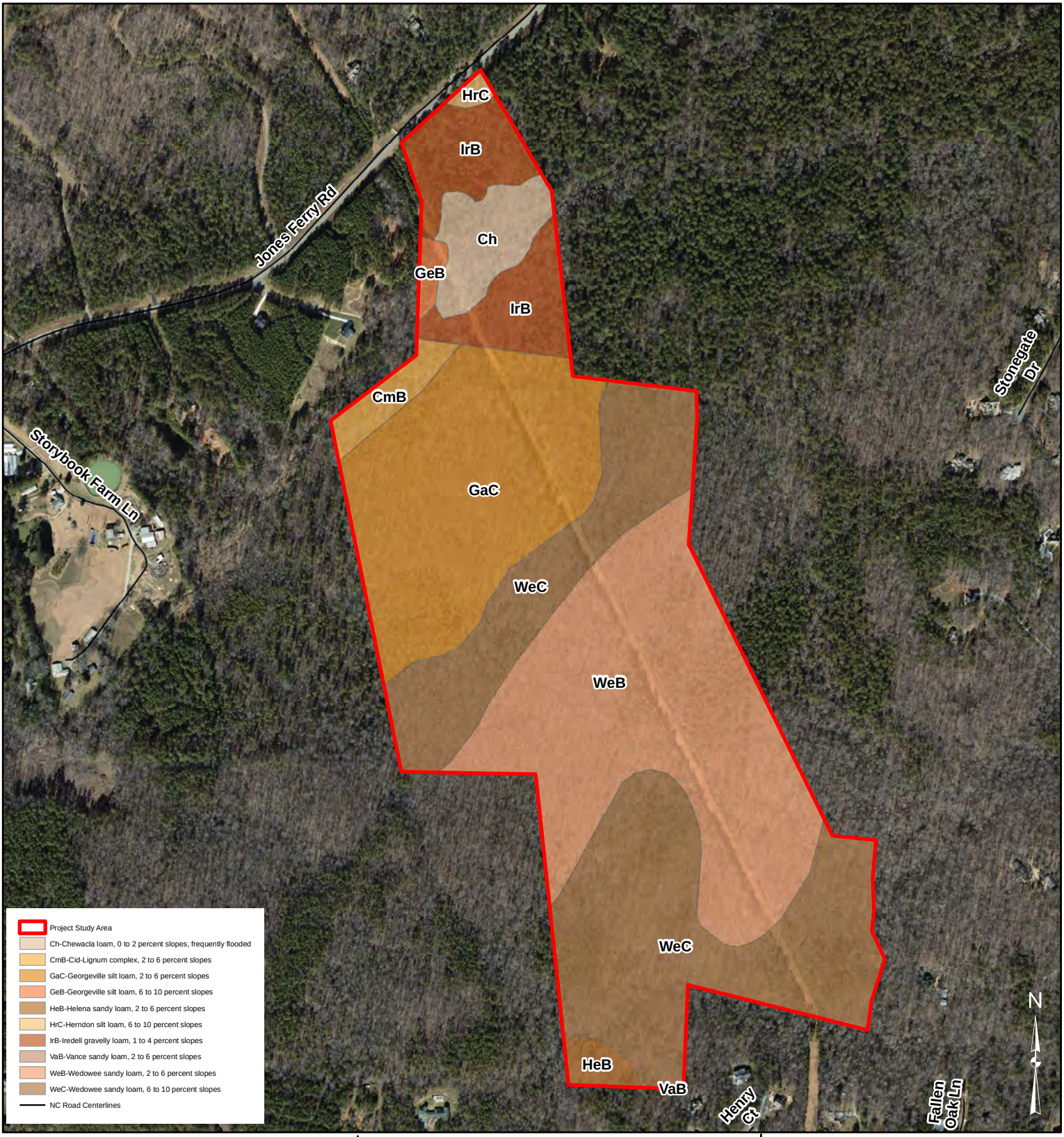
Pyewacket Subdivision
Sage Project # 2020.108
Source: flood.nc.gov
Map FIRM ID: 3710974600K
Effective Date:November 17, 2017
Map Prepared by: Philip Beach
December 28, 2020

N

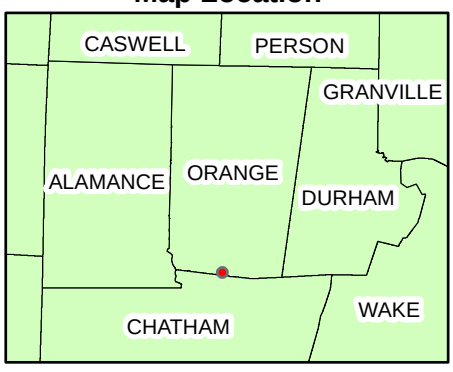
0 750 1,500 Feet

**Figure 6**

Sage Ecological Services, Inc.
Office: 919-335-6757
Cell: 919-559-1537




## Map Location



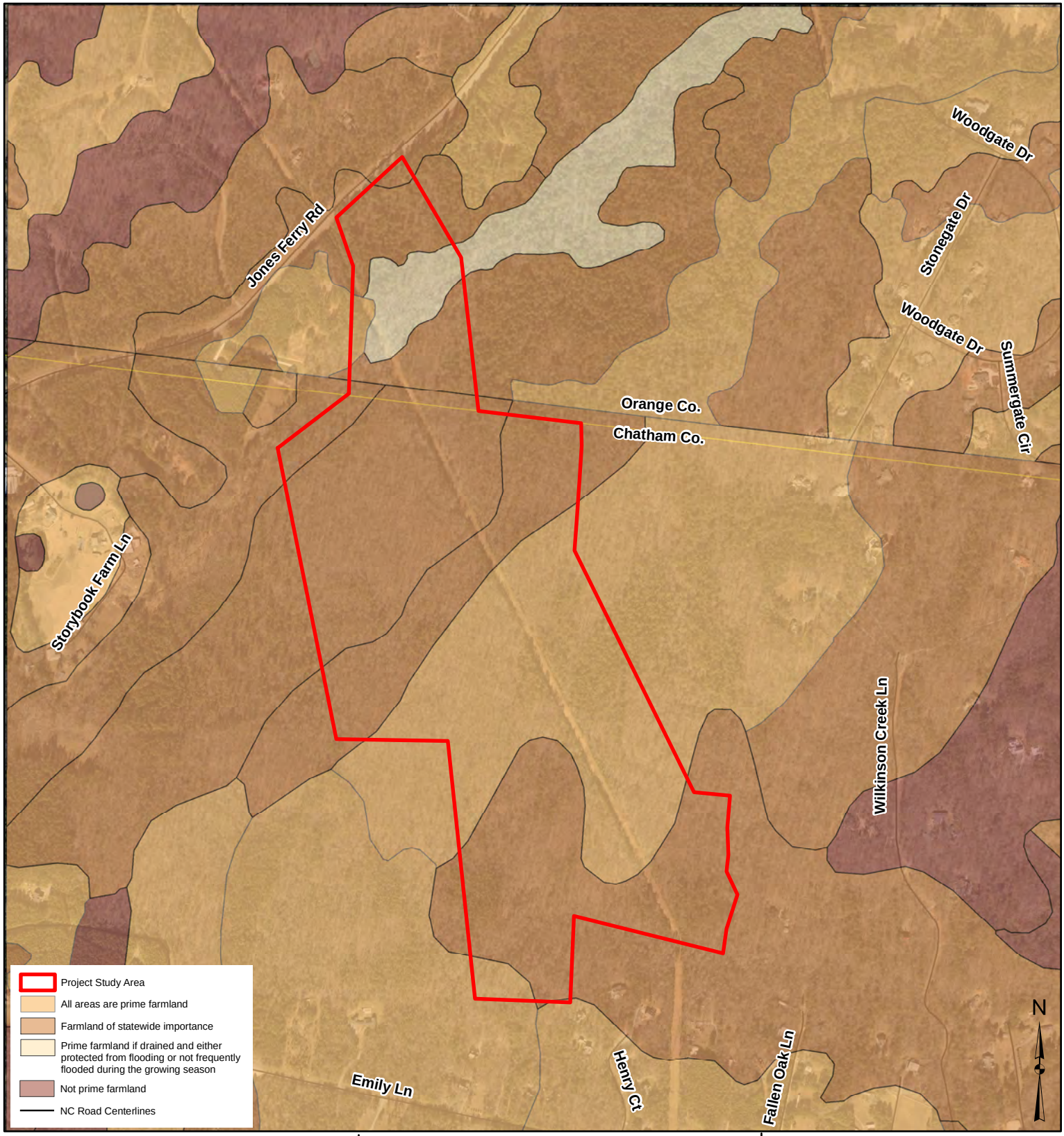

## Dominant Soil Series Areas

Pyewacket Subdivision
Sage Project # 2020.108
Source: USDA NRCS Web Soil Survey
Chatham and Orange County, NC
Download Date: December 28, 2020
Map Prepared by: Philip Beach
December 28, 2020

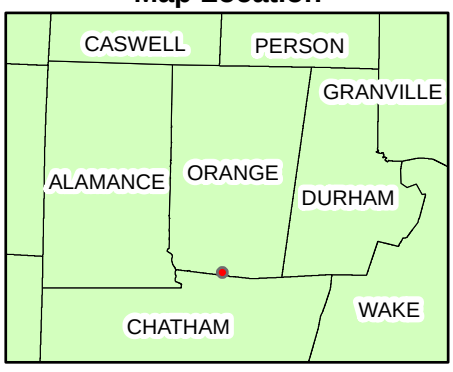
0 500 1,000 Feet

**Figure 7**

Sage Ecological Services, Inc.
Office: 919-335-6757
Cell: 919-559-1537




## Map Location



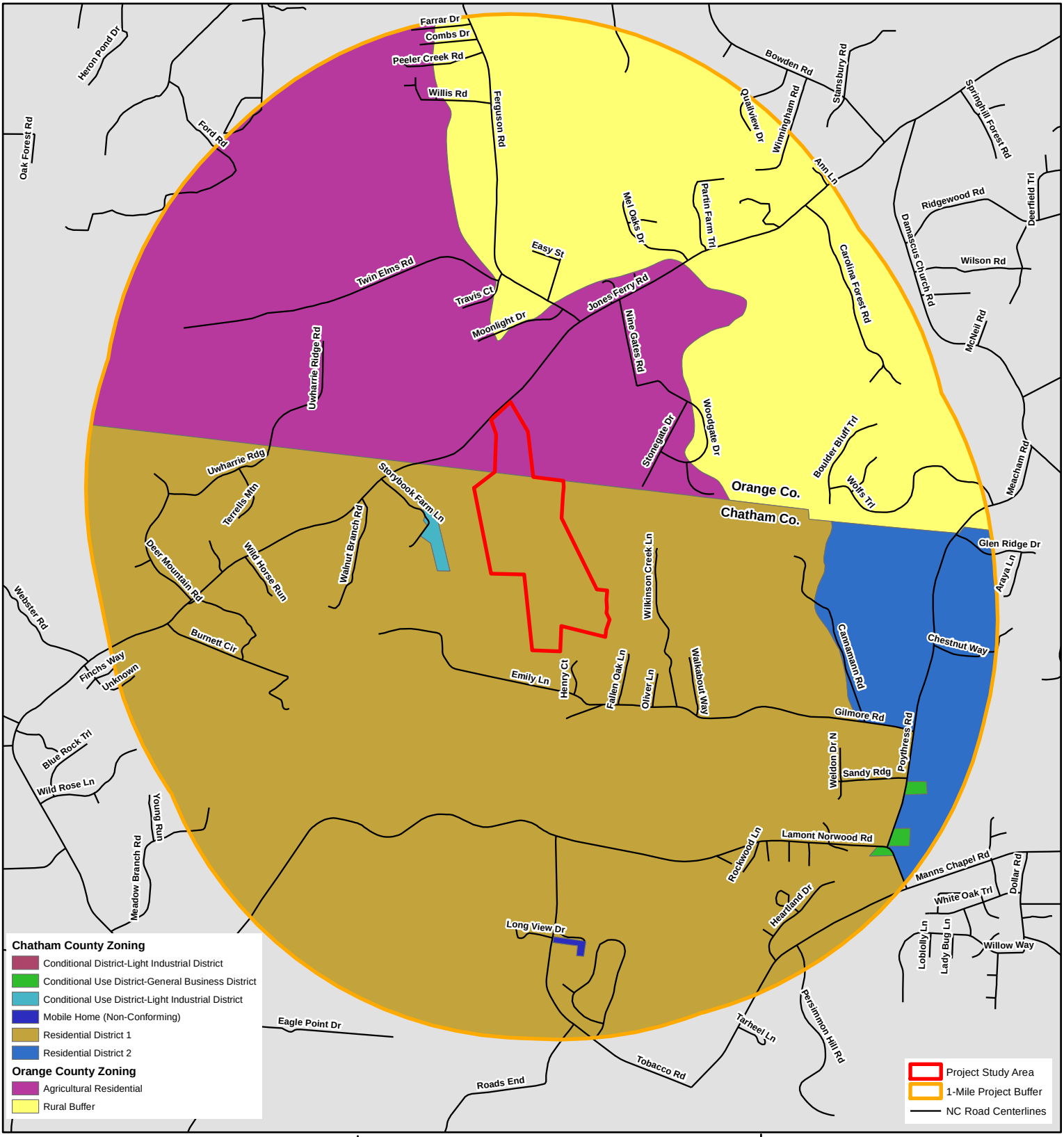

## Farmland Soils Map

Pyewacket Subdivision
Sage Project # 2020.108
Source: USDA NRCS Web Soil Survey
Chatham and Orange County, NC
Download Date: December 28, 2020
Map Prepared by: Philip Beach
December 28, 2020

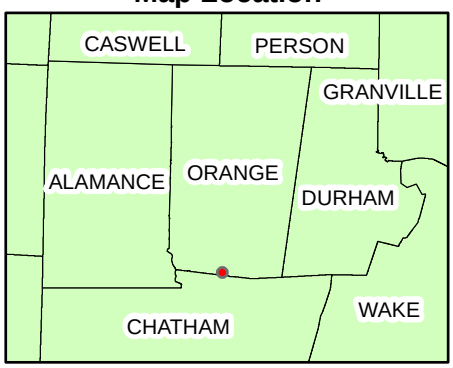
0 500 1,000 Feet

**Figure 8**

Sage Ecological Services, Inc.
Office: 919-335-6757
Cell: 919-559-1537




## Map Location




## County Zoning Map

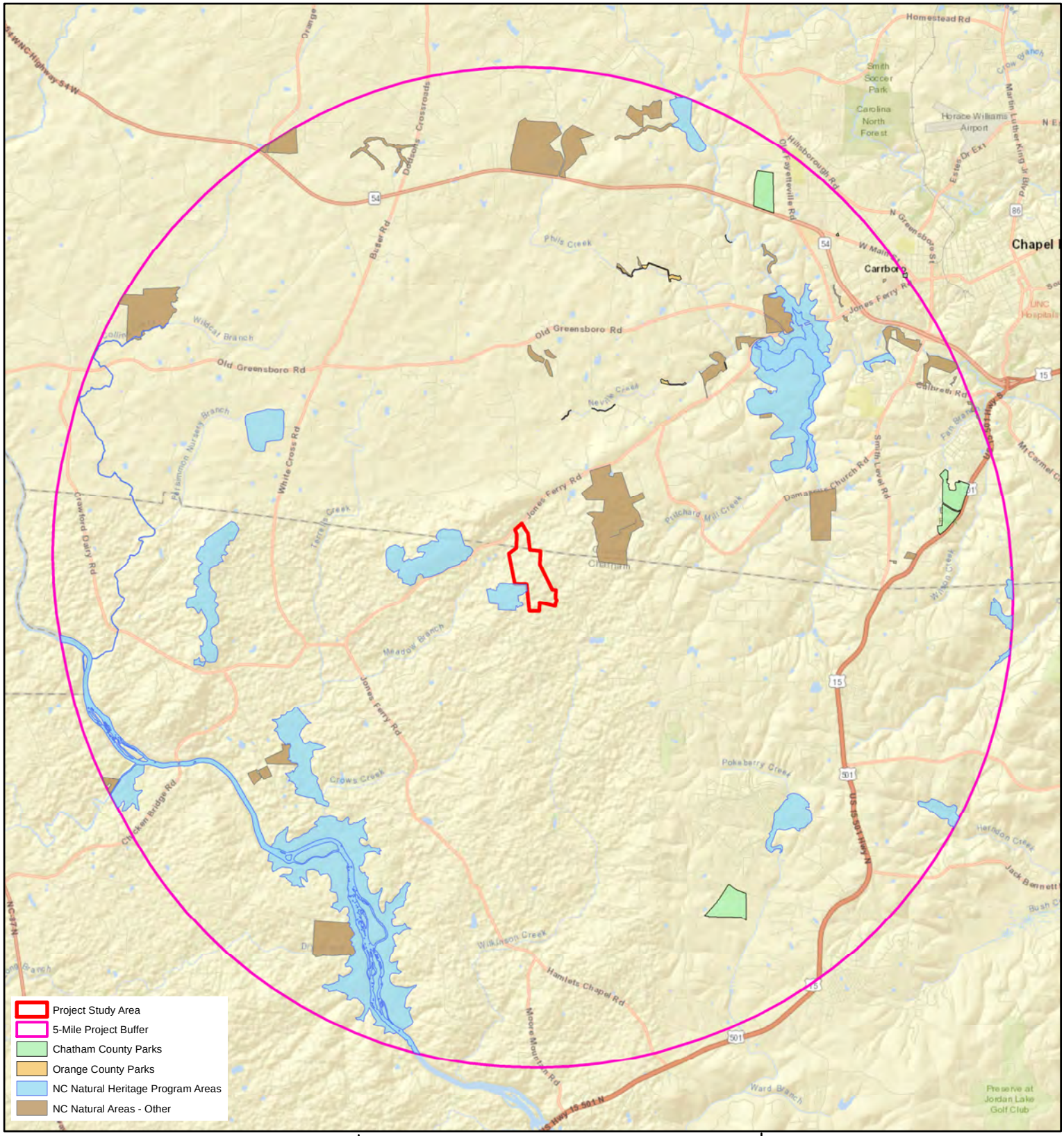
Pyewacket Subdivision
Sage Project # 2020.108
Data Source:
Chatham & Orange Co., GIS Data
Map Prepared by: Philip Beach
December 28, 2020

N

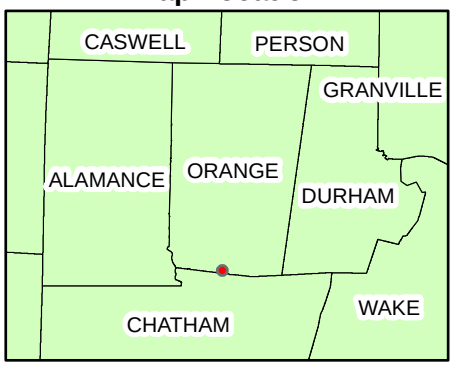
0 0.25 0.5 Miles

**Figure 9**

Sage Ecological Services, Inc.
Office: 919-335-6757
Cell: 919-559-1537




## Map Location




## Public Lands and State Natural Areas

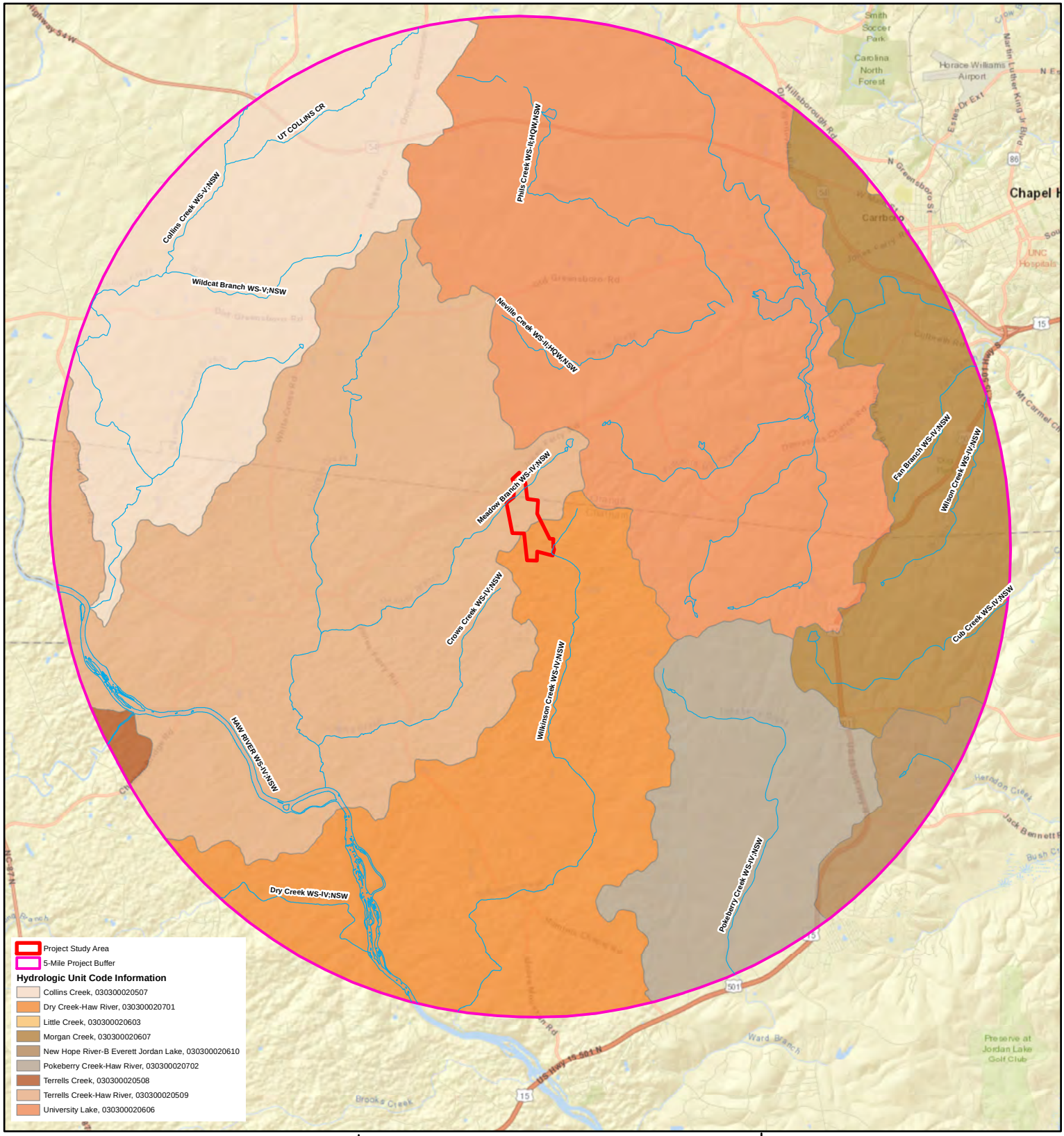
Pyewacket Subdivision
Sage Project # 2020.108
Data Source:
Chatham / Orange Co., GIS - Dec 2020
Map Prepared by: Philip Beach
December 28, 2020

0 0.75 1.5 Miles

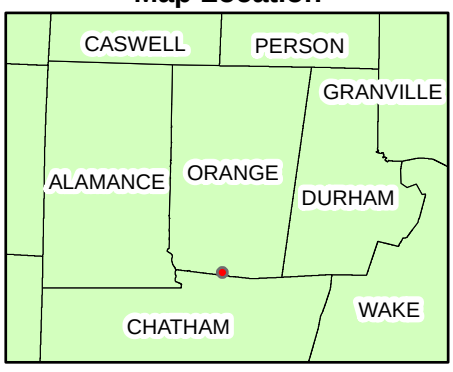
N

**Figure 10**

Sage Ecological Services, Inc.
Office: 919-335-6757
Cell: 919-559-1537




## Map Location




**Surface Water Resources**
**Water Quality Ratings and**
**12 Digit Hydrologic Units**

Pyewacket Subdivision
Sage Project # 2020.108
Data Source:
NC OneMap GIS - Dec 2020
Map Prepared by: Philip Beach
December 28, 2020

0 0.75 1.5 Miles

N

**Figure 11**

Sage Ecological Services, Inc.
Office: 919-335-6757
Cell: 919-559-1537

Plan prepared by:
*Warren D. Mitchell, PE*
*104 Amber Wood Run*
*Chapel Hill, NC 27516*
warrendmitchellpe@gmail.com
919-593-1916

250 0 250 500
1" = 250'
GRAPHIC SCALE

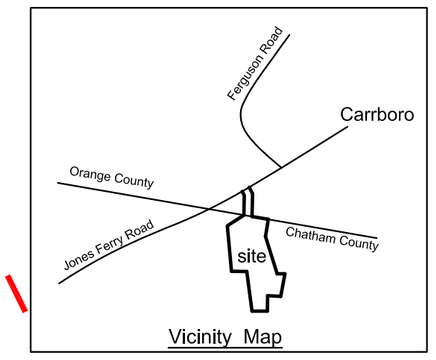
# pyewacket subdivision

concept plan - page 1
chatham county, nc
December 28, 2020
revised Feb. 02, 2021

## SITE DATA

Owner: Wyndell H. Merritt
Address: Jones Ferry Road
Parcel ID: 90267
Zoning: R1
Parcel Size: 139.63 acres
Orange County = 11.24 acres
proposed lots = 0
Chatham County: (gross ac)=128.391 acres
Floodplain = 0.95 acres
Streams = 0.50 acres
total lots allowed:
128.391-0.95-0.50 = 126.941 acres
126.941 / .918(40,000sf) = 138.2 lots
138.2 x 1.1 = 152 lots
total lots proposed = 93
maximum lot size: +/- 0.9 ac
minimum lot size: +/- 0.4 ac
average lot size: +/- 0.6 ac
length of roads: +/- 8500 LF (60' public r/w)
area within road r/w: +/- 12.1 ac
steep slopes: 0 acres
Water provided by Community Well
Sewer provided by private septic systems

CONSERVATION SPACE
Conservation Space Required = 40%
128.391 ac x 0.4 = 51.35 acres
Natural Space Required = 32%
128.391 ac x 0.32 = 41.08 acres
Open Space Required = 8.0%
128.391 ac x 0.08 = 10.27 acres
Total Conservation Space Provided:
Chatham County
Natural Space Provided = 46.63 ac (36.3%)
Open Space Provided= 15.08 ac (11.7%)
Conservation Space Provided = 61.71 ac
Conservation Space = 48% of total site area
Orange County
Conservation Space Provided = 9.24 acres
TOTAL FOR CHATHAM AND ORANGE COUNTIES
61.71 ac. + 9.24 ac. = 70.95 acres
70.95 / 139.63 acres = 50.8 % Conservation Space



Vicinity Map

## LEGEND

Conservation Natural Space
Conservation Open Space
Orange County Open Space
Perennial Streams
Intermittent Streams
Ephemeral Streams
Wetlands
Stream + Wetland Buffer
Septic system area
400 ft Boundary Offset

Jones Ferry Road
natural gas easement
Orange County
Chatham County
Orange Co
Chatham Co
Morgan Ridge Way
Ivy Ridge Road
Black Bear Ct. 60' Public r/w
(60 ft Public r/w)
Emily Lane (private road)
ROAD 'A'
ROAD 'B'
ROAD 'C'
ROAD 'D'
ROAD 'E'
ROAD 'F'
MORGAN RIDGE PH 1
MORGAN RIDGE PH 2
MORGAN RIDGE NATURAL SPACE
MORGAN RIDGE CONSERVATION SPACE
The Enclave Subdivision
Lot 1 (septic)
Lot 2 (septic)
Lot 1
Lot 2
Lot 3
Lot 4
Lot 5
Lot 6
Lot 7
Lot 8
Lot 9
Lot 10
Lot 11
Lot 11A
Lot 12
Lot 13
Lot 14
Lot 15
Lot 16
SW
community well
community building and pool
community garden
WELL
SW POND
Septic Field for Community Building
Primary and Repair Septic Field for lots 7,8,46,47,50-53
Primary and Repair Septic Field for lots 57,62 - 65
Primary Septic Field for lots 33 - 39
Repair Septic Field for lots 33 - 39
Primary and Repair Septic Field for lots 66,67
100 yr floodplain
539
536
533
530

*Curtis and Celestine Luce PIN: 9757-30-6877 DB 6269 PG 35*
*James Baca PIN: 9757-40-2737 DB 6262 PG 31*
*Rodrigo Sarria, Maria Victoria Montenegro PIN: 9757-40-3964 DB 6617 PG 412*
*Wyndell H Merritt PIN: 9757-51-3504 DB 5914 PG 252*
*Iris M Womble PIN: 9757-61-8816 DB 5922 PG 0174*
*Iris M Womble AKPAR 90266 PIN: 9756-69-4741 DB 1785 PG 0306*
*Jones Ferry Properties, LLC AKPAR 1443 PIN: 9756-39-8388 DB 1748 PG 0757*
*J. Fuller Homes, LLC AKPAR PIN: 9757-40-2737 DB 2167 PG 1023*
*Morgan Ridge Partners, LLC AKPAR 69883 PIN: 9756-37-7676 DB 2093 PG 0018*
*Morgan Ridge Partners, LLC AKPAR 1435 PIN: 9756-47-8960 DB 2099 PG 0119*
*Martha Sheard Farley, John Farley AKPAR 74474 PIN: 9756-78-9432 DB 1932 PG 0179*
*Anna Griffiths AKPAR 74466 PIN: 9756-77-6103 DB 712 PG 0908*
*Mary Dianne Hulett AKPAR 74467 PIN: 9756-77-6103 DB 1731 PG 1094*
*Sara Jill Froning AKPAR 74468 PIN: 9756-77-6103 DB 796 PG 1018*
*Burke P. Riggsbee, Lisa Riggsbee AKPAR 75521 PIN: 9756-67-1251 DB 813 PG 232*
*Frank Watson, Jessica Shipley AKPAR 75520 PIN: 9756-67-4026 DB 2008 PG 0074*
*John K. Read Jr. AKPAR 62289 PIN: 9756-66-6918 DB 1707 PG 0126*
*Dahlia Lynn Hodges AKPAR 66980 PIN: 9756-76-0927 DB 1733 PG 0196*
*Christine Choate Wend AKPAR 65532 PIN: 9756-66-9797 DB 1072 PG 0534*
*Teri Varillas AKPAR 62255 PIN: 9756-66-5792 DB 1658 PG 0989*
*John Martyn and Carol Sue Gunn AKPAR 62281 PIN: 9756-66-8657 DB 1475 PG 0756*
*Marilyn G Ozer AKPAR 75522 PIN: 9756-56-9955 DB 833 PG 1034*
*James and Susan Groves AKPAR 75519 PIN: 9756-66-3579 DB 812 PG 0217*
*Suzanne W Wannamaker AKPAR 75523 PIN: 9756-56-7794 DB 1701 PG 0099*
*Richard Mark Pereira AKPAR 75526 PIN: 9756-56-2850 DB 1631 PG 0069*
*Richard W and Suzanne K Paar AKPAR 75528 PIN: 9756-46-6872 DB 1540 PG 0695*
*William K and Lynn G Kirk AKPAR 75529 PIN: 9756-36-9898 DB 812 PG 0071*
*John E and Robin B Parks AKPAR 75530 PIN: 9756-36-6327 DB 1696 PG 1066*
*Jennifer Blair and Joseph Henry Thompson AKPAR 75527 PIN: 9756-56-1572 DB 858 PG 0332*
*Joe and Kyara Franzen AKPAR 75525 PIN: 9756-56-6446 DB 2012 PG 1101*
*William and Lynn Kirk AKPAR 75524 PIN: 9756-56-9377 DB 812*

Plan prepared by:
*Warren D. Mitchell, PE*
*104 Amber Wood Run*
*Chapel Hill, NC 27516*
warrendmitchellpe@gmail.com
919-593-1916

250 0 250 500
1" = 250'
GRAPHIC SCALE

# pyewacket subdivision

concept plan - page 2
chatham county, nc
December 28, 2020
revised Feb. 02, 2021

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128.391-0.95-0.50 = 126.941 acres
126.941 / .918(40,000sf) = 138.2 lots
138.2 x 1.1 = 152 lots
total lots proposed = 93
maximum lot size: +/- 0.9 ac
minimum lot size: +/- 0.4 ac
average lot size: +/- 0.6 ac
length of roads: +/- 8500 LF (60' public r/w)
area within road r/w: +/- 12.1 ac
steep slopes: 0 acres
Water provided by Community Well
Sewer provided by private septic systems

## CONSERVATION SPACE

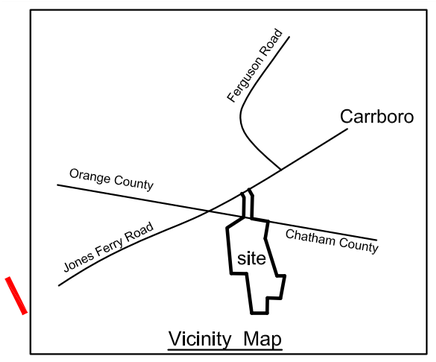
Conservation Space Required = 40%
128.391 ac x 0.4 = 51.35 acres
Natural Space Required = 32%
128.391 ac x 0.32 = 41.08 acres
Open Space Required = 8.0%
128.391 ac x 0.08 = 10.27 acres

Total Conservation Space Provided:

Chatham County
Natural Space Provided = 46.63 ac (36.3%)
Open Space Provided= 15.08 ac (11.7%)
Conservation Space Provided = 61.71 ac
Conservation Space = 48% of total site area

Orange County
Conservation Space Provided = 9.24 acres

TOTAL FOR CHATHAM AND ORANGE COUNTIES
61.71 ac. + 9.24 ac. = 70.95 acres
70.95 / 139.63 acres = 50.8 % Conservation Space



Vicinity Map

## LEGEND

Conservation Natural Space
Conservation Open Space
Orange County Open Space
Perennial Streams
Intermittent Streams
Ephemeral Streams
Wetlands
Stream + Wetland Buffer
Septic system area
400 ft Boundary Offset
NHP (Dry Basic Oak Hickory)
NHP (Dry Oak Hickory Forest)

natural gas easement
Jones Ferry Road
Orange County
Chatham County
Orange Co
Chatham Co
Morgan Ridge Way
Ivy Ridge Road
Black Bear Ct. 60' Public r/w
ROAD 'A'
ROAD 'B'
ROAD 'C'
ROAD 'D'
ROAD 'E'
ROAD 'F'
60 ft Public r/w
Emily Lane (private road)
100 yr floodplain

The Enclave Subdivision
MORGAN RIDGE PH 1
MORGAN RIDGE PH 2
MORGAN RIDGE NATURAL SPACE
MORGAN RIDGE CONSERVATION SPACE

Lot 1 (septic)
Lot 2 (septic)
Lot 3
Lot 4
Lot 5
Lot 6
Lot 7
Lot 8
Lot 9
Lot 10
Lot 11
Lot 11A
Lot 12
Lot 13
Lot 14
Lot 15
Lot 16
Lot 1
Lot 2
Lot 3
Lot 4
Lot 5

Rodrigo Sarria
Maria Victoria Montenegro
PIN: 9757-40-3964
DB 6617
PG 412

Curtis and Celestine Luce
PIN: 9757-30-6877
DB 6269
PG 35

James Baca
PIN: 9757-40-2737
DB 6262
PG 31

Jones Ferry Properties, LLC
AKPAR 1443
PIN: 9756-39-8388
DB 1748
PG 0757

J. Fuller Homes, LLC
AKPAR
PIN: 9757-40-2737
DB 2167
PG 1023

Wyndell H Merritt
PIN: 9757-51-3504
DB 5914
PG 252

Iris M Womble
PIN: 9757-61-8816
DB 5922
PG 0174

Iris M Womble
AKPAR 90266
PIN: 9756-69-4741
DB 1785
PG 0306

Morgan Ridge Partners, LLC
AKPAR 69883
PIN: 9756-37-7676
DB 2093
PG 0018

Morgan Ridge Partners, LLC
AKPAR 1435
PIN: 9756-47-8960
DB 2099
PG 0119

Martha Sheard Farley
John Farley
AKPAR 74474
PIN: 9756-78-9432
DB 1932
PG 0179

Anna Griffiths
AKPAR 74466
PIN: 9756-77-6103
DB 712
PG 0908

Mary Dianne Hulett
AKPAR 74467
PIN: 9756-77-6103
DB 1731
PG 1094

Sara Jill Froning
AKPAR 74468
PIN: 9756-77-6103
DB 1796
PG 1018

Dahlia Lynn Hodges
AKPAR 66980
PIN: 9756-76-0927
DB 1733
PG 0196

Christine Choate Wend
AKPAR 65532
PIN: 9756-66-9797
DB 1072
PG 0534

Teri Varillas
AKPAR 62255
PIN: 9756-66-5792
DB 1658
PG 0989

John Martyn and Carol Sue Gunn
AKPAR 62281
PIN: 9756-66-8657
DB 1475
PG 0756

Burke P. Riggsbee
Lisa Riggsbee
AKPAR 75521
PIN: 9756-67-1251
DB 813
PG 232

Frank Watson
Jessica Shipley
AKPAR 75520
PIN: 9756-67-4026
DB 2008
PG 0074

John K. Read Jr.
AKPAR 62289
PIN: 9756-66-6918
DB 1707
PG 0126

Marilyn G Ozer
AKPAR 75522
PIN: 9756-56-9955
DB 833
PG 1034

James and Susan Groves
AKPAR 75519
PIN: 9756-66-3579
DB 812
PG 0217

William K and Lynn G Kirk
AKPAR 75529
PIN: 9756-36-9898
DB 812
PG 0071

Richard W and Suzanne K Paar
AKPAR 75528
PIN: 9756-46-6872
DB 1540
PG 0695

Richard Mark Pereira
AKPAR 75526
PIN: 9756-56-2850
DB 1631
PG 0069

Suzanne W Wannamaker
AKPAR 75523
PIN: 9756-56-7794
DB 1701
PG 0099

John E and Robin B Parks
AKPAR 75530
PIN: 9756-36-6327
DB 1696
PG 1066

Jennifer Blair and
Joseph Henry Thompson
AKPAR 75527
PIN: 9756-56-1572
DB 858
PG 0332

Joe and Kyara Franzen
AKPAR 75525
PIN: 9756-56-6446
DB 2012

William and Lynn Kirk
AKPAR 75524
PIN: 9756-56-9377
DB 812

539
536
533
530

# pyewacket subdivision

## conventional subdivision layout
## chatham county, nc
## March 21, 2021


Plan prepared by:
*Warren D. Mitchell, PE*
*104 Amber Wood Run*
*Chapel Hill, NC 27516*
warrendmitchellpe@gmail.com
919-593-1916


250 0 250 500
1" = 250'
GRAPHIC SCALE

### SITE DATA

Owner: Wyndell H. Merritt
Address: Jones Ferry Road
Parcel ID: 90267
Zoning: R1
Parcel Size: 139.63 acres
Orange County = 11.24 acres
proposed lots = 0
Chatham County: (gross ac)=128.391 acres
Floodplain = 0.95 acres
Streams = 0.50 acres
total lots allowed:
128.391-0.95-0.50 = 126.941 acres
126.941 / .918(40,000sf) = 138.2 lots
138.2 x 1.1 = 152 lots
total lots proposed = 90
maximum lot size: +/- 2.0 ac
minimum lot size: +/- 0.92 ac
length of roads: +/- 7600 LF (60' public r/w)
area within road r/w: +/- 12.1 ac
Water provided by Community Well
Sewer provided by private septic systems

Vicinity Map
Ferguson Road
Carrboro
Orange County
Jones Ferry Road
site
Chatham County

### LEGEND

Perennial Streams
Intermittent Streams
Ephemeral Streams
Wetlands
Stream + Wetland Buffer
Stormwater Quality Basin SW

Orange Co.
Chatham Co.

MORGAN RIDGE PH 1
MORGAN RIDGE PH 2
MORGAN RIDGE NATURAL SPACE
MORGAN RIDGE CONSERVATION SPACE

Morgan Ridge Partners, LLC
AKPAR 69883
PIN: 9756-37-7676
DB 2093
PG 0018

Morgan Ridge Partners, LLC
AKPAR 1435
PIN: 9756-47-8960
DB 2099
PG 0119

Ivy Ridge Road
Black Bear Ct. 60' Public r/w
(60' Public r/w)
Emily Lane (private road)

100 yr floodplain
539
536
533
530

well
well

The Enclave Subdivision (existing)

**APPENDIX C**

# NC SHPO ENVIRONMENTAL RECORDS REVIEW & ARCHAEOLOGICAL EVALUATION REPORT

**North Carolina Department of Natural and Cultural Resources**
**State Historic Preservation Office**
Ramona M. Bartos, Administrator
Governor Roy Cooper Secretary D. Reid Wilson

March 10, 2021

Kim Hamlin KHamlin@sageecological.com
Sage Ecological Services, Inc.
3707 Swift Drive
Raleigh, NC 27606

Re: Construct Pyewacket Subdivision, north east of intersection at Crawford Dairy Road and Jones Ferry Road, Chatham and Orange County, ER 21-0523

Dear Ms. Hamlin:

Thank you for your letter received February 19, 2021, concerning the above-referenced project. We have reviewed the information provided and offer the following comments:

While no archaeological resources have been previously recorded within the project area, the stone chimney foundation noted in submission document needs to be recorded as an archaeological site and evaluated for the Nation Register of Historic Places. Given the apparent age of the chimney, there is also a possibility that an unmarked cemetery could be located in the vicinity.

None of the project area has been systematically surveyed for archaeological resources. Based on the topographic and hydrological setting, we expect the project area may contain intact, significant archaeological sites.

Prior to the initiation of any ground disturbing activities within the project area, we recommend that a comprehensive archaeological survey be conducted by an experienced archaeologist, excluding areas of low archaeological potential due to excessive slope or other site conditions. The purpose of this survey will be to identify and evaluate the significance of archaeological sites that may be damaged or destroyed by the proposed project and make recommendations regarding their eligibility status in terms of the National Register of Historic Places. Potential effects on unknown resources must be assessed prior to the initiation of construction activities. This work should be conducted by an experienced archaeologist that meets the Secretary of the Interior professional qualifications standards. A list of archaeological consultants who have conducted or expressed an interest in contract work in North Carolina is available at https://archaeology.ncdcr.gov/archaeological-consultant-list.

***Please note that our office requests consultation with the Office of State Archaeology Review Archaeologist to discuss appropriate field methodologies prior to the archaeological field investigation.*** One paper copy and one digital copy (PDF) of all resulting archaeological reports, as well as a digital copy (PDF) of the North Carolina site form for each site recorded, should be forwarded to the Office of State Archaeology (OSA) through this office for review and

comment as soon as they are available and in advance of any construction or ground disturbance activities. OSA's *Archaeological Standards and Guidelines for Background Research, Field Methodologies, Technical Reports, and Curation* can be found online at: https://files.nc.gov/dncr-arch/OSA_Guidelines_Dec2017.pdf.

We have determined that the project as proposed will not have an effect on any historic structures.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-814-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona Bartos, Deputy
State Historic Preservation Officer

## Kim Hamlin

**From:** Jim and Bev Wiggins <jimerly@embarqmail.com>
**Sent:** Sunday, January 31, 2021 2:50 PM
**To:** Ron.Lambert
**Cc:** Warren Mitchell; Kim Hamlin; Dennis Brooks; Brantley Webster; Jay Palmer; Jim Sizemore; Chris Webster; Mike Smith; S T Phillips
**Subject:** Re: Billy Morgan gravesite search

Ronnie and team--
Thanks to all of you for trying to locate W.A. Morgan's gravesite. This just highlights the importance of getting good location coordinates for all of Chatham's cemeteries recorded with the county. The folks who worked on the cemetery project way back did the best they could. Today's technology allows us to be very precise. Whole cemeteries have been destroyed because they were not recognized, or sometimes they were recognized but not protected from timbering or, more often, livestock. A single grave with no wall or fence around it would be particularly susceptible to being overlooked. I will touch base with Britt Norwood again and see if he has garnered any additional information. I'll let you know the minute I learn anything.

Bev Wiggins
CCHA Cemetery Project

---

**From:** "Ron.Lambert" <Ron.Lambert@elevatetextiles.com>
**To:** "Warren Mitchell" <warrendmitchellpe@gmail.com>, "Kim Hamlin" <KHamlin@sageecological.com>
**Cc:** "jimerly" <jimerly@embarqmail.com>, "Dennis Brooks" <jdenbros55@gmail.com>, "Brantley Webster" <bpfarms@embarqmail.com>, "Jay Palmer" <rjpalmer72@gmail.com>, "Jim Sizemore" <jesizemorejr@gmail.com>, "Chris Webster" <wcwebster1975@yahoo.com>, "Mike Smith" <msmith26nc@gmail.com>, "S T Phillips" <stphillips@centurylink.net>
**Sent:** Saturday, January 30, 2021 2:14:15 PM
**Subject:** RE: Billy Morgan gravesite search

No luck today in our gravesite search. Hopefully more clues will come available & we'll try again soon.
We had 6 folks there for the search. More details later. Comments are welcome.

Thanks for everyone's efforts!
Ronnie

---

**From:** Ron.Lambert
**Sent:** Friday, January 29, 2021 7:37 PM
**To:** Warren Mitchell <warrendmitchellpe@gmail.com>; Kim Hamlin <KHamlin@sageecological.com>
**Cc:** Jim and Bev Wiggins <jimerly@embarqmail.com>; Dennis Brooks <jdenbros55@gmail.com>; Brantley Webster <bpfarms@embarqmail.com>; Jay Palmer <rjpalmer72@gmail.com>
**Subject:** RE: Billy Morgan gravesite search

Warren,
We plan to leave the Siler area in time to be there at 10:00.

Looking forward to it as well.
Ronnie

**From:** Warren Mitchell <warrendmitchellpe@gmail.com>
**Sent:** Friday, January 29, 2021 1:15 PM
**To:** Ron.Lambert <Ron.Lambert@elevatetextiles.com>; Kim Hamlin <KHamlin@sageecological.com>
**Cc:** Jim and Bev Wiggins <jimerly@embarqmail.com>; Dennis Brooks <jdenbros55@gmail.com>; Brantley Webster <bpfarms@embarqmail.com>; Jay Palmer <rjpalmer72@gmail.com>
**Subject:** Re: Billy Morgan gravesite search

Ronnie:

I am planning to be at the site tomorrow morning about 9:30-10:00. I attached the map again for your reference where we can park in the cul-de-sac of the new Morgan Ridge subdivision.
Looking forward to it!

Warren Mitchell
919-593-1916

On Mon, Jan 25, 2021 at 9:56 AM Ron.Lambert <Ron.Lambert@elevatetextiles.com> wrote:

> All,
>
> So we'll plan to meet Saturday morning, Jan. 30th at 10:00 at Morgan Ridge Way unless the weather changes. As of now, the weather looks good.
>
> Warren, I will call you Saturday as we leave the Siler City area to give you an update on our ETA. BTW…your plumber Robert Lambert is my first cousin. I found this out yesterday while telling him about Billy Morgan.
>
> Jay, Dennis told me that you would be interested in joining us. Please read through the below email thread to catch up on the search.
>
> Thanks to all,
>
> Ronnie
>
> 919-542-7942

**From:** Warren Mitchell <warrendmitchellpe@gmail.com>
**Sent:** Monday, January 25, 2021 9:11 AM
**To:** Ron.Lambert <Ron.Lambert@elevatetextiles.com>
**Cc:** Jim and Bev Wiggins <jimerly@embarqmail.com>; Dennis Brooks <jdenbros55@gmail.com>; Brantley Webster <bpfarms@embarqmail.com>
**Subject:** Re: Billy Morgan gravesite search

All:

I am available this Saturday 1/30 to meet. I will keep the morning open and can meet whenever the group is ready. Looking forward to it!

I didn't see any signs of an old dwelling, but there are the remains of a barbed wire fence and a very old roadbed so we are starting with something.

Warren Mitchell

919-593-1916

On Sun, Jan 24, 2021 at 7:20 PM Ron.Lambert <Ron.Lambert@elevatetextiles.com> wrote:

> Good evening Billy Morgan Team,
>
> Thanks Warren for your input in the search for this gravesite. Having access from Morgan Ridge Way appears to be the best location to start our search.
>
> In response to Bev's previous email…"100 feet west of a dwelling owned by Mrs. Ward." Hopefully there's something left of the old dwelling along with the roadbed. Also the contour lines on the topo map that Bev sent indicates that the gravesite is just west of a ridge. Another clue in our search.
>
> Dennis, Brantley & myself are available to meet & search this coming Saturday, Jan. 30th at 10:00 am. Brantley's a chicken farmer, so this dictates our time of arrival. Warren, will this time work for you?
>
> Bev, have you heard anything else from the Norwoods?
>
> Thanks,
>
> Ronnie Lambert

919-542-7942

**From:** Warren Mitchell <warrendmitchellpe@gmail.com>
**Sent:** Monday, January 18, 2021 11:56 AM
**To:** Jim and Bev Wiggins <jimerly@embarqmail.com>
**Cc:** Ron.Lambert <Ron.Lambert@elevatetextiles.com>; Dennis Brooks <jdenbros55@gmail.com>; Brantley Webster <bpfarms@embarqmail.com>
**Subject:** Re: Billy Morgan gravesite search

Good morning:

I am glad to meet any of you at the property to look for this grave. You can get close by using this map. The road is a new paved road that we just constructed. It is called Morgan Ridge Way but there is no sign yet.

Just let me know when is a good time for you.

Thanks,

Warren Mitchell

919-593-1916

On Sat, Jan 16, 2021 at 1:07 PM Jim and Bev Wiggins <jimerly@embarqmail.com> wrote:

> Dear Billy Morgan team--
>
> I've added Warren Mitchell to this thread so you will all have the same information.
>
> Ronnie noted that the gravesite location is described as being 3000 feet north of [the west end of] Gilmore Rd., but that the coordinates put it west of that. I noticed that as well. I have gone back to the paper records to see if any additional information is available there. The coordinates on Lamont's original data sheet (which someone else would have filled in, I'm sure), are exactly what we have in the current record and put the cemetery at the mark on the county GIS. However, I noticed that Lamont's original sheet describes the location differently. It says "100 feet west of a dwelling owned by Mrs. Ward." The oldest map layer available on the GIS is 1997. I can't see any dwellings. They could be there, of course, but just not visible. If Warren has found any traces of old dwellings, that would be a good clue. He mentioned an old roadbed or driveway. That could be helpful. Perhaps he can supply the coordinates for that, or show you all when you go out there.
>
> There's also a topo map in the notebook with the cemetery location penciled in. That was done by Will Heiser when he was doing all of the cemetery work. Comparing that map with the topo on the GIS, it appears to me--just estimating the coordinates from the GIS--that more accurate coordinates would be 35-51-44.7 79-08-58.38. Caution--all of this is really rough. We are working with small maps, so the tiniest fraction of an inch changes the coordinates a lot. The main point is that the X on the map seems to put the gravesite a bit east of where we currently indicate it--and that meshes with Ronnie's observation that it is a bit west of how

it is described. It is unclear that Will knew the location of the "dwelling owned by Mrs. Ward" when he plotted this. He might have. I'm sure he changed the description so that there would be a reference to a landmark shown on the map. I will attach a scan of Will's map so you all can play with this and see if you come up with something different. Perhaps Warren can have his cultural resources consultant do a more intensive search in the area suggested by this info, as well as near what might have been any structures on the parcel.

New coordinates will give you another place to look. However, sometime after 1997 and before 2002, a gas line was put in through the parcel in question (90267) and my new guessed-at coordinates put the gravesite just a tad to the west of it. It could have been in the path of the gas line. I hope not! And the area east of the gas line has been logged, so that's scary, too.

I have looked up some info about Billy Morgan, none of which will help find his gravesite. I will write up a fact sheet and share it with you in the next few days just in case you are interested.

I will let you know as soon as I get any info from Britt Norwood. He said he has already checked with several people with no luck yet, but has a few more in mind to ask about it.

Thanks,
Bev

----- Original Message -----
From: "Ron.Lambert" <Ron.Lambert@elevatetextiles.com>
To: "jimerly" <jimerly@embarqmail.com>
Cc: "Dennis Brooks" <jdenbros55@gmail.com>, "Brantley Webster" <bpfarms@embarqmail.com>
Sent: Friday, January 15, 2021 9:03:55 PM
Subject: RE: CSA question-- can you help?

Sounds like a plan. Guess we need to pick a day this winter that fits everyone's schedule. Anyone that knows the area would be a great help. Yes, please keep us informed what Britt Norwood finds out.

Another issue I noticed was the gravesite location description has it 3000 feet north of Gilmore Road. The coordinates show the gravesite due north of Emily Lane.

Best wishes taking care of your parent.

Thanks,

Ronnie

-----Original Message-----
From: Jim and Bev Wiggins <jimerly@embarqmail.com>
Sent: Friday, January 15, 2021 8:49 PM
To: Ron.Lambert <Ron.Lambert@elevatetextiles.com>
Cc: Dennis Brooks <jdenbros55@gmail.com>; Brantley Webster <bpfarms@embarqmail.com>
Subject: Re: CSA question-- can you help?

Thanks for your willingness to help with this.  Dennis and Warren Mitchell now have each other's contact

info and Warren has invited you all to walk the property with or without him. I worked with him on another property he developed and found him willing to do the right thing.

I've also contacted Britt Norwood, who knows that area and most of the older folks around there. He's asking around to see if he can find anyone with more info. I'll let you know if I learn anything.

If y'all go out walking to look for Billy, please take some photos that we can share to let people know of your efforts and maybe encourage others to help locate other gravesites. Wish I could go with you, but I'm avoiding everyone except my very small bubble, trying to keep my folks (ages 96 and 101) safe.

Thank you!
Bev

----- Original Message -----
From: "Ron.Lambert" <Ron.Lambert@elevatetextiles.com>
To: "jimerly" <jimerly@embarqmail.com>
Cc: "Dennis Brooks" <jdenbros55@gmail.com>, "Brantley Webster" <bpfarms@embarqmail.com>
Sent: Wednesday, January 13, 2021 9:06:57 PM
Subject: RE: CSA question-- can you help?

Hey Bev,

I copied Dennis on this reply so you'll have his new email address.

It's unfortunate that this CSA veteran's gravesite can't be located. Only one grave sure makes it hard to find even if the coordinates were correct or close. With the amount of text on the marker, it should be of descent size. Since it doesn't have dates, it won't be a Confederate marker. I assume that you, Jim & others have done a thorough search of this area. Have you been there at different times of the year? How about during the winter when the underbrush foliage has died down vs. the summer time. Of course, the fallen leaves can make the marker harder to see along with possibly falling over or being pushed down.

I see that J. Lamont Norwood canvassed the grave in 1991. I found where James Lamont Norwood died in 2005 & is buried at Mt. Pleasant UMC, Pittsboro. Lamont Norwood Road is just south of Gilmore Road (Gilmore Road becomes Emily Lane). According to the county GIS, there's only one parcel on Lamont Norwood Road that is owned by a Norwood. It's owned by James Norwood. I can only assume that he's the son of James Lamont Norwood. James doesn't live there but does lives nearby at 35 Norwood Road, Chapel Hill, NC which intersects Manns Chapel Road. I wonder if he would know where William Morgan's grave is?

Dennis & Brantley...any ideas? Our roster only has name, rank, company, unit & born date.

Thanks,

Ronnie

-----Original Message-----
From: Jim and Bev Wiggins <jimerly@embarqmail.com>
Sent: Thursday, January 7, 2021 2:03 PM
To: Ron.Lambert <Ron.Lambert@elevatetextiles.com>
Subject: CSA question-- can you help?

Hi Ronnie and Dennis--
(I don't have a current email address for Dennis--please share this with him. Thanks!)

CCHA has the estimated location of the gravesite of William "Billy" Anderson Morgan in Baldwin Township on a parcel scheduled for development. Recent efforts to locate the gravesite have been unsuccessful. It's possible that the estimated location of off enough to put the grave on another parcel, but if the grave is out there, I'm hoping we can locate it so it can be protected. If you or anyone in your group has any info that might help, please let me know. What we have in our records is pasted below. Thanks, Bev Wiggins

052 MORGAN, WILLIAM [D17.1]
Location - Baldwin. 3,000 feet north of west end of SR 1535, Gilmore Road

Coordinates: 35d 51m 44.0s N; 79d 09m 09.0s W Click here for Online Maps

Reported by J. Lamont Norwood, 27 March 1991.

Topo Quadrant: Bynum.
Family owned: Yes.
Abandoned: Yes.
Number of graves: 1.
White: Yes.
Restricted access: Yes. Private property Well maintained: Yes.
Enclosed: No.
Markers: Yes.
Markers with inscriptions: Yes.
Number of readable markers: 1.
Last burial: 1900.
First burial: 1900.
Markers damaged: Yes.
Hazards: None.
Miscellaneous information: There are no dates on stone. Dates obtained from a relative..
Last canvassed by: J. Lamont Norwood. Date: 27 Mar 1991.

Morgan, William "Billy" Anderson (b. 25 Mar 1825 - d. 15 Dec 1900)
Only words on stone are: W.A. Morgan, Company D, 61st NC Infantry, CSA. A descendant of his brother filled in birth and death dates. He was called "Billy".

--
Jim and Beverly Wiggins
jimerly@embarqmail.com
--
Jim and Beverly Wiggins
jimerly@embarqmail.com
--
Jim and Beverly Wiggins
jimerly@embarqmail.com

# Archaeological Evaluation of Site 31CH1090 for the National Register of Historic Places, Pyewacket Subdivision

Chatham and Orange Counties, North Carolina

NEW SOUTH ASSOCIATES, INC.

# Archaeological Evaluation of Site 31CH1090 for the National Register of Historic Places, Pyewacket Subdivision

Chatham County, North Carolina

Report submitted to:

Warren D. Mitchell, P.E. • 104 Amber Wood Run • Chapel Hill, North Carolina 27516

Report prepared by:

New South Associates • 6150 East Ponce de Leon Avenue • Stone Mountain, Georgia 30083

Shawn Patch – Principal Investigator

Samantha Taylor– Archaeologist and Co-Author
Brittany McKee Hyder – Historian and Co-Author

May 10, 2021 • Draft Report

New South Associates Technical Report 4145

# MANAGEMENT SUMMARY

New South Associates, Inc. (New South) conducted an archaeological assessment of a probable historic house with a standing chimney located in the proposed Pyewacket Subdivision in Orange and Chatham Counties, North Carolina. The work was conducted on behalf of Warren Mitchell, PE, and is associated with the development of the Pyewacket Subdivision. The purpose of the survey was to delineate, record, and evaluate the possible dwelling site for the National Register of Historic Places (NRHP). The work adhered to the procedures and policies established by the North Carolina Office of State Archaeology (OSA).

The project included background research, pedestrian survey, metal detection, excavation of shovel tests, laboratory analysis, and NRHP eligibility recommendations. The standing chimney was recorded as Site 31CH1090. Archival research indicates the site is a late nineteenth-century dwelling potentially associated with the Atwater family. The site is recommended not eligible for the NRHP because it did not meet any of the four criteria and was extensively disturbed by the construction of a natural gas utility corridor. No further work is recommended at Site 31CH1090.

New South also investigated two sets of coordinates associated with a probable Confederate grave that was initially recorded in 1991. New South was not able to identify the grave or its marker. Deed and census research suggests the grave could be on a neighboring parcel historically associated with the Morgan family. It is also possible that the grave is present in the proposed subdivision but was inaccurately recorded or is no longer visible from the surface.

The presence of human remains cannot be ruled out; however, identification is difficult without a precise location. New South recommends that proposed construction activities proceed carefully in the two possible grave locations with the awareness that an unmarked grave may be present. If unmarked graves are identified, work would need to stop, and it would be necessary to notify the state archaeologist pursuant to North Carolina General Statute Chapter 70, Article 3, *Unmarked Burial and Human Skeletal Remains Protection Act,* Section 70-29.

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# LIST OF FIGURES AND TABLES

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# I. INTRODUCTION

New South Associates, Inc. (New South) completed an archaeological assessment of a possible dwelling site located in the proposed Pyewacket Subdivision in Orange and Chatham Counties, North Carolina. The site was identified by the presence of a stone chimney located on the eastern edge of a utility corridor. The work was conducted on behalf of Warren Mitchell, PE, and was associated with the development of the Pyewacket Subdivision. The work adhered to the procedures and policies established by the North Carolina Office of State Archaeology (OSA).

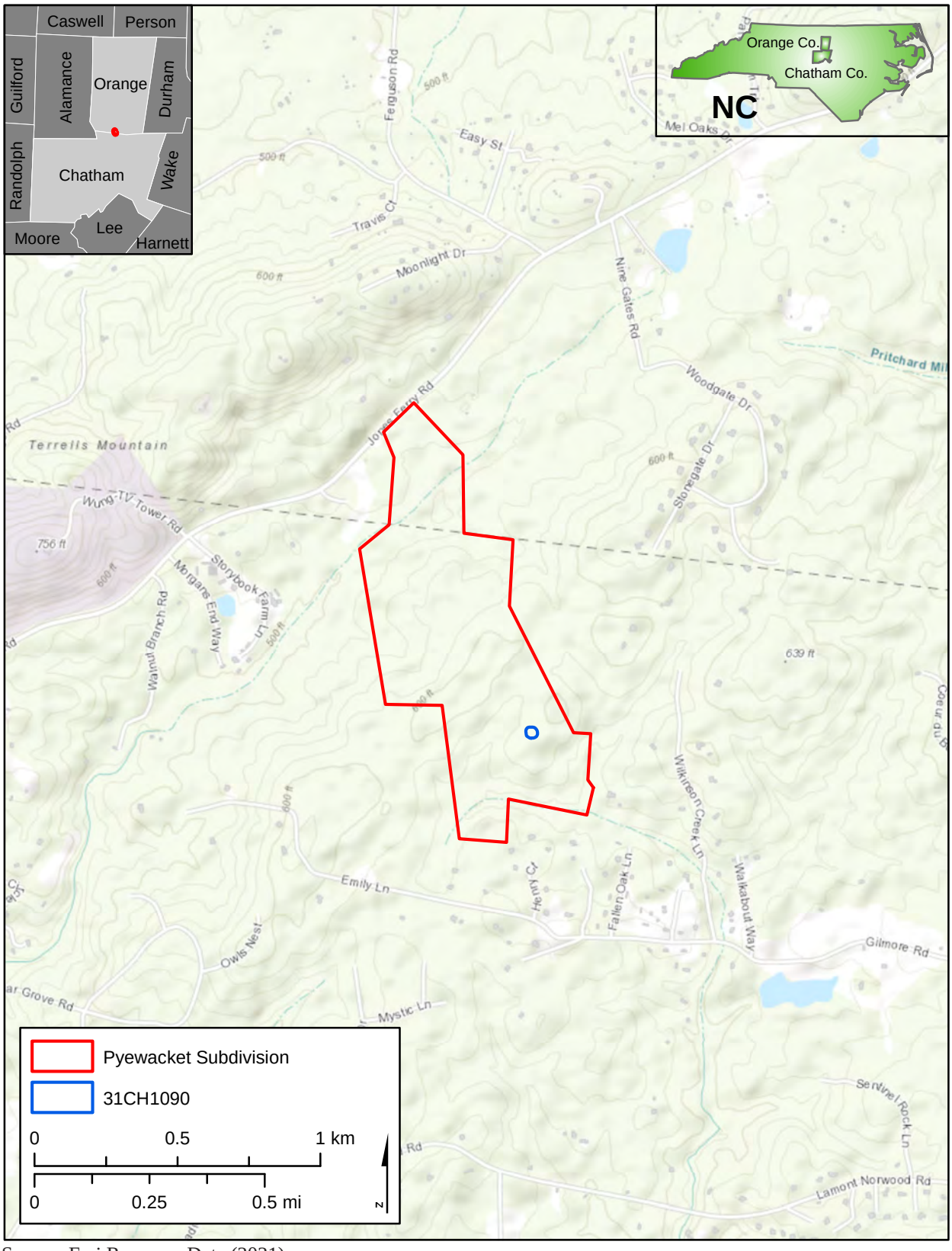
The archaeological assessment was conducted in association with the development of the Pyewacket Subdivision, which proposes to build a subdivision on a 139.6-acre property south of Jones Ferry Road. The proposed subdivision includes the construction of 91 buildings and an associated community garden, maintenance of 51.35 acres of conservation space, 41.08 acres of natural space, and 10.27 acres of green space (Figure 1).

The purpose of the survey was to delineate, record, and evaluate the possible dwelling site for the National Register of Historic Places (NRHP). Additionally, New South sought to locate and document a previously recorded probable Confederate grave located within the Pyewacket Subdivision.

Fieldwork was conducted on April 5, 2021. Samantha Taylor served as Field Director, Maeve Herrick as Field Technician, and Shawn Patch as the Principal Investigator. Britany Hyder served as a historian. The project included background research, pedestrian survey, metal detection, excavation of shovel tests, laboratory analysis, and NRHP eligibility recommendations.

This report is organized into six chapters, including this introduction. Chapters II and III discuss the environmental setting and cultural contexts of the APE. Chapter IV presents the methods used during background research, survey, analysis, and site evaluation. Chapter V summarizes the project results. Chapter VI summarizes the findings and offers recommendations. Appendix A includes a specimen catalog.

Figure 1.
The Pyewacket Subdivision and Site 31CH1090




Source: Esri Resource Data (2021)

# II. ENVIRONMENTAL CONTEXT

This chapter provides information on the natural setting of site 31CH1090 and surrounding areas. Relevant information presented herein includes discussions of physiographic setting, hydrology, soils, climate, and floral and faunal resources. This information provides a context in which potential archaeological resources can be assessed in terms of settlement location and locally occurring subsistence resources.

## PHYSIOGRAPHY AND GEOLOGY

Chatham and Orange Counties are located within the Piedmont physiographic region of North Carolina. The North Carolina Piedmont Province is located between the Blue Ridge Mountains and Coastal Plains provinces. To the east are the lower elevations of the Coastal Plains. Elevations increase approaching the Blue Ridge Mountains to the west. The Piedmont region ranges from 400-2,000 feet above mean sea level (amsl) and generally consists of low rolling hills, long low ridges, and shallow valleys. It is often referred to as a plateau area (ESRI 2015). This province is known for its variation in both land surfaces and biotic resources. The Pyewacket Subdivision is located along a series of gentle ridges. Site 31CH1090 is located on a gently sloping ridge toe.

## SOIL ASSOCIATIONS

The North Carolina Piedmont Province is commonly associated with well-drained, moderately permeable Cecil Soils. This soil type is found on slopes and ridges throughout the region (National Cooperative Soil Survey 2007a). The soils at the are mapped as Wedowee Sandy Loam, with slopes ranging from two to six percent. Wedowee series soils are typically very deep, well-drained, and moderately permeable soils formed by felsic igneous and metamorphic rocks found in the Piedmont uplands (National Cooperative Soil Survey 2007b).

## HYDROLOGY

The hydrology of the Piedmont region is characterized by many watercourses that flow through the v-shaped valleys. The Pyewacket Subdivision is located in the Cape Fear River Basin, which contains three major rivers: Deep River, Rocky River, and Haw River. These three rivers converge in Chatham County. The closest body of water to site 31CH1090 is Wilkinson Creek, located 212 meters (695.5 feet) south of the site. Wilkinson Creek is a first-order tributary of the Haw River.

## CLIMATE, FLORA, AND FAUNA

Chatham and Orange Counties are characterized by a moderate climate with mild winters, moderate summers, and brief spring and autumn seasons. The average high temperature in the summer is 86 degrees Fahrenheit, and the average low in the winter is 29 degrees Fahrenheit. Annual precipitation averages 47.31 inches (U.S. Climate Data 2021).

The Piedmont physiographic province of North Carolina is characterized by rich, unique biological diversity. The climax vegetation of the area consists of oak-hickory-pine forest and southern mixed forest. Roughly equal numbers of cold-deciduous, broad-leaved forest with evergreen needle-leaved trees are characteristic. Oak-hickory areas are dominated by species of oak and pignut and mockernut hickory. Loblolly-shortleaf pine cover occurs on disturbed areas with an understory of dogwood and sourwood (McNab and Avers 1996).

Fauna that would be present and that might have had economic significance for past human populations, include white-tailed deer, black bears, bobcats, raccoons, cottontail rabbits, and squirrels. Bird species include turkeys, bobwhite quails, and doves. Box turtles, garter snakes, copperheads, and timber rattlesnakes are common reptile species in the region (North Carolina Wildlife Resources Commission 2020).

## PROJECT LOCATION DESCRIPTION

Site 31CH1090 is located in the Pyewacket Subdivision directly east of Terrells Mountain in Chatham County, North Carolina. It is in the Bynum (B26) 1972 USGS Topographic Quadrant Map. Site 31CH1090 is located in the southeast portion of the Pyewacket Subdivision, approximately 227.6 meters north of Wilkinson Creek. The site is located along the northeastern edge of a natural gas utility corridor that intersects the subdivision. The site itself is primarily located in a wooded area that borders the utility corridor. This area is lightly wooded with little to no secondary growth and is interspersed with natural stone outcrops (Figure 2).

Figure 2.
Representative Photographs of 31CH1090 Site Condition

A. Utility Corridor Directly Southwest of 31CH1090 (Facing Northwest)

B. Eastern Half of Site 31CH1090 (Facing Southeast)

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# III. THE CULTURAL CONTEXT

## HISTORIC OVERVIEW

### CHATHAM AND ORANGE COUNTIES

Directly prior to European colonization, Orange County was home to the Eno, Occaneechi, and Haw Indians. Early European documentation of the region includes a 1701 account of the village of Occaneechi, located near modern-day Hillsborough. The Village of Occaneechi was located along the Great Trading Path. Orange County was formed in 1752 from neighboring Johnston, Bladen, and Granville Counties. It was named for William V of Orange, the grandson of King George III (Corbitt 1987). Early European settlers included the English, German, Scotch-Irish, and Welsh. By 1759, Childsburgh was incorporated as the county seat. Childsburgh was later renamed Hillsborough to honor Earl Wills Hill.

Orange County played a pivotal role in the Regulator Movement (1764-1771). The Regulator Movement was a series of uprisings in North Carolina and South Carolina that were a response to excessive taxation and lack of law enforcement in the colonies. This effort was unsuccessful but is often considered a prelude to the American Revolution (Sadlier 2012). Public protests in Orange County began in 1764 and culminated in several well-documented violent acts against local officials, including the two-hour Battle of Alamance on May 16, 1771. This skirmish resulted in a government victory and the end of the Regulator Movement. Chatham County was formed from Orange County as a direct result of the Regulator Movement. Previously occupied by Iroquoian and Siouan tribes, the area soon became a hub for Scottish, English, and German settlement. The county seat, Pittsboro, was incorporated in 1778 (Corbitt 1987). The early economy in both Chatham and Orange Counties was predominately agriculture-based, with a specific focus on the dairy and livestock industries as cultivation of tobacco was not feasible due to the natural soil conditions of the region.

### THE NINETEENTH CENTURY AND THE AMERICAN CIVIL WAR

The nineteenth century brought many changes to the Piedmont region of North Carolina. By the 1790s, there were massive waves of emigration from the original thirteen colonies into newer territories, such as Tennessee, Alabama, and Florida. This emigration trend continued into the beginning of the nineteenth century (Trelease 2006). Despite the decline in the population of the Piedmont region at the beginning of the nineteenth century, by the 1840s and 1850s, North

Carolinians began to focus on improving transportation across the state. Roads were improved, and the North Carolina Railroad (NCRR) was built, connecting the eastern portion of the state with the Piedmont Province (Trelease 2006). The NCRR was chartered in 1849 and completed in 1856, successfully extending from Goldsboro in the east to Charlotte in the west. The advent of the railroad changed settlement patterns and trade. Towns that were bypassed by the railroad had trouble staying afloat, whereas new towns, such as Durham and High Point, were founded along the railroads (Trelease 2006). The railroad also enabled more efficient trade between the Piedmont region and the Coastal Plain. Improvements to transportation throughout the state benefited the coal mining industry in Chatham County, home to the Deep River Coal Field, the state's most profitable bituminous coal deposit.

Despite pressure from Yeoman farmers who called for political reform, most white farmers in the Carolina Piedmont expanded their use of enslaved labor during the first half of the nineteenth century, and North Carolina seceded from the United States of America on May 20, 1861 (Tullos 2004). Despite joining the Confederacy, North Carolinians were divided on whether to support the Confederacy. This led to political dissent and outright resistance (Williard 2010). During the Civil War, the Piedmont region of North Carolina was tasked with providing crops that fed the Confederate troops. Despite this, the agricultural economy of North Carolina suffered due to conscription laws forcing farm owners and operators to enlist in the Confederate Army (Moore et al. 2015).

When the Civil War ended in 1865, North Carolina was left in a state of disarray. The emancipation of African Americans and the return of surviving soldiers flooded the Piedmont region as it struggled with economic turmoil, social upheaval, and widespread political dissatisfaction. However, the influx of newly freed African Americans and surviving soldiers did little to offset the casualties of war. The war resulted in the destruction of property across the state and the dismantling of the state's primary economic force: enslaved labor. White plantation-owning families were often forced to abandon their homes or significantly downsize, greatly impacting the agricultural economy. Freed African Americans returned to North Carolina with little, aside from their freedom, many having to live in makeshift refugee camps or as sharecroppers while struggling to make a living (Bell 2017).

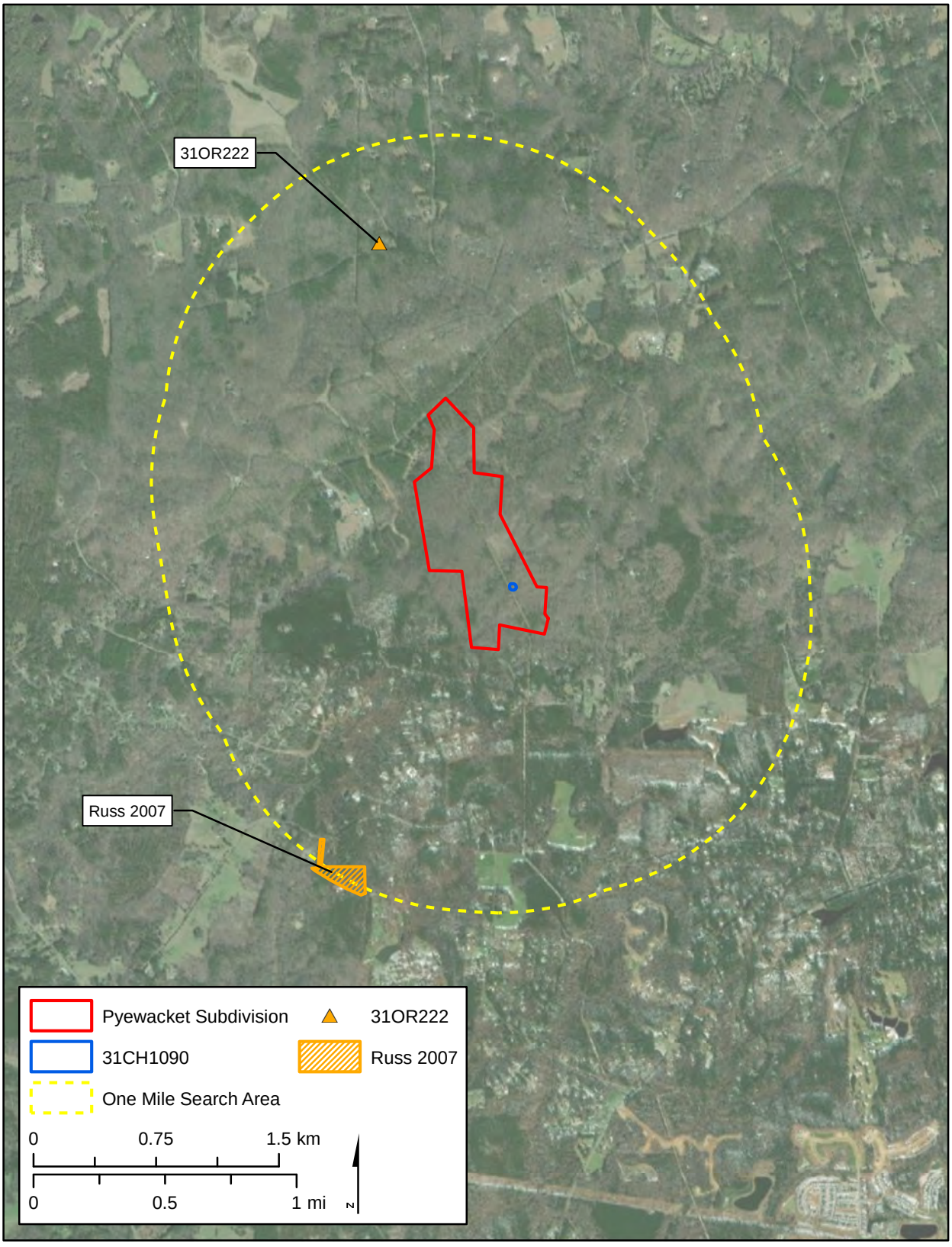
## TWENTIETH CENTURY CHATHAM AND ORANGE COUNTIES

Chatham and Orange Counties are considered part of the Durham-Chapel Hill North Carolina Metropolitan Statistical Area. By the twentieth century, agriculture was no longer the leading industry in either county. The focus had shifted to industrial pursuits such as brick manufacturing, greenstone mining, and undergraduate and graduate education. Today, the most common industries in the counties are health care, manufacturing, education services, and scientific and technical services.

## PREVIOUS ARCHAEOLOGICAL RESEARCH

A review of OSA records indicated that only one previous survey had been conducted within a mile of the Pyewacket Subdivision. In 2007, Environmental Services, Inc. conducted a preliminary cultural resource assessment of Arcadia Tract in Chatham County. The survey took place approximately 0.8 miles southwest of the subdivision and 1.1 miles southwest of site 31CH1090. The survey did not result in the identification of any cultural resources (Russ 2007). Only one previously recorded site is located within one mile of the Pyewacket Subdivision. Site 31OR222 was initially identified by two residents that had collected various Archaic-period materials from the site prior to 1982. According to the site file, 31OR222 is an Archaic site located in a cultivated field approximately 0.6 miles north of the subdivision and 1.4 miles north of site 31CH1090 (Ward 1982:222) (Figure 3).

Figure 3.
Archaeological Sites and Previous Surveys within One Mile of the Pyewacket Subdivision




Source: Esri Resource Data (2021)

# IV. METHODS

## BACKGROUND RESEARCH

The statewide architectural records of the North Carolina State Historic Preservation Office (NCHPO) were reviewed using HPOWEB, their online GIS service, which showed no previously surveyed resources in the project area. Historic topographic maps and aerial photographs were viewed at historicaerials.com, nationalmap.gov, the North Carolina Maps collection online at the University of North Carolina, and the U.S. Geological Survey's (USGS) historical topographic map collection. Property information was obtained from the Chatham County Lands Records Viewer and the Orange County GIS Website. Deed records were searched through Chatham and Orange Counties' Register of Deeds' remote sites. The genealogy and local history resources in the North Carolina Collection, census records, and the online database of cemetery records at FindAGrave.com were also reviewed.

## FIELD METHODS

### PEDESTRIAN RECONNAISANCE

The area surrounding the stone chimney and the probable grave location was wooded but had a ground surface visibility of greater than 50 percent, and thus pedestrian reconnaissance was implemented as a preliminary method of determining the extent of surface features. Survey intervals were based on ground surface visibility (GSV) and followed the North Carolina Office of State Archaeology's Archaeological Investigation Standards and Guidelines (North Carolina Office of State Archaeology 2017). New South investigated both locations using 10-meter survey intervals to determine the presence or absence of surface features and artifacts. Upon encountering potential features, New South surveyed the area in question in 1 to 2-meter intervals and using shovels and soil probes.

### METAL DETECTION

Metal detector survey is a highly effective means of locating yard features, fence lines, outbuilding loci, surface features, and artifact scatters. For example, rear yard sheet middens typically developed along fence lines that enclosed the domestic yard space – metal detection identification of fence locations will assist in identifying potential midden locations.

Site 31CH1090 was investigated using both a systematic and judgmental metal detection survey. Based on the results of the pedestrian reconnaissance survey, a 15x20 meter grid was established to encompass the chimney feature, with the utility corridor bounding the survey area to the west. A Garrett ATPro was used to sweep the area from east to west along transects in two-meter intervals. The Garrett detector is a high-end instrument capable of greater depths and better discrimination than entry-level instruments. The instrument was set to discriminate against small iron items and to focus more on lead, brass, and large iron objects. The machine was ground-balanced to filter out the interference from the natural inclusions of the site soils.

As the sweeper located a potential target, it was marked with a nylon-shaft pin-flag and then excavated using a Garrett pinpointer and trowel. This helped the operator develop a feel for and understanding of the types of artifacts and their associated signals and also saved time. The locations of all excavated finds were recorded using a Trimble Geo 7x GPS unit with submeter accuracy. Artifacts to be sent in for further analysis, such as diagnostics, were assigned a Metal Detector Find (MDF) number and were bagged and collected. Artifacts that were not collected were recorded, the flag was pulled, and the item was backfilled. In certain cases, metal detection incidentally uncovered non-ferrous artifacts such as ceramic and glass. These artifacts were recorded, and if they were determined to be diagnostic, they were bagged and collected.

New South conducted judgmental metal detection surveys in areas of interest, including the utility corridor and a linear rock feature east of the chimney. Metal detection was used in the utility corridor to determine the presence or absence of artifacts within the corridor and to determine the extent of disturbance in the area. The linear rock feature was metal detected to determine the presence of artifacts and whether the feature was cultural.

## SHOVEL TESTING

Shovel testing was the primary means of delineating site 31CH1090. Shovel tests were excavated in 15-meter intervals radiating from the stone chimney, which served as the datum point. A north-south grid was then expanded in each cardinal direction until two negative shovel tests were excavated. Distinct provenience numbers were assigned to each shovel test based on a Cartesian grid system. This method allowed for the systematic delineation of the archaeological site. Shovel tests were not excavated in areas determined to have a low probability for archaeological resources, such as poorly drained areas and areas with a slope greater than 15 percent.

Shovel tests were 35 centimeters in diameter and were excavated until one of the following conditions applied: excavation had reached at least 10 centimeters into sterile subsoil; groundwater was reached, or there was an impasse such as dense concrete or cement through which hand excavation was not feasible. Soil was screened through a 0.25-inch mesh. All artifacts identified

in shovel tests were counted, recorded, and collected for formal analysis. Following fieldwork, the site was assigned a state site number and recorded on a state site form and 7.5' USGS topographic maps. The site location, shovel tests, surface finds, relevant features, and boundaries were plotted with a Trimble Geo 7x GPS unit with submeter accuracy. Site boundaries were determined by close-interval shovel tests in cardinal directions, maximum extents of surface artifact scatters, and surface structures such as wells, foundations, and cisterns.

## DIGITAL DATA RECORDING

New South has developed and implemented procedures for digitally recording standard field survey data using Motorola Moto G cellphones. The electronic documentation process is driven by spatial data and can generate a range of digital data. The *Memento* and *FileMaker* databases allow for in-field data collection. Recording of shovel test attributes included USDA–NCRS soil texture and Munsell color designation, depth, and artifacts recovered in a consistent format with dropdown menus and required fields. At the end of the field day, the records were automatically synced to New South's server once the user completed a review of the data and connected to a Wi-Fi network. The Field Director then performed additional QA/QC as necessary. One of the benefits of digital recording is that the data are automatically populated in a spreadsheet that can be used to create summary logs and other tables based on any combination of attributes.

Photographs were taken using the Moto G phones and a Pentax WG-3 GPS digital camera. Photographs were taken of general settings, disturbances, selected shovel test profiles, and the locations of all archaeological resources. Photographs were recorded in a digital format of no less than eight megapixels and stored in standard and non-proprietary formats such as JPEG or TIFF.

## LABORATORY METHODS

At the completion of all fieldwork, all artifacts were transported to New South's Stone Mountain, Georgia laboratory for processing. All artifacts were washed and cataloged. All materials were analyzed using a computer database system developed by New South in the 4$^{th}$ Dimension relational database software package. The primary emphasis of the analysis was to identify the recovered artifacts by type, material, function, and cultural association.

Analysis of historic artifacts was based on methods outlined by New South (1977) for pattern analysis. For purposes of this study, artifacts were classified to organize the data into meaningful analytic units and to provide consistency with previous studies. Artifacts were identified by material type, function, and presumed date range using sources such as Noel-Hume (1969), Miller (2000), and Toulouse (1971). Specific attention was paid to establishing the chronology of post-contact sites by providing date ranges for artifacts to the best extent possible.

## CURATION

All artifacts and associated documentation were prepared for curation. All artifacts were stored in archival quality bags or boxes (for fragile items) and labeled with provenience, level, data, and other information, as appropriate. All material culture items were washed, dried, and inventoried. Materials were packaged for curation with a corresponding inventory. They were temporarily curated at New South's laboratory and will be permanently curated at the North Carolina Office of State Archaeology Research Center (OSARC).

## NATIONAL REGISTER OF HISTORIC PLACES EVALUATION

Cultural resources were evaluated based on criteria for NRHP eligibility specified in the Department of Interior Regulations 36 CFR Part 60: National Register of Historic Places. Cultural resources were defined as significant 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 the 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) yield, or are likely to yield, information important in prehistory or history.

In general, there are several factors that influence evaluations of eligibility, particularly under Criterion D. The most important factors include sites with sufficient artifact density and diversity to generate information regarding spatial patterning, technology, adaptations, behavior, and lifeways. Both the presence of clear spatial patterning, either vertically or horizontally, and artifact depth are important variables. The presence or absence of known or suspected features can also be important because of the information they often contain. Sites that represent types, components, or periods that are rare or relatively unknown can be important, even if they lack other variables such as high artifact density (e.g., Paleoindian). Sites may also be recommended eligible based on their association with certain events, themes, unique construction methods or materials, or important people.

Under Criteria A, B, and C, an archaeological property must be able to convey its significance, while under Criterion D, only the potential to yield information is required (Hardesty 2000:33; King 1998:77–80). Criterion D is frequently used for the evaluation of archaeological sites. Archaeological sites identified in the study area were evaluated according to the criteria outlined above, with particular emphasis on their potential to contribute new and significant information to local, regional, and national research. The quality of archaeological information must be addressed in terms of historical contexts, research questions, and data requirements needed to answer specific questions. Integrity, artifact density, and potential for intact features and subsurface deposits are some of the key factors that ordinarily are considered during the evaluation of a site for inclusion on the NRHP.

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# V. RESULTS

## REVIEW OF HISTORIC MAPS AND AERIAL PHOTOGRAPHS

A review of aerial imagery from 1955 to 1979 and historic maps from 1870 to 1968 indicates that the Pyewacket Subdivision has remained undeveloped and seemingly unoccupied. The 1870 Chatham County map depicts a road running north-south through the center of the proposed subdivision. While no structure is depicted near the location of site 31CH1090, the road would have sat directly west of the site connecting the residence to the Haw River and Pittsboro to the south (Figure 4). This road is no longer present on the 1936 county map (Figure 5-6). The 1955 and 1991 historic aerial depicts the proposed subdivision as wooded and undeveloped. The natural gas utility corridor is not present in either aerial (Figure 7-8). Based on a review of historic aerials, the utility corridor was constructed sometime between 1998 and 2002.

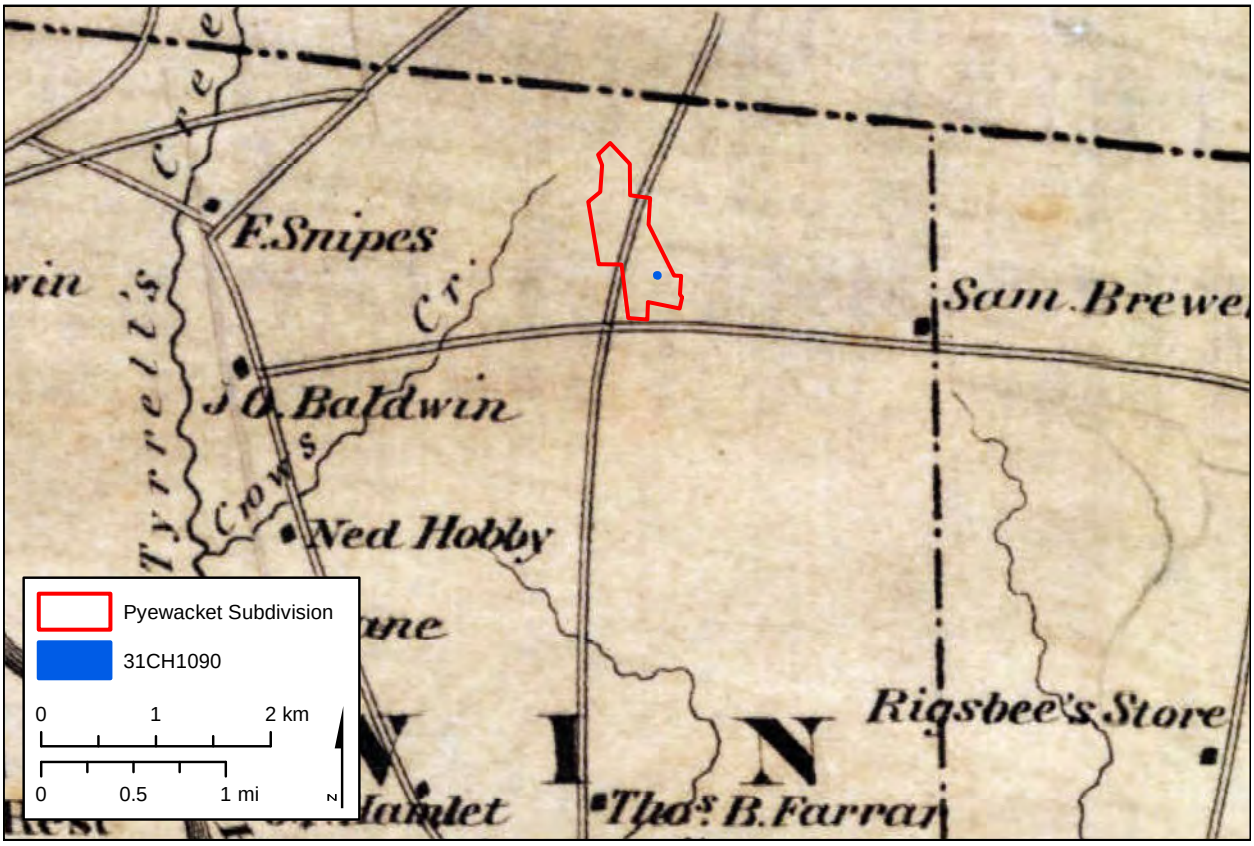
Although historic aerial photographs suggests the land was unoccupied during the latter half of the nineteenth century, deed and census records indicate that the Pyewacket Subdivision historically belonged to the Atwater family. From 1870 to 1925, the property was passed between several individuals, including Dr. York Cotton, Otis Neville, R. L. Stroud, R. L. Sutphin, and Robert Cotton before it was deeded back to the Atwater family in 1925 (Chatham County 1925). The 1886 deed describes the land as bounded by James Atwater's property line, the Willis' property line to the west, and the Morgan property line to the north (Chatham County 1886:564).

## SURVEY RESULTS

### SITE CONDITION

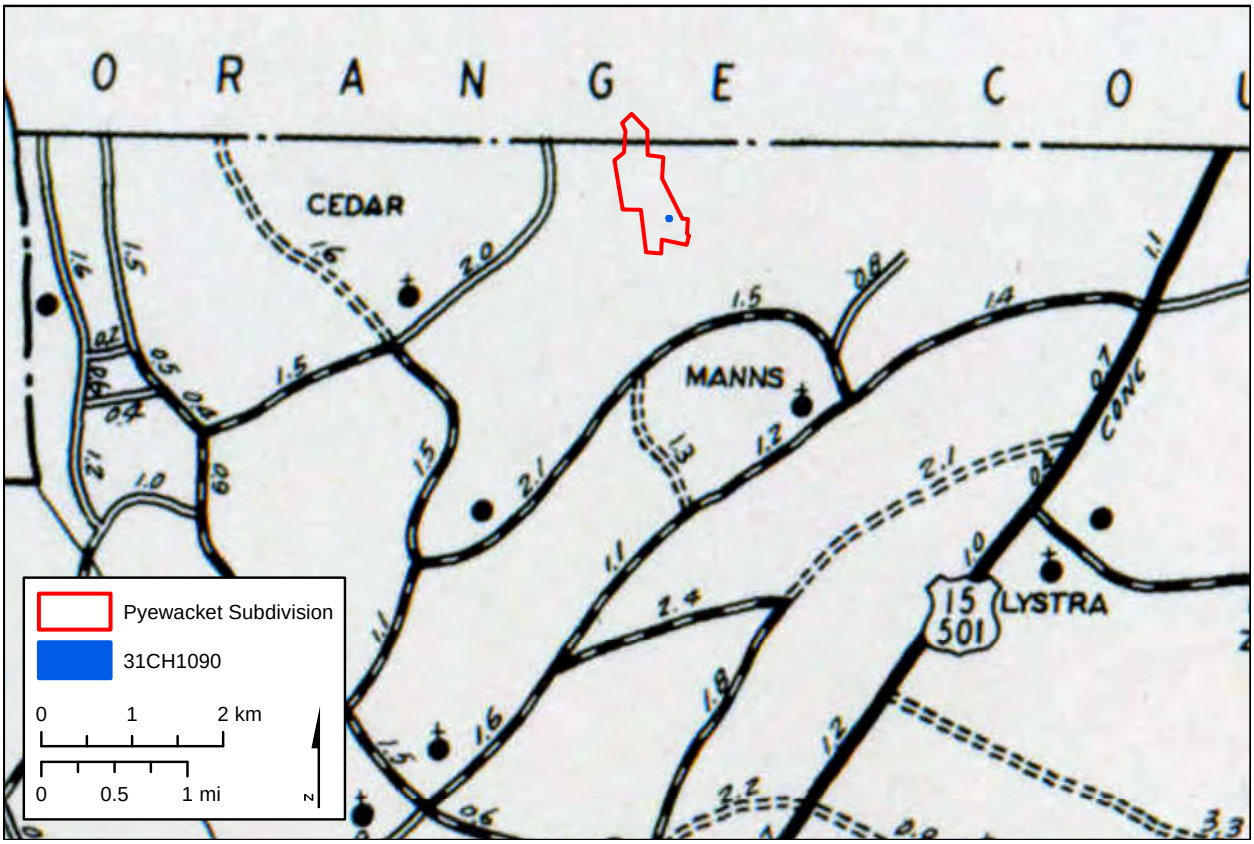
| | |
|---|---|
| Field Number: | 31CH1090 |
| Datum UTM Coordinates: | 3970088.048 m N, 667227.2728 m E (UTM, Zone 17N, NAD 1983) |
| Elevation: | 600 ft. amsl |
| USGS Quadrangle (7.5′): | Bynum 1972 |
| Property/Site Type: | Domestic Site |
| Temporal Affiliations: | Nineteenth Century |
| Setting: | Mixed Woods |
| Soil(s): | Badin-Tarrus Complex |
| Site Size: | 38.7 m North/South by 40.4 m East/West. 1,318.7 $m^2$ |
| Cultural Deposit Depth: | 20 cmbs |
| Features: | Stone chimney, stone-lined driveway |
| NRHP Recommendation: | Not Eligible |
| Management Recommendation: | No Further Work |

Figure 4.
The Project Area Depicted on the 1870 Chatham County Map by Captain N.A. Ramsey



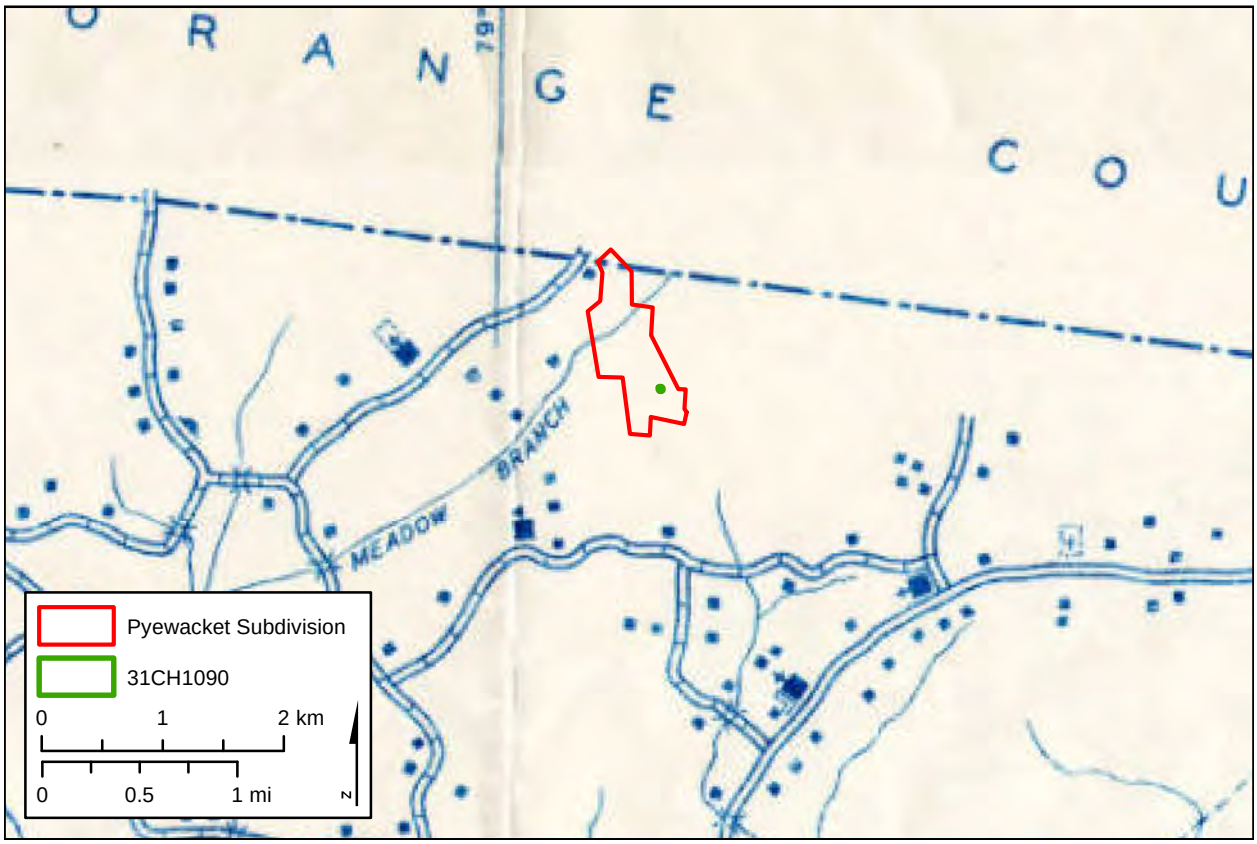

Source: Old Maps Online

Figure 5.
The Project Area Depicted on the 1936 Chatham County Road Map



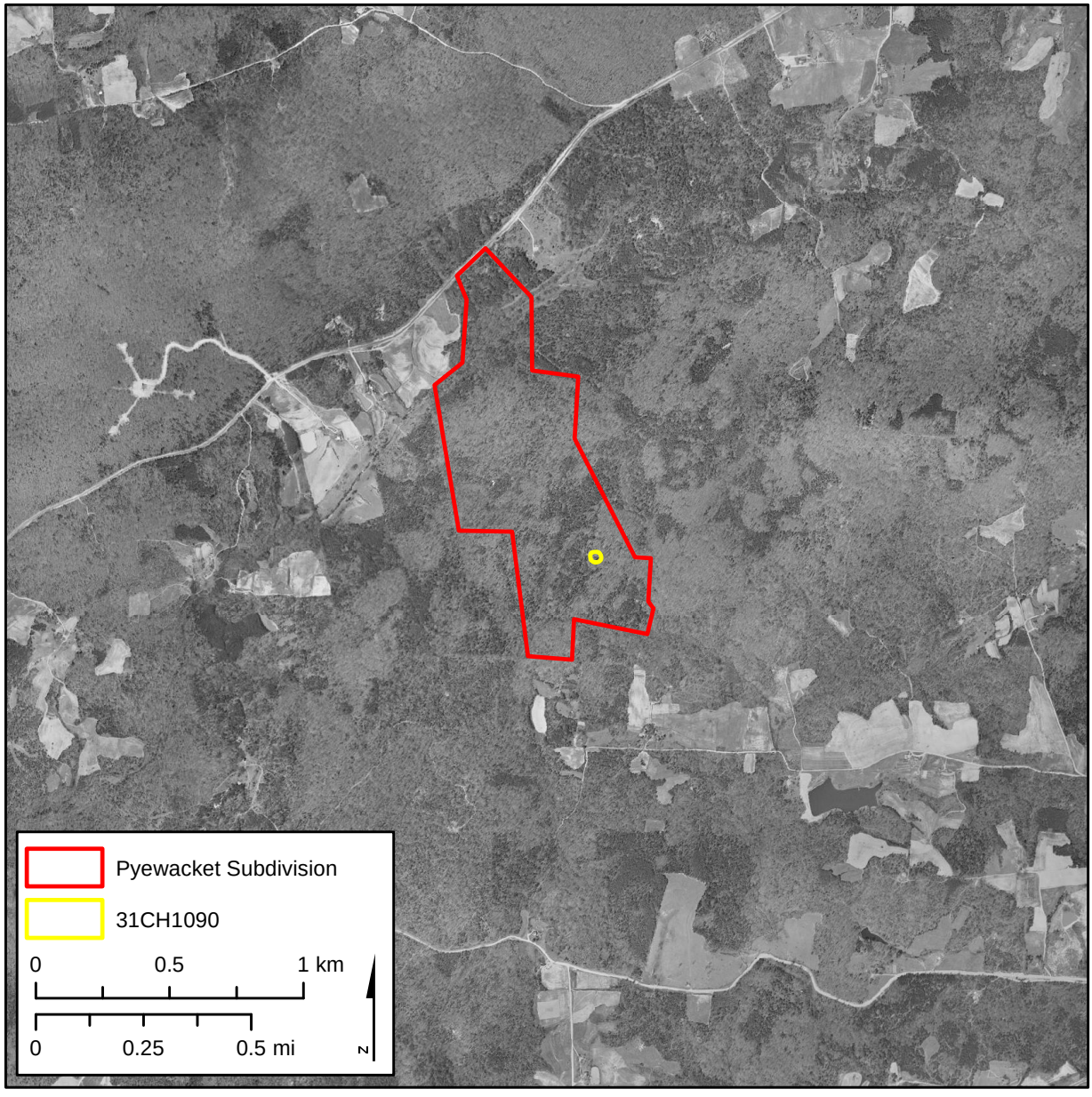

Source: Old Maps Online

Figure 6.
The Project Area Depicted on the 1938 Federal Works Agency Map of Chatham County



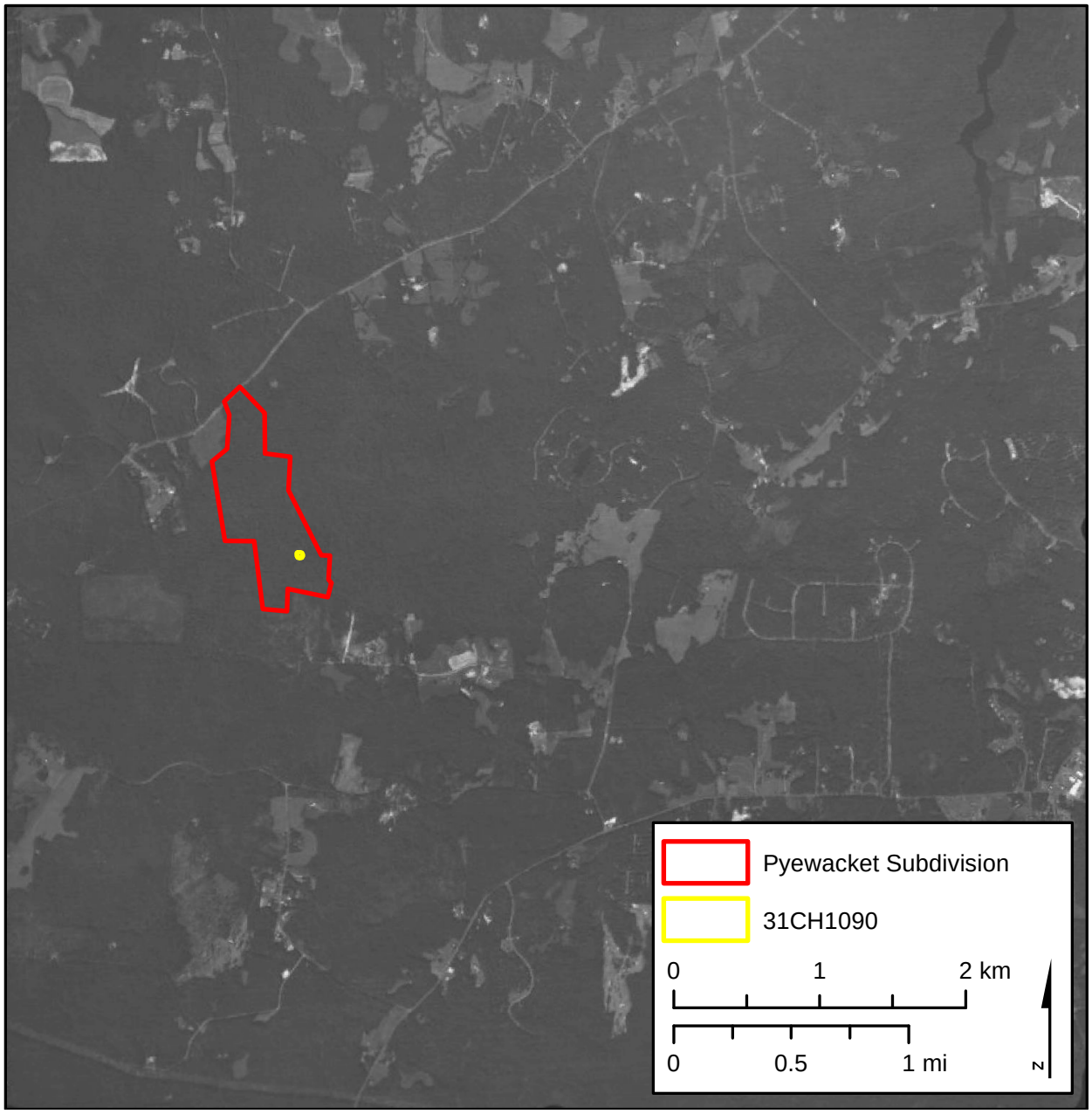

Source: Old Maps Online

Figure 7.
The Project Area Depicted in 1955




Source: Nationwide Environmental Title Research, LLC

Figure 8.
The Project Area Depicted in 1991




Source: North Carolina Department of Transportation

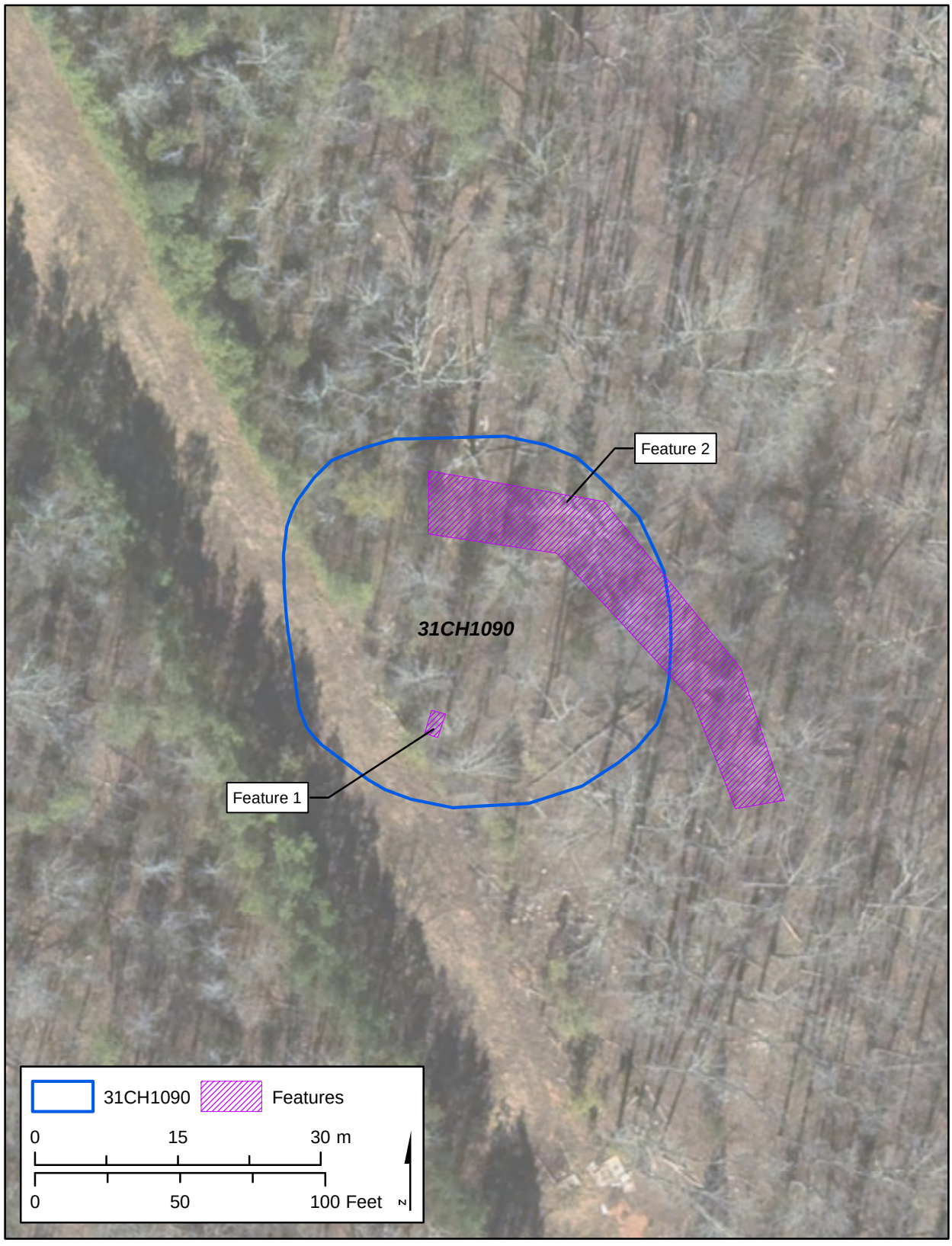
Site 31CH1090 was identified in the southeastern portion of the proposed subdivision along the eastern edge of a natural gas pipeline that intersects the property. The site was initially identified as a chimney located along the edge of the utility corridor. The chimney (Feature 1) is made of stone and measures 0.97 meters (3.1 feet) wide, 1.9 meters (6.2 feet) in length, and is 1.7 meters (5.5 feet) tall (Figure 9-10). The interior of the chimney faces east towards the utility corridor. This portion of the chimney has been extensively damaged, likely due to the construction of the utility. The probable location of the firebox is obscured by rubble. The exterior of the chimney, the base of which is largely unscathed, faces west towards the wooded area that contains the rest of the site. Directly north of the chimney is a pile of stone rubble measuring 3x2.6 meters (9.8x8.5 feet). In the center of the rubble is an intact section of the chimney that may have fallen from the flue during the demolition of the structure (Figure 11). The position of the stone chimney and associated rubble suggests that the structure was in the direct path of the utility corridor and was likely demolished as a result. The debris from the chimney was pushed to the edge of the utility corridor alongside the chimney. It is unclear what happened to the remainder of the structure, as no evidence of a foundation or the construction of the building was identified.

The area east of Feature 1 is lightly wooded with little to no secondary growth. The area contains scattered natural stone outcrops, none of which appear to be worked. Similar outcrops were observed throughout the Pyewacket Subdivision. Two surface stone alignments were identified northeast of Feature 1 (Figure 12). Both alignments (Feature 2) were initially recorded as probable boundary or road markers. Feature 2 consists of seemingly unmodified local stone, similar to the naturally occurring stone observed throughout much of the proposed subdivision. Feature 2 is 20.2 meters (66.2 feet) northeast of Feature 1. The feature itself is 51 meters (167.3 feet) long and approximately 6.3 meters (20.6 feet) wide. It stretches from the area directly north of the chimney and wraps around the northeastern half of the site. The shape and angle of Feature 2 suggest that it is a driveway that approached the house. It is possible that this drive was connected to the road depicted on the 1870 Chatham County Map (see Figure 4).

## METAL DETECTION RESULTS

Metal detection identified 50 artifacts and one nail cloud. Additionally, New South was able to determine the approximate boundaries of historic deposits and the level of disturbance within the natural gas utility corridor to the west of the site. The metal detection survey located 25 target points at the site, 24 of which were in the 15x20-meter grid encompassing the chimney (Feature 1). Forty-five metal objects were recovered from the grid along with two container glass fragments and three plain ironstone sherds. A quick sweep of the utility corridor bordering Feature 1 determined that it was largely devoid of metal artifacts, suggesting that the area had been heavily disturbed by the construction of the utility.

Figure 9.
Location of Features at 31CH1090




Source: Esri Resource Data (2021)

Figure 10.
31CH1090 Feature 1

A. Feature 1 (Facing Southwest)

B. Feature 1 (Facing North)

C. Feature 1 (Former Interior of the Chimney (Facing East)

Figure 11.
Rubble Associated with the Chimney

A. Feature and Rubble (Facing Southeast)

B. The Intact Portion of Chimney Fall in the Rubble (Facing North)

Figure 12.
Feature 2 (Facing North)

A nail cloud consisting of 35 nails was identified directly east of the stone chimney. It measured approximately 12.5x28.8 meters (41.0x94.4 feet) and abruptly terminated upon reaching the utility corridor to the west. Of the 35 nails excavated from the nail cloud, 20 were cut nails, six were wire nails, and nine were unidentified due to oxidization. The density of metal artifacts, particularly nails, in the area directly east of the chimney suggests that the debris from the structure was pushed east out of the utility corridor.

In addition to the 15 x 20-meter grid, New South also metal detected along the stone alignments (Feature 2) to determine if they were cultural in origin. The metal detector identified several target points, only one of which was excavated, resulting in the identification of a cast-iron burner cover for a wood stove. The area directly northeast of Feature 2 was also judgmentally metal detected to determine whether cultural deposits were present beyond the feature. The metal detector had noticeably fewer hits in this area, suggesting that the majority of archaeological deposits were located southwest of Feature 2 (Figure 13).

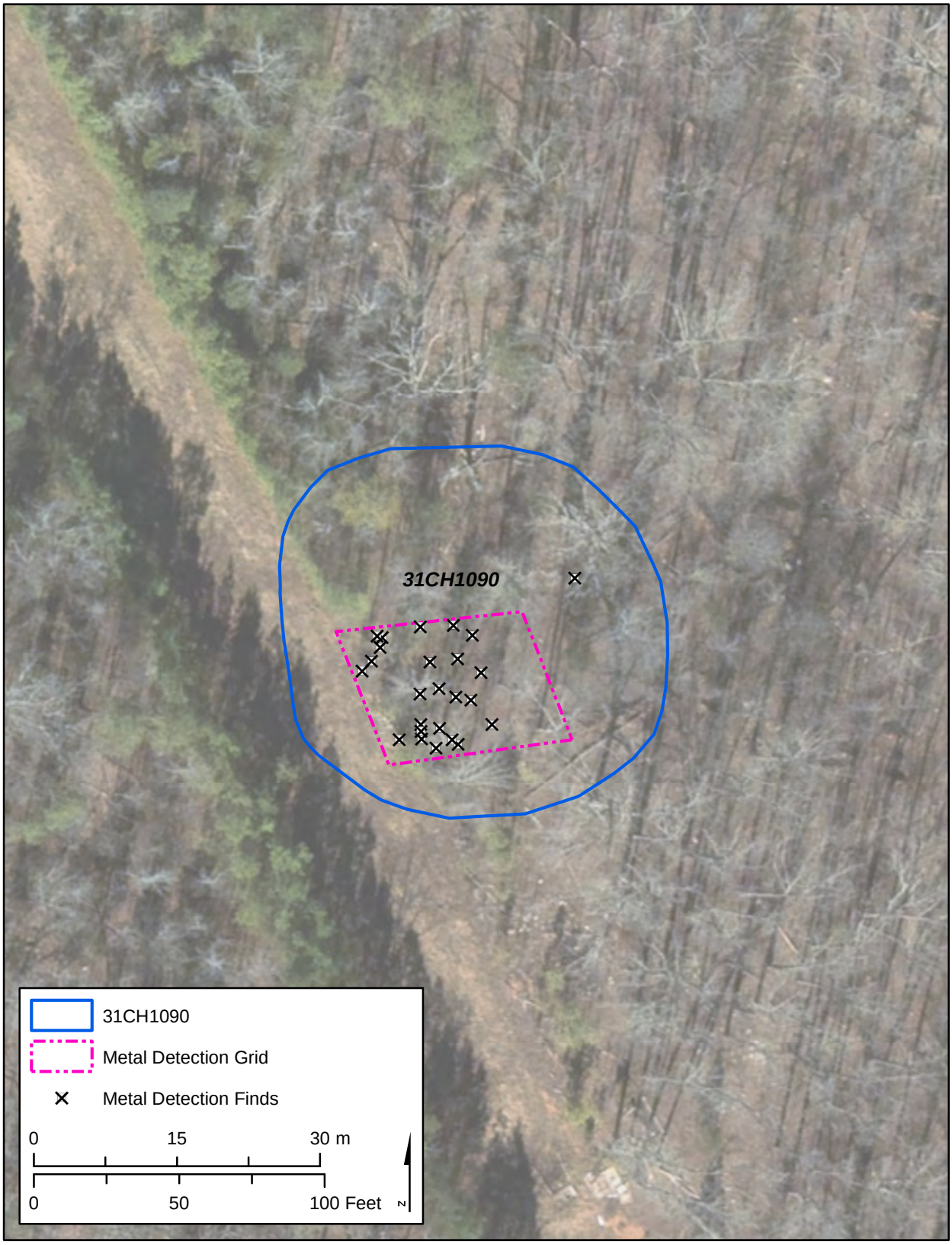
## SHOVEL TESTING RESULTS

Twenty shovel tests were excavated to delineate site 31CH1090, the first of which served as a datum (STP N500 E500) and was located 9.9 meters (32.4 feet) east-northeast of Feature 1. Of the 20 shovel tests, four were positive, and 16 were negative (Figure 14). Positive shovel tests (N500 E500, N515 E500, N500 E485, and N515 E485) were north-northeast of Feature 1, indicating the site boundary that measured 40.4x38.7 meters (132.5x126.9 feet). A typical soil profile consisted of 10-15 centimeters of dark yellowish brown (10YR 4/6) silty loam over a yellowish brown (10YR 5/6) silty clay loam subsoil (Figure 15). Shovel tests located in the utility corridor were sterile and disturbed, exposed of five centimeters of red (10R 5/8) silty clay over yellowish red (5YR 5/6) silty clay (Figure 16).

## ARTIFACT ANALYSIS

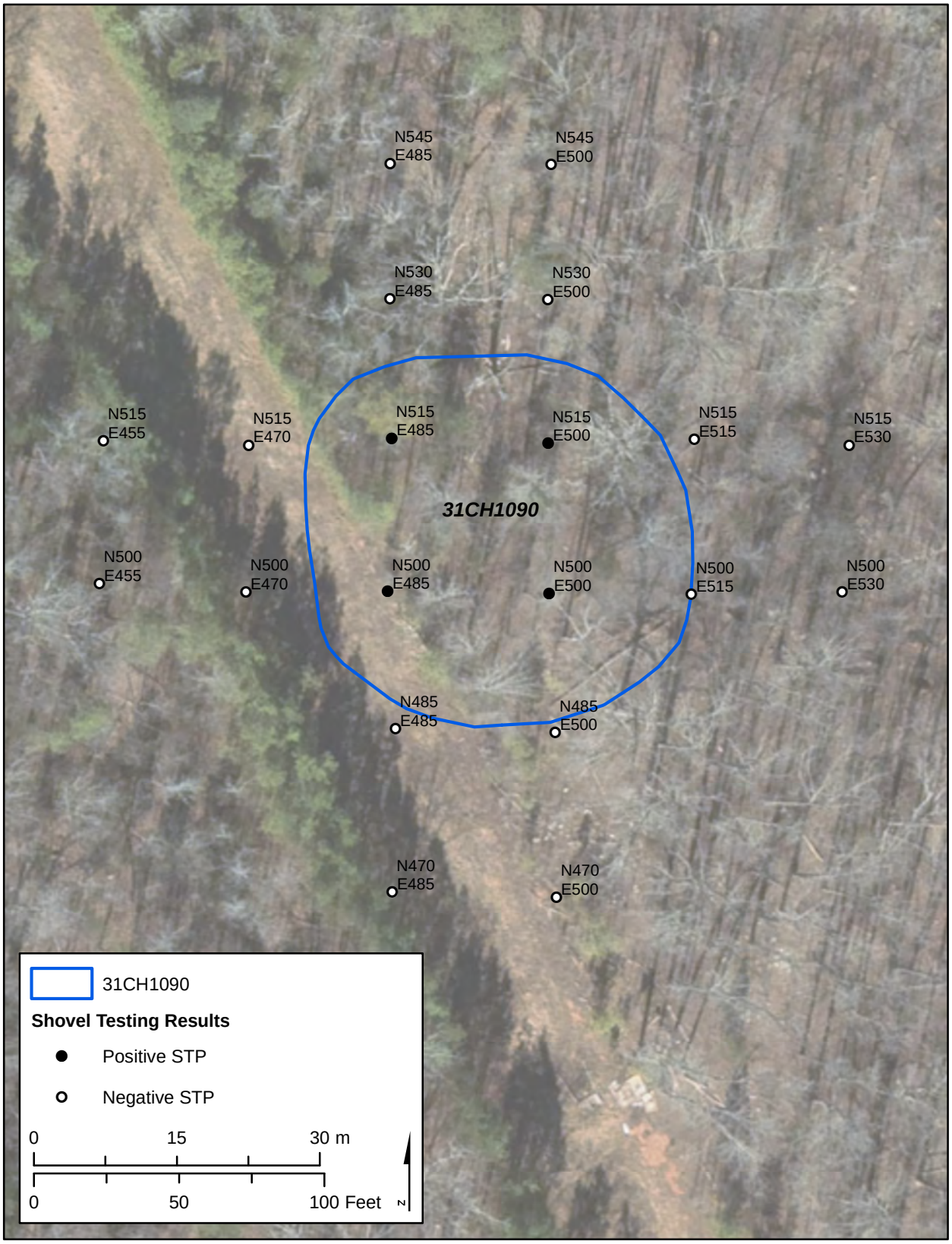
Eighty-one artifacts were identified at 31CH1090, only 43 of which were sent to the laboratory for further analysis (Table 1). Diagnostic artifacts include cut nails, wire nails, a tool-finished bottle, amethyst container glass, plain ironstone, and an aqua glass canning mason jar screw cap. These artifacts suggest that the site dates to the second half of the nineteenth century (Baugher-Perlin 1982; Miller 1991; Miller et al. 2000; Nelson 1968; Orser et al. 1987). Non-diagnostic artifacts included a horseshoe fragment, a clear container glass, unidentified iron/steel architectural hardware, slate roofing, flat aqua glass, an iron/steel stove plate, and an iron/steel button, and unidentified nails. Artifacts were primarily recovered from 0-20 cmbs in the uppermost stratum. The artifacts recovered from the site were primarily architectural in function, apart from a few storage and foodways items that suggest that the structure was domestic in nature. The artifacts

Figure 13.
Metal Detection Targets at 31CH1090




Source: Esri Resource Data (2021)

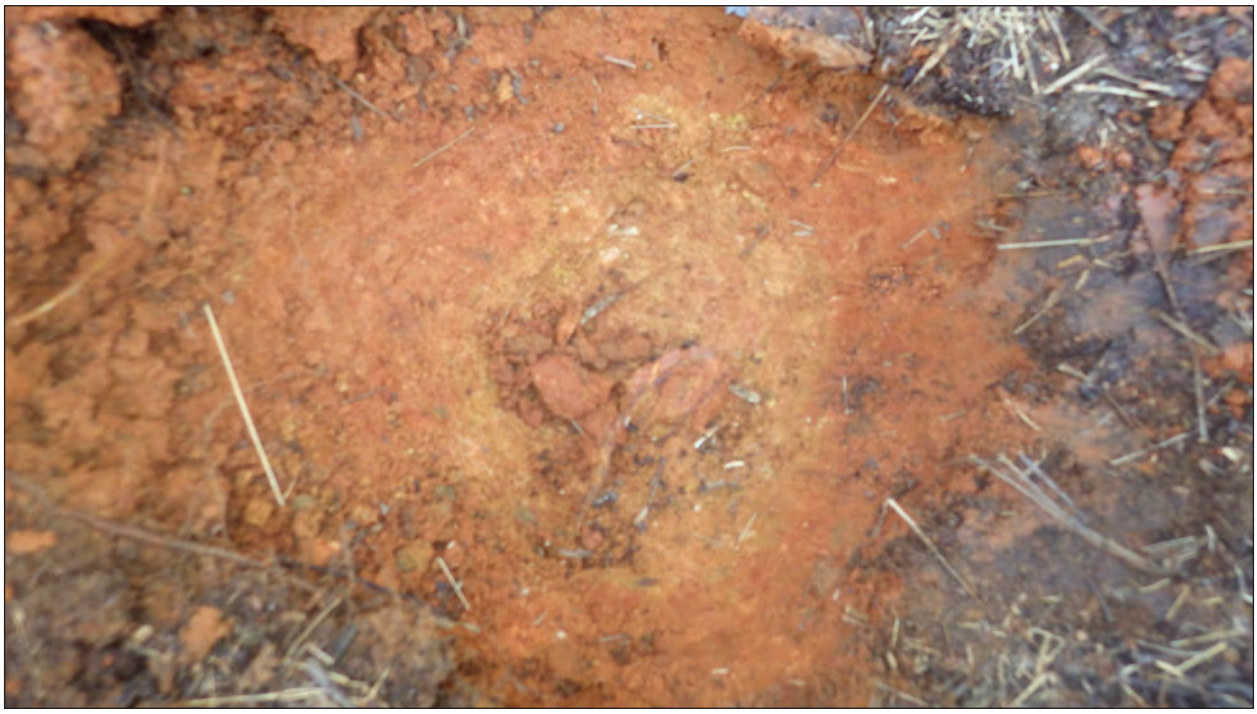
Figure 14.
Shovel Test Locations at 31CH1090




Source: Esri Resource Data (2021)

Figure 15.
31CH1090 Shovel Test N515 E515

Figure 16.
31CH1090 Shovel Test N470 E485



recovered date the site to the period in which the parcel was swiftly passed from owner to owner, though there is no written evidence to suggest that the Cotton, Neville, Stroud, and Sutphin families ever occupied the parcel. Table 1. Artifacts from Site 31CH1090

| Provenience | Artifact Description | Count | Weight |
|---|---|---|---|
| MDF 1 | Nail, Cut Fragment | 3 | 9.2 |
| MDF 2 | Nail, Wire Common, Unmeasured | 1 | 6.3 |
| MDF 3 | Bottle Glass, Lipping Tool Finish, Fine | 2 | 20.6 |
| MDF 4 | Horseshoe | 1 | 153.1 |
| MDF 5 | Container Glass, Clear | 1 | 0.2 |
| | Container Glass, Amethyst Color | 1 | 1.9 |
| | Ironstone, Plain | 3 | 38.8 |
| MDF 6 | Iron/Steel Stove Plate | 1 | 893.2 |
| STP N500 E500 | Nail, Unidentified, Unmeasured | 1 | 6.5 |
| STP N515 E500 | Nail, Cut Fragment | 1 | 3.4 |
| STP N500 E485 | Iron/Steel Architectural Hardware, Misc. | 1 | 126.1 |
| | Slate, Roofing | 6 | 17.3 |
| | Canning Jar Aqua Glass, Mason Screw Cap | 1 | 7.0 |
| | Aqua Glass, Unmeasured Flat | 8 | 9.5 |
| | Nail, Cut Fragment | 3 | 15 |
| | Nail, Wire Common, Unmeasured | 7 | 16.0 |
| | Screw, Blunt End | 1 | 7 |
| STP N515 E485 | Button, Other Iron/Steel | 1 | 0.9 |
| | | 43 | 1,332.0 |

## IDENTIFYING A PROBABLE CONFEDERATE GRAVE

In addition to recording and evaluating site 31CH1090, New South also sought to identify a probable grave that was observed on the property in 1991. The site of the proposed Pyewacket Development and the surrounding parcels in Orange and Chatham Counties are historically associated with the Atwater and Morgan families. According to correspondence from the Chatham County Historic Association, the gravesite of William Anderson Morgan is located on the Chatham County section of Parcel No. 90267 in the Baldwin Township. The gravesite was documented in 1991 by J. Lamont Norwood, who noted that it was the only grave in the vicinity and was described as unfenced with an inscription reading, “W.A. Morgan, Company D, 61st N.C. Infantry, CSA.” Morgan’s birth and death dates were not inscribed on the maker, and a descendant of W.A.’s brother informed the surveyor that he lived from March 25, 1825 to December 15, 1900 and was called Billy. This account notes that the grave marker was damaged but did not specify anything further about the condition of the marker. Notes from a previous survey mention that a dwelling

owned by a Mrs. Ward was situated about 100 feet east of the gravesite. Two potential gravesite locations were identified by the property owner (Wiggins, personal communication, 2021). Neither the dwelling nor gravesite appear on Bynum USGS Historic Topographic Maps or historic aerials.

A Concise Morgan Family History

Born in 1825, William Anderson Morgan lived in the Upper Regiment of Chatham County by 1850 and worked as a farmer. As of the 1850 U.S. Federal Census, William shared a dwelling with his parents Alexander and Polly Morgan and siblings: Isaac R., Sarah N., Barlett M., Cynthia A., Joseph A., and Mark J. Morgan (U.S. Census Bureau 1850). Deed records and the 1865 will of Alexander Morgan indicate that the Morgan family owned a 200-acre parcel adjoining the property of Jehiel Atwater on the "waters of Meadow Branch" in Chatham and Orange Counties (North Carolina Division of Archives and History 1865). Conveyed to Alexander and his eldest son, Isaac Morgan, by Wilson Atwater on April 25, 1856, the Morgan parcel is described as beginning on the south side of a branch near Jehiel Atwater's line and bounded by the Ellis, Snipes, and Willis properties (see Figure 4) (Chatham County 1856). According to Alexander Morgan's 1865 will, portions of the property were given to his children Cynthia and Joseph, indicating that his older children may have already owned property. Deed records indicate that Isaac R. Morgan died in the 1850s and willed 100 acres of the 200-acre parcel on Meadow Branch that adjoined the lands of Jehiel Morgan to his siblings William, Manly (possibly Barlett M. in the census record), Sally (possibly Sarah B. in the census record), Cynthia, Joseph, Franklin, and Mark. In December of 1857, William Morgan sold his interest in the parcel to his brother Manly Morgan (Chatham County 1857).

At age 39, William A. Morgan enlisted as a Private in the Confederate Army on October 24, 1864. A member of the 61st Infantry, his assigned occupation was a shoemaker (Ancestry.com 2009) (U.S. Civil War Soldier Records and Profiles, 1861-1865). By 1880, William (now a widower) returned to farming in the Baldwin Township, where he lived with his wife Mary E. Morgan and nephew, James McLennan. William lived about three numbered dwellings from his brother Manly Morgan (U.S. Census Bureau 1880). By 1900, William was remarried to Elizabeth Morgan and continued working his farm. Census records indicate that he could both read and write and owned his farm free of mortgage (U.S. Census Bureau 1900). Morgan's will states that he died intestate before 1901, and A.R. Norwood served as his administrator. A few years after his death, all of his personal property was exhausted, and his estate was unable to pay the administrator (North Carolina Division of Archives and History 1901).

## A Concise History of Parcel No. 90267, The Pyewacket Subdivision

The proposed location of the Pyewacket Subdivision (Parcel No. 90267) was historically known as the "Atwater Property." In 1947, E.G. Merritt and Ruby Hunt Merritt purchased a 560-acre parcel "running up Meadow Branch and crossing the state road to Chapel Hill" from Henry A. and Mary Ellice Doak (Chatham County 1947). The property had passed through the Lobisser family, and a 1944 deed describes the property as "meandering down Meadow Branch thence with Robert Morgan's line and crossing the public road." The parcel had been previously conveyed from R.L. Strowd (Stroud) to J.B. Atwater in March of 1925 (Chatham County 1944). As of 1925, the parcel was bounded to the north by the lands of Charles Neville, to the west by lands of Wilson Atwater and Manly Morgan, and was identified as a 350-acre portion of the land formerly associated with Jehiel Atwater and Dr. Cotton (Chatham County 1925).

These property descriptions indicate that while the Merritt family may have at one time owned the William Morgan estate (they previously owned Parcel No. 69883 and No. 1235 to the west), the segment of the property most likely associated with the Morgan family is adjacent to the Pyewacket Subdivision parcel. A 2014 plat and an Orange County deed dated April 18, 1930 between Jane Morgan and Robert Morgan indicate that the parcel directly east of the proposed location of the Pyewacket Subdivision was part of the 93-acre tract divided amongst the siblings of Isaac R. Morgan (Chatham County 1930; Orange County 2014). This parcel has since been divided into Chatham County Parcels 94339, 94340, 94341, 94352, 94351, 94349, 94347, 94345, 94344, and 94343. As of 1930, the parcel was bounded to the south by the estate of William Morgan (possibly present-day Parcel No. 69883), to the north by the lands of Jane Morgan, and to the east by the lands of Amis Cotton (sections of present-day parcel No. 90267)(Chatham County 1930). The parcel remained in the Morgan-Ivy families until 2011; 2007 and 2011 deeds state that the parcel is bounded to the south by the William Morgan Estate that was later purchased by E.B. and Ruby Hunt Merritt (Chatham County 2007, 2011).

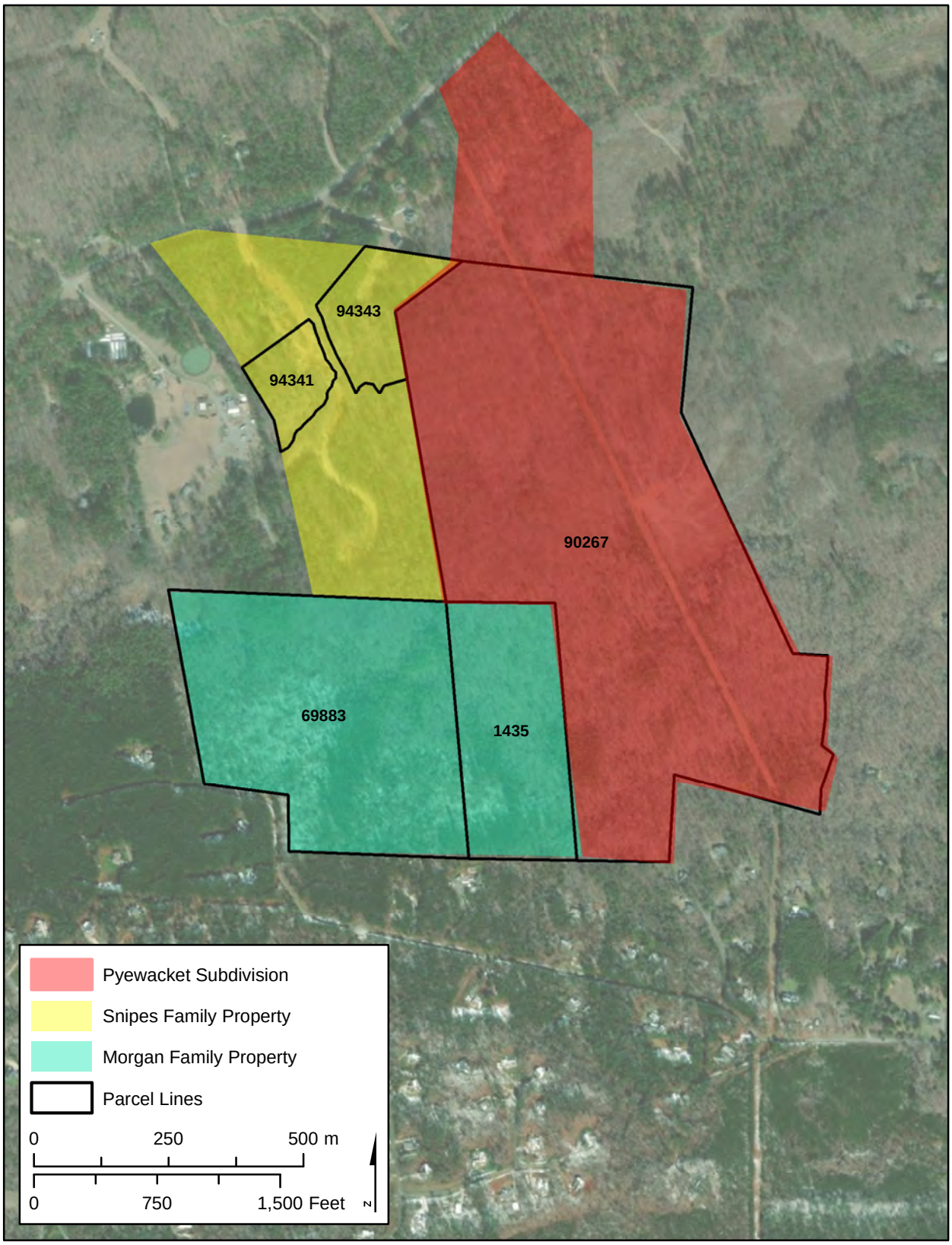
## Identification Efforts

New South investigated two sets of coordinates (35.862417 Latitude, 79.14955 Longitude, and 35.862222 Latitude, 79.1525 Longitude) associated with previous accounts of the grave. Both sets of coordinates were provided by the Chatham County Historical Association and were based upon the notes from Norwood's 1991 account of the grave. Both locations were in the eastern half of the subdivision, east of the utility corridor. New South conducted a visual assessment of a 60-meter (196.8-feet) buffer around the coordinate locations to locate the headstone or a depression reminiscent of an interment. The visual assessment sought to identify obvious surface features such as depressions, formal markers, and ornamental vegetation. The presence of natural stone throughout both locations made the identification of the broken headstone difficult (Figure 17).

Figure 17.
Location Investigated in Search of Probable Grave

Survey efforts conducted by New South did not identify Morgan's gravesite at either of the previously identified locations, and the gravesite is not identified on any of the associated deeds or plat maps (FindAGrave.com 2019; Wiggins, personal communication, 2021). Archival research and a review of associated Chatham and Orange County deeds indicate that the Chatham County parcels purchased by E.B. and Ruby Hunt Merritt in 1947 were likely adjacent to the Morgan family property, and the Morgan home site was likely located to the west of the proposed Pyewacket Subdivision, on an adjacent parcel (Parcel No. 69883 or No. 1435) (Figure 18). After 1983 these parcels passed through the Page family are now owned by Morgan Ridge Partners, LLC (Chatham County 2020). This information, along with the absence of the grave in either previously identified location, suggests two possibilities: 1) the grave is no longer visible from the surface, and the marker has been displaced; 2) the grave is located on the proposed subdivision parcel, but the previously recorded location is inaccurate, or 3) the grave is located to the west of the proposed location of the Pyewacket Subdivision on either Parcel No. 1435 or Parcel No. 69883 which was documented as the Morgan family estate.

Figure 18.
Chatham County Parcels on the Chatham County Land Record Viewer




Source: Esri Resource Data (2021)

# VII. SUMMARY AND RECOMMENDATIONS

New South conducted an archaeological assessment of a standing chimney (Site 31CH1090) and probable grave location in the Pyewacket Subdivision in Orange and Chatham Counties, North Carolina. Site 31CH1090 represents a late nineteenth-century residence that was heavily impacted by the construction of a natural gas pipeline. With respect to Criterion A and B, the site lacks the potential to convey association with broad patterns in history or significant individuals. With respect to Criteria C, there is no evidence of the work of a master, and the site is too disturbed to stand as an example of a resource type. The low artifact density and the absence of subsurface features reflect the site's disturbance and inability to yield significant archaeological data. Site 31CH1090 is recommended not eligible for the NRHP under Criteria A, B, C, and D, and no further work is recommended.

New South also investigated two sets of coordinates associated with a probable confederate grave location belonging to William "Billy" Anderson Morgan. A pedestrian survey of both locations suggests that either the grave is not present at either location or that it is no longer visible from the surface. Deed and census records suggest that the William A. Morgan gravesite is located to the west of the proposed location of the Pyewacket Subdivision, and it is likely a single burial. Sixteen other members of the Morgan family were interred at Bethel Baptist Church Cemetery, approximately seven miles north of the project area (FindAGrave.com 2008). Although a review of historic deeds more clearly ties the Morgan family with the parcels to the west, it cannot be entirely ruled out that the William A. Morgan's gravesite is potentially located on the Pyewacket Subdivision parcel. As addressed in the previous section, boundary lines shifted, and parcels were divided throughout the late nineteenth and early twentieth centuries, and a segment of this parcel could have been used by the Morgan family as the chain of title is less direct after 1870.

The presence of human remains cannot be ruled out; however, identification is difficult without a precise location. New South recommends that proposed construction activities proceed carefully in the two possible grave locations with the awareness that an unmarked grave may be present. If unmarked graves are identified, work would need to stop, and it would be necessary to notify the state archaeologist pursuant to North Carolina General Statute Chapter 70, Article 3, *Unmarked Burial and Human Skeletal Remains Protection Act,* Section 70-29.

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# APPENDIX A: SPECIMEN CATALOG

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# Specimen Catalog

**County: Chatham**
**State: South Carolina**
**Project: Pyewacket Subdivision Evaluation (2021)**

| Field Site # | State Site # | Field Bag # | Excavation Unit | Horizontal Location | Vertical Location | Count/ Weight | Artifact Description | Field Date |
|---|---|---|---|---|---|---|---|---|
| SET 01 | 31CH1090 | 1 | MDF 1 | | Level 1, Stratum I | 3 (9.2g) | Nail, Cut Fragment | 4/5/21 |
| SET 01 | 31CH1090 | 2 | MDF 2 | | Level 1, Stratum I | 1 (6.3g) | Nail, Wire Common, Unmeasured | 4/5/21 |
| SET 01 | 31CH1090 | 3 | MDF 3 | | Level 1, Stratum I | 2 (20.6g) | Bottle Glass, Lipping Tool Finish, Fine | 4/5/21 |
| SET 01 | 31CH1090 | 4 | MDF 4 | | Level 1, Stratum I | 1 (153.1g) | Horseshoe, Possible | 4/5/21 |
| SET 01 | 31CH1090 | 5 | MDF 5 | | Level 1, Stratum I | 1 (0.2g) | Container Glass, Clear | 4/5/21 |
| SET 01 | 31CH1090 | 5 | MDF 5 | | Level 1, Stratum I | 1 (1.9g) | Container Glass, Amethyst Color | 4/5/21 |
| SET 01 | 31CH1090 | 5 | MDF 5 | | Level 1, Stratum I | 3 (38.8g) | Ironstone, Plain | 4/5/21 |
| SET 01 | 31CH1090 | 6 | STP N500 E500 | N500 E500 | Level 1, Stratum I | 1 (6.5g) | Nail, Unidentified, Unmeasured | 4/5/21 |
| SET 01 | 31CH1090 | 7 | STP N515 E500 | N515 E500 | Level 1, Stratum I | 1 (3.4g) | Nail, Cut Fragment | 4/5/21 |
| SET 01 | 31CH1090 | 8 | STP N500 E485 | N500 E485 | Level 1, Stratum I | 1 (126.1g) | Metal, Architectural Hardware, Miscellaneous, iron/ steel | 4/5/21 |
| SET 01 | 31CH1090 | 8 | STP N500 E485 | N500 E485 | Level 1, Stratum I | 6 (17.3g) | Slate, Roofing | 4/5/21 |
| SET 01 | 31CH1090 | 8 | STP N500 E485 | N500 E485 | Level 1, Stratum I | 1 (7g) | Canning Jar Glass, Mason Screw Cap, Aqua color | 4/5/21 |
| SET 01 | 31CH1090 | 8 | STP N500 E485 | N500 E485 | Level 1, Stratum I | 8 (9.5g) | Glass, Unmeasured Flat, Aqua color | 4/5/21 |
| SET 01 | 31CH1090 | 8 | STP N500 E485 | N500 E485 | Level 1, Stratum I | 3 (15g) | Nail, Cut Fragment | 4/5/21 |
| SET 01 | 31CH1090 | 8 | STP N500 E485 | N500 E485 | Level 1, Stratum I | 7 (16g) | Nail, Wire Common, Unmeasured | 4/5/21 |
| SET 01 | 31CH1090 | 8 | STP N500 E485 | N500 E485 | Level 1, Stratum I | 1 (7g) | Screw, Blunt End | 4/5/21 |
| SET 01 | 31CH1090 | 9 | STP N515 E485 | N515 E485 | Level 1, Stratum I | 1 (0.9g) | Button, Other Iron/Steel | 4/5/21 |
| SET 01 | 31CH1090 | 10 | MDF 6 | | Level 1, Stratum I | 1 (893.2g) | Iron/ Steel Plate, Stove plate | 4/5/21 |

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Stone Mountain, GA 30083

APPENDIX D

# NCNHP DATABASE REPORT AND NATURAL COMMUNITIES REPORT

# Pyewacket Conservation Subdivision

Photo: Justin Robinson

County: Chatham Quad: Bynum

Date: January 13, 2021

NHP Staff: Justin Robinson, Special Projects Botanist

## Executive Summary

The North Carolina Natural Heritage Program (NHP) is a nonregulatory state agency in the Department of Natural and Cultural Resources. Our biologists, data managers, and stewardship specialists assist landowners and managers in assessing and managing properties for the preservation of North Carolina's

natural heritage. At the request of the landowners, NHP conducted a customized environmental review for the Pyewacket Conservation Subdivision near the intersection of Jones Ferry Road and Storybrook Lane near Bynum, NC to look for natural communities and rare plants. The project area was surveyed on January 14, 2020.

## Disclaimer

Data gathered during site visits provided the basis for this ecological assessment, but not all areas of the property were visited in all seasons or during all trips. As such, this inventory should not necessarily be considered comprehensive. Some plant species, are visible and/or identifiable only during certain times of the year. In mid January, many of the herbaceous plants could not be identified. Also, while the inventory of the flora and plant communities was thorough, no detailed or methodical survey of terrestrial fauna was performed.

## Background and Site Description

The project area is located on the south side of Jones Ferry Road, east of the intersection with Storybook Lane. The tract is a combination of even-aged stands of loblolly pine (*Pinus taeda*) and naturally regenerated hardwood stands. During the time of agriculture, this tract was likely in pasture land or used as a wood lot. The current condition of this tract is likely the result of a series of timber harvests, in which forests were allowed to regenerate between harvest rotations.

## Landscape Characteristics and Context

The project area is located within the Carolina Slate Belt and contains the acidic soils characteristic of the central Piedmont. Soils in the Slate Belt tend to be acidic, clayey, highly erodible and therefore usually unsuitable for the long-term cultivation of row crops. The northern portion of the project area is located on a metavolcanic geological feature which accounts for the abundant rocks and boulders and the slightly higher soil pH than the adjoining soils. Most of the non-residential and non-commercial areas within the county are typically forest lands. The project area is adjacent to timber and residential parcels.

The project area is largely made up of rocky upland flats, gentle slopes and small floodplains and is approximately 129 acres with an elevation of 500-600 feet. Wilkinson Creek forms part of the southern boundary of the project area.

## Ecological Significance

Morgan Ridge Natural Area

Based on information gathered during this survey, the Morgan Ridge natural area was expanded to include the high quality natural communities found on this tract. The forests mapped within the proposed Pyewacket Conservation Subdivision include mature examples of upland oak forests previously known from adjacent land. Morgan Ridge is a broad, gently sloped ridge top, giving way to steeper side slopes. The area is underlain by diorite and gabbro and shows evidence of soils with unusually high pH and base saturation. Parts of the area are also unusually rocky, with numerous boulders on some knobs. Though successional pine forests are embedded, most of the site supports Dry Basic Oak—Hickory Forest and Dry Oak—Hickory Forest communities that are quite mature and in excellent condition. The natural heritage rating for this natural area is R3C4.

Natural Communities

Dry Basic Oak-Hickory Forest (Piedmont Subtype) – G2G3

This mature community has a canopy dominated by southern shagbark (*Carya carolinae-septrionalis*), white oak (*Quercus alba*) with post oak *(Quercus stellata),* black oak (*Quercus velutina),* Shumard oak (*Quercus shumardii*) and scarlet oak *(Quercus coccinea)* occurring occasionally. This community is in excellent condition and the average diameter at breast height (DBH) for dominant canopy trees is 12" with some trees being 20" DBH. Eastern red-cedar (*Juniperus virginiana)*, southern sugar maple (*Acer floridanum),* flowering dogwood (*Cornus florida*), and red maple (*Acer rubrum*) dominate the understory. The shrub layer consists of occasional invasive exotic silverthorn (*Elaeagnus umbellata).* The herb layer consists of blueberry (*Vaccinium* sp.), littlehead nutrush (*Scleria oligantha*), two-flowered melic grass (*Melica mutica),* American dittany (*Cunila origanoides*) and little brown jug (*Hexastylis americana)*. This community covers approximately 41 acres of the project area. This community type found in the northern portion of the project area contains more tulip-poplar (*Liriodendron tulipifera)* and has a shrub layer dominated by (*Elaeagnus umbellata).*

Dry Oak-Hickory Forest (Piedmont Subtype) - G4G5

This mature community has a canopy dominated by white oak (*Quercus alba*) with post oak *(Quercus stellata),* black oak (*Quercus velutina)* and scarlet oak *(Quercus coccinea)* occurring occasionally. This community is in good condition and the average diameter at breast height (DBH) for dominant canopy trees is 12". American holly (*Ilex opaca*) and sweetgum (*Liquidambar styracifula*) dominate the understory. The shrub layer consists of viburnum (*Viburnum* sp.) and occasional silverthorn (*Elaeagnus umbellata).* The herb layer consists of blueberry (*Vaccinium* sp.) and little brown jug (*Hexastylis americana)*. This community covers approximately 33 acres of the project area.

Other communities

The remaining portion of the project area is an even-aged stand of largely young hardwoods. The stands range from 15 to 40 years since the previous timber harvest. This community covers approximately 55 acres of the project area.

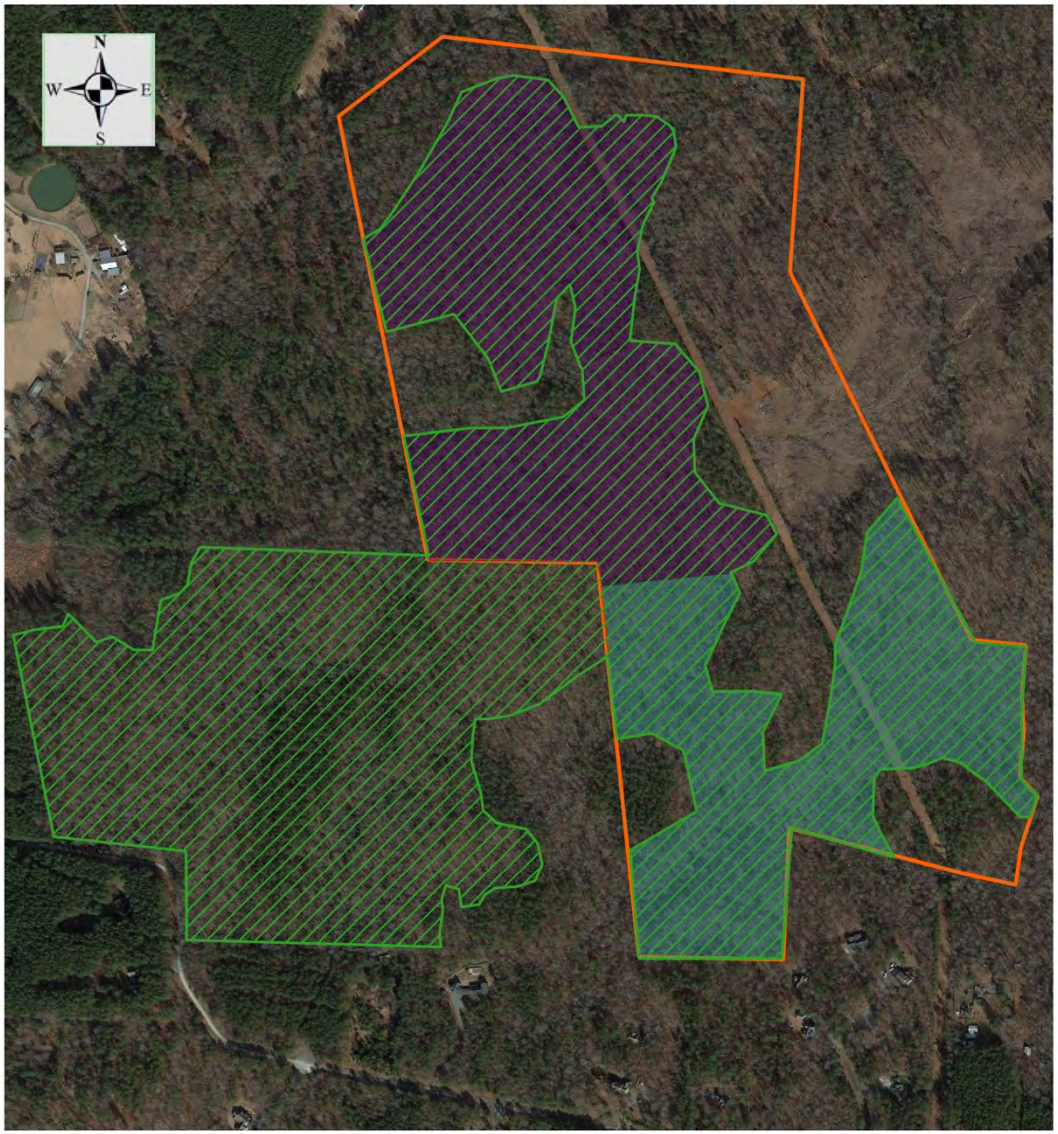
Wilkinson Creek is a tributary to the Haw River, which is an aquatic site of high significance, supporting rare dragonflies and mussels. One Significantly Rare mussel, eastern creekshell (*Villosa delumbis*) is present in Wilkinson Creek a short way downstream of the tract.

## Restoration Potential and Management Recommendations

Although no rare plants or natural communities were observed in this survey, this project area represents a tract that has not been used for row crop agriculture in the recent past. Due to this fact, plant communities in this project area largely contain few invasive species and have large populations of native species that are much less common throughout the area.

The most significant portions of the tract are the Dry Oak—Hickory Forest and the Dry Basic Oak-Hickory Forest. These forest systems are a remnant of the natural communities that once covered much of the uplands in this part of the Piedmont. These remnants would benefit from prescribed burning and the removal of invasive exotics. Due to the lack of rare plants in these ecosystems and ever-growing residential re-development, little has been done to conserve these kinds of plant communities. The restoration potential for this project area is high. Similar plant communities nearby have benefited greatly from prescribed fire and the elimination of pine plantation silviculture.

The Natural Heritage Program recommends a protected 200-foot riparian buffer for Wilkinson Creek and any tributary on the property to conserve aquatic habitat and water quality onsite and downstream to protect the Haw River Aquatic Habitat. Even though an aquatic survey was not performed on the tract, the recommendation would be the same whether or not rare aquatic species are found to be present within the project area. This recommendation is not dependent upon the presence or absence of rare aquatic species on or adjacent to the parcels proposed for development, because the development parcel drains into Wilkinson Creek and the Haw River Aquatic Habitat, supporting populations of Federally and State Endangered Cape Fear Shiner (*Notropis mekistocholas*), as well as other aquatic animals considered Significantly Rare in North Carolina, but not formally protected, including Eastern Creekshell (*Villosa delumbis*), Carolina Ladle Crayfish (*Cambarus davidi*), and Septima's Clubtail Dragonfly (*Gomphurus septima*).




**January 13, 2020**

Pyewacket Conservation Subdivision
with aerial photo

Pyewacket Conservation Subdivision

Natural Communities

Dry Basic Oak-Hickory Forest (Piedmont Subtype)

Dry Oak-Hickory Forest (Piedmont Subtype)

Morgan Ridge Natural Area

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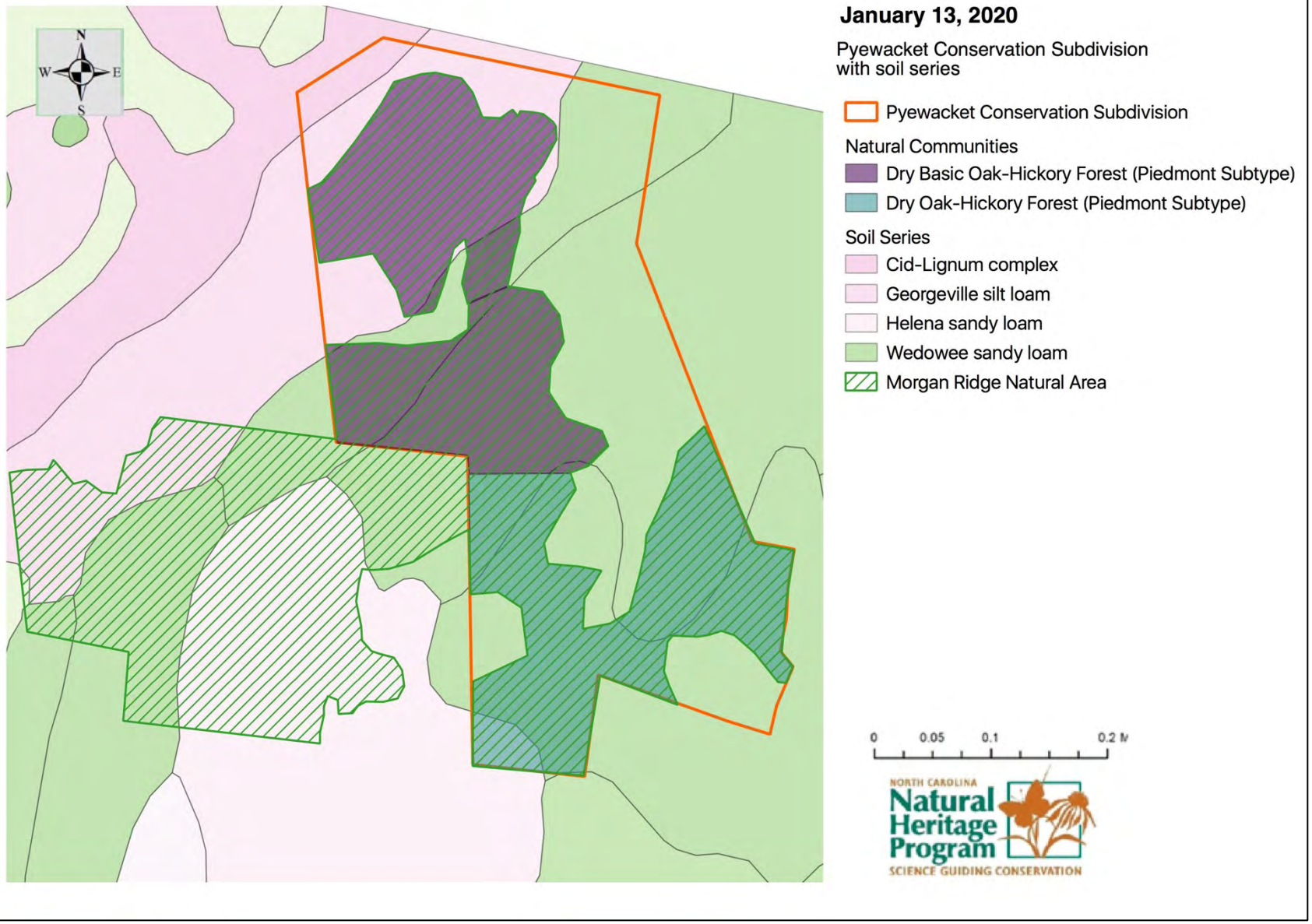
NORTH CAROLINA
Natural Heritage Program
SCIENCE GUIDING CONSERVATION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January 13, 2020
Pyewacket Conservation Subdivision
with soil series
Pyewacket Conservation Subdivision
Natural Communities
Dry Basic Oak-Hickory Forest (Piedmont Subtype)
Dry Oak-Hickory Forest (Piedmont Subtype)
Soil Series
Cid-Lignum complex
Georgeville silt loam
Helena sandy loam
Wedowee sandy loam
Morgan Ridge Natural Area
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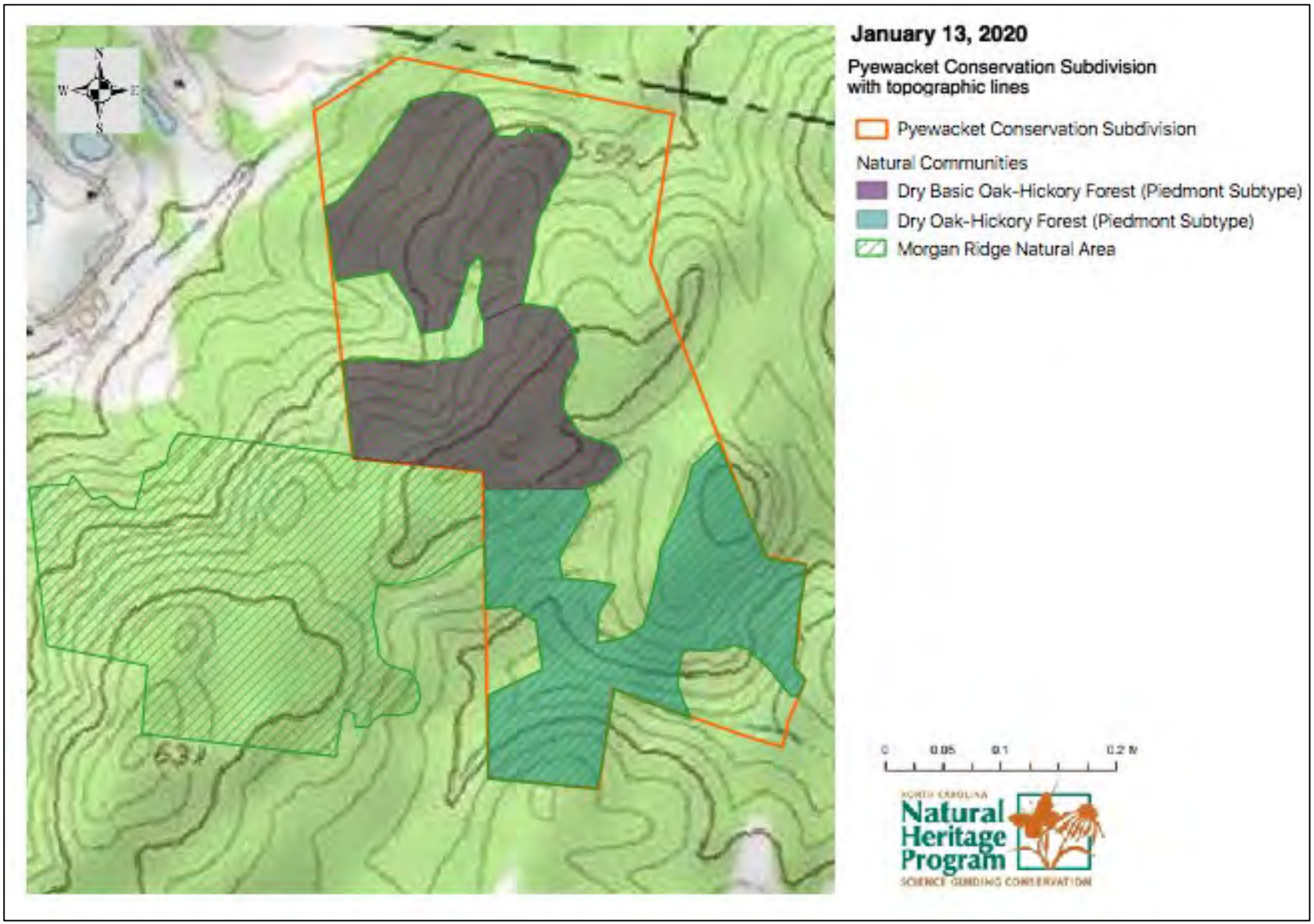
NORTH CAROLINA
Natural
Heritage
Program
SCIENCE GUIDING CONSERVATION


January 13, 2020
Pyewacket Conservation Subdivision
with topographic lines
Pyewacket Conservation Subdivision
Natural Communities
Dry Basic Oak-Hickory Forest (Piedmont Subtype)
Dry Oak-Hickory Forest (Piedmont Subtype)
Morgan Ridge Natural Area
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NORTH CAROLINA
Natural
Heritage
Program
SCIENCE GUIDING CONSERVATION

NC DEPARTMENT OF
NATURAL AND CULTURAL RESOURCES

Roy Cooper, **Governor**
Susi Hamilton, **Secretary**
Walter Clark, **Director, Land and Water Stewardship**

NCNHDE-13664

January 8, 2021

Sean Clark
Sage Ecological Services
3707 Swift Drive
Raleigh, NC 27606-2543
RE: Pyewacket Subdivision; 2020.108

Dear Sean Clark:

The North Carolina Natural Heritage Program (NCNHP) appreciates the opportunity to provide information about natural heritage resources for the project referenced above.

A query of the NCNHP database indicates that there are records for rare species, important natural communities, natural areas, and/or conservation/managed areas within the proposed project boundary. These results are presented in the attached 'Documented Occurrences' tables and map.

The attached 'Potential Occurrences' table summarizes rare species and natural communities that have been documented within a one-mile radius of the property boundary. The proximity of these records suggests that these natural heritage elements may potentially be present in the project area if suitable habitat exists. Tables of natural areas and conservation/managed areas within a one-mile radius of the project area, if any, are also included in this report.

If a Federally-listed species is documented within the project area or indicated within a one-mile radius of the project area, the NCNHP recommends contacting the US Fish and Wildlife Service (USFWS) for guidance. Contact information for USFWS offices in North Carolina is found here: https://www.fws.gov/offices/Directory/ListOffices.cfm?statecode=37.

Please note that natural heritage element data are maintained for the purposes of conservation planning, project review, and scientific research, and are not intended for use as the primary criteria for regulatory decisions. Information provided by the NCNHP database may not be published without prior written notification to the NCNHP, and the NCNHP must be credited as an information source in these publications. Maps of NCNHP data may not be redistributed without permission.

Also please note that the NC Natural Heritage Program may follow this letter with additional correspondence if a Dedicated Nature Preserve, Registered Heritage Area, Land and Water Fund easement, or an occurrence of a Federally-listed species is documented near the project area.

If you have questions regarding the information provided in this letter or need additional assistance, please contact Rodney A. Butler at rodney.butler@ncdcr.gov or 919-707-8603.

Sincerely,
NC Natural Heritage Program

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Intersecting the Project Area
Pyewacket Subdivision
Project No. 2020.108
January 8, 2021
NCNHDE-13664

Element Occurrences Documented Within Project Area

| Taxonomic Group | EO ID | Scientific Name | Common Name | Last Observation Date | Element Occurrence Rank | Accuracy | Federal Status | State Status | Global Rank | State Rank |
|---|---|---|---|---|---|---|---|---|---|---|
| Natural Community | 39364 | Dry Basic Oak--Hickory Forest | --- | 2019-09-11 | A | 2-High | --- | --- | G2G3 | S2S3 |

Natural Areas Documented Within Project Area

| Site Name | Representational Rating | Collective Rating |
|---|---|---|
| Morgan Ridge | R3 (High) | C4 (Moderate) |

No Managed Areas Documented within the Project Area

Definitions and an explanation of status designations and codes can be found at https://ncnhde.natureserve.org/help. Data query generated on January 8, 2021; source: NCNHP, Q3 October 2020. Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Within a One-mile Radius of the Project Area
Pyewacket Subdivision
Project No. 2020.108
January 8, 2021
NCNHDE-13664

Element Occurrences Documented Within a One-mile Radius of the Project Area

| Taxonomic Group | EO ID | Scientific Name | Common Name | Last Observation Date | Element Occurrence Rank | Accuracy | Federal Status | State Status | Global Rank | State Rank |
|---|---|---|---|---|---|---|---|---|---|---|
| Butterfly | 34564 | Erynnis martialis | Mottled Duskywing | 1952-07-01 | H | 5-Very Low | --- | Significantly Rare | G3 | S2 |
| Dragonfly or Damselfly | 33764 | Somatochlora georgiana | Coppery Emerald | 2004-Pre | H? | 5-Very Low | --- | Significantly Rare | G3G4 | S1? |
| Natural Community | 39364 | Dry Basic Oak--Hickory Forest | --- | 2019-09-11 | A | 2-High | --- | --- | G2G3 | S2S3 |
| Natural Community | 25747 | Dry Oak--Hickory Forest (Piedmont Subtype) | --- | 2010 | B | 2-High | --- | --- | G4G5 | S4 |
| Natural Community | 25746 | Piedmont Monadnock Forest (Typic Subtype) | --- | 2010 | B | 2-High | --- | --- | G3G4 | S3 |
| Natural Community | 39362 | Upland Depression Swamp Forest | --- | 2019-09-11 | C | 2-High | --- | --- | G2G3 | S2S3 |
| Vascular Plant | 22304 | Tridens chapmanii | Chapman's Redtop | 1894-08-21 | H | 5-Very Low | --- | Threatened | G5T3 | S1S2 |

Natural Areas Documented Within a One-mile Radius of the Project Area

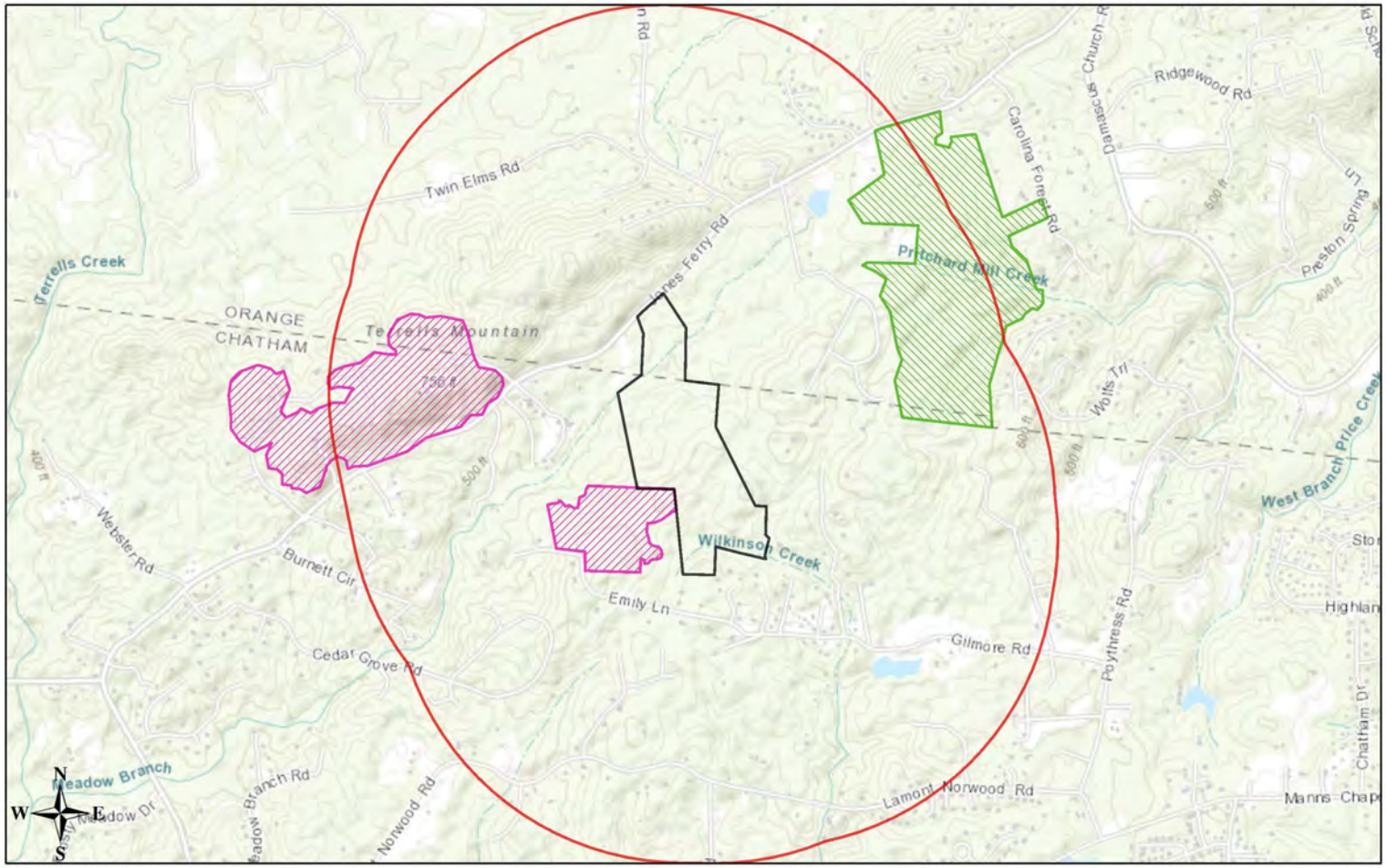
| Site Name | Representational Rating | Collective Rating |
|---|---|---|
| Terrells Mountain | R5 (General) | C5 (General) |
| Morgan Ridge | R3 (High) | C4 (Moderate) |

Managed Areas Documented Within a One-mile Radius of the Project Area

| Managed Area Name | Owner | Owner Type |
|---|---|---|
| Triangle Land Conservancy Preserve | Triangle Land Conservancy | Private |

Definitions and an explanation of status designations and codes can be found at https://ncnhde.natureserve.org/help. Data query generated on January 8, 2021; source: NCNHP, Q3 October 2020. Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

# NCNHDE-13664: Pyewacket Subdivision




January 8, 2021

- Project Boundary
- Buffered Project Boundary
- NHP Natural Area (NHNA)
- Managed Area (MAREA)

1:30,172

0 0.25 0.5 1 mi

0 0.4 0.8 1.6 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

APPENDIX E

# DETAILED SOIL/SITE EVALUATION

PIEDMONT ENVIRONMENTAL ASSOCIATES, P.A.

12/14/20 Project # 2112

Jones Ferry Project (Merritt Tract)
c/o: Warren Mitchell
104 Amber Wood Run
Chapel Hill, NC 27516

RE: Detailed Soil/Site Evaluation on Property Located off of Jones Ferry Road, Guilford County Parcel Number 0090267(Chatham)/ 9757513504(Orange)

Mr. Mitchell,

This report details the findings of a detailed site and soil evaluation performed on the tract referenced above. The evaluation was conducted at the clients written request in order to determine the site's suitability for the installation of sub-surface wastewater disposal systems to serve domestic strength wastewater. This evaluation was for residential strength wastewater applications. Any other type of use may require additional testing and/or stricter setbacks. This report does not address systems receiving more than 3,000 gallons per day of flow.

The evaluation was conducted by Chris Murray, Ryan Smith, Jim Beeson and Edwin Stott, North Carolina Licensed Soil Scientists, in December, 2020. The evaluation was conducted during moist soil conditions with the use of a hand-auger to determine soil suitability for on-site sewage disposal systems in accordance with 15A NCAC 18A .1900 "Laws and Rules for Sewage Treatment and Disposal Systems". Characteristics that affect the suitability of sub-surface systems include soil depth to expansive clay, seasonal high-water table, rock, and unusable saprolite. Topography and slope also affect the suitability of an area for septic systems. The evaluation of these components was conducted on the site. The level of the evaluation was detailed for this tract.

Findings are conveyed by showing areas on the enclosed map that are usable for different system types. Areas that are suitable for conventional depth wastewater systems are hatched in red. These areas have usable topography and a minimum slope-corrected soil depth of 24 inches. Areas that are suitable for low profile chamber depth wastewater systems (which require more space) are hatched in orange. These areas have usable topography and a minimum slope-corrected soil depth of 21 inches. All hatched areas are generated using gps technology in the field and are not survey located. The areas are labeled with approximate square footages.

Once the soils map is complete the size of area required for a septic system can be estimated. Residential systems are sized according to the number of bedrooms in the proposed dwelling. Systems are not sized based on the number of bathrooms in the

dwelling. Each bedroom in the proposed dwelling is calculated to generate a daily flow of 120 gallons. A four-bedroom dwelling would have a daily calculated flow of 480 gallons. The daily flow is divided by the loading rate based on the soil texture. This site has a clay texture so would have an estimated long-term acceptance rate (LTAR) of 0.25 gallons per square foot of trench bottom per day. The minimum required area or square footage on the ground for the primary septic system and the repair area with this LTAR for the conventional hatched areas would be approximately 10,000 – 12,000 square feet. The minimum required area or square footage on the ground for the primary septic system and the repair area with this LTAR for the low profile chamber hatched areas would be approximately 13,000 – 16,000 square feet. These areas must meet all setbacks from property lines, wells, water lines and structures as well as any other easement imposed by other entity. All lots will require an application and evaluation by the county health department on an individual basis.

This report discusses the general location of potentially usable soils for on-site wastewater disposal and the soil and site limitations on the property that exists at the time of the evaluation. Piedmont Environmental Associates, PA ("Piedmont") provides professional consulting specializing in the practice of soil science and wastewater management. Piedmont is therefore hired for its professional opinion regarding these matters. Laws and rules governing wastewater treatment and disposal are forever evolving and subject to the interpretation and opinion of individuals which are employed by local and state agencies that govern these laws and rules. Due to this fact, Piedmont cannot guarantee in any way that any area located in the field, shown on a sketch, or discussed with the client will be permitted by any of these agencies. It is for this reason that **Piedmont strongly recommends to anyone considering a financial commitment on any piece of property be completely aware of any and all permit requirements on that property before purchase and obtain those permits prior to a final financial commitment**.

We are pleased to be of service in this matter. If you have any further questions, please feel free to call (336) 662-5487.

Sincerely,


G. Christopher Murray
NC Licensed Soil Scientist #1284
Piedmont Environmental Associates, PA

**Attachment I**

.1950 Location of Sanitary Sewage Systems

(c) Every sanitary sewage treatment and disposal system shall be located at least the minimum horizontal distance from the following:

| | | |
|---|---|---|
| (1) | Any private water supply source including a well or spring | 100 feet |
| (2) | Any public water supply source | 100 feet |
| (3) | Streams classified as WS-I | 100 feet |
| (4) | Water classified as S.A. from mean high water mark | 100 feet |
| (5) | Other coastal waters from mean high water mark | 50 feet |
| (6) | Any other stream, canal, marsh, or other surface waters | 50 feet |
| (7) | Any Class I or Class II reservoir from normal pool elevation | 100 feet |
| (8) | Any permanent storm water retention pond from flood pool elevation | 50 feet |
| (9) | Any other lake or pond from normal pool elevation | 50 feet |
| (10) | Any building foundation | 5 feet |
| (11) | Any basement | 15 feet |
| (12) | Any property line | 10 feet |
| (13) | Top of slope of embankments or cuts of 2 feet or more vertical height | 15 feet |
| (14) | Any water line | 10 feet |
| (15) | Drainage systems: | |
| | (A) Interceptor drains, foundation drains and storm water diversions | |
| | (i) upslope | 10 feet |
| | (ii) sideslope | 15 feet |
| | (iii) downslope | 25 feet |
| | (B) Groundwater lowering ditched and devices | 25 feet |
| (16) | any swimming pool | 15 feet |
| (17) | any other nitrification field (except repair area) | 20 feet |

(b) Ground absorption, sewage treatment and disposal systems may be located closer than 100 feet from a private well supply, except springs and uncased wells located downslope and used as a source of drinking water, repairs, space limitations and other site-planning considerations but shall be located the maximum feasible distance and, in no case, less than 50 feet.

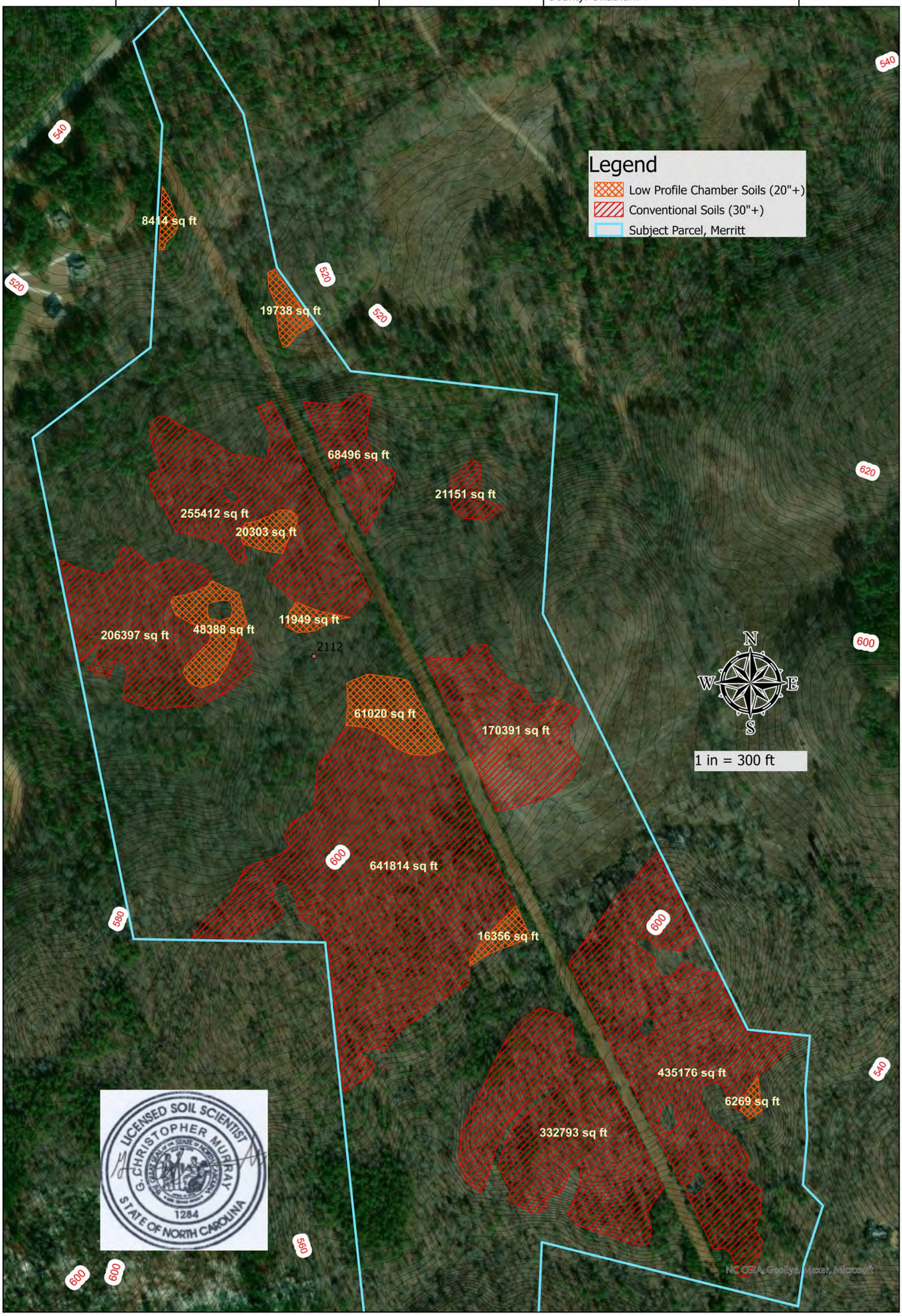
(c) Nitrification fields and repair areas shall not be located under paved areas or areas subject to vehicular traffic. If effluent is to be conveyed under areas subject to vehicular traffic, ductile iron or its equivalent pipe shall be used. However, pipe specified in Rule .1955 (e) may be used if a minimum of 30 inches of compacted cover is provided over the pipe.

**Note: Systems over 3000 GPD or an individual nitrification fields with a capacity of 1500 GPD or more have more restrictive setback requirements, see .1950 (a) (17) (d) for specifics.**

PIEDMONT ENVIRONMENTAL ASSOCIATES, P.A.
216 S. Swing Rd. Suite 1
Greensboro, NC 27409
piedmontsoil.com

# Merritt Tract - Warren Mitchell

Job# 2112
Date: 12/14/20
Client: Warren Mitchell
County: Chatham




LICENSED SOIL SCIENTIST
G. CHRISTOPHER MURRAY
1284
STATE OF NORTH CAROLINA

APPENDIX F

# STATE AND FEDERAL PERMITS

State and federal approvals/permits potentially required include, but are not limited to, the following:

- USACE approved stream and wetland delineation and permit
- NCDWR approved stream and wetland permit
- NCDOT driveway permit
- County riparian buffer review and authorization
- County soil erosion and sediment control
- County environmental resources stormwater permit
- County Public Works water system approval
- County Public Works fire flow analysis
- NCDEQ Public Water Supply water permit
- County and NCDEQ individual septic permit