Big Woods Forest Preserve
Project Design Document

Table of Contents

INSTRUCTIONS

Project Operators must complete and submit this Project Design Document (PDD) to request credits. City Forest Credits (CFC) then reviews this PDD as part of the validation process along with all other required project documents. An approved third-party verifier then does an independent check of all documents and compliance with the Protocol known as verification.

The Protocol Requirements at the end of this document are a list of eligibility requirements for informational purposes which are also found in more detail in the CFC Tree Preservation Protocol Version 13.40, dated February 29, 2024.

Project Operators should enter data and supporting attachments starting on page 3 under Project Overview where you find "[Enter text here]" as thoroughly as possible and provide numbered attachments for maps and other documentation (ex: 1 – Regional Map). Keep all instructions in the document.

Below is a list of documents that are needed to complete a successful project:

- *Geospatial Location Map*
- *Regional Map*
- *Project Area Map*
- *Proof of Land Ownership or Agreement to Transfer Credits*
- *Preservation Commitment*
- *Land Use Regulations*
- *Land Use/Zoning Map*
- *Overlay Zones or Restrictions*
- *Threat of Loss Demonstration*
- *Attestation of No Double Counting and No Net Harm*
- *Attestation of Additionality*
- *Carbon Quantification Calculator*
- *Plot Sampling Map (if relevant)*
- *Sampling Raw Data*
- *Carbon Biomass calculations*
- *i-Tree Eco file*
- *Forest Composition*
- *Co-Benefit Quantification Calculator*
- *iTree Canopy Report*
- *Social Impacts*

PROJECT OVERVIEW

Project Name: Big Woods Forest Preservation
Project Number: 059
Project Type: Preservation Project (under the Tree Preservation Protocol – version 13.40, dated February 29, 2024)
Credit Commencement Date: July 25, 2025
Project Location: Chatham County, NC

Project Operator Name: Triangle Land Conservancy (TLC)
Project Operator Contact Information:

Primary:
Matt Rutledge
Phone: 919-908-0057
Email: mrutledge@triangleland.org

Secondary:
Robert Howes
Phone: 919-908-0052
Email: rhowes@triangleland.org

Project Description:
Describe overall project details and goals as summarized in application. Include information about where the Project is located, Project Area acreage and other relevant background. If the Project Area is part of a larger program or preservation effort, include one sentence with more information (2 paragraphs).

The Big Woods Forest Preservation project is an effort to protect 206.77 acres of mature upland forest in the Research Triangle region of central North Carolina. Named after its state-recognized natural community, the project supports a mix of loblolly pine, sweetgum, yellow-poplar, wooded wetlands, and other mixed upland hardwood tree species. In addition to the significant ecological value of the land, the property helps protect clean drinking water for several downstream communities. Located in the Durham-Chapel Hill-Carrboro metropolitan planning area, the Big Woods Forest project has faced significant development pressure from neighboring residential growth. Large, forested tracts of land in this region have become increasingly rare, as rapid development continues to change land use and fragment large parcels.

Triangle Land Conservancy's long-term goals for the project are to protect the land in perpetuity through fee simple acquisition and a state held conservation easement. The organization purchased the property in June 2023, with the hope to open it up to the community in the future as a public nature preserve. It is currently split between R-5 and R-1 Chatham County zoning districts, which allow for low-density residential development. Big Woods Forest would be TLC's first carbon crediting project. The organization has been exploring carbon crediting options for several years to help serve its mission in creating a healthier and more vibrant Research Triangle region by safeguarding clean water, protecting natural habitats, supporting local farms and food, and connecting people with nature. Triangle Land Conservancy envisions that funding from this project could be reinvested into protecting neighboring forested land facing similar development pressures.

DEFINING THE PROJECT AREA (Section 1.3 and 1.4)

Project Area Location
Describe the city, town, or jurisdiction where the Project is located. State which urban location criteria is met from Protocol Section 1.3.

The project is in Chatham County of central North Carolina (county parcel number 19351). The property meets CFC urban criteria by its location within the Durham-Chapel Hill-Carrboro metropolitan planning organization boundary.

Project Area Parcel Information
List parcel(s) in the Project Area.

Municipality	**Parcel Number**	**Notes** *Include total acres and acres included in Project Area*
Chatham, County	19351	Total parcel area – 247.68 acres Portion of parcel included – 206.77 acres
	Total Project Area	206.77 acres*

Project Area Maps
Provide three maps of the Project Area that illustrate the location: geospatial location, regional, and detailed. Maps should include project title, relevant urban or town boundaries, defined Project Area, and legend.

- Geospatial Location Map
  Show the boundaries of the Project Area in a KML, KMZ, or shapefile format
  Attachment: 1 BWF Project Area.zip
  1 BWF Parcel Boundary.zip

*The total project area (excluding wetland and stream buffer restrictions presented in Section 4) is 206.77 acres. Within this 206.77 acres, TLC has reserved the right to build a 0.2 acre parking lot to open the property as a nature preserve for the public. Credits have been adjusted accordingly to compensate for this tree removal in Section 11.

- Regional Map
  Show where the Project Area is located in relation to the state and/or region
  Attachment: 2 BWF Regional Location Map.pdf

- Detailed map of Project Area
  Show the Project Area and parcel boundaries.
  Attachment: 3 BWF Project Area Map.pdf

OWNERSHIP OR ELIGIBILITY TO RECEIVE POTENTIAL CREDITS (Section 1.5)

Project Operator must demonstrate ownership of potential credits or eligibility to receive potential credits. If Project Operator is the landowner, attach a deed showing ownership and explanation of when the property was acquired. If the Project Operator is not the landowner, provide the Agreement between Project Operator and landowner authorizing Project Operator to execute this project.

Name of landowner of Project Area and explanation

Triangle Land Conservancy is the current owner of the property with no plans to transfer ownership. The property was acquired on June 30, 2023 to protect it from encroaching development as part of the organization's mission as an accredited land trust. TLC is an experienced landowner, holding over 7,000 acres in fee simple ownership within its six-county service area.

Attachment: 4 BWF Recorded Deed

PROJECT DURATION (Section 2.2)

Project Operator commits to the 40- or 100-year project duration requirement through a signed Project Implementation Agreement with City Forest Credits and agrees to the statement below.

Project Operator has committed to the 40-year project duration and signed a Project Implementation Agreement with City Forest Credits on March 11, 2024.

PRESERVATION COMMITMENT (Section 4.1)

Describe the Preservation Commitment terms and attach a complete copy of the recorded document. If Project Area does not have the same boundaries as Preservation Commitment, please state the reasons why.

Preservation Term: Perpetuity

Date recorded: July 25, 20225

Preservation Commitment Explanation: Triangle Land Conservancy has an agreement to protect the Big Woods Forest property in perpetuity, as demonstrated by a conservation easement recorded with the State of North Carolina through the Land and Water Fund. In Article III, Section C, the conservation easement states "there shall be no cutting or removal of trees and no disturbance of other natural features in the Property."

Attachment: 5 BWF Declaration of Development Restrictions

DEMONSTRATION OF THREAT OF LOSS (Section 4.2, 4.3, and 4.4)

Demonstrating the Threat of Loss is shown in several ways: land use designation that allows a non-forest use, overlay zones, existing restrictions, and one of three conditions that illustrate pressure to convert the Project Area to a non-forest use.

Land use designation

Describe the land use designation, including what types of non-forest use it allows. Attach a copy of the relevant land use designations, which may include development regulations such as zoning ordinances. Include a map depicting the designation of the relevant municipality, with the Project Area boundaries clearly indicated on the map.

The Big Woods Forest Preservation project boundary crosses two different zoning districts, as defined by the Chatham County Zoning Ordinance: Residential District 1 (R1) and Residential District 5 (R5). R1 districts are defined by the county ordinance as, "primarily for low to moderate density residential development within the residential-agricultural areas of the jurisdiction" (Chatham County Zoning Ordinance 2022 pg. 3). The minimum lot size for one dwelling unit within an R1 district is 40,000 ft^2. R5 districts are defined by the county ordinance as, "primarily for very low-density residential developments along the County's rivers and streams which are compatible with protecting the water quality of the rivers and streams" (Chatham County Zoning Ordinance 2022 pg. 3). The minimum lot size for one dwelling unit within an R5 district is 5 acres, except for family subdivisions which can be as small as 3 acres.

Non-forested uses are permitted in both zoning districts including, but not limited to, single-family dwellings, accessory dwelling units, avocational farming, horticulture, and minor utilities. An exhaustive list of permitted and special permitted uses within the R1 and R5 zoning districts is included in the attached zoning ordinance. Specific language on tree removal restrictions for residential zones is not present within the Chatham County Zoning Ordinance. A Tree Protection Ordinance Working Group has been established by Chatham County's Commissioners, but the group has not yet formalized rules at the time of this project.

The Big Woods Forest project also falls within the county's WS-IV Protected Area (WS-IV PA) watershed district. The county's Watershed Protection Ordinance defines this district as land within 10 miles and draining to the water intakes for Pittsboro (Haw River), Sanford (Cape Fear River), and Goldston-Gulf (Deep River), or land within 5 miles and draining to Jordan Lake. The watershed ordinance specifies that silviculture is permitted within these areas, as well as residential and non-residential development. The ordinance also includes a mandatory 100' riparian buffer for all perennial streams and 50' riparian buffer for intermittent streams.

Attachment (Ordinances): 6a BWF Chatham Zoning Ordinance
6b BWF Chatham Watershed Ordinance

Attachment (Maps): 7a BWF Zoning Ordinance Map.pdf
7b BWF Watershed Ordinance Map.pdf

Overlay zones or other restrictions

Describe any overlay zones that prohibit development or forest clearance such as critical areas, wetlands, or steep slopes and their protection buffers. Describe any legal encumbrances or other pre-existing

tree/forest restrictions that may have hindered removal of the Project Trees (in the pre-Preservation Commitment condition). If present, attach a copy of the applicable restriction and a map depicting the overlay boundaries, with the Project Area boundaries clearly indicated on the map.

The Big Woods Forest project parcel contains 17 acres of wetlands surrounding Bush Creek, delineated by the United States Geological Survey in the National Wetland Inventory. This acreage is undevelopable and has been removed from the project area according to version 13.40 of the *City Forest Credits (CFC) Tree Preservation Protocol*. There are an additional 2 streams that cut through the property – Bush Creek flowing from West to East, and an unnamed tributary of Bush Creek flowing South to North. A 100-ft buffer around each of these streams has also been cut out of the project area, due to its development restrictions governed by the Chatham County Watershed Ordinance (version July 2022).

Attachment: 6b BWF Chatham Watershed Ordinance
8 BWF Wetland Restrictions Map.pdf

Threat of loss demonstration (Section 4.4 A, B, or C)
Describe one of the three threat of loss conditions that are applicable prior to the Preservation Commitment. Provide supporting evidence such as maps, sale or assessed value documentation, or appraisal information.

A) Developed or improved uses surrounding at least 30% of perimeter of Project Area
- *A map depicting the Project Area with parcel boundaries, perimeter of developed or improved uses, and calculation of the border with these uses*

B) Sold, conveyed, or assessed in past three years at value greater than $8K/acre for bare land
- *A settlement statement, assessor statement, or other evidence of land transaction*

C) Fair market value higher after conversion to a non-forested use
- *A "highest and best use" study from a state certified general real estate appraiser stating that the Project Area Would have a fair market value after conversion to a non-forested "highest and best use" greater than the fair market value after preservation]*

Threat of loss for this project is demonstrated through Section 4.4A – developed or improved uses surrounding at least 30% of the perimeter of the Project Area. Improved residential use abuts the Big Woods Forest project on two of its borders. This includes the Fearrington Village residential development on the western boundary and several residential properties on the eastern boundary. The total length of the bordering non-forested uses is approximately 8,855 feet. The perimeter of the project parcel is approximately 17,400 feet. Therefore, the project is surrounded by about 51% improved or developed uses.

Developed Residential land	8,855 ft
Big Woods Forest Perimeter	17,410 ft
Total Developed Perimeter	**51%**

Attachment: 9 BWF Threat of Loss Map.pdf

ATTESTATION OF NO DOUBLE COUNTING OF CREDITS AND NO NET HARM (Section 5)

Complete and attach the following attestation: Attestation of No Double Counting of Credits and Attestation of No Net Harm. Provide any additional notes as relevant. Provide a map that includes both the Project Area and the closest registered urban forest Preservation Project based on the registered urban forest preservation database KML/Shapefile provided by CFC to demonstrate that the Project does not overlap with any existing urban forest carbon projects.

Project Operator has mapped the Project Area against the registered urban forest preservation project database and determined that there is no overlap of Project Area with any registered urban forest preservation carbon project.

Project Operator has signed the Attestation of No Double Counting of Credits and No Net Harm on August 29, 2024

Attachment: 10a BWF CFC Project Database Map.pdf
10b BWF CFC Attestations.pdf

ADDITIONALITY (Section 6)

Additionality is demonstrated by the Project in several ways, as described in the City Forest Credits Standard Section 4.9.1 and Tree Preservation Protocol.

Project Operator demonstrates that additionality was met through the following:

- Prior to the Preservation Commitment, the trees in the Project Area were not protected via easement or recorded encumbrance or in a protected zoning status that preserves the trees
    - See Demonstration of Threat of Loss section above
- Prior to the Preservation Commitment, the land use designation/zoning in the Project Area allowed for a non-forest use
    - See Demonstration of Threat of Loss section above
- Prior to the Preservation Commitment, the trees in the Project Area passed one of the three tests to show risk of removal or conversion out of forest
    - See Demonstration of Threat of Loss section above
- The Project Operator records in the public land records an easement, covenant, or deed restriction specifically protecting the trees for the project duration of 40 years or 100 years (40 or 100 years depending on the Protocol version)
    - See Preservation Commitment section above

Taken together, the above elements allow crediting only for unprotected trees at risk of removal, which are then protected by a Project action of preservation, providing additional avoided GHG emissions.

Additionality is also embedded in the quantification methodology. Projects cannot receive credits for trees that would have remained had development occurred, nor can they receive soil carbon credits for

soil that would have been undisturbed had development occurred. Leakage is prevented by a deduction for displaced development in Protocol Section 11.4.

Baseline Project Activities are not "common practice," leaving aside financial or regulatory incentives. This project utilizes the activity penetration analysis demonstrating that, at a national scale, the measured level of urban and peri-urban forest conservation between 2001 to 2021 is 4.3%, which is less than the 5% maximum adoption capacity threshold set in the CFC Standard to demonstrate that an activity is not common practice. Support for this is found in the Registry's Activity Penetration Analysis of Urban Forest Conservation (Tree Preservation Protocol, Version 13, Appendix E)

Additionality is also reflected in the project financing. The revenue from the sale of carbon credits will play a material role in the successful and durable preservation of the Project Area's carbon stock by providing funding for stewardship and maintenance that ensure the forest's long-term health and resilience. TLC plans to use revenue from the Big Woods Forest project to help offset the cost of stewarding the property in perpetuity, and future public access improvements. Land management costs (invasive species management, trail maintenance, etc.) were not covered by any other funding source that supported the acquisition of the property. The project borders several residential communities, and the organization has a long-term vision to open a public nature preserve for passive recreation. This will require trail design, construction, capital improvements (signs, gates, etc.) as well as long-term maintenance.

The Big Woods Forest project acquisition timeline spanned just over a decade. The property was purchased in June 2023, through coordination of several funding sources and bargain sale negotiations. TLC has been researching different carbon crediting protocol options for several years. City Forest Credits was introduced to the organization in 2022 at a Land Trust Alliance conference and chosen for its manageable level of risk and profitability for smaller scale projects. Successful work with other land trusts throughout the Southeast supported CFC's reputability. When TLC expanded its capacity in May 2023, pursuing a project with CFC became a higher priority and the Big Woods Forest project was identified as a good match for the registry's preservation protocol.

Project Operator has signed an Attestation of Additionality.

Attachment: 10c BWF Attestation of Additionality

CARBON QUANTIFICATION DOCUMENTATION (Section 11)

Follow detailed instructions in the Protocol for conducting quantification and use the Carbon Quantification Calculator to show calculations. CFC will provide the Carbon Quantification Calculator and Forest Composition Report Template. Ensure that your requested credit issuance schedule (issuance dates) is accurate and complete in the calculator. Project Operators should describe and appropriately reflect in their carbon quantification any and all planned future activities that may affect the percent canopy or carbon stocking.

Summary numbers from Carbon Quantification Calculator

Project Area (acres)	**206.77**

Does carbon quantification use stratification (yes or no)	**yes**
Accounting Stock (tCO_2e)	**30,190**
On-site avoided biomass emissions (tCO_2e)	**15,844**
On-site avoided soil carbon emissions (tCO_2e)	**11,782**
Deduction for displaced biomass emissions (tCO_2e)	**2,899**
Deduction for displaced soil emissions (tCO_2e)	**3,570**
Credits from avoided biomass emissions (tCO_2e)	**12,944**
Credits from avoided soil emissions (tCO_2e)	**8,212**
Total credits from avoided biomass and soil emissions (tCO_2e)	**21,156**
Credits attributed to the project (tCO_2e), excluding future growth	**21,156**
Contribution to Registry Reversal Pool Account	**2,116**
Total credits to be issued to the Project Operator (tCO_2e) *(excluding future growth)*	**19,041**

GHG Assertion:
Project Operator asserts that the Project results in GHG emissions mitigation of 19,041 tons CO_2e issued to the project.

The total project area is 206.77 acres, which excludes a 0.2 acre floating parking lot area removed from stand 2. 31 tCO2e were removed from the Accounting Stock, 14 tCO2e were removed from the Avoided Biomass Emissions, and 12 tCO2e were removed from the Soil Carbon Emissions of the project to compensate for tree removal to take place in stand 2. Corresponding deductions were altered as well. See Carbon Quantification Spreadsheet for further details.

Approach to quantifying carbon

TLC hired a forestry team from Gelbert, Fullbright, and Randolph (GFR) to conduct an inventory on the Big Woods Forest project area. The team sampled 1/10th acre plots at 29 locations within the project area, measuring all tree stems 5-inches or greater at standard diameter at breast height (4.5 ft). Tree species, DBH, and crown condition were recorded at each plot, in addition to the overall canopy coverage. All sampling was performed to the standard outlined in version 13.40 of *CFC's Tree Preservation Protocol*. Carbon storage was then calculated using i-Tree Eco software (v6.0.35). These results, in combination with CFC's 11.B carbon quantification spreadsheet, were used to calculate the carbon biomass and forest composition derived values presented in Section 11.

Attachment: 11 BWF Carbon Quantification Spreadsheet, 12 BWF Carbon Biomass, 13 BWF Stand Map and Plot Location Map, 14 BWF iTree Eco Raw Data, 15 BWF iTree Eco Source File

Accounting Stock Measurement Method
Provide an overview to describe quantification methods, including which method was used to determine the accounting stock.

This project used the i-Tree Eco v6.0.35 algorithm to determine carbon stocking from a forest inventory performed by GFR. The sample inventory was designed with uniformly distributed 1/10th acre plots,

following section 11.1.B in the CFC Tree Preservation Protocol. The overall standard error of the inventory was 6%.

Attachment: 12 BWF Carbon Biomass

Plot Sampling Map and Raw Data
If sampling was utilized to estimate the carbon stock, include the map of plot sample locations and raw data collected.

A forest inventory with plot sampling was performed to estimate carbon stock. Both inventory design and raw sampling data are included as attachments.

Attachment: 13 BWF Stand Map and Plot Location Map
14 BWF iTree Eco Raw Data

Carbon Biomass Calculations
Include calculations used to determine the biomass in the Project Area. Attach i-Tree Eco file if i-Tree was used to calculate the carbon biomass.

Forest Carbon Biomass was determined for two different delineated forest stands within the forest area using *i-Tree Eco software v6.0.35* (source file attached). The following calculation was used:

Biomass [tC/ac] = (metric tons of carbon – standard error)/stand area

Stand 1 (Hardwood Dominant):
(4,821.19 tC – 433.89)/114.45 ac = **38.33 tC/ac**

Stand 2 (Pine Dominant):
(4,162.06 tC – 306.98)/92.33 ac = **41.75 tC/ac**

Taking a weighted average of the biomass in each stand (38.33 tC/ac * 114.45 ac + 41.75 tC/ac * 92.33 ac)/(114.45+92.33) yields an overall biomass value of **39.86 tC/ac.** Full calculations are available in the carbon quantification spreadsheet attachment.

Attachment: 15 BWF iTree Source File
12 BWF Carbon Biomass
11 BWF Carbon Quantification Spreadsheet

Stratification
If stratification is used, maps of strata and stratum definitions. If not used, list not applicable.

The project area was stratified into two different forestry stands based on dominant species and age class. Summary information is included below:

Stands	Acreage	Dominant Species	Biomass (tC)	Standard Error

Stand 1 (Hardwood)	114.45	Tulip tree, Red maple, Pignut hickory	4,821.19	+/-433.89 (9%)
Stand 2 (Pine)	92.33	Loblolly pine, Sweetgum, Tulip Tree	4,162.06	+/-306.98 (7%)

Attachment: 13 BWF Stand Map and Plot Location Map.pdf
12 BWF Carbon Biomass.pdf

Forest Composition
Summarize the forest composition and attach the Forest Composition Report.

In accordance with version 13.40 of *CFC's Tree Preservation Protocol*, a certified forester from Gelbert, Fullbright, and Randolph conducted an on-site inventory of the Big Woods Forest project area in July 2024. The sample design included 29 plots that captured tree data with an overall standard error of 5.9%. All trees with DBH values greater than 5-inches were measured at 4.5-feet from the ground with species name and crown condition recorded. The three most dominant species within the project area are *Pinus taeda* (loblolly pine – 37.2%), *Liriodendron tulipifera* (tulip tree – 12.2%), and *Acer rubrum* (red maple – 9.0%). The full composition report is included as an attachment.

Attachment: 16 BWF Forest Composition Report.pdf

Area Expected to Remain in Trees after Potential Development (11.2)
Describe the land use designation, any restrictions, and the method used to determine the area expected to remain in trees after potential development (fraction at risk of removal). If residential land use, follow 11.2.B. and provide the calculation showing which percentage of accounting stock at risk of removal is appropriate to include.

The Big Woods Forest project is located within two different county land use designations: R-1 residential zoning and R-5 residential zoning. These allow for development on lots up to 1 acre and 5 acres, respectively. It also falls within the WS-IV Protected Area of the county's watershed ordinance, requiring a 100-ft non-developable riparian buffer on all streams intersecting the property. The fraction of forest at risk for removal was calculated for both residential zones.

R-1 Residential Zone:
The minimum Lot size is smaller than 2.25 acres, therefore, an automatic **90% fraction at risk** is assigned to the 30.55 acres of forest within the R-1 residential zone of the project.

R-5 Residential Zone:
There are 176.22 acres of forest in this residential zone with a minimum lot size of 5 acres/unit. If this portion of the forest were to be developed, it would fit a maximum of 35 potential dwellings. Assuming 2 acres of each dwelling unit were cleared, plus an additional 10% of the total forested acreage, gives a total of 80.6 acres of forest cleared. This corresponds to approximately **45.75% of the forest at risk for removal** within the R-5 residential zone of the project.

Zoning	Acres	Allowed Number of Dwellings	Total Potentially Cleared Acres	Fraction at Risk of Tree Removal
Chatham R-1	30.55	30	N/A	90.00%
Chatham R-5	176.22	35	80.6	45.75%

Taking a weighted average of the area in both zones (90% of 30.55 acres + 45.75% of 176.22 acres) gives a total potentially cleared acreage of 108.12 acres or 52.29% of the total project area.

Attachment: 11 BWF Carbon Quantification Spreadsheet

Quantification of Soil Carbon - Existing Impervious Area and Impervious Limits (11.4)
The *Project may claim avoidance of emissions from soil carbon caused by conversion of soils to impervious surfaces. Describe applicable land use designation and development rules, any restrictions, existing impervious area and maximum fraction impervious cover.*

R-1 Residential Zone (31 acres of total project area):
The minimum lot size for development within this zone is 40,000 ft^2/unit. Minimum lot width is 100 ft, with a 40-ft front yard setback, 25-ft rear yard setback and 25-ft side yard setbacks. The total area of all required setbacks is 23,250 ft^2/unit. Based on these minimums, a total of **41.88%** of each lot can be converted to impervious surfaces based on the zoning code. There are no other specifications for impervious surface limits in this zone.

R-5 Residential Zone (176 acres of total project area):
The minimum lot size for development within this zone is 217,800 ft^2/unit. Minimum lot width is 100 ft, with a 40-ft front yard setback, 25-ft rear yard setback and 25-ft side yard setbacks. The total area of all required setbacks is 112,150 ft^2/unit. Based on these minimums, a total of **48.51%** of each lot can be converted to impervious surfaces based on the zoning code. There are no other specifications for impervious surface limits in this zone.

Zoning	Acres	Minimum Lot Size	Fraction at Risk of Impervious Surface
Chatham R-1	30.55	40,000 sf/unit	41.88%
Chatham R-5	176.22	217,800 sf/unit	48.51%

Taking a weighted average of the area in both zones (41.88% of 30.55 acres + 48.51% of 176.22 acres) gives a total potential impervious surface of 98.28 acres or 47.53% of the total project area.

Attachment: 11 BWF Carbon Quantification Spreadsheet

Future Planned Project Activities
Describe future activities that may affect the percent canopy or carbon stocking in any way. Describe maintenance and stewardship activities that could improve the carbon stock.

TLC has long term vision to open the Big Woods Forest project site as a public nature preserve. The organization has a stewardship team dedicated to maintaining its currently owned properties, including TLC's eight nature preserves. Stewardship activities on the project site may include invasive species

removal and prescribed burns, as well as trail design and ongoing maintenance. The organization has experience completing restoration projects, stream rehabilitation, and invasive species control projects as needed on its properties.

CO-BENEFITS QUANTIFICATION DOCUMENTATION (Section 11.5)

Summarize co-benefit quantification per year and provide supporting documentation. CFC will provide a Co-Benefits Quantification calculator for quantifying rainfall interception, reduction of certain air compounds, and energy savings.

Ecosystem Services	***Resource Units***	***Value***
Rainfall Interception (m3/yr)	55,742.6	$145,799.76
Air Quality (t/yr)	5.4697	$11,908.99
Cooling – Electricity (kWh/yr)	328,001	$24,895.24
Heating – Natural Gas (kBtu/yr)	131,215	$1,363.37
Grand Total ($/yr)		**$183,967.35**

Co-benefits were quantified using CFC's Co-Benefits Quantification Calculator for the Southeastern region of the United States. These ecosystem services represent values in avoided costs of $183,967.35 annually and $7,358,694.20 over 40 years.

Attachment: 17 BWF CoBenefit Calculator

Canopy Cover

An i-Tree Eco Forest Composition report was used to quantify project co-benefits and the total canopy cover is 90.5%. Of this 90.5% forested area (186.3 ac), 41.9% of species are coniferous and 58.1% of species are deciduous.

Attachment: 16 BWF Forest Composition Report

SOCIAL IMPACTS (Section 12)

Project Operators shall use the Carbon Project Social Impacts template to evaluate how their Project aligns with the UN Sustainable Development Goals (SDGs). CFC will provide the template. Summarize the three to five main SDGs attributed to this Project.

SDG 6: Clean Water and Sanitation

The Big Woods Forest project is located just 1.7 miles upstream of Jordan Lake, a drinking water reservoir for nearly 700,000 residents across the Research Triangle (Jordan Lake One Water). Jordan Lake has historically struggled with water quality, exceeding NC Department of Environmental Quality criteria for chlorophyll-a, nitrogen, and phosphorus total loads and management strategies as recently as 2022 (NC DEQ Integrated Report, 2022). This body of water is also classified as both nutrient sensitive and a critical area for the state. Forested land acts as a buffer for water resources, helping reduce some of the downstream impact of watershed nutrient loading. The project area also contains soil groups

prone to rapid surface runoff (Web Soil Survey) as well as steep slopes exceeding 18% grade. Both these characteristics give the project area potential for extreme storm runoff that contributes to streambank erosion and sedimentation when converted to other land uses. Keeping the project area forested ensures soil stability, helping to prevent these negative storm impacts and safeguard aquatic habitats. This is exceedingly important as storm frequency and intensity are predicted to increase in the Southeast as climate changes (IPCC).

SDG 15: Life on Land
The project will bolster local biodiversity by protecting over 1.4 miles of perennial streams on the property, including over 50 acres of buffer and wetland area. This is immensely important for protecting riverine life and fragile ecosystems in the region. Additionally, there are rare and diverse natural communities present within the project area, including 28 acres of Big Woods Rd Upland Forests and 105 acres of Bush Creek Marshes (NC Natural Heritage Program 2024). The project area is also directly adjacent to bird habitat distinguished as continentally important by the National Audubon Society. This habitat is home to the largest population of nesting Bald Eagles in North Carolina and one of only 2 nesting sites for Double-crested Cormorants. The Nature Conservancy includes the project area in its network of climate resilient and connected land, designating it as resilient to climate impacts and an important future migration corridor for species in the region.

SDG 3: Good Health and Wellbeing
As a future nature preserve, the Big Woods Forest project area will provide protection from UV exposure as well as help mitigate extreme summer temperatures typical of the Southeastern United States. The canopy coverage exceeds 90% on nearly all the property area. This has been demonstrated to both reduce UV exposure and extreme temperature. On a typical summer day in central North Carolina (June 3, 2023) the average surface temperature of the project area can be almost 30°F cooler than the average temperature of neighboring residential developments. This is particularly important for the health of vulnerable populations such as children and the elderly. The project is within a 15-minute driving distance of approximately 28,500 people, over 45% of which are over the age of 65 or under the age of 18 (ESRI). The census block containing the project also falls into the 99th percentile for large elderly populations in North Carolina (Social Vulnerability Index, 2022). With extreme temperatures only anticipated to increase in the Southeast, the Big Woods Forest project will offer a hub of safe recreation in the future for these vulnerable groups, in addition to the 2,500 residents living within walking distance of the project.

Attachment: 18 BWF Social Impacts Report

MONITORING AND REPORTING (Section 8)

Throughout the Project Duration, the Project Operator must report on tree conditions across the Project Area.

Monitoring Reports
Monitoring reports are due every three years determined by the date of the verification report. For example, if the verification report is dated January 1, 2023, the first report will be due by January 1, 2026 and every three years thereafter for the duration of the project. CFC will provide a list of dates to Project Operator after the first verification report is approved. Project Operators must submit reports in writing

and must attest to the accuracy of the reports. The reports must contain any changes in eligibility status of the Project Operator and any significant tree loss. The information includes updates to land ownership, changes to project design, changes in implementation or management and changes in tree or canopy loss. The reports must be accompanied by some form of telemetry or imaging that captures tree canopy, such as Google Earth, aerial imagery, or LiDAR. The reports must estimate any loss of stored carbon stock or soil disturbance in the Project Area.

Monitoring Plans

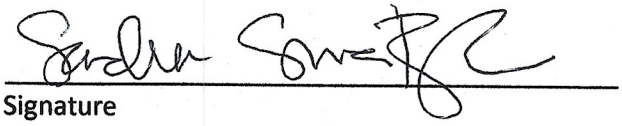
Describe your monitoring plans. If Project Operator plans to claim credits for future growth, describe methods that will be used to quantify future growth.

The entire Big Woods Forest Preserve will be encumbered by a conservation easement held by the North Carolina Land and Water Fund as demonstrated in Section 4. This easement restricts the harvest of timber and new development on the entire property, except for one 0.2-acre improvement area for a future parking lot. Triangle Land Conservancy is an accredited land trust with experience monitoring over 175 easements on more than 10,000 acres in the Research Triangle Region of North Carolina. Easements are monitored annually by the organization's stewardship team. They usually involve walking the property to ensure terms have not been violated (including no timber harvesting, new development within easement boundaries, dumping, etc.) Reports are generated after each monitoring visit to summarize findings and site conditions. Any supplementary monitoring information required by Section 8 of this protocol (ex: aerial imagery analysis) will be included every three years in addition to Triangle Land Conservancy's routine annual monitoring practices.

Any additional credits that can be registered in the future due to forest growth will be quantified using the same approach presented in Section 11 of this document. A new forest inventory will be conducted to gather DBH values from plot samples. This data will then be analyzed with i-Tree Eco software. TLC had not determined at the time of this document whether they will pursue the option of claiming credits for future growth.

PROJECT OPERATOR SIGNATURE

Signed on August 11, 2025, by Sandra Sweitzer, for the Triangle Land Conservancy.



Signature

Sandra Sweitzer

Printed Name

919-908-0051

Phone

ssweitzer@triangleland.org

Email

ATTACHMENTS

Update the attachments list as appropriate for your project.

Geospatial Location Map	1 BWF Project Area.zip
	1 BWF Parcel Boundary.zip
Regional Map	2 BWF Regional Location Map.pdf
Project Area Map	3 BWF Project Area Map.pdf
Proof of Land Ownership or Agreement to Transfer Credits	4 BWF Recorded Deed.pdf
Preservation Commitment	5 BWF Conservation Easement
Land Use Regulations	6a BWF Chatham Zoning Ordinance.pdf
	6b BWF Chatham Watershed Ordinance.pdf
Land Use/Zoning Map7a:	7a BWF Zoning Ordinance Map.pdf
	7b BWF Watershed Ordinance Map.pdf
Overlay Zones or Restrictions	8 BWF Wetland Restrictions Map.pdf
Threat of Loss Demonstration	9 BWF Threat of Loss Map.pdf
Attestation of No Double Counting and No Net Harm	10a BWF CFC Project Database Map.pdf
	10b BWF CFC Attestations.pdf
Attestation of Additionality	10c BWF Attestation of Additionality.pdf
Carbon Quantification Calculator	11 BWF Carbon Quantification Spreadsheet.xlsx
Plot Sampling Map (if relevant)	13 BWF Stand Map and Plot Location Map.pdf
Sampling Raw Data	15 BWF iTree Eco Source File.xlsx
Carbon Biomass calculations	12 BWF Carbon Biomass.pdf
i-Tree Eco file	14 BWF iTree Eco Raw Data.ieco
Forest Composition	16 BWF Forest Composition Report.pdf
Co-Benefit Quantification Calculator	17 BWF CoBenefit Calculator.xlsx
Social Impacts	18 BWF Social Impacts Report.docx

PROTOCOL REQUIREMENTS

Project Operator (Section 1.1)
Identify a Project Operator for the project. This is the entity or governmental body who takes responsibility for the project for the 40-year duration.

Project Duration and Project Implementation Agreement (Section 1.2, 2.2)
Project Operator must commit to a 40-year duration and sign a Project Implementation Agreement. This is a 40-year agreement between the Project Operator and City Forest Credits (the "Registry") for an urban forest carbon project.

Location Eligibility (Section 1.3)
Projects must be located in or along the boundary of at least one of the following criteria:

A. "Urban Area" per Census Bureau maps;
B. The boundary of any incorporated city or town created under the law of its state;
C. The boundary of any unincorporated city, town, or unincorporated urban area created or designated under the law of its state;
D. The boundary of any regional metropolitan planning agency or council established by legislative action or public charter. Examples include the Metropolitan Area Planning Council in Boston, the Chicago Municipal Planning Agency, the Capital Area Council of Governments (CAPCOG) in the Austin area, and the Southeastern Michigan Council of Governments (SEMCOG)
E. Within the boundary of land owned, designated, and used by a municipal or quasi-municipal entity for source water or watershed protection. Examples include Seattle City Light South Fork Tolt River Municipal Watershed (8,399 acres owned and managed by the City and closed to public access);

Ownership or Right to Receive Credits Eligibility (Section 1.5)
Project Operator must demonstrate ownership of property and eligibility to receive potential credits by meeting one of the following:

A. Own the land and potential credits upon which the Project trees are located; or

B. Own an easement or equivalent property interest for a public right of way within which Project trees are located and accept ownership of those Project trees by assuming responsibility for maintenance and liability for them; or

C. Have a written and signed agreement from the landowner, granting ownership to the Project Operator of any credits for carbon storage, other greenhouse gas benefits, and other co-benefits delivered by Project trees on that landowner's land. If the Project Area is on private property, the agreements in this sub-section must be recorded in the public records in the county where the property is located. The recordation requirement can be satisfied if the agreements specified in this sub-section are contained in a recorded easement, covenant, or deed restriction on the property.

Demonstrate Tree Preservation (Section 4.1)
The Project Operator must show that the trees in the Project Area are preserved from removal by a recorded easement, covenant, or deed restriction (referred to hereafter as "Recorded Encumbrance") with a term of at least 40 years. This action is referred to as the "Preservation Commitment." This

Recorded Encumbrance must be recorded not later than 12 months after Registry approval of the Project's Application.

Demonstrate Threat of Loss (Section 4.2, 4.3, and 4.4):
The Project Operator must show that prior to the Preservation Commitment:

- Project trees were not preserved from removal through a Recorded Encumbrance or other prohibitions on their removal,
- The Project Area was:
    - In a land use designation that allowed for at least one non-forest use. Non-forest uses include industrial, commercial, transportation, residential, agricultural, or resource other than forest, as well as non-forest park, recreation, or open space uses.
    - Is not in an overlay zone that prohibits all development. Examples include critical areas or wetland designations.
- The Project Area met one of the following conditions:
    - Surrounded on at least 30% of its perimeter by non-forest, developed or improved uses, or
    - Sold, conveyed, or had assessed value within three years of preservation for greater than $8,000 average price per acre for the bare land. When the assessed value is a percentage of the appraised value, as determined by the local assessing authority, then the appraised value is the value to be used for this determination; or
    - Would have a fair market value after conversion to a non-forested "highest and best use" greater than the fair market value after preservation in subsection 4.1, as stated in a "highest and best use" study from a state certified general real estate appraiser in good standing

Additionality (Section 6)
Additionality is ensured through the following:

- Prior to the Preservation Commitment, the trees in the Project Area were not protected via easement or recorded encumbrance or in a protected zoning status that preserves the trees.
- Prior to the Preservation Commitment, the zoning in the Project Area must currently allow for a non-forest use
- Prior to the Preservation Commitment, the trees in the Project Area passed one of the three tests to show a threat or risk of removal or conversion out of forest
- The Project Operator records in the public land records an easement, covenant, or deed restriction specifically protecting the trees for the project duration of 40 years or 100 years (40 or 100 years depending on the protocol version)

Quantification for Credits (Section 11)
The full Protocol describes the following steps for carbon stock and soil carbon quantification in detail:

1. Stored carbon stock present in Project Area (Section 11.1)
   Estimate the biomass stock present and adjust for uncertainty to calculate the "Accounting Stock". This can be done using the US Forest Service General Technical Report NE-343 tables, on-site inventory of some live trees with i-Tree methods and tools, or an on-site forest inventory

2. Areas expected to remain in trees after potential development (Section 11.2)

Calculate the fraction of the Accounting Stock that likely would be emitted as a result of development, to calculate "Avoided Biomass Emissions"

3. Quantification of soil carbon (Section 11.3)
   Calculate "Avoided Soil Carbon Emissions" caused by conversion of soils to impervious surfaces in the Project Area

4. Deduction for displaced development (Section 11.4)
   Apply the deductions in Section 11.5 and Appendix B to Biomass and Soil Carbon calculations to adjust for development and emissions that would be displaced by the preservation of the Project Area (leakage deductions). This will reduce the creditable tonnes of Avoided Biomass Emissions and Avoided Soil Carbon Emissions to adjust for displaced development

5. Quantify Co-Benefits (Section 11.5)
   The Project Operator will calculate co-benefits separately from CO_2(e). The Registry will supply a spreadsheet template based on their climate zone, and will provide values for rainfall interception, reductions of air compounds, and energy savings.

6. Claiming additional credit for growth (Section 11.6)
   The Project Operator may elect to also account for ongoing growth of trees within the Project Area after Project Commencement

Social Impacts (Section 12)
The Project Operator will describe how the Project impacts contribute towards achievement of the global UN Sustainable Development Goals (SDGs). The Registry will supply a template to evaluate how the Project aligns with the SDGs.

Attestation of No Net Harm and No Double Counting (Section 5)
The Project Operator will sign an attestation that no project shall cause net harm and no project shall seek credits on trees, properties, or projects that have already received credits.

Validation and Verification by Third-Party Verifiers (Section 13)
Project compliance and quantification must be verified by a third-party Validation and Verification Body approved by the Registry.

Issuance of Credits to Project Operator (Section 7)
Ex-post credits are issued after the biomass is protected via a recorded encumbrance protecting the trees. Issuance is phased or staged over one and five years at the equivalent of 50 aces of crediting per year. This staged issuance reflects the likely staging of development over time if the Project Area were to have been developed.

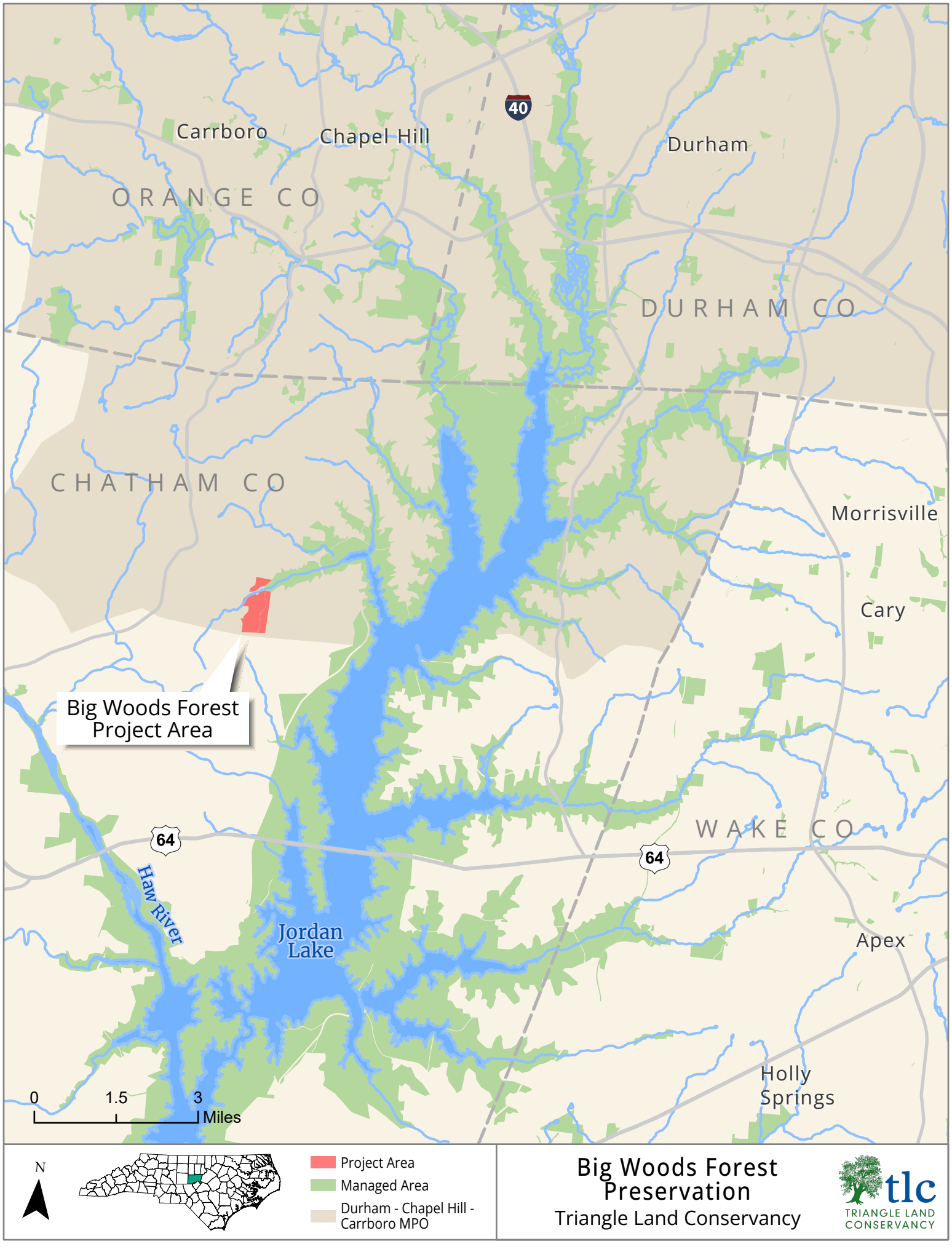
After validation and verification, the Registry issues credits to the Project Operator based on the Project Area size:

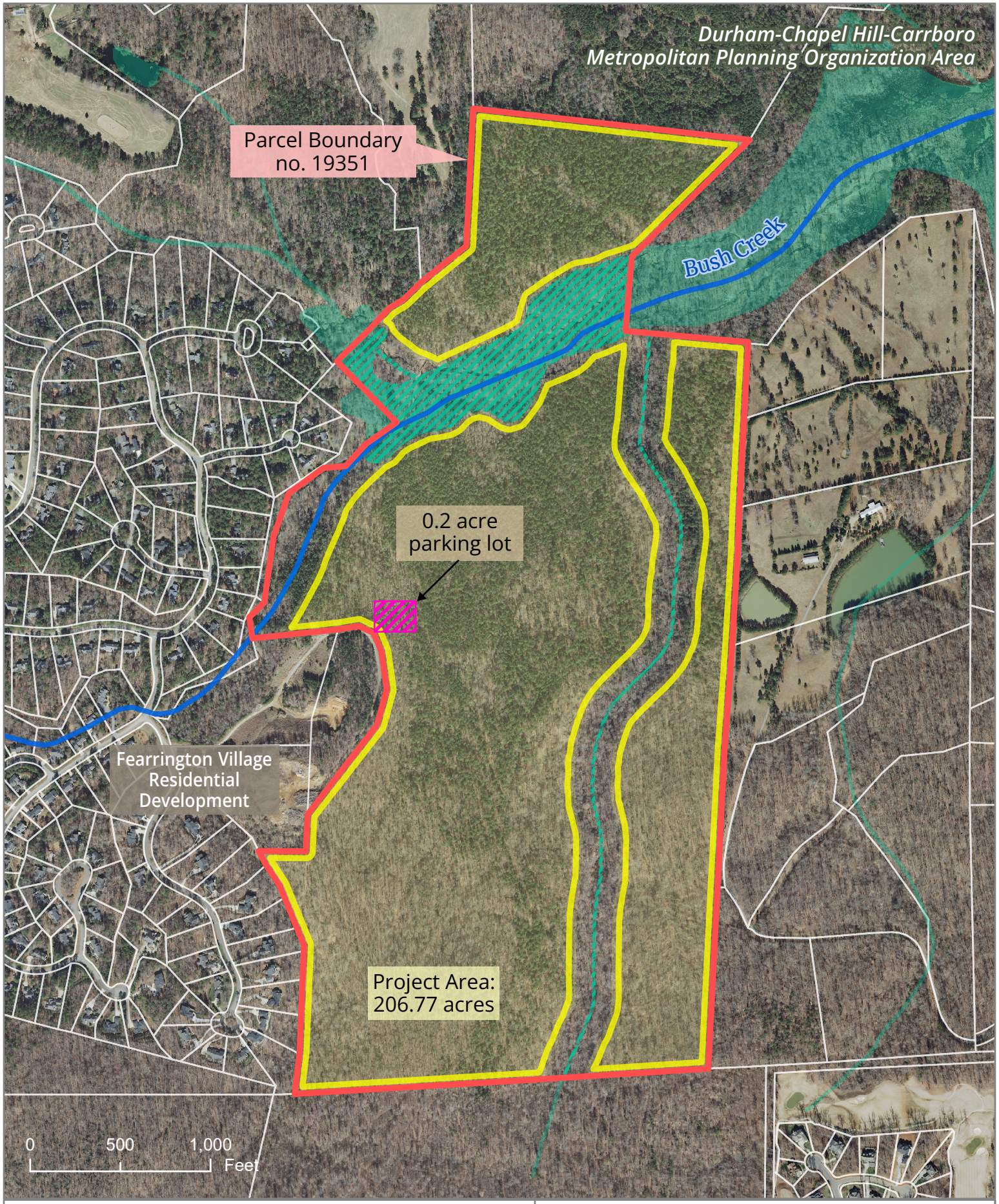
- 50 acres or less: all credits are issued after validation and verification
- Greater than 50 but less than 200 acres: credits are issued in the equivalent of 50 acres per year
- Greater than 200 acres: credits are issued in equal amounts over five years

Credits for Reversal Pool Account (Section 7.3):
The Registry will issue 90% of Project credits earned and requested and will hold 10% in the Registry's Reversal Pool Account.

Understand Reversals (Section 9)
If the Project Area loses credited carbon stock, the Project Operator must return or compensate for those credits if the tree loss is due to intentional acts or gross negligence of Project Operator. If tree loss is due to fire, pests, or other acts of god (i.e., not due to the Project Operator's intentional acts or gross negligence), the Registry covers the reversed credits from its Reversal Pool Account of credits held back from all projects.

Monitoring and Reporting (Section 8)
The Project Operator must submit a report every three years for the project duration. The reports must be accompanied by some form of telemetry or imaging that captures tree canopy, such as Google Earth, aerial imagery, or LiDAR. The reports must estimate any loss of stored carbon stock or soil disturbance in the Project Area.


Carrboro
Chapel Hill
40
Durham
ORANGE CO
DURHAM CO
CHATHAM CO
Morrisville
Cary
Big Woods Forest
Project Area
64
64
WAKE CO
Haw River
Jordan
Lake
Apex
Holly
Springs
0
1.5
3
Miles
N
Project Area
Managed Area
Durham - Chapel Hill -
Carrboro MPO
Big Woods Forest
Preservation
Triangle Land Conservancy
tlc
TRIANGLE LAND
CONSERVANCY



Big Woods Forest Preservation

Triangle Land Conservancy

tlc
TRIANGLE LAND CONSERVANCY

FILED ELECTRONICALLY
CHATHAM COUNTY NC
LUNDAY A. RIGGSBEE
REGISTER OF DEEDS

FILED Jun 30, 2023
AT 02:51:23 PM
BOOK 02370
START PAGE 0118
END PAGE 0122
INSTRUMENT # 05783
EXCISE TAX $6,500.00

NORTH CAROLINA GENERAL WARRANTY DEED

Excise Tax: $6,500.00

Parcel Identifier: __ Verified by _____ County on the ____ day of_____, 20_____
By:_____

Mail/Box to: Grantee

This instrument was prepared by: Thomas R. Holt, Attorney at Law

Brief description for the Index: 247.68 acre Tract 2, Plat Slide 2023-174-175

THIS DEED made effective as of the 29 day of June, 2023, by and between

GRANTOR	GRANTEE
FITCH CREATIONS, INC., a North Carolina corporation	TRIANGLE LAND CONSERVANCY, a North Carolina non-profit corporation
2000 Fearrington Village Center Pittsboro, NC 27312	520 South Duke Street Durham, NC 27701

Enter in appropriate block for each Grantor and Grantee: name, mailing address, and, if appropriate, character of entity, e.g. corporation or partnership.

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH, that the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell, and convey unto the Grantee in fee simple, all that certain lot, parcel of land, or condominium unit situated in Chatham County, North Carolina, and more particularly described as follows:

See Exhibit A attached and incorporated herein by reference.

The property hereinabove described was acquired by Grantor by instrument recorded in Book 536, Page 735, Book 595, Page 502, and in Book 1132, Page 878.

All or a portion of the property herein conveyed does not include the primary residence of a Grantor.

A map showing the above-described property is recorded in Plat Slide 2023, Pages 174 & 175.

TO HAVE AND TO HOLD the aforesaid lot or parcel of land and all privileges and appurtenances thereto belonging to the Grantee in fee simple.

And the Grantor covenants with the Grantee, that Grantor is seized of the premises in fee simple, has the right to convey the same in fee simple, that title is marketable and free and clear of all encumbrances, and that Grantor will warrant and defend the title against the lawful claims of all persons whomsoever, other than the following exceptions:

Ad valorem taxes for the current year, and those Permitted Exceptions shown on Exhibit B hereto.

IN WITNESS WHEREOF, the Grantor has duly executed the foregoing as of the day and year first above written.

FITCH CREATIONS, INC.,
a North Carolina corporation

By: _____
Roy B. Fitch, Jr., President

STATE OF NORTH CAROLINA

ORANGE COUNTY

I, a Notary Public, certify that the following person personally appeared before me this day acknowledging to me that he/she signed the foregoing document:

Roy B. Fitch, Jr., President of Fitch Creations, Inc.

Date: June 29, 2023

(Affix Official Seal below)

Jalisa McMillan
NOTARY
MY COMMISSION EXPIRES 11/1/2027
PUBLIC
CHATHAM COUNTY, N.C.

Jalisa McMillan
Official Signature of Notary Public

Print Name: Jalisa McMillan

My commission expires: 11/01/2027

EXHIBIT A

BEING all of the parcel designated as Tract 2 containing 247.68 acres as shown on the plat entitled "Property of / Boundary Survey – Recombination – Conservation Easement / Triangle Land Conservancy and Fitch Creations Inc." by Benjamin L. Bryan, PLS of Ben L. Bryan, P.A., dated February 2, 2023, last revised June 20, 2023, and recorded in Plat Slide 2023 – 174-175, Chatham County Registry;

TOGETHER WITH the access easement established in that certain Declaration of Access Easement recorded in Book 2370, Page 75, Chatham County Registry.

EXHIBIT B

(Permitted Exceptions)

1. Taxes for the year 2023, and subsequent years, not yet due and payable.

2. Matters shown on recorded Plat Slide 2023 at 174 and 175.

3. Declaration of Access Easement recorded in Book 2370, Page 75, Chatham County Registry.

4. Matters shown on recorded Plat Slide 97-170 (access easement and Phase 2 Tract) and Plat Slide 2008-170 (access easement only); Plat Slide 89-9 (Phase 1 Tract); Plat Slide 94-40 (Phase 1 Tract, Phase 2 Tract and access easement): Plat Slide 2004-301 (Phase 1 and Phase 2 Tracts).

5. Easement (s) to Carolina Power & Light Company recorded in Book 979 at Page 454. (Phase 1 Tract and access easement)

6. Easement(s) to Progress Energy Carolinas, Inc. recorded in Book 1110 at Page 453. (Please 1 Tract and access easement)

7. Easement(s) to Public Service Company of North Carolina, Incorporated recorded in Book 1186 at Page 833; Book 1233 at Page 879; Book 1425, Page 732; Book 1432, Page 333; Book 1718, Page 909. (Phase 1 & Phase 2 Tracts and access easement)

8. Easement(s) to Duke Progress Energy, LLC recorded in Book 1939 at Page 1089. (Phase 1 & Phase 2 Tracts and access easement)

9. Rights of others for ingress and egress purposes in and to the use of easement for ingress, egress and regress over 50' access easement located on the Land. (Phase 1 & Phase 2 Tracts)

10. Easement(s) to Carolina Power & Light Company recorded in Book JS at Page 95 and Book KU at Page 249. (Phase 1 & Phase 2 and access easement tracts)

11. Easement(s) to University of North Carolina recorded in Book 246 at Page 44. (Phase 1 & Phase 2 and access easement tracts)

12. Rights of otherers thereto entitled in and to the continued uninterrupted flow of Bush Creek and the branch, located on the Land.

13. Rights of others thereto entitled in and to the continued uninterrupted flow of branch and stream, located on the Land.

14. Rights of others for ingress and egress purposes in and to the use of old road located on the Land as shown on Plat Slide 2004-301. (Phase 1 Tract)

15. Rights of others for ingress and egress purposes in and to the use of access easement recorded in Book 2370, Page 75 located on the Land.
16. The effect on the Title of an encumbrance, violation, variation, adverse circumstance, boundary line overlap, or encroachment (including an encroachment of an improvement across the boundary lines of the Land), but only if the encumbrance, violation, variation, adverse circumstance, boundary line overlap, or encroachment would have been disclosed by an accurate and complete land title survey of

the Land.

FILED ELECTRONICALLY
CHATHAM COUNTY NC
LUNDAY A. RIGGSBEE
REGISTER OF DEEDS

FILED	Jul 25, 2025
AT	09:09:41 AM
BOOK	02478
START PAGE	0904
END PAGE	0922
INSTRUMENT #	06416
EXCISE TAX	$0.00

CONSERVATION EASEMENT
Triangle Land Conservancy Fitch Tract Property

Prepared by: Kennon Craver, PLLC, Triangle Land Conservancy, and North Carolina Land and Water Fund

After Recording Return to: PO Box 1848, Durham NC 27702

NORTH CAROLINA
Tax Parcel No. 19351

CHATHAM COUNTY
NCLWF Nos. 2021-047 and 2022-097

THIS DEED OF CONSERVATION EASEMENT ("**Conservation Easement**") is made, given, granted, and executed on this the 24 day of July, 2025, by and between TRIANGLE LAND CONSERVANCY, a nonprofit corporation organized and existing under the laws of the State of North Carolina ("**Grantor**"), its address being: PO Box 1848, Durham NC, 27702, and the STATE OF NORTH CAROLINA ("**Grantee**" or "**State**"), its address being: Attn: NCLWF Real Property Agent, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321, acting by and through NORTH CAROLINA LAND AND WATER FUND a.k.a. North Carolina Clean Water Management Trust Fund, a division of the North Carolina Department of Natural and Cultural Resources ("**Fund**"), its address being: Attn: Stewardship, North Carolina Land and Water Fund, 1651 Mail Service Center, Raleigh, North Carolina 27699-1651. Grantor and Grantee may hereinafter be referred to individually as a "**Party**" or collectively as the "**Parties**."

RECITALS

A. Grantor owns in fee simple absolute certain real property lying and being in Williams Township, Chatham County, North Carolina, which consists of 247.68 acres, and which is more particularly described in "**Exhibit A**" which is attached hereto and incorporated herein by reference as if fully set forth herein (the "**Property**").

B. Grantor is a nonprofit organization whose primary purpose is the conservation, preservation, or restoration of North Carolina's cultural, historical, environmental, or natural resources.

C. The State has enacted the Conservation and Historic Preservation Agreements Act (the "**Act**"), Chapter 121, Article 4 of the North Carolina General Statutes ("**N.C.G.S.**"), which provides for the enforceability of restrictions, easements, covenants, and conditions "appropriate to retaining land or water areas predominantly in their natural, scenic or open condition . . . ."

D. The North Carolina Land and Water Fund a.k.a. North Carolina Clean Water Management Trust Fund is authorized by N.C.G.S. Chapter 143B, Article 2, Part 41 to acquire land and interests in land on behalf of the State:

- for riparian buffers for the purposes of providing environmental protection for surface waters and urban drinking water supplies and establishing a network of riparian greenways for environmental, educational, and recreational uses,

- for the purpose of protecting and conserving surface waters and enhancing drinking water supplies, including the development of water supply reservoirs,

- to provide buffers around military bases to protect the military mission,

- that represent the ecological diversity of North Carolina, including natural features such as riverine, montane, coastal, and geologic systems and other natural areas to ensure their preservation and conservation for recreational, scientific, educational, cultural, and aesthetic purposes, and

- that contribute to the development of a balanced State program of historic properties.

E. Grantor and Grantee have agreed that the entire Property shall be subject to this Conservation Easement. As aforementioned, the Property is more particularly described in **Exhibit A**.

The Property has the following conservation values and serves the following conservation purposes:

- to preserve, enhance, restore, and maintain the natural features and resources of the riparian buffer, to control runoff of sediment, and to improve and maintain the water quality, of portions of Bush Creek and its tributaries,

- to preserve and maintain the natural features and resources of the riparian buffer, and to provide environmental, educational, and recreational uses, including riparian greenway along portions of Bush Creek and its tributaries, and

- to protect and preserve the ecological diversity including natural features such as Bush Creek and several tributaries of Bush Creek, approximately 22 acres of the Bush Creek Marshes Natural Heritage Area, over 100 acres of the Big Woods Forest Natural Heritage Area, approximately 17 acres of wetlands, a mature upland hardwood forest, and a mature mixed pine forest, all for recreational, scientific, educational, cultural, and aesthetic purposes.

Moreover, Grantor and Grantee recognize that the Property has other conservation values and purposes, including fish and wildlife conservation, open space values, scenic values, and archaeological values (hereinafter, collectively with the conservation values described in this **Section E** of the Recitals and the conservation purposes of this Conservation Easement, the "**Conservation Values**").

F. Grantor has received or will receive grants from Fund in accordance with Grant Contract No. 2021-047 and 2022-097 between Grantor and Fund dated July 11, 2022 and November 20, 2023, respectively (the "**Grant Contracts**"). In the Grant Contracts, Grantor agreed to enter into this Conservation Easement. The Grant Contracts are on file and available for public inspection in the offices of Grantor and Fund. The Grant Contracts and this Conservation Easement are collectively referred to herein as the "**Project.**"

G. Town of Cary ("**Town**") is also providing funding to the Grantor for the acquisition of the Property for the purpose of protecting the water quality of Bush Creek, which is a tributary of Jordan Lake, the Town's source of drinking water.

H. Grantor and Grantee acknowledge that the Property is currently unencumbered except as permitted in **Article V** of this Conservation Easement. The Property's characteristics, its current use, and its state of improvement are described in a Baseline Documentation Report (the "**BDR**"), which was required under the Grant Contracts and is on file and available for public inspection in the offices of Grantor and Fund. The Parties acknowledge that the BDR is the appropriate basis for monitoring compliance with the objectives of preserving the Conservation Values and that it is not intended to preclude the use of other evidence (e.g. surveys, appraisals) to establish the condition of the Property at the time of the execution of this Conservation Easement if there is a controversy over such condition.

NOW, THEREFORE, in consideration of the premises and the mutual benefits recited herein, together with other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by the Parties, Grantor hereby unconditionally and irrevocably gives, grants, and conveys forever and in perpetuity to Grantee, its successors and assigns, and Grantee hereby accepts, this Conservation Easement of the nature and character and to the extent hereinafter set forth in, on, over, under, through, above, and across the Property, together with the right and easement to preserve and protect the Conservation Values.

The purpose of this Conservation Easement is to protect and preserve the Conservation Values as outlined above in **Section E** of the Recitals including the conservation purposes and it

shall be so held, maintained, and used therefor. Grantor hereby conveys to Grantee all development rights that are now or hereafter allocated to, or are implied or inherent in, the Property, and the Parties agree that such rights are terminated and extinguished, and may not be used on or transmitted to any other property. It is the further purpose of this Conservation Easement to prevent any use of the Property that will impair or interfere with the preservation of the Conservation Values. Grantor intends that this Conservation Easement will restrict the use of the Property to such activities as are consistent with the Conservation Values.

FURTHER, for the purpose of providing uninterrupted access to the Property, Grantor grants and conveys unto Grantee, its successors and assigns, a perpetual vehicular and pedestrian right of ingress, egress, and regress to and from the Property (1) in that certain 50-foot wide right-of-way described in the easement recorded in Book 2730, Page 75, Chatham County Register of Deeds or shown on the Plat identified in **Exhibit A** as providing access to the Property from Woodham S.R. 1838, (2) in any other right-of-way appurtenant to the Property, and (3) across any other lands owned by Grantor.

ARTICLE I. DURATION OF EASEMENT

This Conservation Easement shall be perpetual. It is an easement in gross, runs with the land, and is enforceable by Grantee, its successors and assigns, against Grantor, its representatives, successors, assigns, lessees, agents, and licensees.

ARTICLE II. RIGHTS RESERVED TO GRANTOR

Grantor reserves the right accruing from the fee simple ownership of the Property to engage in or permit others to engage in the uses of the Property that are not inconsistent with this Conservation Easement or the Conservation Values. All rights reserved by Grantor are reserved for Grantor and its successors and assigns. The specific reserved rights listed below in this **Article II** are considered to be consistent with this Conservation Easement and the Conservation Values. Grantor shall continue to own and may use the Property in any lawful manner that is consistent with this Conservation Easement and the Conservation Values. The Parties acknowledge and agree that they have no right to agree to any activity that would result in the termination of this Conservation Easement.

The Property shall be restricted from any development or usage that would impair or interfere with the Conservation Values including the purposes of this Conservation Easement. The following uses are reserved as indicated:

A. Access and Use. Grantor reserves the right to allow access and use of the Property for the purposes of the activities permitted herein. Grantor reserves the right to generate income from individuals and groups related to the activities permitted under the rights reserved herein, so long as the activities are not detrimental to the Conservation Values.

B. Passive Recreational Use. Grantor reserves the right to engage in and to permit others to engage in passive recreational uses of the Property that do not require surface alteration of the land and pose no threat to the Conservation Values. By way of illustration, such passive recreational uses may include hiking, walking, scientific study, animal/plant observation, nature and environmental education, historic tours, photography, so long as such uses are consistent with the maintenance of the Conservation Values, and such uses are subject to all applicable federal, state, and local laws and regulations.

C. Existing Roads and Trails. Grantor reserves the right to maintain existing unpaved roads and trails on the Property. These roads and trails shall not be paved without prior written approval of Fund. The existing roads and trails may be stabilized with gravel and permanent vegetation. Associated ditches, culverts, stream crossings, and bridges may be maintained and replaced as necessary as maintenance of the road or trail. All necessary care shall be taken to maintain existing roads and trails in a manner so as not to impair any Conservation Values. Existing roads and trails shall not be realigned without the prior written approval of Fund.

D. Parking Area. Grantor reserves the right to construct and maintain a parking area for up to fifteen (15) cars in the location labeled on the Plat in Exhibit A as "Area Reserved For Parking". Grantor must receive written approval from Fund prior to the construction, paving, or realignment of the parking area. All necessary care shall be taken to construct and maintain the parking area in a manner so as not to impair any Conservation Values either during or after construction.

E. Motorized Vehicles. Grantor reserves the right to use motorized vehicles on allowed roads and trails for management, maintenance, or stewardship purposes. Grantor further reserves the right to allow motorized vehicles on existing roads and parking area for the purpose of public access.

F. New Natural Surface Trails. Grantor reserves the right to construct and maintain new natural surface trails for the purpose of hiking. All natural surface trails must be located a minimum distance of fifty (50) feet from the top of the bank of all surface water, unless such locations are physically impracticable, and must be located so as not to impair the Conservation Values. Natural surface trails may include stream crossings, provided they are permitted by all applicable regulatory authorities. When required by the terrain, public use natural surface trails may include boardwalks, ramps, and handrails to the extent necessary. All natural surface trail construction involving soil disturbance must follow best practices for sustainable trail design and construction and must have prior written approval by Fund. All necessary care shall be taken to construct and maintain natural surface trails in a manner so as not to impair any Conservation Values either during or after construction. Fund shall have the authority to require the closure of any natural surface trail that is detrimental to any Conservation Values. All realignments of natural surface trails are subject to the requirements of this Paragraph.

G. New Paved Trails. Grantor reserves the right to construct and maintain new paved trails for the purpose of non-motorized recreation. All paved trails must be located a minimum distance of fifty (50) feet from the top of the bank of all surface water, unless such locations are physically impracticable, and must be located so as not to impair the Conservation Values. Paved trails may include stream crossings, provided they are permitted by all applicable regulatory authorities. When required by the terrain, paved trails may include boardwalks, ramps, and handrails to the extent necessary. All paved trail construction involving soil disturbance must follow best practices for sustainable trail design and construction and must have prior written approval by Fund. All necessary care shall be taken to construct and maintain paved trails in a manner so as not to impair any Conservation Values either during or after construction. Fund shall have the authority to require the closure of any paved trail that is detrimental to any Conservation Values. All realignments of paved trails are subject to the requirements of this Paragraph.

H. Trail and Recreational Accessories. Grantor reserves the right to construct and maintain park benches, litter receptacles, and directional, educational, and informational signs along existing trails and approved new natural surface and paved trails. All necessary care shall be taken to construct and maintain trail and recreational accessories in a manner so as not to impair any Conservation Values either during or after construction. Fund shall have the authority to require the removal of any trail or recreational accessory that is detrimental to any Conservation Values.

I. Vegetation Management. Grantor reserves the right to manage vegetation for boundary marking, fencing, signage, fire containment, disease control, insect control, invasive exotic plant control, and removal of conditions that threaten life or property. Methods of vegetation management may include, but are not limited to, selective cutting, prescribed burning, and application of herbicides or pesticides.

J. Native Community Restoration, Management, and Maintenance. Grantor reserves the right to perform all activities necessary to restore, manage, or maintain the native plant and animal communities on the Property, provided, however, that the conversion of one habitat type to a native habitat type requires prior written approval of Fund. All necessary care shall be taken to protect all Conservation Values, and restoration, management, and maintenance activities shall be carried out in a manner so as not to impair any Conservation Values either during or after the activities.

K. Stream/Wetland Restoration. Grantor reserves the right to perform all activities necessary to restore and stabilize streams and wetlands to enhance water quality on the Property. Such activities shall be based upon prevailing design and permitting standards. Restoration and stabilization activities shall be based on a design using as many natural materials as possible, shall require prior written approval of Fund, and shall be subject to all applicable regulatory authorities.

L. Hunting and Fishing. Grantor reserves the rights to recreational hunting and recreational fishing and to permit others to hunt and fish on the Property in compliance with all

federal, state, and local rules and regulations. Grantor may lease or license the Property for recreational hunting and fishing in accordance with **Article VI, Paragraph B**, but such leases and licenses are exempt from the 60-day notification requirement. Recreational hunting and fishing leases and licenses shall be in writing and shall reference this Conservation Easement and shall require tenants and licensees to abide by its terms.

M. Signs. Grantor reserves the right to post the following signs: no trespassing signs, local, state, or federal traffic or similar information signs, for sale or lease signs, signs identifying the Conservation Values of the Easement, signs identifying Grantor as owner of the Property, signs identifying the funders or the holders of Conservation Easements, educational signs, directional signs, and interpretative signs.

ARTICLE III. PROHIBITED AND RESTRICTED ACTIVITIES

Any activity on, or use of, the Property that is inconsistent with this Conservation Easement or the Conservation Values is prohibited. The Property shall be maintained in its natural, scenic, wooded, and open condition and restricted from any development or use that would impair or interfere with this Conservation Easement or the Conservation Values.

Without limiting the generality of the immediately foregoing Paragraph, the following activities and uses are expressly prohibited or restricted on the Property as stated, except to the extent of rights specifically reserved to Grantor in **Article II**. When an activity or use is prohibited or restricted in, within, on, or of the Property, the activity or use is prohibited or restricted in, on, over, under, through, above, and across the Property.

A. Industrial and Commercial Use. Industrial and commercial activities and any rights of passage for such purposes are prohibited on the Property.

B. Agricultural, Grazing and Horticultural Use. Agriculture, grazing, horticultural, and animal husbandry operations and any rights of passage for such purposes are prohibited on the Property.

C. Disturbance of Natural Features, Plants, and Animals. There shall be no cutting or removal of trees and no disturbance of other natural features on the Property.

D. Construction of Structures or Improvements. There shall be no constructing or placing of any temporary or permanent structure, improvement, building, fixture, mobile home, asphalt, concrete, or other pavement, billboard or other advertising display, antenna, utility pole, tower, conduit, line, or facility on the Property.

E. Motorized Vehicles. Use of motorized vehicles on the Property is prohibited.

F. Signs. Signs are not permitted on the Property.

G. Mineral Use, Excavation, Dredging. There shall be no filling, excavation, dredging, mining, or drilling on the Property. There shall be no removal of topsoil, sand, gravel, rock, peat, minerals, hydrocarbons, or other materials from the Property. There shall be no change in the topography of the Property in any manner.

H. Wetlands and Water Quality. There shall be no pollution or alteration of surface waters on the Property. There shall be no construction or other activities that would be detrimental to water quality or that would alter the natural water levels, drainage, sedimentation, or water flow in, on, or over the Property or into any surface waters. There shall be no construction or other activities that would cause soil degradation or erosion. There shall be no diking, dredging, alteration, draining, filling, or removal of wetlands.

I. Dumping. Dumping of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or other materials on the Property is prohibited.

J. Conveyance and Subdivision. The Property shall not be divided, subdivided, or partitioned. No property interest in the Property, including, but not limited to the fee simple interest, shall be divided, subdivided, or partitioned. Without limiting the foregoing, the Property shall not be conveyed except in its current configuration as a single parcel of property.

K. Open Space and Development Rights. The Property shall not be used to satisfy open space or density requirements of any cluster or other development scheme or plan. The development rights encumbered by this Conservation Easement shall not be transferred to any other land pursuant to a transfer of development rights scheme, a cluster development arrangement, or otherwise.

L. Mitigation. There shall be no use of the Property or any portion thereof to satisfy compensatory mitigation requirements under 33 USC Section 1344, N.C.G.S. §143-214.11 or any successor or replacement provision of the foregoing.

M. Destruction of Archaeological Resources Prohibited. Notwithstanding anything to the contrary stated herein, Grantor agrees to manage the Property in such a way as to protect the archaeological integrity of the Property and to not disturb, demolish, destroy, or otherwise deface or alter any known archaeological features on the Property without prior written approval of Fund. In the event that an archaeological feature is uncovered during the course of any improvements on the Property or through a natural event such as but not limited to flood or erosion, Grantor shall notify Fund immediately and shall assist with any requested actions by Grantee to document and protect the feature.

ARTICLE IV. ENFORCEMENT AND REMEDIES

A. Enforcement and Remedies. Grantee has the right to prevent and stop any

violation of this Conservation Easement, including, but not limited to, preventing and stopping any activity on or use of the Property that is inconsistent with this Conservation Easement or its purposes, and to require the prompt restoration to the condition required by this Conservation Easement of such areas or features of the Property that may have been damaged by such violation, activity, or use. Upon any breach of the terms of this Conservation Easement by Grantor that comes to the attention of Grantee, Grantee, may notify Grantor in writing of such breach. Grantor shall have ninety (90) days after receipt of such notice to correct the conditions constituting such breach. If the breach remains uncured after ninety (90) days, Grantee may enforce this Conservation Easement by legal proceedings for damages, injunctive relief, and any other legal or equitable remedy. Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Property by acts which may be unlawful or in violation of this Conservation Easement, (b) to otherwise preserve or protect its interest in the Property, and (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, Grantee has the immediate right, without notice, to obtain a temporary restraining order, injunction, or other appropriate relief if a breach or threatened breach of the terms of this Conservation Easement is or would irreversibly or materially impair the benefits to be derived from this Conservation Easement. Grantor and Grantee acknowledge that under such circumstances damage to Grantee would be irreparable and remedies at law will be inadequate. The rights and remedies of Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement, including, without limitation, those set forth in the Grant Contracts under which this Conservation Easement was obtained.

B. Access for Inspection and Right of Entry. Grantee shall have the right, by and through its agents and employees, to enter the Property to inspect the Property for compliance with this Conservation Easement at all reasonable times and with prior notice and, if necessary, cross other lands owned by Grantor for the purposes of (1) inspecting the Property to determine if Grantor is complying with this Conservation Easement and its purposes, (2) enforcing the terms of this Conservation Easement, (3) taking any and all actions with respect to the Property as may be necessary or appropriate with or without order of the Court, to remedy or abate violations hereof, and (4) making scientific and educational observations and studies and taking samples in such a manner as will not disturb the quiet enjoyment of the Property by Grantor.

C. Termination and Proceeds of Property Rights Created. This Conservation Easement gives rise to a property right that is immediately vested in Grantee at the time of recordation, with a fair market value that is at least equal to the proportionate value that the Conservation Easement bears to the full value of the whole Property, as if unencumbered by the Conservation Easement, on the date of the recording of this Conservation Easement. This proportionate value shall remain constant. For the purposes of determining any distribution of proceeds pursuant to this Paragraph, Grantor's proportionate contribution to the purchase price shall be deemed to be 50%, and Grantee's proportionate contribution to the purchase price shall be deemed to be 50%. "**Proceeds of Sale**" shall include, but not be limited to, the cash value of all money and property paid, transferred, or contributed in consideration for, or as otherwise required as a condition to, the taking of, sale of, exchange of, involuntary conversion of, or

severance damages to the Property or part thereof, and any money, damages, or just compensation otherwise awarded as a result of judicial proceedings. If any Proceeds of Sale are due, payable, or otherwise obligated to the United States government or any department or agency thereof related to funding provided to Grantor, then any such obligation shall be paid or satisfied solely from Grantor's portion of the Proceeds of Sale.

1. Eminent Domain. The Conservation Easement may only be extinguished due to Eminent Domain, in whole or in part, by judicial proceeding. Whenever all or part of the Property is taken by eminent domain, threatened to be taken by an entity with the power of eminent domain, or acquired, or sought to be acquired, by negotiated sale in lieu of condemnation, whether by public, corporate, or other authority, Grantor shall immediately give notice to Grantee and Fund, and shall take all appropriate actions related to such taking or negotiated sale in coordination with and with the prior written approval of Grantee and Fund, to recover the full fair market value (without regard to any diminution in value attributable to the Conservation Easement) of the taking or acquisition and all incidental, direct, and severance damages resulting from the taking or acquisition. Grantee, its successors and assigns, shall be entitled to its proportionate share of the Proceeds of Sale according to Grantee's proportional interest in the value of the Property as determined under Treasury Regulations §1.170A-14(g)(6)(ii) or any successor regulation. As such designation is allowed by N.C.G.S. §146-30(a), Grantee shall use its share of the Proceeds of Sale in a manner consistent with the purpose(s) of the Conservation Easement as set forth herein. Notwithstanding the foregoing, all Proceeds of Sale shall be distributed among the Parties according to each Party's respective contribution to the purchase price of the Property and this Conservation Easement as specified above. Nothing herein limits Grantee's right to be included as a named party in any eminent domain action or its right to just compensation for the taking of its property interest.

2. Changed Conditions. If a subsequent, unexpected change in conditions surrounding the Property makes impossible or impractical the continued use of the Property or any part thereof for the purposes of this Conservation Easement as set forth herein, the Conservation Easement may only be extinguished in whole or in part by judicial proceeding. If this Conservation Easement is extinguished, in whole or in part, by judicial proceeding because of changed conditions, Grantee, its successors and assigns, shall be entitled to its proportionate share of the Proceeds of Sale according to Grantee's proportional interest in the value of the Property as determined under Treasury Regulations §1.170A-14(g)(6)(ii) or any successor regulation. As such designation is allowed by N.C.G.S. §146-30(a), Grantee shall use its share of the Proceeds of Sale in a manner consistent with the purpose(s) of the Conservation Easement as set forth herein. Notwithstanding the foregoing, all Proceeds of Sale shall be distributed among the Parties according to each Party's respective contribution to the purchase price of the Property and this Conservation Easement as specified above. Nothing herein limits Grantee's right to be included as a named party in any judicial proceedings related to changed conditions.

D. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement

shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Property resulting from the acts of third parties not authorized by Grantor, or from causes beyond Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life, property, or the Property, resulting from such causes.

E. Costs of Enforcement. Any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

F. No Waiver. Any forbearance by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be deemed or construed to be a waiver by Grantee of such term or of any subsequent breach of the same or of any other term of this Conservation Easement or of Grantee's rights. No delay or omission by Grantee in exercise of any right or remedy shall impair such right or remedy or be construed as a waiver.

ARTICLE V. TITLE

Grantor covenants, represents, and warrants (i) that Grantor is the sole owner and is seized of the Property in fee simple and has good right to grant and convey this Conservation Easement, (ii) that there is legal access to the Property, (iii) that the Property is free and clear of any and all encumbrances, except those permitted exceptions outlined below, none of which would nullify, impair, or limit in any way the terms or effect of this Conservation Easement, (iv) that Grantor shall defend its title and Grantee's title against the claims of all persons whomsoever, and (v) that Grantee, its successors and assigns, shall have the right to monitor and defend the terms of this Conservation Easement. The following are permitted exceptions to the above covenants, representations, and warranties:

1. The following matters that are shown on the plat of survey by Benjamin Bryan, Professional Land Surveyor, entitled "Property of / Boundary Survey — Recombination — Conservation Easement / Triangle Land Conservancy and Fitch Creations Inc.", dated 02/02/2023, which is recorded in Plat Slide 2023, Page 174, Chatham County Registry:
   Parking Area
   Bush Creek
   Flood area
   all located on the land.

2. The following matters that are shown on the plat of survey by Benjamin Bryan, Professional Land Surveyor, entitled "Property of / Boundary Survey — Recombination — Conservation Easement / Triangle Land Conservancy and Fitch

Creations Inc.", dated 02/02/2023, which is recorded in Plat Slide 2023, Page 175, Chatham County Registry:
Parking Area
Bush Creek
all located on the land.

3. The following matters that are shown on the plat of survey by Van R. Finch, Professional Land Surveyor, entitled "Fearrington Phase IV of Section VIII, "Bush Creek" Revision of Lot 930", dated 03/11/2008, which is recorded in Plat Slide 2008, Page 170, Chatham County Registry.

4. The following matters that are shown on the plat of survey by Van R. Finch, Professional Land Surveyor, entitled "Fitch Creations, Inc.", dated 09/07/2004, which is recorded in Plat Slide 2004, Page 301, Chatham County Registry:
Bush Creek
Stream
Branches
Creek
all located on the land.

5. The following matters that are shown on the plat of survey by Van R. Finch, Professional Land Surveyor, entitled "Fitch Creations, Inc.", dated 01/20/1994, which is recorded in Plat Slide 94, Page 40, Chatham County Registry:
Bush Creek
Branch
all located on the land.

6. Preliminary Plat of survey by Benjamin Bryan, PLS, entitled "Property of / Boundary Survey – Conservation Easement / Triangle Land Conservancy" dated January 15, 2024, and recorded in Plat Slide 2025-206, Chatham County Registry as required in Number 9 of Schedule B, Part II, shows Falls in Creek, Bush Creek, Area reserved for parking, Manhole, Existing Dirt Road, Woodham 45' RW, 50' Access Easement, and 30' drainage and sewer easement located on the Land.

7. Easement(s) to Public Service Company of North Carolina, Incorporated recorded in Book 1186 at Page 833; Book 1233 at Page 879; Book 1425 at Page 732; Book 1432 at Page 333 and Book 1718 at Page 909.

8. Easement(s) to Duke Progress Energy, LLC recorded in Book 1939 at Page 1089.

9. Rights of others for ingress and egress purposes in and to the use of easement for ingress, egress and regress over 50' access easement and existing private road located on the Land and as shown on Plat Slide 2004-301.

10. Easement(s) to Carolina Power & Light Company recorded in Book JS at Page 95 and Book KU at Page 249.

11. Easement(s) to University of North Carolina recorded in Book 246 at Page 44.

12. Title to that portion of the Land within the right-of-way of Whitehurst, Graycliff, Spindlewood, Lassiter Lane, Millcroft, and Woodham.

13. Rights of others thereto entitled in and to the continued uninterrupted flow of Bush Creek, the creek, the branch and the stream, located on the Land.

ARTICLE VI. MISCELLANEOUS

A. Stewardship of the Conservation Easement. Pursuant to the terms of the Grant Contracts and any contract for stewardship of the Property entered into pursuant to the Grant Contracts, Triangle Land Conservancy will monitor and observe the Property in perpetuity to assure compliance with the purposes and provisions of this Conservation Easement and the provisions of the Grant Contracts, and that it will report on the condition of the Property, or provide for such reporting, to State and Fund no less frequently than once a year, and further will report immediately to State and Fund any observed and/or known violations of this Conservation Easement or the Grant Contracts. The Parties acknowledge that the associated stewardship monies awarded under the Grant Contracts are administered pursuant to N.C.G.S. §143B-135.236 which establishes the North Carolina Conservation Easement Endowment Fund, or any successor law, and Fund's internal policies and procedures, and that Triangle Land Conservancy's obligation to monitor the Property at any given time is contingent on the availability of said stewardship funds. Further, the Parties acknowledge that this obligation to monitor the Property is assignable provided such assignment is made with the prior written approval of Fund and evidenced by a written instrument signed by the Parties thereto and recorded in the Office of the Register of Deeds of Chatham County. Provided further, that any such assignment of Triangle Land Conservancy's obligation to monitor the Property shall include a right of entry onto the Property for the assignee of said monitoring obligation, and shall require the monitoring to be carried out in accordance with and subject to N.C.G.S. §143B-135.236 or any successor law, and Fund's internal stewardship policies and procedures. The Parties specifically acknowledge that neither Triangle Land Conservancy's obligation to monitor the Property, nor its assignment of said obligation, shall have any effect on the rights and obligations of Grantee of this Conservation Easement. Further, the Parties covenant that the obligation to provide monitoring of the Property will survive any transfer of Grantor's fee interest in the Property.

B. Subsequent Transfers of the Fee or Other Interests; Licenses. Grantor agrees for itself, its successors and assigns, that in the event it intends to transfer the Property, any interest in the Property, or any license to use the Property, to notify Grantee and Fund in writing of the names and addresses of any party to whom the Property, any interest in the Property, or any license to use the Property, is to be transferred, the nature of the interest or license to be

transferred, and the terms and conditions of the intended transfer, at least sixty (60) days before the transfer is intended to be consummated. Grantor, for itself, its successors and assigns, further agrees to make specific reference to this Conservation Easement in a separate paragraph of any subsequent lease, deed, license, or other legal instrument by which any interest or license in the Property is conveyed. The Property owner shall not convey the Property or any interest or license therein, and shall not incur, assume, or suffer to exist any lien, upon or with respect to the Property, without disclosing to the prospective transferee the Conservation Easement, the obligations of the Property owner, and the limitations on use of the Property. No interest or license in the Property shall be transferred except in writing in accordance with the above. Nothing in this Paragraph abrogates or limits **Paragraph J of Article III** hereof.

C. Subsequent Transfers of the Conservation Easement. The Parties hereto recognize and agree that the benefits of this Conservation Easement are in gross and assignable with any such assignee having all the rights and remedies of Grantee hereunder. The Parties hereby covenant and agree, that in the event this Conservation Easement is transferred or assigned, the transferee or assignee of the Conservation Easement will be a qualified organization as that term is defined in Section 170(h)(3) of the Internal Revenue Code of 1986 (the "**Code**"), as amended, or any successor section, and the regulations promulgated thereunder that is organized or operated primarily for one of the conservation purposes specified in Section 170(h)(4)(A) of the Code, a qualified holder as that term is defined in the Act or any successor statute, and a qualified grant recipient pursuant to N.C.G.S. Chapter 143B, Article 2, Part 41. The Parties further covenant and agree that the terms of the transfer or the assignment will be such that the transferee or assignee will be required to continue to carry out in perpetuity the purpose(s) of the Conservation Easement that the contribution was originally intended to advance as set forth herein, but acknowledge specifically that any transfer or assignment of the Conservation Easement shall have no effect on Triangle Land Conservancy's obligation to provide stewardship of the Conservation Easement as set forth in this **Article VI**.

D. Existing Responsibilities of Grantor and Grantee Not Affected. Other than as specified herein, this Conservation Easement is not intended to impose any legal or other responsibility on Grantee, or in any way to affect any existing obligation of Grantor as owner of the Property. Among other things, this shall apply to:

1. Taxes. Grantor shall continue to be solely responsible for payment of all taxes and assessments levied against the Property. If Grantee is ever required to pay any taxes or assessments on its interest in the Property, Grantor shall reimburse Grantee for the same.

2. Upkeep and Maintenance. Grantor shall continue to be solely responsible for the upkeep and maintenance of the Property to the extent it may be required by law. Grantee shall have no obligation for the upkeep or maintenance of the Property.

3. Liability and Indemnification. If Grantee is ever required by a court to pay

damages resulting from personal injury or property damage that occurs on the Property, Grantor shall indemnify and reimburse Grantee for these payments, as well as reasonable attorneys' fees and other expenses of defending itself, unless Grantee has committed a deliberate act that is determined to be the sole cause of the injury or damage.

E. Conservation Purpose. Grantor and Grantee, each for itself, and its respective successors and assigns, agree that this Conservation Easement shall be held exclusively for conservation purposes set forth by the Grant Contracts, this Conservation Easement and as specified in Section 170(h)(4)(A) of the Code. Further, this Conservation Easement shall be construed to promote the purposes of the Act and such purposes of this Conservation Easement as are defined in Section 170(h)(4)(A) of the Code.

F. Recording. Grantee shall record this instrument and any amendment hereto in the official records of Chatham County, North Carolina, and may re-record it at any time as may be required to preserve Grantee's rights.

G. Notices. Any notices shall be sent by registered or certified mail, return receipt requested, to the Parties at their addresses shown below, and each Party may update its information by a notice sent in accordance with this Paragraph:

If to Grantee:
NC Land and Water Fund
Attn: Stewardship
1651 Mail Service Center
Raleigh, NC 27699-1651

If to Grantor:
Triangle Land Conservancy
PO Box 1848
Durham, NC 27702

H. Amendments. Grantor and Grantee, or their successors in interest in the Property, are free to jointly amend this Conservation Easement, provided that no amendment will be allowed that is inconsistent with the purposes of this Conservation Easement or affects the perpetual duration of this Conservation Easement. Such amendments require the prior written approval of both Grantor and Grantee and shall be effective upon recording in the public records of Chatham County, North Carolina.

I. Environmental Condition of the Property. Grantor warrants, represents, and covenants to Grantee that to the best of its knowledge after appropriate inquiry and investigation: (a) the Property described herein is and at all times hereafter will continue to be in full compliance with all federal, state, and local environmental laws and regulations, (b) as of the date hereof, there are no hazardous materials, substances, wastes, or environmentally regulated substances (including, without limitation, any materials containing asbestos) located on, in, or under the Property or used in connection therewith, (c) that there are no environmental conditions existing on the Property that may prohibit or impede use of the Property for the purposes set forth herein, and (d) Grantor will not allow such conditions.

J. Indemnity. Grantor agrees to the fullest extent permitted by law, to protect, indemnify, and hold harmless Grantee from and against all claims, actions, liabilities, damages, fines, penalties, costs, expenses, and attorneys' fees suffered or incurred as a direct or indirect result of any violation of any federal, state, or local environmental or land use law or regulation or of the use or presence of any hazardous substance, hazardous waste, or other regulated material in, on, or under the Property.

K. Entire Agreement. The Recitals set forth above and the exhibits, if any, attached hereto are incorporated herein by reference. This instrument, including the Grant Contracts incorporated by reference herein, sets forth the entire agreement of the Parties with respect to the Project and supersedes all prior discussions, negotiations, understandings, and agreements relating to the Project. To the extent that this Conservation Easement is in conflict with the Grant Contracts, the terms of this Conservation Easement shall control.

L. Interpretation and Severance. This Conservation Easement shall be construed and interpreted under the laws of the State and the United States, and any ambiguities herein shall be resolved so as to give maximum effect to the conservation purposes sought to be protected herein. The normal rule of construction of ambiguities against the drafting party shall not apply in the interpretation of this Conservation Easement. Further, this Conservation Easement shall be construed to promote the purposes of the Act, which authorizes the creation of conservation agreements for purposes including those set forth herein, and such conservation purposes as are defined in Section 170(h)(4)(A) of the Code. If any provision of this Conservation Easement is found to be invalid, the remainder of the provisions of this Conservation Easement, and the application of such provisions to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby and shall remain in full force and effect.

M. Parties. Every provision of this Conservation Easement that applies to Grantor or to Grantee or to Fund shall likewise apply to their respective executors, administrators, successors, and assigns.

N. No Extinguishment through Merger. The Parties agree that the doctrine of extinguishment by merger shall not apply to this Conservation Easement because of the public interest in its enforcement. The Parties agree that this Conservation Easement and its terms shall survive any coming together of the ownership of the fee interest in the Property and the Conservation Easement interest, and that this Conservation Easement shall not be merged into the fee interest. Further, the Parties agree that if Grantee, or any successor in interest to Grantee, acquires title to any fee interest in the Property subject to this Conservation Easement, (i) said owner shall observe and be bound by the obligations and the restrictions imposed upon the Property by this Conservation Easement and (ii) this Conservation Easement shall not be extinguished through the doctrine of merger in any way in view of the public interest in its enforcement.

O. Subsequent Liens. No provision of this Conservation Easement shall be construed as impairing the ability of Grantor to use the Property for collateral for borrowing purposes,

provided that any mortgage or lien arising therefrom shall be subordinate to this Conservation Easement.

P. Gender. The designations Grantor, Grantee, State, and Fund, as used herein shall include the persons or entities indicated and their administrators, successors, and assigns, and shall include the singular, plural, masculine, feminine, or neuter as the context may require.

Q. Headings. The headings of the various sections of this Conservation Easement have been inserted for convenience only and shall not modify, define, limit, or expand the express provisions of this Conservation Easement.

TO HAVE AND TO HOLD unto Grantee, its successors and assigns, forever. The covenants agreed to and the terms, conditions, restrictions, and purposes imposed as aforesaid shall be binding upon Grantor and Grantor's representatives, successors and assigns, and shall continue as a servitude running in perpetuity with the Property.

[See next page for signatures and notary acknowledgement]

IN WITNESS WHEREOF, Grantor, by authority duly given, has hereunto caused these presents to be executed under seal in such form as to be binding, the day and year first above written, and Grantee accepts this Conservation Easement by the recording hereof in the public records.

GRANTOR:

TRIANGLE LAND CONSERVANCY

By: _____ **(SEAL)**
Sandra Sweitzer
Executive Director

ATTEST:

By: _____
Lysandra Weber
Corporate Secretary

[Affix Corporate Seal]

STATE OF NORTH CAROLINA
COUNTY OF Orange

I, the undersigned Notary Public of the aforesaid county, North Carolina, do hereby certify that Lysandra Weber personally appeared before me this day and acknowledged that she is the Corporate Secretary of Triangle Land Conservancy, a nonprofit corporation, and that by authority duly given and as the act of the corporation, the foregoing instrument was signed in its name by its Executive Director, Sandra Sweitzer, sealed with its corporate seal, and attested by herself as its Corporate Secretary.

Witness my hand and notarial seal this the 23rd day of July, 2025.

MELISSA CLUNAN NOTARY PUBLIC My Comm. Exp. Sept 2, 2029 WAKE COUNTY, NC

STAMP/SEAL

Notary Public: _____

Printed Name: Melissa Clunan

My commission expires: September 2, 2029

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY
PROPERTY OF TRIANGLE LAND CONSERVANCY
WILLIAMS TOWNSHIP
CHATHAM COUNTY, NORTH CAROLINA

BEING all of the parcel designated as Tract 2 containing 247.68 acres as shown on the plat entitled "Property of / Boundary Survey – Conservation Easement / Triangle Land Conservancy" by Benjamin Bryan, PLS of Ben L. Bryan, P.A. dated January 15, 2024, and recorded in Plat Slide 2025-206, Chatham County Registry.

TOGETHER WITH the access easement established in that certain Declaration of Access Easement recorded in Book 2370, Page 75, Chatham County Registry.

Together with those rights of access described on page(s) 4 of this Conservation Easement.

The Chatham County Zoning Ordinance

Chatham County, North Carolina

For Baldwin, Williams, New Hope, Cape Fear, and portions of Haw River, Oakland, Center, Albright, Gulf, Hickory Mountain, Matthews, and Hadley Townships

Chatham County
North Carolina

Adopted: December 1, 2008
Effective: December 2, 2008

DATE OF ORDINANCE ADOPTION: DECEMBER 1, 2008

EFFECTIVE DATE OF ORDINANCE: DECEMBER 2, 2008

ORDINANCE AMENDMENT DATES:

April 19, 2010

June 21, 2010

February 21, 2011

May 16, 2011

June 6, 2011

September 6, 2011

May 21, 2012
Effective July 1, 2012

August 20, 2012

April 15, 2013

May 20, 2013

July 15, 2013

September 16, 2013

February 17, 2014

June 16, 2014

July 21, 2014

November 17th, 2014

December 15th, 2014

May 18th, 2015

January 15th, 2016

April 17th, 2017

April 16, 2018

January 22, 2019

August 19th, 2019

September 16th, 2019

April 20th, 2020

February 15th, 2021

March 21st, 2022

TABLE OF CONTENTS
CHATHAM COUNTY ZONING ORDINANCE

SECTION 4 DISTRICTS ESTABLISHED

In order to achieve the purposes of this Ordinance as set forth above, the jurisdictional area subject to this Ordinance is hereby divided into general use districts of which there shall be 10 with the designation and purposes as listed below:

R5 Residential district
Primarily for very low density residential developments along the County's rivers and streams which are compatible with protecting the water quality of the rivers and streams.

R2 Residential district
Primarily for low density residential development to protect water supply watersheds

R1 Residential District
This district is primarily for low to moderate density residential development within the residential-agricultural areas of the jurisdiction.

O&I Office and Institutional District
Primarily for office and institutional type uses along with residences

B-1 General Business District
Intended for retail trade and consumer services dealing with the general public; the old district has been split into 3 new districts (NB, CB, and RB, below) that are intended for retail and consumer services, but are scaled to better fit different needs around the County. This district is historical and no parcel or portion of a parcel can be rezoned to this district. Should an applicant for a rezoning wish to rezone to a district with approved land uses listed for this district, the applicant may apply for a rezoning to one of the 3 new business districts (NB, CB, and RB, below).

NB Neighborhood Business District
This district is meant to serve a small retail market, roughly equivalent to the trade area of a small (40,000 square foot) grocery store and limited ancillary services. No building within this district shall exceed 40,000 square feet and the cumulative building square footage shall not exceed 160,000.

CB Community Business District
This district is similar to the Neighborhood Business District, but at a slightly larger scale, roughly equivalent to a 80,000 square foot grocery store and ancillary services. No building within this district shall exceed 80,000 square feet and the cumulative building square footage shall not exceed 320,000.

RB Regional Business District
This district is similar to the old General Business District in that a wider array of uses is allowed and there are not limitations on single-occupant, single-use structure sizes or outdoor storage and display of merchandise.

IL Light Industrial District

SECTION 5 CONDITIONAL ZONING DISTRICTS

Conditional Zoning district (bearing the designation CD) corresponds to the general purpose zoning districts and to the mixed use districts as authorized in this ordinance.

5.1. Purpose

Conditional Zoning districts are zoning districts in which the development and use of the property is subject to predetermined ordinance standards and the rules, regulations, and conditions imposed as part of the legislative decision creating the district and applying it to the particular property.

Some land uses are of such a nature or scale that they have significant impacts on both the immediate surrounding area and on the entire community, which cannot be predetermined and controlled by general district standards. The review process established in this Ordinance provides for accommodation of such uses by a reclassification of property into a conditional zoning district, subject to specific conditions, which ensure compatibility of the use with neighboring properties. A conditional zoning district is not intended for securing early zoning for a proposal, except when that proposal is consistent with an approved land use plan or the proposal can demonstrate that public infrastructure needed to serve the development will be made available within a reasonable time period.

5.2 Conditional Zoning Districts

A. Residential Districts

The following districts are identical to the corresponding residential districts, except that approval of a conditional zoning district is required as a prerequisite to any use or development, as provided for in this Ordinance:

CD-R5
CD-R2
CD-R1

B. Office, Institutional and Commercial Districts

The following districts are identical to the corresponding commercial districts, except that approval of a conditional zoning district is required as a prerequisite to any use or development, as provided for in this Ordinance:

CD-O&I Office & Institutional
CD-B1 General Business
CD-NB Neighborhood Business
CD-CB Community Business
CD-RB Regional Business

C. Industrial Districts

The following districts are identical to the corresponding industrial districts, except that approval of a conditional zoning district is required as a prerequisite to any use or development, as provided for in this Ordinance:

CD-IL Light Industrial
CD-IH Heavy Industrial

SECTION 10 SCHEDULE OF DISTRICT REGULATIONS

Within the districts as established by this Ordinance, the requirements as set forth in this section shall be complied with in addition to any other general or specific requirements of this Ordinance. Permitted uses for all districts, both by-right and conditional are listed in Table 1: Zoning Table of Permitted Uses. Uses permitted by right are subject to obtaining a zoning permit from the Zoning Official; Uses permitted by conditional use are only permitted subject to the issuance of a special use permit by the Board of Commissioners as provided for in Section 15. Certain uses as listed in the subsection may be subject to certain specific conditions as set forth in Section 15 and if permitted by the Board of Commissioners shall be subject to any such conditions as may be listed for that use. In addition, in granting a special use permit the Board of Commissioners may impose such additional conditions and safeguards that the Board may deem as reasonable and appropriate.

When the conservation subdivision option of the Subdivision Ordinance is exercised, then the minimum lot area and setbacks listed for each district is superseded by the density bonus requirements of the conservation subdivision. The minimum lot area used for the initial calculation of the density bonus is still based on the minimums listed here.

10.1. R 5 - Residential District

A. Permitted Uses

The following uses are permitted subject to obtaining a zoning and/or special use permit from the Zoning Official. (See Table 1: Zoning Table of Permitted Uses on page 47)

B. Dimensional Requirements

Minimum Required Lot Area - Family subdivisions may have lots a minimum of two acres in size. Existing (as of December 31, 1990) lots of ten acres or less may be divided provided that no resultant lot is smaller than three acres. New lots other than these previously described must average five acres in size with no lots smaller than three acres; lots larger than ten acres shall not be included in the averaging.

Lots to be created for the express purpose of minor utilities are exempted from the Required Minimum Lot Area, but must comply with the required setback of the district. Any noise producing equipment or generators must be stored within a structure, or must be setback a minimum fifty (50) feet from any public right-of-way or property line.

Minimum Required Lot Width - 100 feet

Minimum Required Front Setback - 40 feet

Minimum Required Side Setback - 25 feet

Minimum Required Rear Setback - 25 feet

Maximum Building Height - 60 feet

Location of Accessory Buildings and Structures – Accessory buildings and structures must conform to the minimum required setbacks for the district. Provided, however, well houses,

satellite dishes, and open structures may be located in the required yards provided they are located at least 10 feet from any street or property line. Fences are permitted within the front, side and rear yards with no minimum setback requirement.

C. Visibility at Intersections
On a corner lot nothing shall be erected, placed, planted or allowed to grow in such a manner as materially to impede vision between a height of 2 1/2 feet and 10 feet in a sight triangle as established by NCDOT.

D. Off-Street Parking and Loading
Off-street parking and loading shall be provided in accordance with the provisions set forth in Section 14.

E. Signs
Signs shall be governed by the provisions of Section 15.

10.2. R 2 - Residential District

A. Permitted Uses
The following uses are permitted subject to obtaining a zoning and/or special use permit from the Zoning Official. (See Table 1: Zoning Table of Permitted Uses on page 47)

B. Dimensional Requirements
Minimum Required Lot Area - 90,000 square feet

Minimum Required Lot Area for a Two-Family Dwelling -except an accessory dwelling unit 180,000 square feet. Each unit of a two-family dwelling may be placed on a separate lot, provided that each lot consists of not less than 90,000 square feet, and provided that the common wall between the units is a fire wall as required by the building code.

Lots to be created for the express purpose of minor utilities are exempted from the Required Minimum Lot Area, but must comply with the required setback of the district. Any noise producing equipment or generators must be stored within a structure, or must be setback a minimum fifty (50) feet from any public right-of-way or property line.

Minimum Required Lot Width - 100 feet

Minimum Required Lot Width for a Two-Family Dwelling - 110 feet

Minimum Required Front Setback - 40 feet

Minimum Required Side Setback - 25 feet. Where a two-family dwelling is placed such that the units are on separate lots with a common fire wall, no side yard shall be required at the common wall.

Minimum Required Rear Setback - 25 feet

Maximum Building Height - 60 feet

Location of Accessory Buildings and Structures – Accessory buildings and structures must conform to the minimum required setbacks for the district. Provided, however, well houses, satellite dishes, and open structures may be located in the required yards provided they are at least 10 feet from any street or property line. Fences are permitted within the front, side and rear yards with no minimum setback requirement.

C. Visibility at Intersections
On a corner lot nothing shall be erected, placed, planted or allowed to grow in such a manner as materially to impede vision between a height of 2 1/2 feet and 10 feet in a sight triangle as established by NCDOT.

D. Off-Street Parking and Loading
Off-street parking and loading shall be provided in accordance with the provisions set forth in Section 14.

E. Signs
Signs shall be governed by the provisions of Section 15.

10.3. R 1 - Residential District

A. Permitted Uses
The following uses are permitted subject to obtaining a zoning and/or special use permit from the Zoning Official. (See Table 1: Zoning Table of Permitted Uses on page 47)

B. Dimensional Requirements
Minimum Required Lot Area - 40,000 square feet or 65,340 square feet for lots with individual wells and individual wastewater disposal systems.

Minimum Required Lot Area for a Two-Family Dwelling - except an accessory dwelling unit 80,000 square feet. Each unit of a two-family dwelling may be placed on a separate lot, provided that each lot consists of not less than 40,000 square feet, and provided that the common wall between the units is a fire wall as required by the building code.

Lots to be created for the express purpose of minor utilities are exempted from the Required Minimum Lot Area, but must comply with the required setback of the district. Any noise producing equipment or generators must be stored within a structure, or must be setback a minimum fifty (50) feet from any public right-of-way or property line.

Minimum Required Lot Width - 100 feet

Minimum Required Lot Width for a Two-Family Dwelling - 110 feet

Minimum Required Front Setback - 40 feet

Minimum Required Side Setback - 25 feet. Where a two-family dwelling is placed such that the units are on separate lots with a common fire wall, no side yard shall be required at the common wall.

Minimum Required Rear Setback - 25 feet

Maximum Building Height - 60 feet

Location of Accessory Buildings and Structures – Accessory buildings and structures must conform to the minimum required setbacks for the district. Provided, however, well houses, satellite dishes, and open structures may be located in the required yards provided they are at least 10 feet from any street or property line. Fences are permitted within the front, side and rear yards with no minimum setback requirement.

C. Visibility at Intersections
On a corner lot nothing shall be erected, placed, planted or allowed to grow in such a manner as materially to impede vision between a height of 2 1/2 feet and 10 feet in a sight triangle as established by NCDOT.

D. Off-Street Parking and Loading
Off-street parking and loading shall be provided in accordance with the provisions set forth in Section 14.

E. Signs
Signs shall be governed by the provisions of Section 15.

10.4. O&I - Office and Institutional District

A. Permitted Uses
The following uses are permitted subject to obtaining a zoning and/or special use permit from the Zoning Official. (See Table 1: Zoning Table of Permitted Uses on page 47)

B. Dimensional Requirements
Minimum Required Lot Area - 40,000 square feet or 65,340 square feet for lots with individual wells and individual wastewater disposal systems.

Minimum Required Lot Area for a Two-Family Dwelling - 80,000 square feet each unit of a two-family dwelling may be placed on a separate lot provided that each lot consists of not less than 40,000 square feet, and provided that the common wall between the units is a fire wall as required by the building code.

Lots to be created for the express purpose of minor utilities are exempted from the Required Minimum Lot Area, but must comply with the required setback of the district. Any noise producing equipment or generators must be stored within a structure, or must be setback a minimum fifty (50) feet from any public right-of-way or property line.

Minimum Required Lot Width - 100 feet

Minimum Required Lot Width for a Two-Family Dwelling - 110 feet

Minimum Required Front Setback - 40 feet

10.13 Table 1: Zoning Table of Permitted Uses Notes: Compact Communities (CC) uses are listed separately in the Compact Communities Ordinance

Many commercial activities that are otherwise prohibited in this table may be allowed as Home Occupations if they meet the requirements of that section.

Key: P = Permitted; A = Accessory Only; SUP = Special Use Permit Only; PRD = Planned Residential Development Only; * = Historical district; (this district is no longer permitted for future rezonings)

Zoning District	R5	R2	R1	O&I	B-1*	NB	CB	RB	IL	IH
ABC stores					P	P	P	P		
Accessory dwelling unit i.e. guest house, pool house, garage apartment and in-house apartment	P	P	P							
Accessory uses and structures clearly incidental to a permitted use	P	P	P							
Airports and landing fields for fixed and rotary wing aircraft									CU	SUP
Alcohol and alcoholic beverages manufacture										P
Amusement enterprises such as pool, bowling, roller rink when housed entirely within a permanent structure					P		P	P		
Animal Husbandry Specialized with a minimum lot area and setback twice the minimum required of the zoning district. Lot area and setback for the AG district measured as if R5	SUP	SUP	SUP							
Antique shops					P	P	P	P		
Apartment Complex or Residential Condominium Complex	PRD	PRD	PRD							
Appliance distributors for wholesale									P	
Appliance sales and service					P	P	P	P		
Art supply retail sales					P	P	P	P		
Arts and Crafts fabrication and related sales	SUP				P	P	P	P		
Asphalt manufacture or refining (Subject to additional requirements of Section 17.9)										SUP
Assembly halls, coliseums, gymnasiums and similar structures								SUP	SUP	SUP
Assembly of ammunition, for small arms only, from previously prepared parts									SUP	SUP
Assembly of machines, appliances and goods from previously prepared parts									P	P
Automobile and truck assembly									SUP	P
Automobile and automobile accessory sales and service					P		SUP	P		

Zoning District	R5	R2	R1	O&I	B-1*	NB	CB	RB	IL	IH
Automobile service stations including tune-ups, minor repairs, tire service, washing facilities both manual and automatic and similar services.[1]					P	P	P	P	P	P
Aviation/aerospace equipment, engine and instrument manufacturing and/or assembly. (Subject to additional requirements of Section 17.9)										SUP[3]
Avocational farming	P	P	P							
Bait and tackle shops					P	~~P~~	P	P	P	P
Bake shops and similar food preparation intended primarily for retail sales on the premises for consumption either on or off premises					P	P	P	P		
Bakeries or baking plants									P	P
Banks, savings and loans, finance companies, credit agencies and similar financial institutions				P	P	P	P	P		
Battery Manufacture (Subject to additional requirements of Section 17.9)										SUP
Beauty Shops, Salons					P	P	P	P		
Owner-occupied bed and breakfast homes with no more than two (2) rooms (units) for rent for stays no longer than seven (7) consecutive days and may be located on legal, non-conforming and conforming lots of record, on at least one and one half (1.5) acres, which may have standard setbacks as set in the district in which it is located	P	P	P							
Bed and breakfast inns with no more than six rooms for rent with a minimum lot area of three acres and provided that all buildings, structures and high intensity activity areas shall be set back a minimum of two times the minimum yard requirement for the district in which it is located	SUP	SUP	SUP				P	P		
Bedding, carpet and pillow manufacturing, cleaning and renovating									P	P
Bicycle sales and repair					P	P	P	P		
Blacksmith or horseshoeing shops						P			P	P
Blueprinting and Photostatting establishments								P	P	P
Boarding kennels (See Section 17.5 for acreage requirements)	SUP	SUP	SUP			P	P	P		
Boat, trailer and other utility vehicle sales and service					P		SUP	P		
Boat Storage Facility					SUP	SUP	SUP	SUP	SUP	SUP

[1] Fuel, oil and similar pumps and appliances may be located in the minimum required front and side yards provided that none shall be located nearer than 15 feet to any street line and may be covered by an attached or free standing unenclosed canopy provided such canopy does not extend nearer than five feet to any property line and does not cover greater than 30% of the required yard area.

[3] When Chatham County Water or Town of Sanford Water and Sewer Infrastructure is utilized the use is allowed by right.

Zoning District	R5	R2	R1	O&I	B-1*	NB	CB	RB	IL	IH
Book, stationery and office supply stores					P	P	P	P		
Bookbindery									P	P
Bottling works for soft drinks									P	P
Breeding kennels with a minimum lot area of three acres and provided that all buildings, structures and high intensity activity areas shall be set back a minimum of two times the minimum yard requirement for the district in which it is located	SUP	SUP				P	P	P		
Brick, tile, clay pipe and other clay products manufacture (Craft pottery is not covered in this definition)										P
Bus passenger stations					P			P		
Cabinet shops					P	P	P	P		
Campgrounds—SEE Public and Private recreation camps and grounds										
Candy products manufacture									P	P
Canvas and burlap products manufacture, sales and storage									P	P
Carpeting, Flooring, Tile, and Stone Products Sales					P	P	P	P		
Catering establishments					P	P	P	P		
Cement, lime, plaster manufacture (Subject to additional requirements of Section 17.9)										SUP
Cemeteries	SUP	SUP	SUP	P						
Churches and other places of worship	SUP[2]	SUP[2]	SUP[2]	P	P	P	P	P		
Circuses, carnivals, exhibition shows, sideshows, races, trade shows, flea markets, banquets, conventions, religious events, arts and crafts shows, stage shows, athletic events and other similar events, including temporary living quarters such as mobile homes and recreational vehicles provided that the stay of such temporary living quarters shall be limited to a period of not more than five days longer than the duration of the event and no more than 30 total days in any 12 month period for any one separate event								CU	CU	CU
Clothing manufacture									P	P
Clothing shops					P	P	P	P		
Clubs and other places of entertainment operated as commercial enterprises								SUP	SUP	SUP

[2] Provided such are located on a lot of not less than three acres and provided further that the minimum side and rear yards shall be 50 feet and the front yard setback a minimum of 25 feet greater than required for a single-family residence within the district.

Zoning District	R5	R2	R1	O&I	B-1*	NB	CB	RB	IL	IH
Coal or coke yards (Subject to additional requirements of Section 17.9)									SUP	SUP
Coffee roasting									P	P
Cold storage plants									P	P
Computer and Electronic product manufacture										SUP[3]
Congregate care facilities				P	P	P	P	P		
Contractor's plants or storage yards and staging areas	SUP	SUP	SUP	SUP	SUP	SUP	SUP	SUP	SUP	SUP
Cooperage works										P
Cosmetics and perfume manufacture(Subject to additional requirements of Section 17.9)										SUP[3]
Dairy bars and ice cream shops intended primarily for retail sale on the premises for consumption either on or off premises					P	P	P	P		
Dairy products, processing, bottling and distribution, ice-cream manufacture, all on a wholesale basis									P	P
Data processing, hosting and related services										SUP[3]
Day care centers for 15 or fewer children.	SUP	SUP	SUP							
Day Care Centers for more than 15 children.				P	P	P	P	P		
Day care centers in the principal residence to accommodate not more than 15 children at any one time, provided such are located on a lot of not less than one acre and provided further that all buildings, structures and high intensity activity areas shall be set back a minimum of two times the minimum yard requirement for the district in which it is located	SUP	SUP	SUP							
Drive-in or outdoor motion picture show									SUP	SUP
Drug stores					P	P	P	P		
Dry cleaning, pressing, and related retail service counter					P	P	P	P	P	P
Dwellings, single-family, manufactured	P	P	P		P					
Dwellings, single-family, site built and modular	P	P	P		P					
Dwellings, single-family attached (Duplex)		P	P	P						
Dwellings, manufacture of										P
Dye stuff manufacture and dyeing plants									SUP	SUP
Eating and drinking establishments					P	P	P	P		
Electrical equipment, appliance, and component manufacturing										SUP[3]
Electric light or power generating station (Subject to additional requirements of Section 17.9)									SUP	SUP
Emory cloth or sandpaper manufacture									P	P

Zoning District	R5	R2	R1	O&I	B-1*	NB	CB	RB	IL	IH
Enameling, japanning, lacquering or the plating or galvanizing of metals										P
Event Center Limited (See Section 17.7)					P	P	P	P		
Excelsior and fiber manufacture										P
Fabric shops					P	P	P	P		
Family Care Home (except that a Family Care Home may not be located within 1,125 feet of an existing Family Care Home)	P	P	P	P						
Feed and seed processing									P	P
Feed and seed wholesale									P	P
Feed, seed, fertilizer retail sales					P	SUP	SUP	P	P	P
Felt manufacture										P
Fertilizer wholesale sales									P	P
Fire stations and emergency medical facilities with a minimum lot area of three acres and provided that all buildings, structures and high intensity activity areas shall be set back a minimum of two times the minimum yard requirement of the district in which it is located	P	P	P							
Fire stations, emergency medical service facilities, police stations and law enforcement offices (less than three acres in the residential districts)	SUP	SUP	SUP	P	P	P	P	P	P	P
Flammable liquids - bulk plants and storage (Subject to additional requirements of Section 17.9)										SUP
Flea markets and rummage sales conducted either within a building or outdoors provided that no principal building or sales area shall be located in the required yard								SUP	SUP	SUP
Florist - greenhouses, cultivation facilities and warehousing for wholesale and related retail sales									P	P
Florist shops					P	P	P	P		
Food processing in wholesale quantities									P	P
Food stores, retail					P	P	P	P		
Foundries casting nonferrous metals where conducted wholly within an enclosed structure, except for open air storage and having a total furnace capacity of not more than 1,000 aluminum pounds (Subject to additional requirements of Section 17.9)									SUP	SUP
Foundries producing iron and steel products (Subject to additional requirements of Section 17.9)										SUP
Frozen food lockers									P	P

Zoning District	R5	R2	R1	O&I	B-1*	NB	CB	RB	IL	IH
Funeral homes, undertaking establishments, embalming including crematoria				P	P		P	P	P	P
Fur storage (no sales)					P				P	P
Furniture Manufacture										SUP[3]
Furniture stores					P	P	P	P		
Furrier, retail sales (can include storage)					P	P	P	P		
Garbage and waste incinerators (except hazardous waste) (Subject to additional requirements of Section 17.9)										SUP
Gas and Petroleum Processing (Subject to additional requirements of Section 17.9)										SUP
Gas storage in bulk										SUP
Gases or liquefied petroleum gases in approved portable metal cylinders									P	P
General, professional, and medical offices				P	P	P	P	P	P	P
Gift shops					P	P	P	P		
Golf courses and tennis clubs, public or private				P				P		
Golf courses, tennis and recreation clubs with a minimum lot area of five acres and provided that all buildings, structures and high intensity activity areas shall be set back a minimum of two times the minimum yard requirements for the district in which it is located	SUP	SUP	SUP							
Government Offices and Facilities	P	P	P	P	P	P	P	P	P	P
Grain elevators									P	P
Grounds and facilities for hunting and fishing clubs with a minimum lot area of 20 acres and provided that all buildings, structures and high intensity activity areas shall be set back a minimum of two times the minimum yard requirement for the district in which it is located	SUP	SUP	SUP							
Grounds and facilities for non-profit clubs with a minimum lot area of three acres and provided that all buildings, structures and high intensity activity areas shall be set back a minimum of two times the minimum yard requirement for the district in which it is located	SUP	SUP	SUP	P						
Grounds and facilities for open air games or sports except the following:								SUP	SUP	SUP
* Paintball Gaming Outdoor									P	P
* Shooting Range Indoor									SUP	P
* Shooting Range Outdoor										SUP

Zoning District	R5	R2	R1	O&I	B-1*	NB	CB	RB	IL	IH
Group Care Home				P						
Guest house, pool house, garage apartment meeting the same setback for the principal use	P	P	P							
Hardware, appliances, electrical and similar items retail sales					P	P	P	P		
Heating, plumbing, electrical, cabinet and similar shops					P	P	P	P		
Heavy manufacturing, processing or assembly not otherwise named herein provided no operations are carried on, or are likely to be carried on, which will create smoke, fumes, noise, odor or dust which will be detrimental to the health, safety or general welfare of the community (Subject to additional requirements of Section 17.9)										SUP
Home occupations when conducted in accordance with the provisions of SECTION 16	P	P	P							
Horticulture, specialized					P	P	P	P		
Horticulture, specialized with a minimum lot area of three acres and provided that all buildings, structures and high intensity activity areas shall be set back a minimum of two times the minimum yard requirement for the district in which it is located	P	P	P							
Hosiery manufacture									P	P
Hospital, health and welfare centers, nursing homes and/or convalescent homes				P	P		P	P		
Hotels, motels and inns (See definition for accessory use/s)					P	P	P	P		
Ice manufacture, storage and sales									P	P
Industrial chemical manufacture (Subject to additional requirements of Section 17.9)										SUP
Inert Debris Landfill	SUP	SUP	SUP							
Insulation material manufacture and sale										P
Interior design shops					P	P	P	P		
Jail and penal institutions									SUP	SUP
Jewelry and watch sales and service, goldsmith					P	P	P	P		
Junk yards and auto wrecking, but only when conducted within an enclosure not less than six feet in height and with a solidity of not less than 60% outside any required yard area									SUP	SUP
Kindergartens and nurseries (See Daycares)										
Laboratories for research and testing (Subject to additional requirements of Section 17.9)									SUP	SUP[3]

Zoning District	R5	R2	R1	O&I	B-1*	NB	CB	RB	IL	IH
Laboratory - dental, medical, optical					P			P		
Land clearing and inert debris landfill (For beneficial fill see "Inert Debris")								SUP	SUP	SUP
Landscape design business					P	P	P	P		
Landscaping and grading business					P			P	P	P
Laundries, Laundromats and dry cleaning establishments	SUP	SUP			P	P	P	P		
Laundries, steam								SUP	P	P
Lawn and garden shops					P	SUP	P	P		
Leather goods manufacture excluding tanning									P	P
Leather goods sales and service including manufacture for retail sales on premises					P	P	P	P		
Libraries, museums and art galleries				P	SUP	SUP	P	P		
Light manufacturing, processing, or assembly not otherwise named herein provided no operations are carried on, or are likely to be carried on, which will create smoke, fumes, noise, odor or dust which will be detrimental to the health, safety or general welfare of the community (Subject to additional requirements of Section 17.9)									SUP	SUP
Lock and gunsmiths	SUP	SUP			P	P	P	P	P	P
Lumberyards, building materials storage and sales									P	P
Machinery Manufacture										SUP[3]
Machine shops									P	P
Meat processing and packing										P
Meat processing and packing related to onsite raising of livestock										
Medical clinics - inpatient and outpatient care				P	P	SUP	P	P		
Metal fabricating plants using plate and structural shapes and including boiler for tank works										P
Mining[4] (Subject to additional requirements of Section 17.9)										SUP
Major Utilities									P	P
Machinery Manufacture										SUP[3]
Medical Equipment and Instrument Manufacture										SUP[3]
Metal manufacturing for primary and fabricated materials										SUP[3]

[4] Parcels used in whole or in part for mining operations or as to which mining permits are applicable in whole or in part as of April 17, 2017, are exempt from the conditional use permit requirement for mining uses, as are "accessory uses", as that term is defined in the Zoning Ordinance.

[3] When Chatham County Water and Town of Sanford Sewer Infrastructure is utilized the use is allowed by right.

Zoning District	R5	R2	R1	O&I	B-1*	NB	CB	RB	IL	IH
Minor Utilities (Any noise producing equipment must be stored within a structure, or must be setback a minimum fifty (50) feet from any public right-of-way or property line)	P	P	P	P	P	P	P	P	P	P
Mixed Use Building				SUP	SUP	SUP	SUP	SUP		
Mixing plants for concrete, or paving materials and manufacture of concrete products										SUP
Mobile home sales and service					P		SUP	P	P	P
Motorcycle sales and service					P		SUP	P	P	P
Mulch – grinding, screening (sifting and separating of particles), mixing, blending, processing or dyeing of mulch									SUP	SUP
Music stores including repair and craft manufacture	SUP	SUP			P	P	P	P		
Natural gas compressor station (Subject to additional requirements of Section 17.9) –.	SUP	SUP	SUP	SUP	SUP	SUP	SUP	SUP	SUP	SUP
Newsstands					P	P	P	P		
Oil and Gas Exploration, Development and Production (Subject to additional requirements of Section 17.9)	SUP	SUP	SUP	SUP	SUP	SUP	SUP	SUP	SUP	SUP
Office – business and professional				P	P	P	P	P		
Office - engineering supply and similar sales and services including blueprinting, Photostatting and similar services				P	P	P	P	P		
Open air sales and service of accessory buildings and gazeboes and like free-standing structures					P		SUP	P		
Open-air sales or displays from a temporary building or structure					P	SUP	P	P	P	P
Optical and scientific instrument, jewelry and clock, musical instrument manufacture									P	P
Owner-occupied bed and breakfast homes with no more than two (2) rooms (units) for rent for stays no longer than seven (7) consecutive days and may be located on legal, non-conforming and conforming lots of record, on at least one and one half (1.5) acres, which may have standard setbacks as set in the district in which it is located.	P	P	P							
Oxygen manufacture and/or storage										P
Paint and enamel manufacture not employing a boiling process										P
Paint retail shops					P	P	P	P		
Paper, cardboard and building board manufacture										SUP
Pawnshops and secondhand stores					P	P	P	P		
Pet shops					P	P	P	P		

Zoning District	R5	R2	R1	O&I	B-1*	NB	CB	RB	IL	IH
Pharmaceutical products manufacture (Subject to additional requirements of Section 17.9)									SUP	SUP[3]
Photographic studios, camera shops					P	P	P	P		
Planing or sawmills									P	P
Planned residential developments	SUP	SUP	SUP							
Plastics manufacture										SUP
Plating works										P
Plumbing shop and yard									P	P
Post offices				P	P		P	P		
Pottery (hand crafted) and related retail					P	P	P	P		
Pottery, porcelain and vitreous china manufacture										P
Printing and publishing					P	P	P	P		
Printing, publishing and reproduction establishments									P	P
Private recreation camps and ground with a minimum lot area of 10 acres and provided that all buildings, structures, spaces, and high intensity activity areas shall be set back a minimum of fifty (50) feet from all property line/boundary areas except in the Haw River Township, which shall meet the minimum setback requirements of the base zoning district					P	P	P	P		
Public and private recreation camps and grounds (See Section 17.5 for acreage requirements)	SUP	SUP	SUP							
Public and private schools, training and conference centers				P	P	SUP	SUP	P	SUP	SUP
Public parks and recreation areas including marinas and concessions with a minimum lot area of three acres and provided that all buildings, structures and high intensity activity areas shall be set back a minimum of two times the minimum yard requirement for the district in which it is located	SUP	SUP	SUP							
Public utility transmission lines	P	P	P	P	P	P	P	P	P	P
Radio and television stations and their towers when the towers are located on the same site with the station					P			P		
Rag, bag and carpet cleaning establishments										P
Railroad freight yards, terminals or classification yards and rights-of-way									P	P
Railroad rights-of-way									P	P
Recreational Facilities (Gyms, yoga studios, et cetera)					P	P	P	P		
Recreational Vehicle Storage Facility					SUP	SUP	SUP	SUP	SUP	SUP
										P

Zoning District	R5	R2	R1	O&I	B-1*	NB	CB	RB	IL	IH
Recycling industries that do not include the storage and/or processing of hazardous waste										
Repair and service of office and household equipment	SUP	SUP	SUP					P	P	P
Repair and servicing of industrial equipment machinery, except railroad equipment									P	P
Repair shops for jewelry, shoes, radios, televisions and other small office or household appliances	SUP	SUP	SUP		P	P	P	P		
Retail stores and personal service shops similar to those listed dealing in direct consumer and personal services					P	P	P	P		
Rock crushers										SUP
Rodenticide, insecticide and pesticide mixing plants (Subject to additional requirements of Section 17.9)										SUP
Sanitary landfill excluding the burning of trash out of doors (Subject to additional requirements of Section 17.9)										SUP
Schools, public and private with a minimum lot area of three acres and provided that all buildings, structures and high intensity activity areas shall be set back a minimum of two times the minimum yard requirement for the district in which it is located	SUP	SUP	SUP							
Scrap paper or rag storage, sorting or bailing when conducted within a building									P	P
Secretarial and job service offices					P	P	P	P		
Self-storage facility / mini-warehouse storage facility with related retail and services (i.e. moving truck rental)					SUP		SUP	SUP	SUP	SUP
Semiconductor Manufacture (Subject to additional requirements of Section 17.9)										SUP[3]
Sexually Oriented Businesses (see Section 17.8 for standards)										P
Sheet metal shops									P	P
Sign manufacture, painting and maintenance					P			P	P	
Soap, detergent and washing compound manufacture										SUP
Solar Farm <less than 2 acres follow Section 17.6	P	P	P	P					P	P
Solar Farm >greater than 2 acres follow Section 17.6	SUP	SUP	SUP	SUP					SUP	SUP
Sporting goods sales					P	P	P	P		
Spray irrigation of tertiary tested wastewater (reclaimed water)	P	P	P	P	P	P	P	P	P	P
Stonecutting, monument manufacture and sales									P	P
Storage warehouses									SUP	SUP

Zoning District		R5	R2	R1	O&I	B-1*	NB	CB	RB	IL	IH
Storage yards (outdoor storage)										SUP	SUP
Street and railway rights-of-way		P	P	P							
Swimming pool and related items sales and service						P		P	P		
Tannery or tanning operations (Subject to additional requirements of Section 17.9)											SUP
Tar and waterproofing materials manufacture, treatment and storage (Subject to additional requirements of Section 17.9)											SUP
Wireless Telecommunications Facilities and Wireless Support Structures **Subject to the provisions of the Wireless Facilities Ordinance*	Wireless Support Structures that are sixty (60) feet or less in height	P*	P*	P*	P*	P*	P*	P*	P*	P*	P*
	Concealed Wireless Facilities that are sixty (60) feet or less in height	P*	P*	P*	P*	P*	P*	P*	P*	P*	P*
	Concealed Wireless Facilities one hundred fifty (150) feet or less in height but greater than sixty (60) feet in height	SUP*	SUP*	SUP*	P*	P*	P*	P*	P*	P*	P*
	Wireless Support Structures that are less than one hundred ninety-nine (199) feet, but greater than sixty (60) feet in height	SUP*	SUP*	SUP*	SUP*	SUP*	SUP*	SUP*	SUP*	P*	P*
	Wireless Support Structures that are greater than one hundred ninety-nine (199) feet, but no more than four hundred (400) feet in height	SUP*	SUP*	SUP*	SUP*	SUP*	SUP*	SUP*	SUP*	SUP*	SUP*
Temporary construction trailers or structures (See definitions for requirements)		P	P	P	P	P	P	P	P	P	P
Textile machinery manufacture											P
Textile manufacture including spinning, dyeing, bleaching and other heavy processes (Subject to additional requirements of Section 17.9)											SUP
Tire recapping and re-treading										P	P
Tobacco processing and storage										P	P
Trailer sales areas										P	P

Zoning District Transportation equipment Manufacture	**R5**	**R2**	**R1**	**O&I**	**B-1***	**NB**	**CB**	**RB**	**IL**	**IH** SUP[3]
Truck terminals, repair shops, hauling and storage yards									P	P
Upholstery, paper hanging and decorator shops					P	P	P	P	P	P
Uses and structures customarily accessory to any permitted use					P	P	P	P	P	P
Veterinary clinics and hospitals with dog runs or equivalent facilities					P		SUP	SUP	SUP	SUP
Veterinary hospitals & clinics					P		P	P	P	P
Wastepaper and rags, collection and bailing									P	P
Wholesale and jobbing establishments including incidental retail outlets for only such merchandise as is handled at wholesale									P	P
Woodworking shops, mill work									P	P

CHATHAM COUNTY WATERSHED PROTECTION ORDINANCE

Ordinance Adopted December 6, 1993
Ordinance Effective January 1, 1994
Latest Revision July 18, 2022

Table of Contents

if the recording of such plat would be in conflict with this Ordinance.

ARTICLE 300: DEVELOPMENT REGULATIONS

Section 301. Establishment of Watershed Area.

The purpose of this Article is to list and describe the watershed areas herein adopted. The areas of Chatham County within the jurisdiction of this Ordinance as specified in Section 102 are hereby established as watershed areas.

For purposes of this Ordinance the county is hereby divided into the following areas:

(A) WS II - BW (Balance of Watershed):

This area is the portion of Chatham County draining to University Lake. Generally it is bounded on the east by U.S. 15-501, the south by S.R. 1532 (Manns Chapel Road), on the west by S.R. 1534 and on the north by the Chatham/Orange County line.

(B) WS III - CA (Critical Area):

This area is the land extending beyond the area designated as River Corridor, but within a distance of 2,640 feet from the normal pool elevation of approximately 540 feet of the Rocky River Lower Reservoir. (#8)

(C) WS III - BW (Balance of Watershed)

This area is the land draining to the Siler City water system intake on the Rocky River.

(D) WS IV - CA (Critical Area):

This area is the land within: (1) One mile and draining to the water intakes for Pittsboro (Haw River), Sanford (Cape Fear River), and Goldston-Gulf (Deep River). (2) One-half mile from the normal pool level and draining to Jordan Lake.

(E) WS IV - PA (Protected Area):

This land is the area that is within 10 miles and draining to the water intakes listed in (D) (1) above and within 5 miles and draining to (D) (2) above.

(a) New sludge application sites

(b) New landfills

(c) Petroleum contaminated soil remediation

(d) Toxic or hazardous materials unless specifically in relation to a permitted use and unless a spill containment plan is approved and implemented.

(E) WS-IV Watershed Areas - Protected Area (WS-IV-PA).

(1) Uses Allowed:

(a) Agriculture, subject to the provisions of the Food Security Act of 1985 and the Food, Agricultural, Conservation and Trade Act of 1990. Agricultural activities conducted after January 1, 1993 shall maintain a minimum ten (10) foot vegetative buffer, or equivalent control as determined by the Soil and Water Conservation Commission, along all perennial waters indicated on the most recent versions of U.S.G.S. 1:24,000 (7.5 minute) scale topographic maps or as determined by local government studies. Animal operations greater than 100 animal units shall employ Best Management Practices by July 1, 1994 recommended by the Soil and Water Conservation Commission.

(b) Silviculture, subject to the provisions of the Forest Practices Guidelines Related to Water Quality (15 NCAC 1I.6101-.0209).

(c) Residential development.

(d) Non-residential development

(2) Density and Built-upon Limits:

(a) Single Family Residential--development shall not exceed one (1) dwelling unit

per acre, as defined on a project by project basis, except within conservation subdivisions that shall not exceed two (2) dwelling units per acre, as defined on a project by project basis. No residential lot shall be less than 40,000 square feet or 65,340 square feet for lots with individual wells and individual wastewater disposal systems, except within an approved cluster development (#6), compact community, or conservation subdivision. (#12)

(b) All Other Residential and Non-Residential--development shall not exceed twenty-four percent (24%) built-upon area on a project by project basis. For projects without a curb and gutter street system, development shall not exceed thirty-six percent (36%) built-upon area on a project by project basis. In addition, in the portion of the WSIV PA draining to the state designated Cape Fear WSIV PA, non-residential uses may occupy ten percent (10%) of the PA with a seventy percent (70%) built upon area when approved as a special non-residential intensity allocation (SNIA). The Watershed Administrator is authorized to approve SNIAs consistent with provisions of this ordinance for projects within the designated Moncure Megasite Watershed Overlay District. Projects that are approved for an SNIA must minimize built-upon surface area, direct stormwater away from surface waters, and incorporate Best Management Practices to minimize water quality impacts. For the purpose of calculating built-upon area, total project area shall include acreage in the tract on which the project is to be developed. No residential or non-residential lot shall be less than 40,000 square feet, except within an approved cluster development (#6), compact community, or conservation subdivision. (#12)

(c) Lots to be created for the express

purpose of minor utilities are exempted from the Required Minimum Lot Area. Any noise producing equipment or generators must be stored within a structure, or must be setback a minimum fifty (50) feet from any public right-of-way or property line.

(3) Prohibited Uses:

(a) The storage of toxic and hazardous materials unless a spill containment plan is approved and implemented.

(F) River Corridor (RC)

(1) Allowed Uses:

(a) Agriculture, subject to the provisions of the Food Security Act of 1985 and the Food, Agricultural, Conservation and Trade Act of 1990. Agricultural activities conducted after January 1, 1993 shall maintain a minimum ten (10) foot vegetative buffer, or equivalent control as determined by the Soil and Water Conservation Commission, along all perennial waters indicated on the most recent versions of U.S.G.S. 1:24,000 (7.5 minute) scale topographic maps or as determined by local government studies. Animal operations greater than 100 animal units shall employ Best Management Practices by July 1, 1994 recommended by the Soil and Water Conservation Commission.

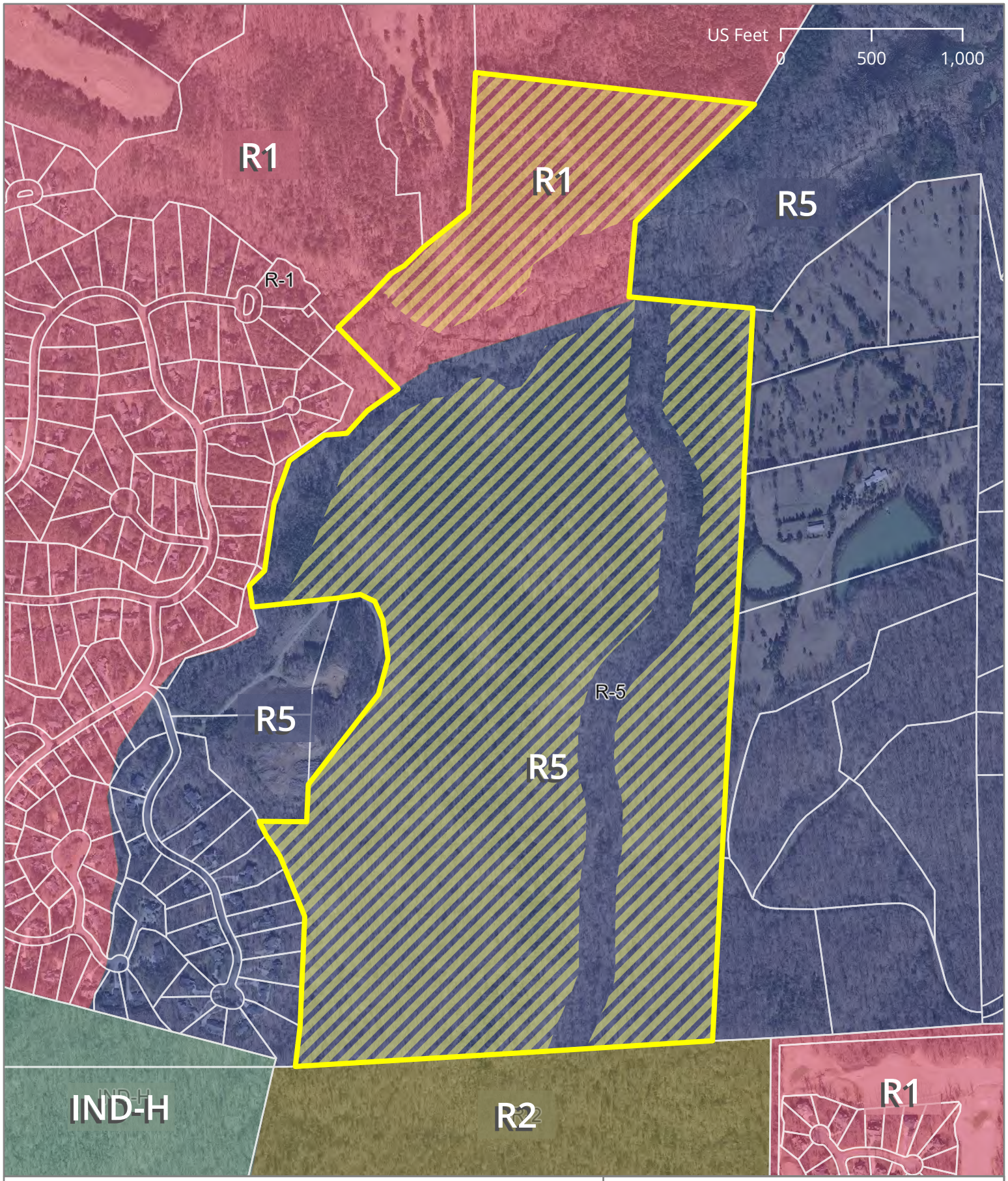
(b) Silviculture, subject to the provisions of the Forest Practices Guidelines Related to Water Quality (15 NCAC 1I.6101-.0209).

(c) Residential development.

(d) Non-residential development listed as permitted uses in attachment A.

(2) Density and Built-upon Limits:

(a) Single Family Residential--development shall average one dwelling unit per



Zoning Ordinance Map

N

Parcel Boundary

Project Area

Residential District 5

Residential District 2

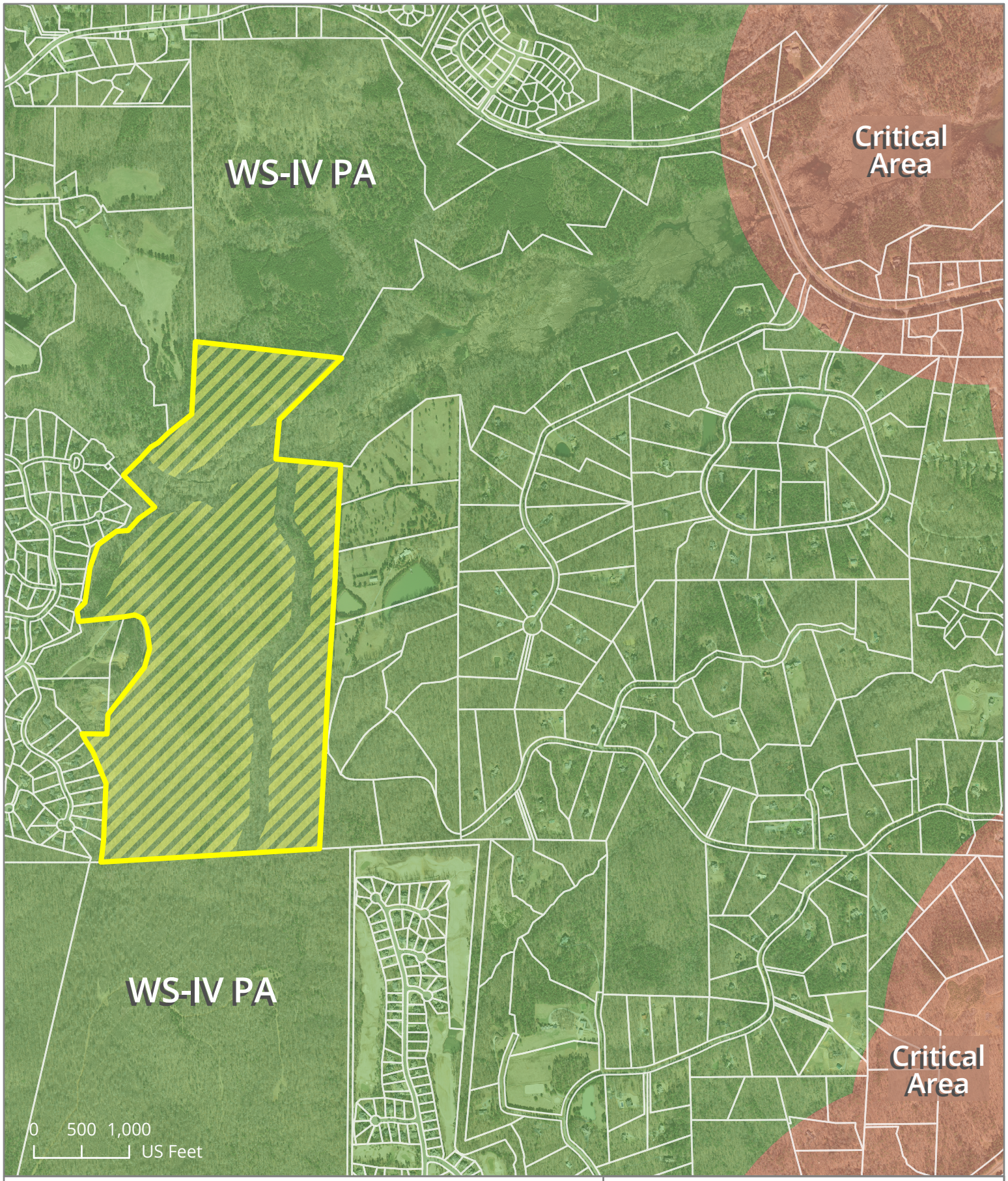
Residential District 1

Heavy Industrial District

Big Woods Forest Preservation

Triangle Land Conservancy

tlc TRIANGLE LAND CONSERVANCY



Wetland Restrictions Map

N

Parcel Boundary

Project Area

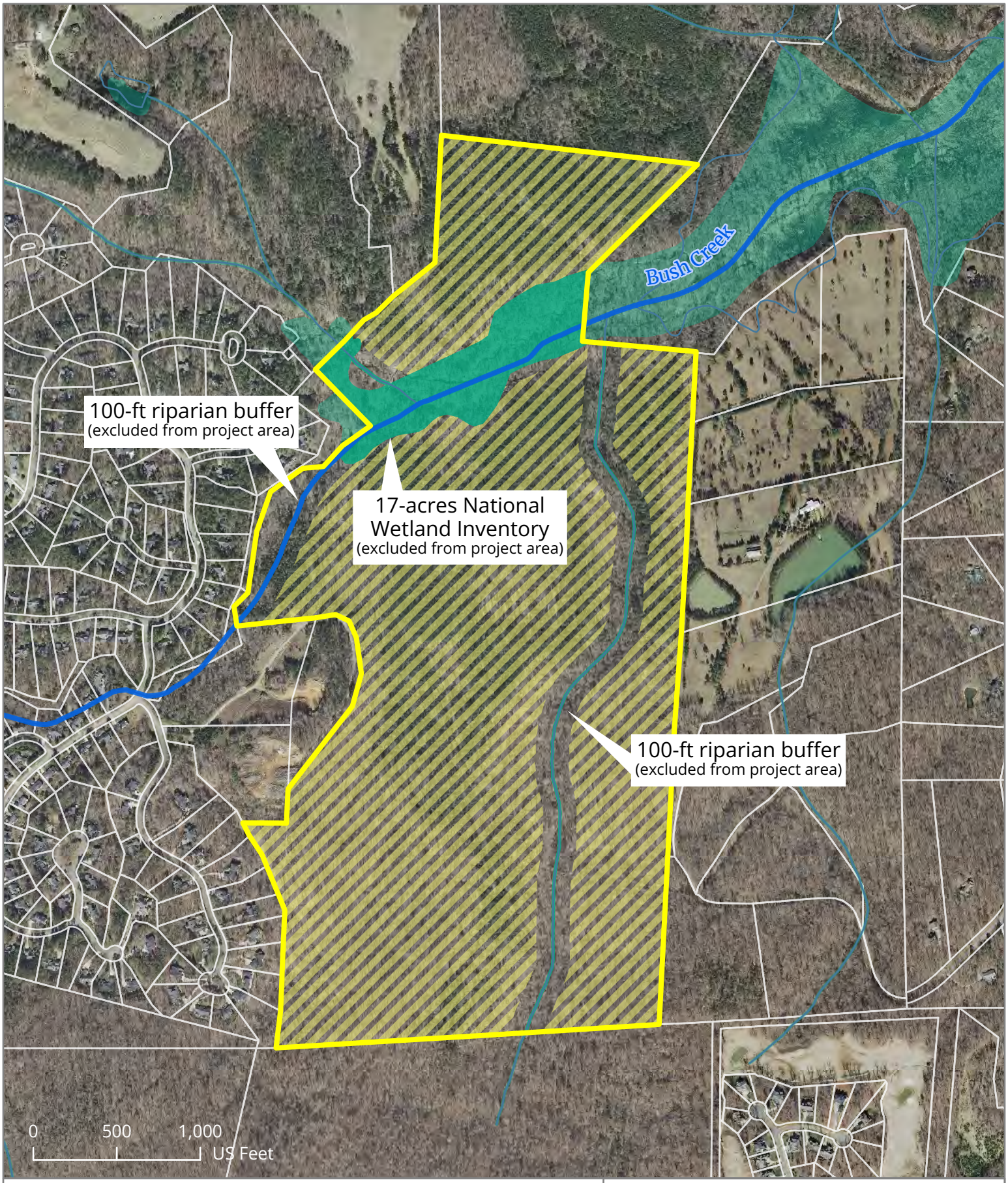
WS-IV Protected Area

Critical Area

Big Woods Forest Preservation

Triangle Land Conservancy

tlc TRIANGLE LAND CONSERVANCY



Wetland Restrictions Map

N

Parcel Boundary

Project Area

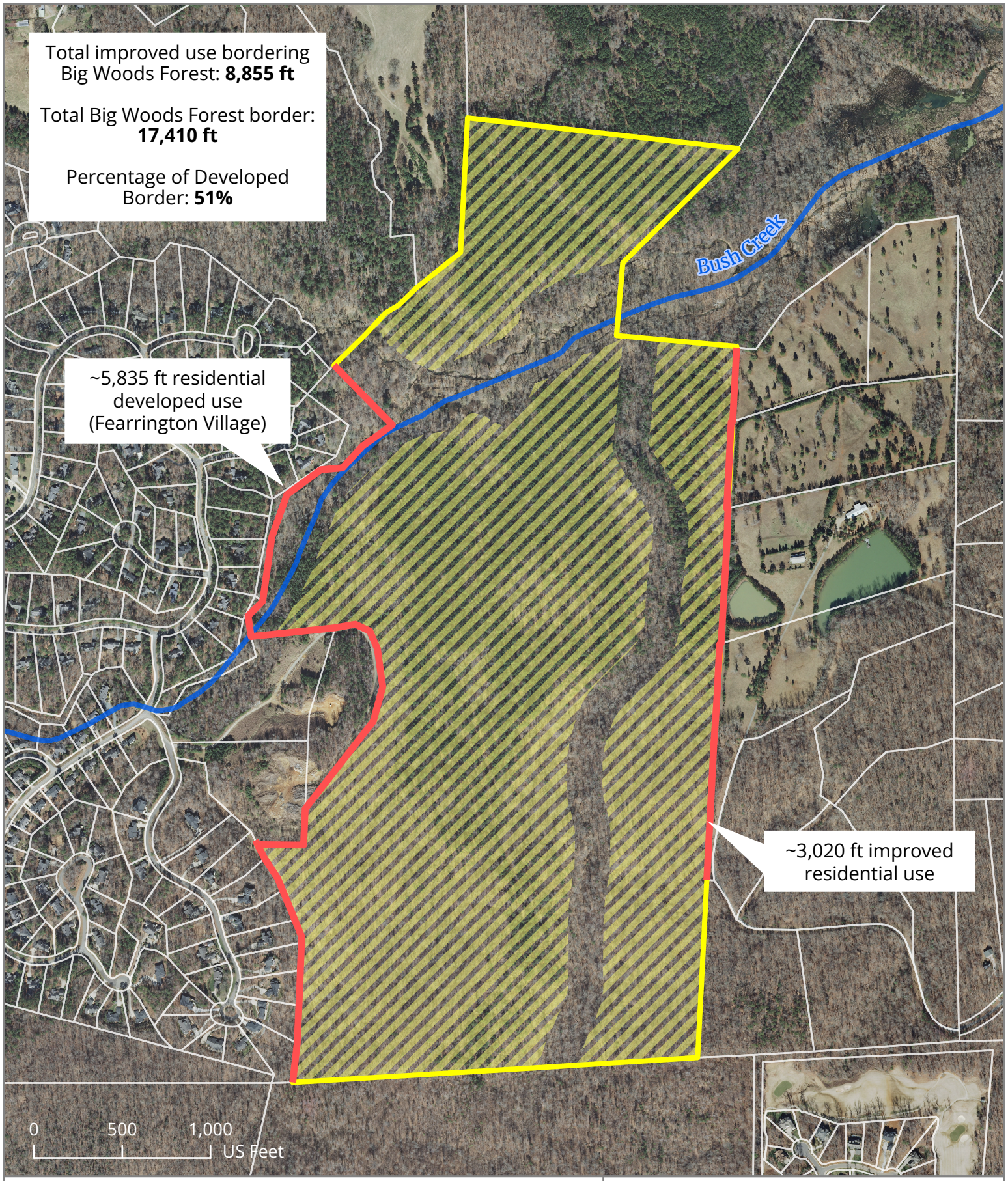
Streams

Wetlands

Big Woods Forest Preservation

Triangle Land Conservancy

tlc
TRIANGLE LAND CONSERVANCY



Threat of Loss Map

N

Parcel Boundary

Project Area

Streams

Improved Use Border

Big Woods Forest Preservation

Triangle Land Conservancy

tlc TRIANGLE LAND CONSERVANCY

Big Woods Forest Preservation

Triangle Land Conservancy

tlc TRIANGLE LAND CONSERVANCY

Big Woods Forest Preserve
Attestation of No Double Counting of Credits & No Net Harm

I am the Executive Director of Triangle Land Conservancy and make this attestation regarding the no double counting of credits and no net harm from this tree preservation project, Big Woods Forest Preserve.

1. Project Description

The Project that is the subject of this attestation is described more fully in both our Application and our Project Design Document (PDD), both of which are incorporated into this attestation.

2. No Double Counting by Applying for Credits from another Registry

Triangle Land Conservancy has not and will not seek credits for CO_2 for the project trees or for this project from any other organization or registry issuing credits for CO_2 storage.

3. No Double Counting by Seeking Credits for the Same Trees or Same CO_2 Storage

Triangle Land Conservancy has not and will not apply for a project including the same trees as this project nor will it seek credits for CO_2 storage for the project trees or for this project in any other project or more than once. Triangle Land Conservancy checked the location of the Project Area against the Registry-provided geospatial database, which contains geospatial data on the project areas of all registered urban forest carbon preservation projects to date. Project Operator has determined that there is no overlap of Project Area or Project Trees with any registered urban forest carbon preservation project.

4. No Net Harm

The trees preserved in this project will produce many benefits, as described in our Application and PDD. Like almost all urban trees, the project trees are preserved for the benefits they deliver to people, communities, and the environment in a metropolitan area.

The project trees will produce many benefits and will not cause net harm. Specifically, they will not:

- Displace native or indigenous populations
- Deprive any communities of food sources
- Degrade a landscape or cause environmental damage

Signed on August 29 in 2024, by Sandra Sweitzer, for Triangle land Conservancy

Sandra Sweitzer
_____
Signature

919-630-4691
_____
Phone

ssweitzer@triangleland.org

Email

Big Woods Forest Preserve
Attestation of Additionality

I am the Executive Director of Triangle Land Conservancy and make this attestation regarding additionality from this tree preservation project, Big Woods Forest Preserve.

- Project Description
    - The Project that is the subject of this attestation is described more fully in the Application and the Project Design Document (PDD), both of which are incorporated into this attestation.
- Prior to the Preservation Commitment, the trees in the Project Area were not protected via easement or recorded encumbrance or in a protected zoning status that preserves the trees
- Prior to the Preservation Commitment, the zoning in the Project Area allowed for a non-forest use.
- Prior to the Preservation Commitment, the trees in the Project Area passed one of three tests to demonstrate a threat or risk of removal or conversion out of forest
- Triangle Land Conservancy recorded in the public land records an easement, covenant, or deed restriction specifically protecting the trees for the project duration of 40 years.
- Additionality is also embedded in the quantification methodology that our project followed. Projects cannot receive, and the project will not receive, credits for trees that would have remained had development occurred, nor can they receive soil carbon credits for soil that would have been undisturbed had development occurred. The project also had to apply a discount to credited carbon for potential displaced development due to the project.
- Project Implementation Agreement for Project Duration
    - Triangle Land Conservancy signed a Project Implementation Agreement with City Forest Credits for 40 years.
- Financial Additionality
    - The successful preservation of carbon stock on the Project Area over the 40-year Project Duration requires stewardship and maintenance to manage forest health, including the increased risk of pests, disease, and invasive species encroachment in urban and peri-urban areas. The Project Operator has no guaranteed source of long-term maintenance funding outside of the carbon revenues. Funding used to acquire the Big Woods Forest project does not cover stewardship activity beyond annual monitoring costs.
    - The revenue from the sale of carbon credits will play a material role in the successful and durable preservation of the Project Area's carbon stock by providing funding for stewardship and maintenance that ensure the forest's long-term health and resilience. TLC plans to use the revenue from this project to assist with stewardship needs including invasive species removal and restoration, and trail design. A portion of it will also be used for capital improvements (building trails, gates, signs, neighboring acquisitions, etc.) that will enable the project to be opened as a nature preserve for the public.

The organization is in the process of adopting a policy dictating the acceptable uses for revenue generated from individual properties. The policy will ensure that funds are used for long-term stewardship activities, investments, improvements, or additions on the property. This includes, but is not limited to, trail building and maintenance, invasive species control, and neighboring land acquisitions that protect and enhance the health of the property.

- Prior consideration: The Big Woods Forest Preserve is Triangle Land Conservancy's first carbon crediting project. The organization has been exploring carbon crediting options for several years to help serve its mission in creating a healthier and more vibrant Research Triangle region by safeguarding clean water, protecting natural habitats, supporting local farms and food, and connecting people with nature. The City Forest Credits protocol aligns with TLC's goals and mission and has proven successful project completion with other similarly sized land trust projects across the country. An increase in organizational capacity in 2023 allowed TLC to actively pursue registering the Fitch property with City Forest Credits, as it was determined to be a good fit for their tree preservation protocol.

Signed on August 11th in 2025, by Sandra Sweitzer, for Triangle Land Conservancy.

Signature

Sandra Sweitzer

Printed Name

919-908-0051

Phone

ssweitzer@triangleland.org

Email

City Forest Credits - Preservation Protocol Carbon Quantification Calculator

Project Operator Triangle Land Conservancy
Project Name Big Woods Forest
Project Location Chathan County, NC
Date 9-Aug-24

Carbon Quantification Summary		**Protocol Section**	**Supplemental information/notes**
206.77	Total Project Area Acres		include project area for all parcels enrolled in carbon project
39.86	Biomass tC/ac	11.1.B	A complete inventory was performed on all trees within the project area that had a diameter at breast height of 5 inches or more, corresponding to method 11.1.B , include i-Tree eco results
146.16	Biomass tCO2e/ac	11.1.B	
30,190	Accounting Stock, tCO2e	11.1.B	
53%	Fraction at risk of tree removal	11.2	Based on zoning - see 11.2 in preservation protocol
15,844	Avoided Biomass Emissions, tCO2e	11.2	
48%	Avoided impervious surface, percent	11.3	Based on zoning - see 11.3 in preservation protocol
98	Avoided impervious surface, acres	11.4	
11,782	Avoided Soil Carbon Emissions, tCO2e	11.4	
18.3%	Displacement	11.5	Fraction of avoided development that cannot be served by development or re-development of existing non-treed properties within the urban area
2,899	Displaced Biomass Emissions, tCO2e		
3,570	Displaced Soil Emissions		Assumes that redevelopment causes increase in impervious surface on redeveloped parcels
12,944	Credits from Avoided Biomass Emissions, tCO2e		
8,212	Credits from Avoided Soil Emissions, tCO2e		
21,156	Total Credits attributed to the project, tCO2e		
2,116	Registry Reversal Pool Account (10%), tCO2e		
19,041	**Total credits issued to the project, tCO2e**		
92	**Total credits issued to the project, tCO2e/acre**		

Year	Credits Issued This Year	Credits Issued	Buffer Credits Issued
1	4,604	4,604	512
2	4,604	9,208	512
3	4,604	13,812	512
4	4,604	18,416	512
5	625	19,041	68

City Forest Credits - Preservation Protocol Carbon Quantification Calculator

Project Operator
Project Name
Project Location
Date

Carbon Quantification Summary		**Protocol Section**	**Supplemental information/notes**
6.83	Total Project Area Acres		include project area for all parcels enrolled in carbon project
38.33	Biomass tC/ac	11.1.B	A complete inventory was performed on all trees within the project area that had a diameter at breast height of 5 inches or more, corresponding to method 11.1.B , include i-Tree eco results
140.56	Biomass tCO2e/ac	11.1.B	
960	Accounting Stock, tCO2e	11.1.B	
90.00%	Fraction at risk of tree removal	11.2	Based on zoning - see 11.2 in preservation protocol
864	Avoided Biomass Emissions, tCO2e	11.2	
41.88%	Avoided impervious surface, percent	11.3	Based on zoning - see 11.3 in preservation protocol
3	Avoided impervious surface, acres	11.4	
343	Avoided Soil Carbon Emissions, tCO2e	11.4	
18.3%	Displacement	11.5	Fraction of avoided development that cannot be served by development or re-development of existing non-treed properties within the urban area
158	Displaced Biomass Emissions, tCO2e		
104	Displaced Soil Emissions		Assumes that redevelopment causes increase in impervious surface on redeveloped parcels
706	Credits from Avoided Biomass Emissions, tCO2e		
239	Credits from Avoided Soil Emissions, tCO2e		
945	Total Credits attributed to the project, tCO2e		
95	Registry Reversal Pool Account (10%), tCO2e		
851	**Total credits issued to the project, tCO2e**		
125	**Total credits issued to the project, tCO2e/acre**		

City Forest Credits - Preservation Protocol Carbon Quantification Calculator

Project Operator
Project Name
Project Location
Date

Carbon Quantification Summary		**Protocol Section**	**Supplemental information/notes**
23.72	Total Project Area Acres		include project area for all parcels enrolled in carbon project
41.75	Biomass tC/ac	11.1.B	A complete inventory was performed on all trees within the project area that had a diameter at breast height of 5 inches or more, corresponding to method 11.1.B , include i-Tree eco results
153.10	Biomass tCO2e/ac	11.1.B	
3,631	Accounting Stock, tCO2e	11.1.B	
90%	Fraction at risk of tree removal	11.2	Based on zoning - see 11.2 in preservation protocol
3,268	Avoided Biomass Emissions, tCO2e	11.2	
41.88%	Avoided impervious surface, percent	11.3	Based on zoning - see 11.3 in preservation protocol
10	Avoided impervious surface, acres	11.4	
1,192	Avoided Soil Carbon Emissions, tCO2e	11.4	
18.3%	Displacement	11.5	Fraction of avoided development that cannot be served by development or re-development of existing non-treed properties within the urban area
598	Displaced Biomass Emissions, tCO2e		
361	Displaced Soil Emissions		Assumes that redevelopment causes increase in impervious surface on redeveloped parcels
2,670	Credits from Avoided Biomass Emissions, tCO2e		
831	Credits from Avoided Soil Emissions, tCO2e		
3,501	Total Credits attributed to the project, tCO2e		
350	Registry Reversal Pool Account (10%), tCO2e		
3,151	**Total credits issued to the project, tCO2e**		
133	**Total credits issued to the project, tCO2e/acre**		

City Forest Credits - Preservation Protocol Carbon Quantification Calculator

Project Operator
Project Name
Project Location
Date

Carbon Quantification Summary		**Protocol Section**	**Supplemental information/notes**
107.61	Total Project Area Acres		include project area for all parcels enrolled in carbon project
38.33	Biomass tC/ac	11.1.B	A complete inventory was performed on all trees within the project area that had a diameter at breast height of 5 inches or more, corresponding to method 11.1.B , include i-Tree eco results
140.56	Biomass tCO2e/ac	11.1.B	
15,125	Accounting Stock, tCO2e	11.1.B	
45.75%	Fraction at risk of tree removal	11.2	Based on zoning - see 11.2 in preservation protocol
6,920	Avoided Biomass Emissions, tCO2e	11.2	
48.51%	Avoided impervious surface, percent	11.3	Based on zoning - see 11.3 in preservation protocol
52	Avoided impervious surface, acres	11.4	
6,264	Avoided Soil Carbon Emissions, tCO2e	11.4	
18.3%	Displacement	11.5	Fraction of avoided development that cannot be served by development or re-development of existing non-treed properties within the urban area
1,266	Displaced Biomass Emissions, tCO2e		
1,898	Displaced Soil Emissions		Assumes that redevelopment causes increase in impervious surface on redeveloped parcels
5,654	Credits from Avoided Biomass Emissions, tCO2e		
4,366	Credits from Avoided Soil Emissions, tCO2e		
10,020	Total Credits attributed to the project, tCO2e		
1,002	Registry Reversal Pool Account (10%), tCO2e		
9,018	**Total credits issued to the project, tCO2e**		
84	**Total credits issued to the project, tCO2e/acre**		

City Forest Credits - Preservation Protocol Carbon Quantification Calculator

Project Operator
Project Name
Project Location
Date

Carbon Quantification Summary				**Protocol Section**	**Supplemental information/notes**
68.61	Total Project Area Acres	0.2	Parking lot Area Acres		include project area for all parcels enrolled in carbon project
41.75	Biomass tC/ac	41.75	Biomass tC/ac	11.1.B	A complete inventory was performed on all trees within the project area that had a diameter at breast height of 5 inches or more, corresponding to method 11.1.B , include i-Tree eco results
153.10	Biomass tCO2e/ac	153.10	Biomass tCO2e/ac	11.1.B	
10,504	Accounting Stock, tCO2e	31	Accounting Stock, tCO2e	11.1.B	
45.75%	Fraction at risk of tree removal	45.75%	Fraction at risk of tree removal	11.2	Based on zoning - see 11.2 in preservation protocol
4,806	Avoided Biomass Emissions, tCO2e	14	Avoided Biomass Emissions, tCO2e	11.2	
48.51%	Avoided impervious surface, percent	48.51%	Avoided impervious surface, percent	11.3	Based on zoning - see 11.3 in preservation protocol
33	Avoided impervious surface, acres	0.10	Avoided impervious surface, acres	11.4	
3,994	Avoided Soil Carbon Emissions, tCO2e	12	Avoided Soil Carbon Emissions, tCO2e	11.4	
18.3%	Displacement	18.3%	Displacement	11.5	Fraction of avoided development that cannot be served by development or re-development of existing non-treed properties within the urban area
879	Displaced Biomass Emissions, tCO2e	3	Displaced Biomass Emissions, tCO2e		
1,210	Displaced Soil Emissions	4	Displaced Soil Emissions		Assumes that redevelopment causes increase in impervious surface on redeveloped parcels
3,926	Credits from Avoided Biomass Emissions, tCO2e	11	Credits from Avoided Biomass Emissions, tCO2e		
2,784	Credits from Avoided Soil Emissions, tCO2e	8	Credits from Avoided Soil Emissions, tCO2e		
6,710	Total Credits attributed to the project, tCO2e	20	Total Credits attributed to the project, tCO2e		
671	Registry Reversal Pool Account (10%), tCO2e	2	Registry Reversal Pool Account (10%), tCO2e		
6,039	**Total credits issued to the project, tCO2e**	**18**	**Removed credits from project due to 0.2 ac parking lot (tCO2e)**		
88	**Total credits issued to the project, tCO2e/acre**	**90**	**Removed credits from project due to 0.2 ac parking lot (tCO2e/acre)**		

Fraction at Risk & Impervious Surface Worksheet - Residential Zoning

Fraction at Risk of Tree Removal		Supplemental Information/Notes
If minimum lot size is smaller than 2.25 acres, use 90%		
OR if minimum lot size is larger than 2.25 acres:		
30.55	Project Area (acres)	
1.000	Minimum lot size (acres/unit)	Check the local zoning code
30.00	Max potential dwelling units	
60.00	Clearing estimated at 2 acres/unit	
-2.95	Clearing estimated at 10% of remaining area	
57.1	Total potentially cleared area	
90.00%	Fraction at risk of tree removal	

Impervious Surface		
If zoning code does not specify maximum lot coverage or yard setbacks, use the lesser of 50% or the fraction at risk of tr		*Per 11.3.B
OR If the Zoning Code specifies maximum lot coverage		
	Avoided impervious surface (maximum lot coverage)	Check the local zoning code
OR If the Zoning Code does <u>not</u> specify maximum lot coverage but specifies minimum yard setbacks		
30.55	Project Area (acres)	
40000.00	Minimum lot size (sqft/unit)	Check the local zoning code
100.00	Minimum lot width (feet)	
400.00	Estimated lot length (feet)	
40	Front yard setback (ft)	
4,000	Estimated front yard setback (sqft)	
25	Rear yard setback (ft)	
2,500	Estimated rear yard setback (sqft)	
25	Side yard setback	
16,750	Estimated side yard setbacks (sqft/unit)	
23,250	All setbacks per unit (sqft/unit)	
41.88%	Avoided impervious surface	**CHECK: if greater than 50%, the standard deduction for residential use should be used. If less than 50%, use this number instead.**
		The standard deduction for residential use is the lesser of 50% or the fraction at risk of tree removal

Fraction at Risk & Impervious Surface Worksheet - Residential Zoning

Fraction at Risk of Tree Removal		Supplemental Information/Notes
If minimum lot size is smaller than 2.25 acres, use 90%		
OR if minimum lot size is larger than 2.25 acres:		
176.22	Project Area (acres)	
5.000	Minimum lot size (acres/unit)	Check the local zoning code
35.00	Max potential dwelling units	
70.00	Clearing estimated at 2 acres/unit	
10.62	Clearing estimated at 10% of remaining area	
80.6	Total potentially cleared area	
45.75%	Fraction at risk of tree removal	

Impervious Surface		
If zoning code does not specify maximum lot coverage or yard setbacks, use the lesser of 50% or the fraction at risk		*Per 11.3.B
OR If the Zoning Code specifies maximum lot coverage		
	Avoided impervious surface (maximum lot coverage)	Check the local zoning code
OR If the Zoning Code does <u>not</u> specify maximum lot coverage but specifies minimum yard setbacks		
176.22	Project Area (acres)	
217800.00	Minimum lot size (sqft/unit)	Check the local zoning code
100.00	Minimum lot width (feet)	
2178.00	Estimated lot length (feet)	
40	Front yard setback (ft)	
4,000	Estimated front yard setback (sqft)	
25	Rear yard setback (ft)	
2,500	Estimated rear yard setback (sqft)	
25	Side yard setback	
105,650	Estimated side yard setbacks (sqft/unit)	
112,150	All setbacks per unit (sqft/unit)	
48.51%	Avoided impervious surface	**CHECK: if greater than 50%, the standard deduction for residential use should be used. If less than 50%, use this number instead.**
		The standard deduction for residential use is the lesser of 50% or the fraction at risk of tree removal

Benefits Summary of Trees by Stratum and Species

Location: Fearrington Village, Chatham, North Carolina, United States of America
Project: Big Woods Forest Preserve, Series: BWF Tree Carbon Inventory, Year: 2024
Generated: 8/22/2024

Stratum	Species	Trees		Carbon Storage	
		Number	SE	(ton)	SE
Stand 1	Red maple	2,490	±707	348.09	±136.62
	Pignut hickory	1,936	±412	1,109.35	±360.68
	Shagbark hickory	69	±69	14.66	±14.55
	Mockernut hickory	553	±267	254.71	±115.18
	Eastern redbud	138	±94	8.89	±6.51
	Sugarberry	138	±137	3.64	±3.62
	American beech	553	±285	139.72	±111.40
	White ash	692	±425	81.99	±47.06
	Green ash	69	±69	5.72	±5.68
	Black walnut	69	±69	59.00	±58.57
	Eastern red cedar	692	±348	86.94	±67.37
	Sweetgum	1,383	±730	126.10	±69.68
	Tulip tree	3,181	±894	809.44	±231.69
	Red mulberry	69	±69	9.15	±9.08
	Black tupelo	553	±203	100.79	±40.23
	Eastern hophornbeam	69	±69	2.67	±2.65
	Sourwood	553	±302	42.48	±22.66
	Shortleaf pine	622	±414	127.91	±71.42
	Loblolly pine	346	±218	36.34	±22.20
	Black cherry	692	±301	60.75	±27.57
	White oak	1,452	±354	641.31	±181.94
	Southern red oak	207	±150	148.30	±101.58
	Willow oak	138	±94	92.50	±66.87
	Northern red oak	899	±309	407.20	±176.75
	Winged elm	553	±362	103.57	±88.40
	Total	**18,118**	**±1,713**	**4,821.19**	**±433.89**
Stand 2	Red maple	1,475	±448	319.47	±85.21
	Mockernut hickory	78	±77	10.35	±10.28

Benefits Summary of Trees by Stratum and Species

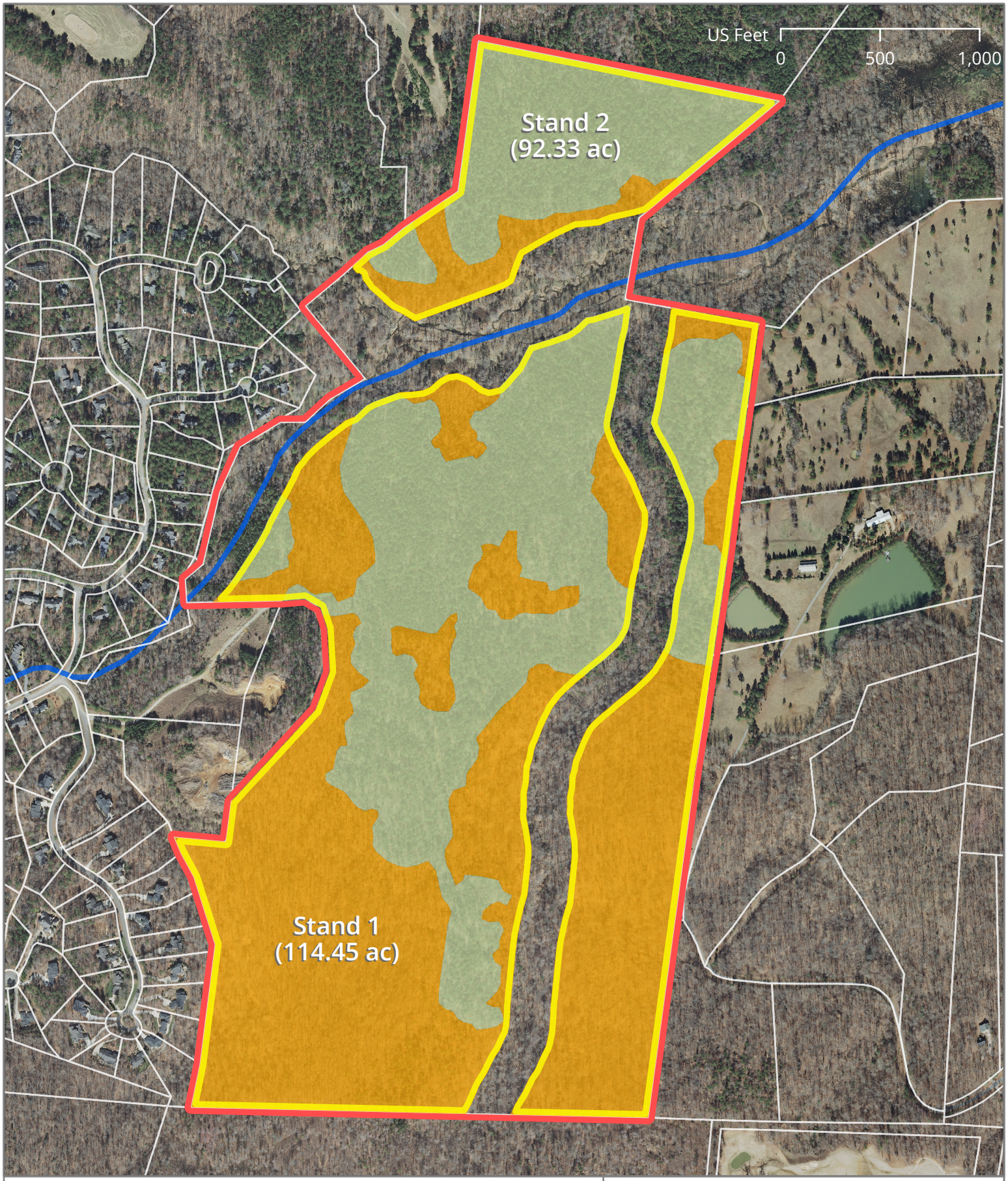
Location: Fearrington Village, Chatham, North Carolina, United States of America
Project: Big Woods Forest Preserve, Series: BWF Tree Carbon Inventory, Year: 2024
Generated: 8/22/2024

Stratum	Species	Trees		Carbon Storage	
		Number	SE	(ton)	SE
	American beech	311	±174	30.42	±20.05
	Eastern red cedar	78	±77	10.69	±10.62
	Sweetgum	2,407	±476	173.19	±46.06
	Tulip tree	2,174	±596	389.57	±107.84
	Black tupelo	233	±166	11.11	±8.67
	Sourwood	544	±266	48.53	±22.06
	Shortleaf pine	621	±263	124.99	±52.44
	Loblolly pine	15,997	±2,159	2,739.70	± 310.76
	Virginia pine	78	±77	3.93	±3.90
	Black cherry	233	±166	10.22	±7.21
	White oak	388	±241	19.23	±11.94
	Southern red oak	78	±77	15.93	±15.82
	Willow oak	233	±121	25.17	±17.27
	Northern red oak	621	±329	217.68	±151.23
	Post oak	78	±77	4.44	±4.41
	Black oak	78	±77	3.97	±3.95
	Winged elm	78	±77	3.46	±3.44
	Total	**25,781**	**±1,995**	**4,162.06**	**± 306.98**
Study Area		**43,899**	**±2,629**	**8,983.25**	**±531.51**

Biomass tC/acre calculation: A plot sample forest assessment adhering to the standards set in CFC Tree Preservation Protocol Section 11.1.B was conducted. The sample established 29 sample plots sized at 1/10th-acre. Within every plot, each live tree at least 5" in diameter at 4.5' above the ground where the height above the ground is measured on the uphill side of the tree was inventoried. Species, diameter, and overall tree condition were recorded for each tree. i-Tree Eco was utilized to input the sample plot data to determine the carbon storage.

Carbon quantification is based on the sample plots. The metric tons of Carbon in Stand 1 is 4,821.19 and the standard error is 433.89. The metric tons of Carbon in Stand 2 is 4,162.06 and the standard error is 306.98.

Biomass tC/ac = (metric tons of carbon – standard error)/project area acres
Stand 1 biomass = (4821.19-433.89)/114.45 = 38.33 (cell B11 on tabs R1-ST1 and R5-ST1 of the carbon quantification spreadsheet)
Stand 2 biomass = (4162.06-306.98)/92.33 = 41.75 (cell B11 on tabs R1-ST2 and R5-ST2 of the carbon quantification spreadsheet)



Forest Inventory Stand Map - Plot Locations

N

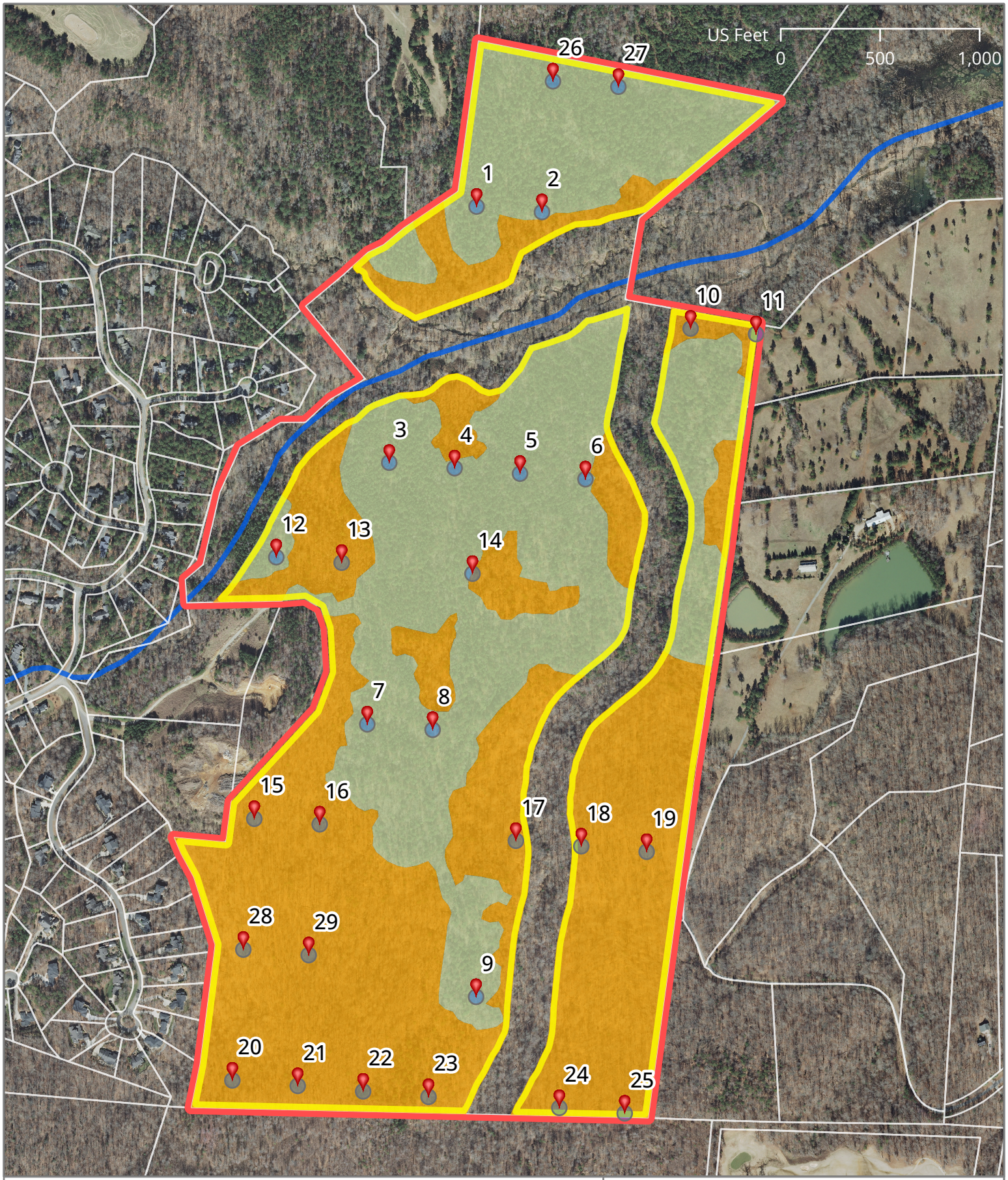
Stand 1 (Hardwood Dominant)

Stand 2 (Pine Dominant)

Big Woods Forest Preservation

Triangle Land Conservancy

tlc
TRIANGLE LAND CONSERVANCY



Forest Inventory Stand Map - Plot Locations

N

Stand 1 (Hardwood Dominant)

Stand 2 (Pine Dominant)

Forest Inventory Plots

Big Woods Forest Preservation

Triangle Land Conservancy

tlc TRIANGLE LAND CONSERVANCY

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	PlotID	StratumID	Latitude	Longitude	Tree	SpC	Dbh1	Dbh1 ht	Dbh2	Dbh2 ht	Dbh3	Dbh3 ht	RdG	Crown Condition	% Canopy Cover	% Measured	DBH Estimated	Comments	Scientific Name	
2	17	ST1	354748.970	-790344.360	0										83	100				
3	17				1	BC	6.9							87.0					Prunus serotina	
4	17				2	BEE	8.4							97.0					Fagis grandifolia	
5	17				3	RM	5.0							63.0					Acer rubra	
6	17				4	BEE	6.7							87.0						
7	17				5	NRO	22.2							93.0					Quercus rubra	
8	17				6	PH	8.6							67.0					Carya glabra	
9	17				7	NRO	11.1							97.0						
10	17				8	RM	7.8							83.0						
11	17				9	WO	8.2							93.0					Quercus alba	
12	17				10	RC	5.2							27.0					Juniperus virginiana	
13	17				11	BEE	5.0							53.0						
14	17				12	WA	16.0	11.00						0			Y		Fraxinus alba	
15	17				13	RM	5.1							0						
16	18	ST1	354748.970	-790340.350	0										93	100				
17	18				1	WO	20.3							77.0						
18	18				2	NRO	5.8							73.0						
19	18				3	WO	13.7							67.0						
20	18				4	WO	14.0							87.0						
21	18				5	PH	15.8							93.0						
22	18				6	MH	12.3							87.0					Carya tomentosa	
23	18				7	WO	5.1							83.0						
24	18				8	RM	5.0							67.0						
25	18				9	MH	16.2							93.0						
26	19	ST1	354748.980	-790336.350	0										87	100				
27	19				1	SL	16.4							87.0					Pinus echinata	
28	19				2	NRO	13.6							87.0						
29	19				3	WO	8.0							17.0						
30	19				4	WO	15.4							93.0						
31	19				5	PH	12.4							87.0						
32	19				6	WO	15.3							83.0						
33	19				7	SRO	20.5							77.0					Quercus falcata	
34	19				8	RC	5.7							73.0						
35	25	ST1	354735.920	-790336.340	0										93	95				
36	25				1	WO	15.0							57.0						
37	25				2	RM	7.0							67.0						
38	25				3	PH	12.7							83.0						
39	25				4	RM	5.1							83.0						
40	25				5	PH	20.1							93.0						
41	25				6	IW	5.7							67.0					Ostrya virginiana	
42	25				7	PH	21.5							97.0						
43	25				8	RM	7.1							63.0						
44	25				9	RC	8.4							0						
45	24	ST1	354735.920	-790340.340	0										77	94				
46	24				1	WO	16.0							67.0						
47	24				2	BC	8.0							83.0						
48	24				3	BC	7.5							87.0						
49	24				4	RM	5.6							77.0						
50	24				5	BC	6.1							53.0						
51	24				6	WA	5.1							77.0						
52	24				7	PH	12.7							97.0						
53	24				8	NRO	7.4							77.0						
54	24				9	RM	6.8							93.0						
55	24				10	RM	9.0							93.0						
56	24				11	WO	10.1							0						
57	24				12	RM	6.7							0						
58	24				13	RM	5.6							0						
59	23	ST1	354735.920	-790348.350	0										93	100				
60	23				1	RM	10.2							73.0						
61	23				2	YP	6.6							73.0					Liriodendron tulipifera	
62	23				3	YP	7.8							27.0						
63	23				4	RM	6.8							67.0						
64	23				5	MH	10.7							83.0						
65	23				6	YP	13.9							43.0						
66	23				7	MH	12.4							87.0						
67	23				8	SW	5.3							93.0					Oxydendrum arboreum	
68	23				9	YP	12.3							87.0						
69	23				10	BEE	5.2							93.0						
70	23				11	RM	16.4							83.0						
71	23				12	YP	13.6							87.0						
72	23				13	SW	6.4							67.0						
73	23				14	SL	12.7							73.0						
74	23				15	RM	5.2							83.0						
75	23				16	RM	6.1							43.0						
76	23				17	MH	11.7							83.0						
77	23				18	RM	10.1							37.0						
78	23				19	RM	13.2	5.10						77.0						
79	23				20	SW	7.4							47.0						
80	23				21	PH	8.5							67.0						
81	23				22	SW	6.9							23.0						
82	23				23	RM	6.5							0						
83	22	ST1	354735.910	-790352.360	0										93	100				
84	22				1	RM	5.9							83.0						
85	22				2	RM	11.7	5.50	7.4	5.5				63.0			Y			
86	22				3	PH	11.6							73.0						
87	22				4	BG	6.3							83.0					Nyssa sylvatica	
88	22				5	SL	15.0							77.0						
89	22				6	YP	11.7							77.0						
90	22				7	SL	13.0							67.0						
91	22				8	RM	5.8							93.0						
92	22				9	YP	24.0							87.0						
93	22				10	RM	5.0							13.0						
94	22				11	SL	8.7							13.0						
95	22				12	MH	17.0							87.0						
96	22				13	SL	12.2							77.0						
97	22				14	RM	5.9							87.0						
98	22				15	SL	11.2							0						
99	22				16	SL	15.0							87.0						
100	22				17	RM	8.4							67.0						
101	21	ST1	354735.910	-790356.370	0										83	100				
102	21				1	PH	5.5							67.0						
103	21				2	YP	27.6							97.0						
104	21				3	NRO	15.3	5.30						73.0						
105	21				4	PH	17.8		12.4					83.0						
106	21				5	YP	6.7							67.0						
107	21				6	NRO	19.2							87.0						
108	21				7	NRO	15.4	5.70						83.0						
109	21				8	RM	8.8							93.0						
110	21				9	SW	7.6							87.0						
111	21				10	RM	11.0							67.0						
112	21				11	WO	8.9							63.0						
113	21				12	BG	10.0							73.0						
114	21				13	SW	6.8							73.0						
115	21				14	RM	13.3							43.0						
116	21				15	RM	10.7							27.0						
117	21				16	RM	5.9	5.00						77.0						
118	21				17	WO	18.6							87.0						
119	21				18	WO	6.7													
120	21				19	SRO	6.1													
121	9	st2	354741.070	-790345.980	0										93	100				
122	9				1	RM	8.2							73.0						
123	9				2	SW	7.1							83.0						

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
124	9				3	SL	6.2							43.0						
125	9				4	SL	17.4							83.0						
126	9				5	RM	10.9							87.0						
127	9				6	LP	19.0							97.0						
128	9				7	RM	6.1							33.0						
129	9				8	YP	18.3							97.0						
130	9				9	LP	9.0							37.0					Pinus taeda	
131	9				10	SW	6.0							17.0						
132	9				11	LP	17.4							83.0						
133	9				12	SW	5.5							27.0						
134	9				13	SL	13.2							77.0						
135	9				14	LP	5.1							63.0						
136	9				15	LP	11.0							47.0						
137	12	st2	354802.020	-790400.390	0										93	100				
138	12				1	LP	23.5							93.0						
139	12				2	SL	15.2							67.0						
140	12				3	RM	12.0							87.0						
141	12				4	SW	5.6							67.0						
142	12				5	RM	8.2							67.0						
143	12				6	RM	7.5							87.0						
144	12				7	LP	5.7							23.0						
145	12				8	YP	8.5	5.20						77.0						
146	12				9	YP	8.8							77.0						
147	12				10	SW	9.4							87.0						
148	12				11	LP	12.3							73.0						
149	12				12	BO	5.0							53.0					Quercus velutina	
150	12				13	SG	5.5							63.0					Liquidambar styraciflua	
151	12				14	YP	5.2							63.0						
152	12				15	YP	7.7							93.0						
153	12				16	YP	9.4							87.0						
154	12				17	YP	8.7							73.0						
155	12				18	LP	13.8							93.0						
156	12				19	LP	9.4							77.0						
157	12				20	RM	5.3							87.0						
158	12				21	LP	6.1							43.0						
159	12				22	LP	8.9							83.0						
160	12				23	LP	8.4							57.0						
161	12				24	LP	8.5							77.0						
162	12				25	LP	7.5							83.0						
163	12				26	LP	6.4							27.0						
164	12				27	LP	11.3							77.0						
165	12				28	LP	11.0							83.0						
166	12				29	LP	7.6							67.0						
167	12				30	SL	10.6							0						
168	12				31	RM	7.6							97.0						
169	13	ST1	354802.020	-790356.390	0										93	100				
170	13				1	SW	6.3							93.0						
171	13				2	SG	5.7							63.0						
172	13				3	SG	5.2							37.0						
173	13				4	YP	8.1							47.0						
174	13				5	YP	13.0							87.0						
175	13				6	YP	12.5		11.1					93.0						
176	13				7	SG	5.5							27.0						
177	13				8	RC	5.0							17.0						
178	13				9	SG	9.3							93.0						
179	13				10	YP	7.6	5.30						47.0						
180	13				11	SRO	16.6							93.0						
181	13				12	BC	5.5							43.0						
182	13				13	SG	5.8	5.30						63.0						
183	13				14	YP	8.2							67.0						
184	13				15	SG	6.3							83.0						
185	13				16	SG	5.8							53.0						
186	13				17	YP	10.2							87.0						
187	13				18	SG	5.1							53.0						
188	13				19	SRO	16.0							93.0						
189	13				20	YP	10.5							87.0						
190	13				21	YP	5.1	5.30						0						
191	10	ST1	354815.090	-790336.370	0										97	100				
192	10				1	PH	5.0							27.0						
193	10				2	YP	6.7		5.5					77.0						
194	10				3	ELM	5.1							57.0					Ulmus alata	
195	10				4	PH	7.5							57.0						
196	10				5	YP	15.1							83.0						
197	10				6	PH	5.3							77.0						
198	10				7	SG	13.0							83.0						
199	10				8	WO	11.9							77.0						
200	10				9	ELM	7.6							23.0						
201	10				10	RM	6.4							47.0						
202	10				11	BC	8.2							93.0						
203	10				12	BC	7.3							83.0						
204	10				13	SG	12.0							87.0						
205	10				14	SG	10.1							47.0						
206	10				15	SL	18.8							83.0						
207	10				16	LP	7.9							37.0						
208	10				17	LP	11.5							77.0						
209	10				18	YP	13.1							77.0						
210	10				19	YP	6.6							67.0						
211	10				20	SH	9.8							97.0					Carya ovata	
212	10				21	YP	9.7							77.0						
213	10				22	YP	17.3							93.0						
214	10				23	WO	7.4							13.0						
215	10				24	SG	8.0							23.0						
216	10				25	LP	5.8							13.0						
217	11	ST1	354815.090	-790332.360	0										93	77				
218	11				1	YP	10.2							97.0						
219	11				2	NRO	16.1							83.0						
220	11				3	RC	5.0							33.0						
221	11				4	WIO	20.3							87.0					Quercus phellos	
222	11				5	YP	9.4							97.0						
223	11				6	ELM	6.7							73.0						
224	11				7	PH	6.4							77.0						
225	11				8	SG	12.3							83.0						
226	11				9	NRO	5.2							87.0						
227	11				10	GA	7.9							0					Fraxinus pennsylvanica	
228	2	st2	354820.240	-790346.010	0										93	95				
229	2				1	LP	20.9							73.0						
230	2				2	SG	6.8							67.0						
231	2				3	LP	15.9							67.0						
232	2				4	LP	6.1							37.0						
233	2				5	LP	6.2							53.0						
234	2				6	LP	6.3							43.0						
235	2				7	SG	5.0							33.0						
236	2				8	LP	17.3							87.0						
237	2				9	LP	14.9							57.0						
238	2				10	WIO	11.5							73.0						
239	2				11	SG	13.7							67.0						
240	2				12	SG	13.2							47.0						
241	2				13	ELM	5.5							87.0						
242	2				14	LP	8.7							67.0						
243	2				15	LP	8.2							67.0						
244	2				16	LP	7.9							27.0						
245	2				17	LP	5.4							37.0						
246	2				18	LP	20.0							93.0						
247	2				19	LP	8.7							57.0						

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
248	2				20	LP	7.0							23.0						
249	2				21	LP	6.1							27.0						
250	2				22	LP	7.4							37.0						
251	2				23	LP	6.0							53.0						
252	2				24	VP	7.3							57.0					Pinus virginiana	
253	2				25	LP	7.4							47.0						
254	2				26	SG	8.9							83.0						
255	1	st2	354820.230	-790350.010	0										93	100				
256	1				1	LP	8.4							57.0						
257	1				2	LP	12.0							77.0						
258	1				3	SG	5.6							77.0						
259	1				4	LP	11.7							77.0						
260	1				5	LP	13.1							83.0						
261	1				6	WO	5.0							77.0						
262	1				7	YP	16.1							93.0						
263	1				8	LP	6.9							23.0						
264	1				9	LP	6.0							57.0						
265	1				10	RM	6.0							15.0						
266	1				11	LP	13.8							87.0						
267	1				12	LP	7.2							37.0						
268	1				13	LP	5.1							33.0						
269	1				14	LP	9.0							83.0						
270	1				15	SW	7.4							63.0						
271	1				16	BEE	6.2							67.0						
272	1				17	SG	11.3							73.0						
273	1				18	RM	12.5							77.0						
274	1				19	LP	15.4							73.0						
275	1				20	SRO	9.5							83.0						
276	1				21	YP	14.9							83.0						
277	1				22	LP	12.0							77.0						
278	1				23	LP	19.3							93.0						
279	1				24	LP	7.7							13.0						
280	1				25	LP	14.8							77.0						
281	1				26	LP	17.8							93.0						
282	1				27	RM	6.7							73.0						
283	1				28	LP	10.8							47.0						
284	1				29	LP	5.9							0						
285	26	st2	354826.770	-790346.060	0										83	100				
286	26				1	PO	6.1							93.0					Quercus stellata	
287	26				2	LP	9.6							87.0						
288	26				3	LP	5.7							33.0						
289	26				4	LP	8.0							73.0						
290	26				5	LP	7.4							67.0						
291	26				6	LP	12.2							83.0						
292	26				7	LP	17.0							87.0						
293	26				8	RM	11.3							0						
294	26				9	LP	6.6							13.0						
295	26				10	LP	15.9							83.0						
296	26				11	LP	14.3							73.0						
297	26				12	LP	6.4							47.0						
298	26				13	RM	11.5							47.0						
299	26				14	LP	7.8							83.0						
300	26				15	LP	5.3							13.0						
301	26				16	LP	8.8							87.0						
302	26				17	LP	9.7							27.0						
303	26				18	SG	6.4							0						
304	26				19	LP	13.5							87.0						
305	26				20	SG	5.5	5.80						93.0						
306	26				21	LP	17.5							93.0						
307	26				22	LP	9.0							53.0						
308	26				23	LP	6.0							33.0						
309	26				24	LP	9.2							53.0						
310	27	st2	354826.780	-790342.050	0										87	100				
311	27				1	LP	11.0							87.0						
312	27				2	LP	6.8							17.0						
313	27				3	LP	5.4							73.0						
314	27				4	LP	6.0							83.0						
315	27				5	SG	7.9							83.0						
316	27				6	SG	5.6							63.0						
317	27				7	LP	10.6							77.0						
318	27				8	LP	11.1							67.0						
319	27				9	LP	7.7							67.0						
320	27				10	SG	5.2							87.0						
321	27				11	SG	7.7							63.0						
322	27				12	RM	13.5							93.0						
323	27				13	LP	12.4							83.0						
324	27				14	LP	16.6							97.0						
325	27				15	RM	5.1							13.0						
326	27				16	LP	17.0							93.0						
327	27				17	WIO	6.3							67.0						
328	27				18	LP	5.7							17.0						
329	27				19	LP	10.4							43.0						
330	27				20	LP	5.6							13.0						
331	27				21	LP	5.0							17.0						
332	27				22	LP	12.7							87.0						
333	27				23	LP	7.0							47.0						
334	27				24	LP	9.4							77.0						
335	27				25	LP	6.7							17.0						
336	27				26	LP	13.9							93.0						
337	27				27	LP	12.7							93.0						
338	27				28	LP	9.0							53.0						
339	27				29	BG	5.0							93.0						
340	27				30	SG	12.0							67.0						
341	28	ST1	354742.450	-790400.420	0										83	100				
342	28				1	WA	6.6							63.0						
343	28				2	WO	15.8							83.0						
344	28				3	BEE	17.7							93.0						
345	28				4	YP	6.7							93.0						
346	28				5	BG	12.3							43.0						
347	28				6	BEE	7.8							97.0						
348	28				7	YP	13.7							47.0						
349	28				8	YP	11.0							93.0						
350	28				9	YP	5.6							77.0						
351	28				10	YP	5.4							83.0						
352	28				11	YP	5.8							77.0						
353	28				12	WA	7.9							63.0						
354	28				13	YP	7.4							93.0						
355	28				14	PH	14.2	5.40						97.0						
356	28				15	BEE	14.9							87.0						
357	29	ST1	354742.450	-790356.420	0										87	100				
358	29				1	BG	9.1							43.0						
359	29				2	RM	9.0							53.0						
360	29				3	WA	5.2							77.0						
361	29				4	RM	6.1							97.0						
362	29				5	WA	6.2							67.0						
363	29				6	PH	17.7							47.0						
364	29				7	RBUD	7.7							37.0					Cercis canadensis	
365	29				8	WA	5.2							57.0						
366	29				9	BEE	5.2							73.0						
367	29				10	PH	10.7							67.0						
368	29				11	PH	18.8							93.0						
369	29				12	WA	6.9							43.0						
370	29				13	WA	6.0							67.0						
371	29				14	PH	21.6							93.0						

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
372	29				15	PH	10.7							87.0						
373	29				16	WA	6.9							47.0						
374	29				17	BG	13.5							63.0						
375	20	ST1	354735.910	-790400.370	0										93	100				
376	20				1	NRO	12.5							73.0						
377	20				2	BC	5.1							33.0						
378	20				3	NRO	5.1							33.0						
379	20				4	NRO	18.9							93.0						
380	20				5	BC	7.4							73.0						
381	20				6	WO	18.9							83.0						
382	20				7	LP	7.4							67.0						
383	20				8	BC	7.4							87.0						
384	16	ST1	354748.970	-790356.380	0										97	100				
385	16				1	WO	13.5							73.0						
386	16				2	PH	15.7							77.0						
387	16				3	PH	9.3							63.0						
388	16				4	YP	5.2							67.0						
389	16				5	WO	16.3							87.0						
390	16				6	BG	6.2							15.0						
391	16				7	YP	6.9							77.0						
392	16				8	WO	17.7							73.0						
393	16				9	YP	8.7							83.0						
394	16				10	BG	10.3							27.0						
395	16				11	YP	7.1							47.0						
396	16				12	PH	11.5							93.0						
397	16				13	RM	10.0							15.0						
398	15	ST1	354748.960	-790400.380	0										87	100				
399	15				1	YP	9.1							83.0						
400	15				2	PH	8.7							77.0						
401	15				3	PH	21.1							87.0						
402	15				4	BG	12.1							87.0						
403	15				5	PH	16.6							93.0						
404	15				6	YP	14.4							73.0						
405	15				7	PH	15.5							63.0						
406	15				8	RM	5.5							93.0						
407	15				9	YP	8.1							57.0						
408	15				10	YP	12.5							63.0						
409	15				11	YP	15.5							83.0						
410	15				12	YP	14.5							63.0						
411	15				13	YP	8.2	5.30	6.0	5.3				0						
412	15				14	YP	13.0							47.0						
413	15				15	YP	16.9							87.0						
414	15				16	SW	7.1							73.0						
415	7	st2	354754.120	-790354.000	0										93	100				
416	7				1	LP	18.1							97.0						
417	7				2	YP	8.1							93.0						
418	7				3	YP	6.6							87.0						
419	7				4	LP	16.8							93.0						
420	7				5	LP	15.0							93.0						
421	7				6	SG	9.9							77.0						
422	7				7	LP	10.0							63.0						
423	7				8	SG	8.1							87.0						
424	7				9	BG	5.1							63.0						
425	7				10	BG	7.2							43.0						
426	7				11	SG	9.3							67.0						
427	7				12	LP	14.4							87.0						
428	7				13	LP	14.5							97.0						
429	7				14	YP	7.9							83.0						
430	7				15	LP	6.0							13.0						
431	7				16	LP	15.4							67.0						
432	7				17	LP	16.0							93.0						
433	7				18	LP	14.5							87.0						
434	7				19	LP	13.5							73.0						
435	7				20	LP	13.0							87.0						
436	7				21	LP	13.6							93.0						
437	7				22	LP	15.0							87.0						
438	7				23	NRO	6.6							97.0						
439	7				24	NRO	5.0							93.0						
440	7				25	BC	5.3							73.0						
441	7				26	BC	5.2							73.0						
442	8	st2	354754.120	-790349.990	0										93	100				
443	8				1	LP	18.2							87.0						
444	8				2	LP	5.6							37.0						
445	8				3	LP	13.4							63.0						
446	8				4	LP	16.0							83.0						
447	8				5	RM	5.2							73.0						
448	8				6	NRO	16.8							93.0						
449	8				7	RM	7.5							83.0						
450	8				8	YP	10.2							93.0						
451	8				9	BEE	5.5							93.0						
452	8				10	YP	15.2							97.0						
453	8				11	WO	5.7							63.0						
454	8				12	RM	11.2		10.8					93.0						
455	8				13	SL	16.6							83.0						
456	8				14	WO	6.5							43.0						
457	8				15	WO	5.0							93.0						
458	8				16	SL	8.2													
459	14	ST1	354802.030	-790348.370	0										87	100				
460	14				1	MH	5.4							17.0						
461	14				2	ELM	19.5							87.0						
462	14				3	RC	8.1	5.5	6.4	5.5				13.0						
463	14				4	WO	5.7							77.0						
464	14				5	ELM	7.1							87.0						
465	14				6	SG	16.8							83.0						
466	14				7	YP	16.1							93.0						
467	14				8	ELM	7.4							83.0						
468	14				9	ELM	8.8							37.0						
469	14				10	SG	7.5							67.0						
470	14				11	ELM	5.9							27.0						
471	14				12	SG	6.3							67.0						
472	14				13	MUL	8.1							63.0					Morus rubra	
473	14				14	SG	7.4							77.0						
474	14				15	MH	16.5							87.0						
475	14				16	SG	5.5							83.0						
476	14				17	LP	12.5							87.0						
477	14				18	WIO	15.2							87.0						
478	14				19	RBUD	5.5							73.0						
479	14				20	RC	11.1							57.0						
480	14				21	RC	6.2							33.0						
481	14				22	SG	15.9							43.0						
482	14				23	HA	8.2							77.0					Celtis laevigata	
483	14				24	HA	7.1							67.0						
484	14				25	SG	10.0							83.0						
485	14				26	RC	10.9							27.0						
486	14				27	BW	19.0							73.0					Juglans nigra	
487	14				28	RC	11.5	5.30	8.0	5.3				17.0						
488	6	st2	354807.180	-790341.990	0										93	100				
489	6				1	NRO	6.1							63.0						
490	6				2	SL	17.1							97.0						
491	6				3	MH	8.1							93.0						
492	6				4	SG	11.8							43.0						
493	6				5	YP	7.1							83.0						
494	6				6	RM	13.9		8.3		6			67.0						
495	6				7	NRO	8.1							47.0						

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
496	6				8	NRO	24.7							93.0						
497	6				9	YP	21.5		8.0					93.0						
498	6				10	LP	12.0							93.0						
499	6				11	SG	5.3							63.0						
500	6				12	LP	10.0							83.0						
501	6				13	LP	10.0							37.0						
502	6				14	YP	7.5							93.0						
503	6				15	LP	10.3							83.0						
504	6				16	WO	6.6							77.0						
505	6				17	LP	18.1							93.0						
506	6				18	LP	19.0							97.0						
507	6				19	LP	9.0							77.0						
508	6				20	LP	14.4							73.0						
509	6				21	LP	14.5							73.0						
510	6				22	RC	9.3							10.0						
511	6				23	NRO	7.3							23.0						
512	6				24	LP	5.3							0						
513	6				25	LP	5.0							23.0						
514	6				26	SG	5.2							83.0						
515	5	st2	354807.180	-790346.000	0										93	100				
516	5				1	BC	5.4							67.0						
517	5				2	YP	8.8							93.0						
518	5				3	SG	6.8							93.0						
519	5				4	LP	11.0							73.0						
520	5				5	LP	10.0							67.0						
521	5				6	LP	10.6							83.0						
522	5				7	LP	8.7							73.0						
523	5				8	LP	14.2							93.0						
524	5				9	LP	14.0							93.0						
525	5				10	LP	8.7							53.0						
526	5				11	YP	5.0							73.0						
527	5				12	LP	6.5							23.0						
528	5				13	LP	15.0							97.0						
529	5				14	LP	8.0							33.0						
530	5				15	LP	14.8							93.0						
531	5				16	LP	8.1							33.0						
532	5				17	SG	5.0							87.0						
533	5				18	LP	11.6							77.0						
534	5				19	LP	12.3							77.0						
535	5				20	LP	13.8							93.0						
536	5				21	LP	9.2							53.0						
537	5				22	LP	8.5							43.0						
538	5				23	LP	10.1							93.0						
539	5				24	LP	12.0							93.0						
540	5				25	LP	15.5							83.0						
541	5				26	LP	5.8							17.0						
542	5				27	LP	12.5							83.0						
543	5				28	LP	13.3							68.0						
544	5				29	SL	9.0							53.0						
545	5				30	LP	16.0							93.0						
546	5				31	LP	10.2							77.0						
547	5				32	SG	5.7							93.0						
548	5				33	LP	11.7							83.0						
549	5				34	LP	11.5							87.0						
550	5				35	LP	10.4							57.0						
551	4	st2	354807.180	-790350.000	0										93	100				
552	4				1	LP	15.2							93.0						
553	4				2	YP	6.5							73.0						
554	4				3	LP	13.3							97.0						
555	4				4	LP	7.8							13.0						
556	4				5	LP	13.5							87.0						
557	4				6	YP	5.4							93.0						
558	4				7	LP	10.4							97.0						
559	4				8	LP	16.2							97.0						
560	4				9	LP	11.8							87.0						
561	4				10	LP	7.0							27.0						
562	4				11	LP	11.5							87.0						
563	4				12	LP	9.2							27.0						
564	4				13	LP	15.2							93.0						
565	4				14	LP	8.5							57.0						
566	4				15	LP	13.0							87.0						
567	4				16	LP	7.5							13.0						
568	4				17	SG	7.4							83.0						
569	4				18	LP	9.8							67.0						
570	4				19	LP	8.6							93.0						
571	4				20	LP	12.1							93.0						
572	4				21	YP	12.1							93.0						
573	4				22	LP	9.0							77.0						
574	4				23	LP	8.3							97.0						
575	4				24	LP	14.1							93.0						
576	4				25	LP	9.5							73.0						
577	4				26	LP	11.2							93.0						
578	4				27	LP	15.1							97.0						
579	4				28	LP	10.7							23.0						
580	4				29	LP	12.1							97.0						
581	4				30	LP	7.8							37.0						
582	4				31	LP	10.6							67.0						
583	4				32	SG	12.4							93.0						
584	4				33	YP	6.1							57.0						
585	4				34	SW	8.2							97.0						
586	4				35	LP	5.4							13.0						
587	4				36	YP	9.3							93.0						
588	4				37	YP	6.6							87.0						
589	4				38	YP	7.1							83.0						
590	4				39	LP	11.9							83.0						
591	3	st2	354807.180	-790354.010	0										87	100				
592	3				1	WIO	6.3							73.0						
593	3				2	LP	10.7							87.0						
594	3				3	YP	5.5							33.0						
595	3				4	LP	10.8							93.0						
596	3				5	LP	7.8							0						
597	3				6	LP	11.5							97.0						
598	3				7	LP	7.0							33.0						
599	3				8	LP	14.8							77.0						
600	3				9	LP	9.8							83.0						
601	3				10	LP	6.4							17.0						
602	3				11	SG	5.0							23.0						
603	3				12	LP	6.0							33.0						
604	3				13	BEE	9.2							97.0						
605	3				14	YP	7.6							87.0						
606	3				15	LP	5.8							17.0						
607	3				16	LP	14.8							93.0						
608	3				17	LP	6.3							13.0						
609	3				18	LP	10.6							67.0						
610	3				19	LP	11.0							93.0						
611	3				20	LP	9.4							93.0						
612	3				21	LP	8.2							13.0						
613	3				22	LP	6.4							47.0						
614	3				23	LP	10.5							87.0						
615	3				24	LP	14.3							97.0						
616	3				25	LP	7.5							13.0						
617	3				26	LP	11.7							93.0						
618	3				27	LP	8.8							93.0						
619	3				28	LP	9.8							77.0						

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
620	**3**				**29**	**BEE**	**5.6**							**87.0**						
621	**3**				**30**	**NRO**	**8.2**							**63.0**						
622	**3**				**31**	**SG**	**8.3**							**63.0**						
623	**3**				**32**	**SG**	**14.1**							**87.0**						
624	**3**				**33**	**LP**	**9.2**							**77.0**						
625	**3**				**34**	**LP**	**7.0**							**0**						
626	**3**				**35**	**SG**	**10.0**							**0**						
627	**3**				**36**	**SG**	**5.8**							**77.0**						

I. Tree Characteristics of the Urban Forest

The urban forest of Big Woods Forest Preserve has an estimated 43,900 trees with a tree cover of 90.5 percent. The three most common species are Loblolly pine (37.2 percent), Tulip tree (12.2 percent), and Red maple (9.0 percent).

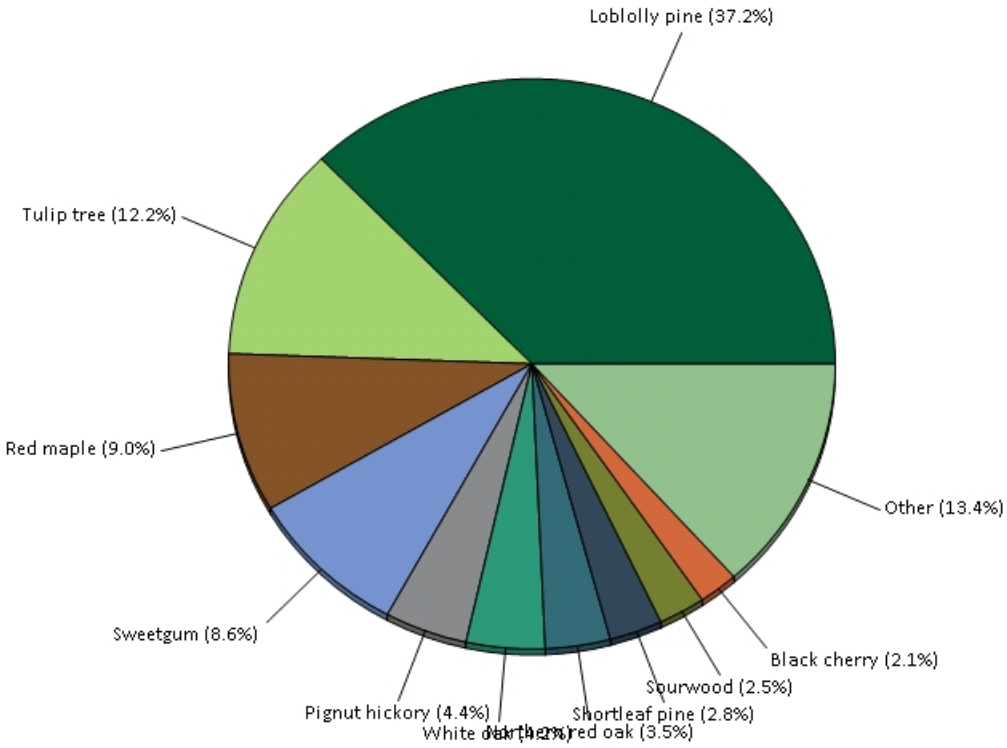


Figure 1. Tree species composition in Big Woods Forest Preserve

The overall tree density in Big Woods Forest Preserve is 212 trees/acre (see Appendix III for comparable values from other cities). For stratified projects, the highest tree densities in Big Woods Forest Preserve occur in Stand 2 followed by Stand 1.

City Forest Preservation Co-Benefits Quantification Tool for the South Climate Zone

The analyst can use this method to calculate the amount of co-benefits estimated to be produced by existing tree canopy. The tool uses information you provide on tree canopy cover (deciduous and coniferous), and estimates annual co-benefits in Resource Units and $ per year. Transfer functions (i.e., kWh of electricity per m^2 of tree canopy) were calculated as the average of values for the large, medium and small trees in the deciduous and coniferous life forms. Resource units for the dbh corresponding to a 25-year old tree were used, along with the crown projection area of the representative species for each tree-type. Energy effects are reduced to 20% of values in the i-Tree Streets source data because preserved areas generally have fewer nearby buildings affected by climate and shade effects than areas with street trees. Local prices were from i-Tree Streets.

Steps

1) Use i-Tree Canopy, or another tool, to estimate the amount of area that is covered by deciduous and coniferous tree cover. In Table 1 enter the area (acres) in deciduous and coniferous tree cover in the project area. Also, enter the non-tree cover area.

2) Table 2 automatically provides estimates of co-benefits for the current canopy in Resource Units (e.g., kWh) per year and $ per year. Values are adapted from i-Tree Streets results for this climate zone and assume that the deciduous and coniferous canopy is evenly distributed among large, medium and small tree types.

Light yellow background denotes an input cell ->

Directions
1) Use i-Tree Canopy, or another tool, to estimate the amount of deciduous and coniferous tree cover area (acres) (Cell C20 and D20).
2) Use i-Tree Canopy, or another tool, to estimate the amount of non-tree cover area (acres) (Cell F20) in the project area.
3) In Cell G20 the total area of the project is calculated (acres). Prompt i-Tree Canopy to provide an estimate of the project area by clicking on the gear icon next to the upper right portion of the image and selecting "Report By Area."
4) Total Project Area, cell G17 should equal 100%.

Table 1. Tree Cover

	Deciduous Tree Cover	Coniferous Tree Cover	Total Tree Cover	Non-Tree Cover	Total Project Area
Percent (%)	53%	38%	91%	9%	100%
Area (sq miles)	0.170	0.123	0.292	0.031	0.32
Area (m2)	439,981	317,301	757,282	79,480	836,762
Area (acres)	108.72253	78.40747	187.130	19.64	206.77

Using the information you provide on tree canopy cover, the tool provides estimates of co-benefits in Resource Units and $ per year.

Table 2. Co-Benefits per year with current tree canopy cover.

Ecosystem Services	Resource Units Totals	Total $
Rain Interception (m3/yr)	55,742.6	$145,799.76
Air Quality (t/yr)		
O3	3.9125	$11,624.24
NOx	1.0546	$3,133.37
PM10	2.5003	$2,824.00
Net VOCs	-1.9978	-$5,672.63
Air Quality Total	5.4697	$11,908.99
Energy (kWh/yr & kBtu/yr)		
Cooling - Elec.	328,001	$24,895.24
Heating - Nat. Gas	131,215	$1,363.37
Energy Total ($/yr)		$26,258.61
Grand Total ($/yr)		$183,967.35

City Forest Carbon Project
Social Impacts

UN Sustainable Development Goals

The 17 United Nations Sustainable Development Goals (SDGs) are an urgent call for action and global partnership among all countries, representing key benchmarks for creating a better world and environment for everyone. Well-designed and managed urban forests make significant contributions to the environmental sustainability, economic viability and livability of cities. They help mitigate climate change and natural disasters, reduce energy costs, poverty and malnutrition, and provide ecosystem services and public benefits. See more details in the CFC Carbon Project Social Impact Reference Guide.

Instructions

This template sets out all relevant SDGs and lists various urban forest project activities that fall within each SDG. Evaluate the SDGs to determine how your carbon project provides social impacts that may contribute towards achievement of the global goals. Check the box(es) that contain one of your project activities and describe in no fewer than two sentences how your project activities align with the corresponding SDG. On page 12, select the icon for three to five of the most relevant SDGs to your project and provide any additional information.

SDG 3 - Good Health and Well Being ✓

Goal: Ensure healthy lives and promote well-being for all at all ages.

Examples of project activities include, but are not limited to:

- ☐ Plant or protect trees to reduce or remove air pollutants
- ☐ If planting trees, select trees for reduced pollen counts and irritant production
- ☒ Plant or protect trees to create shade, provide UV exposure protection, reduce extreme heat negative effects, and/or reduce temperatures to relieve urban heat effects
- ☒ Design project to buffer sounds, optimize biodiversity, or create nature experiences
- ☒ Locate project near vulnerable populations, such as children or elderly
- ☐ Locate project near high volume roads to screen pollutants
- ☒ Locate project near people to encourage recreation, provide new parks or green space, or otherwise promote an active lifestyle
- ☐ Locate project near schools, elderly facilities, or mental health services to promote nature-based wellness, attention restoration, or other mental well-being
- ☐ Locate project in area with conditions of project-defined high inequity to trees, such as at schools, affordable or subsidized housing, formerly redlined neighborhoods, areas with high property vacancy rates, or area with high proportion of renters
- ☒ Reduce stormwater runoff or improve infiltration rates
- ☐ Design project to reduce human exposure to specific pollutants or toxins
- ☐ Other

As a future nature preserve, the Big Woods Forest project area will provide protection from UV exposure as well as help mitigate extreme summer temperatures typical of the Southeastern United States. The canopy coverage exceeds 90% on nearly all the property area. This has been demonstrated to both reduce UV exposure and extreme temperature. On a typical summer day in central North Carolina (June 3, 2023) the average surface temperature of the project area (83°F) can be almost 30°F cooler than the average temperature of the neighboring Fearrington residential development (110°F) (USGS Landsat imagery). This is particularly important for the health of vulnerable populations such as children (< 18 yrs) and the elderly (65 yrs+) in the area. The project is within a 15-minute driving distance of approximately 28,500 people in 2024. Over 25% of this population is over the age of 65 and 20% is under the age of 18 (ESRI). The census block containing the project is in the 99th percentile for elderly populations in North Carolina (Social Vulnerability Index, 2022). With extreme temperatures only anticipated to increase in the Southeast, the Big Woods Forest project will offer a hub of safe recreation in the future for these vulnerable groups, in addition to the 2,500 residents living within walking distance in the Fearrington residential neighborhood.

There are rare and diverse natural communities present within the project area, including 28 acres of Big Woods Rd Upland Forests and 105 acres of Bush Creek Marshes (NC Natural Heritage Program 2024). Protecting these communities will help fortify biodiversity in the region. The project area is also directly adjacent to bird habitat distinguished as continentally important by the National Audubon Society. This habitat is home to the largest population of nesting Bald Eagles in North Carolina and one of only 2 nesting sites for Double-crested Cormorants. The Nature Conservancy also includes the project area in its network of climate resilient and connected land, designating it as being resilient to climate change and an important future migration corridor for species in the region.

Keeping this parcel of land forested has an impact on downstream flood prevention. The project area contains soil groups prone to rapid surface runoff (ChA & CrB subtypes; Web Soil Survey) as well as steep slopes exceeding 18% grade. Both these characteristics give the project area potential for extreme storm runoff that contributes to streambank erosion and sedimentation in channels. Keeping the project area forested ensures soil stability and helps prevent these potential negative storm impacts. This is exceedingly important as storm frequency and intensity are predicted to increase in the Southeast.

SDG 6 - Clean Water and Sanitation ✓

Goal: Ensure availability and sustainable management of water and sanitation for all

Examples of project activities include, but are not limited to:

- ☐ Research and assess environmental injustices related to water in project area
- ☐ Locate project near high-traffic roads or to otherwise improve, mitigate, or remediate toxic landscapes near water
- ☒ Protect or plant trees to improve historically or culturally important sites related to water that have been degraded and/or neglected
- ☒ Reduce stormwater by planting or protecting trees
- ☐ Plant forested buffers adjacent to streams, rivers, wetlands, or floodplains
- ☒ Prevent soil erosion by protect steep slopes
- ☐ Improve infiltration rates
- ☐ Improve, mitigate, or remediate toxic landscapes and human exposure to risk
- ☐ Drought resistance, such as selecting appropriate water-efficient trees for project climate zone
- ☒ Other – Located in the service area of a new watershed-scale collaborative known as Jordan Lake One Water

Protecting trees on this property will help with erosion control and downstream flooding impacts. The Big Woods Forest project area contains soil groups prone to rapid surface runoff (ChA & CrB subtypes; Web Soil Survey) as well as steep slopes exceeding 18% grade. Both these characteristics give the project area potential for extreme storm runoff that contributes to streambank erosion and sedimentation. Keeping the project area forested ensures soil stability and helps prevent these potential negative storm impacts. This is exceedingly important as storm frequency and intensity are predicted to increase in the Southeast.

There are over 1.4 miles of perennial streams that run through the property that will be protected by this project. The Big Woods Forest preserve is also located just 1.7 miles upstream of Jordan Lake, a drinking water reservoir for nearly 700,000 residents across the Research Triangle (Jordan Lake One Water). Jordan Lake has historically struggled with water quality, exceeding NC Department of Environmental Quality criteria for chlorophyll-a, total nitrogen, and total phosphorus total loads and management strategies as recently as 2022 (NC DEQ Integrated Report, 2022). This body of water is also classified as both nutrient sensitive and a critical area for the state. Forested land in watersheds acts as a buffer for downstream water bodies, helping reduce some of the impact of nutrient loading.

The Big Woods Forest project is also located within the service area of Jordan Lake One Water, a “new collaborative entity that seeks to facilitate cooperation and integrated water resource management in the Jordan Lake watershed” (Jordan Lake One Water). This provides the opportunity to further engage TLC’s conservation work in a unique multi-disciplinary approach to clean water management.

SDG 8 - Decent Work and Economic Growth ✓

Goal: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Examples of project activities include, but are not limited to:

- ☐ Community participation in project implementation, including such things as providing access to financial resources for ongoing community-based care
- ☐ Emphasize local hiring and support small businesses
- ☐ Promote local economic opportunities through workforce training, career pathway development, or other employment
- ☐ Other

[Enter text describing activities you checked above]

SDG 10 - Reduced Inequalities ✓

Goal: Reduce inequalities within and among countries

Examples of project activities include, but are not limited to:

- ☒ Provide connections and cohesion for social health, such as create or reinforce places that promote informal interactions, engage local residents and users in tree management, include symbolic or cultural elements, or other events
- ☐ Research, understand, and design to address understand historic and current sociocultural inequities, community health conditions, environmental injustices, or prior local greening efforts in community
- ☒ Locate project near vulnerable populations, such as children or elderly, to provide air quality improvements or buffer against extreme heat effects
- ☐ Locate project in high-density residential areas or where there is a lack of trees to improve access and promote an active lifestyle
- ☐ Locate project near schools, elderly facilities, or mental health services to promote nature-based wellness, attention restoration, or other mental well-being
- ☐ Locate project in area with conditions of project-defined high inequity to trees, such as at schools, affordable or subsidized housing, formerly redlined neighborhoods, areas with high property vacancy rates, or area with high proportion of renters
- ☐ Locate project near high-traffic roads or to otherwise improve, mitigate, or remediate toxic landscapes
- ☐ Protect or plant trees to improve historically or culturally important sites that have been degraded and/or neglected
- ☐ Community engagement in project design, including such things as engaging and respecting existing relationships and social networks, community cultural traditions, and public participation methods that are empowering and inclusive
- ☐ Community participation in project implementation, including such things as addressing and removing barriers to participation, promote ongoing community-based care and access to financial resources
- ☐ Emphasize local hiring and support small businesses
- ☐ Research and consider potential for gentrification and displacements
- ☐ Promote local economic opportunities through workforce training, career pathway development, or other employment
- ☐ Other

As a future nature preserve, the Big Woods Forest project area will provide protection from UV exposure as well as help mitigate extreme summer temperatures typical of the Southeastern United States. The canopy coverage exceeds 90% on nearly all the property area. This has been demonstrated to both reduce UV exposure and extreme temperature. On a typical summer day in central North Carolina (June 3, 2023) the average surface temperature of the project area (83°F) can be almost 30°F cooler than the average temperature of the neighboring Fearrington residential development (110°F) (USGS Landsat imagery). This is particularly important for the health of vulnerable populations such as children (< 18 yrs) and the elderly (65 yrs+) in the area. The project is within a 15-minute driving distance of approximately 28,500 people in 2024. Over 25% of this population is over the age of 65 and 20% is under the age of 18 (ESRI). The census block containing the project falls into the 99th percentile for

elderly populations in North Carolina (Social Vulnerability Index, 2022). With extreme temperatures only anticipated to increase in the Southeast, the Big Woods Forest project will offer a hub of safe recreation in the future for these vulnerable groups, in addition to the 2,500 residents living within walking distance in the Fearrington residential neighborhood.

In addition to offering passive recreation opportunities, TLC strives to engage the local community with both environmental education initiatives and volunteer programs on its public nature preserves. The education and outreach department organizes birding, astrology, dendrology and other conservation management focused events for the local community. TLC also hosts a plethora of guided hikes led by local trail guide volunteers and a site steward program, in which local community members assist with preserve stewardship by walking trails and reporting the conditions to staff. The Big Woods Forest project will offer another site on which the community will be able to gather, participate in TLC's programming, and establish connections with natural landscapes. Engaging others in the ongoing management of the property will help foster a model of community-based care.

SDG 11 - Sustainable Cities and Communities ✓

Overall: Make cities inclusive, safe, resilient, and sustainable.

Examples of project activities include, but are not limited to:

- ☐ Plant or protect trees to reduce or remove air pollutants
- ☐ If planting trees, select trees for reduced pollen counts and irritant production
- ☐ Locate project near high volume roads to screen pollutants
- ☒ Locate project near vulnerable populations, such as children or elderly
- ☒ Plant or protect trees to create shade, provide UV exposure protection, reduce extreme heat negative effects, and/or reduce temperatures to relieve urban heat effects
- ☒ Locate project near people to encourage recreation, provide new parks or green space, or otherwise promote an active lifestyle
- ☒ Design project to improve wellness and mental health, such as planting trees to buffer sounds, optimize biodiversity, optimize views from buildings, or create nature experiences
- ☐ Locate project near schools, elderly facilities, or mental health services to promote nature-based wellness, attention restoration, or other mental well-being
- ☒ Provide connections and cohesion for social health, such as create or reinforce places that promote informal interactions, engage local residents and users in tree management, include symbolic or cultural elements, or other events
- ☐ Research, understand, and design to address understand historic and current sociocultural inequities, community health conditions, environmental injustices, or prior local greening efforts in community
- ☐ Locate project in area with conditions of project-defined high inequity to trees, such as at schools, affordable or subsidized housing, formerly redlined neighborhoods, areas with high property vacancy rates, or area with high proportion of renters
- ☐ Community engagement in project design, including such things as engaging and respecting existing relationships and social networks, community cultural traditions, and public participation methods that are empowering and inclusive
- ☐ Community participation in project implementation, including such things as addressing and removing barriers to participation, promote ongoing community-based care and access to financial resources
- ☐ Other

As a future nature preserve, the Big Woods Forest project area will provide protection from UV exposure as well as help mitigate extreme summer temperatures typical of the Southeastern United States. The canopy coverage exceeds 90% on nearly all the property area. This has been demonstrated to both reduce UV exposure and extreme temperature. On a typical summer day in central North Carolina (June 3, 2023) the average surface temperature of the project area (83°F) can be almost 30°F cooler than the average temperature of the neighboring Fearrington residential development (110°F) (USGS Landsat imagery). This is particularly important for the health of vulnerable populations such as children (< 18 yrs) and elderly (65 yrs+) in the area. The project is within a 15-minute driving distance of approximately 28,500 people in 2024. Over 25% of this population is over the age of 65 and 20% is under the age of 18 (ESRI). The census block containing the project falls into the 99th percentile for large elderly populations in North Carolina (Social Vulnerability Index, 2022). With extreme temperatures only

anticipated to increase in the Southeast, the Big Woods Forest project will offer a hub of safe recreation in the future for these vulnerable groups, in addition to the 2,500 residents living within walking distance in the Fearrington residential neighborhood.

In addition to offering passive recreation opportunities, TLC strives to engage the local community with both environmental education initiatives and volunteer programs on its public nature preserves. The education and outreach department organizes birding, astrology, dendrology and other conservation management focused events for the local community. TLC also hosts a plethora of guided hikes led by local trail guide volunteers and a site steward program, in which local community members assist with preserve stewardship by walking trails and reporting the conditions to staff. The Big Woods Forest project will offer another site on which the community will be able to gather, participate in TLC's programming, and establish connections with natural landscapes. Engaging others in the ongoing management of the property will help foster a model of community-based care.

The project will enhance local biodiversity by protecting over 1.4 miles of perennial streams on the property including over 50 acres of buffer and wetland area. This is immensely important for protecting riverine life and fragile ecosystems in the region. Additionally, there are rare and diverse natural communities present within the project area, including 28 acres of Big Woods Rd Upland Forests and 105 acres of Bush Creek Marshes (NC Natural Heritage Program 2024). The project area is directly adjacent to bird habitat distinguished as continentally important by the National Audubon Society. This habitat is home to the largest population of nesting Bald Eagles in North Carolina and one of only 2 nesting sites for Double-crested Cormorants. The Nature Conservancy also includes the project area in its network of climate resilient and connected land, designating it as being resilient to climate impacts and an important future migration corridor for species in the region.

SDG 12 - Responsible Production and Consumption ✓

Goal: Ensure sustainable consumption and production patterns

Examples of project activities include, but are not limited to:

- ☒ Plant or protect trees to create shade or reduce temperatures to relieve urban heat effects
- ☐ Provide cooling benefits and energy savings by shading impervious surfaces such as streets or parking lots, or planting trees on south and west sides of buildings
- ☐ Other

The Big Woods Forest project area will provide protection from UV exposure as well as help mitigate extreme summer temperatures typical of the Southeastern United States and the urban heat island effect. The canopy coverage exceeds 90% on nearly all the property area. This has been demonstrated to both reduce UV exposure and extreme temperature. On a typical summer day in central North Carolina (June 3, 2023) the average surface temperature of the project area (83°F) can be almost 30°F cooler than the average temperature of the neighboring Fearrington residential development (110°F) (USGS Landsat imagery).

SDG 13 - Climate Action ✓

Goal: Take urgent action to combat climate change and its impacts.

- ☐ Plant or protect trees to reduce or remove air pollutants
- ☒ Plant or protect trees to create shade or reduce temperatures to relieve urban heat effects
- ☒ Promote community capacity for social and climate resilience by engaging local residents or users in tree management, or other events to connect people to the project
- ☐ Reflect cultural traditions and inclusive engagement for climate resilience
- ☐ Design project to improve soil health
- ☐ Provide cooling benefits and energy savings by shading impervious surfaces such as streets or parking lots, or planting trees on south and west sides of buildings
- ☒ Plant or protect trees to reduce stormwater runoff
- ☐ Select water-efficient trees for climate zone and drought resistance
- ☒ Create and/or enhance wildlife habitat
- ☐ Other

The Big Woods Forest project area will provide protection from UV exposure as well as help mitigate extreme summer temperatures typical of the Southeastern United States and the urban heat island effect. The canopy coverage exceeds 90% on nearly all the property area. This has been demonstrated to both reduce UV exposure and extreme temperature. On a typical summer day in central North Carolina (June 3, 2023) the average surface temperature of the project area (83°F) can be almost 30°F cooler than the average temperature of the neighboring Fearrington residential development (110°F) (USGS Landsat imagery). Reducing urban temperatures is more important than ever, with extreme heat fluctuations only expected to increase in the Southeastern United States (IPCC).

In an effort to expand climate change awareness, TLC strives to engage the local community with both environmental education initiatives and volunteer programs on its public nature preserves. The education and outreach department organizes birding, astrology, dendrology and other conservation management focused events for the local community. TLC also hosts a plethora of guided hikes led by local trail guide volunteers and a site steward program, in which local community members assist with preserve stewardship by walking trails and reporting the conditions to staff. The Big Woods Forest project will offer another site on which the community will be able to gather, participate in TLC's programming, and establish connections with natural landscapes.

Protecting trees on this property will help with erosion control and downstream flooding impacts. The Big Woods Forest project area contains soil groups prone to rapid surface runoff (ChA & CrB subtypes; Web Soil Survey) as well as steep slopes exceeding 18% grade. Both these characteristics give the project area potential for extreme storm runoff that contributes to streambank erosion and sedimentation in channels. Keeping the project area forested ensures soil stability and helps prevent these potential negative storm impacts. This is exceedingly important as storm frequency and intensity are predicted to increase in the Southeast.

Protecting the natural forested habitats on this property will help bolster local biodiversity. There are rare and diverse natural communities present within the project area, including 28 acres of Big Woods Rd Upland Forests and 105 acres of Bush Creek Marshes (NC Natural Heritage Program 2024). The project area is directly adjacent to bird habitat distinguished as continentally important by the National

Audubon Society. This habitat is home to the largest population of nesting Bald Eagles in North Carolina and one of only 2 nesting sites for Double-crested Cormorants. The Nature Conservancy also includes the project area in its network of climate resilient and connected land, designating it as being resilient to climate impacts and an important future migration corridor for species in the region.

SDG 14 - Life Below Water ✓

Goal: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

Examples of project activities located in areas with marine ecosystems include, but are not limited to:

- ☐ Locate project near high-traffic roads or to otherwise improve, mitigate, or remediate toxic landscapes near water
- ☒ Plant or protect trees in project areas to reduce stormwater runoff
- ☒ Plant forested buffers adjacent to streams, rivers, wetlands, or floodplains
- ☒ Prevent soil erosion into by protecting steep slopes
- ☐ Improve infiltration rates
- ☐ Improve, mitigate, or remediate toxic landscapes and human exposure to risk
- ☐ Drought resistance, such as selecting appropriate water-efficient trees for project climate zone
- ☒ Enhance wildlife habitat, such as riparian habitat for fish, birds, and other animals
- ☐ Other

Protecting trees on this property will help with erosion control and downstream flooding impacts from storm runoff. The Big Woods Forest project area contains soil groups prone to rapid surface runoff (ChA & CrB subtypes; Web Soil Survey) as well as steep slopes exceeding 18% grade. Both these characteristics give the project area potential for extreme storm runoff that contributes to streambank erosion and sedimentation in channels. Keeping the project area forested ensures soil stability and helps prevent these potential negative storm impacts. This is exceedingly important as storm frequency and intensity are predicted to increase in the Southeast.

The project will enhance aquatic habitats by protecting over 1.4 miles of perennial streams on the property, including over 50 acres of buffer and wetland area. This is immensely important for protecting riverine life and fragile ecosystems in the region. Additionally, there are rare and diverse natural communities present within the project area, including 28 acres of Big Woods Rd Upland Forests and 105 acres of Bush Creek Marshes (NC Natural Heritage Program 2024). The project area is directly adjacent to bird habitat distinguished as continentally important by the National Audubon Society. This habitat is home to the largest population of nesting Bald Eagles in North Carolina and one of only 2 nesting sites for Double-crested Cormorants. The Nature Conservancy also includes the project area in its network of climate resilient and connected land, designating it as being resilient to climate impacts and an important future migration corridor for species in the region.

SDG 15 - Life on Land ✓

Goal: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Examples of project activities include, but are not limited to the following with increased functionality of green infrastructure:

- ☒ Plant or protect trees to reduce stormwater runoff
- ☐ Select water-efficient trees for climate zone and drought resistance
- ☒ Create and/or enhance wildlife habitat to improve local biodiversity
- ☒ Plant forested buffers adjacent to streams, rivers, wetlands, or floodplains
- ☒ Prevent soil erosion by protect steep slopes
- ☐ Improve infiltration rates
- ☐ Other

Protecting trees on this property will help with erosion control and downstream flooding impacts from storm runoff. The Big Woods Forest project area contains soil groups prone to rapid surface runoff (ChA & CrB subtypes; Web Soil Survey) as well as steep slopes exceeding 18% grade. Both these characteristics give the project area potential for extreme storm runoff that contributes to streambank erosion and sedimentation in channels. Keeping the project area forested ensures soil stability and helps prevent these potential negative storm impacts. This is exceedingly important as storm frequency and intensity are predicted to increase in the Southeast.

The project will bolster local biodiversity by protecting over 1.4 miles of perennial streams on the property, including over 50 acres of buffer and wetland area. This is immensely important for protecting riverine life and fragile ecosystems in the region. Additionally, there are rare and diverse natural communities present within the project area, including 28 acres of Big Woods Rd Upland Forests and 105 acres of Bush Creek Marshes (NC Natural Heritage Program 2024). The project area is directly adjacent to bird habitat distinguished as continentally important by the National Audubon Society. This habitat is home to the largest population of nesting Bald Eagles in North Carolina and one of only 2 nesting sites for Double-crested Cormorants. The Nature Conservancy also includes the project area in its network of climate resilient and connected land, designating it as being resilient to climate impacts and an important future migration corridor for species in the region.

SDG 17 - Partnerships for the Goals ✓

Overall: Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Examples of project activities include, but are not limited to:

- ☒ Promote community connections and capacity for social resilience by engaging local residents or users in tree management, or other events to connect people to the project
- ☐ Community engagement in project design, including such things as engaging and respecting existing relationships and social networks, community cultural traditions, and public participation methods that are empowering and inclusive
- ☒ Community participation in project implementation, including such things as addressing and removing barriers to participation, promote ongoing community-based care and access to financial resources
- ☐ Other

Connecting people with nature is a core tenant of Triangle Land Conservancy's mission in central NC. In addition to offering passive recreation opportunities, TLC strives to engage the local community with both environmental education initiatives and volunteering on its public nature preserves. The organization's education and outreach department often provides birding, insect, astrology, dendrology and other conservation themed events for the local community at our nature preserves. TLC also hosts a plethora of guided hikes led by local trail guide volunteers and a site steward program, in which local community members assist with preserve stewardship by walking trails and reporting the conditions to staff. The Big Woods Forest project will offer another site on which the community will be able to gather, participate in TLC's programming, and establish connections with natural landscapes. Engaging others in the ongoing management of the property will help foster a model of community-based care.

The Big Woods Forest project is also located within the service area of Jordan Lake One Water, a "new collaborative entity that seeks to facilitate cooperation and integrated water resource management in the Jordan Lake watershed". This provides the opportunity to further engage TLC's conservation work in a unique multi-disciplinary approach to clean water management.

Summary of Project Social Impacts

SDG6 Clean Water and Sanitation

The Big Woods Forest project is located just 1.7 miles upstream of Jordan Lake, a drinking water reservoir for nearly 700,000 residents across the Research Triangle (Jordan Lake One Water). Jordan Lake has historically struggled with water quality, exceeding NC Department of Environmental Quality criteria for chlorophyll-a, nitrogen, and phosphorus total loads and management strategies as recently as 2022 (NC DEQ Integrated Report, 2022). This body of water is also classified as both nutrient sensitive and a critical area for the state. Forested land acts as a buffer for water resources, helping reduce some of the downstream impact of watershed nutrient loading. The project area also contains soil groups prone to rapid surface runoff (Web Soil Survey) as well as steep slopes exceeding 18% grade. Both these characteristics give the project area potential for extreme storm runoff that can cause streambank erosion and sedimentation if converted to other land uses. Keeping the project area forested ensures soil stability and helps prevent these negative storm impacts and safeguard aquatic habitats. This is exceedingly important as storm frequency and intensity are predicted to increase in the Southeast (IPCC).

SDG15 Life on Land

The project will bolster local biodiversity by protecting over 1.4 miles of perennial streams on the property, including over 50 acres of buffer and wetland area. This is immensely important for protecting riverine life and fragile ecosystems in the region. Additionally, there are rare and diverse natural communities present within the project area, including 28 acres of Big Woods Rd Upland Forests and 105 acres of Bush Creek Marshes (NC Natural Heritage Program 2024). The project area is also directly adjacent to bird habitat distinguished as continentally important by the National Audubon Society. This habitat is home to the largest population of nesting Bald Eagles in North Carolina and one of only 2 nesting sites for Double-crested Cormorants. The Nature Conservancy includes the project area in its network of climate resilient and connected land, designating it as resilient to climate impacts and an important future migration corridor for species in the region.

SDG3 Good Health and Wellbeing

As a future nature preserve, the Big Woods Forest project area will provide protection from UV exposure as well as help mitigate extreme summer temperatures typical of the Southeastern United States. The canopy coverage exceeds 90% on nearly all the property area. This has been demonstrated to both reduce UV exposure and extreme temperature. On a typical summer day in central North Carolina (June 3, 2023) the average surface temperature of the project area can be almost 30°F cooler than the average temperature of neighboring residential developments. This is particularly important for the health of vulnerable populations such as children and the elderly. The project is within a 15-minute driving distance of approximately 28,500 people, over 45% of which are over the age of 65 or under the age of 18 (ESRI). The census block containing the project also falls into the 99th percentile for large elderly populations in North Carolina (Social Vulnerability Index, 2022). With extreme temperatures only anticipated to increase in the Southeast, the Big Woods Forest project will offer a hub of safe recreation in the future for these vulnerable groups, in addition to the 2,500 residents living within walking distance of the project.


8 DECENT WORK AND ECONOMIC GROWTH
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
17 PARTNERSHIPS FOR THE GOALS