



 Urban Offsets City Series, Durham

Walltown & Guthrie Durham Pilot

Peer Validation Report

Walltown and Guthrie Durham Pilot Validation Report

General Verification Information	
Project Title	<i>Walltown & Guthrie Durham Pilot</i>
Report Title	<i>Walltown & Guthrie Durham Pilot Validation</i>
Version	<i>1</i>
Client	<i>Urban Offsets</i>
Date of Issue	<i>7/13/18</i>
Prepared by	<i>Elon University</i>
Contact	<i>David Vandermast CB #2625 Elon, NC 27244 dvandermast@elon.edu 336-278-6171</i>
Approved by	<i>David Vandermast</i>
Work carried out by	<i>David Vandermast and Kylie Roehrle</i>
Number of verification reports completed	<i>1</i>

Table of Contents

Validation Summary	2
Eligibility Conditions	3
Permanence	3
Additional	4
Verifiable	5
Enforceable	5
Real	5
Co-Benefits of Urban Tree Plantings	6
Interview Questions for Project Participants	7
Site Visit	9
Validation Statement	9
(Use this space to build the Validation Statement)	4
Appendices	10

Validation Summary

This project is a pilot planting developed by Urban Offsets to provide carbon offsets to Duke University for trees planted on the city streets of Durham, NC. The stakeholders in this project are Duke University and Duke Carbon Offsets Initiative (purchaser of offset credits, and provider of the offset protocol), Keep Durham Beautiful (a non-profit that distributes funds for the plantings) and the City of Durham (provider of the space and maintenance of the plantings).

The planted trees will be used to sequester atmospheric carbon, to demonstrate that urban forestry carbon offset programs can be used as a viable business, and to determine co-benefits of carbon offset plantings. This project involves 42 trees planted in Durham, NC's Walltown neighborhood (23 trees) and along Guthrie Avenue (19 trees) planted in January 2017. In June 2018 the planted trees were verified using data uploaded by Urban Offsets to Fulcrum, a downloadable app with GPS coordinates, tree vitality, and size (dbh).

Tree verification involved using Fulcrum to visit every tree listed for these plantings and verifying location, tree species identity, and tree health condition. The verification identified sites where 42 trees were planted, meeting expectations of the Project Description Document. Of the 42 trees, there were 7 exceptions (16.7% of planted trees): 4 mis-identified trees (9.5%), and 3 dead trees (7.5%).

Trees planted for this project are in a location where other, similarly sized, non-carbon-offset trees are also planted. Determining which trees were part of this planting versus those from other plantings was of some concern but did not affect the results of this verification.

We conclude that this project meets all of the PAVER requirements but that errors in tree identification change the number of carbon offsets expected for this project. Because of contradictory language in some of the documents and differences in management expectations between the City of Durham and DCOI protocol, we feel that this project is not currently a useful model for the Duke Carbon Offset Initiative. This project should meet the co-benefits described in the PDD.

Eligibility Conditions

Project Location:

As defined by the most recent publication of the United States Census Bureau, the project site is located within an Urban Area boundary and has not experienced commercial harvesting of timber within the last ten years. There is an electronic file available that identifies the project boundaries located on the Fulcrum website. An “end-of-life use” plan for fallen, damaged or management directed tree removals exist per the standard Urban Management Forestry Plan (Page 16,19) for the City of Durham.

Project Commencement

The project commenced on January 2017, the day the trees were planted. The Project commencement date was approved by Duke Carbon Offset Initiative (DCOI). The initial project inventory was completed during May of 2017 by Alex Johnson, the Urban Forestry Manager at City of Durham.

Legal Requirements

The project is not the result of compliance with any federal, state or local law, statute, rule, regulation, ordinance, court order or other legally binding mandates. The project will yield surplus emission reductions above and beyond legal and compliance requirements for the area. The City of Durham acknowledges this directly via their contract with Urban Offsets.

Minimum Time Commitment

Alex Johnson is charged with conducting annual monitoring events but does not know about the DCOI protocol. He is following his City of Durham management protocol. The VERPA states that he should use the same management practices to care for W&G plantings as he does for all of the other trees in Durham, which doesn't align with the DCOI protocol. His maintenance plan is as follows:

- Full inventory of the trees during the first two years
- Inspections then occurring every two years
- Once the trees are older, inspections will occur every seven to ten years

The project crediting period is 20 years with option for renewal and is expected to be renewed and span two crediting periods. Project establishes a timeline of 40 years via the contract between Urban Offset, Keep Durham Beautiful and the City of Durham.

Permanence

The Durham Urban Forest Management Plan (the “plan”) governs the maintenance practices in place at the site of the urban forest project. The plan is relevant to the climate region and species planted at the project site. The plan includes provisions for pruning and recommends that pruning cycles should be implemented. Alex Johnson, based on his responses to the interview questions, is planning on pruning on an as needed basis. There are no provisions for watering in times of high heat or drought to prevent die-off. There are no irrigation systems present at any of the project locations. The plan recommends an annual inspection and the provision of natural mulch to trees. The plan further recommends training and education for staff and volunteers to prevent tree injury

in order to increase root zone protection. The plan recognizes scale insects, defoliators and borers as potential pests and recommends the city avoid planting trees with known associated lethal insect pests, monitor vulnerable populations, and consider funding for treatment options when necessary. The plan recommends that the city plant a diversity of tree species and varieties in order to minimize the effects of disease. It is also recommended that the city consider the costs and benefits of treating individual trees in the event an epidemic of treatable disease threatens major portions of Durham's Urban Forest. The plan includes provisions for the replacement of dead trees if beyond anticipated project mortality.

According to the PDD, Keep Durham Beautiful is to ensure that at least 85% of the trees survive. If more than 15% of the trees die, the City of Durham is to present a replacement plan resulting in an equal amount of carbon sequestration. Mortality of 3-8% is expected. Contrary to the PDD, answers to the interview questions make it clear that it the City of Durham's job to ensure that at least 85% of the trees survive and Keep Durham Beautiful is not involved in ongoing maintenance. Therefore, it is not clear exactly whose job it is to take care of the trees. Also, according to the PDD this project uses the DCOI protocol's standard 40-year timeline for permanence. To reduce risk, the Sustainable Sandhills 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. The PDD does not explain what Sustainable Sandhills is and how it is involved with the project aside from replacing the trees.

Overall, it is unclear as to which entity is in charge of taking care of the trees and replacing them if they die.

Buffer Pool and Risk

There is no reason for the project to deviate from the standard 15% contribution of generated credits as stated by the DCOI protocol. The appropriate buffer pool contribution is being made and separated from the available project credits. The project is expected to produce a total of 483.16 carbon offsets by maturity and 15% of that total is 72.47 carbon offsets, which will be placed into the buffer pool. Duke University will receive 350 VERs according to the PDD, which leaves 60.68 credits unaccounted for.

Additional

The City of Durham and the state of North Carolina do not have any laws, regulations, statutes, or court orders that require the planting of trees. There are no relevant required actions. The project operator did attest via signature within the project description document, to the validity that the City of Durham and state of North Carolina do not have any laws, regulations, statutes, or court orders that require the planting of trees. This project includes the requirement that the 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. Keep Durham Beautiful, via their contract with Urban Offsets, agrees that they will not alter their current level or pursuit for tree funding. Data pertaining to a planting program or urban forest budget was difficult to acquire. Instead, Urban Offsets requires the City to sign a contract that states explicitly that A) all money from the program must go directly to tree plantings and maintenance, thereby directly increasing planting/maintenance resources, B) the City will not change their level or pursuit of tree funds, and C) the City is not legally required to plant additional trees. Implementation barriers did limit the ability to plant trees beyond current business as usual levels. Funding and staffing barriers exist and

prevented the expansion of planting programs. The city of Durham has acknowledged the barriers directly in their contract with Urban Offsets. The project does follow the procedure for “Determining a Baseline” from the DCOI Urban Forestry Protocol in establishing the business-as-usual scenario. We cannot think of a scenario in which the project would have happened without the offset project. We are certain that the project is additional because it demonstrates financial additionality, a plan to minimize leakage and goes beyond the “business as usual” scenario.

Verifiable

Project Monitoring

The project monitoring schedule is in line with the DCOI Urban Forestry Protocol, but during the interview, Alex Johnson stated that he didn’t know about the DCOI.

Project monitoring is being done by Alex Johnson in line with the Durham Urban Forest Management Plan referenced above. His maintenance plan is as follows:

- Full inventory of the trees during the first two years
- Inspections then occurring every two years
- Once the trees are older, inspections will occur every seven to ten years

The initial inventory occurred during May of 2017. The annual survey is recorded in the Fulcrum app and include tree species, location (address and GPS coordinates), DBH, and health condition. The data collected does not include height or estimated age of the trees and there are no explanations as to why the data is missing. The monitoring report exists on the Fulcrum software and on the Open Tree Map software.

Sampling

Sampling was not employed in monitoring; a full measurement was conducted. Sampling would not have been appropriate for a project of this size.

Enforceable

Credit ownership is clearly defined through the project contract and the offsets will be distributed to Duke University as the project generates credits following verification events. According to the Urban Offsets website, the project has generated 60 credits to date.

Real

There are 60.68 credits unaccounted for in the PDD. The project carbon sequestration estimates are not accurate because the numbers of trees per species was miscalculated. The revised total using the correct numbers of each species comes out to 485.98 credits, not much different from the original calculation of 483.16.

Species	Total	Carbon offsets per tree over 40 years x tree count= Projected sequestration totals
Quercus bicolor (Swamp White Oak)	8	10.81x8= 86.48
Quercus lyrata (Overcup Oak)	11	11.75x11= 129.25
Ulmus americana (American Elm)	9	11.75x9= 105.75
Zelkova serrata (Japanese Zelkova)	14	11.75x14= 164.5

The DCOI protocol and the W&G project use the US Forest Service carbon calculator in accordance with the previous version of the protocol. The source used to estimate growth rate is clearly stated in the PDD. The US Forest Service carbon calculator is in good standing and accepted within academic and professional communities. Transparent methodologies are not employed to calculate project impact and are not included in the PDD. The PDD does not include input specs and parameters (azimuth, tree distance, class, etc.). 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.

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

Project details are publicly available at:

<https://registry.urbanoffsets.co/project/projectview?projectIdKey=49dc2267-8818-4d9b-8722-691343f1002e>

Co-Benefits of Urban Tree Plantings

Co-Benefits are reasonably assessed by the project. The PDD addresses all five categories of co-benefits.

Interview Questions for Project Participants

Alex Johnson,
Urban Forestry Manager at City of Durham,
alexander.johnson@durhamnc.gov,
(919) 560-4197

Background Information:

Initially, Alex Johnson partnered with Duke University in order to plant around 100 trees in Walltown. There is no explanation as to why 100 trees were intended but only 42 were planted. Later on, the City of Durham partnered with Keep Durham Beautiful, Urban Offsets and, Delta Airlines to plant over 1000 trees around the City of Durham. Alex Johnson is tasked with purchasing the trees, offloading them at the correct locations and coordinating tree planting events all around Durham. He also assigns specific trees to specific planting sites due to their size and class. Before volunteers show up to a planting, each tree is placed at the location in which it will be planted. Quality control for the trees plantings is provided by volunteers that have shown up to multiple tree planting events, otherwise known as Tree Keepers. Alex Johnson states that there is not 100% accuracy in the tree plantings and each project may be missing upwards of 10% of the trees. After the trees are planted, data points are collected the following week by city staff and put into the Open Tree Map Software. The data points include location of the tree, vigor, diameter at breast height (DBH) and species. Alex Johnson uses his own protocol to monitor, take inventory of and replace the trees. He does not follow the Duke Carbon Offset Initiative (DCOI) protocol for monitoring and caring for the trees. At the end of the whole process, Alex Johnson expects to find a higher than 3-8% tree mortality rate.

Sampling Methods:

Sampling the trees is an ongoing process with no set yearly checkup plan. Alex Johnson uses his own sampling method separate from the DCOI. His inventory plan is as follows:

1. Full inventory of the trees during the first two years
2. Inspections then occurring every two years
3. Once the trees are older, inspections will occur every seven to ten years

His maintenance plan is as follows:

1. Small trees pruned once a year
2. After a year, staking will be taken off of the trees
3. When the trees are older, tree pruning will be done on an as needed basis and will be assigned to city workers to be completed in the offseason.
4. There is not an irrigation system or plan for the trees
5. Remove and replace dead trees

Steps taken when a tree dies:

1. Alex Johnson is in charge of replacing trees that die

2. When a tree dies, it is recorded in the Open Tree Map Software and a tree planting site is created
3. Tree replacement is included in the city budget
4. Tree issues can be reported by city workers or the public via phone or online form

Barriers:

The main barriers of the project come from lack of quality control and resources rather than a lack of enthusiasm and community support. The issues with quality control seem to be particularly important during the planting phase. From our interviews it is clear that there are many people willing to help plant trees, but the professional knowledge of some of the crew leaders is lacking with respect to appropriate planting techniques for the long-term health of the tree. Furthermore, it is too expensive to hire outside contractors and the crew and machinery provided by the city are not enough to ensure consistent quality. Alex Johnson is willing to work with non-profits and volunteer groups and would consider a citizen science program but would rather work with government staff in order to increase quality. Alex Johnson states that the program is well funded but resources at his disposal mean that he has a hard time meeting the expectations of Carbon Offsets and Keep Durham Beautiful.

Tania Dautlick,
Executive Director of Keep Durham Beautiful, Inc.,
tania.dautlick@durhamnc.gov,
919-354-2729

Background information:

Keep Durham Beautiful is a non-profit organization that works closely with the City of Durham and provides the initial funds for the W&G project. Keep Durham Beautiful is not involved with monitoring or tree data collection. Its main role in the project is to provide initial funds through donations as well as provide volunteers to help with planting the trees.

Barriers to the project are as follows:

1. It takes a lot of work and a lot of time in order to get donations
2. Alex's time is a barrier because it takes a while to select and transport trees
3. The project is not a priority for the higher ups in the city. More could be done to get the trees planted.
4. Maintenance, it is time-consuming to take care of so many trees
5. Volunteers, often with little experience, sometimes have to help with pruning

Site Visit

The number of trees identified during validation (42) matches the number of trees described by the PDD and available from data provided to the validators by Urban Offsets. However, there were 4 trees (see appendix) that were misidentified and the numbers of trees of each species do not match the data in the PDD. The revised estimate of carbon offsets from trees identified during the validation exceeds that of the trees listed in the PDD (see data in Real, above).

There were no missing trees for this project, so no explanation was necessary. However, Alex Johnson mentioned that as many as 10% of trees for any project could be missing.

Tree deaths are currently within the expected range of mortality (3 of 42 trees, 7.1% were dead) for projects such as this. A 7.1% death rate possibly suggests the future need to replenish the buffer pool.

We conclude that the tree deaths were not the result of a failure to employ the management plan. There was no explanation for tree deaths. We recommend that tree deaths should be investigated by the project maintainer and future monitoring events should seek to identify the reason for tree deaths.

Validation Statement

The validation work, including the site visit, verifies that 42 trees were planted for the Walltown & Guthrie Pilot Project as per the PDD and data provided to us by Urban Offsets. The trees planted for this project meet PAVER requirements by providing at least the number of offsets described in the PDD.

The Durham Urban Forest Management Plan does not meet the requirements for the frequency of tree maintenance in the DCOI. The purchase agreement (VERPA) signed by Alex Johnson requires that he treat the offset trees as he does all other trees planted in the City of Durham and within his oversight as Urban Forester for the City. The DCOI requires more frequent monitoring and intervention than does the City's plan.

The project impact estimate provided in the PDD appears to be legitimate as does the timing of project events and the project's ability to generate carbon offsets.

Appendices

Include any interview transcripts, notes or email correspondence, as well as any supplemental information relevant to the verification report within separate appendices in this template document.

Appendix 1: Comments from Urban Offsets' Shawn Gagne

Comments on over all peer verification structure:

- Reports could use a section at the beginning that identifies all names mentioned in the report along with their organization and title.
- Reports could use a summary table of actions at the end of each report. The table could include items that should be reviewed/fixed before next verification and items that should be checked at next verification. For example, items that keep the project out of compliance should be in this table to help others act to correct those errors.
- All changes made to PDD's, contracts, inventories, etc.. should be reported on a changelog that stays with the verification report.
- It might benefit verifiers if a single dedicated GPS device was made available for all regional verification events. This would control for errors created using multiple platforms.
- DCOI - How flexible do you want to be wrt city tree management being out of step with the DCOI protocol requirements? It seems this was a common issue (minor) throughout all 4 reports.

Comments specific to this project validation:

- What is the exact wording of the "contradictory language" highlighted in the report?
- The city's responsibilities appear to be confused with the responsibilities of KDB. These should be clarified.
- Define the role of Sustainable Sandhills in the PDD

tree_id	tree_species	dbh (in)	health	Notes	N	PDD
2640156	Quercus bicolor (Swamp White Oak)	2	good	3.6cm		
2640157	Quercus bicolor (Swamp White Oak)	2	Excellent	4.1cm		
2640158	Quercus bicolor (Swamp White Oak)	2	Excellent	4.8cm		
2640159	Quercus bicolor (Swamp White Oak)	2	good	3.4cm		
2640160	Quercus bicolor (Swamp White Oak)	2	good	4.5cm		
2640164	Quercus bicolor (Swamp White Oak)	2	Excellent	4.0cm		
2640165	Quercus bicolor (Swamp White Oak)	2	good	4.1cm		
2640166	Quercus bicolor (Swamp White Oak)	2	poor	4.2cm		
2640145	Quercus lyrata (Overcup Oak)	2	Excellent	3.4cm Originally recorded as swamp white oak but we changed it to overcup oak	8	11
2640146	Quercus lyrata (Overcup Oak)	2	Excellent	4.4cm		
2640151	Quercus lyrata (Overcup Oak)	2	Excellent	3.9cm		
2640152	Quercus lyrata (Overcup Oak)	2	Excellent	4.1cm		
2640153	Quercus lyrata (Overcup Oak)	2	good	3.5cm		
2640154	Quercus lyrata (Overcup Oak)	2	good	4.4cm		
2640155	Quercus lyrata (Overcup Oak)	2	Excellent	4.2cm		
2640161	Quercus lyrata (Overcup Oak)	2	Excellent	3.9cm was recorded as swamp white oak but we changed it to overcup oak		
2640162	Quercus lyrata (Overcup Oak)	2	Excellent	3.9cm		
2640163	Quercus lyrata (Overcup Oak)	2	Excellent	5.4cm		
2640167	Quercus lyrata (Overcup Oak)	2	Excellent	5.0cm was recorded as swamp white oak but we changed it to overcup oak	11	9
2576905	Ulmus americana (American Elm)	2	Excellent	4.5cm		
2576906	Ulmus americana (American Elm)	2	Excellent	5.8cm		
2576907	Ulmus americana (American Elm)	2	Excellent	6.1cm		
2576908	Ulmus americana (American Elm)	2	Excellent	4.3cm		
2576912	Ulmus americana (American Elm)	2	Excellent	4.4cm		
2576913	Ulmus americana (American Elm)	2	Excellent	4.5cm		
2640728	Ulmus americana (American Elm)	2	good	4.9cm		
2640729	Ulmus americana (American Elm)	2	Dead	1.4cm was recorded as excellent condition but we found it dead		
2640733	Ulmus americana (American Elm)	2	Excellent	5.3cm	9	9
2640734	Zelkova serrata (Japanese Zelkova)	2	Dead	Missing. Was recorded as excellent condition but we found that the tree wasn't present.		
2640738	Zelkova serrata (Japanese Zelkova)	2	Excellent	5.6cm		
2640739	Zelkova serrata (Japanese Zelkova)	2	Excellent	5.1cm		
2640741	Zelkova serrata (Japanese Zelkova)	2	Excellent	4.3cm		
2640742	Zelkova serrata (Japanese Zelkova)	2	Excellent	3.9cm		
2640744	Zelkova serrata (Japanese Zelkova)	2	Excellent	4.9cm		
2640745	Zelkova serrata (Japanese Zelkova)	2	Excellent	4.8cm		
2640747	Zelkova serrata (Japanese Zelkova)	2	Excellent	4.5cm		
2640748	Zelkova serrata (Japanese Zelkova)	2	good	5.5cm		
2640749	Zelkova serrata (Japanese Zelkova)	2	Dead	3.9cm		
2640750	Zelkova serrata (Japanese Zelkova)	2	Excellent	4.1cm		
2640751	Zelkova serrata (Japanese Zelkova)	2	Excellent	5.4cm		
2640752	Zelkova serrata (Japanese Zelkova)	2	good	4.7cm		
2640753	Zelkova serrata (Japanese Zelkova)	2	Excellent	5.2cm Said it was overcup oak but we changed it to Japanese Zelkova	14	13
					42	42