Educational Forests in Charlotte, NC

Project Description Document

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Document Overview

This Project Description Document (PDD) describes the TreesCharlotte community planting carbon offset project located in Mecklenburg County, NC. The project follows the Duke Carbon Offset Initiative Protocol 2.0 and this PDD provides the information required by the protocol, including a baseline data set and an outline of the project's processes in detail. These details and the data will be referenced in validating the project site and the greenhouse gas emissions associated.

Introduction

Project Title

Educational Forests in Charlotte, NC

Project Purpose & Objectives

The purpose of this project is to sequester atmospheric carbon dioxide (CO_2) through afforestation at local parks in Mecklenburg County, NC. The project was developed by Urban Offsets, Inc., a Delaware corporation with a place of business in Greensboro, NC. This project is to serve as a pilot program and will help establish a viable business model utilizing the Duke Carbon Offset Initiative protocol standards. For this project, Urban Offsets established relationships with a Charlotte non profit, TreesCharlotte, and the Mecklenburg County School District. Through these relationships Urban Offsets organized the logistics of purchasing, planting and maintaining urban trees on five separate school locations. The CO_2 sequestered through this project will be estimated using growth models for trees, shrubs and other carbon sinks outlined by the Duke Carbon Offset Initiative Urban Forestry Protocol and applied to offset the carbon footprint of two buyers as of April 2017. Additionally, the project will help identify and quantify the environmental co-benefits of the project trees, and improve forest management practices for the City of Charlotte. Urban Offsets and TreesCharlotte also intend on allowing companies who bought offsets access to the inventory data which will create a living laboratory for both the company and the school. This project will be one of the first projects for Urban Offsets showcasing the partnership with Duke Carbon Offset Initiative and the use of their urban forestry protocol. Afterward this will also serve as one of the first projects for Urban Offsets that will be peer validated facilitated by the Offset Network, an establish an innovative carbon offsetting program.

Type of GHG Project

This is an Afforestation Project which quantifies emissions based on annual inventory reports. The project's GHG impact will be calculated by applying peer-reviewed research to estimate the growth rates of planted and self-recruiting tree species.

Project Site

Charlotte, NC has a population of 731,424 as of 2010[1]. With over 210 parks and facilities located on more than 21,000+ acres of parkland Mecklenburg County, NC values their green spaces[2]. The city has a nonprofit partner, TreesCharlotte, to help maintain and manage community gardens. Mecklenburg County Schools, the City Government, and TreesCharlotte have developed a tree ordinance[3] to help keep the city green.

Project location(s)

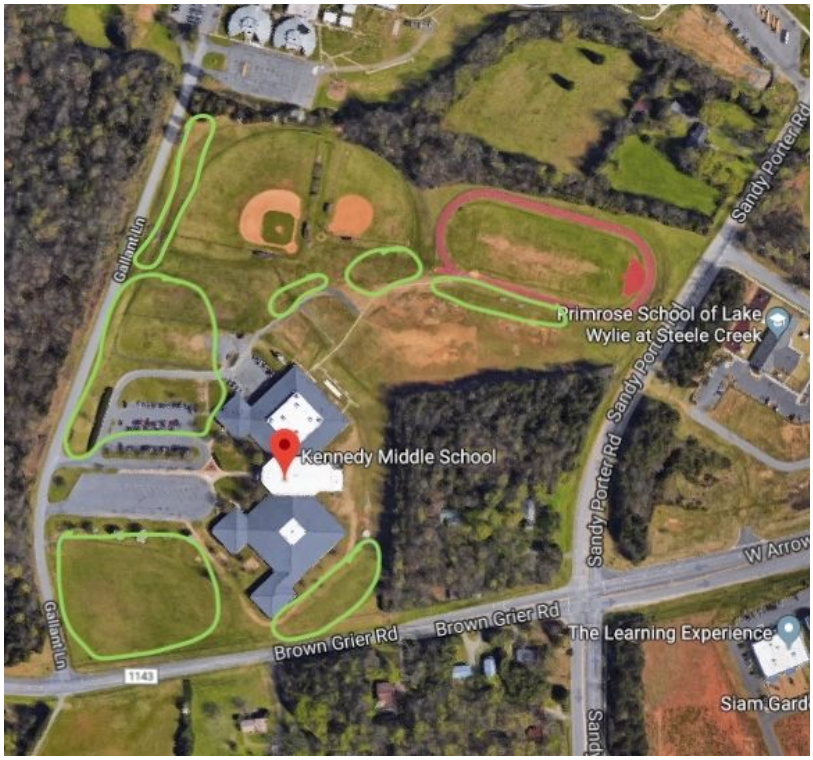
This project was divided between five sites in Mecklenburg County: Hidden Valley Elementary, Robert F. Kennedy Middle School, Starmount Elementary, Hornets Nest Elementary, Hickory Grove Elementary School.

Hidden Valley Elementary: 5100 Snow White Ln, Charlotte, NC 28213

Hidden Valley Elementary is a member of Charlotte-Mecklenburg Schools in eastern Charlotte. It is the proud home of the Eagles. The tree locations are demarcated by the red outline in the image above. 156 trees were planted on this site.

[1] https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml
[2] https://www.mecknc.gov/ParkandRec/Parks/Pages/default.aspx
[3] http://charlottenc.gov/ld/treeordinance/Pages/default.aspx

Robert F. Kennedy Middle School: 4000 Gallant Ln, Charlotte, NC 28273

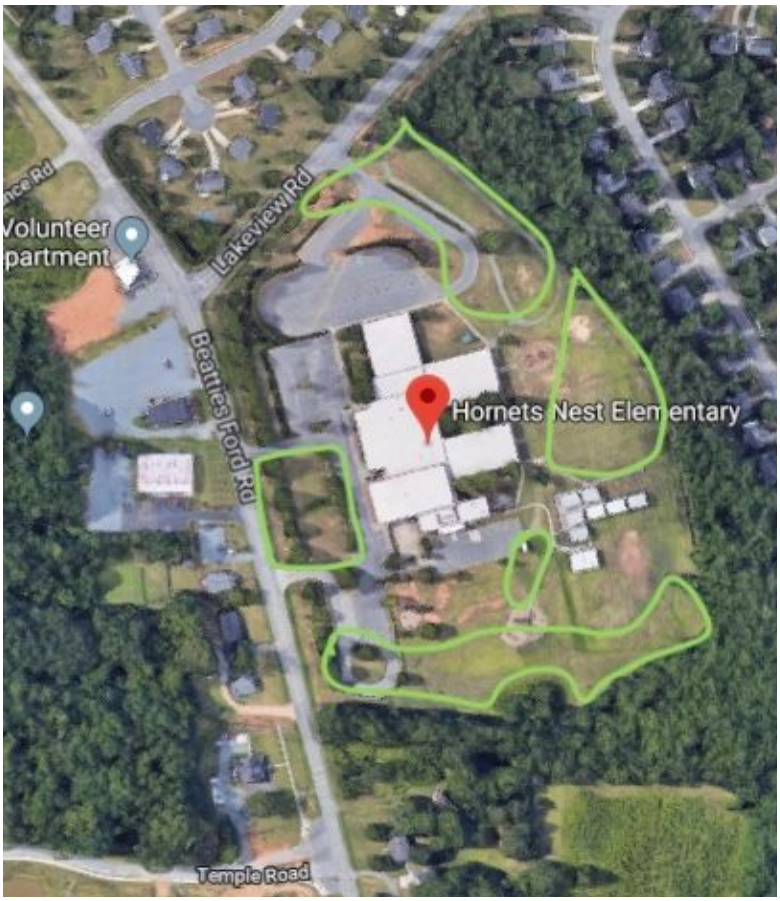


Robert F. Kennedy Middle School is a member of Charlotte-Mecklenburg Schools in south-western Charlotte. It is the proud home of the Wapitis. Tree locations are demarcated by the green outline in the image above. 284 trees were planted on this site.

Starmount Elementary: 1600 Brookdale Ave, Charlotte, NC 28210

Starmount Elementary is a member of Charlotte-Mecklenburg Schools in south-western Charlotte. It is the proud home of the Owls. The tree locations are demarcated by the green outline in the image above. 172 trees were planted on this site.

Hornets Nest Elementary: 6700 Beatties Ford Rd, Charlotte, NC 28216



Hornets Nest Elementary is a member of Charlotte-Mecklenburg Schools in northern Charlotte. It is the proud home of the Hornets. The tree locations are demarcated by the green outline in the image above. 267 trees were planted on this site.

Hickory Grove Elementary School: 6709 Pence Rd, Charlotte, NC 28215

Hickory Grove Elementary is a member of Charlotte-Mecklenburg Schools in eastern Charlotte. It is the proud home of the Wildcats. The tree locations are demarcated by the green outline in the image above. 100 trees were planted on this site.

Site Eligibility

The project site is located within a designated urban area and has not experienced commercial harvesting of timber within the last 10 years. In addition, the site meets the Offset Network's Peer Verification local project eligibility requirements as it is both accessible to and within one day's travel for students from the purchasing university.

Condition Prior to Project Commencement

Project Grounds have been maintained by a small group of community gardeners associated with TreesCharlotte, along with the school staff. Both sites are owned by the Mecklenburg County School District.

GHG Impact

Description of Project Impact on GHG Emissions

The GHG impact from this project will occur via the sequestration of CO_2 from the atmosphere by the project trees as they grow. GHG Impact is estimated using US Forest Service growth models. Initial estimates are based on tree type, with future verification estimates adding DBH and height.

Project Technologies, Products, and Services

Saplings were planted to sequester CO_2 and promote native species forest growth. Digital and hardcopy inventory software was used. The total amount of annual CO_2 storage for all sites is estimated to be 6103.09 metric tons of CO2e.

GHG Assertion

Identification of Risk to GHG impact of Project

The risks associated with this project are typical for an urban forest project. Therefore, this project uses the standard risk identification laid out by the DCOI Urban Forestry Protocol and accounts for these risks via the buffer pool. These risks are leakage and the anticipated mortality of the project trees - they are laid out below.

Per the DCOI Urban Forest Protocol:

1) "Leakage occurs when the maintenance burden on the UTP Maintainer increases to the point where tree health across the UTP Owner's sites (project & non-project trees) suffers, or when offset project funding causes a reduction in the baseline budget for urban forest management. Unmitigated leakage can increase the likelihood of tree mortality.
    a) A 5% contribution to the buffer pool accounts for this burden.
    b) Adjustments can be made to identify the impact of Leakage 10 years after project initiation. At that point, if the Leakage contribution is found to be too high, offsets can be reconciled and returned to the UTP Owner.
2) Anticipated Mortality
    a) Urban foresters anticipate a 3-8% mortality rate on transplanted trees in North Carolina
    b) In lieu of 3rd party verification, buffer pool contributions related to anticipated mortality will be a conservative 10%."

The total risk factor is 15%, which aligns closely to the ACR's urban forest risk factor of 16%

Carbon Offset Program and Protocol

Urban Offsets originally partnered with the Duke Carbon Offsets Initiative (DCOI) in 2015 to develop a way to viably and cost effectively develop Urban Forestry carbon offset projects using DCOI's urban forest protocol. Using this protocol, Urban Offsets and the DCOI piloted multiple projects in North Carolina. Soon after the initiation of these projects, Duke University partnered with Second Nature, Oberlin College, and the University of Florida to build the offsetnetwork.org, and the DCOI led an academic committee of 10-15 institutions to create a peer review process to be used in place of 3rd party ISO-accredited verification in order to reduce verification costs and encourage innovative offset projects for educational institutions with voluntary carbon reduction goals. Offsetnetwork.org acts as the hub for the peer review process developed through academic committee. Now, Urban Offsets and the DCOI are looking to use this peer review process to make their projects in North Carolina the first peer reviewed carbon offsets in the world.

Educational Forests in Charlotte, NC

Program:

Offset Network Peer Verification

Protocol:

Duke Carbon Offset Initiative Urban Forestry Protocol v2.0

Protocol Eligibility Conditions & Justification:

This project meets all of the protocol eligibility conditions outlined by the DCOI Urban Forestry Protocol 2.0.

1. Project location
    a. Project is located within the boundary of Mecklenburg County, an incorporated county created under the laws of North Carolina
2. Project commencement
    a. Project commenced on the date the trees were planted - February 15th 2017
    b. Project commencement date was approved by the DCOI
3. Project additionality and performance standard test
    a. Project will yield surplus emission reductions compared to a business as usual scenario - evidence and logic for additionality provided in the additionality section of this document
4. Legal requirement
    a. The project is not the result of compliance with any federal state or local law, statute, rule regulation or ordinance.
    b. Project will yield surplus emission reductions above and beyond legal and compliance requirements for the area
    c. TreesCharlotte acknowledges this directly via their contract with UO
5. Project crediting period
    a. The project crediting period is 20 years with option for renewal
        i. The project is expected to be renewed and span two crediting periods.
6. Minimum time commitment
    a. Project establishes a timeline of 40 years via UO's direct contract with TreesCharlotte.

The following sections are included for reference, as the DCOI protocol only requires the information provided above.

Additional justification for reference:

Legal
The project is not the result of compliance with any federal state or local law, statute, rule regulation or ordinance.

Technical
Chuck Cole, the Executive Director of TreesCharlotte, will oversee management of the project and utilize the Fulcrum application to inventory and track the trees.

Economic, Sectoral
No market factors pose a substantial impact to the project or the project site.

Social
The project owner did not have previously stated goals or plans for the project site's use or development as a forest. We are aware of no social or cultural elements that might negatively impact the project's success.

Geographic Site Specific
The project site has not experienced commercial harvesting of timber within the last 10 years. The project is within the Peer Reviewed Offset Networks' designation of local as it qualifies for one of the three definitions offered:

1) Accessible by students from one of the College or University from which Afforestation Project funds originated without requiring greater than 1 day of travel round trip to visit the project site;
2) Within the same State as the College or University;
3) Within 100 miles of the College or University Campus.

Temporal
The start date of the project is recorded as 2/15/17 which is the date that project trees were first planted. Normally, the start date would be when the project contract was signed, but due to delays on the city/nonprofit side, UO did not receive an executed copy of the contract until 6/7/17. However, the terms were agreed upon via conversation and emails prior to the planting. All calculations of project GHG impact shall use the date of the tree planting until the present, as the timeframe for measurement of forest growth and carbon accumulation.

Roles & Responsibilities

Internal Structure & Stakeholders

- Duke Carbon Offset Initiative
  - Established the protocol for quantifying carbon offsets from urban trees.
- Buyer 1
  - Purchased the carbon sequestered from the project trees.
- Duke University:
  - Through a matching fund, Duke University purchased additional carbon offsets and project trees to support the other buyer's initiatives.
- Urban Offsets:
  - Project developer and manager - facilitated communication and implemented the project based on the Duke Carbon Offset Initiative's Protocol.
- Mecklenburg County, NC:
  - The County acted as the land owner and coordinated the purchase and shipping of project trees.
- TreesCharlotte:

    - TreesCharlotte helped determine the species and the landscaping of the project trees.
- The Offset Network:
    - The Network helped facilitate the peer validation of the project site.

Transfer of ownership via contractual agreements (i.e. chain of custody):

Through the contracts established by Urban Offsets, and both buyers will receive portions of the total carbon credits from these project trees. By selling the carbon credits, Urban Offsets is able to pay TreesCharlotte for the trees successfully planted through the project. The university and company are able to reduce their GHG emissions while the county and local non-profit are able to reforest local parks. The specific chain of custody for the carbon offsets is outlined below:

1. Mecklenburg County Schools owns the land, the trees, and the original right to the carbon
    a. TreesCharlotte helps plant and maintain the trees in partnership with Mecklenburg County.
2. Mecklenburg County Schools transfers the right to the carbon from planted project trees to Urban Offsets in exchange for payment and additional resources (inventory application, etc.)
3. Upon peer verification, Urban Offsets will transfer the right to the carbon from the planted project trees to the purchasers per the corresponding contracts.

Environmental Impact Assessment

Trees will be planted under the guidance of expert arborists in areas of need. There is no expected negative environmental impact.

Chronological Project Plan

Project Commencement Date: 2017
Project Termination Date: 2057

Date	Task	Status
Summer 2016	Project Created: TreesCharlotte established an offset project with Urban Offsets.	Complete
Fall 2016	Planting location found: Urban Offsets coordinated with both the TreesCharlotte to determine the appropriate planting sites.	Complete
January 2017	Site prepared for planting: The County and TreesCharlotte determined the tree species and shipping logistics for the project trees at the Price Park location.	Complete
February 2017	Planting event: Urban Offsets and TreesCharlotte organized the first tree planting event.	Complete

March 2017	1st inventory completed: Chuck Cole, executive director of TreesCharlotte conducted the inventory for the project trees in Mecklenburg County.	Complete
Spring, 2018	The Offset Network will coordinate a peer validation event for the Mecklenburg County locations.	Current
Summer, 2018	The Offset Network will coordinate a peer validation event for the Price Park location.	TBD
Annual	Project inventory, data input, and offset accounting	On-going
2018; every 5th year thereafter	Initial Project Verification and subsequent verifications at 5-year intervals	On-going

Project Boundaries & SSR List

The physical project boundary is the Mecklenburg County, North Carolina. The additionality section below analyzes the TreesCharlotte's tree planting activities to determine if this project's trees go beyond business as usual.

The GHG boundaries for the project are listed below:

- Project Sinks and Reservoirs:
  - Standard tree plantings (TreesCharlotte's planting program)
    - These emissions are sequestered in both the baseline scenario and the project scenario. Therefore, while they are included, they are not measured or calculated as they occur equally in either scenario. This is also protected via the contract between the school district and Urban Offsets.
  - Project trees
    - These emissions are calculated using the tree species, height and DBH.
      - These are included and are the main source of sequestration.
  - Phoenix and Tempe AZ tree plantings.
    - These emissions are calculated using the tree species, height and DBH.
      - A portion of these trees are included only as a buffer pool for the project.
- Project Sources
  - Vehicle emissions for planting and maintenance
    - Excluded:
      - These emissions are negligible and below the *de minimis* threshold as stated in the DCOI Urban Forestry Protocol.

Determination of Baseline Scenario

This project follows the DCOI Urban Forestry Protocol requirements for a baseline scenario and additionality which are presented in the "Protocol Eligibility Conditions & Justification" and "project additionality" section of this document. Through the questions listed in these sections, the baseline is determined to be business as usual, also defined as the city/nonprofit planting a similar amount of trees every year proportional to their

funding. This project, via discussions, data, and legally binding contracts, provides additional funding to be used only for tree plantings and maintenance which allows the city/nonprofit to plant additional trees. For additionality requirements please refer to the "Project Scenario Additionality Section", as this section aligns directly with the DCOI Urban Forestry Protocol being used.

Product or Service Created by Project Activity

This project provides the necessary monetary resources for planting trees and maintaining trees.

Geographic Area & Temporal Range

The physical areas are the areas shown in the Project Site section of this document. The temporal range is from 2017, when the first trees were initially planted, to 40 years in the future based on project contracts with the local government and nonprofit partners.

Additional Criteria

N/A

Baseline Candidate

Standard planting - Trees are planted by the city/nonprofit in proportion to their funding. This is a relatively stable amount that does not change unless funding changes. Project scenario - This project, via discussions, data, and legally binding contracts, provides additional funding to be used only for tree plantings and maintenance which allows the city/nonprofit to plant additional trees.

Barrier's Test Results

Standard planting - No barriers

Project scenario - Large economic barrier, as trees can only be planted and maintained with proper funding. Social barrier, none. Political barrier, none.

Overall – project scenario faces large barrier due to limited resources. For a more detailed analysis, see section "Project Scenario Additionality Section" below.

Baseline Scenario Solution

Standard planting is accepted as the baseline scenario.

Project Scenario Additionality

This project applies a national baseline and couples it with the protocol's additionality checklist to show clear additionality:

- Do you have historical data for the number of trees planted in the past 5 years?
    - No, this data was difficult to acquire. Instead, UO requires the nonprofit to sign a contract that states explicitly that A) all $ from the program must go

directly to tree plantings and maintenance, thereby directly increasing planting/maintenance resources, B) the nonprofit will not change their level or pursuit of tree funds, and C) the nonprofit is not legally required to plant additional trees.

- Are you or your organization bound by law, regulation, statute, or court order to plant trees in the same manner this project does?
    - No, the Mecklenburg County Schools and state of NC do not have any laws, regulations, statutes, or court orders that require the planting of trees.
    - Mecklenburg County Schools has acknowledged this directly in their contract with UO.
- Do implementation barriers exist that limit the ability of the TreesCharlotte to plant trees?
    - Yes, funding barriers and staffing barriers exist that prevent expansion of planting programs.
    - TreesCharlotte has acknowledged this directly via communications and in their contract with UO.
- Are these plantings above the business as usual scenario?
    - UO requires that all $ provided by the program go directly to tree planting and maintenance.
    - Via their contract with UO, TreesCharlotte agrees that receiving these $ will not alter their current level or pursuit of tree funding and other resources.
- Is there a legal contract that minimizes leakage?
    - Yes, via their contract with UO, the TreesCharlotte agrees that receiving these $ will not alter their current level or pursuit of tree funding and other resources.

The items above, in conjunction with an overall declining national baseline, show that the project actions result in a scenario that goes above and beyond business as usual and that these trees would not have been planted under a business as usual scenario.

Baseline Scenario and Project Scenario SSR

For this project, the SSR are the same for both the identified baseline scenario and the project scenario. They are as follows:

The GHG boundaries for the project are listed below:

- Standard tree plantings
    - These emissions are sequestered in both the baseline scenario and the project scenario. Therefore, while they are included, they are not measured or calculated as they occur equally in either scenario. This is also protected via the contract between TreesCharlotte and Urban Offsets.
- Project Sinks and Reservoirs
    - Project trees

        - These emissions are calculated using the tree species, height and DBH.
            - These are included and are the main source of sequestration.
    - Phoenix and Tempe AZ tree plantings.
        - These emissions are calculated using the tree species, height and DBH.
            - A portion of these trees are included only as a buffer pool for the project.
- Project Sources
    - Vehicle emissions for planting and maintenance
        - Excluded,
            - These emissions would likely occur under a business as usual since TreeCharlotte has to maintain trees within the same area as the planted trees;

          And, these emissions are negligible.

This project will monitor the included sinks - carbon sequestered via project trees and TreesCharlotte trees.

Risk Assessment & Future Consideration

Double Counting

All carbon offsets produced by the project will be registered with the Urban Offsets Registry. Each carbon offset will receive a unique identification number. The registry will track the chain of custody to ensure that offsets are not double counted, and retired immediately after their use. The chain of custody is determined via the legally binding contracts the project has with the city/nonprofit.

Leakage

This project includes the requirement that county sign a legally binding contract that they will not change their current efforts and approach to acquiring funding for planting trees. This mitigates the risk of project funding leading to a reduction in baseline funding, which, in turn, would impact trees planted.

Project Permanence

This project uses the DCOI protocol's standard 40 year timeline for permanence. To reduce risk, the TreesCharlotte has agreed via legal contract to replace any trees that die in the program within 1 year of that tree's death with a similar tree at least 1" caliper in diameter. While increased mortality rates could result in short term reversals that are not accounted for via the buffer pool, long term permanence is assured.

Total Risk Factor

This project uses the standard risk factor established by the DCOI Urban Forest Protocol. This risk factor is 15%- 5% for leakage and 10% for tree mortality.

Additional Risks

N/A

Buffer Pool Designation & Total Project Risk Factor

To reduce risk, this project also uses the DCOI protocol's standard 15% buffer pool. This buffer pool is provided by projects in North Carolina and Arizona.

Project Impact Calculation

Global Warming Potential Used:

Only metric tons of CO_2 are used to calculate offsets for this project. Urban Offsets' used carbon sequestration and tree growth values produced by the USFS carbon calculator[4] (#'s gathered in 2016/2017), this calculator has been updated since we ran the numbers.

Baseline Scenario Total Atmospheric GHG Impacts:
X carbon offsets. X = the amount of carbon sequestered by standard tree plantings. X does not need to be calculated as it occurs both for the baseline scenario and the project scenario and cancels out within the GHG assertion.

Project Scenario Total Atmospheric GHG Impacts:
X carbon offsets + offsets from trees planted via project

GHG Assertion:

Total project carbon offsets = (Project scenario (X carbon offsets + offsets from project trees) - Baseline scenario (X carbon offsets)) * (1 - 0.15) = Offsets from project trees * 0.85

Calculation procedure and project offsets:

Per the DCOI protocol, all calculations will use the US Forest Service carbon calculator along with tree species, DBH, and height to total calculate carbon sequestered. This projected data will be made available to all partners. After peer validation this information will be made public with actual measured data points.

Currently, the project has planted 979 project trees of varying species, including:

Species	Total	Carbon offsets per tree over 40 years x tree count = Projected sequestration totals.
Acer palmatum (Japanese Maple)	2	4.94 x 2 = 9.88

[4] https://www.fs.usda.gov/ccrc/tools/tree-carbon-calculator-ctcc

Acer rubrum (Red Maple)	75	4.94 x 75 = 370.5
Betula nigra (River Birch)	15	11.75 x 15 = 176.25
Carpinus caroliniana (American Hornbeam)	36	.67 x 36 = 24.12
Cersis canadensis (Eastern Redbud)	150	1.22 x 150 = 183
Cornus florida (Flowering Dogwood)	9	4.94 x 9 = 44.46
Cornus kousa (Kousa Dogwood)	50	4.94 x 50 = 247
Diospyros virginiana (Persimmon)	18	6.98 x 18 = 125.64
Ginkgo biloba (Ginkgo)	25	4.94 x 25 = 123.5
Juniperus virginiana (Red Cedar)	65	6.98 x 65 = 453.7
Lagerstroemia indica (Crape Myrtle)	8	.67 x 8 = 5.36
Liriodendron tulipifera (Tulip Poplar)	42	11.75 x 42 = 493.5
Magnolia grandiflora (Southern Magnolia)	31	4.94 x 31 = 153.14
Magnolia virginiana (Sweetbay)	19	4.94 x 19 = 93.86
Magnolia x soulangiana (Saucer Magnolia)	2	4.94 x 2 = 9.88
Nyssa sylvatica (Black Gum)	42	4.94 x 42 = 207.48
Pinus taeda (Loblolly Pine)	25	4.94 x 25 = 123.5
Prunus spp. (Flowering Cherry)	27	11.75 x 27 = 317.25
Quercus alba (White Oak)	75	11.75 x 75 = 881.25
Quercus michauxii (Swamp Chestnut Oak)	26	4.94 x 26 = 128.44
Quercus nigra (Water Oak)	3	11.75 x 3 = 35.25
Quercus nuttallii (Nuttall Oak)	32	11.75 x 32 = 376
Quercus phellos (Willow Oak)	77	4.94 x 77 = 380.38
Ulmus americana (American Elm)	92	11.75 x 92 = 1081

Ulmus parvifolia (Chinese Elm)	5	11.75 x 5 = 58.75
Unknown Species (Unknown Species)	28	

Input data - tree species, DBH, height ⇒ US Forest Service carbon calculator ⇒ estimate total carbon stored by the tree.

Based on US Forest Service estimates, this project is projected to produce a total of 6103.09 carbon offsets by maturity. 915.46 carbon offsets will be placed in a buffer pool as required by the DCOI protocol.

These offsets will be distributed in the following manner:

- Buyer 1 - 334 Verified Emission Reductions (VERs)
- Duke University - 334 VERs

These offset will be calculated according to the project timeline by using the height and DBH to estimate carbon offset sequestration via US Forest Service estimates.

Project Implementation

The goal of this project is to ensure the survivability and health of the trees planted. The following sections provide an overview of how the project is managed.

Project Management:

Chuck Cole, executive director of TreesCharlotte, will oversee management of the project and utilize the Fulcrum application to inventory and track the trees.

Urban Offsets will support Chuck Cole and project stakeholders by providing technological support, calculating the offsets from the project, helping coordinate future peer review verification events, registering the offsets with the Urban Offsets Registry, and ensuring the offsets are transferred to the purchasers.

Project Monitoring Plan

TreesCharlotte will maintain the project trees. In order to ensure that the trees have been planted, the City/Nonprofit is required to use the Fulcrum app to record the GPS coordinates and species of each project tree within three months of planting. The City/Nonprofit is then required to use the same app to inventory the trees according to the project timeline below. For each inventory, the app operator must note the tree's height, the diameter at breast height (DBH), and tree species following standard practices. Photo documentation is optional.

All data will be submitted to UO and UO will house these data in a secure database that is accessible, upon request, by project partners.

UO will work with the DCOI and the Offset Network to organize a peer validation event within the first year and every fifth year following the initial inventory. The peer validator will have access and will update the fulcrum app in a similar fashion. After the first validation event, peer validation will occur every five years. The Project's progress is made public on UO's registry platform, and this PDD as well as subsequent validation and verification reports will be available at offsetnetwork.org.

TreesCharlotte is to ensure that at least 85% of the trees survive. If more than 15% of the trees die, and will present a replacement plan resulting in an equal amount of sequestration.

Project Baseline Monitoring Schedule

Project Timeline	Monitoring Event Type	Data Collected
Start Date – once completed:	Stratification	Biomass stratification; if trees planted: species, DBH, height, estimated age, (GPS coordinates)
12 months After Planting	Peer Validation	Validation of project methods, quantifying sequestered C02 & validating maintenance methods
Years 1-4	Full inventory	An annual representative sampling: Species, DBH, height, estimated age, (GPS coordinates)
Year 5	Full inventory	Representative sampling: Species, DBH, height, estimated age, (GPS coordinates)
Year 5	Peer verification	Validation of project methods, quantifying sequestered C02 & validating maintenance methods
Year 6-10	Full inventory	An annual representative sampling: Species, DBH, height, estimated age, (GPS coordinates)
Years 10	Peer verification	Validation of project methods, quantifying sequestered C02 & validating maintenance methods
Year 11-15	Full inventory	An annual representative sampling: Species, DBH, height, estimated age, (GPS coordinates)
Years 15	Peer verification	Validation of project methods, quantifying sequestered C02 & validating maintenance methods
Year 16-20	Full inventory	An annual representative sampling: Species, DBH, height, estimated age, (GPS coordinates)
Year 20	Full inventory Recalculation of baseline scenario	Representative sampling: Species, DBH, height, estimated age, (GPS coordinates). Pertinent laws, common practice and other information to determine baseline suitability.

Years 20	Peer verification	Validation of project methods, quantifying sequestered C02 & validating maintenance methods
Year 21-25	Full inventory	An annual representative sampling: Species, DBH, height, estimated age, (GPS coordinates)
Year 25	Peer verification	Validation of project methods, quantifying sequestered C02 & validating maintenance methods
Year 26-30	Full inventory	An annual representative sampling: Species, DBH, height, estimated age, (GPS coordinates)
Years 30	Peer verification	Validation of project methods, quantifying sequestered C02 & validating maintenance methods
Year 31-35	Full inventory	An annual representative sampling: Species, DBH, height, estimated age, (GPS coordinates)
Years 35	Peer verification	Validation of project methods, quantifying sequestered C02 & validating maintenance methods
Year 36-40	Full inventory	An annual representative sampling: Species, DBH, height, estimated age, (GPS coordinates)
Year 40	Peer verification	Validation of project methods, quantifying sequestered C02 & validating maintenance methods

Verification

Per the DCOI protocol, all calculations will use the US Forest Service carbon estimates along with tree species, DBH, and height to calculate carbon sequestered.

Verification of the project and carbon offset calculations will be carried out through the Peer Reviewed Network and the Offset Network. They will enlist an institution considered a peer to the offset purchasers to act as the validator/verifier. The peer validator will have forestry experience but will not have a certification or license. The Offset Network, Peer Review Network, and the Duke Carbon Offsets Initiative are collectively still reviewing and editing the guidelines for peer validation. This project will serve as a pilot for the peer review process.

Document Author(s) & Contact

The author(s) of this document, Leanna Grondy & Charles Adair, attest that they have performed duties regarding the documentation required within this document with complete honesty and truthfulness. The signature below certifies that the authors did not intentionally misrepresent or present information in misleading ways through this document.

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