CLIMATE ACTION RESERVE

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Mexico Forest Protocol

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Abbreviations and Acronyms

C	Carbon
CH_4	Methane
CO_2	Carbon dioxide
CONAFOR	Comisión Nacional Forestal
MCRT	Mexican Climate Reserve Tonne
ENAREDD+	National REDD+ Strategy
GHG	Greenhouse gas
GWP	Global warming potential
Ha	Hectare
Kg	Kilogram
INFyS	National Forest and Soils Inventory
IPCC	Intergovernmental Panel on Climate Change
MFP	Mexico Forest Protocol
N_2O	Nitrous oxide
NGO	Non-governmental organization
PIA	Project Implementation Agreement
REDD+	Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks
Reserve	Climate Action Reserve
SEMARNAT	Secretaria de Medio Ambiente y Recursos Naturales
UMAFOR	Forest Management Unit
UNFCCC	United Nations Framework Convention on Climate Change
Vision	Mexico's Vision on REDD+

1 Introduction

The initial release of the draft Climate Action Reserve's (Reserve) Mexico Forest Protocol (MFP) followed 14 months of meetings, consultations, and conference calls among an expansive list of Mexican and American stakeholders. The participants in the stakeholder process included non-governmental organizations (NGOs), government agencies, project developers, and landowner representatives. Following a public comment period in January, 2012, in which many important ideas were raised, the Reserve postponed further elaboration of the protocol while important activities were taking place in Mexico with regard to REDD+ initiatives and Mexico's Climate Change Law. The current draft was developed with improved clarity as to which activities will be eligible in Mexico and with a vision toward seeking synergies with a standard being developed in Mexico (*Norma Mexicana (NMX) para el desarrollo de proyectos forestales de carbono*) that will create an important infrastructure for all forest project activities.

This protocol is focused on crediting of activities that sequester CO_2 from the atmosphere. The protocol provides project eligibility rules, methods to calculate a project's net removals of CO_2 from the atmosphere due to sequestration activities, procedures to address and compensate for the release of CO_2 back to the atmosphere (i.e. "reversals"), and approaches for long-term project monitoring and reporting. The goal of this protocol is to ensure that the net GHG removals caused by a project are accounted for in a complete, consistent, transparent, accurate, and conservative manner and may therefore be reported to the Climate Action Reserve (Reserve) as the basis for issuing carbon offset credits (called Mexican Climate Reserve Tonnes or MCRTs). The protocol is designed to interface and reconcile with future accounting strategies developed at jurisdiction levels, where the focus is expected to be on avoiding emissions from deforestation and degradation (REDD). The intention is for this protocol to be complementary to jurisdictional efforts by focusing on forest carbon enhancements.

The Reserve is an international offsets program working to ensure integrity, transparency, and financial value in the North American carbon market. It does this by establishing regulatory-quality standards for the development, quantification and verification of GHG emissions reduction projects in North America; issuing carbon offset credits known as MCRTs generated from such projects; and tracking the transaction of credits over time in a transparent, publicly-accessible system. Adherence to the Reserve's high standards ensures that emission removals associated with projects are real, additional, and meet rigorous permanence standards, thereby instilling confidence in the environmental benefit, credibility, and efficiency of carbon markets.

1.1 About Forests, Carbon Dioxide, and Climate Change

Forests have the capacity to both emit and sequester carbon dioxide (CO_2), a leading greenhouse gas that contributes to climate change. Trees, through the process of photosynthesis, naturally absorb CO_2 from the atmosphere and store the gas as carbon in their biomass, i.e. trunk (bole), leaves, branches, and roots. Carbon is also stored in the soils that support the forest, as well as the understory plants and litter on the forest floor. Wood products that are harvested from forests can also provide long-term storage of carbon.

When trees are disturbed, through events like fire, disease, pests or harvest, some of their stored carbon may oxidize or decay over time releasing CO_2 into the atmosphere. The quantity and rate of CO_2 that is emitted may vary, depending on the particular circumstances of the disturbance. Forests function as reservoirs in storing CO_2. Depending on how forests are managed or impacted by natural events, they can be a net source of emissions, resulting in a

decrease to the reservoir, or a net sink, resulting in an increase of CO_2 to the reservoir. In other words, forests may have a net negative or net positive impact on the climate.

Through sustainable management and protection, forests can also play a positive and significant role to help address global climate change. The Reserve's MFP is designed to address the forest sector's unique capacity to sequester, store, and emit CO_2 and to facilitate the positive role that forests can play to address climate change.

1.2 Nested Projects in a Jurisdictional Framework

The development of the Reserve's protocol is occurring simultaneously with the development and ongoing evolution of Mexico's REDD+ Strategy (ENAREDD+). Jurisdictions are also moving forward with strategies to address climate change, as well as addressing biodiversity, social, and watershed issues. Additionally, Mexico is currently involved in the development of a project standard (Norma Mexicana-NMX) that will ensure integrity and consistency in the accounting of all forest carbon project activities in Mexico.

These dynamics have shaped the discussions and the development of the protocol, since it is a key objective to produce a protocol that is respected in international frameworks and relevant to Mexico's REDD+ Strategy. Early on, the workgroup discussed the concept of developing a protocol that could function in the near term as standalone project guidance and be adaptable to REDD+ accounting systems as they develop. Ultimately, it is expected that the Reserve's MFP will provide guidance for landscape projects that are reconciled to, or nested within, jurisdictional accounting systems either at the regional, state or federal level (or all).

The protocol is intended to help catalyze the development of carbon sequestration activities in Mexican forests. The guidance in this protocol provides:

1. Assurances that environmental and social safeguards are achieved where credited activities occur.
2. A resolute assessment of additionality where activities occur.
3. Accurate quantification methods, based on measurable benefits resulting from explicit management activities.
4. Practical methods for ensuring permanent carbon storage.

While the current guidance is designed to quantify GHG removals from enhanced sequestration at the landscape scale, the Reserve expects this guidance to evolve as broader accounting frameworks are developed at the national and sub-national level in Mexico. Addressing REDD+ activities at jurisdictional scales will provide opportunities to comprehensively address forest sector emissions and enhancements and improve the overall accuracy of forest carbon accounting. The ability to control and account for leakage, for instance, is proportional to the geographic scale of a program and monitoring efforts. Hence, the intent is to embed this protocol in jurisdictional mechanisms as they are developed and provide sound metrics for directing incentive programs for carbon enhancement activities. The ultimate objective is a system in which projects are reconciled to jurisdictional REDD+ frameworks in a way that is mutually reinforcing with respect to accounting, permanence, and safeguarding environmental and social values.

This protocol has been designed with conservative assumptions in order to minimize the risk of over-crediting and to facilitate the protocol's incorporation into jurisdictional programs. Incorporating the protocol in a jurisdictional REDD+ framework, however, may require

reconsidering or revising a number of protocol elements at the time such jurisdictional systems are developed, including:

1. **Crediting Pathway**

   The protocol has been designed with the assumption that credits will be issued directly to projects as described in CONAFOR' s (2012) statement on carbon rights[1]. This allows individuals managing the forest to be directly rewarded for activities that increase carbon sequestration. The protocol will be fully compatible with programs that issue credits at both the jurisdiction and project levels (or at the project level only), provided mechanisms are devised to reconcile project- and jurisdiction-level accounting. This protocol does not currently reference or incorporate such mechanisms, however, we assume that any credits due to reduced deforestation will be assigned to the jurisdictional level only, and the forest enhancement credits (which can be concretely measured in situ at the level of individual parcels under management) to the owners/managers of such parcels only. This creates two clearly separate fields of crediting, avoiding the problem of how to settle accounts.

   It is possible to design jurisdictional REDD+ frameworks for which credits are issued at the jurisdiction level, and not directly to projects. Such programs may still incorporate project-level activities and could rely on the accounting structures within this protocol to determine the relative contribution of projects to jurisdiction-wide performance.

2. **Baselines and Reconciliation**

   In this protocol, baselines are a benchmark or reference for measuring increased sequestration. A baseline should be a representation of the future expected level of sequestration from the Project Area in the absence of carbon credit incentives (also known as business as usual). This protocol provides crediting for enhancement activities and conservatively requires that forest-related emissions from the Project Area be discontinued prior to receiving credits. Project baselines are estimated as a standardized function of risk to the existing forest carbon stocks within the Project Area.

   In a jurisdictional system, a jurisdictional reference level will be set to measure performance in the jurisdiction as a whole. As long as jurisdictional reference levels are designed only to account for emissions from deforestation, project-level crediting of enhancement activities facilitates reconciliation of project- and jurisdiction-level crediting since The carbon inventories associated with enhancement activities and the location of Project Areas are known. Project Area can be backed out of areas considered for avoided deforestation.

3. **Scope**

   Jurisdictional programs may choose to monitor and account for reduced emissions from deforestation and/or degradation (RED and/or REDD), but may also include accounting for enhanced sequestration (typically called REDD+). This protocol accounts only for enhanced sequestration at the project level (described in Section 2.3). A jurisdictional program that

[1] CONAFOR considers property rights as established on article 27 of the Mexican Constitution. Furthermore, it acknowledges what is established in article 5 of the General Law for Forest Sustainable Development that states that forest resources belong to the *ejidos*, communities, indigenous groups, individuals and others. As such, and recognizing that CO_2 is a gas that can be absorbed by the vegetation and that carbon is incorporated to the biomass, CONAFOR states that it belongs to the forest owners. In this sense, any additional carbon sequestered that complies with the specific market mechanism requirements will belong to the forest owner.

relies on this protocol may therefore need to include accounting for sequestration at the jurisdiction level (REDD+), or adopt methods for reconciling jurisdiction- and project-level accounting frameworks based on these different activities.

4. **Liability and Risk-Sharing**

   Under this protocol, projects are credited for their individual performance against a project baseline, and issuance of credits to Forest Owners is adjusted to account for risk of reversals. At the project scale, unavoidable reversals of carbon sequestration are compensated by the Reserve out of a common buffer pool. Contributions to the buffer pool are required by projects at a rate determined by project risk. Avoidable reversals must be compensated for by the Forest Owner in cases where the credits have been contractually secured and have been issued based on a defined time commitment. Similarly, jurisdictional systems must define mechanisms to compensate for reversals at a jurisdictional level. However, since jurisdictional REDD(+) performance will depend on the performance of both Project and non-Project Areas, a mechanism for sharing risk among projects and between projects and the jurisdiction must be defined. Conversely, the existence of a jurisdictional program that performs well may decrease the risk of reversals to individual projects, and wall-to-wall jurisdictional monitoring may decrease the need for leakage discounting. The protocol is designed to recognize the benefits of jurisdictional monitoring as it relates to leakage. Thus, leakage discounting and project risk assessments in the current protocol may be adjusted over time.

5. **Safeguards**

   Where possible, this protocol strives to incorporate safeguards at the project level by providing explicit social and environmental safeguards. Certain base criteria for social and environmental safeguards are embedded within this protocol. As jurisdictional systems for REDD+ develop, policy decisions regarding appropriate environmental and social safeguards will be determined.

The Reserve uses a rigorous, transparent, and comprehensive process for developing all of its protocols, focusing on accurate and conservative accounting to ensure that credits are issued only for GHG reductions and removals that are real, permanent, additional, verifiable, and enforceable by contract. The Reserve may update the MFP from time to time to reflect new scientific findings or policy decisions. For additional information about the update process and further news on future updates, please visit the Reserve website at www.climateactionreserve.org.

2 Stages of Project Development and Maintenance

The many key steps involved in developing a project credit are shown in Figure 2.1.

Figure 2.1. Key Steps Involved in Developing and Maintaining a Forest Carbon Project

2.1 Forest Projects

For the purposes of the MFP, a Forest Project is a planned set of activities designed to increase removals of CO_2 from the atmosphere through increasing forest carbon stocks.

A glossary of terms related to Forest Projects is provided in Section 12 of this protocol. Throughout the protocol, important defined terms are capitalized (e.g. “Forest Owner”).

2.2 Project Areas and Activity Areas

Project Areas include all areas within an ownership, communally held or privately held, in which Project Activities (defined below) may occur as part of the project, currently or in the future. Communally owned lands (known in Mexico as *communidades* and *ejidos*) must include the entire community ownership as the Project Area. Individually owned parcels within *ejido*

boundaries are allowed if the title-holder chooses to participate. Project Areas cannot be redefined, without approval by the Reserve, following the first site verification. Activity Areas are explicit areas within the Project Area where Project Activities occur that lead to quantified increased sequestration compared to baseline levels. The protocol has developed flexible terms to allow additional Activity Areas to be added to the project over time. Non-Activity Areas are areas within the Project Area that do not have explicit management activities that lead to increased sequestration, or where activities occurring within the areas are not quantified.

Separate and distinct monitoring guidance is provided for Project Areas and Activity Areas. The purpose of developing monitoring mechanisms for both Activity Areas and Project Areas is to ensure adequate rigor in addressing project safeguards, leakage, and to provide flexibility for adding new project activities without the need to create a new project, while striving for efficiency in monitoring objectives.

The geographic boundaries defining the Project Area must be described in detail at the time a Forest Project is listed on the Reserve.

The following rules apply to the definition of a Project Area:

1. The Project Area may be contiguous or separated into tracts.
2. For communally owned lands, the Project Area must consist of the entire area owned by the community or *ejido*.
3. For privately owned lands, the Project Area must consist of the entire area owned within boundaries of municipalities.[2]

The boundaries must be defined using a map, or maps that display public and major private roads, major watercourses (4th order or greater), towns, and latitude and longitude. A GIS shapefile or Google Earth KML file that includes the project boundary is required to be included with the project submission that matches project boundaries in the project document. The maps should be of adequate resolution to clearly identify the requested features.

2.3 Project Activities

The Reserve will register forest project activities for enhancement of forest carbon stocks that fall under the definition of the "+" of REDD+[3] adopted by the United Nations Framework Convention on Climate Change (UNFCCC).

Eligible management activities include any forestry-related activity that results in a higher level of carbon stocks within Activity Areas compared to the project's baseline. Such activities may include, but are not limited to:

1. Increasing the overall age of the forest by increasing rotation ages
2. Selecting healthy and vigorous trees for stand growing stocks
3. Managing competing species for improved growth and vigor
4. Increasing the stocking of trees on under-stocked forest areas

[2] Municipalities are subdivisions of states in Mexico.

[3] Decision 2/CP.13. Bali Action Plan - reducing emissions from deforestation and forest degradation in developing countries. Decision 1/CP.16. Cancun Agreements, paragraph 70. Encourages developing country Parties to contribute to mitigation actions in the forest sector by undertaking the following activities, as deemed appropriate by each Party and in accordance with their respective capabilities and national circumstances (a) Reducing emissions from deforestation; (b) Reducing emissions from forest degradation; (c) Conservation of forest carbon stocks; (d) Sustainable management of forests; (e) Enhancement of forest carbon stocks.

5. Removing impediments to natural forest regeneration
6. Afforestation/Reforestation
7. Increasing carbon stocks through agroforestry
8. Urban tree planting

Avoided emissions from deforestation and degradation are not eligible as project activities.

3 Eligibility Criteria and Participation Requirements

Forest Projects must meet several criteria and conditions to be eligible for registration with the Reserve, and must adhere to certain requirements related to their duration and crediting periods.

3.1 Project Location

This protocol is applicable to Forest Projects located anywhere in Mexico, provided they meet all other eligibility requirements described in this protocol.

3.2 Jurisdictions

Mexico's development of jurisdictional REDD+ is well underway. Jurisdiction REDD+ is addressing many issues beyond carbon accounting. Jurisdictional boundaries are being considered to address watershed, biodiversity, and social benefits, along with forest carbon. As progress is made in the definition of jurisdictions and development of jurisdictional accounting frameworks, the Reserve will seek ways to improve efficiencies of accounting for carbon benefits associated with project activities. The Reserve will also work closely with jurisdictional frameworks to ensure alignment with accounting frameworks. Alignment with carbon accounting is anticipated to be relatively straightforward since, per current discussions, project activities are accounting only for enhancements and jurisdictions will be accounting for avoided emissions (with regards to carbon) and possibly enhancements as well.

3.3 Forest Owner

A Forest Owner can be an individual or a collective legal person (*ejido* and/or communal land) that owns or legally possesses forestland. A Forest Owner must have undisputed control of the carbon in the trees within the Project Area, either through outright ownership of the trees, or through rights granted from a state or federal agency. In cases where multiple claims of ownership exist for control of forest carbon, the parties must enter into agreement prior to the initiation of project activities as to which party will assume the role of Forest Owner for purposes of a forest carbon project. Public agencies may not be Forest Owners. Individuals with clear title to land within *ejido* boundaries must decide at the project initiation whether to participate or not in the project. The decision cannot be reversed after the first verification.

The Forest Owner is responsible for undertaking a Forest Project and registering the project with the Reserve, and is ultimately responsible for all Forest Project reporting. The Forest Owner may, however, engage a project developer to assist or consult with the Forest Owner and to implement the Forest Project. All information submitted to the Reserve on behalf of the Forest Owner shall reference the Forest Owner, who is ultimately responsible for the accuracy and completeness of the information submitted.

The following types of ownership are eligible for participation (following the Agrarian Law[4] and Civil Code):

3.3.1 Communal Land (*Ejidos* and Communities)

Ejidos – Inscribed in the National Agrarian Registry (*Registro Agrario Nacional*, RAN[5]). Eligibility includes communally-owned land and *ejidal* parcels that voluntarily want to join the project with corresponding parcel certificates.

[4] *Ejidos*, Chapter I, article 9. Communities, Chapter V, article 98. Private Property, Fifth Title, article 115.

Communities (agrarian and indigenous) – Inscribed in the National Agrarian Registry (RAN).

3.3.2 Private Property

Private Property – Inscribed on the Public Registry of Property (*Registro Público de la Propiedad*).

Land owned by federal, state, or local governments is not eligible for participation.

3.4 Forest Project Coordinator

A Forest Project Coordinator must be identified through a process identified in the Social Safeguard section on Governance for communally owned Forest Owners. The role of FPCs is to be the main communication link between the Reserve and the Forest Owner and to ensure proper implementation of the protocol requirements. In communities and *ejidos*, the FPC must be a community/*ejido* member and must prove through a signed Assembly Act that he/she has been chosen by the *ejido* or community as project coordinator.

3.5 Required Documentation for Land Tenure Status

All landowners must demonstrate proof of ownership of the Project Area.

Communities and *Ejidos*

1. Official identification of the members of the Agrarian Authority[6] that could include: voter ID (*credencial de elector*), military ID (*cartilla militar*), passport, or certificate of naturalization.
2. Basic File (*Carpeta Básica*[7]).
3. Presidential Resolution (*Resolución Presidencial*) – For *ejidos* and communities constituted or recognized before 1992
    a. Possession Act (*Acta de Posesión y Deslinde*)
    b. Property Boundaries (*Plano Definitivo*)
    c. Registration Proof (*Constancia Registral del ejido*[8])
4. For certified *Ejidos*: Delimitation, Destination, and Land Allocation Act (*Acta de Delimitación, Destino, y Asignación de Tierras Ejidales*, ADDAT). Each parcel certificate must be presented where the project will be developed.
5. For legitimate possessors it will be required to obtain the legal possession of the land and for parcel ejidal land copy of the parcel certificate in the name of the participating ejidatario
6. Communal land use plan (*Ordenamiento Territorial Comunitario*[9]).
7. Communal bylaws (*Estatutos comunales*[10]).

[5] Decentralized body of the Ministry of the Agrarian Reform responsible for communal land (*ejido*) tenure regulation through the provision of legal certainty.
[6] The Agrarian Authority is the *Comisariado Ejidal* or *Bienes Comunales*, which in general is composed of three individuals elected by the General Assembly: president, secretary, and treasurer.
[7] *La Carpeta Basica* is constituted of information that proves the creation and constitution of *ejidos* and communities. Documents include: *Resolución Presidencial, Acta de Posesión y Deslinde*, and *Plano Definitivo*. The information can be provided at the Agrarian Registry. The *Resolucion Presidencial* (Presidential Resolution) is a decree given by the president where it is stated that the land is given to the corresponding community or *ejido*. This fact is stated on the *acta de posesión y deslinde* and a map of the community was drawn, called *Plano Definitivo*. Presidential resolutions are registered in the Agrarian Registry and on the Public Registry.
[8] Document that refers to the land dimensions and number of current beneficiaries.
[9] Defines land uses within a community or *ejido*.

8. Official identification – Identification of the Project Coordinator responsible for the project that has the approval of the agrarian nucleus.[11]

Small Private Property[12]

1. Official identification of the members of the Agrarian Authority[13] that could include: voter ID (*credencial de elector*), military ID (*cartilla militar*), passport, or certificate of naturalization.
2. Property titles inscribed under the Public Registry.

3.6 Regulatory Compliance

Each time the Forest Project is verified, the Forest Owner must attest that the project is in material compliance with all applicable laws[14] relevant to the project activity. Forest Owners are required to disclose in writing to the verifier any and all instances of material non-compliance[15] of the project with any law. MCRTs will not be issued for GHG reductions that occurred for the monitoring period in which the material non-compliance occurred.

3.7 Social Safeguards

Forest Projects can create long-term climate benefits as well as providing other social and environmental benefits. Investment into forest carbon projects has the potential to improve quality of life for rural communities, both in terms of increased revenues and in terms of sustaining and improving forest ecosystems.

For *ejidos* and communities, this protocol provides certain general social and environmental safeguards to be included in the project design and implementation throughout the project life to help guarantee that the project will have positive environmental and social outcomes. (Private, non-communal landowners are not required to address the social safeguards). The safeguards in the protocol are intended to respect internal governmental processes, customs, and rights of Forest Owners while ensuring projects are beneficial, both socially and environmentally. The section on Monitoring, Reporting, and Verification specifies the criteria for verification of each of these safeguards and consequences for failure to achieve the minimum thresholds.

The social safeguard requirements for *ejidos* and communities include:

1. Free, Prior, and Informed Consent
2. Meeting Notification, Participation, and Documentation
3. Project Governance

[10] Internal rules and regulations.
[11] An agrarian nucleus refers to social property, communities and *ejidos*. Many times the authority of the agrarian nucleus is the *Comisariado Ejidal* or *Bienes Comunales* who is the responsible body to execute and enforce the decisions taken in the General Assembly.
[12] Owners that legally possess their land but do not have a property title must demonstrate this through an affidavit supporting the ownership claim from the municipality.
[13] The Agrarian Authority is the *Comisariado Ejidal* or *Bienes Comunales*, which in general is composed of three individuals elected by the General Assembly: president, secretary, and treasurer.
[14] Including the General Law of Environmental Equilibrium and Protection, Law for Sustainable Rural Development, General Law for Sustainable Forest Development, Agrarian Law, and The Political Constitution of the Mexican United States, among others.
[15] Material non-compliance with the law, for purposes of this protocol, is any illegal act, for which the Forest Owner has been prosecuted, that impacts forest stocking, diversity, and/or conservation efforts.

The requirements for each of the categories are identified below.

Free, Prior, and Informed Consent	
Prior to project submission, Forest Owners must hold a meeting or series of meetings to discuss the themes addressed in this section. Provisions must be made to ensure non-Spanish speaking participants can understand the material and communicate during meetings. Meetings must be announced in a manner to ensure that the information reaches all community members, including vulnerable groups like women, *avecindados* and young people. The meeting notes and proof of it (through photographs or signatures) must be included in the PDD. These meetings must adhere to proper notification, participation, and meeting documentation requirements in the section on Meeting Notification, Participation, and Documentation below.	
Themes	**Description**
SS1 Forest Carbon Project Concepts	The rationale behind the participation in a forest carbon project must be discussed. Presentations must address: ▪ Concept of climate change associated with GHGs ▪ Role of forests in mitigation climate change ▪ Opportunities (economic and environmental) for participation in forest carbon project ▪ Methods to enhance forest carbon stocks ▪ Additionality and permanence associated with forest carbon projects ▪ Importance of maintenance of native biodiversity
SS2 Anticipated Costs	Reports must be prepared and presented to community members that clearly define responsibilities of Forest Owners due to involvement in a forest carbon project. Anticipated costs must be documented for: ▪ Site preparation ▪ Provision of and planting of forest seedlings ▪ Inventory and monitoring ▪ Opportunity costs ▪ Project governance ▪ Project verification
SS3 Anticipated Benefits	Presentations must be provided that define economic benefits to Forest Owners due to involvement in a forest carbon project. Anticipated benefits discussed must address: ▪ Local environmental benefits associated with biodiversity, water quality, soil conservation, and recreation ▪ Economic benefits associated with carbon and other forest resources ▪ Distribution of benefits to the community and/or community members
SS4 Project Approval	The project must be approved through: ▪ Established formal and/or traditional authorities ▪ An Assembly Act with consensus of all community members in favor. Alternatively, the project may be approved by a subset of the community members where the subset of community members agrees, in writing, to responsibility for the project costs, project benefits, and project liabilities. The written agreement must include provisions that will allow other community members to join the project in the future. In cases where the subset of community members does not hold direct title to the parcels where the project activities occur, the subset of community members must have 66% of all community members in favor of the project

Meeting Notification, Participation, and Documentation	
Meetings occur biannually (i.e. January and June) to discuss critical elements associated with project activities. These meetings can be included in the general assemblies, as desired by each community. Meetings must prove that vulnerable groups are included, including *avecindados*. Each meeting must include the following items on the agenda: ▪ Forestry activities (management actions, environmental issues, grievances, other concerns and opportunities) ▪ Programmatic events (monitoring, reporting, and verification) ▪ Credits issued ▪ Benefit sharing arrangements ▪ Finances	
Themes	**Description**
SS5 Proper Notification	▪ Notices of meetings are posted at least one week prior to meeting, but not more than 10 days
SS6 Participation	▪ Meetings must provide a sign-in sheet so that meeting attendance can be monitored ▪ Opportunities for all community members to share opinions, both in writing and orally. Project Coordinator must specifically request comment from community members during meetings
SS7 Meeting Documentation	▪ Meeting notes must document the discussions associated with each required item on the agenda ▪ Meeting notes must be publically available within a week of each meeting as part of the project record

Project Governance	
Forest carbon projects require an organizational structure that will endure for long periods of time. A Project Coordinator must be selected for the community to represent the project with community members, with verifiers, and with Reserve staff. The Project Coordinator is responsible for: ▪ Ensuring all project-related documentation is in order and up to date ▪ Ensuring meetings include the required elements above and providing meeting notes ▪ Organizing logistics with verifiers and Reserve staff The process for identifying the Project Coordinator is at the discretion of the community (it is encouraged that it is a member of the community) but must include the elements described below.	
Themes	**Description**
SS8 Identification of a Project Coordinator	▪ A description of the nomination process must be documented in the PDD ▪ A description of the selection/election process must be documented in the PDD Both processes must be approved with a 66% vote through a public process.
SS9 Term of a Project Coordinator	▪ The length of the term of Project Coordinator must be identified in the PDD ▪ The PDD must identify whether the position of Project Coordinator can be renewed and, if so, for how many terms Both terms must be defined and approved through a public process with 66% of community members voting in favor of definitions.
SS10 Replacing the Project Coordinator	▪ To address potential disputes associated with the Project Coordinator, a process for community involvement in replacing the Project Coordinator from the position must be documented in the PDD

3.8 Environmental Safeguards

The protocol has a goal of sustaining and/or enhancing forest ecosystem functions. All Forest Projects must promote and maintain native forests comprised of multiple ages and mixed native species with the Project Area. For the purposes of this protocol, native forests are comprised of species naturally found in and around the Project Area. An affidavit from the appropriate regional CONAFOR office is required wherever a dispute arises as to whether a tree is native to the Project Area or not. The use of native species outside of their historic range is permitted if

the use is intended as an adaptation strategy against climate change. In such cases, a letter stating the use of the particular species is appropriate from the appropriate regional CONAFOR office is required. Elements of forest structure within Project Activity Areas must be managed at a spatial distribution to ensure integrity of ongoing forest ecosystem functions.

The following key requirements shall apply to all Forest Projects regardless of the silviculture or regeneration methods that are used to manage the forest:

1. Forest Project Activity Areas must maintain or increase standing live and dead carbon stocks over the project life, as determined by a running 10-year average of carbon stocks within the Project Area.

2. Forest Project Activity Areas must demonstrate verified continuous progress towards achieving a goal of 95% native species within the Project Activity Areas, as measured by average trees per hectare. This must be met within 50 years.

3. Forest Project Activity Areas must demonstrate verified continuous progress towards meeting the composition of native species according to the Table 3.1. This must be met within 50 years.

Table 3.1. Requirements for the Proportion of Native Species within the Project Activity Areas

Project Activity Area[1]	Native Species Composition Requirements (Trees per Hectare)
Up to 10 hectares	Up to 100% can be in one species.
10.1 to 50 hectares	Up to 90% can be in one species. The balance must be made up of at least 10% in one other species.
50.1 to 100 hectares	No more than 80% can be in one species. The balance must be made up of at least 10% from each of at least two other species.
100.1 to 1,000 hectares	No more than 70% can be in one species. The balance must be made up of at least 10% from each of at least two other species.
Greater than 1,000 hectares	No more than 60% can be in one species. The balance must be made up of at least 10% from each of at least three other species.

[1] The area is determined by the sum of hectares in all Project Activity Areas.

For Forest Project Activities where the activity involves the establishment of new forest stands (reforestation, afforestation, urban forestry, and agroforestry), the criteria in Table 3.1 must be met immediately following the establishment of the new forest stand. For Project Activity Areas where the activity is based on Improved Forest Management, the criteria in Table 3.1 must be met through continuous progress towards the criteria over the Project Life. Exceptions to the composition of native species are accepted through a letter signed by the appropriate regional CONAFOR office that ecological rationale justifying an alternative composition of native species.

4. Where harvest occurs within the Project Activity Areas in a contiguous area larger than 5 hectares, a minimum of 10% dispersed or aggregated forest canopy must be retained following harvest to provide refugia for wildlife species among other ecological benefits of retained trees. This is commensurate with a canopy cover rating of ‘fragmented’, as explained in the Quantification and Monitoring Guidance.

5. Forest Project Non-Activity Areas must demonstrate verified sustainability of native species on non-Project Activity lands within the Project Area. The section on forest quantification provides guidance on a stratification design based on forest vegetation types. This system will facilitate monitoring of this criterion.

6. Forest areas identified by government agencies as high conservation value (HCV) forests must be maintained. Harvesting of forest materials must be compliant with any regulations and must not result in a reduction of conservation value. The section on forest quantification provides guidance on attributing stands that have been identified by CONAFOR as High Conservation Value stands.

3.9 Project Start Date

The start date of a Forest Project is the date that management activities are initiated that will lead to permanently increased GHG removals relative to the Forest Project's baseline. A Forest Project must be submitted for listing no more than six months after initiation of project activities. The Start Date of subsequent Activity Areas is based on the initiation of additional project activities within the Project Area. Verification of eligibility, project baselines, and Start Date conditions must occur within 18 months of the project Start Date. Project activities may defer verification of project inventories:

- For up to 15 years following the Project Start Date for project activities that are based on the establishment of new seedlings. Alternative, projects that establish new seedlings can base their inventory estimates for annual reporting from CONAFOR-approved projections of forest growth for a period of 15 years.

- For up to 5 years for project activities that begin where there is pre-existing forest cover (greater than 10% or with a density cover greater than *iniciado* described in Appendix A. Projects that occur in areas with pre-existing forest vegetation must adjust the inventory to the Start Date by calculating annual increment in terms of CO_2e for the Activity Area and subtracting the appropriate increment that has occurred since the Activity Area Start Date. Projects that do not meet the required verification deadline must be resubmitted under the latest version of the protocol.

3.10 Project Crediting Period

The baseline for any Forest Project registered with the Reserve under this version of the MFP is assumed to be valid for 20 years following the Start Date. This means that a registered Forest Project will be eligible to receive MCRTs for GHG removals quantified using this protocol, and verified by Reserve-approved verification bodies, for a period of 20 years following the project start date. Credits that were generated during the crediting period must continue to be monitored to meet contractual obligations, if any, and for credits to be issued according to the tonne-year accounting guidance. Crediting periods may be renewed by reviewing the project's baseline at the end of 20 year period.

3.11 Minimum Time Commitment

Projects may commit to maintaining carbon sequestered due to project activities for any length of time. However, credits will be issued in an amount proportional to the length of the commitment relative to 100 years. Commitments must be secured through a contractual agreement referred to as a Project Implementation Agreement (see below). If project carbon is

secured for a period of 100 years, then one credit will be issued for each tonne of CO_2e sequestered. Projects that are secured contractually for shorter timeframes will be issued a lesser number of credits per tonne of CO_2 sequestered, commensurate with the length of the contractual commitment relative to 100 years. This is discussed further in the section entitled Tonne-Year Accounting. Carbon secured through a contractual agreement must be monitored and verified for the duration of the agreement.

Forest Projects must submit annual monitoring reports and undergo periodic site verification every 5 years for the duration of their contractually agreed time commitment.

There are three possible exceptions to this minimum time commitment:

1. A Forest Project automatically terminates if a Significant Disturbance occurs[16], leading to an Unavoidable Reversal (see Section 9.2.2) that reduces the project's standing live tree carbon stocks below the project's baseline standing live tree carbon stocks. Once a Forest Project terminates in this manner, the Forest Owner has no further obligations to the Reserve. The project's credits are made whole through the Reserve's buffer pool.
2. A Forest Project may be voluntarily terminated prior to the end of its minimum time commitment if the Forest Owner retires a quantity of MCRTs equal to the total number of MCRTs secured through contractual relationship.
3. A Forest Project may be automatically terminated if there is a breach of certain terms described within the Project Implementation Agreement. Such a termination will require the Forest Owner to retire a quantity of MCRTs, equal to the total number of MCRTs secured.

3.12 Project Implementation Agreement

A Project Implementation Agreement (PIA) is a contract between the Reserve and the Forest Owner that effectively secures verified carbon for periods of time (up to 100 years).

The PIA ensures that the net quantity of carbon sequestered by a project will continue to be monitored and verified for the duration of the agreed upon commitment period, specifies remedies in the event of a contract breech, and stipulates the number of credits to be issued for each net tonne of CO_2e sequestered due to project activities.

The PIA sets forth the Forest Owner's obligation (and the obligation of its successors and assignees) to comply with the monitoring and verification requirements of the Mexico Forest Protocol. The Forest Owner's responsibilities in the event of a reversal are also addressed in the PIA. The PIA must be signed by the governance body of the *ejido*/community or the land owner of private properties.

Contracts that bind actions of communal landscapes are limited by law to 30 years. The PIA can be renewed annually to allow credits associated with prior vintages to be issued, such that projects can receive additional credits for previously stored carbon until the 100 year permanence commitment is reached.

It is not possible at this time to terminate the PIA for only a portion of the Project Area.

[16] The natural disturbance shall not be the result of avoidable or grossly negligent acts of the Forest Owner.

3.12.1 Attestation of Title

Each time a Forest Project is verified, the Forest Owner must sign the Reserve's standard Attestation of Title form indicating that the Forest Owner has an exclusive ownership claim to the GHG removals achieved by their Forest Project over the verification period. Copies of the Attestation of Title form are available on the Reserve's website. Please note that in requesting this form, the Reserve is not providing credit or acting as a broker to trade any Forest Project MCRTs.

3.13 Other Eligibility Criteria

An affidavit stating that there are no ongoing encumbrances or expectations for specific forest management activities is required in cases where a Reserve project is to be initiated in an area where a previous project existed. Projects may not be located on any part of a project that was terminated as the result of an avoidable reversal.

4 Additionality

The Reserve registers only projects that yield GHG emission removals that are determined to be additional to what would have occurred in the absence of a carbon offset market (i.e. under "Business As Usual"). For a general discussion of the Reserve's approach to determining additionality see the Reserve's Program Manual (available at http://www.climateactionreserve.org/how/program/program-manual/).

Forest Projects must satisfy the following tests to be considered additional:

1. **Legal requirement test.** Forest Projects must achieve GHG removals above any GHG removals that would result from compliance with any law, statute, rule, regulation or ordinance. Legally-binding mandates entered into as part of the project and in support of project activities are not considered for the purpose determining additionality under the legal requirement test.
2. **Performance test.** Forest Projects must achieve GHG removals above and beyond any GHG reductions or removals that would result from engaging in "Business As Usual" activities, as defined by the requirements described below (Section 4.2).

4.1 Legal Requirement Test

At the Forest Project's first verification, the Forest Owner must sign the Reserve's Attestation of Voluntary Implementation form indicating that project activities are not legally required at the time of the project start date.

Legal constraints must be included in the determination of the project baseline, as described in Section 7 of this protocol.

4.2 Performance Test

Project activities are considered additional to the extent they produce GHG reductions and removals in excess of those that would have occurred under a Business As Usual (BAU) scenario. The performance test for the Mexico Forest Protocol is based on evidence that risks to forest inventories are present at considerable levels within the Project Area. The guidance for the standardized interpretation of risks to forest inventories and its effect on the project baseline is described in Section 7.

5 GHG Assessment Boundary

The GHG Assessment Boundary defines all the GHG sources, sinks, and reservoirs that must be accounted for in quantifying a Forest Project's GHG reductions and removals. The GHG Assessment Boundary encompasses all the GHG sources, sinks, and reservoirs that may be significantly affected by Forest Project activities, including forest carbon stocks, sources of biological CO_2 emissions, and GHG emissions from mobile combustion. For accounting purposes, the sources, sinks, and reservoirs included in the GHG Assessment Boundary are organized according to whether they are predominantly associated with a Forest Project's "Primary Effect" (i.e. the Forest Project's intended changes in carbon stocks, GHG emissions or removals) or its "Secondary Effects" (i.e. unintended changes in carbon stocks, GHG emissions or removals caused by the Forest Project).[17] Secondary Effects may include increases in mobile combustion CO_2 emissions associated with site preparation, as well as increased CO_2 emissions caused by the shifting of harvesting activities from the Project Area to other forestlands (often referred to as "leakage"). Projects are required to account for Secondary Effects from leakage following the methods described in Section 8.

The following table provides a comprehensive list of the GHG sources, sinks, and reservoirs (SSRs) that may be affected by a Forest Project, and indicates which SSRs must be included in the GHG Assessment Boundary depending on the project specifics. If a SSR is designated as a reservoir/pool, this means that GHG reductions and removals are accounted for by quantifying changes in carbon stock levels. For SSRs designated as sources or sinks, GHG reductions and removals are accounted for by quantifying changes in GHG emission or removal rates, as described in the tables.

[17] The terms "Primary Effect" and "Secondary Effect" come from WRI/WBCSD, 2005. *The Greenhouse Gas Protocol for Project Accounting*, World Resources Institute, Washington, DC. Available at http://www.ghgprotocol.org.

Table 5.1. GHG Assessment Boundary

SSR	Description	Type	Gas	Included or Excluded?	Quantification Method	Justification/Explanation
Primary Effect Sources, Sinks, and Reservoirs						
1	Standing live carbon (carbon in all portions of living trees)	Reservoir / Pool	CO_2	Included	**Baseline**: Modeled based on initial field inventory measurements; methodology outlined in Section 7 **Project**: Measured by field measurements and updating forest carbon inventory	Increases in standing live carbon stocks are likely to be a large Primary Effect of carbon enhancement projects. For baseline estimation purposes, pre-existing trees and trends in carbon storage in the Project Area must be modeled. See Section 7 for more details on baseline modeling.
2	Shrubs and herbaceous understory carbon	Reservoir / Pool	CO_2	Included for estimating site preparation emissions	**Baseline**: Estimates based on carbon inventories prior to site preparation **Project**: Estimates based on proportion of carbon remaining following site preparation	For crediting purposes shrubs and herbaceous understory carbon is excluded since changes in this reservoir are unlikely to have a significant effect on total quantified GHG reductions or removals. Furthermore, it is generally not practical to undertake measurements of shrubs and herbaceous understory accurate enough for crediting purposes. Clearing of shrubs and herbaceous understory for purposes of reforestation/afforestation activities may have significant emissions.
3	Standing dead carbon (carbon in all portions of dead, standing trees)	Reservoir / Pool	CO_2	Included	**Baseline**: Measured based on initial field inventory measurements **Project**: Measured by updating forest carbon inventory	Carbon enhancement projects may significantly increase standing dead carbon stocks over time.
4	Lying dead wood carbon	Reservoir / Pool	CO_2	Included	**Baseline**: Required through standardized estimation processes in forest carbon inventories **Project**: Required through standardized estimation processes in forest carbon inventories	In some cases, project activities may have significant effects in conserving carbon in lying dead wood (fuel efficient stoves, for example). Standardized estimation processes are required to ensure the difference between baseline and project activities are consistently accounted for.

5	Litter and duff carbon (carbon in dead plant material)	Reservoir / Pool	CO_2	Excluded	**Baseline**: Not included in baseline measurements **Project**: Not included in project measurements	Litter and duff carbon is excluded since changes in this reservoir are unlikely to have a significant effect on total quantified GHG reductions or removals. Furthermore, it is generally not practical to undertake measurements of litter and duff accurate enough for crediting purposes.
6	Soil carbon	Reservoir / Pool	CO_2	Excluded for crediting Required for certain management activities	**Baseline**: Conservative default values must be used to estimate baseline soil carbon **Project**: Default estimates of emissions must be used	Soil carbon is not anticipated to change significantly as a result of most carbon enhancement project activities that do not include intensive site preparation. Obtaining accurate estimates of soil carbon is expensive and highly variable. Soil carbon cannot be included as a credited reservoir/pool. Soil carbon emissions associated with intensive site preparation for reforestation/afforestation must be estimated.
7	Carbon in in-use forest products	Reservoir / Pool	CO_2	Excluded	**Baseline**: NA **Project**: NA	While long-term harvested wood products may increase, along with onsite forest carbon, due to improved management, long-term wood products are not included as credible data supporting long-term sequestration of harvested wood products is lacking.
8	Forest product carbon in landfills	Reservoir / Pool	CO_2	Excluded Excluded	**Baseline**: NA **Project**: NA	No data has been obtained to suggest wood products remain in long-term storage in landfills in Mexico.
Secondary Effects Sources, Sinks, and Reservoirs						
9	Nutrient application	Source	N_2O	Excluded	**Baseline:** NA **Project:** NA	The use of broadcast fertilization is not an eligible activity.
10	Mobile combustion emissions from site preparation activities	Source	CO_2	Included	**Baseline**: Assumed to be zero **Project**: Accounted for by use of equipment hours	Mobile combustion CO_2 emissions from site preparation may be important when machinery is used to prepare areas for planting.
			CH_4	Excluded	**Baseline**: N/A **Project**: N/A	Changes in CH_4 emissions from mobile combustion associated with site preparation activities are not considered significant.

			N_2O	Excluded	**Baseline**: N/A **Project**: N/A	Changes in N_2O emissions from mobile combustion associated with site preparation activities are not considered significant.
11	Mobile combustion emissions from ongoing project operation and maintenance	Source	CO_2	Excluded	**Baseline**: N/A **Project**: N/A	Mobile combustion CO_2 emissions from ongoing project operation and maintenance are unlikely to be significantly different from baseline levels, and are therefore not included in the GHG Assessment Boundary.
			CH_4	Excluded	**Baseline**: N/A **Project**: N/A	CH_4 emissions from mobile combustion associated with ongoing project operation and maintenance activities are not considered significant.
			N_2O	Excluded	**Baseline**: N/A **Project**: N/A	N_2O emissions from mobile combustion associated with ongoing project operation and maintenance activities are not considered significant.
13	Stationary combustion emissions from ongoing project operation and maintenance	Source	CO_2	Excluded	**Baseline**: N/A **Project**: N/A	Stationary combustion CO_2 emissions from ongoing project operation and maintenance could include GHG emissions associated with electricity consumption or heating/cooling at Forest Owner facilities or at facilities owned or controlled by contractors. These emissions are unlikely to be significantly different from baseline levels, and are therefore not included in the GHG Assessment Boundary.
			CH_4	Excluded	**Baseline**: N/A **Project**: N/A	CH_4 emissions from stationary combustion associated with ongoing project operation and maintenance activities are not considered significant.
			N_2O	Excluded	**Baseline**: N/A **Project**: N/A	N_2O emissions from stationary combustion associated with ongoing project operation and maintenance activities are not considered significant.

14	Biological emissions from clearing of forestland outside the Project Area for agriculture and/or grazing	Source	CO_2	Included	**Baseline**: N/A **Project**: Estimated using default land use conversion factors for non-project land	Projects on land currently, or projected to be used for, grazing or growing crops may cause displacement of these activities to other lands, leading to a reduction in carbon stocks on those lands (e.g. due to clearing of trees and shrubs). The shift may be either a market response or physical response to the project activity. Emissions associated with shifting land uses are estimated using default "leakage" factors outlined in Section 8 of the protocol.
15	Biological emissions or removals from changes in timber harvesting on forestland outside the Project Area	Source / Sink	CO_2	Included/ Excluded	**Baseline**: N/A **Project**: Leakage factors outlined in Section 8	If harvesting is reduced in the Project Area, harvesting on other lands may increase to compensate for the lost production. This "leakage" effect is outlined in Section 8 of the protocol. Projects may also increase harvesting levels relative to the baseline, potentially causing other landowners to reduce harvesting in response to increased wood product supply. The reduction in harvesting may lead to increased carbon stocks on their lands.
16	Combustion emissions from production, transportation, and disposal of forest products	Source	CO_2	Excluded	**Baseline**: N/A **Project**: N/A	The Primary Effect of Forest Projects in Mexico is to conserve and increase onsite forest carbon stocks, without substantially affecting the production, transportation, and disposal of wood products with regards to baseline levels. Therefore, these emissions are not included in the GHG Assessment Boundary of this protocol.
			CH_4	Excluded	**Baseline**: N/A **Project**: N/A	Combustion-related CH_4 emissions from changes in the production, transportation, and disposal of forest products are not considered significant.
			N_2O	Excluded	**Baseline**: N/A **Project**: N/A	Combustion-related N_2O emissions from changes in the production, transportation, and disposal of forest products are not considered significant.

17	Combustion emissions from production, transportation, and disposal of alternative materials to forest products	Source	CO_2	Excluded	**Baseline**: N/A **Project**: N/A	The Primary Effect of Forest Projects in Mexico is to conserve and increase onsite forest carbon stocks, without substantially affecting the production, transportation, and disposal of wood products with regards to baseline levels. Therefore, these emissions are not quantified in the assessment boundary of this protocol.
			CH_4	Excluded	**Baseline**: N/A **Project**: N/A	Combustion-related CH_4 emissions from changes in the production, transportation, and disposal of alternative materials are not considered significant.
			N_2O	Excluded	**Baseline**: N/A **Project**: N/A	Combustion-related N_2O emissions from changes in the production, transportation, and disposal of alternative materials are not considered significant.
18	Biological emissions from decomposition of forest products	Source	CO_2	Excluded	**Baseline**: NA **Project**: NA	While long-term harvested wood products may increase, along with onsite forest carbon, due to improved management, long-term wood products are not included as credible data supporting long-term sequestration of harvested wood products is lacking.
			CH_4	Excluded	**Baseline**: N/A **Project**: N/A	In-use wood products will produce little to no CH_4 emissions. CH_4 emissions can result from anaerobic decomposition of forest products in landfills. Additionally, dimensional wood products are assumed to be in landfills in minimal quantities. Thus, changes in forest-product production are assumed to have no significant effect on future CH_4 emissions from anaerobic decomposition of forest products in landfills. These emissions are therefore excluded from the GHG Assessment Boundary.
			N_2O	Excluded	**Baseline**: N/A **Project**: N/A	Decomposition of forest products is not expected to be a significant source of N_2O emissions.

6 Quantifying Net GHG Reductions and Removals

This section provides requirements and guidance for quantifying a Forest Project's net GHG removals. The Reserve will issue Mexican Climate Reserve Tonnes (MCRTs) to a Forest Project upon confirmation by an ISO-accredited and Reserve-approved verification body that the Forest Project GHG removals have been quantified following the applicable requirements of this section (see Section 11 for verification requirements).

The quantification method proceeds in seven steps:

1. **Quantifying the project onsite carbon stocks (Appendix A).** Each year, the Forest Owner must determine the Forest Project actual onsite carbon stocks. This does not require a re-measurement of the inventory each year, but does require that inventory estimates are updated using the guidance in this section and in Appendix A. The estimate of actual onsite carbon stocks must be adjusted by an appropriate confidence deduction, as described in Appendix A.
2. **Determining the project baseline onsite carbon stocks (Section** 7**).** The baseline is a standardized estimate of what would have occurred in the absence of a Forest Project. Projects are eligible to receive credits to the extent they increase forest carbon inventories above baseline levels. The guidance for determining a project baseline is discussed in Section 7. The baseline is established for renewable 20-year crediting periods.
3. **Calculating the project Primary Effect.** Each year, the Forest Owner must quantify the actual change in GHG emissions or removals associated with the Forest Project's intended ("Primary") effect, as defined in Section 8. For any given year, the Primary Effect is calculated by:
    a. Taking the difference between actual onsite carbon stocks for the current year and actual onsite carbon stocks for the prior year.[18]
    b. Subtracting from (a) the difference between baseline onsite carbon stocks for the current year and baseline onsite carbon stocks for the prior year.[19]
4. **Quantifying the project Secondary Effects.** Each year, the Forest Owner must quantify the actual change in GHG emissions or removals associated with the Forest Project's unintended ("Secondary") effects, as defined in Section 8. Requirements and guidance for quantifying Secondary Effects are provided below for each type of Forest Project. Secondary Effects will almost always be negative (i.e. they will reflect an increase in GHG emissions caused by the project).
5. **Calculating total net GHG reductions and removals.** For each year, total net GHG reductions and removals are calculated by summing a Forest Project's Primary and Secondary Effects for the total carbon inventory that is secured through the Project Implementation Agreement or the amount that has been verified that fulfills a tonne-year (see the section on tonne-year accounting). If the result is positive, then the Forest Project has generated GHG reductions and/or removals in the current year. If the result is negative, this may indicate a reversal has occurred (see Section 9).[20]

[18] For the purposes of calculating the project's Primary Effect, actual and baseline carbon stocks prior to the start date of the project are assumed to be zero.
[19] See footnote 14.
[20] A reversal occurs only if: (1) Total net GHG reductions and removals for the year are negative; and (2) MCRTs have previously been issued to the Forest Project. If calculated GHG reductions and removals are negative and no MCRTs have been issued to the project since its start date, then the result should be treated as a "negative carryover" to GHG reduction calculations in subsequent years (variable N_{y-1} in Equation 6.1). This may happen, for example, because the confidence deduction applied to actual onsite carbon stocks can result in actual values being less than baseline values in a Forest Project's initial years.

The required formula for quantifying annual net GHG reductions and removals is presented in Equation 6.1. Net GHG reductions and removals must be quantified and reported in units of carbon dioxide-equivalent (CO_2e) metric tons.

Equation 6.1. Annual Net GHG Reductions and Removals

$$\boldsymbol{QR_y = \left[(\Delta AC_{onsite} - \Delta BC_{onsite}) + SE_y\right] + N_{y-1}}$$

Where,			Units
QR_y	=	Quantified GHG reductions and removals for year y	CO_2e
AC_{onsite}	=	Actual onsite carbon (see below)	CO_2e
BC_{onsite}	=	Baseline onsite carbon (see below)	CO_2e
SE_y	=	Secondary Effect GHG emissions caused by the project activity in year y	CO_2e
N_{y-1}	=	Any negative carryover from the prior year (occurs when total quantified GHG removals are negative prior to the issuance of any MCRTs for the project)	CO_2e

And,

$$\boldsymbol{\Delta AC_{onsite} = (AC_{onsite,y})(1 - CD_y) - (AC_{onsite,y-1})(1 - CD_{y-1})}$$

Where,			Units
$AC_{onsite,y}$	=	Actual onsite carbon as inventoried for year y	CO_2e
CD_y	=	Appropriate confidence deduction for year y, as determined in Appendix A	
$AC_{onsite,y-1}$	=	Actual onsite carbon as inventoried for year y-1 (if y is the first year of the project, then the value for $AC_{onsite,y-1}$ will be zero)	CO_2e
CD_{y-1}	=	Appropriate confidence deduction for year y-1, as determined in Appendix A	

And,

$$\boldsymbol{\Delta BC_{onsite} = BC_{onsite,y} - BC_{onsite,y-1}}$$

Where,			Units
$BC_{onsite,y}$	=	Baseline onsite carbon as estimated for year y	CO_2e
$BC_{onsite\ y-1}$	=	Baseline onsite carbon as estimated for year y-1 (if y is the first year of the project, then the value for $BC_{onsite,y-1}$ will be zero)	CO_2e

7 Determining the Project Baseline

A forest carbon project can be issued credits to the extent forest carbon stocks have increased above and beyond baseline forest carbon stocks within the Project Area. A baseline for purposes of crediting is established only for the Activity Areas within the Project Area. One project baseline is constructed by analyzing benchmark scenarios for each Activity Area included and subsequently merging them. The baseline may be modified with the inclusion of additional Activity Areas in the future, which is explained in the section below. This section describes:

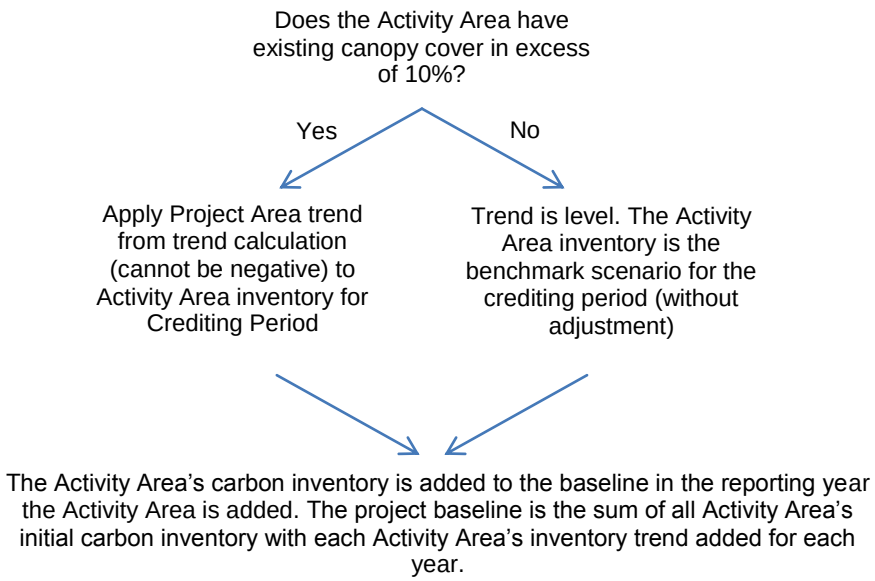
- Determining the standardized annual increase of forest carbon inventory to apply to each Activity Area's onsite forest carbon inventory and projecting forest carbon inventory to establish an Activity Area baseline
- Calculation of the Project Area baseline from benchmark scenarios of multiple Activity Areas

7.1 Determining the Baseline Annual Increase of Forest Carbon to Apply to Each Activity Area's Onsite Forest Carbon Inventory

A standardized assessment is conducted at the project initiation to determine the project's baseline. The standardized assessment results in a percentage increase that is applied to existing forest carbon inventories in Activity Areas to create a trend line. The assessment to develop a trend where the Activity Area has existing above ground carbon inventories is based on evidence of three factors.

Two of the factors are focused on risks to forest inventories. Conceptually, a Project Area that had no risks to forest inventories would have all potential forest growing areas in forest cover and forest canopy cover approaching the maximum canopy cover found in nature for that particular forest community. The assessment of forest carbon inventory trends is based on the proportional area of potential forested area in forest cover and the overall percentage of canopy cover present compared to canopy cover expected in a natural forest condition.

The third factor is based on a proportional assessment of regenerated forests in the larger forest context within the Project Area. A forest in a sustainable state in even-aged management or in traditional rotations between forest cover and agriculture cover would have no more than 20% of the forested areas in young trees (<10 years old, for example). Young trees, for purposes of this protocol, are correlated with forest strata size classes 0 and 1 from stratifying the forest cover (Appendix A). The baseline is an assessment of the probability of future forest inventory increases in the Project Area based on evidence of pressures to existing mature trees and evidence of regeneration present.



The trends of benchmark scenarios for Activity Areas where the principal activity is the planting of new trees or management of areas such that natural regeneration is able to occur, such as with reforestation or afforestation activities, is always level. The trends of benchmark scenarios that have existing canopy cover of forests in excess of 10% are calculated according to the calculation in Table 7.1 below. The project's baseline is calculated by summing the carbon inventories from each of the Activity Areas and their associated trend calculations together. The conceptual framework for the baseline calculation is displayed below. An example is provided later in this section.

The trend that is applied to Activity Area carbon inventories, as required, is based on stratification data applied to the Project Area based on guidance in Appendix A. A worksheet for calculating Activity Area benchmarks is provided on the Reserve website (forthcoming). Table 7.1 below displays the critical elements of the worksheet and displays how the trend calculation is derived.

Table 7.1. Calculation of Benchmark Trends

Project Area Data	Estimated Project Area Capable of Supporting Native Forest Communities (From Table 7.3) (Ha)	Project Area in Forest Cover (from Project Area stratification required in Section 7) (Ha)	Canopy Cover Percentage Normally Existing in Native Forest (from Table 7.3, weighted by area in different vegetation types)	Canopy Cover Percentage Estimated in Existing Forest (Weighted by Stratum Canopy Cover Percentage and Area from Required Stratification (Section 7))	Area of Forest Cover in Stands of Trees in Size Classes 0 and 1 (Ha) (From Table 7.6)
	500	200	85%	60%	55
Project Area Calculations	Percent of Potential Forest Cover in Actual Forest Cover	Existing Canopy Cover Percentage of Normally Existing Canopy Cover in Native Forest	Percent of Forest Cover in Stands of Trees in Size Classes 0 and 1 in Excess of 25%	Benchmark Annual Inventory Increase Multiplied by Activity Area carbon inventories	
	40%	70.59%	27.5%	**1.01**	
Percent Classes	Multiplier	Multiplier	Multiplier	Calculation of Benchmark Annual Increase is as Follows:	
0 -25%	0.00%	0.00%	0.00%	1+(1-(1-Percent of Potential Forest Cover in Actual Forest Cover)*(1-Existing Canopy Cover Percentage of Normally Existing Canopy Cover in Native Forest)*(1-Percent of Forest Cover in Stands of Trees in Size Classes 0 and 1 in Excess of 25%))	
26 - 50%	0.00%	0.00%	1.00%		
51 - 75%	0.10%	0.50%	2.00%		
76 - 100%	0.20%	1.00%	4.00%	Calculation carried out to hundreths	

The benchmark scenario is a projection of the forest carbon inventory (standing live and dead wood and lying dead wood) within each Activity Area. The project baseline is the sum of forest carbon inventories from each Activity Area included in the project with each of their benchmark scenarios applied. Emissions from site preparation must be added to Activity Area benchmarks as required. The first step is to establish a projection of the onsite carbon pools. Table 7.1 displays values to be applied to current onsite carbon inventories within Activity Areas based on the area within the Project Area that has been converted from forest cover to other land uses.

The benchmark scenario calculation must be calculated for a period of 20 years for the project crediting period. Upon termination of the crediting period, projects that have not experienced avoidable reversals can maintain the baseline they had at the project's initiation for an additional 20-year crediting period. Projects that have experienced avoidable reversals must recalculate the project's baseline for the next 20-year crediting period. As an example, an Activity Area (1) that has an initial onsite carbon inventory of 100 tonnes of CO_2e with a multiplier of 1.01 would have a benchmark scenario as follows:

Activity Area 1							
Year	**Onsite Forest Carbon Inventory (CO_2e)**	**Year**	**Onsite Forest Carbon Inventory (CO_2e)**	**Year**	**Onsite Forest Carbon Inventory (CO_2e)**	**Year**	**Onsite Forest Carbon Inventory (CO_2e)**
Activity Area Initiation (1)	100						
Year 1	101	Year 6	118	Year 11	137	Year 16	159
Year 2	105	Year 7	122	Year 12	141	Year 17	164

Year 3	108	Year 8	125	Year 13	145	Year 18	169
Year 4	111	Year 9	129	Year 14	150	Year 19	174
Year 5	115	Year 10	133	Year 15	154	Year 20	179

7.2 Calculating the Project Area Baseline where Multiple Activity Area Projections are Included

Where only one Activity Area is included as part of the project, the projection of the Activity Area, as described above, is the project baseline. The protocol allows additional Activity Areas to be added to the project's baseline over time as the areas are prepared with sampling efforts for forest carbon inventories and management activities are initiated to increase forest carbon. This section describes how a new Activity Area can be added to pre-existing baseline projections. This approach allows a variety of enhancement activities, including reforestation, improved forest management, agroforestry, and urban forestry to be credited over time.

Each Activity Area is calculated independently based on the onsite forest carbon inventory within the Activity Area and applying the steps mentioned above to project the inventory. The projected forest carbon inventory associated with the recently added Activity Area is added to any previously added Activity Area(s). Each Activity Area included in project is included in the baseline (and the project activity monitoring) for the 20 year crediting period associated with each Activity Area. An example is shown below.

The baseline methodology allows for additional Activity Areas to be added to the project at any year during the Project Life. As before, the benchmark scenario for the additional Activity Area (2) is based on the initial forest carbon inventory within the Activity Area the year it is included for crediting. In the example below, Activity Area 2 is added in the fourth year of the project. The initial inventory of forest carbon is shown as is the linear trend of 0% (as allowed for reforestation and afforestation activities) added to it.

Activity Area 2							
Year	**Onsite Forest Carbon Inventory (CO_2e)**	**Year**	**Onsite Forest Carbon Inventory (CO_2e)**	**Year**	**Onsite Forest Carbon Inventory (CO_2e)**	**Year**	**Onsite Forest Carbon Inventory (CO_2e)**
Project Initiation	-						
Year 1	-	Year 6	20	Year 11	20	Year 16	20
Year 2	-	Year 7	20	Year 12	20	Year 17	20
Year 3	-	Year 8	20	Year 13	20	Year 18	20
Year 4 - Activity Area 2 Initiation	20	Year 9	20	Year 14	20	Year 19	20
Year 5	20	Year 10	20	Year 15	20	Year 20	20

The resulting baseline for the entire project is based on adding the two Activity Area components (Activity Area 1 and Activity Area 2) together, as shown below.

Project Baseline – Sum of all Activity Area Components							
Year	**Onsite Forest Carbon Inventory (CO_2e)**	**Year**	**Onsite Forest Carbon Inventory (CO_2e)**	**Year**	**Onsite Forest Carbon Inventory (CO_2e)**	**Year**	**Onsite Forest Carbon Inventory (CO_2e)**
0	100						
Year 1	102	Year 6	138	Year 11	157	Year 16	179
Year 2	105	Year 7	142	Year 12	161	Year 17	184
Year 3	108	Year 8	145	Year 13	165	Year 18	189
Year 4	131	Year 9	149	Year 14	170	Year 19	194
Year 5	135	Year 10	153	Year 15	174	Year 20	199

7.3 Consideration of Legal Constraints

As discussed in the section on additionality, Forest Projects may only receive credit to the extent they achieve GHG removals beyond baseline levels, assuming baseline compliance with all applicable laws, statutes, rules, regulations or ordinances. Legal constraints include all laws, regulations, and legally-binding commitments applicable to the Project Area at the project initiation that could affect standing live carbon stocks. Legal constraints include the following constraints that are enforced within the Project Area.

1. Federal, state/provincial or local government regulations that are required and might reasonably be anticipated to influence carbon stocking over time including, but not limited to:
    a. Zones with harvest restrictions (e.g. buffers, streamside protection zones, wildlife protection zones, protected areas (ANPs))
    b. Minimum stocking standards
2. Forest practice rules established by federal, state or municipal government
3. Other binding requirements that affect forest carbon stocks such as trusts (*fideicomisos*)

As part of the additionality analysis, projects must identify all legal requirements that would have an effect on the trajectory of forest carbon within the Activity Areas. If the effect of the legal requirement would lead to increases of forest carbon inventories above the standardized trajectory described above, the legal constraints must be included in the baseline trajectory.

7.4 Consideration of Financial Constraints

Enhancement activities must be the result of defined investment rather than the result of natural activities. Defined investment for reforestation/agroforestry activities means an investment of labor or capital to establish tree seedlings, either directly (tree planting, site preparation, etc.) or indirectly (protecting natural regeneration against herbivory or other abrasive environmental elements). Direct investment for other enhancement activities includes investments in stocking improvements and opportunity costs associated with extended rotations. Indirect investment activities include investments into the protection of forested stands against environmental threats or manmade elements, including illegal harvesting.

8 Assessment of Secondary Effects

The baseline approach provides assurances that forest enhancement activities do not result in increased forest carbon emissions on the balance of the Project Area, since the entire Project Area is monitored for forest biomass flux. It is possible that forest enhancement activities result in emissions on external sites. The approach to the calculation of secondary effects is split into an analysis conducted for reforestation/afforestation activities and an analysis for all other enhancement activities. The figure below displays the logic which must be applied to each Activity Area to calculate leakage associated with the activity.

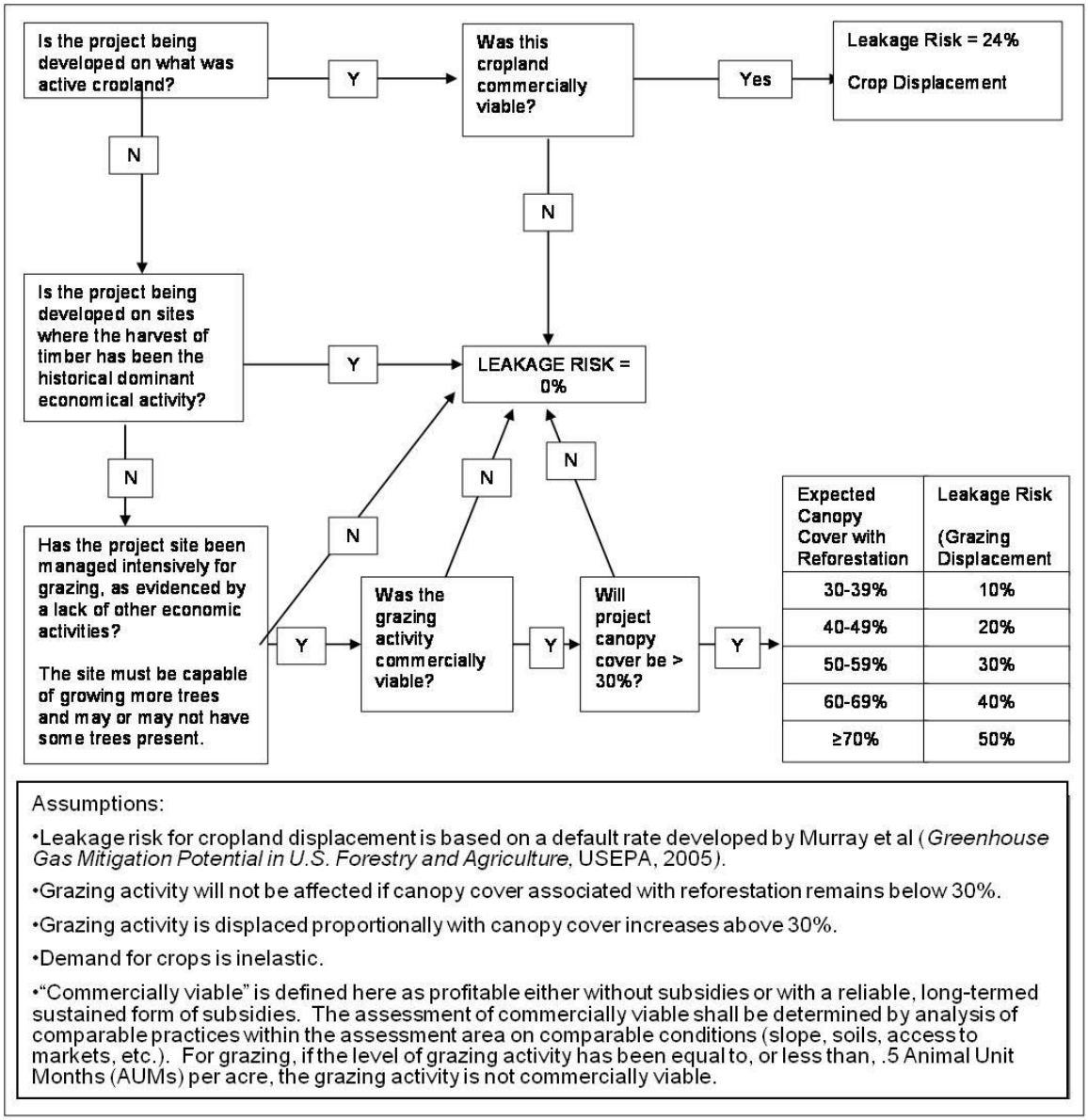


Figure 8.1. Activity Shifting ("Leakage") Risk Assessment for Projects

The assessment of secondary effects for all other (non-reforestation/non-afforestation) activities is based on estimating the average annual quantity, based on the past 10 years, of forest carbon in trees harvested for wood products prior to project implementation, which is compared

to an estimate of the forest carbon in trees harvested for wood products following project implementation. Where harvested forest carbon has decreased as the result of project activities, the estimate of secondary effects is 20% multiplied times the difference between baseline estimates and project estimates. The estimate is calculated for each Activity Area and summed for the Project Area.

Total Secondary Effect emissions for projects are calculated as follows (Equation 8.1). The value for Secondary Effect emissions will always be negative or zero.

Equation 8.1. Total Secondary Effect Emissions

$$\boldsymbol{SE_y} = \left(\boldsymbol{AS_y} + \boldsymbol{MC_y} + \boldsymbol{HW_y}\right) \textit{ or } \mathbf{0}\text{, whichever is lower}$$

Where,			Units
SEy	=	Secondary Effect emissions caused by the project activity in year y (Equation 6.1)	CO_2e
ASy	=	Emissions due to shifting of cropland or grazing activities	CO_2e
MCy	=	Emissions due to mobile combustion from site preparation	CO_2e
HWy	=	Emissions due to shifting harvest levels	CO_2e

9 Ensuring Permanence of Credited GHG Reductions and Removals

Under this protocol, credits are issued based on the proportion of carbon that is maintained over a 100-year time period. Tonne-year accounting principles are used to quantify the time-value of storing carbon. This value is used to determine how many credits may be issued over time per tonne of CO_2e sequestered by a project. The longer carbon is stored (or contractually secured), the more credits are issued. The ratio of credits issued to carbon stored will reach 1:1 only at the end of 100 years. If a contractual agreement guarantees the maintenance of carbon stocks for a period longer than one year (e.g. 30 years), then credits will be issued based on the time-value of storing carbon for the guaranteed period, relative to 100 years (e.g. the time-value for storing carbon for 30 out of 100 years).

This section discusses:

- Tonne-Year Accounting
- Compensation for Reversals
- Avoidable and Unavoidable Reversals
- The Reserve Buffer Pool

9.1 Tonne-Year Accounting

Under this protocol, one credit (MCRT) is issued for each tonne of CO_2e removed from the atmosphere for a period of 100 years. Tonnes of CO_2e sequestered and stored for shorter periods will receive a fractional amount of credits according to the length of time they are stored and/or contractually secured. Specifically, for each year that a tonne of CO_2e is stored, 1/100th of a credit will be issued. If a Forest Owner commits to maintaining carbon for a period longer than one year, then credits will be issued in a fraction proportional to the length of the commitment – e.g. 0.3 credits per tonne that is secured for 30 years. The commitment must be established through a contract with the Reserve. The contract does not need to be recorded on the deed to the Forest Owner's property. Equation 9.1, below, shows the formula for determining the number of credits that will be issued for a carbon sequestered in any given year.

The benefit of the approach is that projects develop an ongoing economic incentive to protect against reversals over time, based on an expected stream of future credits as long as carbon is maintained.

Equation 9.1. Formula for Credit Issuance Under Tonne-Year Accounting

$$\boldsymbol{MCRT_y = C_{1,y} \times (y + s) \times 0.01 - TD}$$

Where,			Units
$MCRT_y$	=	Number of credits to be issued in year *y*	
$C_{1,y}$	=	Quantity of carbon sequestered in year 1 that remains stored in year *y*. This quantity is determined by comparing actual carbon to baseline carbon in year *y*; if this difference exceeds the quantity of carbon that was sequestered in year 1, then $C_{1,y}$ is set equal to the quantity sequestered in year 1	Tonne CO_2e
y	=	Current year, relative to the year in which a given quantity of carbon was sequestered (defined as year 1)	
s	=	Number of years remaining in the term of any contract securing the carbon sequestered in year 1 against reversals	
TD	=	Number of credits already issued to date (prior to year *y*) for the carbon sequestered in year 1	

If a contractual commitment is extended, further credits may be released based on the length of the extension. For example, if 100 tonnes of CO_2e sequestered in year 1 of a project are secured by contract against reversals for 30 years, then 30 credits will be issued. The next year, if the contract is extended by another year (so that the contract still has a term of 30 years total), then another credit will be issued on top of the 30 prior credits. Contracts may be extended in this way until the end of the contractual commitment reaches a date that is 100 years after the carbon was first sequestered. At that point, a total of 100 credits will have been issued for the 100 tonnes CO_2e.

Forest Owners may also choose not to contractually secure carbon sequestered by a project. In this case, credits will be issued over time based on the quantity that remains stored (as determined through monitoring and verification) in any given year until the end of 100 years is reached.

Carbon that has been secured through contract, and that is therefore subject to legal protection against reversal for the term of the contract, is considered “obligated” carbon. Carbon that is not secured by contract is considered “unobligated” carbon. If obligated carbon is reversed (see definition of a reversal, below), then it must be compensated for through the retirement of MCRTs.

9.2 Compensation for Reversals

A GHG removal can be “reversed” if the carbon stored as a result of the removal is subsequently released to the atmosphere. Under tonne-year accounting, reversals need to be compensated for if they affect carbon that is contractually secured against reversal. A reversal occurs if the quantified GHG reductions and removals for a given reporting period (QR_y in Equation 6.1) are negative, and a contractual obligation to retain carbon sequestered by the project has not yet expired.

Under this protocol, carbon is considered reversed in the opposite order to which its sequestration was quantified and verified. For example, suppose a project sequestered 100 tonnes of carbon in year 1 and another 50 tonnes in year 2. In year 3, a reversal occurs that releases 75 tonnes to the atmosphere. In this situation, the 50 tonnes sequestered in year 2 are considered reversed, along with 25 of the tonnes sequestered in year 1.

Reversals are deemed avoidable if they are the direct result of human activities through acts of gross negligence. Reversals are deemed unavoidable if they are the result of natural events, such a wildfire, insect-related mortality or wind.

9.2.1 Compensation Formula for Reversals

If a reversal affects obligated carbon (see definition in Section 9.1, above), credits must be retired to fulfill the terms of the contract that secures the carbon. Equation 9.2 shows the formula to use to determine how many MCRTs to retire to compensate for a reversal affecting a specific vintage of sequestered carbon.

Equation 9.2. Formula to Determine the Number of MCRTs to Retire to Compensate for a Reversal from a Specific Vintage

$$\boldsymbol{MCRT_{ret} = RC_n \times s \times 0.01}$$

Where,			Units
$MCRT_{ret}$	=	Number of credits to be retired	
RC_n	=	Quantity of carbon sequestered in year *n* that has been reversed	Tonne CO_2e
s	=	Number of years remaining in the term of any contract securing the carbon sequestered in year *n* against reversals	

The quantity $MCRT_{ret}$ must be determined for each vintage of carbon affected by a reversal. As indicated above, carbon is considered reversed in the opposite order to which its sequestration was quantified and verified.

9.2.2 Compensation of Unavoidable Reversals

An Unavoidable Reversal is any reversal that is not due to the Forest Owner’s negligence, gross negligence or willful intent, including natural events like wildfires or disease that are not the result of the Forest Owner's negligence, gross negligence or willful intent. Requirements following an Unavoidable Reversal are as follows:

1. If the Forest Owner determines there has been an Unavoidable Reversal, the annual monitoring report must clearly indicate that an Unavoidable Reversal has occurred. The Forest Owner must explain the nature of the Unavoidable Reversal as part of the annual monitoring report and provide a verified estimate of onsite carbon stocks within one year so that the reversal can be quantified (in units of CO_2-equivalent metric tons).

If the Reserve agrees that the reversal is unavoidable in origin, the Reserve will retire a quantity of MCRTs from its Buffer Pool (see below) according to the formula in Equation 9.2, for each vintage affected by the reversal. The tracking of carbon stocks and any reversals will be transparent within the Registry and clearly indicate that the compensation has occurred.

9.2.3 Compensation of Avoidable Reversals

An Avoidable Reversal is any reversal that is due to the Forest Owner’s negligence, gross negligence or willful intent, including harvesting, development, or harm to the Project Area due to the Forest Owner’s negligence, gross-negligence or willful intent. Reversals are detected during annual monitoring and verification events. Subsequent to the identification of a reversal, the following requirements apply:

1. A written description and explanation of the reversal must accompany the annual monitoring report.
2. Within six months of receiving an Avoidable Reversal notice, the Forest Owner must provide the Reserve with a verified estimate of current onsite carbon stocks.

If an avoidable reversal occurs:

1. Within one year of receiving the Avoidable Reversal notice, the Forest Owner must retire a quantity of MCRTs determined according to the formula in Equation 9.2, for each vintage affected by the reversal. Project registration and transaction activities will be suspended until the required amount of MCRTs is retired.
2. Failure to compensate within the stated time will result in restitution as defined within the contract securing the carbon.

9.2.4 Role of Monitoring, Reporting, and Verification in the Finding of a Reversal

A reversal can be identified through monitoring by Forest Owners and/or during site verifications by third-party verifiers. Since Forest Owners are responsible to maintain current inventories of the onsite carbon stocks and submitting annual monitoring reports, a reversal can be identified by a Forest Owner as part of updating their inventory estimates for growth, harvest, and any other disturbances. Third-party verifiers can identify a reversal by a finding that the inventory is incorrectly characterized in the monitoring report. Adjustments to the contributions to the Buffer Pool and adjustments based on the uncertainty of the carbon estimates (which can only occur during site verification, Section 11) can lead to reversals.

9.2.5 The Reserve Buffer Pool

The Buffer Pool is a holding account for MCRTs that is administered by the Reserve. All Forest Projects must contribute a percentage of MCRTs to the Buffer Pool any time they are issued MCRTs for obligated carbon. Each Forest Project contribution is determined by a project-specific risk rating, as described in the following sections. If a Forest Project experiences an Unavoidable Reversal of GHG reductions and removals (as defined in Section 9.2.2), the Reserve will retire a number of MCRTs as indicated in Section 9.2.2. Contributions are also required from each project for Avoidable Reversal risks to ensure the program remains whole in the event Avoidable Reversals are not compensated by a Forest Owner. The Buffer Pool acts as a general insurance mechanism against reversals for all Forest Projects in Mexico registered with the Reserve.

9.2.5.1 Determination of Risk Rating for the Buffer Pool

Forest Owners must derive a risk rating for their Forest Project using the tables in this section. This risk assessment must be updated every time the project undergoes a verification site visit. Therefore, a project risk assessment is dynamic. Furthermore, estimated risk values and associated mitigation measures will be updated periodically by the Reserve as improvements in quantifying risks or changes in risks are determined. Any adjustments to the risk ratings will affect only current and future distribution of credits.

In the Tables below, the risk rating is based on the years in which the carbon is secured through a contract. ‘Secured’ in the Tables means secured through contractual agreement. Carbon that is not secured through a contractual relationship with the Reserve will be issued credits according to the tonne-year formula and buffer pool contributions will not be required.

Forest Owners may be able to reduce the risk rating through actions that lower the risk profile of their project. These actions and lower risk rating must be verified. Once verified, if a Forest Project's risk rating declines, the Reserve may distribute previously withheld Buffer Pool MCRTs to the Forest Owner in proportion to the reduced risk. Similarly, however, the Reserve may require additional contributions to the Buffer Pool if the risk rating increases, to ensure that all MCRTs (including those issued in prior years) are properly insured.

Forest Owners must derive a risk rating for their Forest Project using the worksheets provided by the Reserve. The risk ratings are used to determine buffer pool contributions for any given credit issuance that is secured by contract.

9.2.5.1.1 Natural Disturbance Risk I – Wildfire

A wildfire has the potential to cause significant reversals, especially in certain carbon pools. These risks can be reduced by certain techniques including reducing surface fuel loads, removing ladder fuels, adding fuel breaks, and reducing stand density. However, these techniques cannot reduce emission risk to zero because all landowners will not undertake fuel treatments, nor can they prevent wildfire from occurring.

Risk Category	Contribution from Risk Descriptions Above
	Source
Wildfire	(0.02% * Number of Years Carbon Secured) * Credit Issuance

9.2.5.1.2 Natural Disturbance Risk II – Disease or Insect Outbreak

A disease or insect outbreak has the potential to cause a reversal, especially in certain carbon pools.

Risk Category	Contribution from Risk Descriptions Above
	Source
Disease or Insect Outbreak	(0.02% * Number of Years Carbon Secured) * Credit Issuance

9.2.5.1.3 Natural Disturbance Risk III – Other Episodic Catastrophic Events

A major wind-throw event (hurricane, tornado, high wind event) has the potential to cause a reversal, especially in certain carbon pools.

Risk Category	Contribution from Risk Descriptions Above
	Source
Other Catastrophic Events	(0.02% * Number of Years Carbon Secured) * Credit Issuance

9.2.5.1.4 Land Tenure Risk

Different land tenures have different reversal risks due to specific legal characteristics of each type (see Table 9.1 below).

Table 9.1. Land Tenure Risk

Applies to all types of projects.

Identification of Risk	Contribution to Reversal Risk Rating
Private Property (*Pequeña propiedad*): Land with property titles inscribed at the "*Registro Público de la Propiedad.*" The PIA can be affixed to the title of these lands whereby the land can be used as collateral to ensure reversal compensation obligations.	(0% * Number of Years Carbon Secured) * Credit Issuance
Agrarian Community (*Comunidad Agraria - propiedad privada comunal*): Common land with an agrarian certificate (*certificado agrario*) where the property is recognized and inscribed at the "*Registro Agrario Nacional.*"	(0.01% * Number of Years Carbon Secured) * Credit Issuance
Communal Parcel (*Parcela Comunal - Poseedor legítimo*): Parcel land with an agrarian certificate where the property is recognized and inscribed at the "*Registro Agrario Nacional.*" The PIA cannot be affixed to the title of these lands.	(0.01% * Number of Years Carbon Secured) * Credit Issuance
Ejido (*propiedad privada ejidal*): Common land with an agrarian certificate (*certificado agrario*) where the property is recognized and inscribed at the "*Registro Agrario Nacional."*	(0.02% * Number of Years Carbon Secured) * Credit Issuance
Ejidal Parcel (*Parcela ejidal - Poseedor legítimo*): Parceled land where the property is recognized and inscribed at the "*Registro Agrario Nacional.*"	(0.02% * Number of Years Carbon Secured) * Credit Issuance
Legit Possession (*Posesion legítima / legal*): Land that has a municipal document that recognized possession of the land.	(0.04% * Number of Years Carbon Secured) * Credit Issuance

9.2.5.2 Summarizing the Risk Analysis and Determining the Buffer Pool Contribution

The contribution to the buffer pool is based on summing the individual risk ratings from the tables above by the credits that are issued in a given year by the number of years the same credits are secured by contract. Equation 9.3 displays the methodology for calculating the amount of contribution.

Equation 9.3. Contribution to the Buffer Pool

Contribution to Buffer Pool $_{\text{Year X}}$	=	***(1- ((1 – Wildfire Risk %)*** *x* ***(1 – Disease/Insect Risk%)*** *x* ***(1 – Episodic Risk1 %)*** *x* ***(1 – Land Tenure Risk1 %))) x (Net Obligated Carbon, year X)***
Where,		
Net Obligated Carbon, year X	=	Carbon secured (through contractual agreement net of confidence deductions and leakage adjustments) and verified in year X

9.3 Disposition of Forest Projects after a Reversal

If a reversal lowers the Forest Project actual standing live carbon stocks below its approved baseline standing live carbon stocks, the Forest Project will automatically be terminated (In this circumstance, the original approved baseline for the project would no longer be valid.) If the Forest Project is automatically terminated due to an Unavoidable Reversal, another project may be initiated and submitted to the Reserve for registration on the same Project Area. New projects may not be initiated on the same Project Area if the Forest Project is terminated due to an Avoidable Reversal.

If the Forest Project has experienced a reversal and its actual standing live carbon stocks are still above the approved baseline levels, it may continue without termination as long as any reversal of secured carbon has been compensated. The project must continue contributing to the Buffer Pool in future years based on its verified risk rating.

10 Project Documentation, Monitoring, and Verification

This section provides requirements and guidance on project monitoring, reporting rules and procedures. Table 10.1 provides a summary of many of the documentation and monitoring reports and forms required by the protocol. The table displays the schedule associated with the reporting and submission requirements. Details related to project documentation, monitoring, and verification are described below.

Table 10.1. List of Important Documents and Activities by Timing of Requirement for Forest Carbon Projects

Timing of Event	**Project Submission** (At least 2 months prior to verification)	**Verification Preparation** (At least 1 month prior to first verification)	**Site Verification** (Project Initiation)	**Site Verification** (1st Reporting Period, Year 5, 10, 15, etc.)	**Annual Reporting Periods and Desktop Verification** (Between Site Verifications)
Document/Monitoring Report					
Project Submittal Form	X				
Land Tenure Documentation (Section 3.5)	X				
Project Design Document		X			
Attestation of Title			X	X	
Attestation of Regulatory Compliance			X	X	
Attestation of Voluntary Implementation			X	X	
Carbon Monitoring Worksheet (all but Wood Products Component)			X		
Carbon Monitoring Worksheet with Wood Products				X	X
Native Species (Presence) Report from the Reserve's MS Access Database			X	X	X
Native Species (Composition) Report from the Reserve's MS Access Database			X	X	X
Harvest Retention Report from the Reserve's MS Access Database			X	X	X
Forest Carbon Project Concepts, Anticipated Benefits, and Project Approval			X		
Meeting Notification, Participation, and Documentation			X	X	X
Project Governance			X	X	X

Verification Report			X	X	
Verification Statement			X	X	
Project Implementation Agreement			X	X	X
MCRTs Issued?				X	X

10.1 Project Documentation

Project Operators must provide the following documentation to the Reserve at the project initiation in order to register a Forest Project. Each of these documents is discussed in this section in greater detail. The scheduling of each of these documents is provided at the end of this section.

- Project Submittal form
- Land Tenure Status (from Section 3.5)
- Project Design Document
- Signed Attestation of Title form
- Signed Attestation of Regulatory Compliance form
- Signed Attestation of Voluntary Implementation form
- Verification Report
- Verification Statement
- Project Implementation Agreement (if applicable)

Project Operators must provide the following monitoring reports to the Reserve on an annual basis.

- Forest Carbon Calculation Worksheet
- Native Species Report (Environmental Safeguards 2 and 3)
- Canopy Retention Report (Environmental Safeguard 4)
- Native Species Report – Non-Activity Areas (Environmental Safeguard 5)

Project Coordinators must provide the following documentation each time a Forest Project is verified in order for the Reserve to issue MCRTs for quantified GHG reductions.

- Verification Report
- Verification Statement
- Signed Attestation of Title form
- Signed Attestation of Regulatory Compliance form
- Signed Attestation of Voluntary Implementation form

10.1.1 Project Submittal Form

The Project Submittal form is required to determine if the project meets general eligibility requirements of the protocol (validation) and to establish a relationship between the Forest Owner and the Reserve. An account is initiated with the Reserve once a Project Submittal form is accepted for filing. The form is a template that provides a general description of the project's environmental, social, and land tenure conditions to be outlined. It is intended to enable the Reserve staff to become familiar with the project's environmental and social aspects, project concepts for increasing carbon stores, and information related to eligibility requirements. It is also designed to highlight any potential challenging areas of the project that might require

additional consideration prior to fully developing the project. A copy of the form is available at: http://www.climateactionreserve.org/how/program/documents/.

A KML file displaying the general Project Area is required along with the Project Submittal form. The KML file is not considered final at this time. Revisions of the Project Area may occur up until the project is initially verified.

10.1.2 Project Design Document

The Project Design Document (PDD) is a required document for reporting project information. PDDs are intended to serve as the main project document that thoroughly describes how the project meets eligibility requirements, describes the project's vegetative and social framework, discusses current forest conditions, threats, and activities associated with the Project Area. It also outlines how the project complies with terms for additionality. PDDs must be of professional quality and free of incorrect citations, missing pages, incorrect project references, etc. PDDs are intended to communicate project information in a transparent manner and be available for the public. The initial monitoring report submitted simultaneously with the PDD establishes much of the project's base information. The PDD is submitted at the initial verification. A PDD template has been prepared by the Reserve and is available on the Reserve's website. The template is arranged to assist in ensuring that all requirements of the protocol are addressed.

10.1.3 Monitoring Reports

Monitoring is the process of regularly collecting and reporting data related to a project's performance. Annual monitoring of Forest Projects is required to ensure up-to-date estimates of project carbon stocks and provide assurance that GHG reductions or removals achieved by a project have not been reversed. Additionally, monitoring ensures the project remains in compliance with environmental and social safeguards. Monitoring is required for a period of 100 years following the final issuance of MCRTs to a project or for the length of time the project remains active. Monitoring reports are subject to verification according to the verification schedule in Section 11.

The specific objectives of project monitoring are listed in the introduction of the Appendix A. The quantification methodologies provide data needed for many of the monitoring requirements.

The following documents related to forest carbon and environmental safeguards are required to be submitted annually:

- Carbon Monitoring Worksheet for Activity Areas
- Monitoring Report for Native Species (Presence and Composition) – Activity Areas Only
- Monitoring Report for Minimum Harvest Retention within Harvested Areas – Activity Areas Only
- Monitoring Report for Native Species Maintenance – Non-Activity Areas Only
- Monitoring Report for Maintenance of High Conservation Value Forests
- Monitoring Report for Maintenance of Forest Carbon Stocks – Non-Activity Areas Only

Many of the reports are automated from the Reserve's Microsoft (MS) Access database.

10.1.3.1 Carbon Monitoring Worksheet for Active Areas

The Reserve will provide an example of the Carbon Monitoring Worksheet (CMW) used for tracking forest carbon within the Activity Areas. The CMW can be downloaded from the

Reserve's website. The CMW must be used by Forest Owners and submitted to the Reserve on an annual basis. The CMW is the basis for data reporting of:

1. Live and dead carbon in standing trees associated with baseline and project activity
2. Inventory sampling confidence and adjustments for uncertainty for project stocks
3. Contribution to reversal buffer pool

The CMW automates the calculation, or provides evidence of:

1. Carbon credits generated by vintage
2. Estimates of secondary effects
3. Reversals (if any)
4. Maintenance or increase of standing live and dead carbon stocks over the project life, as determined by a running 10-year average (Environmental Safeguard 1)

The CMW must be updated on an annual basis to reflect changes in forest carbon stocks according to Appendix A in the Quantification Guidance.

10.1.3.2 Monitoring Report for Native Species (Presence and Composition)

Monitoring is required within the Activity Areas to ensure compliance with native species requirements and that harvest within Activity Areas adheres to the retention requirements. The non-carbon requirements within Activity Areas include:

1. Demonstration of continuous progress toward a goal of 95% native species (Environmental Safeguard 2)
2. Demonstration of continuous progress towards meeting the composition of native species (Environmental Safeguard 3)

Inventory data from sampling activities provides the basis for monitoring compliance with the native species requirements (Environmental Safeguards 2 and 3). Inventory data must be updated annually according to guidance in Appendix A to reflect current conditions.

Data from inventory sampling shall be summarized based on aggregating all plots within a common forest cover stratum and calculating weighted average trees per hectare by species for all stands within the Activity Areas. An identified list of native species is provided by the Reserve.

A report must be generated to display the distribution of natives species based on percentage representation of trees per hectare within the Activity Areas. Continuous progress means that the percentage of native species positively trends toward the targets on an annual basis. A total relapse of no greater than 3% is allowed from year to year address issues of uncertainty associated with inventory estimates. The project is out of compliance if the project exceeds a relapse of 3% in any year or if the 10-year rolling average does not show positive improvement of 5% or greater toward the target. The MS Access database provided by the Reserve automates the required reports. Annual submission of the report will facilitate verification of Environmental Safeguards 2 and 3.

10.1.3.3 Monitoring Report for Harvest Retention within Harvested Areas in Activity Areas

Monitoring is required to ensure project Activity Areas remain in compliance with the requirement to retain adequate trees to meet canopy cover requirements (Environmental Safeguard 4).

Monitoring for compliance with Environmental Safeguard 4 is based on tracking changed forest cover attributes assigned to stands as part of the inventory update process described in Appendix A. All stands within Activity Areas are identified in the MS Access database. Updated forest cover attributes resulting from harvest activities are compared with previous assignments. An updated stand following harvest should have a canopy cover attribute of 'Fragmented' or higher (more dense) to be in compliance. The report is automatically generated from the MS Access database and must be submitted to the Reserve on an annual basis. Verification will occur on normally scheduled verification dates.

10.1.3.4 Monitoring Report for Native Species Maintenance and Maintenance of High Conservation Value Forests

Environmental Safeguards 5 and 6 are associated with Non-Activity Areas within the Project Area. The stratification design associated with monitoring the entire Project Area is the basis for tracking compliance with these requirements. Forest vegetation cover is updated on an annual basis. Additionally, stands associated with High Conservation Value Forests are attributed as such. The requirement that stands update the forest cover label if any substantial changes occur to the stand in the previous year forms the basis of the monitoring activity. An automated report from the MS Access database that is based on changed stand attributes must be submitted to the Reserve on an annual basis as part of annual monitoring.

10.1.3.5 Monitoring Report for Maintenance of Forest Carbon Stocks in Non-Activity Areas

Monitoring is required to ensure project activities do not lead to increase harvest or conversion of forests outside of the Activity Areas. The monitoring strategy is based on the stratification methodology required in the Project Area. Appendix A discussed the requirement to stratify the Project Area into stands of homogeneous vegetation, based on species, size, and density attributes. The stratification developed as part of that requirement is the basis for ongoing monitoring. A carbon inventory of the Non-Activity Areas is not required. Monitoring is conducted through a scoring system that ensures the protocol requirements are being met in a cost effective manner. The scoring system is based on values assigned to each stand based on the stands attributes.

Forest carbon stocks are highly correlated with the size and density of individual trees. Monitoring of forest carbon stocks is based on the annual reporting of relative carbon values compared to the carbon value at the Project Start Date. A decrease in the forest carbon rating by more than 5% relative to the Start Date value will require that a report be sent to the Reserve stating the cause of the decrease. If the decrease is the result of an avoidable reversal to forest carbon stocks and not the result of natural events (fire, hurricanes, etc.) or a clarification of stratification assignment, transactions of credits from the project's account will be suspended until the relative rating is within 5% of the original forest carbon rating. Decreases that are the result of natural events and/or justifiable corrections to the stratification assignment will result in an update to the project's carbon rating and form the basis for future monitoring.

The density and size attributes assigned to forested stands are used to generate a carbon relative value for each stand by multiplying the density. Table 10.2 and Table 10.3 display the relative values associated with the stratum.

Table 10.2. Forest Carbon Values for Density Attributes Assigned to Each Stratum

Density Attribute (from the Quantification Section)	Value
Non-Forest	0
Initiated	1
Fragmented	2
Open	3
Closed	4

Table 10.3. Forest Carbon Values for Size Attributes Assigned to Each Stratum

Size Attribute (from the Quantification Section)	Value
Non-Forest	0
0	1
1	2
2	3
3	4
4	5

The forest carbon relative rating is determined by multiplying the two attributes together. For example, a stand with a density attribute of ‘closed’ and a size attribute of ‘4’ would receive a value of 20 (4 * 5). The forest carbon relative rating is multiplied by the stand’s area to determine a weighted contribution. The weighted contributions of all stands are summed and divided by the sum of the Project Area to determine the project forest carbon value. Table 10.4 displays and example of how a project forest carbon value is determined.

Table 10.4. Calculation Example of a Weighted Average Project Area Forest Carbon Value

Stand ID	Area (Hectares)	Density Attribute	Size Attribute	Stand Forest Carbon Value	Weighted Forest Carbon Value
1	20	3	2	6	120
2	5	4	2	8	40
3	10	2	5	10	100
4	15	0	0	0	0
5	3	4	5	20	60
Sum Area	53		Sum Forest Carbon Values		320
Weighted Average Project Forest Carbon Value					6.0

The monitoring report for maintenance of forest carbon stocks in the Non-Activity Areas is automated from the MS Access database. Comparisons are made to the initial attributes assigned to the stands to ensure compliance. This report must be submitted to the Reserve on an annual basis. Verification of the project data will occur according to scheduled verification activities in Section 11.

10.2 Monitoring Guidance for Social Safeguards

The monitoring requirements associated with social safeguards are designed to ensure the requirements specified in Section 3 of the protocol are being followed. The schedule of monitoring varies depending on the monitoring theme. Table 10.5 displays the monitoring requirements and schedule for each monitoring theme.

Table 10.5. Monitoring Requirements and Schedule

Monitoring Theme	Monitoring Requirement	Required Documentation	Schedule of Requirement
SS1 Forest Carbon Project Concepts	The Reserve has prepared a presentation that addresses the concepts of global warming and GHG accounting principles. The presentation must be presented to the community group prior to submitting a project to the Reserve. The required elements from Section 3, SS5 and SS6 apply to the meeting.	1. Meeting notice and agenda for meeting where presentation was made. 2. A list of the names of all attendees, along with addresses and contact information. 3. Meeting notes, including any follow up questions and comments.	Meeting must be held prior to project submission. Documentation must be included with Project Submission.
SS2 Anticipated Costs	A community meeting must be held in which a report that outlines the anticipated project costs is presented at a community meeting. The report and presentation must, at a minimum, include the themes specified in Section 3 (SS2). The required elements from Section 3, SS5 and SS6 apply to the meeting.	1. A copy of the estimated project costs which includes the elements described in Section 3, SS2. 2. Meeting notice and agenda for the meeting where the presentation was made. 3. A list of the names of all attendees, along with addresses and contact information. 4. Meeting notes, including any follow up questions and comments.	Meeting must be held prior to project submission. Documentation must be included with Project Submission.
SS3 Anticipated Benefits	A community meeting must be held in which a report that outlines the anticipated project benefits is presented at a community meeting. The report and presentation must, at a minimum, include the themes specified in Section 3 (SS3). The required elements from Section 3, SS5 and SS6 apply to the meeting.	1. A copy of the estimated project benefits which includes the elements described in Section 3, SS3. 2. Meeting notice and agenda for the meeting where the presentation was made. 3. A list of the names of all attendees, along with addresses and contact information. 4. Meeting notes, including any follow up questions and comments.	Meeting must be held prior to project submission. Documentation must be included with Project Submission.
SS4 Project Approval	A community meeting must be held in which the community approves/disapproves the project. The meeting must result in an Assembly Act and meet the voting requirements specified in Section 3 (SS4). The required elements from Section 3, SS5 and SS6 apply to the meeting.	1. A copy of the results of the vote of the community members. 2. Meeting notice and agenda for the meeting where the presentation was made. 3. A list of the names of all attendees, along with addresses and contact information. 4. Meeting notes, including any follow up questions and comments.	Meeting must be held prior to project submission. Documentation must be included with Project Submission.
SS5 Proper Notification	Required meetings include: ▪ Meetings prior to project submission to discuss SS1, SS2, and SS3. ▪ Biannual meetings that address the themes in Section 3 (Meeting Notification, Participation, and Documentation) Posting requirements are specified in Section 3, SS5.	1. A copy of meeting notices and a description of locations where the meeting notices were posted and the date(s) they were posted.	Must be provided at first site verification and as part of annual reporting.
SS6 Participation	Meeting must be open for community member participation. Community leadership must actively encourage participation from community members.	1. Copies of sign – in sheets must be attached to the meeting agenda. 2. Meeting notes that summarize community comments must be prepared.	Must be provided at first site verification and as part of annual monitoring.
SS7 Meeting Documentation	Documentation of meetings must occur as per Section 3, SS7. Meeting notes must address each item on the agenda and not on the agenda that were discussed. Meeting notes must be available to the public with one week of the meeting.	1. Meeting notes, accompanied with a description of how and when the meeting notes were made available to community members must be prepared.	Must be provided at first site verification and a part of annual monitoring.
SS8 Identification of a	Section 3, SS8 requires that a description of the nomination and selection/election	1. The description of the nomination and election/selection process must be included	Must be provided with the PDD prior

Project Coordinator	process for a Project Coordinator be included in the PDD.	in the PDD. 2. Meeting notes that describe how the processes were reviewed in a public meeting and approved with 66% vote.	to the first site verification.
SS9 Term of a Project Coordinator	Section 3, SS9 requires that the length of the term of the Project Coordinator along with the mechanisms for term renewal be defined through a public process.	1. A description of the term of Project Coordinator must be included in the PDD. 2. The process for renewing the term of Project Coordinator must be addressed in the PDD. 3. Meeting notes that describe how the terms were discussed in a public meeting and approved with a 66% vote.	Must be provided with the PDD prior to the first site verification.
SS10 Replacing the Project Coordinator	Section 3, SS10 requires that a provision be included in the PDD describing the process for replacing a Project Coordinator, even prior to completion of a term, shall be conducted.	1. A description of the process for replacing the Project Coordinator must be included in the PDD. 2. Meeting notes that describe how the terms were discussed in a public meeting and approved with a 66% vote.	Must be provided with the PDD prior to the first site verification.

10.3 Summary of Monitoring Objectives and Results of Being Out of Compliance

Monitoring Objective	Monitoring Tool	Programmatic Concerns and Rationale for Monitoring	Result of being Out of Compliance
Maintenance or Increase of forest carbon stocks in Activity Areas	Forest Carbon Calculation Worksheet	Reversal of credited carbon stocks and Environmental Safeguard 1	Project Operator must compensate for reversal. Project activity is suspended until reversal fully compensated.
Credit Issuance by Vintage	Forest Carbon Calculation Worksheet	Over-/Under-issuance of forest carbon credits. Data are periodically verified for quality of input	Measurements, calculations and data input may need to be improved or enhanced.
Continuous progress toward a goal of 95% native species	Native Species (Presence) Report from the Reserve's MS Access database	Environmental Safeguard 2	Project activity suspended until project in brought into compliance and data used for determination are verified.
Continuous progress toward a compositional diversity of native species	Native Species (Composition) Report from the Reserve's MS Access database	Environmental Safeguard 3	Project activity suspended until project in brought into compliance and data used for determination are verified.
Harvest retention within harvested areas in Activity Areas	Harvest Retention Report from the Reserve's MS Access database	Environmental Safeguard 5	A notice will be issued from the Reserve upon indication of the issue that the project is out of compliance. It this issue is associated with a reversal of forest carbon stocks, project activity is suspended until the reversal is remedied. If not, the Project Operator will be warned. If another out of compliance event occurs within a 5-year period, project activity is suspended for a five year period and may be reinitiated if project remains in compliance during the same period.
Maintenance of High Conservation Value Forests	Report from the Reserve's MS Access database	Environmental Safeguard 6	Project activity suspended for 5 years of continuous monitoring without other compliance issues.

10.4 Reporting Periods

A "reporting period" is a period of time for which a Forest Owner quantifies and reports GHG removals (i.e. the length of time covered by a monitoring report) and submits monitoring reports for all required monitoring elements listed above. Reporting periods for Forest Projects have a required duration of 12 months, with two exceptions:

1. A Forest Project's first reporting period (i.e. the reporting period that precedes initial verification) may be any length of time, lasting from the project start date to any date prior to the initial verification.
2. A Forest Project's second reporting period may be less than 12 months, but no greater than 12 months.

All reporting periods after the second reporting period must be 12 months in duration and cover the same calendar period each year. Reporting periods must be contiguous, i.e. there must be no gaps in reporting during the crediting period of a Forest Project once the first reporting period has commenced.

The period of time over which GHG reductions or removals are verified is referred to as the "verification period." All projects are considered verified through the randomized process of verification whether they were selected for site visit verification, desktop verification, or neither, provided the projects that were selected achieve successful verification reports. If more than 10% of the projects randomly selected fail to be successfully verified, the Reserve will randomly select another batch of projects for verification. This will continue until at least 90% of the projects selected receive successful verification reports. The end date of any verification period must correspond to the end date of a reporting period.

A Forest Project is considered automatically terminated if the Forest Owner chooses not to report data and undergo verification at required intervals.

11 Project Verification

Verification is the inspection and review of all sampling and quantification activities and reported data. Verification is conducted by approved third-party verification bodies that are responsible for ensuring that all requirements in the protocol are adhered to and that reported data meets the accuracy requirements defined in the protocol. Verification activities occur both on the project site and remotely. Onsite verification activities include inspection of stratification activities, plot measurements, compliance with social safeguards, etc. Remote verification activities include reviewing project documentation related to eligibility criteria, calculation methods, baseline, and leakage determination. Onsite verification activities are required on a 5-year basis. Additionally, verifiers will randomly select meetings in communities and *ejidos* to attend to ensure social safeguards are being adhered to. A detailed guide of verification activities will be developed during the piloting phase and made accessible on the Reserve's website.

All projects must undergo an initial site verification to ensure that the PDD includes the required information to develop the project. The initial verification will check to ensure that inventory and baseline development are consistent with the protocol requirements and that the project meets the eligibility requirements. Additionally, the initial verification will ensure that the project is in compliance with all social and environmental safeguards.

The verification of annual monitoring reports is a separate activity from site visit verification and is referred to as a desktop verification. The desktop verification focuses on ensuring that the reported data and monitoring reports are within acceptable tolerance bounds. Tolerance bounds for carbon reporting are identified in the verification guidance document and based on ranges of expected carbon flux, given forest growth and harvest/disturbance and reasonable assurances that there are no errors in transcription in the project's calculation worksheet. Additionally, monitoring reports for environmental and social safeguards will be reviewed to determine if reported data are within acceptable defined tolerance bounds in the verification guidance for a desktop review.

Determination of whether the data is within tolerance bounds will be identified by the Reserve based on guidelines stated in the verification guidance. Projects that are determined to be within tolerance bounds are considered verified for the current reporting year. Projects that are not within tolerance bounds will be ineligible for crediting until any and all outstanding issues are resolved. Alternatively, the Forest Owner can request a site verification from an approved verifier to justify the reported information.

All Forest Projects must complete site visit verification within 30 months of being submitted to the Reserve. Both site verification and desktop verifications must be completed within 12 months of the end of the reporting period(s) being verified. For required verifications, failure to complete verification within the 12 month time period will result in account activities being suspended until the verification is complete. The project will terminate if the required verification is not completed within 36 months of the end of the reporting period(s) being verified.

If material issues arise during verification of a participating project, the Forest Owner will need to independently address the issues and required corrective actions. These are described in the verification guidance for this protocol and the Reserve Verification Program Manual (http://www.climateactionreserve.org/how/verification/verification-program-manual/).

The Forest Owner is responsible for selecting a single verification body for all enrolled projects in any given year or set of years. The same verification body may be used up to five consecutive years (two regularly scheduled sequential site verifications). A different verification body must perform at least one site verification following the 5-year period. Verification bodies must pass a conflict-of-interest review against all enrolled Forest Owners.

While Forest Owners may depend on consultants or cooperatives to complete project requirements, responsibility for monitoring reports and verification compliance is assigned to the Forest Owner.

11.1 Transparency and Record Keeping

The Reserve requires data transparency for all Forest Projects, including data that displays current carbon stocks, reversals, and verified GHG reductions and removals, as well as verification reports. For this reason, all non-confidential project data reported to the Reserve will be publicly available on the Reserve's website.

All documents and forms related to the project must be retained by the Forest Owner for the duration of the project. This information may be requested by the verification body or the Reserve at any time.

11.1.1 Issuance and Vintage of MCRTs

The Reserve will issue MCRTs for quantified GHG reductions and removals that have been verified through either site visits or desktop verifications.

In general, vintages will be assigned to MCRTs by *reporting period* according to the proportion of each reporting period that falls within a particular calendar year. See an example below.

Project Start Date	First Reporting Period		Second Reporting Period	
August 15, 2012	February 15, 2013		February 15, 2014	
	1,000 Credits Verified		2,000 Credits Verified	
	Vintage Credits at Verification		**Vintage Credits at Verification**	
	2012	**2013**	**2013**	**2014**
	137 days in 2012/ 185 total days = 74%	46 days in 2013 / 185 total days = 26%	319 days in 2013 / 365 days = 92%	46 days in 2014 / 365 days = 8%
Vintage	2012	2013		2014
Credits	740	260	1,840	160

12 Glossary of Terms

Above-Ground Live Biomass	Live trees including the stem, branches, and leaves or needles, brush and other woody live plants above ground.
Activity Area	An Activity Area is a spatially discrete area within the Project Area where management activities are undertaken for the purpose of increasing forest carbon inventories for which the Forest Owner intends to generate offsets. Inventories within Activity Areas are held to a higher standard than inventories in Non-Activity Areas.
Additionality	A criterion for Forest Project eligibility. A Forest Project is "additional" if it would not have been implemented without incentives provided by the carbon offset market, including the incentives created through the Climate Action Reserve program. Under this protocol, Forest Projects meet the additionality criterion by demonstrating that they pass a legal requirement test and a performance test, as described in Section 4, and by achieving GHG reductions and removals quantified against an approved baseline, determined according to the requirements in Section 7.
Allometric Equation	An equation that utilizes the genotypical relationship among tree components to estimate characteristics of one tree component from another. Allometric equations allow the below-ground root volume to be estimated using the above-ground bole volume.
Asesor Tecnico Forestal	Individuals and/or corporations who voluntarily complied with the procedures and requirements of the standard published in the Official Journal of the Federation (*Diario Oficial de la Federacion*) for CONAFOR. A list of forest technical advisors can be found in http://www.conafor.gob.mx/portal/index.php/component/content/article/34-notas/157-asesores-tecnicos-forestales-2011.
Avoidable Reversal	An avoidable reversal is any reversal that is due to the forest owner's negligence, gross negligence or willful intent, including harvesting, development, and harm to the Project Area.
Baseline	The level of GHG emissions, removals, and/or carbon stocks at sources, sinks, and reservoirs affected by a Forest Project that would have occurred under a "business as usual" scenario. For the purposes of this protocol, a project baseline must be estimated following standard procedures in Section 7.
Biological Emissions	For the purposes of this protocol, biological emissions are GHG emissions that are released directly from forest biomass, both live and dead, including forest soils. For Forest Projects, biological emissions are deemed to occur when the reported tonnage of onsite carbon stocks, relative to baseline levels, declines from one year to the next.
Biomass	The total mass of living organisms in a given area or volume; recently dead plant material is often included as dead biomass.[21]

[21] (Metz, Davidson, Swart, & Pan, 2001)

Bole	A trunk or main stem of a tree.
Buffer Pool	The buffer pool is a holding account for Forest Project MCRTs administered by the Reserve. It is used as a general insurance mechanism against unavoidable reversals for all Forest Project registered with the Reserve. If a Forest Project experiences an unavoidable reversal of GHG reductions and removals (as defined in Section 9.2.2), the Reserve will retire a number of MCRTs from the buffer pool equal to the total amount of carbon that was reversed (measured in metric tons of CO_2-equivalent).
Business As Usual	The activities, and associated GHG reductions and removals that would have occurred in the Project Area in the absence of incentives provided by a carbon offset market
Carbon Pool	A reservoir that has the ability to accumulate and store carbon or release carbon. In the case of forests, a carbon pool is the forest biomass, which can be subdivided into smaller pools. These pools may include above-ground or below-ground biomass or harvested wood products, among others.
Deforestation	The conversion from forestland use to another land use.
Degradation	From the point of view of climate change policy and the IPCC, it refers to loss of carbon stock within forests that remain forests.[22]
Forest Management	The commercial or noncommercial growing and harvesting of forests.
Forest Owner	A Forest Owner is an *ejido*, a community or an individual that owns forestland.
Forest Project	A planned set of activities designed to increase removals of CO_2 from the atmosphere, or reduce or prevent emissions of CO_2 to the atmosphere, through increasing and/or conserving forest carbon stocks.
Forest Project Design Document (PDD)	A standard document for reporting required information about a Forest Project. The Forest Project Design Document must be submitted for review by a verification body and approved by the Reserve before the Forest Project can be registered with the Reserve (see Section 10.1.2).
Forestland	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ and that allows for management of one or more forest resources, including timber, fish and wildlife, biodiversity, water quality, recreation, aesthetics, and other public benefits.
GHG Assessment Boundary	The GHG Assessment Boundary defines all the GHG sources, sinks, and reservoirs that must be accounted for in quantifying project GHG reductions and removals (Section 5). The GHG Assessment Boundary encompasses all the GHG sources, sinks, and reservoirs that may be significantly affected by Forest Project activities,

[22] UNFCCC, 2008.

	including forest carbon stocks, sources of biological CO_2 emissions, and mobile combustion GHG emissions.
Greenhouse Gas (GHG)	Gas that contributes to global warming and climate change. For the purposes of this protocol, GHGs are the six gases identified in the Kyoto Protocol: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).
Listed	A Forest Project is considered "listed" when the forest owner has created an account with the Reserve, submitted the required Project Submittal form and other required documents, paid the project submission fee, and the Reserve has approved and accepted the project for listing.
Litter	Any piece(s) of dead woody material from a tree, e.g. dead boles, limbs, and large root masses, on the ground in forest stands that is smaller than material identified as lying dead wood.
Lying Dead Wood	Any piece(s) of dead woody material from a tree, e.g. dead boles, limbs, and large root masses, on the ground in forest stands. Lying dead wood is all dead tree material with a minimum average diameter of 5 inches (12.7 cm) and a minimum length of 8 feet (2.44 m). Anything not meeting the measurement criteria for lying dead wood will be considered litter. Stumps are not considered lying dead wood.
Metric Ton or "Tonne" (MT)	A common international measurement for the quantity of GHG emissions, equivalent to about 2204.6 pounds or 1.1 short tons.
Mexican Climate Reserve Tonne (MCRT)	The unit of offset credits used by the Climate Action Reserve. Each Mexican Climate Reserve Tonne represents one metric ton of CO_2 reduced or removed from the atmosphere.
Non-Activity Area	Areas within the Project Area that are not managed with the specific intent to increase forest carbon inventories for purposes of creating forest carbon offsets. Non-Activity Areas are subject to monitoring activities to ensure conformance with environmental safeguards and that leakage is accounting for locally.
Non-Forest Cover	Land with a tree canopy cover of less than 10 percent.
Non-Forest Land Use	An area managed for residential, commercial or agricultural uses other than for the production of timber and other forest products, or for the maintenance of woody vegetation for such indirect benefits as protection of catchment areas, wildlife habitat, or recreation.
Onsite Carbon Stocks	Carbon stocks in living biomass, dead biomass, and soils within the Project Area.
Permanence	The requirement that GHGs must be permanently reduced or removed from the atmosphere to be credited as carbon offsets. For Forest Projects, this requirement is met by ensuring that the carbon associated with credited GHG reductions and removals remains stored for at least 100 years.
Primary Effects	The Forest Project's intended changes in carbon stocks, GHG

	emissions or removals.
Project Area	The area inscribed by the geographic boundaries of a Forest Project, as defined following the requirements in Section 2.1 of this protocol. Also, the property associated with this area.
Project Life	Refers to the duration of a Forest Project and its associated monitoring and verification activities, as defined in Section 11.
REDD+	In policy texts currently in discussion under the UNFCCC, REDD+ is understood to include reduced deforestation and degradation, forest enhancement, sustainable management of forest, and forest conservation.
Reduction	The avoidance or prevention of an emission of CO_2 (or other GHG). GHG reductions are calculated as gains in carbon stocks over time relative to a Forest Project's baseline (also see Removal).
Registered	A Forest Project becomes registered with the Reserve when it has been verified by a Reserve-approved and ISO-accredited verification body, all required documentation (see reference document on the Mexico Forest Protocol webpage [to be developed]) has been submitted by the Forest Owner to the Reserve for final approval, and the Reserve approves the project.
Removal	Sequestration ("removal") of CO_2 from the atmosphere caused by a Forest Project. GHG removals are calculated as gains in carbon stocks over time relative to a Forest Project's baseline (also see Reduction).
Reservoir	Physical unit or component of the biosphere, geosphere or hydrosphere with the capacity to store or accumulate carbon removed from the atmosphere by a sink, or captured from a source.
Retire	To retire a MCRT means to transfer it to a retirement account in the Climate Action Reserve's software system. Retirement accounts are permanent and locked, so that a retired MCRT cannot be transferred or retired again.
Reversal	A reversal is a decrease in the stored carbon stocks associated with quantified GHG reductions and removals that occurs before the end of the Project Life. Under this protocol, a reversal is deemed to have occurred if there is a decrease in the difference between project and baseline onsite carbon stocks from one year to the next, regardless of the cause of this decrease (i.e. if the result of ($\Delta AC_{onsite} - \Delta BC_{onsite}$) in Equation 6.1 is negative).
Safeguard	Policy or procedure that identifies, evaluates, minimizes, and mitigates direct and indirect impacts to communities and ecosystems.
Secondary Effects	Unintended changes in carbon stocks, GHG emissions, or GHG removals caused by the Forest Project.
Sequestration	The process of increasing the carbon (or other GHGs) stored in a reservoir. Biological approaches to sequestration include direct

	removal of CO_2 from the atmosphere through land-use changes[23] and changes in forest management.
Significant Disturbance	Any natural impact that results in a loss of least 20 percent of the above-ground live biomass that is not the result of avoidable or grossly negligent acts of the Forest Owner.
Sink	Physical unit or process that removes a GHG from the atmosphere.
Source	Physical unit or process that releases a GHG into the atmosphere.
Standing Dead Carbon Stocks	The carbon in standing dead trees. Standing dead trees include the stem, branches, roots, or section thereof, regardless of species, with minimum diameter (breast height) of five inches and a minimum height of 15 feet. Stumps are not considered standing dead stocks.
Standing Live Carbon Stocks	The carbon in the live tree pool. Live trees include the stem, branches, roots, and leaves or needles of all above-ground live biomass, regardless of species, with a minimum diameter (breast height) of five inches and a minimum height of 15 feet (inventory methodology must include all trees 5 inches and greater).
Stocks (or Carbon Stocks)	The quantity of carbon contained in identified carbon pools.
Submitted	The Reserve considers a Forest Project to be “submitted” when all of the appropriate forms have been submitted and uploaded to the Reserve software system, and the forest owner has paid a project submission fee.
Tree	A woody perennial plant, typically large and with a well-defined stem or stems carrying a more or less definite crown with the capacity to attain a minimum diameter at breast height of 13 cm and a minimum height of 4.5 m.[24]
Unavoidable Reversal	An unavoidable reversal is any reversal not due to the forest owner’s negligence, gross negligence or willful intent, including wildfires or disease that are not the result of the forest owner's negligence, gross negligence or willful intent.
Verification	The process of reviewing and assessing all of a Forest Project’s reported data and information by an ISO-accredited and Reserve-approved verification body, to confirm that the forest owner has adhered to the requirements of this protocol.
Verification Period	The period of time over which GHG reductions or removals are verified. A verification period may cover multiple reporting periods. The end date of any verification period must correspond to the end date of a reporting period.

[23] (Metz, Davidson, Swart, & Pan, 2001)
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Appendix A: Project Monitoring and Carbon Stock Quantification Guidance

This protocol identifies specific monitoring objectives recognized as being critical to Forest Project activities in Mexico. The specific monitoring objectives are:

1. Provide highly accurate estimates of carbon stocks within project Activity Areas for purposes of reporting carbon stocks for crediting and ensuring that credited stocks meet permanence requirements and to ensure environmental safeguards related to native species and harvest retention are being adhered to.
2. Provide data relative to vegetation classes and land use in Non-Activity Areas within Project Area to address internal leakage and to assess compliance with environmental safeguards related to high conservation value stands.
3. Provision of a tracking mechanism to ensure social/governance requirements of project are in compliance and to serve as indicators for interpreting project benefits.

This section addresses quantification activities needed for carbon accounting and environmental safeguards.

The quantification guidance is standardized to provide consistency between projects and an objective and clear basis for project verification with the intent of improving overall efficiencies in project monitoring. The approach to quantification and monitoring of onsite carbon stocks is designed to be inclusive of a broad range of project activities. Activities such as agroforestry, sustainable forest management, and reforestation can be conducted under one project with a goal of improving project quantification and monitoring efficiencies.

The first two objectives of project quantification and monitoring are described in the next section. Quantification and monitoring of social and governance requirements are described in Section 2.

A.1 Characterizing Land Use, Forest Vegetation, and Quantifying Carbon Stocks

The approach to forest quantification and monitoring is divided into two pathways, designed to achieve the first two monitoring objectives described above.

The first objective of achieving highly accurate estimates of carbon stocks, ensuring permanence, and ensuring compliance to environmental safeguards is achieved through an intensive approach to monitoring carbon stocks. An intensive inventory requires that field sample plots are installed, field measurements acquired, and the data input into a database for analytical purposes. Intensive inventories are necessary where management actions are undertaken for the purpose of increasing carbon stocks where quantification for carbon crediting will occur.

Intensive inventories can be deferred for up to 5 years for Activity Areas that have been planted with new trees for reforestation, afforestation, agroforestry, and related efforts. No credits can be issued for these areas until sampling efforts are completed.

The second objective is met through an extensive approach to quantification and monitoring carbon stocks. An extensive inventory is based on default values provided by the Reserve based on estimates from the National Inventory (INFyS). It is based on the stratification of land

use and vegetation cover using globally available data and provides the basis for monitoring gross fluctuations in carbon levels and ensuring environmental co-benefits are met. The extensive approach provides reasonable assurance that carbon benefits claimed on one portion of the Project Area are not transferred as emissions to another part of the Project Area and that environmental safeguards related to high conservation stands are maintained.

The Reserve provides monitoring worksheets for both types of monitoring. These worksheets are available on the Reserve's Mexico Forest Protocol Website.

A.2 Stratifying the Project into Stands

Stands are the base units of assessment for tracking Activity Areas and Non-Activity Areas within the Project Area. The term 'polygon' is sometimes used interchangeably in this protocol with stands, particularly when referring to geometrical aspects of the land definition and its relationship to Geographic Information System (GIS) software. Stands provide the basis for achieving both intensive and extensive aspects of project quantification and monitoring. A stand is a spatially explicit polygon that consists of the following similar attributes:

- Stand identifier
- Area (hectares)
- Land use/vegetation cover
- Density
- Size class
- Regulatory/legal constraints
- Responsibility/legal ownership

The Project Area must be stratified into stands that share common attributes for each of the fields above. The stratification design provides efficiencies for both trend reporting of vegetation conditions and inventory sampling. For the purposes of carbon inventory analysis and reporting, stands that share common land use/vegetation cover class, density class, and size class are referred to as a stratum. The varied classes of land use/vegetation cover classes, density classes, and size classes are collectively referred to as vegetation strata.

Determination of the attributes related to vegetation strata shall be based on local knowledge and available remotely sensed data. The level of precision and accuracy associated with stratifying the Project Area is commensurate with tracking general trends in forest cover. Statistical sampling for quantification purposes will only be used in the Activity Areas. The guidance below describes the rules for assigning vegetation strata. Verification of vegetation strata will be based on random visits to stands and checking for consistency based on a scoring system developed in the verification guidance.

The stands shall be created within a GIS file with sufficient utility so that they can be displayed on Google Earth. It is acceptable for stands to be developed directly in Google Earth using Google Earth imagery and local knowledge as the basis for stratification. Google Earth Pro is an inexpensive tool that calculates area for each stand digitized in Google Earth. Minimal training and resources are needed to produce maps of project strata, along with attribute data, needed for project development

A KML file or GIS shapefile of the Project Area must be provided to the Reserve at the project's initiation and on a 5-year monitoring basis throughout the project life.

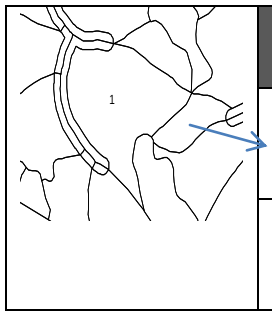
The minimum required mapping resolution (polygon size) for identifying and presenting stand boundaries is 2 hectares. In other words, where notable variation exists for any of the attributes identified above, the standard for resolving the variation is set at 2 hectares. It is acceptable to create smaller stands that increase the mapping resolution as this exceeds the minimum standard. It is also acceptable to create larger stands where the attributes are relatively homogeneous (i.e. where no internal polygons contain varied polygons exceed 2 hectares). The identification of a land use/vegetation cover attribute must be based on 'best-fit' at this level. Forest Owners may choose to map stands smaller than 2 hectares at their own discretion.

Roads and trails may be appropriate to use as the borders of stands but are not to be mapped as a stand.

The Reserve provides a Microsoft Access database template that Project Developers must use to enter stand attributes as discussed in this section. The database contains standard reports that are to be submitted at project initiation and at regular monitoring intervals specified in this protocol. The database can be downloaded from the Reserve's website. Table A.1 displays the relationship between a stand as a spatial entity and the data associated with it in the database, based on the stand's unique identifier. The relational database will include other data tables that will include strata estimates of CO_2e/hectare for generalized, extensive, monitoring activities and tree lists from sampling for quantification of carbon stocks on Activity Areas.

Table A.1. Example of Relationship between Stands in the GIS and Stands in a Relational Database

The image on the left displays a stand with a unique identifier (1). Information about the stand is stored in a relational database.



Stand	Area (Ha)	Stratum (Vegetation Code)	Size Class	Density Class	Regulatory / Legal Constraint	Forest Type	Activity Area
1	25	BGg	2	c	Determined Independently for each project	High Conservation Value	NA
2	14	BC_mc	1	f	Determined Independently for each project	General	Agroforestry

The following guidance shall be used for attributing each field.

A.2.1 Stand Number

Stands must be defined (digitized) based on the current combination of land use and vegetation cover at the project's initiation using the descriptions provided within this section. Stand polygons must be updated any time change occurs to the polygon as the result of significant forest growth (that changes the species, density, or size class attributes), harvesting, temporal conversion to agriculture, etc. Each stand must be attributed with a unique numeric value that allows the GIS and tabular databases to relate with each other, as shown above in the example.

A.2.2 Area

Area must be calculated for each polygon as hectares by the GIS. Google Earth Pro provides the capability to calculate area and may be used as a GIS tool for calculated area. Care must be taken however to ensure that the reporting of area is not duplicated. Google Earth Pro does not allow for sophisticated GIS analysis that would provide for ensuring shared lines between

polygons are coincident and that the area of "island" polygons within larger polygons is subtracted from the larger polygon.

A.2.3 Vegetation/Land Use Identifiers

Each stand is assigned a vegetation/land use label based on current characteristics (at the reporting date) which forms the basis of a stratified landscape and provides the framework for developing an inventory based on a stratified design. Vegetation/land use labels are determined for each stand from remote sensing (including aerial photos) or field observations. The vegetation/land use is based on defining ecosystems, vegetation form, type of vegetation, and canopy cover. The ecosystem portion of the stratum is defined using the guidance in Table A.2 below.[25]

Table A.2. Descriptions of General Ecosystems for Determination of Vegetation/Land Use Strata

Ecosystem	Description
Forest	Land spanning more than 2 hectares with trees higher than 5 meters and a canopy cover of more than 10%, or trees able to reach these thresholds in situ.
Tropical Rainforest	Tropical forest vegetation where woody perennial species are dominant that develop spontaneously, with crown cover greater than 10%, providing that the area is larger than 2 hectares, excluding *acahuales.*
Arid Zones	Vegetation that develops spontaneously in regions of arid or semiarid climate, with area larger 2 hectares.
Plantations	Land spanning more than 2 hectares with trees higher than 5 meters and a canopy cover of more than 10%, or trees able to reach these thresholds in situ. Plantations are characterized by 80% cover or more of one species, little variation in age and usually young trees.
Other Uses and/or Non-Forest	Lands devoted principally to agriculture or buildings, water systems, etc. Lands can be managed with agroforestry or urban forests.
Wetlands	Lands that are saturated with water to create distinct and unique plant relationships.

Selection of the formation and vegetation categories must be based on dominance (estimated basal area) of the species groups listed. Where criteria are defined within each category in Table A.2, they are to be used. Otherwise, the selection is based on general dominance. Each polygon must be attributed with a Land-Use/Vegetation Key. The vegetation/land-use portion, or key, of the stratum identified for each stand is determined using the codes displayed in Table A.3.

Table A.3. Guidance for the Selection of the Vegetation/Land-Use Key

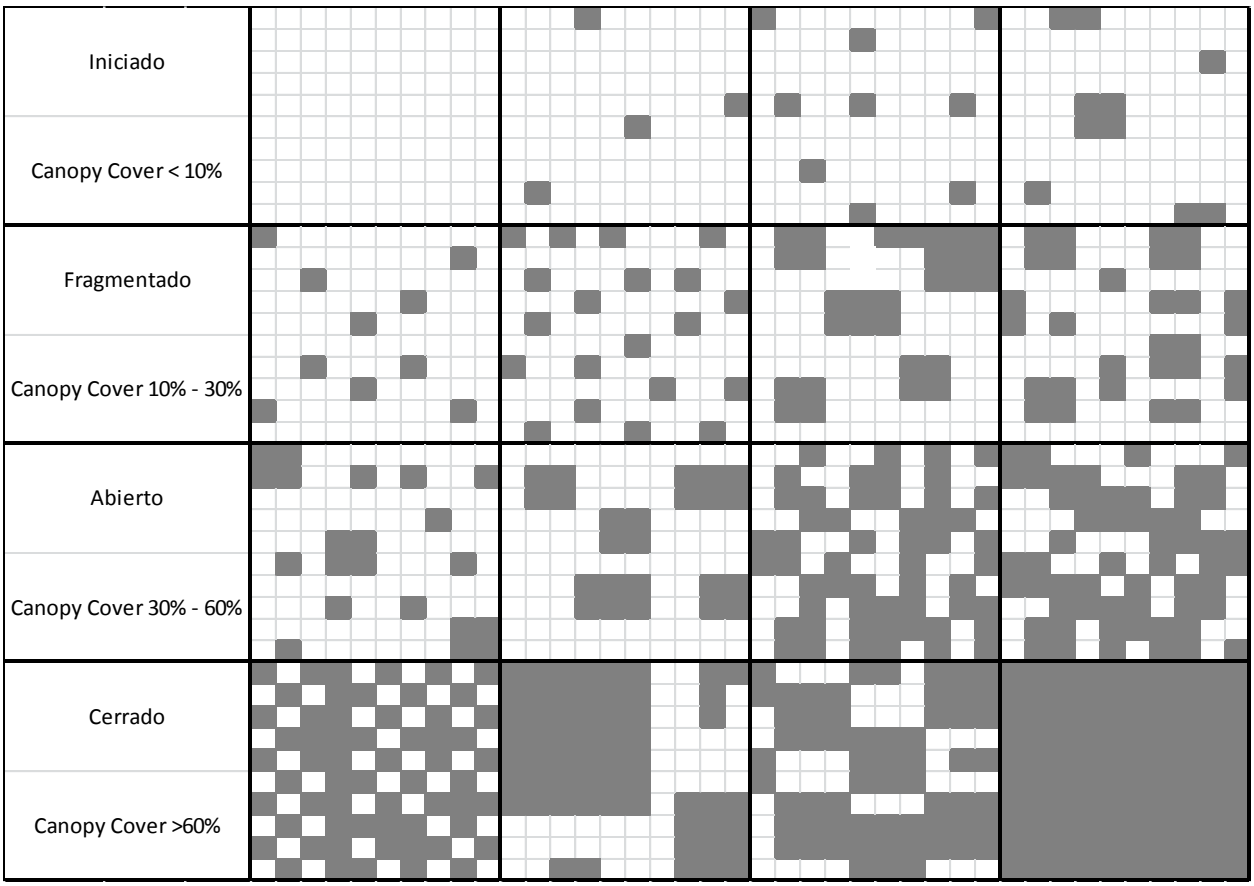
Ecosystem	Formation	Vegetation Type	Key	Canopy Cover for Baseline
Bosque	*Galería*	*Bosque de Galería*	BG	85%
	Coníferas	*Bosque de ayarin* (*Ayarin* > 66% BA)	BA	85%
		Bosque de cedro (*Cedro* > 66% BA)	BB	85%
		Bosque de oyamel (*Oyamel* > 66% BA)	BA	85%

[25] The stratification design is based on *Guia para la interpretacion de cartografia uso de suelo y vegetacion. Serie III. Instituto Nacional de Estadistica y Geografia (Mexico). C2009.* Descriptions of each land use/forest class, including representative species, are included in the guide.

		Bosque de pino (*Pino* > 80%)	BP	85%
		Bosque de pino-encino (*Pino* > 50%, *Encino Importante*)	BPQ	65%
		Bosque de táscate	BJ	65%
		Matorral de coníferas	MJ	65%
	Latifoliadas	*Bosque de Encino* (*Encino* > 80%)	BQ	65%
		Bosque de encino-pino (*Encino* > 50%, *Pino Importante*)	BQP	75%
	Mesófilo	*Mesófilo de montana*	BM	65%
		Popal	VA	65%
		Selva de galería	SG	65%
		Tular	VT	65%
		Vegetación de galería	VG	65%
		Vegetación halófila	VH	65%
Selvas	*Selva Caducifolia*	*Matorral subtropical*	MST	75%
		Selva baja caducifolia	SBC	75%
		Selva mediana caducifolia	SMC	75%
	Selva Espinosa	*Selva baja espinosa*	SBK	75%
	Selva Perennifolia	*Selva alta perennifolia*	SAP	75%
		Selva alta subperennifolia	SAQ	75%
		Selva baja perennifolia	SBP	75%
		Selva baja subperennifolia	SAQ	75%
		Selva mediana perennifolia	SMP	75%
		Selva mediana subperennifolia	SMQ	75%
	Selva Subcaducifolia	*Selva baja subcaducifolia*	SMC	75%
		Selva mediana subcaducifolia	SMS	75%
Zonas áridas	*Matorral Xerófilo*	*Chaparral*	ML	25%
		Matorral crasicaule	MC	25%
		Matorral desértico microfilo	MDM	25%
		Matorral desértico rosetofilo	MDR	25%
		Matorral espinoso tamaulipeco	MET	25%
		Matorral rosetofilo costero	MRC	25%
		Matorral sarcocaule	MSC	25%
		Matorral sarco-crasicaule	MSCC	25%
		Matorral sarco-crasicaule de neblina	MSN	25%
		Matorral submontano	MSM	25%
		Mezquital	MK	25%
		Mezquital Xerófilo	MKX	25%
		Vegetación de desiertos arenosos	VD	10%
		Vegetación gipsofila	VY	25%
Plantación	*Plantaciones Forestales*	*Bosque inducido*	BI	90%
		Palmar inducido	PI	90%
Otros Usos o No Forestal	*Otros Usos o No Forestal*	*Agricultura*	AG	NA
		Agroforestal	AGF	NA
		Asentamientos Humanos	AS	NA
		Cuerpo de agua	AQ	NA
		Zona urbana	UR	NA
		Pastizales	PI	NA
		Vegetación de dunas costeras	VU	NA
		Rocas	RO	NA
Vegetación Hidrófila	*Vegetación Hidrófila*	*Manglar*	VM	NA
		Popal	VA	NA
		Selva de galería	SG	NA
		Tular	VT	NA
		Vegetación de galería	VG	NA
		Vegetación halófila	VH	NA

Density in forest stands varies as the result of human and natural interactions with the forest. Humans may harvest trees for wood products, fuel, or to enable other land uses to be implemented, such as agriculture. Natural forest disturbances such as fires, wind throw, and disease also have temporal effects on forest density. The amount of forest biomass in a stand is related to the density of trees within it. The density attribute of the stand shall be based on the guidance provided in this section. Table A.4 also displays classes of density by percent canopy cover and provides examples of the variation within each density class. The density attribute assigned to each stand shall be based on the overstory component of the stand and determined from remotely sensed data, such as Google Earth, or from field observations, or from a combination of both. Each stand shall be attributed with a density class based on Table A.4.

Table A.4. Density Criteria with Examples of Variation within Each Class



Forest carbon estimates for a stand are also affected by the size of the trees in the stand. A size class attribute must be determined for each stand.

A.2.4 Determining Size Classes

The size of trees within a forested stand also influences the carbon quantity in the stand. Size must be defined for forested stands based on the dominant diameter. Determining dominant diameter can be accomplished through visual comparison of crown diameters and ground-based knowledge of tree sizes. A diameter size class label is assigned to each stand if it contains forest vegetation or is expected to contain forest vegetation as part of project activities.

A size class value must be entered into the Microsoft Access database in the 'Size' field for each stand that contains forest vegetation. The size classes are as follows in Table A.5.

Table A.5. DBH Classes

Class	DBH
0	Trees < 1 centimeter or non-existent
1	1- 20 centimeters
2	21 – 40 centimeters
3	41 – 60 centimeters
4	> 60 centimeters

Tree diameter is based on diameter at breast height (1.3 m vertical height from the base of the tree). The process for determining size class is described in Figure A.1 below.

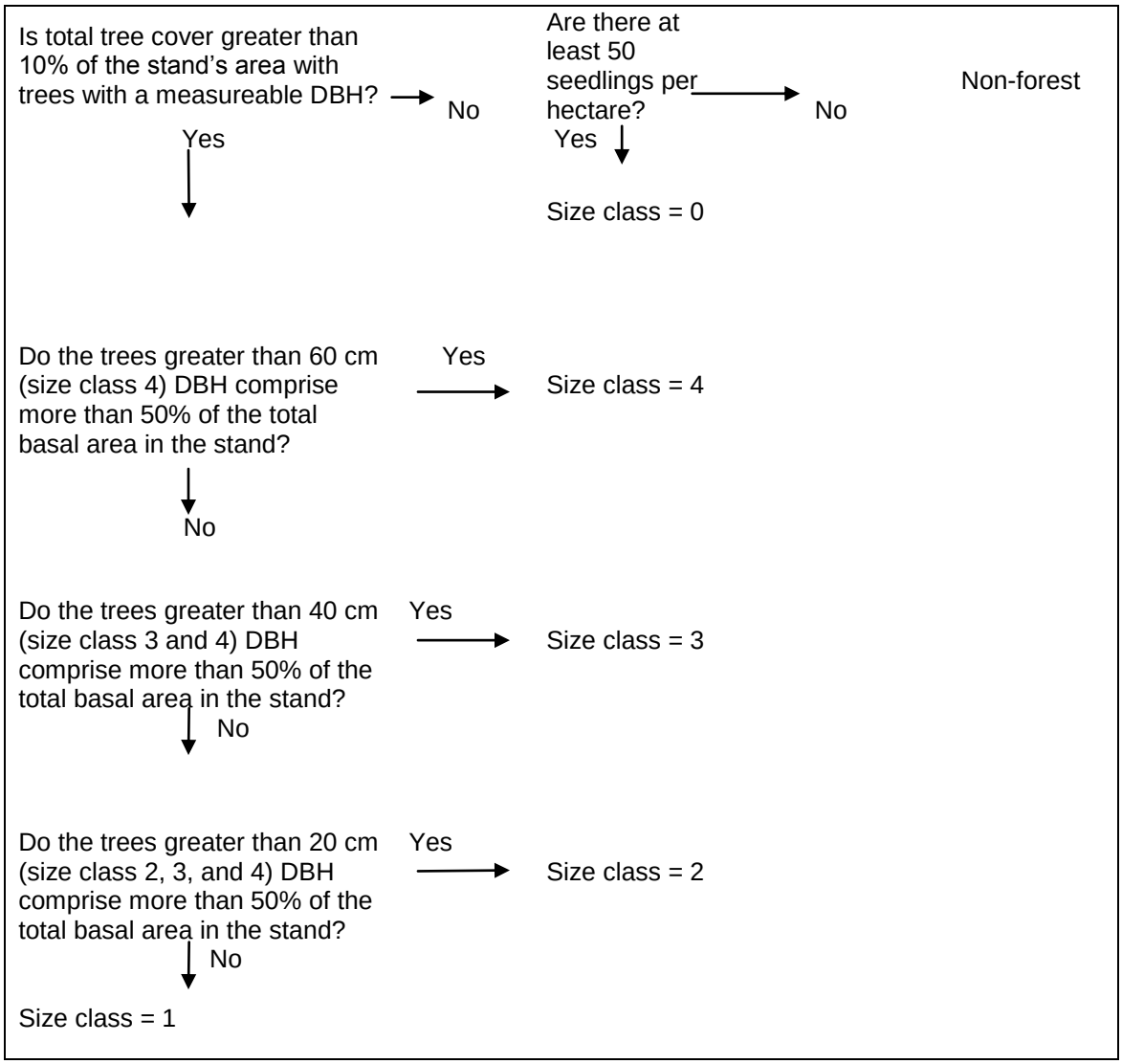


Figure A.1. Determining Size Class for the Stratum

A.3 Sampling Methodology (Standing Live and Dead Wood)

Inventory sample plots for developing a carbon inventory are only required for areas where trees will be inventoried for the purposes of generating credits (Activity Areas). Inventory sample plots are not required to be measured for:

- Activity Areas where seedlings have been planted that are less than 15 years old. The inventory of carbon stocks in newly planted areas can be based on projections of diameter and height increments for the species present, according to appropriate designation of site class and stocking levels. These projections must be approved by CONAFOR representatives at state or national levels. These areas must be inventoried with measurements from sample plots and verified when the stands achieve an age of 15.

- All Non-Activity Areas. The stratification requirements described above along with the default values provided by the Reserve are sufficient for monitoring purposes for the portion(s) of the Project Area that are not included for crediting.

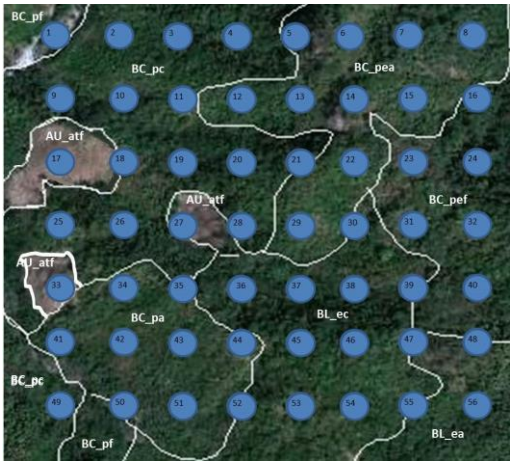
Any portion of the Project Area can be added to the project as an Activity Area for crediting provided the area is eligible for crediting and an intensive inventory is conducted for the area. Therefore, sampling activities can be staggered over time as management activities evolve and funding streams become available.

Where sampling is required, the sampling methodology is designed to achieve an unbiased inventory estimate with a target precision of +/- 5% at the 90% confidence interval for standing live and dead trees based on CO_2e estimates. The forest vegetation strata developed following the guidance above form the basis for a stratified sampling design.

A.3.1 Inventory Sample Plots

A 25 meter grid of plot locations must be randomly placed on the Project Area. This will result in plots being associated with both Activity Areas and Non-Activity Areas. Only the plots within Activity Areas are subject to being selected randomly for field sampling. The grid will serve as a reference for plot locations throughout the project life. Therefore, as new stands are added as Activity Areas, plot locations will be readily available for selecting for field measurements.

Once the grid is produced, plots are organized in a tabular database with the plot/stratum combinations to facilitate the selection of plots (discussed below). Figure A.2 below displays how plots are systematically located across the Project Area.



Stratum	Plot
BP	1
BP	2
BP	3
BCc	4
BCe	5
BC_pae	6
BC_pae	7
…and continued for each plot	

Figure A.2. Example of a Systematic Grid of Sample Plots Overlaid Across the Project Area and the Plot Ordered by Stratum in a Database

Plots are randomly selected from the pool of plots available in Activity Areas for sampling. Achieving the overall sampling goal of +/- 5% at the 90% confidence interval will require a different approach for each project based on number of strata and the variability of stocking within the strata.[26] Forest Owners are responsible for calculating their own descriptive statistics to determine if more or less plots are needed to achieve the target confidence level.

Data from inventory plots are valid for a period of 10 years following field sampling, during which time the plot data can be updated with estimates of annual increment to both diameter and height measurements. The process for updating plots is described in detail in a subsequent section. Since plot data can be no older than 10 years, plots must be periodically re-measured or new plots installed for both annual monitoring and periodic field verification. New inventory plots must be selected randomly for measurement from the grid of potential plots described above. Plot data (not plot location) must be removed or replaced from the inventory when an event substantially changes the forest cover surrounding the plot's location (such as harvest or forest fire) that requires the stratum designation to be modified or when the plot is older than 10 years of age.

Inventory plots are to be installed as fixed radius plots. The size of the radius varies depending on the attribute that is measured, as shown in Table A.6 below. Only the random plots selected in each stratum need to be installed. Plot centers must be monumented so they can be relocated for future measurement or for verification. Monumenting plot locations so that they are available for re-measurement and/or verification can be challenging. GPS coordinates must be recorded for each plot at, or offset from, the plot center. Since GPS coordinates will only partially assist in relocating the plot center, additional navigational devices are necessary. It is recommended that an object be placed at plot center that is highly resistant to environmental features, including weather, animals, and fire. A small piece of metal rebar may be suitable. Relocating the plot center can be enhanced through the identification of bearing trees, or trees with aluminum tags affixed to them with a measured distance and compass bearing to the plot center etched or otherwise written on them. A minimum of two trees will assist in triangulating to

[26] Inventory sampling that achieves a confidence level +/- 5% or less at the 90% confidence interval are accepted with no discounts for uncertainty. No projects are accepted if the confidence is less than +/- 20% at the 90% confidence interval. Projects with confidence intervals greater than 5% up to 20% are accepted with discounts for uncertainty.

the plot center. Marking these trees with highly visible paint will also be useful for plot center relocation. Table A.6 displays the data that are to be collected at each inventory plot.

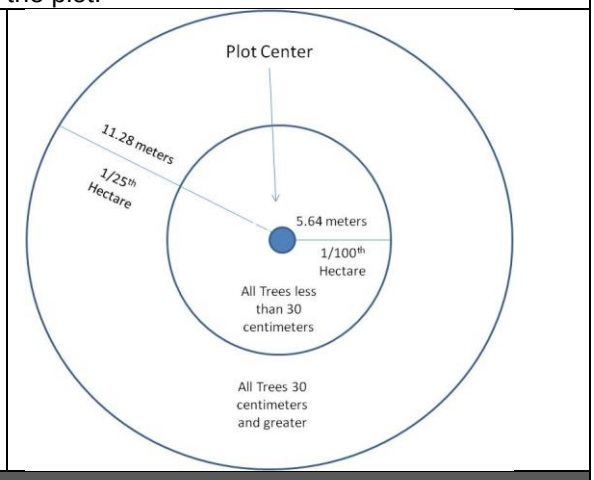
Table A.6. Inventory Plots

For Each Plot	
Attribute	**Description**
Date of Plot Visit	Day/Month/Year
Latitude	From GPS
Longitude	From GPS
Vegetation Stratum	Enter the symbol for the vegetation from section (Vegetation Symbology) above.
Plot Number	Enter the plot number for the plot, as described in the section (Plots) above.
Inventory Personnel	Enter the initials of the inventory technicians responsible for measuring and recording data on the plot.

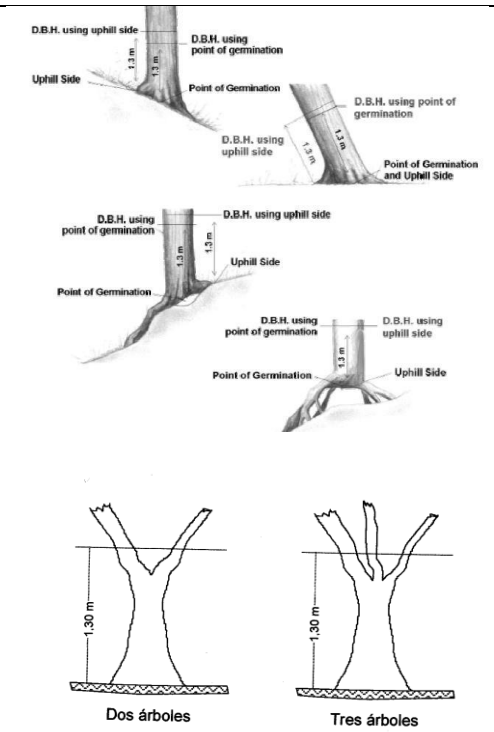
On a Fixed 1/25th Hectare Radius (Radius = 11.28 m), all trees ≥ 30 cm DBH

On a Fixed 1/100th Hectare Radius (Radius = 5.64 m), all trees < 30 cm DBH

Radial measurements need to be corrected for horizontal distances



Attribute	**Description**
Tree Number	Trees are assigned a number 1 to X starting from 0 degrees (North) and generally proceeding clockwise. The numbering convention in the database facilitates the relocation and the verification of the trees.
Species	Enter the species code for each species on the plot. The species code can be found for each species in the corresponding reference document. The species code is based on the first two letters of the genus and the first two letters of the species for any given species.
DBH	Measure and record Diameter at Breast Height (DBH) to the nearest centimeter on every tree using a diameter tape and wrapping the tree at a height of 1.3 meters from the base of the tree on the uphill side.

		
Total Height	Measure of total height (height from base of tree to top) to the nearest meter, according to guidance below.	
	Trees highly homogeneous within stratum with regards to species and diameter and height relationships. An example is a stratum that is made up largely of one species that is even-aged.	Measure tree heights on a minimum of 20% of the trees. Heights should be measured on the first plot and every subsequent fifth plot within the stratum.
	Trees highly homogeneous within stratum with regards to diameter and height relationships. An example is a stratum that consists of up to 3 dominant species that is even-aged.	Measure tree heights on a minimum of 25% of the trees. Heights should be measured on the first plot and every subsequent fourth plot within the stratum.
	Trees somewhat heterogeneous within stratum with regards to diameter and height relationships. An example is a stratum that is made up of single or up to 3 dominant species and is uneven-aged.	Measure tree heights on a minimum of 33% of the trees. Heights should be measured on the first plot and every subsequent third plot within the stratum.
	Trees heterogeneous within stratum with regards to diameter and height relationships. An example is a stratum that consists of multiple species and is uneven-aged.	Measure tree heights on a minimum of 50% of the trees. Heights should be measured on the first plot and every subsequent other plot within the stratum.
	Trees highly heterogeneous with regards to diameter and height relationships. The relationship between tree heights and tree diameters varies tremendously.	Measure tree heights on all trees. Heights should be measured on every plot within the stratum.

Vigor	For each tree, provide a rating of the tree's apparent vigor. Determination of vigor based on consideration of color of foliage, crown proportion and appearance, retention of leaves/needles, appearance of apical growth, length between growth whorls, and presence of cavities and fungal growth. The code is assigned based on the following classes:	
	Code	**Description**
	1	Very poor
	2	Poor
	3	Good
	4	Optimal
Previous 5 years' radial increment	Increment measurements to the nearest millimeter of the tree's past 5 year growth on every plot where heights are measured. Sampling for radial growth may be terminated on a stand by stand basis once 10 or more trees of a given species have been sampled for each vigor class.	
Status	**Code**	**Description**
	V	Live tree
	M	Dead tree
Defect – Bottom 33%	For each portion of the tree, provide an ocular estimate of the portion of tree that is missing (as a percentage of the section) as the result of breakage or cavities.	
Defect – Mid 33%		
Defect – Top 33%		

A.3.2 Calculating the Project Carbon Inventory and Confidence Statistics in Standing Live and Dead Trees

This section provides a step by step approach to calculating the project's carbon inventory in standing live and dead trees. This section applies only to the inventory estimates within the Activity Areas that are subject to intensive inventories. Non-Activity Areas are discussed in subsequent sections. Developing forest carbon estimates from sampling in the Activity Areas must be done according to the following general steps:

1. Calculating the net carbon tonnes for standing live and dead trees on a per hectare basis for each plot.

2. Determining the average net carbon tonnes for standing live and dead trees by stratum by summing the plots that are within a common stratum and dividing by the number of plots represented.

3. Multiplying the average carbon inventory estimate for each stratum by area of each stratum.

4. Summing the carbon tonnes for the Activity Area.

5. Calculating the project sampling error and confidence deduction.

The plot data and stratification used to calculate the inventories must represent current conditions at the time the inventory is created. The process for updating forest inventories is discussed in Section A.4. Volume, biomass, and carbon are to be calculated for each tree sampled in the plots. Volume and density equations are provided in a reference file for each tree based on the tree's measured diameter and height. The biomass estimates calculated for each tree are adjusted based on the defect noted for each tree during inventory sampling. The net

biomass is converted to carbon tonnes and expanded to a per hectare basis, as shown in Table A.7.

Table A.7. Calculate the Carbon Tonnes for each Plot on a per Hectare Basis

Steps	Description	Tools/Process Required	
1	Calculate the cubic volume in each tree.	Formula provided in resource file. Formulas provided will enable volume to be calculated for all portions of the tree.	
2	Calculate the biomass tonnes in each tree.	Formula provided in Resource File.	
3	Adjust the tree's biomass based on defect percentages assigned to each tree.	Defect – Bottom 33%	60% **x** biomass tonnes in gross tree $_{(Step\ 2)}$ **x** Defect% $_{(Bottom\ 33\%)}$
		Defect – Middle 33%	30% **x** biomass tonnes in gross tree $_{(Step\ 2)}$ **x** Defect% $_{(Middle\ 33\%)}$
		Defect – Top 33%	10% **x** biomass tonnes in gross tree $_{(Step\ 2)}$ **x** Defect% $_{(Top\ 33\%)}$
		Sum Defect	Sum of biomass defect from each step above
		Adjusted Biomass	Biomass $_{(Step\ 2)}$ – Sum Defect
4	Calculate the carbon tonnes in each tree.	Adjusted Biomass $_{(Step\ 3)}$ **x** 0.5	
5	Calculate adjustment for dead trees.	If the tree is dead, multiply carbon tonnes in each tree (Step 4) by 0.7. Otherwise, do not adjust.	
6	Expand the carbon estimate in each tree to a per hectare basis.	Multiply the carbon estimate in each tree by the weight required to represent the estimate on a per hectare basis: 25 **x** Carbon Tonnes $_{(Step\ 5)}$ for trees sampled in 1/25th hectare radius 100 **x** Carbon Tonnes $_{(Step\ 5)}$ for trees sampled in 1/100th hectare radius	

The individual tree estimates are summed within each plot, and then the plots in each stratum are averaged to get a mean carbon stock estimate for each stratum. These strata estimates are then expanded to the project based on the area representation (hectares) of each stratum, as shown in Table A.8.

Table A.8. Determine the Carbon Tonnes for Stratum X and for the Project

Steps	Description	Tools/Process Required
7	Calculate the average carbon tonnes per hectare in Stratum X.	Sum the carbon estimates from each plot within Stratum X on a per hectare basis and divide by the number of plots in Stratum X.
8	Calculate the total carbon tonnes in Stratum X.	Multiply the average estimate of carbon tonnes per hectare by the total hectares represented by Stratum X in the project.
9	Calculate the total carbon tonnes in the project.	Repeat Step 7 for each stratum and sum the estimates of each stratum to get total carbon stocks for the Activity Area.

The desired sampling error for the intensive inventory for the Activity Areas is +/- 5% of the mean at the 90% confidence level. Project data will be accepted with sampling errors up to +/- 20% of the mean at the 90% confidence interval; however deductions for uncertainty are applied. The uncertainty deduction is applied directly to the project inventory of live and dead trees, but not to the baseline estimate, to ensure a conservative quantification of project benefits.

Credits that are withheld from transactions due to the uncertainty deduction can be recouped when increased sampling effort (usually the addition of more plots) improves the confidence estimate of the inventory. Likewise, inventory estimates that decrease in confidence will result in a reduction of credits available for transaction, which can result in an apparent reversal. In the event of an apparent reversal due to the application of a confidence deduction, the Forest Owner will have one year to correct the inventory estimate. If the sampling error has not been corrected in the course of the year, the project must compensate for the reversal per the guidance on reversals (Section 9).

Table A.9. Calculate the Sampling Error for the Estimate and Apply the Confidence Deduction

Steps	Description	
10	Guidance for calculating sampling errors for a stratified sample will be added during public comment period.	
11	**Actual Project Sampling Error at 90% Confidence Level**	**Confidence Deduction**
	Project sampling error equal to or less than 5%	0%
	Sampling error greater than 5% but not greater than 20%	Actual sampling error % – 5 % (to the nearest 1 percent)
	Sampling error greater than 20%	100% (Account is suspended until corrections are made)

A.4 Updating Project Carbon Inventories and Determining Actual Onsite Carbon Stocks

Since project forest carbon stock estimates are constantly fluctuating due to additional inventory data, forest growth, harvest, and natural disturbances, estimates of forest carbon stocks must be updated and reported annually. The annual adjustments to inventory data are based on the inclusion of new information, adjusting existing data for forest growth and disturbances, and recalculating the carbon estimates and the confidence deduction.

Monitoring consists primarily of updating and reporting a project forest carbon inventory for the Activity Areas and monitoring trends of forest carbon stocks for the Non-Activity Areas.

The inventory of Activity Areas is based on inventory sample plots and/or modeled increment (up to 15 years old) of diameter and height for planted stands. The modeled projections of diameter and heights of newly planted seedlings must be approved by CONAFOR (state or national) and be relevant to the site classification and stocking densities of the stands using such projections. Monitoring also includes tracking data related to social and environmental safeguards to ensure compliance. Each step is described in greater detail below.

A.4.1 Updating Forest Inventory Data Based on New Information

For the Active Areas, any plots sampled or re-sampled in the past year must be incorporated into the project inventory. If a plot is re-measured, the old data must be replaced with the new data in terms of representing the plot's inventory. Plot data is valid for no longer than 10 years without being re-measured. The project inventory therefore must be based on plots sampled within the 10-year period. Forest Owners may decide to perform all of their inventory sampling in a given year or distribute it throughout the 10-year timeframe.

A.4.2 Updating Forest Inventory Data for Growth

Updating tree records in inventory databases is based on applying an appropriate diameter increment and a height increment to each tree record in the database. There are three acceptable methods for updating the tree records:

1. Through the use of forest growth models that have been approved by regional and/or national CONAFOR offices. A model can be growth simulations in a computer or simply documented rates of diameter and/or height data. The models must be appropriate for the environmental conditions and species present on the project.

2. Through the use of a stand table projection. The guidance for adding annual diameter and height increment is based on diameter increment measurements taken at plots and regression analysis for heights. The steps involved are displayed in Table A.10.

3. Through the use of CONAFOR-approved modeled projections of diameter and height increments for stands up to 15 years old, appropriate for the species present in the stratum, the stocking levels, and the site class.

Table A.10. Steps for Updating Tree Records in Forest Inventory Databases using a Stand Table Projection

This is a process for updating the live trees in the inventory database. Dead trees remain as they were when the plot was measured and only updated when the plot is re-measured.

Steps	Description	Tools/Process Required
1	Querying data for analysis.	Query live tree records by the size classes identified in Appendix A by strata and species that have been measured for increment.
2	Determine annual diameter increment.	The data for diameter increment were collected to represent the increment over the previous 5 years. This data must be divided by 5 to determine the average annual diameter increment.
3	Calculate average annual diameter increment.	The average annual diameter increment by species and size class is calculated by summing the results from Step 2 for each species and size class and dividing by the number of records summed.
4	Add diameter increment to tree records.	The average diameter increment for each species and size class is multiplied by the number of years that have passed since the tree record was measured in the field and added to the original diameter estimate to update the diameter estimate to a current reporting year.
5	Calculate a diameter-to-height regression estimator.	Using only original measured data (not updated data), a regression formula is developed by inserting the measured diameter and height data by species into a spreadsheet (e.g. Microsoft Excel) and using either a logarithmic or linear function depending on which estimator provides the best R^2 value.
6	Calculate the estimated height for each tree based on the regression estimator from Step 5.	Apply the regression formulae developed in Step 5 for each species to the updated diameter (Step 4) to calculate an estimated height for each tree.

A review of the stratification of the Non-Activity Areas must be conducted on an annual basis to determine if forest growth has changed any of the species, size, or density variables associated

with the forest stratification. Any change in these variables will require that these attributes associated with the stand be updated in the database. The project database contains a report that sums the area by strata types. This report must be prepared and submitted with each monitoring report.

A.4.3 Updating Forest Inventory Estimate for Harvests and/or Disturbances that have Occurred in the Previous Year

Harvests and/or natural disturbances that represent changes to forest cover classes require that the stratification system for both the Activity and Non-Activity Areas be updated to reflect current land use and forest cover conditions. Any areas affected by harvest and/or natural disturbances must be indicated on an updated map of land use and forest cover classes. Additionally, the stand attributes must be updated in the Microsoft Access database to reflect the changes. Any plots associated with the changed cover class must either be discarded from the current inventory database until the plot is updated or updated through re-measurement. The updated plots must be associated with the updated land use and forest cover class.

A.4.5 Completing the Annual Update Process

Upon updating the records in the inventory databases to reflect the height and diameter increments, updating the land use and forest cover classes for disturbances, and updating the stratum-associated area (hectare) assignments in the forest inventory database, the forest carbon stocks can be recalculated using the methods identified in Section A.4. The confidence statistics and the associated confidence deduction may only be updated in the monitoring worksheet if it has been reviewed by a verifier.