City Forest Credits Standard

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1. INTRODUCTION

1.1 About City Forest Credits

City Forest Credits (CFC) is a national nonprofit carbon registry that serves one sector of carbon – the carbon stored in forests and trees in metropolitan areas in the United States. CFC has developed the first standard for carbon in forests in cities, towns, and metropolitan areas.

CFC was founded in 2015 as the Urban Forest Carbon Registry and licensed under the laws of the state of Washington in the United States. It operates under the registered trade name of City Forest Credits. CFC has two carbon protocols containing requirements for crediting, including quantification methodologies. CFC has a 40-year and a 100-year Tree Preservation Protocol, modeled after avoided conversion or avoided emissions protocols in forestry. The 40-year Protocol was designed for the voluntary market and the 100-year Protocol for the compliance market in the state of California. CFC also has a 26-year Tree Planting Protocol governing newly planted trees.

1.2 City Forest Credits Standard Overview

The City Forest Credits (CFC) Standard is a national standard for GHG emission reduction and removal projects involving forests and trees in cities and towns. As of August 2021, it credits projects only in the United States. The Standard details the rules and requirements governing the CFC Program for project registration, carbon and co-benefit quantification methodology, monitoring and reporting, validation and verification requirements, and issuance of carbon credits.

Project Operators wishing to develop a project for registration shall follow this Standard. Adherence to the CFC Standard and associated methodologies and protocols will ensure that project-based offsets represent emissions reductions and removals that are real, measurable, permanent, in excess of regulatory requirements and common practice, additional to business-as-usual, net of leakage, verified by an approved independent third party, and used only once.

1.3 Background on Urban Forest Carbon

1.3.1. Previous Urban Forest Carbon Protocol Efforts

CFC developed the urban forest carbon protocols after discussions with urban forest experts about the challenges in the sector as well as experiences in California over the past decade.

In 2011, the State of California's Air Resources Board (ARB) adopted an urban forest carbon protocol. And in 2014 the Climate Action Reserve adopted two urban forest protocols. Both of these were directed at the compliance market in the State of California. There have been no applicants under any of those protocols.

These two early drafting efforts in 2011 at ARB and in 2013 at CAR brought together new resources and provided many learning experiences. Four members of the CFC Protocol Drafting Group served on the

work group for the urban forest protocols at CAR in 2013-2014. The lead scientist on the CFC Protocol Drafting Group also led the science work for the 2013 CAR protocols and for the 2011 ARB protocol.

Urban forest stakeholders perceived at that time that, given the lack of applicants under these California protocols, a national urban forest standard, with national protocols developed by a national drafting group and directed toward the voluntary rather than compliance market, could be an important step toward enabling urban forestry to enter the carbon markets. While it is true that the amount of creditable CO_2 in the urban forest cannot match that of rural and wildland forests, city forests are public resources that provide public climate action and social benefits beyond CO_2 storage.

1.3.2. Urban Forest Carbon Significance

Urban forest scientists and professionals have documented climate and other benefits of city forests.[1] These impacts include equity, human health, stormwater reductions, energy savings, and air quality improvements - all delivered directly to concentrated populations of humans. 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.[2] The climate, ecosystem, and social benefits of urban forests flow directly to the people and communities who live and work in cities and towns. The city forest carbon offsets would be analogous to rare earth minerals – lower in volume but extremely valuable.

The only path to bringing the public resource of urban forests to the carbon markets lay in a specialized standard, methodologies, and a registry developed by people with experience in both carbon and urban forestry. Thus the beginning of City Forest Credits and its diverse stakeholders, many of them donating their time to develop the CFC Standard and Protocols.

1.4 Governance

The CFC Standard relies upon the principles of accountability, transparency, responsiveness, and participatory process. CFC is governed under and is compliant with the laws and licensing of non-profit corporations in Washington state, as well as the Articles of Incorporation and By-Laws. The staff of CFC manage the daily operations of the Standard, and the Board of Directors provides oversight of staff and operations.

1.5 Conflict of Interest Policy

CFC values integrity and transparency. Board of Directors and CFC staff are required to sign and adhere to the Conflict of Interest Policy, which requires disclosure and scrutiny of any potential conflicts of interest.

[1] 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/

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

1.6 Intellectual Property Rights and Copyright

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2. GLOSSARY OF TERMS

2.1 Terms and Abbreviations

City Forest Credits (CFC)	National nonprofit carbon registry that establishes standards for quantifying and verifying GHG emission reduction and removal in urban forest projects, and issues and tracks the transfer and retirement of credits in a secure online database
Carbon dioxide equivalent (CO_2e)	Unit for comparing the radiative forcing of a GHG to carbon dioxide
Carbon+ Credit	A unit representing one metric ton of CO_2e
Credit Commencement Date	The date from which credit issuance is calculated per specific Protocol requirements
Greenhouse gas (GHG)	Gaseous constituent of the atmosphere, both natural and anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds
International Carbon Reduction Offset Alliance (ICROA)	International nonprofit membership organization which promotes best practices across the voluntary carbon market
International Organization for Standardization (ISO)	Independent international nongovernmental organization made up of standards bodies
Project Crediting Period	Defines the time period for which a project's GHG reductions or removals are valid and eligible to be verified for credits.
Project Implementation Agreement (PIA)	Contract with the Registry setting forth the Project Operator's obligation to comply with the Protocol
Project Operator (PO)	Entity who undertakes a Project, registers it with the registry of City Forest Credits, and is ultimately responsible for all aspects of the Project and its reporting
Protocol	The comprehensive set of rules and requirements developed by City Forest Credits and a national Protocol Drafting Group, including quantification methodologies, monitoring, and reporting for Projects

Registry	City Forest Credits
Reversal	A tree loss that results in release of credited CO_2 such that the carbon stock in the project falls below credited CO_2
Validation	Systematic, independent, and documented process for the evaluation of a GHG project against validation criteria in specific Protocols
Validation/Verification Body (VVB)	An organization or individual that has been approved by City Forest Credits to perform validation or verification activities for specific Protocols
Verification	Systematic, independent, and documented process for the evaluation of a GHG project against verification criteria in specific Protocols

2.2 Document Names and Language Framework

The CFC Protocols are the comprehensive rules and requirements for crediting projects. The word "Protocol" is used to refer to those comprehensive set of rules and requirements. The words "methodology" or "quantification methods" are used to refer to the science and methods for quantifying and accounting for CO2 by project actions.

The following terms are used in CFC Protocols, methodologies, and in this Standard document:

- "Shall" or "must" mean required, mandatory
- "Should" means recommended but not required
- "May" or "can" means allowed, permissible

The operating language of CFC is English. All GHG Project documents, methodologies, Protocols, tools, verification reports, and other documents required by CFC shall be in English.

3. CITY FOREST CREDITS PROGRAM

3.1 Program Principles, General Approach, and References

The City Forest Credits (CFC) Program forms the basis for GHG emission reductions and removals that are real, additional, permanent, verifiable and enforceable, which can then result in the issuance of carbon offset credits, called City Forest Carbon+ Credits™.

The overarching Program goal is to provide for accounting of GHG emission mitigation in city forests in a consistent, transparent, and accurate manner, consistent with the principles and policies set forth in the World Resources Institute/World Business Council for Sustainable Development (WRI/WBCSD) Greenhouse Gas Protocol for Project Accounting, which describes greenhouse gas project accounting principles and International Organization for Standardization (ISO) 14064-2:2006.

The Program follows the following GHG Accounting Principles from ISO 14064-2:2006, clause 3.

- Relevance: Select the GHG sources, GHG sinks, GHG reservoirs, data and methodologies appropriate to the needs of the intended user.
- Completeness: Include all relevant GHG emissions and removals. Include all relevant information to support criteria and procedures.
- Consistency: Enable meaningful comparisons in GHG-related information.
- Accuracy: Reduce bias and uncertainties as far as is practical.
- Transparency: Disclose sufficient and appropriate GHG-related information to allow intended users to make decisions with reasonable confidence.
- Conservativeness: Use conservative assumptions, values and procedures to ensure that net GHG emission reductions or removals are not overestimated.

These Program Principles, Goals, and Approaches are contained and reflected in our governance, our protocols, our quantification methodologies, our crediting process, our validation and verification, our monitoring and reporting, and our registry database of credits.

City forests are essentially a public resource, providing social, human health, environmental, and economic benefits. The Program strives to ensure that the offset projects it registers are not harmful. Project activities should not cause or contribute to negative social, economic or environmental outcomes and ideally should result in benefits beyond climate change mitigation. Projects are encouraged to quantify co-benefits of projects for ecosystem services including rainfall interception, air quality improvements, and energy savings from heating and cooling benefits.

CFC operates a transparent online registry system for Project Operators to register projects and record the issuance, transfer, and retirement of verified carbon offsets. See Standard Section 7 for more detail on the Registry Database.

3.2 Project Types

CFC issues credits only to GHG projects that comply with its Protocols and are validated and verified against CFC Protocols. CFC has two project types for city forests, one for tree preservation and one for

tree planting. Approved protocols for tree planting and tree preservation projects are available on the CFC website here: https://www.cityforestcredits.org/carbon-credits/carbon-protocols/

3.3 Reversal Pool Account

Reversals can occur if tree loss results in release of credited CO2 into the atmosphere. 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. Project Operators must compensate for Avoidable Reversals.

CFC maintains a Reversal Pool Account composed of credits from all projects and all project types. CFC deducts 10% of potentially issuable credits from all Preservation Projects before issuance and 5% of all potentially issuable credits from Planting Projects before issuance. This Reversal Pool Account is in place to compensate for 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. CFC does not at this time compensate Project Operators for the retained credits in the Reversal Pool Account. See relevant Protocols for details.

3.4 Prevent Double-Counting

No Project shall seek credits on trees, properties, or projects that have already received credits from the City Forest Credits Registry or any other carbon registry. Project Operators must sign an attestation that there is no double counting of credits.

CFC also has three supporting elements based on the nature of the projects, including the following:

1. Project locations are in metropolitan areas and publicly visible. Project Design Documents contain maps showing project locations and boundaries, so anyone can go to the project trees and view them.

2. Projects developed to the date of this version of this Standard have been by public and not-for-profit entities seeking to implement conservation goals. Offset revenues extend the implementation of those goals.

3. All credits are issued with a unique serial number and tracked from creation to retirement. The registry database is hosted on its own secure platform, with continuous back-up independent from the hosting platform. This is to ensure that there will always be a current version of the registry database and all its records for high availability.

3.5 Timing of Crediting

The City Forest Credits (CFC) Program issues ex-post credits to preservation projects that are preserving at-risk forested stands in cities and towns. Under limited circumstances and with numerous safeguards,

the CFC Program issues to planting projects ex-ante credits that convert to ex-post credits after final quantification of CO_2(e) stored and both validation and verification.

The following information describing the Tree Preservation Protocol, Tree Planting Protocol, and timing of crediting is posted on the City Forest Credits website here: https://www.cityforestcredits.org/carbon-credits/carbon-protocols/

3.5.1 Tree Preservation Projects

The Tree Preservation Protocol is an avoided emission or avoided conversion protocol. Ex-post credits are issued after the biomass is protected via a recorded encumbrance protecting the trees. Issuance is phased or staged over one and five years at the equivalent of 50 aces of crediting per year. More detail is provided in Protocol Section 6.

This staged issuance reflects the likely staging of development over time if the project area were to have been developed. The one to five year staging period reflects that city forest preservation parcels are relatively small by rural forest standards. The largest parcel credited to date is 131 acres. Urban land is also cleared and graded as soon as permitted, so that land developers can "vest" their rights and install water, sewer, and other infrastructure.

Additional growth and biomass increase during the project must be quantified and verified before any credits can be issued for that additional growth.

3.5.2 Tree Planting Projects

The Tree Planting Protocol is an afforestation/reforestation protocol, adapted to the unique circumstances of urban forestry. CFC issues ex ante credits, called City Forest Carbon Forward Removal Credits,™ based on forecasted CO_2 storage at Year 26. Credits are issued at five different time periods containing mortality checks and measurement of trees or canopy. More detail is provided in Protocol Section 6 and Appendix A.

CFC issues credits as follows and requires the following safeguards to ensure performance of these ex ante credits. "Last Project Tree" is intended to mean the trees planted under a Project Application but not replacement trees over a project's lifetime.

- After planting of the Last Project Tree, validation by the Registry, and third-party verification, the Registry will issue 10% of total CO_2e stored by Year 26, according to quantification projections conducted under the Registry's quantification methodology used by that Project;
- In Year 4, after the third anniversary of the planting of the Last Project Tree in a project, validation by the Registry, and third-party verification, the Registry will issue 30% of total projected CO_2e stored by Year 26, subject to data collection, sampling, and quantification projections conducted under the Registry's quantification methodology used by that Project;
- In Year 6, after the fifth anniversary of the planting of the Last Project Tree in a project, validation by the Registry, and third-party verification, the Registry will issue 30% of total CO_2e stored by Year 26, subject to data collection, sampling, and quantification projections conducted under the Registry's quantification methodology used by that Project;

- In Year 14, after the thirteenth anniversary of the planting of the Last Project Tree in a project, validation by the Registry, and third-party verification, the Registry will issue 10% of total projected CO_2e stored by Year 26, subject to data collection, sampling, measurement of sampled trees or canopy, and quantification projections conducted under the Registry's quantification methodology used by that Project;
- In Year 26, after the twenty-fifth anniversary of the planting of the Last Project Tree in a project, the Registry will issue 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, measurement of trees or canopy, approval by the Registry of the quantification methods by the Registry, validation 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;
- Ex-ante planting credits converting to ex post at Year 26

Development of the Tree Planting Protocol recognized that urban forestry and its potential carbon projects are different than virtually all other types of carbon projects:

- City forests are essentially public resources, producing benefits far beyond the specific piece of land upon which individual trees are planted and giving access to nature to millions of city residents
- 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
- Urban trees are not merchantable, are not grown for harvest but for their social and environmental benefits, and generate no revenue or profit
- Because urban forest projects take place in cities and towns, they are highly visible to the public and easily visited by carbon buyers. This contrasts with many rural forest carbon projects that are in more remote areas or in developing countries
- Urban forests provide social impacts such as equity and human health, as well as ecosystem values beyond carbon, such as stormwater reductions, energy savings from cooling and heating effects, and air quality improvements

Documented loss of tree cover across U.S. cities testifies to the lack of municipal funding for city forests. Urban forest planting projects cannot wait for 25 years to receive carbon revenue. In addition, urban trees provide a suite of both social impacts and ecosystem values directly to the millions of people who live, breathe, work, and seek access to nature in cities.

The CFC Protocol Drafting Group and City Forest Credits have been aware from the beginning that ex-ante credits are disfavored due to a higher risk of intentional reversal and potential unsubstantiated claims to an offset. These risks are very real in most carbon projects, particularly those with for-profit owners or developers.

But ex-ante crediting for city forests entails significantly less risk than rural forest carbon projects. The reason is simple but profound: city forests are planted for the sole purpose of providing social and environmental benefits through tree survival. They are not planted for harvest or profit. No city forest project owner will face the economic temptation partway through a project to cut the trees down to reap a harvest profit. No city forest project will lengthen a harvest rotation to earn credits.

Rural forest owners constantly weigh harvest revenues against carbon revenues, and there is a structural misalignment between the economic drive for tree removal for harvest and tree survival for carbon crediting. But with city forests, there are no harvests. Carbon is the only way to monetize the city trees. So city forests are aligned with carbon crediting, and risks of ex-ante crediting are reduced – both the projects and the crediting seek long-term survival of the trees and forest.

4. PROJECT REQUIREMENTS

4.1 General Requirements

This section sets out the rules and requirements for projects under the City Forest Credits (CFC) Program. Specific requirements apply for projects throughout this section with reference to each Protocol.

All Projects must demonstrate their compliance with the CFC Protocols through the validation and verification processes, which are defined in Section 5 of this Standard.

4.2 Project Documentation

All projects shall follow the documentation, reporting, and record-keeping as outlined in relevant protocols and use the templates provided by CFC which are available on the CFC website. Projects shall submit monitoring reports which describe that data and information related to the monitoring of GHG emission reductions or removals.

Project Operators shall keep all documents and forms related to the project for a minimum of the Project Duration required by the protocol. CFC requires data transparency for all projects. For this reason, all project documentation and data except for commercially sensitive information will be publicly available on the CFCs website.

Project Documentation requirements are described in detail in the Tree Planting Protocol Section 3 and Tree Preservation Protocol Section 3.

4.3 Project Design and Aggregation

The CFC Program allows for different approaches to project design per each Protocol. A Project Operator may aggregate multiple properties under one 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 will be set forth in Program Guidelines on Programs of Aggregation.

4.4 Project Geographic Scope

CFC accepts projects from urban area locations in the United States, provided they conform to CFC Protocols.

4.4.1. Project Boundary

CFC does not use the terms "GHG Boundary" or "GHG Project Boundary." Projects complying with the Tree Preservation Protocol must define and submit documentation of the Project Area of the forested stands being preserved and credited. Projects complying with the Tree Planting Protocol must show documentation of the area within which trees are being planted, but trees may be planted in a dispersed manner within that area. Each Project Operator shall provide maps and other relevant information to show trees or project areas per the specific Protocol requirements.

4.4.2. Project Location in Urban Areas

Projects must be located in parcels 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, the Chicago Municipal Planning Agency, the Capital Area Council of Governments (CAPCOG) in the Austin, Texas area, and the Southeastern Michigan Council of Governments (SEMCOG);
E. The boundary of land owned, designated, and used by a municipal or quasi-municipal entity for source water or watershed protection. Examples include Seattle City Light South Fork Tolt River Municipal Watershed (8,399 acres owned and managed by the City and closed to public access);
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 may lie outside the boundary of one of A through F above. But any Project 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.

4.5 Project Start Date

In general, the start date for a project will be when CFC approves a project's written application. Specific protocols must state project timelines or start dates for various actions in detail.

4.6 Project Crediting Period

The project "crediting period" defines the time period for which a project's GHG reductions or removals are valid and eligible to be verified for credits. In general, the start of a project's crediting period will correspond to its start date also known as the "credit commencement date."

The length of a project's crediting period is defined in each Protocol. Per the Tree Preservation Protocol, the Credit Commencement Date is the effective date of the Preservation Commitment. Per the Tree Planting Protocol, the Credit Commencement Date is the date the last tree is planted.

4.7 Ownership

Project Operators shall demonstrate that they have the legal right to control and operate project activities. All Project Operators shall either own the land or have a written agreement from the landowner. Relevant requirements are described in Tree Preservation Protocol Section 1.5 and Tree Planting Protocol Section 1.7.

A summary of the requirements is as follows. The Project Operator shall demonstrate ownership of potential credits or eligibility to receive potential credits by meeting at least one of the following:

A. Own the land and potential credits upon which the Project trees are located; or
B. Own an easement or equivalent property interest for a public right of way within which Project trees are located and accept ownership of those Project trees by assuming responsibility for maintenance and liability for them; or
C. Have a written and signed agreement from the landowner, granting ownership to the Project Operator of any credits for carbon storage, other greenhouse gas benefits, and other co-benefits delivered by Project trees on that landowner's land. If 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.

4.8 Leakage

The term "leakage" is often used to refer to unintended increases in GHG emissions that may result from a GHG reduction or removal project action. CFC requires projects to address, account for, and mitigate leakage, with specific requirements stated in the relevant Protocol.

For example, the Tree Preservation Protocol addresses leakage as follows: Preventing development of some lands is likely to displace development to other lands. Displacing development to other lands may or may not cause emissions from trees and soil. If development is displaced to locations with no trees but with minimally disturbed soils, there would be no biomass emission attributed to the displacement but there would be soil carbon emissions resulting from the displacement. If development is displaced to previously developed sites, there could be negligible emissions from biomass and soil from sites where development is displaced to. The Tree Preservation Protocol addresses leakage by imposing a

deduction for displaced development in Section 10.5 of the quantification methodology. That deduction is described in detail in Appendix B to the Tree Preservation Protocol.

The Tree Planting Protocol addresses leakage by barring projects that convert forested land or that cut down healthy trees in order to plant trees for crediting.

4.9 Additionality

A project activity is additional if it can be demonstrated that the activity results in emission reductions or removals that are in excess of what would be achieved under a "business as usual" scenario and the activity would not have occurred in the absence of the incentive period provided by the carbon markets. In all cases, projects that are required by law or regulation are excluded.

Additionality requirements vary according to the project type. Projects that use the avoided conversion Tree Preservation Protocol must meet additionality requirements embedded in the specific required elements of the protocol.

4.9.1. Tree Preservation Protocol Additionality Requirements

The Standard and the Tree Preservation Protocol ensure additionality through the following:

- Prior to the start of the project, the trees in the project area cannot be protected via easement or recorded encumbrance or in a protected zoning status that preserves the trees.
- The zoning in the project area must currently allow for a non-forest use.
- The trees in the project area face some risk of removal or conversion out of forest.

The Tree Preservation Protocol sets out three tests to determine whether the trees or forest in a project area face a threat or risk of tree removal or conversion out of a forested use. The Project must demonstrate that the Project Area meets at least one of the following three tests:

A. Was surrounded on at least 30% of its perimeter by non-forest, developed, or improved uses, including residential, commercial, agricultural, or industrial. Note, the Protocol contains additional text for clarification of this test; or

B. Project land been sold or conveyed or had an assessed value within three years of preservation under Subsection 4.1 for greater than $8,000 average price per acre for the bare land; or

C. Project land would have a fair market value after conversion to a non-forested "highest and best use" greater than the fair market value after preservation in subsection 4.1, as stated in a "highest and best use" study from a state certified general real estate appraiser in good standing.

The first two of these "risk of conversion" tests are empirical. If the Project Area is surrounded on at least 30% of its perimeter or is valued or sold within the three prior years at more than $8,000 per acre, then the project meets this requirement of risk of tree removal or conversion. Both tests reflect the development pressure on land in metropolitan areas. If a forested parcel in a metropolitan area is

surrounded on 30% of its perimeter by improved or developed uses, and if the zoning allows a more intensive non-forest use, and if the trees are not protected, then the project meets the test of risk of removal or conversion.

Similarly, if a forested parcel has been sold or assessed at greater than $8,000 per acre, then the development pressure is significant. With timber land valued at approximately $2,000 per acre, a valuation of five times greater than that in a metropolitan area indicates that the value of the parcel is in development, not in trees, and that the risk of conversion is high.

The third test also rests upon the value of the land as preserved versus its value as developed. If the highest and best use of the land as developed under existing zoning is higher than the value of the land preserved in forest, then the risk of conversion is high.

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

Additionality is embedded also in the quantification methodology. Projects cannot receive credits for trees that would have remained had development occurred, nor can they receive soil carbon credits for soil that would have been undisturbed had development occurred. Sections 10.2 and 10.4 of the Protocol address displaced development to other lands. This is generally categorized as leakage, but it contains an additionality element as well. Section 10.5 describes the deduction calculations for displaced development.

4.9.2. Tree Planting Protocol Additionality Requirements

The CFC Standard and Tree Planting Protocol ensure additionality through the following:

- A Legal Requirements test that declares city trees planted due to an enacted law or ordinance not eligible (Section 1.8), and
- Either 1) a project-specific baseline or 2) the current version of the Registry's performance standard baseline developed in adherence with the WRI GHG Protocol, and
- Project Operators must sign and comply with a Project Implementation Agreement with the Registry that requires a 26-year Project Duration.

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

Project Operators must also sign an Attestation of Additionality stating that its 26-year Project Duration commitment is additional to and longer than any commitment it makes to non-carbon project tree plantings. Project Operators shall describe how they meet the additionality requirements in the Project Design Document.

CFC has developed a program-wide Performance Standard Baseline in adherence with the WRI GHG Protocol. This is for use until the research upon which it is based is updated in a similar peer-reviewed journal or forum.

4.9.2.1. Performance Standard Baseline

Additionality is often applied only on a project-specific basis in the U.S., with the specific project being required to show that it reduced emissions (or removed them from the atmosphere) beyond its business-as-usual practices.

In the urban forest context, this produces immediate anomalies:

Organizations that plant trees on a regular basis and who begin carbon projects would get far fewer carbon credits than entities with no historical commitment to urban trees. To use the language of baselines, the baseline of entities that plant trees would be the trees they have annually planted, while the baseline of entities that plant no trees would be zero.

- The City of Los Angeles has launched its Million Tree LA initiative (now CityPlants). These voluntarily planted trees would generate no carbon credits for LA, whereas a city like Bakersfield, which plants few to no trees, would get carbon credits for every tree it planted.
- The same anomaly would occur for an entity like the Sacramento Municipal Utility District, which voluntarily plants thousands of trees per year.

If additionality is applied inflexibly on a project-specific basis, then entities that plant trees now would have the perverse incentive to stop their planting, even temporarily, to bring their own business-as-usual baseline to zero.
Governments with progressive tree ordinances or land use regulations that seek to increase canopy cover, would get fewer carbon credits because trees planted per their regulations would be part of their baseline and thus not eligible for crediting. Inflexible application of this "legal requirements" test leads to the perverse incentive for cities to leave their trees unregulated and unprotected.

4.9.2.2. Performance Standard Methodology

There is a second additionality methodology set out in the WRI GHG Protocol guidelines – the Performance Standard methodology. This Performance Standard essentially allows the project developer, or in this case, the developers of the protocol, to create a performance standard baseline using the data from similar activities over geographic and temporal ranges.

A common perception, particularly in the U.S., is that projects must meet a project specific test. Project-specific additionality is easy to grasp conceptually. The 2014 Climate Action Reserve urban forest protocol essentially uses project-specific requirements and methods.

However, the WRI GHG Protocol clearly states that <u>either</u> a project-specific test or a performance standard baseline is acceptable.[3] One key reason for this is that regional or national data can give a more accurate picture of existing activity than a narrow focus on one project or organization.

Narrowing the lens of additionality to one project or one tree-planting entity can give excellent data on that project or entity, which data can also be compared to other projects or entities (common practice). But plucking one project or entity out of its regional or national context ignores all comparable regional or national data. And that regional or national data may give a more accurate standard than data from one project or entity.

[3] WRI GHG Protocol, Chapter 2.14 at 16 and Chapter 3.2 at 19.

By analogy: one pixel on a screen may be dark. If all you look at is the dark pixel, you see darkness. But the rest of screen may consist of white pixels and be white. Similarly, one active tree-planting organization does not mean its trees are additional on a regional basis. If the region is losing trees, the baseline of activity may be negative regardless of what one active project or entity is doing.

Here is the methodology described in the WRI GHG Protocol to determine a Performance Standard baseline, together with the application of each factor to urban forestry:

Table 2.1 Performance Standard Factors

WRI Performance Standard Factor	As Applied to Urban Forestry
Describe the project activity	Increase in urban trees
Identify the types of candidates	Cities and towns, quasi-governmental entities like utilities, watersheds, and educational institutions, and private property owners
Set the geographic scope (a national scope is explicitly approved as the starting point)	Could use national data for urban forestry, or regional data
Set the temporal scope (start with 5-7 years and justify longer or shorter)	Use 4-7 years for urban forestry
Identify a list of multiple baseline candidates	Many urban areas, which could be blended mathematically to produce a performance standard baseline

The Performance Standard methodology approves of the use of data from many different baseline candidates. In the case of urban forestry, those baseline candidates are other urban areas.[4]

As stated above, the project activity defined is obtaining an increase in urban trees. The best data to show the increase in urban trees via urban forest project activities is national or regional data on tree canopy in urban areas. National or regional data will give a more comprehensive picture of the relevant activity (increase in urban trees) than data from one city, in the same way that a satellite photo of a city shows a more accurate picture of tree canopy in a city than an aerial photo of one neighborhood. Tree canopy data measures the tree cover in urban areas, so it includes multiple baseline candidates such as city governments and private property owners. Tree canopy data, over time, would show the increase or decrease in tree cover.

4.9.2.3. Data on Tree Canopy Change over Time in Urban Areas

The CFC quantitative team determined that there were data on urban tree canopy cover with a temporal range of four to six years available from four geographic regions. The data are set forth below:

[4] See Nowak, et al. *"Tree and Impervious Cover Change in U.S. Cities,"* Urban Forestry and Urban Greening, 11 (2012), 21-30

Table 2.2 Changes in Urban Tree Canopy (UTC) by region (Nowak and Greenfield, 2012)

City	Abs Change UTC (%)	Relative Change UTC (%)	Ann. Rate (ha UTC/yr)	Ann. Rate (m2 UTC/cap/yr)	Data Years
EAST					
Baltimore, MD	-1.9	-6.3	-100	-1.5	(2001–2005)
Boston, MA	-0.9	-3.2	-20	-0.3	(2003–2008)
New York, NY	-1.2	-5.5	-180	-0.2	(2004–2009)
Pittsburgh, PA	-0.3	-0.8	-10	-0.3	(2004–2008)
Syracuse, NY	1.0	4.0	10	0.7	(2003–2009)
Mean changes	-0.7	-2.4	-60.0	-0.3	
Std Error	0.5	1.9	35.4	0.3	
SOUTH					
Atlanta, GA	-1.8	-3.4	-150	-3.1	(2005–2009)
Houston, TX	-3.0	-9.8	–890	-4.3	(2004–2009)
Miami, FL	-1.7	-7.1	-30	-0.8	(2003–2009)
Nashville, TN	-1.2	-2.4	-300	-5.3	(2003–2008)
New Orleans, LA	-9.6	-29.2	–1120	-24.6	(2005-2009)
Mean changes	-3.5	-10.4	-160.0	-7.6	
Std Error	1.6	4.9	60.5	4.3	
MIDWEST					
Chicago, IL	-0.5	-2.7	-70	-0.2	(2005–2009)
Detroit, MI	-0.7	-3.0	-60	-0.7	(2005–2009)
Kansas City, MO	-1.2	-4.2	-160	-3.5	(2003–2009)
Minneapolis, MN	-1.1	-3.1	-30	-0.8	(2003–2008)
Mean changes	-0.9	-3.3	-80.0	-1.3	
Std Error	0.2	0.3	28.0	0.7	
WEST					
Albuquerque, NM	-2.7	-6.6	-420	-8.3	(2006–2009)
Denver, CO	-0.3	-3.1	-30	-0.5	(2005–2009)
Los Angeles, CA	-0.9	-4.2	-270	-0.7	(2005–2009)
Portland, OR	-0.6	-1.9	-50	-0.9	(2005–2009)
Spokane, WA	-0.6	-2.5	-20	-1.0	(2002–2007)
Tacoma, WA	-1.4	-5.8	-50	-2.6	(2001–2005)
Mean changes	-1.1	-4.0	-140.0	-2.3	
Std Error	0.4	0.8	67.8	1.2	

These data have been updated by Nowak and Greenfield.[5] The 2012 data show that urban tree canopy is experiencing negative growth in all four regions. The 2018 data document continued loss of urban tree cover. Table 3 of the 2018 article shows data for all states, with a national loss of urban and community tree cover of 175,000 acres per year during the study years of 2009-2014.

To put this loss in perspective, the total land area of urban and community tree cover loss during the study years totals 1,367 square miles – equal to the combined land area of New York City, Atlanta, Philadelphia, Miami, Boston, Cleveland, Pittsburgh, St. Louis, Portland (Oregon), San Francisco, Seattle, and Boise.

Even though there may be individual tree planting activities that increase the number of urban trees within small geographic locations, the performance of activities to increase tree cover shows a negative baseline. The Drafting Group did not use negative baselines for the Tree Planting Protocol, but determined to use baselines of zero.

Deployment of the Performance Standard baseline methodology for a City Forest Tree Planting Protocol is supported by conclusions that make sense and are anchored in the real world:

With the data showing that tree loss exceeds gains from planting, new plantings are justified as additional to that decreasing canopy baseline. In fact, the negative baseline would justify as additional any trees that are protected from removal.
Because almost no urban trees are planted now with carbon as a decisive factor, urban tree planting done to sequester carbon is additional;
Almost no urban trees are currently planted with a contractual commitment for monitoring. Maintenance of trees is universally an intention, one that is frequently reached when budgets are cut, as in the Covid-19 era. The 25-year commitment required by this Protocol is entirely additional to any practice in place in the U.S. and will result in substantial additional trees surviving to maturity;
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 maintenance that will result in additional trees surviving to maturity;
Because virtually all new large-scale urban tree planting is conducted by governmental entities or non-profits, or by private property developers complying with governmental regulations (which would not be eligible for carbon credits under our protocol), and because any carbon revenues will defray only a portion of the costs of tree planting, there is little danger of unjust enrichment to developers of city forest carbon projects.

Last, the WRI GHG Protocol recognizes explicitly that the principles underlying carbon protocols need to be adapted to different types of projects. The WRI Protocol further approves of balancing the stringency of requirements with the need to encourage participation in desirable carbon projects:

Setting the stringency of additionality rules involves a balancing act. Additionality criteria that are too lenient and grant recognition for "non-additional" GHG reductions will undermine the GHG program's effectiveness. On the other hand, making the criteria for additionality too stringent could unnecessarily limit the number of recognized GHG reductions, in some cases excluding project activities that are truly additional and highly desirable. In practice, no approach to additionality can completely avoid these kinds of errors. Generally, reducing one type of error will result in an increase of the other. Ultimately,

[5] Nowak et al. 2018. "Declining Urban and Community Tree Cover in the United States," *Urban Forestry and Urban Greening,* 32, 32-55

there is no technically correct level of stringency for additionality rules. GHG programs may decide based on their policy objectives that it is better to avoid one type of error than the other.[6]

The policy considerations weigh heavily in favor of "highly desirable" planting projects to reverse tree loss for the public resource of city forests.

4.10 Permanence

In GHG accounting, permanence refers to the perpetual nature of GHG removal enhancements (or avoided emissions from conversion) and the risk that a project's atmospheric benefit will not be permanent. GHG emissions reductions from terrestrial sources and sinks may not be permanent if a project has exposure to risk factors such as intentional or unintentional events that result in emissions into the atmosphere of stored or sequestered CO_2e for which offset credits were issued.

The Protocols describe specific rules and project requirements to address permanence. Tree Preservation Protocol Section 8 and Tree Planting Protocol Section 8 provide requirements about avoidable and unavoidable reversals.

4.10.1. Tree Preservation Permanence Requirements

Before a project is verified, the project must establish a Preservation Commitment of either 40 years or 100 years under Section 4 of the Protocols. The Preservation Commitment must be an easement, covenant, deed restriction, or a recorded encumbrance specifically protecting the trees and recorded in the official public records of property ownership.

All preservation projects credited through December 2021 under the CFC Standard have used permanent easements that specifically protect the trees.

4.10.2. Tree Planting Permanence Requirements

The Protocol Drafting Group was unanimous in believing that the longest possible project duration commitment that could be made by planting project operators would be 26 years. Elected and agency officials in cities as well as local non-profit tree organizations simply do not have the money and will not take the risk of a longer commitment for expensive planting projects.[7] Given that almost all planting projects will be done on public property like park land, it is highly likely that these public project trees will remain long past 26 years. But city officials and non-profit tree organizations will not be willing to enter into planting projects with a duration commitment longer than 26 years.

A 26-year project duration period even without a Performance Guarantee is safe and defensible for the following reasons:

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[6] WRI GHG Protocol, Chapter 3.1 at 19.

[7] Note that cities and counties will commit to 40 and even 100 year easements for preservation projects on public land, in contrast to planting projects. Their goal is generally to preserve the land forever.

- Almost all city forest projects will be on public property with secure land tenure and thus will last beyond 26 years
- City trees are grown for conservation, not harvest. There is no monetization for city trees other than through carbon or ecosystem credits, so not only are there no incentives to remove trees, but all incentives are to retain trees. Project Operators are thus highly motivated to obtain credits for additional growth beyond 26 years. In addition, most project costs are expended in planting and early survival, so those costs are sunk by year 26. Carbon revenues after year 26 are not eroded by the high costs of planting and early maintenance
- After making the investment in these city trees, the cities, counties, non-profit organizations, and land trusts planting the trees have every incentive to maintain the trees. Impacts increase as trees age, and almost all motivations, from economics to public love of trees, drive toward preservation of the trees
- Both science and policy recognize and document the many environmental, social, and economic benefits of city forests
- City forests are essentially public resources
- The urgency contained within the scientific conclusions of the IPCC, 2018 indicates that global warming of 1.5°C is likely to occur by 2030 without immediate action that goes beyond any current efforts
- The "permanence" requirement used in other standards has shown a malleability not entirely consistent with the finality implied in the word "permanence" itself. Voluntary forest standards have evolved from 100 years still contained in CAR's protocols to a variety of methods that essentially reduce that period or make it possible to meet a "permanence" requirement through various risk assessments and other mechanisms.

4.11 Quantification

A real offset is the result of a project action that yields quantifiable and verifiable GHG emissions reductions and/or removals. Projects are issued credits based on verified GHG emission reductions and removals achieved by projects. GHG emissions reductions and removals shall be quantified in accordance with the relevant Protocols. Quantification methodologies and their scientific bases can be found in the Tree Preservation Protocol Section 10 and the Tree Planting Protocol Section 10 and Appendix A.

4.12 Reversals

Reversals can occur if tree loss results in release of credited CO2 into the atmosphere. All Project Operators must sign a Project Implementation Agreement, which is a legal contract binding their performance including compliance with the CFC protocol governing its project. All CFC Protocols must have sections on Reversals setting forth requirements for Unavoidable and Avoidable Reversals. Unavoidable Reversals may be compensated from a program-wide Reversal Pool Account. Project Operators must compensate for Avoidable Reversals.

Thus all Project Operators are legally bound to comply with the Reversal requirements set forth in the CFC protocols.

4.13 Project Monitoring

Project activity monitoring is required in order to determine project performance and quantify actual GHG emissions. Projects shall be monitored in accordance with the relevant Protocols.

Throughout the Project Duration, the Project Operator must report on tree conditions across the Project Area to CFC. These reports must be in writing and the Project Operator must attest to the accuracy of the report.

Requirements are described in the Tree Preservation Protocol Section 7 and the Tree Planting Protocol Section 7. Monitoring reports must be submitted no less frequently than on the triennial anniversary of the date of the first Verification Report. If a Project Operator fails to submit a report when due, CFC shall notify the Project Operator of such failure. The Project Operator shall then have 60 days to submit reports under this section.

If a Project Operator fails to monitor or to report after receiving notice and an opportunity to cure its failure under the preceding paragraph, CFC can investigate and take actions including assessing carbon stock and invoking the reversal provisions of Section 8 and cancelling of the Project and all credits issued.

4.14 Safeguards – "No Net Harm" Principle

Project activities shall not cause net harm to the environment or urban communities. Project Operators must sign an attestation that there is no net harm.

Tree planting and preservation projects in cities and towns are implemented by local non-profit or governmental stakeholders who understand their communities and whose goal is to bring benefits to these communities, not harvest trees or obtain a profit. Most are conducted on public property and constitute a public resource that benefits residents, particularly those in under-resourced communities. Trees planted or preserved in cities and towns do not displace native or other populations. Compared to rural or wildland forest projects, city forest projects are small-scale. And non-consumptive uses may continue.

Tree planting and preservation in cities creates jobs rather than displacing them. Urban trees require care, and care requires workers. City forest carbon projects can also advance other valuable city or community goals, including environmental and racial justice.

5. VALIDATION AND VERIFICATION

This section sets out the rules and requirements for validation and verification of projects under the CFC Program. Validation and verification bodies (VVBs) must assess projects compliance with relevant Protocols. VVBs must be approved under the CFC Program.

Validation is the documented assessment of a GHG project that determines as to whether the project complies with the CFC Program rules and relevant Protocols. Verification is the independent and documented assessment by a VVB of the GHG emission reductions and removals that have occurred as a result of the project, conducted in accordance with the relevant Protocol.

5.1 Overall Process

City Forest Credits (CFC) requires validation and verification of all GHG projects before it issues credits. Verification standards and processes shall follow guidelines per 14064-3 and are set out in the Tree Preservation Protocol in Section 12 and 13 and in the Tree Planting Protocol Section 13 and Appendix B.

CFC retains an independent VVB to guard against conflicts of interest when the verifier is paid by the Project Operator. The cost of verification is passed to the Project Operator as part of its fees to CFC, but the contractual obligations of the verifier remain with CFC.

5.1.1. Validation Process

CFC conducts validation activities at three times. CFC conducts a pre-validation screening with each project prior to submittal of an application. This informal pre-validation confirms eligibility under the relevant Protocol requirements and the Project Operator's understanding of the commitments it must make if it proceeds with the project. These commitments include submitting project documents, quantifying carbon dioxide and ecosystem co-benefits according to the appropriate methodology, conducting monitoring and reporting for the Project Duration, and signing a Project Implementation Agreement with CFC.

When a Project Operator submits a Project Design Document ("PDD") and requests credits, CFC conducts a second validation by reviewing the PDD and its supporting documents to ensure that it is complete, accurate and comports with the protocol's PDD and protocol eligibility requirements.

CFC then transmits the PDD and supporting documents to the accredited, independent third-party verifier.

When the third-party verifier produces its Verification Report, City Forest Credits then reviews that Report to ensure that it accurately reflects the documentation contained in the PDD and supporting documents. Only then will the Verification Report be accepted by City Forest Credits and posted. Validation performed by CFC shall be documented in a Validation Report.

5.1.2. Verification Process

Upon receiving all required documentation for project crediting, including but not limited to eligibility, right to receive credits, quantification of carbon and co-benefits, tree data, and a request for credits, CFC will retain a verifier to verify compliance with the Protocol.

CFC will maintain independence from the activities of projects and will treat all projects equally with regard to verification. CFC requires a reasonable level of assurance in the accuracy the asserted GHG removals to a reasonable level. GHG removals must be free of errors, misstatements, or omissions regarding those elements.

The VVB will assess the eligibility, confidence, completeness, and accuracy of the Project. If the information supplied is not sufficient the VVB shall request clarifications or additional information.

The VVB will then produce a Verification Report, which CFC will review to ensure that it accurately reflects the information, documentation, and data contained in the PDD and supporting documents. Only then will the project and associated Verification Report be accepted by CFC.

Project documentation and the Verification Report will be posted on the publicly-available project page of the City Forest Credits website. Credits shall then be issued under the schedule contained in the Verification Report (see Section 7).

5.2 Validation and Verification Body Requirements

All Validation and Verification Bodies (VVBs) shall be approved by City Forest Credits and have the following qualifications or competencies outlined in the Qualification Statement, which is available on the City Forest Credits website in the Validation and Verification Section of the City Forest Credits website at: https://www.cityforestcredits.org/carbon-credits/carbon-protocols/

Requirements include:

- Accreditation by a member of the International Accreditation Forum (IAF) for project validation and verification, or meets the competence requirements as set out in International Organization for Standard (ISO) 14065:2013 , OR

- Credentials, experience, or proficiencies as follows:
    - Educational background such as B.A. or B.S. with a major, minor, or concentration in forestry or urban forestry from an accredited college or university, or work experience of at least three years in urban forestry or forestry
    - Membership in a forestry or urban forestry related professional organization with Continuing Education requirements
    - Greenhouse gas accounting and monitoring
        - Examples include use of CO2 quantification tools and methodologies such as i-Tree

In addition, all VVBs shall:

- Complete a training program through City Forest Credits, including demonstrating proficiency in the applicable CFC Protocol
- Attest to no conflicts of interest in acting as a VVB

Prior to commencing verification, all VVBs shall be in good standing and have followed the application process. The application form and a list of currently approved VVBs is provided in the Validation and Verification Section of the City Forest Credits website at: https://www.cityforestcredits.org/carbon-credits/carbon-protocols/

5.3 Verification Report

After completion of verification, the VVB submits a Verification Report to the Registry. The VVB shall use the approved template provided by CFC per the appropriate Protocol. The Verification Report shall describe the level of assurance, the objectives, scope, and criteria, the data and information supporting the GHG assertion, and the conclusion including any qualifications or limitations.

In addition, the Verification Report shall verify compliance for the following:

- Protocol eligibility requirements
- Carbon quantification and GHG assertion
- Ecosystem co-benefit quantification
- Total credits attributed to the Project
- Deductions from issuable credits for the Reversal Pool Account
- Schedule for issuance of credits

5.4 Records and Information

Projects shall make relevant information available to the VVB during validation and verification. Projects shall retain documents and records related to the project for future reference.

The VVB shall keep all documents and records for at least two years after the end of the relevant project Crediting Period.

6. PROTOCOL DEVELOPMENT PROCESS

6.1 Industry and Stakeholder Input

Urban forests are local, by definition - located and rooted in communities. People live, breathe, work, and recreate in and amongst our city forests. Urban forest projects and services are almost entirely delivered locally. Local stakeholders' views shall be considered in protocol development.

The field of urban forestry is not an industry, primarily because urban forestry, unlike rural and commercial forestry, does not generate any revenue or sell a service or product. There is no urban forest industry per se. There is rather a collection of cities, counties, non-profit tree organizations, and non-profit land trusts that lead the implementation of tree planting and preservation in cities and towns. The tree care industry, by contrast, is for-profit and provides care for trees on both private and public property. But in general, the tree care industry does not implement planting or preservation projects on its own.

6.2 Protocol Drafting Group

The initial CFC Protocol Drafting Group in 2015 consisted of 14 members drawn from many subject fields of urban forestry and climate as well as most regions of the United States.

The Drafting Group members included:

- Zach Baumer – City of Austin, Climate Program Manager
- Rich Dolesh – National Recreation and Park Association, Vice President Conservation and Parks
- Ian Leahy – American Forests, Director of Urban Forest Programs
- Scott Maco – Davey Institute, Director of Research and Development
- Jenny McGarvey – Alliance for Chesapeake Bay, Forest Programs Manager
- Dr. E. Greg McPherson – U.S. Forest Service, Research Scientist
- Mark McPherson – City Forest Credits, Executive Director
- Darren Morgan – City of Seattle Department of Transportation, Manager
- Walter Passmore – City of Palo Alto, City Forester
- Shannon Ramsay – Trees Forever, Founder
- Heather Sage – Pittsburgh Parks Conservancy, Director of Community Projects
- Misha Sarkovich – Sacramento Municipal Utility District, Customer Solutions
- Skip Swenson – Forterra, Vice President Policy and Programming
- Dr. Gordon Smith – Ecofor LLC
- Andy Trotter – West Coast Arborists, Vice President of Field Operations

A list of the members is available on the CFC website here: https://www.cityforestcredits.org/carbon-credits/carbon-protocols/.

One of the co-lead scientists on the CFC Protocol Drafting Group, Dr. E. Greg McPherson, has extensive experience with urban forest protocols. He led the science team on the 2011 California ARB urban forest

carbon protocol. He also led the science team on the CAR urban forest protocols in 2013-2014. His professional experience is further described on the CFC website.[8]

Four members of the CFC Protocol Drafting Group also served on the protocol work group for the CAR protocols in 2013-2014, gaining significant insight into protocol development, eligibility, the principles of rigorous protocols, and the role played by CAR in protocol development.

The co-lead scientist on the CFC Protocol Drafting Group, Dr. Gordon Smith, has over 25 years' experience in forest GHG accounting, protocol development, and verification. He was the Director of Forest Programs at the Environmental Resource Trust before it became the American Carbon Registry, has worked as a verifier on multiple major offset systems, and has accredited verifiers. This experience with actual projects and protocols was used to inform the design of CFC protocols to strengthen the CFC credits and ensure that quantification of credits is reliable, while at the same time streamlining where possible to reflect the public nature of urban forests and the policy arguments in favor of urban forest carbon crediting.

All members of the CFC Protocol Drafting Group served voluntarily and without compensation, devoting hundreds of hours to the development of the two protocols.

CFC updated the protocols nine times since 2016 to reflect new information and data as the protocols were being implemented through the first urban forest carbon projects in the world. CFC has posted all iterations of protocols and solicited public comment. Staff from Natural Capital Partners, South Pole Group, and Bluesource have provided detailed review and comment at various stages of protocol development.

6.3 Revision Process

All CFC Standards and Protocols will be posted for public comment 30 days prior to adoption. To encourage candid as well as informal comment on the protocols, CFC will not publish comments.

CFC will review and revise its Protocols a minimum of once every three years.

[8] https://www.cityforestcredits.org/about-city-forest-credits/

7. CITY FOREST CREDITS REGISTRY DATABASE

7.1 Registry Database of Credits

City Forest Credits shall issue and track credits through transfer, retirement, or cancellation in a Registry Database of credits ("Registry Database"). CFC may manage that Registry Database or contract with a third-party. Currently, CFC manages all access and use of the Registry Database and is the system administrator for the Registry Database. Information about all projects and the status of all credits shall be publicly displayed on the CFC website. Account access to the Registry Database is reserved only to Project Operators and Buyers with current accounts in good standing. CFC verifies all organizations have a legitimate business purpose to access the Registry Database by requiring a certificate of good standing or some documentation of legal registration. The Registry Database is not open to the public.

CFC shall screen all prospective projects and Project Operators during pre-application discussions. The screening shall include determining that the Project Operator has the capacity to undertake a carbon project. After project implementation and third-party verification, CFC staff will create a Project Operator user account and provide log in credentials to the project lead. CFC shall allow only Project Operators who have already completed planting or preservation of trees in verified projects to open a new Registry Database account.

Buyers open their accounts only upon invitation by a Project Operator who already has its account. The Project Operator shall submit a request to CFC to approve their invitation to the buyer to open an account in the Registry Database. CFC staff shall review the request, confirm the buyer information with the Project Operator, approve the new buyer user account, and an automated invitation is emailed to the buyer.

CFC does not at the time of this version of this Standard document outsource any Registry Database management functions. Authorized CFC staff administer all credit issuances, transfers, retirements, cancellations, expiry, etc. internally based on written confirmations and authorized requests only from account holders directly to CFC. As CFC does not outsource management of our Registry Database, there is no third-party vendor involvement other than development and maintenance.

CFC may contract with a third-party software developer to develop, test, and maintain the programming of the Registry Database, but CFC manages the issuance, transfer, and retirement of credits. The Registry Database is hosted on a separate domain that is not directly connected to the CFC website to limit any impact on the registry or its records. The Registry Database is hosted on its own secure platform, with continuous back-up independent from the hosting platform. This is to ensure that there will always be a current version of the Registry Database and all its records for high availability.

CFC shall maintain and display on its website a public list of project and credit information, including Project Operator, verified project and property details, projects in development, and credits issued, transferred, and retired with serial ID information. The credit information is displayed on the main public CFC website, but the issuance and tracking of the credits is done in the Registry Database of credits.

The Registry Database shall also contain credits residing in the CFC Reversal Pool Account for Unavoidable Reversals. When credits are issued, retired, or cancelled their status shall be displayed publicly and updated at least quarterly on the CFC website and Registry Database website.

CFC shall have a Terms of Use statement of the Registry Database. All account holders are required to accept the website's Terms of Use prior to accessing their account. A copy is emailed to all new account holders and saved in the "Resources" area of the Registry Database.

7.2 Issuance

Project Operators shall be eligible to receive credits only upon the receipt of a final verification report signed by a CFC-approved VVB. The Project Operator receives a copy of the verification report and the new project and property is entered into their Registry Database account. The Project Operator's account shall contain, by property, the total number of credits to be issued, vintage, number of buffer credits, and status of the credits.

The Registry Database system shall assign a unique serial ID at the time the credit issuance is approved by CFC.

7.3 Transfer

The Registry Database shall provide a mechanism for the transfer of credits from an owner to a buyer. A buyer shall request to purchase credits by initiating it in their account. The owner of the credits approves the buyer's transfer request after the sale terms have been satisfied. CFC staff will approve the transfer and the credits will then be transferred into the buyer's account and owned by the buyer.

7.4 Retirement

Credits can be retired only through a formal request by the owner of the credit within the Registry Database. CFC, as the system administrator, finalizes all credit retirement requests in the Registry Database. The Registry Database shows the status of the credit as "Owned" or "Retired" with its unique ID, so it is not possible to retire credits that are already retired. Thus, there can be no double counting.

Owners of retired credits receive a Certificate of City Forest Carbon+ Credit Retirement that includes the number of credits, retirement date, project information, and owner name.