CITY FOREST CREDITS

Tree Planting Protocol

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Abbreviations, Acronyms, and Glossary

C	Carbon
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
Credit	A unit representing one metric ton of CO_2e
DBH	Diameter at Breast Height
GHG	Greenhouse gas
ICROA	International Carbon Reduction Offset Alliance
ISO	International Organization for Standardization
PIA	Project Implementation Agreement
PO	Project Operator
Registry	City Forest Credits/Urban Forest Carbon Registry
Reversal	A reversal is tree loss that results in release of credited CO_2 such that the carbon stock in the project falls below credited CO_2.

Introduction

This City Forest or Urban Forest Carbon Protocol sets forth the requirements for Tree Planting projects in urban areas in the U.S. to quantify greenhouse gas (GHG) emission mitigation from woody biomass. That woody biomass is referred to herein by the broader term "urban forest."

This protocol provides eligibility rules, methods for quantifying biomass and CO_2 storage, and reporting, monitoring, issuance of credits, reversal, and verification requirements. We have been guided in our drafting by one of the foundational documents for carbon protocols, the World Resources Institute/World Business Council for Sustainable Development Greenhouse Gas Protocol for Project Accounting, which describes greenhouse gas ("GHG") project accounting principles. We refer to this document as the WRI GHG Protocol.

Our goal is in this protocol is to provide for accounting of GHG emission mitigation is a consistent, transparent, and accurate manner, consistent with the principles and policies set forth in the WRI GHG Protocol document. This process will form the basis for GHG reductions that are real, additional, permanent, verifiable, and enforceable, which can then result in the issuance of carbon offset credits, called City Forest Carbon+ Credits™.

Contributions of City Forests to Carbon Storage, Energy Savings, Storm Water Reduction, Air Quality, and Climate Mitigation

Urban forests in the U.S. are estimated to store over 770 million tonnes of CO_2. [1] The co-benefits of urban forests include air quality improvements, energy savings from reduction of the urban heat island effect in hot weather and reduction of heating costs due to wind mitigation in cold weather, slope stability, bird and wildlife habitat, sound and visual buffering, public health improvements, crime

[1] Nowak, D.J. and E.J. Greenfield. 2018. U.S. Urban Forest Statistics, Values, and Projections. J. For. 116, 164-177.

reduction, safety, livability, social cohesiveness, economic improvements, and more.[2] Urban trees clearly influence air temperatures and energy and affect local climate, carbon cycles, and climate change.[3]

Recently updated research documents the magnitude of the contributions of urban forests to climate mitigation. Annually, these trees produce a total of $18.3 billion in value related to 1) air pollution removal ($5.4 billion), 2) reduced building energy use ($5.4 billion), 3) carbon sequestration ($4.8 billion), and 4) avoided pollutant emissions ($2.7 billion). [4] See City Forest Credits *White Paper*, *City Forests – Functions, Scale, and Value of Climate and Other Benefits* 2018. Appendix E to this Protocol.

Loss of Tree Cover in Urban and Community Areas in the United States

The White Paper also cites peer-reviewed research published in 2018 showing the significant decline in urban tree cover in the United States. Data for all states in the U.S. show a national loss of urban and community tree cover of 175,000 acres per year during the study years of 2009-2014. Urban and community areas in the U.S. lose 36,000,000 trees each year.[5]

The total land area of lost urban and community tree cover during the study period of five years amounts to 1,367 square miles – a land area equal to the combined land area of New York City, Atlanta, Philadelphia, Miami, Boston, Cleveland, Pittsburgh, St. Louis, Portland, OR, San Francisco, Seattle, and Boise.

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[2] See Alliance for Community Trees, Benefits of Urban Forests: a Research List at http://www.actrees.org/files/Research/benefits_of_trees.pdf

[3] Nowak, 229

[4] Nowak, David J. et al, "U.S. Urban Forest Statistics, Values, and Projections," *Journal of Forestry* 116(2) (2018), 164-177

[5] Nowak, D.J. and E.J. Greenfield. 2018. Declining urban and community tree cover in the United States. Urban For. Urban Green. 32, 32-55.

Public funding of urban forests remains minimal.[6] Trees are a maintenance and liability expense for cities, and despite the nature of urban forests as public resources, city trees are not "booked" as an asset on cities' balance sheets. Financial managers in cities see only the expense. And when those managers weigh the expense of trees that have no asset value against dire needs for human services, utility services, public safety, transit, homelessness, and refugee communities, the trees move to the bottom of the budget.

The work of this Drafting Group and of City Forest Credits is focused on the United States. But tree canopy loss in urban areas and shortage of public funding are common to cities around the world. These needs are becoming apparent to international organizations and are partly responsible for new initiatives like Cities4Forests at the World Resources Institute.[7] City Forest Credits has received inquiries from urban forest stakeholders in Uganda, Peru, Australia, the United Kingdom, Belgian NGOs working in west Africa, and others, expressing the same concerns and asking if our protocols could help them to recruit new funding from the sale of credits to support this public resource of city forests.

Adding context to both the value of urban forests around the world and their decline is the recent report from the Intergovernmental Panel on Climate Change.[8] Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate. In the words of the Panel:

> *Pathways limiting global warming to 1.5°C with no or limited overshoot would require rapid and far-reaching transitions in energy, land, urban*

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[6] McDonald, R., L. Aljabar, C. Aubuchon, H.G. Birnbaum, C. Chandler, B. Toomey, J. Daley, W. Jimenez, E. Trieschman, J. Paque, and M. Zeiper. Funding Trees for Health: An Analysis of Finance and Policy Actions to Enable Tree Planting for Public Health. *Global Solutions White Paper*. The Nature Conservancy, 19 September, 2017. See https://www.nature.org/content/dam/tnc/nature/en/documents/Trees4Health_FINAL.pdf

[7] See WRI's Letter of Support dated September 4, 2018 for request of City Forest Credits to ICROA to review City Forest Credits' protocols.

[8] IPCC, 2018: Summary for Policymakers. In: Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P. R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M. I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, T. Waterfield (eds.)]. World Meteorological Organization, Geneva, Switzerland, 32 pp

> *and infrastructure (including transport and buildings), and industrial systems (high confidence). These systems transitions are unprecedented in terms of scale, but not necessarily in terms of speed, and imply deep emissions reductions in all sectors, a wide portfolio of mitigation options and a significant upscaling of investments in those options.9*

One element of mitigation cited by the IPCC is Carbon Dioxide Removal (CDR). City Forests can contribute significantly to CDR, in addition to delivering other climate benefits, as cited above and in the White Paper.

Also recently released is the National Climate Assessment from the U.S. Global Change Research Program, a program containing over ten governmental agencies.[10] The Assessment documents many aspects of climate change and its consequences. It discusses some types of mitigation and adaptation, stating:

> *While these adaptation and mitigation measures can help reduce damages in a number of sectors, this assessment shows that more immediate and substantial global greenhouse gas emissions reductions, as well as regional adaptation efforts, would be needed to avoid the most severe consequences in the long term. Mitigation and adaptation actions also present opportunities for additional benefits that are often more immediate and localized, such as improving local air quality and economies through investments in infrastructure.*[11]

The Drafting Group was mindful of the strong policy reasons, based on the facts and research cited above and in the White Paper, in favor of developing carbon protocols for this valuable public resource of city forests, a resource that delivers multiple benefits relating directly to climate. The Drafting Group worked diligently to develop a planting protocol that would meet standards of bodies like the International Climate Reduction & Offset Alliance and also be feasible in the real world of urban forestry.

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[9] Ibid at 17

[10] Jay, A., D.R. Reidmiller, C.W. Avery, D. Barrie, B.J. DeAngelo, A. Dave, M. Dzaugis, M. Kolian, K.L.M. Lewis, K. Reeves, and D. Winner, 2018: Overview. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*[Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA. doi: 10.7930/NCA4.2018.CH1

[11] Ibid in Summary of Findings, Actions to Reduce Risks

Prior Efforts at Urban Forest Carbon Protocols

In 2011, the State of California's Air Resources Board adopted an urban forest carbon protocol. Despite the efforts of that drafting group, the protocol was acknowledged to contain some flaws and also to be too costly and burdensome to be implemented on the ground. It has had no applicants.

In 2013, the State of California awarded a grant to the Climate Action Reserve to develop a more streamlined and feasible urban forest protocol. The Reserve did adopt a planting protocol and a canopy-related management protocol. But the Reserve had certain inflexible institutional requirements, such as a 100-year project duration requirement that rendered those protocols also not feasible, as feared and expressed by some members of that work group. Those CAR protocols have had no applicants. And the State of California ARB did not even begin a review process for that protocol for adoption.

Four members of our Drafting Group served on the work group for those urban forest protocols at the Climate Action Reserve in 2013-2014.[12] The lead scientist on our Drafting Group also led the science work for the 2013 CAR protocols and for the 2011 ARB protocol. Our Drafting Group had little desire to develop another protocol that no one would use.

Our Drafting Group was also aware of the perception that city forests lacked the scale of carbon storage to make those projects worth including in carbon crediting. The field of urban forestry in general has not done a good job of educating the larger national and international science and forestry communities on the climate values and the quantifiable ecosystem benefits of urban forests. A significant part of that failure is due to the persistent and pervasive lack of public or private funding for city forests.

But, as noted above and in the White Paper, stakeholders in urban forestry have a much broader lens than carbon alone. Urban forest scientists and professionals have documented the many climate and other benefits of city forests, even if they have not disseminated that documentation as thoroughly as it should have been.[13]

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[12] http://www.climateactionreserve.org/how/protocols/urban-forest/

[13] See a recent article in Scientific American reporting on research on loss of tree cover in U.S. cities at https://www.scientificamerican.com/article/u-s-cities-lose-tree-cover-just-when-they-need-it-most/

Urban forest professionals are also acutely aware that almost 80% of the population worldwide lives in metropolitan areas or in cities and towns, and urbanization is a significant demographic trend of the 21st century. [14] The climate, ecosystem, and social benefits of urban forests flow directly to the people and communities who live in cities and towns.

The White Paper also describes some of the programs that are beginning under our existing protocols. While these may not reach the scale of the large forest projects in developing countries, they would be of historic scale for city forests. A program in Austin, TX has the potential to conduct riparian re-forestation along 900 miles of rivers and stream, almost 10,000 acres. An urban forest preservation program in King County (metropolitan Seattle) could generate credits on 1,500 acres of enormously valuable urban forest, with quantified storm water, air quality, and energy savings benefits in the tens of millions of dollars.

Documents and Standards for Protocol Development

No single authoritative body regulates carbon protocols or determines final standards. The Stockholm Environment Institute's Carbon Offset Research and Education resource lists the various institutions and programs that have set out formulations of basic principles that every carbon offset protocol should contain.[15]

CORE lists twenty-five different programs or institutions that have either developed standards for protocols or issued standards and rules for their own programs. These institutions range from international bodies such as the Kyoto Protocol, the World Resources Institute, and the International Organization for Standardization, to U.S. carbon programs such as the Regional Greenhouse Gas Initiative and Midwest Greenhouse Gas Reduction Accord, to registries such as the American Carbon Registry, the Climate Action Reserve, and the Verified Carbon Standard.

[14] Nowak, D.J. and E.J. Greenfield. 2018. U.S. urban forest statistics, values, and projections. J. For. 116, 164-177.

[15] See CORE at http://www.co2offsetresearch.org/policy/ComparisonTableAdditionality.html

The standards issued by these bodies vary, and the specific rules formulated to give content to these different standards vary even more. For example, the Clean Development Mechanism under the UN Framework stemming from the Kyoto Protocol lists 115 different approved baseline and monitoring methodologies for large-scale offset projects.

To complicate matters, the environmental and carbon community have tolerated a de facto different standard between compliance protocols and voluntary protocols. Compliance protocols exist in cap and trade jurisdictions like California. Because these compliance protocols establish the rules for credits that will offset actual regulated GHG emissions from monitored sources, greater rigor is expected than in voluntary protocols, where purchasers are buying credits voluntarily to reduce their carbon footprint, not to offset regulated emissions.

There is, nonetheless, a general consensus that all carbon offset protocols must contain the following:

- Accounting Rules: offsets must be "real, additional, and permanent." These rules cover eligibility requirements and usually include baselines for additionality, quantification methodologies, and permanence standards.
- Monitoring, Reporting, Verification Rules: monitoring, reporting, and verification rules ensure that credits are real, enforceable, and verifiable.

Certification, enforceability, and tracking of credits and reversals are performed by specific programs or registries, guided by language in the protocol where relevant.

Over the last fifteen years, several documents setting forth standard and principles for protocols have emerged as consensus leaders for programs attempting to develop their own offset protocols for specific project types. We will follow and refer most often to:

- WRI GHG Protocol;
- Clean Development Mechanism, Kyoto Protocol, now part of the UN Framework Convention on Climate Change ("CDM").

Recognition of Distinct Urban Forest Issues in Protocol Development

The task for the City Forest Drafting Group was to take the principles and standards set forth in these foundational documents and adapt them to urban forestry. Urban forestry and its potential carbon projects are different than virtually all other types of carbon projects:

- Urban forests are essentially public goods, producing benefits far beyond the specific piece of land upon which individual trees are planted.
- New tree planting in urban areas is almost universally done by non-profit entities, cities or towns, quasi-governmental bodies like utilities, and private property owners.
- Except for a small number of wood utilization projects, urban trees are not merchantable, are not harvested, and generate no revenue or profit.
- With the exception of recent plantings in California using funds from its Greenhouse Gas Reduction Fund, almost no one currently plants urban trees with carbon as a decisive reason for doing the planting.
- Because urban tree planting and maintenance are expensive relative to carbon revenues, urban forestry has not attracted established for-profit carbon developers.
- Because urban forest projects will take place in urban areas, they will be highly visible to the public and easily visited by carbon buyers. This contrasts with most carbon projects that are designed to generate tradeable credits purchased in volume by distant and "blind" buyers.

During the drafting process, we remained mindful at all times that the above unique factors of urban forestry distill down to three central attributes:

- Urban trees deliver a broad array of documented environmental benefits,

- Urban trees are essentially a public good delivering their array of environmental benefits to the people and communities living in cities and towns – almost 80% of the population, and

- There are virtually no harvests, revenues, or profits for those who preserve and grow the urban forest.

These three key attributes lead to the conclusion that urban forest projects are highly desirable, bringing multiple benefits to 80% of the population in a public good that is unlikely to be gamed or exploited.

Our task then was to draft urban forest protocols that encouraged participation in city forest projects through highly-credible protocols that addressed not just catch-phrase principles of carbon protocols, but the policies underlying those principles. Where the needs of urban forest practicality required a variance from accepted principles of carbon protocols, we developed solutions to those variances to maintain a high level of stringency.

1. Eligibility Requirements

1.1 Project Operators and Projects

A Project requires at least one Project Operator ("PO"), an individual or an entity, who undertakes a Project, registers it with the registry of City Forest Credits (the "Registry"), and is ultimately responsible for all aspects of the project and its reporting.

1.2 Project Implementation Agreement

A Project Operator must sign a Project Implementation Agreement (PIA) with the Registry setting forth the Project Operator's obligation to comply with this Protocol.

1.3 Project Location

Project Areas must be located in parcels or properties within or along the boundary of at least one of the following:

A. The Urban Area or Urban Cluster boundary ("Urban Area"), defined by the most recent publication of the United States Census Bureau (https://www.census.gov/geographies/reference-maps/2010/geo/2010-census-urban-areas.html);

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 and the Chicago Municipal Planning Agency;

E. The boundary of land owned, designated, and used by a municipal or quasi-municipal entity such as a utility for source water or water shed protection;

F. A transportation, power transmission, or utility right of way, provided the right of way begins, ends, or passes through some portion of A through D above.

In recognition of the urban-rural gradient and the strong public policy interest in preserving open space and forest land within and along that gradient, the Project Area may lie outside the boundary of one of A through F above. But any Project Area outside the boundary of A through F above must lie within or across parcels that constitute a sequence, chain, or progression of contiguously connected parcels. In addition, some part of the property line of one of those contiguously connected parcels must be coterminous with the boundary of one of A through F above.

2. Ownership and Eligibility to Receive Potential Credits

The Project Operator must demonstrate ownership of potential credits and eligibility to receive potential credits by meeting at least one of the following:

A. Own the land, the trees, 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, own the Project trees and credits within that easement, 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 or other benefits delivered by Project trees on that landowner's land. If Project trees are on private property, this agreement must be recorded in the property records of the county in which the land containing Project trees is located.

3. City Forest Carbon+ Credits with Ex Post Performance Guarantee

Each credit issued under this Planting Protocol includes:

- CO_2e by city forest project trees over a 25-year period, and based on survival, quantification, and verification at survival milestones, as set forth below and in Appendix B on Quantification;
- Quantified co-benefits from project trees of rainfall interception, air quality improvements, energy savings, and avoided CO2, all expressed in Resource Units and dollar values;
- Other benefits from project trees that can include slope and soil stability, flood control, wildlife habitat (including birds and pollinators), human health, and, where relevant, social and environmental justice;

- An ACR or Verra credit as a performance guarantee at the request of a Buyer and retired in the name of the Buyer upon issuance of any City Forest Carbon+ Credit.

The ACR or Verra credits will thus guarantee the performance of the City Forest Carbon+ Credit. Each ACR or Verra credit meets the essential criteria of offsets as stated by ICROA:[16]

- Unique
- Real
- Measurable
- Permanent
- Additional

The ACR or Verra credit retired with each City Forest Carbon+ Credit thus represents one ton of CO_2e removed from the atmosphere under accepted principles, including those promulgated by ICROA. The requesting Buyer receives that offset, guaranteed and within the CF Carbon+ Credit, which itself represents one ton of CO_2e that will be removed from the atmosphere over the 25-year project duration, as well as quantified co-benefits representing quantified resource units and avoided costs. ICROA has approved ACR and Verra standards, so those credits will supply the Performance Guarantee.[17]

The process for requesting and retiring ACR or Verra credits in the name of the Buyer upon issuance of CF Carbon+ Credits is set forth in Attachment 1.

4. Additionality

This Protocol ensures additionality through the following:

[16] See ICROA Offset Standard Review Criteria, Essential Criteria, Section 5 (2017) and ICROA's Code of Best Practice for Carbon Management Services, Technical Specification v.2.1 at Section 2.

[17] If ICROA disapproves of any specific methodologies on ACR or Verra, City Forest Credits will not use credits issued under those methodologies.

A. The Performance Guarantee consisting of an ACR or Verra credit for each City Forest Carbon+ Credit, at the request of a buyer. The ACR or Verra credit has already met the additionality standard, represents one ton of CO_2e already removed from the atmosphere, and is issued under Section 2 above as a Performance Guarantee of the CF Carbon+ Credits;

B. A Legal Requirements Test that declares city trees planted due to an enacted law or ordinance not eligible (Section 3.1);

C. A performance standard baseline developed in adherence with the WRI GHG Protocol (see Appendix D);

D. Almost no urban trees are currently planted with a legal or contractual commitment beyond planting. When a multi-year intention to track or maintain trees does exist, its term rarely extends beyond 1-3 years and it remains an intention only, one that can be overridden by budget cuts. The 25-year commitment required by this Protocol is thus entirely additional for urban forest planting projects;

E. Urban trees are planted for many reasons depending on the local communities' priorities, but almost no urban trees are planted for the purpose of storing carbon. And no urban trees have been credited other than under the City Forest Credits standards.

F. Because the urban forest is a public resource, and because public funding falls far short of maintaining tree cover and stocking, carbon revenues will result in additional trees planted or in additional maintenance that will result in additional trees surviving to maturity.

4.1 Legal Requirements Test

Trees planted due to an enacted ordinance or law are not eligible.

4.2 Conversion Out of Forest Before Planting Not Eligible

Proposed projects that convert a forested land use or that cut down healthy trees in order to plant project trees for crediting are not eligible.

5. Project Duration

Projects must commit to a Project Duration of 25 years from the date the last Project Tree is planted ("Project Duration"). The phrase "last Project Trees" is intended to mean the trees planted under a Project Application but not replacement trees over a project's lifetime. Projects may earn credits after the 25-year Project Duration as provided in Section 11.

Planting trees at scale in urban areas is a substantial conservation investment. It is generally undertaken on public land whose tenure is secure and is performed by cities, counties, and non-profit organizations rather than private landowners or those seeking a profit. The beneficiaries of these projects are the public. City trees are almost never planted for harvest.

When a city invests in growing a tree for 25 years, all incentives drive toward maintaining and conserving the trees. These incentives include demands from the public, motivations of elected officials, support from power, transit, and water utilities that benefit from storm water and energy savings of city forests, and city budget managers who want their investments in the city forests to be fully realized.

This Protocol is intended for trees planted for conservation, not harvest. Only trees planted for conservation are eligible, not trees planted for harvest.

6. Project Documentation, Reporting, and Record-keeping

Documentation, reporting, and record-keeping requirements are contained in Appendix A. All projects must submit annual monitoring reports on the anniversary of the date of the Third-Party Verification Report. All projects must quantify carbon stored and submit a Project Report at the end of the 25-year Project Duration.

7. Project Submittal

Initial project documentation is due within 12 months of approval of the application by the Registry. Appendix A sets forth documentation and reporting requirements and deadlines.

Plantings prior to May 1, 2017 are not eligible, unless a project requests Early Action status and provides written documentation to the Registry that it conducted planting projects prior to May 1, 2017 with explicit reference to or under the guidance of a carbon protocol and with CO_2 storage as a significant part of the reason for the project. The Registry retains sole discretion to determine Early Action status.

8. Aggregation of Properties under a Project

Urban forest stakeholders can develop and apply for a Program of Aggregation that will cover a defined area. The rules for those Programs of Aggregation are set forth in a separate document – the Annex on Programs of Aggregation.

The rules in this Section 8 pertain to projects where a Project Operator seeks one project with multiple properties in that project.

A Project Operator may aggregate multiple properties under one project as follows:

A. The Project Operator may aggregate multiple properties in the same city or in multiple cities

B. The Project Operator may aggregate properties under public or private ownership under the same project

C. The initial planting of trees for all aggregated properties must occur within a 36-month period

D. The Project Operator must demonstrate compliance with all Protocol requirements for each property within an aggregated project

E. The Project Design Document must include all properties

F. The final Project Design Document and request of credits shall be submitted after the last tree is planted in an aggregated project; i.e., all trees must be planted before a project submits its Project Design Document and goes to Third-Party Verification

G. The Project Operator must obtain written pre-approval from the Registry for aggregation before submitting an application for a project that aggregates multiple properties.

9. Issuance of Credits for Tree Planting Projects

The Registry will issue City Forest Carbon+ Credits™, representing a metric tonne of carbon dioxide equivalent (CO_2e), bundled with the quantified co-benefits of rainfall interception, energy savings, and air quality.

All issuances of credits in this Section 9.A are subject to deduction of 5% of credits withheld by the Registry for its Registry-wide Reversal Pool account. The Registry will issue Credits to projects that comply with the requirements of this protocol, as follows:

A. After planting of all Project Trees (intended to mean the trees planted under a Project Application but not replacement trees over a project's lifetime), approval by the Registry, and third-party verification: 10% of total CO_2e stored by Year 26, according to quantification projections conducted under the Registry's quantification methodology;

B. After the third anniversary of the planting of the Last Project Tree in a project (with the "Last Project Tree" intended to mean the trees planted under a Project Application but not replacement trees over a project's lifetime), approval by the Registry, and third-party verification: 40% of total CO_2e stored by Year 26, subject to data collection, sampling, and

quantification projections conducted under the Registry's quantification methodology;

C. After the fifth anniversary of the planting of the Last Project Tree in a project , approval by the Registry, and third-party verification: 30% of total CO_2e stored by Year 26, subject to data collection, sampling, and quantification projections conducted under the Registry's quantification methodology;

D. After the twenty-fifth anniversary of the planting of the Last Project Tree in a project: all remaining credits after Final Quantification and third-party verification of carbon stored. Twenty percent of projected credits are withheld until the end of the project at Year 26. At that point, the Project Operator will conduct a Final Quantification with data collection, sampling, approval of the quantification methods by the Registry, and third-party verification. At that time, the Registry will issue "true-up" credits equaling the difference between credits already issued (which were based on projected CO_2e stored) and credits earned based on Final Quantification and verification of CO_2e stored;

E. 5% of total credits earned will be retained by the Registry for a Registry-wide Reversal Pool.

Projects can continue after Year 25, and earn credits, as provided in Section 11.

9.1 Conversion and Marking of Credits as Ex Post at Year 26

After Final Quantification as set forth in Section 9.D above, all credits issued will embody CO2e stored. All credits issued under the project to that point then will be marked in the Registry of credits as Ex Post Carbon+ Credits.

10. Reversals in Tree Planting Projects

Reversals can occur if tree loss results in release of credited CO_2 into the atmosphere. Or, put it another way, a reversal can occur if there is a loss of stored

carbon serving as the basis for credits for GHG emission mitigation after credits have been received by projects but before the expiration of the Preservation Commitment. (References in this section to "carbon" shall mean CO_2e serving as the basis for credits for GHG emission mitigation). A "Reversal" is loss of stored carbon such that the remaining stored carbon within the Project Area is less than the amount of stored carbon for which Registry credits have been issued.

The Registry will retain in a Reversal Pool account 10% of all credits issued to preservation projects and 5% issued to planting projects. This Reversal Pool account shall be used to compensate for Unavoidable Reversals as set forth below. The Registry does not compensate Project Operators for the retained credits in the Reversal Pool account. The Registry may provide in the future for distribution of credits in the Reversal Pool account to Project Operators if the actual reversals are less than current evaluation of risk.

This section sets forth rules for determining the type of Reversal, calculating the amount of the Reversal, and compensating for the Reversal.

Avoidable Reversals

A. Notice and Calculation of Avoidable Reversals

An Avoidable Reversal is any Reversal that is due to the Project Operator's negligence, gross negligence, or willful intent, including harvesting, development, and harm to the trees in the Project Area due to the Project Operator's negligence, gross negligence or willful intent.

If the Project Operator becomes aware of a potential Avoidable Reversal, the Project Operator shall deliver written notice to the Registry within 60 days of becoming aware of the potential Reversal. If the Registry determines that an Avoidable Reversal has occurred, it shall deliver written notice to the Project Operator.

Within 90 days of receiving written notice from the Registry of an Avoidable Reversal, the Project Operator shall calculate the number of remaining creditable tonnes CO_2e in the Project Area using one of the quantification methods contained

in this Protocol and its appendices. The Project Operator may use another quantification method only after receiving written approval by the Registry.

The Registry shall then determine the number of credits reversed and deliver written notice to the Project Operator of that amount and its obligation to compensate for those reversed credits.

B. Compensation for Avoidable Reversals

Within 60 days of being notified of the number of credits that it is obligated to replace, the Project Operator shall submit to the Registry a sufficient number of City Forest Carbon+ Credits to cover the shortfall. If the Project Operator is unable to obtain sufficient City Forest Carbon+ Credits, the Project Operator may pay the Registry $20 per tonne CO_2e of shortfall to satisfy the Project Operator's reversal obligation.

Quantifications of carbon stocks determined by the Registry shall be considered to be verified amounts under this section.

Unavoidable Reversals

An Unavoidable Reversal is any Reversal not due to the Project Operator's negligence, gross negligence or willful intent, including, but not limited to disease, fire, drought, cold, ice/snow, wind/hurricane, flooding, earthquake, landslide, and volcano.

C. Notice and Calculation of Unavoidable Reversals

If the Project Operator becomes aware of a potential Unavoidable Reversal, the Project Operator shall deliver written notice to the Registry within 60 days of becoming aware of the potential Reversal. If the Registry determines that an Unavoidable Reversal has occurred, it shall deliver written notice to the Project Operator.

The Registry shall calculate the number of remaining creditable tonnes CO_2e in the Project Area using one of the quantification methods contained in this Protocol and

its appendices. If the Registry determines that more credits have been issued to the Project (counting both credits issued to the Project Operator and credits transferred to the Registry's Reversal Pool account), the Registry shall notify the Project Operator of its calculation of remaining CO_2e and of the shortfall.

D. Compensating for Unavoidable Reversals

Unavoidable Reversals are compensated by credits retired by the Registry from the Registry's Reversal Pool account.

If a Project has had its carbon stock go below the carbon stock necessary to support credits issued by the Registry, no further credits will be issued to the Project until the carbon stocks are above the amounts needed to support issued credits, including credits allocated to the Registry's Reversal Pool account.

If a Project Operator fails to compensate for a reversal, that Operator's projects may be terminated and the Project Operator may be barred, at the sole discretion of the Registry, from submitting applications to the Registry.

11. Continuation of Tree Planting Projects after 25-Year Project Duration

After the minimum 25-year Project Duration, projects may continue their activities, submit Project Reports under Appendix A, and seek issuance of credits. Projects must comply with all applicable requirements of this Protocol.

If a project chooses to continue into a second 25-year Project Duration, the Project Operator can conduct at any time a quantification of CO_2 stored in project trees. If that quantification yields more credits than were issued during the project's 25-year project duration (due to additional growth after 25 years or the planting of replacement trees), the Project Operator can request issuance of those additional credits.

12. Quantification of Carbon and Co-Benefits for Credits

The Registry will issue City Forest Carbon+ Credits™ to a Project upon request by a Project Operator and verification of compliance with this Protocol. Project Operators must follow the Quantification methods set forth in Appendix B.

Appendix B sets outs methods for quantification. Each method requires certain steps, data samples from the Project Operator, data from imaging, data from look-up tables that are or will be provided, and calculations.

Appendix B also provides methods for calculating co-benefits, such as rainfall interception (one element of storm water run-off reduction), energy savings, and air quality. Appendix B, Attachment 1 contains a description of the quantification methods and the science used to develop those methods.

13. Verification

The Registry will issue credits only after a Project Operator submits a Project Report Requesting Verification and undergoes third-party verification by a verifier approved by the Registry. Credits issued prior to completion of the 25-year project period will be subject to the Reversal Requirements set forth in Section 9.

The approved third-party verifier will verify compliance with this Protocol per ISO 14064-3 as set forth below and in App. C, "Verification for Tree Planting Projects." Appendix C sets out verification methods and standards. Here is a summary.

- App. C sets out standards for verification for project eligibility, quantification methods, and for the issuance of City Forest Carbon+ Credits. App. C also contains requirements for geocoded photographs, imaging, data, or similar landmarking that provides verification of the Project Operator's data on quantification.

- Project Operators may use data from management or maintenance activities regularly conducted if the data was collected within 12 months of the project's request for credits.

Attachment 1 – Processes for Retirement of ACR or Verra Performance Guarantee Credits with Issuance of City Forest Carbon+ Credits

When and How Are Performance Guarantee Credits Retired in name of Buyer?

- If Buyer is buying credits in Spot Purchases:
    - After the City Forest Credits Registry (the "Registry") has approved a Verification Report and been notified by a Project Operator that the Buyer has funded the City Forest Carbon+ Credits, the Registry will retire a Performance Guarantee Credit in the name of the Buyer for every City Forest Carbon+ Credit issued.
    - This obligation is contained in the Project Implementation Agreement between the Registry and the Project Operator
    - The Registry will give the Buyer view-only access to the Registry's Performance Guarantee ACR account so Buyer can confirm the supply of credits
- If the Buyer is making a Forward Purchase before Credits are issued:
    - Whenever the Project Operator notifies the Registry that the Buyer has funded the forward purchase of credits, the Registry retires Performance Guarantee Credits in the name of the Buyer. I.e., because Buyer has funded up-front, Buyer gets Performance Guarantee Credits retired up-front.
    - In these cases of forward purchases, the Registry will retire the same number of Performance Guarantee Credits as City Forest Carbon+ Credits that the Project Operator estimates it will earn, minus deductions for the buffer pool and 20% mortality in a Credit Estimation Spreadsheet approved by the Registry.
    - This obligation is contained in the Project Implementation Agreement between the Registry and the Project Operator

- The Registry issues City Forest Carbon+ Credits on its issuance schedule per Protocol. (Buyer has received retirement of ACR/Performance Guarantee Credits up-front.)
- The Registry will give Buyer access to its Performance Guarantee ACR account, so Buyer can confirm the Registry's supply of credits