Table of Reviewer Comments

Page Number	Protocol Section	Reviewer Comment	DCOI Response
3	Duke Carbon Offsets Initiative Background- Mission	Duke University is dedicated to knowledge creation and dissemination. Consistent with those goals, an appropriate offset protocol for DCOI should explicitly incorporate experimentation and provide for the data gathering and analysis associated with it. I worry that this protocol is too focused on trying to ensure that the carbon sequestration resulting from Duke University's own urban tree plantings yield sufficient "offset potential" and gives insufficient weight to knowledge creation and dissemination.	We decided to remove the Mission and Vision sections from the protocol since they apply to DCOI specifically. We also added more wording to the protocol regarding sharing data and knowledge dissemination in the 'Co-Benefits' section and 'Project Monitoring' section. However, the focus on the protocol is to generate carbon offsets, not to create data for analysis and experimentation and we want to keep this focus.
5	Benefits of Trees and Carbon Offsets	Would it be helpful to provide an overview of the urban forest carbon cycle describing the major carbon sources/sinks/fluxes? It seems that a bit of education is needed for the reader here in order to understand the implications of not only tree growth rates, mortality rates, and longevity, but also the carbon cost of management interventions and implications of end-of-life utilization.	We added a link to the suggested Forest Service publication so that interested parties can read further. However, we chose to keep the amount of detail we had in the protocol since this section is an introduction for potential project developers and not purely an educational resource.
5	Definitions- Carbon Offset Reversal	Negatively affected' is kinda vague. I think it needs to be more explicity stated since this is an important consideration.	We added the suggested verbage defining a reversal as "(i.e. tree death, diminished growth rate, loss of crown biomass)" to the definition and refined what is considered an unavoidable reversal.
6	Eligibility Conditions- Project Monitoring Period	What is the relationship between this 20-year crediting period and the 40-year commitment period? Also, why is the 40-year commitment period not mentioned until half way through the protocol (much later than here)? Seems that this should be up front and center since it is central to how the offset works.	We made this distinction more explicit in this section. We also included "Project Duration" in the terms list to help limit any confusion.
7	Procedure for Demonstrating High Quality Offsets - Permanence	[Permanence] is obviously not possible when dealing with a living organism. So how do you reconcile this? How do you address the finite lifespan of trees forthrightly here? What constitutes a reasonable median lifespan for project trees? How does	We agree that permanence is not possible with a tree. Therefore, this protocol uses "effective permanence". We require that the trees stay alive for at least 40 years (the length of the protocol) but ideally a project developer

		end-of-life utilization of trees factor into assessing permanence and reversals?	would choose trees with a longer lifespan. End-of-life utilization is out of scope of this protocol but ideally will be addressed by the leakage requirements. Added new language to reflect the reviewer's point about additionality.
7	Procedure for Determining a Baseline - Apply a National Baseline	Any statement of procedures for establishing a BAU baseline should require that data gathered show whether BAU refers to number of trees currently planted per annum or the trend projection of trees planted per annum or, alternatively, the total projected target tree population by year.	We require historic planting and budget data under the Procedure for 'Determining a Baseline – Provide a Planting Program' section, but maybe it could be more clearly stated how that data is used to determine a baseline. We think both approaches would work, but larger government-run programs typically use historical averages to determine the baseline and we're comfortable with how it's worked in the past.
8	Risk Mitigation - Best Practices for Urban Tree Care	Urban tree care is only half of the equation for having a successful tree planting. The other half is species and nursery stock selection. -If the species is not suitable for the region and site type, then it will not survive and will not be compatible with human activity of the site. I think there needs to be a whole parallel section here about species selection and nursery stock selection.	The job of the protocol is not to lead people to create the BEST planting project, but to provide general guidance. We don't want to be too heavy-handed or prescriptive in determining what trees are planted. Protocol includes "Work with your expert tree planting partner to make region appropriate selections"
8	Risk Mitigation - Best Practices for Urban Tree Care	I don't think that including a sentence in the 'Planting' bullet that acknowledges the importance of proper species selection is heavy-handed or prescriptive. You aren't telling them what to plant. It is important to make protocol users aware that short-term survival and long-term longevity of trees is founded on proper species selection (matching species to site). It is irresponsible not to acknowledge this guiding principle in my opinion and will ultimately have consequences for the success of the offset plantings if users are not adherent to the principle.	We added more information about tree selection and edited the 'Tree Species Selection' section to further highlight this point.
9	Procedure for Determining a Baseline - Apply a National Baseline	I can't say that I disagree with this premise, but it makes me feel awfully uncomfortable given reasons I stated earlier. We have an abundance of urban forest assessment data these	We completely understand the reviewer's concerns with using a national baseline. However, we've decided to leave it as is because we feel as though the additionality

		days at a fairly localized level. Should we set a high standard and expect UTP Projects to document the local conditions of changing tree cover? Tools such as i-Tree Landscape, i-Tree Canopy, and the MRLC dataviewer put these capabilities within reach for current, localized tree cover data.	section (see the above 'Additionality Checklist' section) adequately covers local tree cover/planting baselines. This national baseline serves to set the stage for the protocol but does not impact how credits are counted. Something we want to avoid with our protocol is unnecessarily excluding universities from planting trees. Requiring the use of state-level or more local data seems overly restrictive and arbitrary. The greenhouse gases these projects remove mix globally, so why would we allow a school in one state/county to plant trees for credit, but not allow a school in a neighboring state/county (as long as those trees are additional to the BAU scenario)? We feel the national baseline of decreasing urban canopy cover paired with the burden of proving project-specific additionality is inclusive while remaining methodologically robust.
11	Co-Benefits of Urban Tree Plantings	This [increased shade leading to a reduction in energy use for cooling] is a major co-benefit that is an important aspect of the carbon offset of urban forests. I wish that this could be better emphasized in the co-benefits and perhaps find a way to incentivize offset projects that facilitate tree planting where shade provision on buildings and hardscape will be maximized	We can't incentivize where trees are planted within a project location in the protocol (other than in an urban area) but we added a section about planting with increased shade in mind to the 'Other Considerations' section.
12	Eligibility Conditions-Project Location	So could these conceivably fall outside an urban area? Is that the intention?	We decided to leave in the condition that projects can occur in unincorporated cities and towns to allow a more expansive definition of urban areas but removed the power transmission and watershed conditions to focus the conditions to the built environment.
12	Co-Benefits of Urban Tree Plantings - Scalability	Are these two really co-benefits [scalability and use of existing municipal tree planting crews] in the same vein as the others? The claim of scalability is also a bit dubious. Urban tree plantings are notorious for failures	We agree with this comment and removed scalability from the co-benefits section.

		and/or require more management interventions for planting and maintenance than planting an acre of rural forest. There is some truth to the second half of your argument, but I'm not sure about the first half. Think about the carbon footprint of 30-40 people driving their cars for 20 minutes to go to a tree planting on a Saturday morning in a local park.	
12	Eligibility Conditions- Project Area	This doesn't seem to have anything to do with 'Project Area' (except maybe the last sentence). Plus this seems to be burying an important aspect of the provisions for 'permanence' and 'reversion'.Keeping carbon locked up for perpetuity seems to be the 'elephant in the room' for this protocol because trees don't live forever and that carbon will eventually go back to the atmosphere unless the trees are converted to durable wood products or used as a renewable energy source.	We moved end-of-life discussion to 'Best Practices for Urban Tree Care' section and discuss permanence in the PAVER requirements table.
13	PAVER Requirements- Verifiable	Can you get your point across about verification here more briefly and then refer the reader to the Verification section below? Doing so would cut down on redundancy and not bog the reader down on the intricacies of verification right here.	We cut down on the information in this section.
17	Risk Mitigation - Best Practices for Urban Tree Care	Urban tree care is only half of the equation for having a successful tree planting.

The other half is species and nursery stock selection.
-If the species is not suitable for the region and site type, then it will not survive and will not be compatible with human activity of the site.
-If the proper nursery stock type is not selected for the site and high-quality nursery stock is not procured, then trees will likewise not thrive.

I think there needs to be a whole parallel section here about species selection and nursery stock selection. | While species and nursery stock selection are important, we did not want to explicitly state requirements about tree selection because it is very dependent on project needs and location. However, we added a section to 'Other Considerations' about tree species selection so that project developers have it on their mind as something to be intentional about. |
| 18 | Sampling | Do the protocols permit more "advanced" designs than simple random sampling? Is that what is being conveyed with the information on sequential sampling? Given the information already known about the | This is explicitly allowed in Appendix 3 on page 23: "Simple random sampling is this protocol's primary sampling methodology; however, Project Developers can use any sampling methodology as |

		population (species, previous diameter, etc.) and their influence on carbon stock and sequestration, designs that incorporate that information (e.g. stratification, regression/ratio estimation) would likely results in estimates of higher precision for given effort."	long as it is robust and accepted in the scientific community. It is required that Project Developers thoroughly document the sampling methodology they utilize."
19	Verification Requirements	Are validation and verification different? If so, explain the difference. If not, drop use of validation to avoid confusion. This bullet could be Initial Verification to parallel with the next bullet.	Validation and verification are very similar concepts so it was helpful to learn that the distinction could be clearer in the protocol. We made sure the terms were consistent throughout the document and tried to make sure that the distinction was clear.
20	Monitoring Report	Could there be additional options in the near future? Drone surveys? Aerial photography assessment? Google Street View?	These suggestions fit with the needs of the monitoring report and provide more flexibility so we added the suggested options to the protocol.
25	Appendix 4- Inventory Methodology	I don't think that height gains you any additional modeling power in i-Tree Eco unless you also have a crown spread and crown base height. Unless you need this variable for additional monitoring purposes, I suggest dropping it (or add the other crown measurements described above). Plus, people are terrible at estimating heights. The data is almost worthless if based on visual estimation. I wouldn't make that an option.	We removed height measurements and simplified DBH measurements to ensure that the data collected is valid and useful.