As of July 21, 2025, ERS has rebranded to Equitable Earth.

All references to “ERS” refer to the standard body now operating under the Equitable Earth name.

Version:
V1.2

Contact:
Ecosystem Restoration Standard
25 Rue de Frémicourt
75015 Paris, FRANCE
info@ers.org

TEMPLATE

Standard and Methodology Revision Proposition

SUMMARY

This Standard and Methodology Revision Proposition is issued by the Ecosystem Restoration Standard (ERS) Secretariat and outlines proposed revisions for the upcoming release of ERS 1.2 and M001.2. This document is intended for review by ERS's TAB.

READING NOTES

Colour code:

- Every element written in gold refers to a new addition to ERS Standard documentation in an existing paragraph. Entirely new sections will appear in black font.

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REFERENCE

Standard Development Revision ID: RP003

Issuance date: 20/11/2024

Update date: 02/01/2025

REVISION PROPOSITION SUMMARY

The ERS Secretariat presents Revision Proposition RP003 to the TAB, reflecting the latest advancements and insights from internal R&D and certification experience. This update aims to strengthen the ERS Standard by introducing essential adjustments that enhance scientific rigour, transparency, and alignment with market needs.

The proposed revisions include:

1. **Refinement of Dynamic Baseline Calculation Methodology**: A revised methodology for selecting control plots to improve accuracy in reflecting project conditions and impact.
2. **Elimination of Projected Restoration Units (PRUs)**: The removal of PRUs from the Standard to respond to market feedback regarding the complexity of ERS's unit and conversion mechanism, and to avoid non-delivery risk from ex-ante credits.
3. **Enhanced Requirements for Secondary Forest Growth**: Additional clarifications and requirements in Methodology M001 to ensure precise accounting and effective management of projects involving secondary forest growth.

These revisions underscore ERS's commitment to continuous improvement and alignment with global best practices within the VCM. The Secretariat invites the TAB to review this Revision Proposition and looks forward to the TAB feedback on such propositions.

Discussion Points from TAB members

1. Nathalie FLORES: 'Is the ERS acronym registered?'

   Answer Provided by ERS Secretariat: ERS is part of our officially registered trade

name *'ERS - ECOSYSTEM RESTORATION STANDARD'*, which is why we use the ERS acronym directly in our communications. This trade name is registered with the relevant authorities in France.

2. Nathalie FLORES: 'I've been discussing with Brazilian stakeholders the land ownership and the challenges with legal frameworks that don't state carbon ownership and/or the projects' development that will be affected by concessions given by State and Local governments. Beyond the voluntary approach, since we want ERS to be considered for compliance schemes such as CORSIA, is this something we would like to take into account?'

   Answer Provided by ERS Secretariat: The ERS Secretariat recognises the critical importance of addressing land ownership and legal frameworks in Project Design. The Programme includes a specific section on land ownership and carbon rights. Additionally, to ensure there is no double-counting between ERS projects and other Projects, such as jurisdictional initiatives, ERS has determined safeguards and requirements in the Double Counting section. Regarding control plots, we acknowledge that current global datasets on land tenure and ownership are neither comprehensive nor consistently accurate. Therefore, we do not use land tenure as a determining indicator for the identification of control plots. However, we are committed to incorporating this factor in future versions of the Standard when reliable datasets become available.

☐ The answer is deemed satisfactory.

Additional Comment:

3. Sara LÖFQVIST: 'I suggest spelling this (i.e., PRU) out the first time it is used.'

   Answer provided by ERS Secretariat: The acronym PRU refers to **Projected Restoration Units** and has been added to this Revision Proposition. All acronyms, including PRU, are also defined in the Terminology & References documentation for ease of reference and to ensure clarity across all communications.

☑ The answer is deemed satisfactory.

Additional Comment:

4. Nathalie FLORES: 'Depending on where the projects are going to be developed, are we considering endemic species? Some legal schemes refer to that in their national

ARR programs (beyond carbon). If not, can that be suggested or considered referring to the scheme of the country in which the project will be developed? This would be a plus for any governmental permit.'

Answer provided by ERS Secretariat: As of now, ERS requires the use of endemic species in all Restoration Sites to align with ecological best practices. Please refer to M001 - section Ecological Recovery - subsection Species Diversity.

Regarding control plots, differentiating between species in the context of a dynamic baseline poses significant challenges. Such differentiation might imply that the carbon sequestered by one species is not equivalent to that sequestered by another, potentially complicating carbon accounting methodologies. For instance, a project using native species might be seen as additional, even if natural regeneration is occurring through invasive species on control plots.

To balance ecological integrity with the practicalities of carbon accounting, ERS aims to focus on robust methodologies that ensure scientifically sound practices. While we remain open to investigating this further as reliable datasets and techniques become available, we must also ensure that such distinctions are feasible and meaningful in the context of market mechanisms and stakeholder expectations.

☐ The answer is deemed satisfactory.

Additional Comment:

PROPOSED REVISIONS

Quantification Methodology for Terrestrial Forest Restoration

RP #1	
Document	Quantification Methodology for Terrestrial Forest Restoration

Section & Page	Section 'Adjustment Factors', subsection 'Dynamic Baseline' (pages 22-26)
Description	Refinement of the Dynamic Baseline definition and conceptual framework to enhance clarity and understanding.
Proposition	• Modify Section '1. Concept' 1. A dynamic baseline evaluation consists of a periodic re-evaluation of the initial baseline scenario to adjust unit issuance. 2. This ~~dynamic baseline~~ process is performed before each Verification and may~~. This process will~~ lead to the adjustment of unit issuance~~, if necessary,~~ following the procedures detailed in the *Units & Issuance* section of the ERS Programme. 3. The dynamic baseline is established by selecting~~To generate a dynamic baseline, ERS selects~~ control plots located outside both the Project Area and the Leakage Belt, with similar ecological and socioeconomic characteristics, including degradation levels. These Control Plots provide a reference, enabling the comparison of the Project's outcomes against a business-as-usual scenario. Shapefiles of these control plots will be disclosed in the Project Design Document and on the ERS Registry.
Discussion Points from TAB members	1. Nathalie FLORES: 'From an investor perspective, not clear if the leakage belt is part of the project or not, if is not, who takes responsibility of the financial implications of the measurements that need to be taken in that area. -Apologies in advance if I am missing something approved or explained before.'

Answer provided by ERS Secretariat: The Leakage Belt is not part of the Project Area. The precise definition of the Project Area, including any relevant boundaries or distinctions, can be found in the Terminology & References document. The process of calculating leakage, including assessment of the Leakage Belt is integrated into the carbon calculations performed by ERS. The financial responsibility for these calculations is included in the overall certification fees, ensuring that no additional costs are incurred by investors or Developers.

☐ The answer is deemed satisfactory.

Additional Comment:

2. Nathalie FLORES 'Applies the suggestion of at least a legal framework check list.'

Answer provided by ERS Secretariat: The clustering of Control Plots does not incorporate legal frameworks as indicators. However, compliance with legal requirements, such as protected area restrictions or jurisdictional requirements, are addressed during the exclusion process conducted after clustering.

☐ The answer is deemed satisfactory.

Additional Comment:

3. Approved under the understanding that control plots are monitored over time using remote sensing only, and not through ground monitoring. If ground monitoring is used, it is unclear what type of monitoring is expected to be performed in the control plots and to what extent. Additionally, factors such as land tenure, accessibility, as well as the number and sizes of control plots, would become relevant and should be described in detail somewhere.

Answer provided by ERS Secretariat: Indeed, control plots are monitored exclusively through remote sensing. No ground

	monitoring is expected or required for control plots. ☐ The answer is deemed satisfactory. Additional Comment:

RP #2	
Document	Quantification Methodology for Terrestrial Forest Restoration
Section & Page	Section 'Adjustment Factors', subsection 'Dynamic Baseline' (pages 22-26) and Appendix 3 - Carbon Parameters (pages 42-49)
Description	To enhance the accuracy of Control Plot selection, the sections previously titled *2. Project Clustering* and *3. Selection of Control Plots* (pages 23-24) have been consolidated into a single, streamlined section called *2. Identification of Control Plots*. This new section aligns with recent updates for control plot identification, specifically regarding the indicators used and the clustering methodology. Additionally, new quality control elements have been added to include systematic checks on the clustering algorithms.
Proposition	*Section 'Adjustment Factors', subsection 'Dynamic Baseline' (pages 22-26)* • Add new section: **'2. Identification of Control Plots** **2.1. Indicators.** The selection of control plots is based on indicators, which encompass ecological, climatic, and land use factors, such as: ○ Elevation;

- Slope (Derived from Elevation);
- Aspect (Derived from Elevation);
- Above-ground biomass (AGB) trends since 2000, using data from Chloris Geospatial;
- Distance-to-road;
- Biomes.

💡While we recognise the critical role of land tenure in ensuring both the longevity and equity of projects, this Methodology does not currently incorporate land tenure and ownership due to the absence of comprehensive, publicly accessible global or national land tenure registries. However, we are actively exploring ways to integrate these considerations into future versions of the Methodology.

2.2. Clustering. Based on a selected set of indicators, an area surrounding the Restoration Site is defined to guide the selection of appropriate control plots. This area is then stratified using clustering algorithms, such as K-means or other relevant statistical methods, to identify natural groupings within the data. This classification enables the division of the area into distinct sub-zones based on the selected indicators, with each sub-zone representing a cluster of areas that share similar characteristics

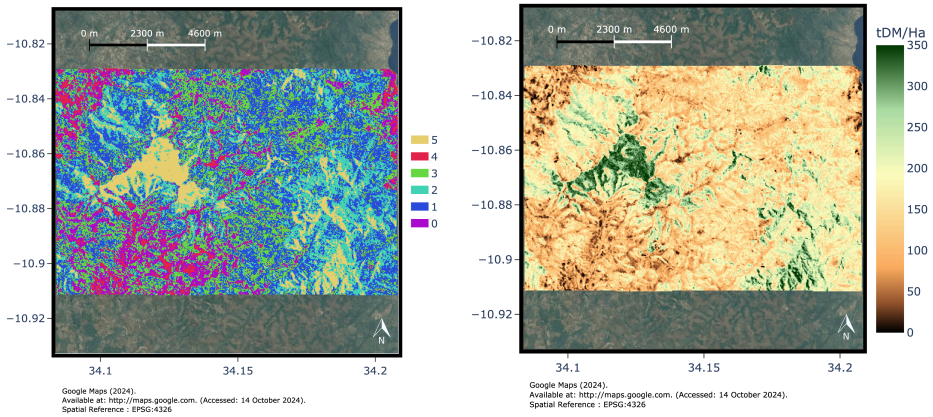


Figure 1: Clustering and AGB stock

2.3. Cluster Integration. In this approach to dynamic baseline evaluation, ERS utilises cohesive spatial units instead of individual, isolated pixels. To achieve this, neighbouring pixels are grouped together to create larger, cohesive areas that better represent the overall landscape characteristics. During this process, any pixel that belongs to multiple clusters will be assigned to the most dominant cluster in its immediate surroundings. Similarly, pixels not assigned to any cluster will be allocated to the dominant surrounding cluster.

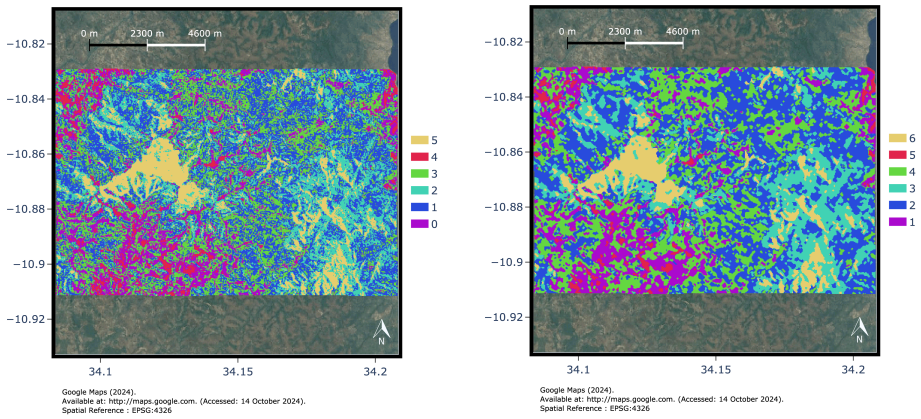


Figure 2: Before and after cluster integration. Each colour and associated number indicates a distinct cluster.

2.4. Matching. Once clustering is completed, only the clusters

that match those found within the Restoration Site are retained for further analysis.

2.6. Exclusion of Inappropriate Areas. Certain regions within the study area are systematically excluded from consideration as Control Plots to ensure a proper "business-as-usual" comparison. These include:

- **Protected areas:** Their conservation status makes them unsuitable for representing typical land-use scenarios.
- **Active carbon projects:** These areas are unsuitable for comparison, as both the Project and Control Plots are subject to the same treatment.
- **Commercial plantations:** These areas are excluded due to different management practices and incentives (e.g., economic incentives for planting and harvesting), which make them incomparable to Restoration Projects.
- **Jurisdiction**: Areas outside the Project's country or jurisdictional boundaries are excluded to ensure alignment with the socio-political context and regulatory frameworks.

Appendix 3 - Carbon Parameters (pages 42-49)

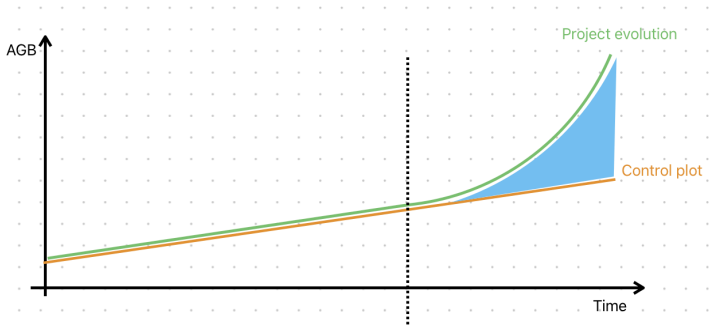
- Modify Quality Assurance and Quality Control requirements regarding Control Plots: **'Quality Assurance:**
  - The selection of control plots is performed using various environmental indicators that encompass~~cover~~ ecological, climatic, and land-use factors to identify appropriate control areas ~~aspects and following the state-of-the-art approach.~~
  - The clustering algorithm is validated through an independent dataset reviewed by experts.
  - The methodology for selecting control plots is documented, with a detailed description of the algorithms, parameter settings, and indicators used.

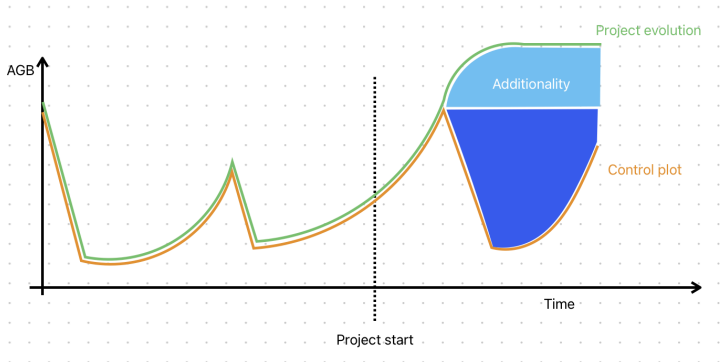
  Quality Control:
  - A visual review is randomly performed to verify spatial continuity and logical groupings, confirming that

	clusters align with the expected ecological characteristics.~~control the quality of the selected control plot~~ ○ Statistical tests are conducted to confirm that the selected control plots share similar key attributes (such as biomass levels, elevation, slope, etc.) with the Restoration Site, ensuring an appropriate baseline comparison.'
Discussion Points from TAB members	1. Nathalie FLORES: Proposition regarding additional indicators to identify control plots 'Biodiversity, Human Activity (such as agriculture or business).' Answer provided by ERS Secretariat: The current approach already incorporates biome consistency as an exclusion criterion, ensuring control plots are selected within the same biome as the Restoration Site. Additionally, human activity is indirectly considered through the use of our land cover indicator, which accounts for cropland and building classes. The R&D team remains committed to refining methodologies and continuously seeks the best ways to enhance accuracy. If more comprehensive and reliable datasets become available, new indicators would be evaluated and implemented to further improve control plot identification. ☐ The answer is deemed satisfactory. Additional Comment: 2. Nathalie FLORES: Regarding Land Tenure 'The legal approach is Verra's biggest weakness (or was) not following so much on them. But I know it is part of their failure. Legal binding frameworks are established at National, State, provincial or local (municipality) level. At least a checklist should elevate the project development. We could have a working session on this early in 2025.' and 3. Sara LÖFQVIST 'Just flagging that I am happy to discuss this in the new year! More research and data collection on this is

	coming out even though we still don't have a perfect database. Could potentially even write here "We acknowledge the importance of tenure for both longevity of projects and equity, and are looking into ways including it in the next version." ' Answer provided by ERS Secretariat: We acknowledge the importance of legal frameworks and land tenure despite all the challenges mentioned above. Your suggestion has been incorporated into this revision proposition. Additionally, we recognise the value of convening a working group session in 2025 to further explore this critical topic, and we are committed to facilitating such a discussion to refine our approach. ☑ The answer is deemed satisfactory. Additional Comment:

RP #3	
Document	Quantification Methodology for Terrestrial Forest Restoration
Section & Page	Section 'Adjustment Factors', subsection 'Dynamic Baseline' (pages 22-26)
Description	Revision of the Dynamic Evaluation section to align with current practices for handling Above-Ground Biomass (AGB) decreases in Control Plots. Further technical insights regarding Dynamic Baseline changes can be found in this document produced by ERS R&D Team.

Proposition	Section '4. Dynamic Evaluation' is renumbered '3.' Modify '3.1. **Refinement of Control Plots**. Before every net GHG removal calculation, ERS reviews the relevance of control plots using the methodology detailed in the *Identification* ~~*Selection*~~ *of Control Plots* section. If current control plots are deemed no longer representative or valid, new control plots must be identified and generated following the established methodology.' Modify '3.3. Following the assessment of control plots, two distinct scenarios may arise: 3.3.1. If the mean carbon stock in control plots has shown an upward trend from Y0 to the present Verification Cycle, indicating positive forest growth, the Baseline ~~Project~~ must ~~will~~ be adjusted to reflect ~~for~~ this increase ~~when calculating GHG removals and issuing units~~. Specifically, the AGB increase in control plots will be factored into the baseline recalculations, reducing the Project's net GHG removals for the period. This adjustment ensures that the VRUs issued reflect only the additional carbon sequestered due to activities carried out on the Restoration Site. ~~In such a scenario, the Project cannot claim full credit for the GHG removals on its Restoration Site. A corrective mechanism must be appliedis used to adjust the overestimated baseline. Refer to the *Units & Issuance* section of the ERS Programme for more details.~~  *Figure 3: Positive Growth with Slight Baseline Increase* 3.3.2. ~~Conversely, ilf a decline in~~ If the mean carbon stock ~~is detected~~

	in the control plots decreased from Y0 to the present Verification Cycle, indicating forest degradation or loss, the Baseline carbon stock values must remain fixed at the levels established during the previous Verification Cycle. This conservative approach mitigates the risk of unintentional claims for emissions avoidance, ensuring the Project does not mistakenly issue Restoration Units for avoided emissions resulting from a declining baseline.. ~~a corrective mechanism must be applied to adjust the underestimated baseline. This mechanism involves adding GHG removals and their corresponding units to the Project. Refer to the *Units & Issuance* section of the ERS Programme for more details.'~~  *Figure 4: Project additionality despite fluctuating Dynamic Baseline*
Discussion Points from TAB members	1. Nathalie FLORES: 'I learnt that CERCarbono is analyzing the countries' GHG inventories https://unfccc.int/non-annex-I-NCs and https://unfccc.int/biennial-transparency-reports, most importantly https://redd.unfccc.int/submissions.html this might be something we want to look into in the future.' Answer provided by ERS Secretariat: Incorporating insights from countries' GHG inventories and submissions under the UNFCCC, such as national communications, biennial transparency reports, and REDD+ submissions, could indeed provide valuable context for enhancing our net GHG removal calculation, specifically regarding baseline determination and

	GHG accounting alignment with national policies. We'll take note of this for potential incorporation into our ongoing research and methodological improvements. ☐ The answer is deemed satisfactory.

RP #4	
Document	Quantification Methodology for Terrestrial Forest Restoration
Section & Page	Section 'Adjustment Factors', subsection 'Dynamic Baseline' (pages 22-26)
Description	Introduce a new section outlining the methodology for projecting a Dynamic Baseline (DB) to determine a Project's Carbon Potential. This projected baseline will evaluate anticipated changes in carbon stocks in the absence of restoration activities, allowing for an accurate assessment of the net GHG removal potential. The section will detail the calculation process, key variables involved, and its application in quantifying the Project's additional carbon sequestration. By incorporating the future evolution of the DB, based on its historical trends, the revision aims to refine the Project's carbon potential. Notably, the DB can influence the number of units, particularly if it indicates a positive trend in above-ground biomass (AGB), ensuring the Project's potential is appropriately adjusted to reflect these dynamics.
Proposition	Add Section 4: 'Estimated evolution' 4.1. ERS calculates the carbon potential of the Project by integrating baseline projections. This dynamic baseline is established through the

historical rate of AGB change observed in selected control plots.

4.1.1. If a positive trend is identified, the slope of this trend is projected as the expected future AGB increase in the control plots. This slope is then deducted from the estimated carbon potential on the Restoration Site.

4.1.2. If the trend is neutral or negative, the baseline will be assumed constant over the crediting period, as shown in the figures below.

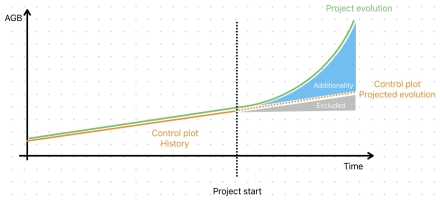


Figure 7: Projected evolution of the Dynamic Baseline with historical data

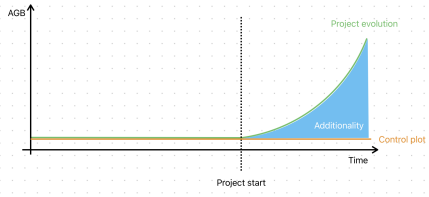


Figure 8: Constant Projected Baseline

The projected dynamic baseline is determined by the following equation:

$$\mathbf{DB}_{\text{projected}} = max(0, \sum_{i=1}^{n}\left[\left(\frac{\mathbf{C}_{t_1,i}-\mathbf{C}_{t_0,i}}{t_1-t_0}\right) \times \mathrm{A}_i\right] \times t_{max}) \quad (19)$$

Where:

- $\mathbf{DB}_{\text{projected}}$ = Projected evolution of Dynamic Baseline; tCO2e.
- $\mathbf{C}_{t_0,i}$ = Initial carbon stock in the control plots of cluster i based on historical AGB data, $tCO_2e \cdot ha^{-1}$.
- $\mathbf{C}_{t_1,i}$ = Carbon stock in the control plots of cluster i at the project start year, $tCO_2e \cdot ha^{-1}$.

	• A_i = Area of the project covered by cluster i, ha. • t_{max} = Crediting period, in years.

RP #5	
Document	Quantification Methodology for Terrestrial Forest Restoration
Section & Page	Section 'Carbon Stock Accounting' (page 27)
Description	As part of the Secretariat's proposal to phase out PRUs from the Standard, this revision updates the 'Carbon Stock Accounting' section to reflect its role in assessing and accounting for units at all stages of the Project's timeline. This revision aligns with the Secretariat's overall PRU removal proposal and is pending feedback from the associated Public Comment Period.
Proposition	Section 'PRU Accounting' • Change section name to 'Carbon Potential Accounting' • Modify 'Total estimation of net GHG removal ~~PRUs~~ is ~~are~~ obtained using the equation (20)' • Change variable name '**PRU**' to '$\mathbf{CP}_{\text{estimated}}$' defined as 'Estimated Project's net GHG removals; tCO2e.' Section 'VRU Accounting' • Modify '~~PRUs conversion into~~ VRUs are issued ~~is performed~~ every two (2) or four (4) years after Verification, and

	throughout the Project's crediting period.'

M001

RP #6	
Document	M001
Section & Page	Section Eligibility Criteria (page 6)
Description	Introducing clear definitions and expanding the scope of eligible activities to clearly outline which interventions are permitted. These interventions fall into two main categories: the restoration of ecosystems that have been degraded and the support of secondary growth resulting from the conservation and/or assisted regeneration of degraded forest areas. Further technical insights regarding Secondary Forest Growth changes can be found in this document produced by the ERS R&D Team.
Proposition	• Modify '1. Project Scope' 1.1 This methodology applies to the following Project types: • Restoration of Degraded Lands: Projects aiming to restore forest cover on degraded lands, as determined by comparison with a reference site, using a variety of restoration techniques that combine both active and passive restoration strategies, allowing for flexible and context-specific approaches. • Promotion of Secondary Forest Growth: Projects fostering the recovery of degraded forests through conservation efforts or assisted regeneration techniques."

	1.2. The Methodology applies no restrictions regarding Project size; no minimum or maximum land area or net GHG removal capacity is required. • Add new section '2. Eligibility Criteria: 2.1. The Project may be located on any type of degraded land that shall be restored as inland forest. 2.2. The Project must be restored to one of the following biomes according to the IUCN Global Ecosystem Typology: 'Tropical-subtropical forests' (T1), 'Temperate-boreal forests' (T2), 'Trophic savannas' (T4.1), 'Pyric tussock savannas' (T4.2), 'Hummock savannas' (T4.3) or 'Temperate woodlands' (T4.4).
Discussion Points from TAB members	1. Nathalie FLORES: Regarding Restoration of Degraded Lands, 'Some countries have these definitions by law, in their forestry legal framework, is this something we would like to refer to?' Answer provided by ERS Secretariat: Regarding legal definitions of degraded lands within national forestry frameworks, we believe it is crucial to maintain ERS's unique approach, which is one of the key differentiators from other Standards. While national definitions can provide a useful reference, they are often outdated and may not take into account the varying biomes within a single country. ERS uses a reference site-based approach to define degraded lands, which allows for more flexibility and accuracy in determining the suitability for restoration projects across different regions and ecosystems. Modification to the definition was made to clarify the use of Reference Site for defining degraded lands.

☐ The answer is deemed satisfactory.

Additional Comment:

2. Nathalie FLORES: 'We must ensure that the country in which the project is developed is a member of https://iucn.org/our-union/members/iucn-members.'

   Answer provided by ERS Secretariat: Requiring the Project country to be an IUCN member might introduce unnecessary restrictions, as membership status doesn't directly impact the ecological or carbon benefits of Restoration Projects. However, ERS ensures adherence to international frameworks through robust safeguards and integrates extensive due diligence and risk analysis throughout its certification process.

☐ The answer is deemed satisfactory.

Additional Comment:

3. Mentioning in 1.1 "Projects aiming to restore forest cover on degraded lands through active and passive restoration strategies" has the risk of criticism from experts for keeping these two as separated. This can give a connotation of them being the only 2 ways of restoring forests, without taking into account the multiple possibilities of the combination between active and passive restoration. This remark is too small to promote it as a necessary change in this RP, but just sharing it for your consideration and relation to outreach communication.

   Answer provided by ERS Secretariat: We fully acknowledge the importance of promoting all possible combinations of restoration methods to suit the diverse contexts of forest restoration projects. Our current language had the intention to integrate both active and passive restoration strategies, but we understand the concern that this may not fully convey the potential for combining various methods in practice. Given the

	diversity of ecosystems and restoration needs, we believe that allowing flexibility in how these methods are applied is crucial. Modification to the definition was made to better reflect the flexibility of combining active and passive restoration strategies. This updated definition now clarifies that projects may utilise a variety of restoration methods, depending on the specific context and needs of the Project Area. ☐ The answer is deemed satisfactory.

RP #7	
Document	M001
Section & Page	Section 'Carbon', subsection 'Principles', subsection 'Leakage' (page 20)
Description	Introducing a precise definition of market leakage assumptions, focused on crediting removals from additional growth beyond a dynamic baseline. This approach excludes avoided emissions linked to conservation activities, ensuring credits are awarded solely for net-positive growth removals.
Proposition	Modify section 3.1: 'Projects must strive to limit activity-shifting leakage, including wood collection (for firewood, charcoal, etc.), timber harvesting, agriculture (e.g. grazing or cultivation), and human settlement. Add section 3.4: 'Market leakage is considered de minimis, as Verified Restoration Units (VRUs) are issued only for net GHG removals that surpass the dynamic baseline. This net GHG quantification approach

	ensures an exclusive focus on forest recovery, with VRUs reflecting only measurable forest restoration from the current degraded condition, without claiming avoided emissions from halted deforestation.' **Footnote References:** 4. Murray, B. C., McCarl, B. A., & Lee, H.-C. (2004). Estimating leakage from forest carbon sequestration programs. Land Economics, 80(1), 109–124. 5. Aukland, L., Costa, P. M., & Brown, S. (2003). A conceptual framework and its application for addressing leakage: The case of avoided deforestation. Climate Policy, 3(2), 123–136.'
Discussion Points from TAB members	1. Robin COLE and Sara LÖFQVIST: ' *"Projects must strive to limit activity-shifting leakage"* Can examples of how this can be achieved be provided?' Answer provided by ERS Secretariat: The requirement to 'strive to limit activity-shifting leakage' is intentionally phrased as a guiding principle rather than a strict requirement, recognising that its achievement depends on the unique context of each Project. For example, Projects can address potential activity-shifting leakage through their Social Additionality Plan. This plan may include strategies to mitigate risks by supporting stakeholders who might otherwise shift their activities outside the Project Area. To achieve this, Projects can promote alternative income-generating activities such as the development of Non-Timber Forest Products (e.g., honey or medicinal plants) and agroforestry initiatives that diversify crops by integrating trees with agricultural practices (e.g., multi-layered cropping systems or alley cropping). Additionally, sustainable practices like rotational grazing can be encouraged to optimise land use without expanding into new areas. Finally, it is essential to note that the design requirements of the ERS framework, with its emphasis on the three-pillar approach and a strong focus on livelihoods, inherently minimise market leakage. The combination of social, environmental, and economic considerations in project design

	ensures that the need for external resources is reduced, lowering the likelihood of activity-shifting leakage. ☑ The answer is deemed satisfactory.

RP #8	
Document	M001
Section & Page	Section 'Carbon', subsection 'Methods', subsection 'Leakage' (page 27)
Description	As part of the Secretariat's proposal to phase out PRUs, we suggest removing the note on PRU-specific leakage impacts from the Standard. This adjustment would align with the proposed PRU removal, pending TAB approval and stakeholder feedback.
Proposition	Delete Help Section 'Leakage emissions are determined at Project start, and thus, are accounted for in the issuance of Projected Restoration Units. Reassessment of Leakage at year 2 and/or 4 that reveals underestimations or overestimations of leakage emissions will not impact the quantity of Projected Restoration Units (PRUs). Instead, these adjustments will exclusively affect the discount factor applied during each issuance, thereby impacting the Verified Restoration Units (VRUs). More details can be found in the Units & Issuance section of the ERS Programme.'

Programme

RP #9	
Document	Programme
Description	This revision consolidates several updates to the Programme to reflect the proposed phase-out of Projected Restoration Units (PRUs) and the transition to a single unit type, Verified Restoration Units (VRUs). In the "General Project Requirements" section, the lingo surrounding the issuance and serialisation of Restoration Units has been updated to reflect the exclusive use of VRUs. References to PRUs have been deleted or replaced. The "Units & Issuance" section has undergone significant changes, with the removal of all references to PRUs, including the sections dedicated to PRUs and the related process of conversion. Specifically, the concept of over/underperformance has been removed, as it no longer applies without PRUs. Furthermore, specific updates have been made in the "Certification Procedures" section, to delete PRUs transfer process and adjust the language regarding the handling of VRUs during the Verification Cycle. Other changes include updates to the "Project Deviation Procedures" and "Governance & Safeguards" sections to align with the new unit structure. This revision streamlines the Programme's unit and issuance processes, ensuring that only VRUs are issued, and aligns all related procedures with this simplification. It will be further reviewed and refined following feedback from the TAB and the Public Comment

	Period.

Proposition	*Whole document*
	• Mentions to 'Restoration Units' have been changed to 'Verified Restoration Units'. 'Restoration Units' lingo is only kept in a few requirements to define the general principles of Units.
	
	Section 'General Project Requirements', subsection 'Core Carbon Principles', subsection 'No double counting' (page 16)
	
	• Modify '4.2.1. **Unique issuance**. Only one Verified Restoration Unit (VRU) is issued for each 1tCO2e of net GHG removal achieved.
	  ○ ~~Where a Project has issued Projected Restoration Units (PRUs), they are converted to VRUs upon Verification.~~
	  ○ ~~PRUs and~~ VRUs cannot be issued for achieved net GHG removals under both ERS and a national, regional, or local Emission Trading System, Binding Limit, or Compliance System.'
	• Modify '4.2.2. Serialisation of Units. All units~~, PRUs and VRUs,~~ are serialised, meaning they are assigned a unique serial number to ensure a distinct identity. Refer to the Labelling and Serialisation procedures in the Registry Procedures for more details.'
	• Modify '4.2.3. Robust Registry Procedures. To prevent double issuance, the ERS Registry includes the following features: Transparent management of the issuance, transfer, ~~conversion,~~ retirement and cancellation of Verified Restoration Units~~ (RUs)~~.
	
	Section 'Certification Procedures', subsection 'Validation' (pages 36-37)
	
	• Delete '1.2.3. PRUs are transferred into the Developer's account. Refer to *Units & Issuance* for more details.'

Section 'Certification Procedures', subsection 'Verification' (page 44)

- Modify 'Upon successful Verification, the ERS Secretariat ~~will~~ issue the corresponding ~~convert PRUs into~~ VRUs, reflecting the quantified net GHG removals achieved during the latest Verification Cycle. Refer to the *Units & Issuance* section for more details.

Section 'Units & Issuance', subsection 'Restoration Units' (pages 45-47)

- Delete '1.2. Restoration Units are split into two categories:
  1.2.1. Projected Restoration Units (PRUs)
  1.2.2. Verified Restoration Units (VRUs)'
- Delete entire section '2. Projected Restoration Units' (pages 45-46)
- Modify '3.2.1. ERS issues VRUs ~~as a result of PRU conversion~~ after a successful Verification during the Project crediting period.'
- Modify '3.2.2. ~~PRUs will convert into~~ VRUs are issued in a sequential manner, with each VRU having a unique serial number determining its issuance ~~conversion~~order.'
- Modify '3.3. **Allocation.** VRUs are issued sequentially, with 20% allocated to the Buffer Pool account, and the remaining 80% distributed equally between the Account Holders.~~All accounts are attributed VRUs according to their PRUs serial number ownership, including the Buffer Pool.'~~
- Modify example 'ERS will proceed with ~~converting~~ the issuance of the first 2,000 VRUs in the Buffer Account. Subsequently, ERS will issue ~~convert~~ the first 8,000 ~~serialised~~ VRUs in the Account Holders's accounts. ~~into VRUs.~~
- Delete Summary Table

Section 'Units & Issuance', subsection 'Over/Underperformance' (page 49)

- Delete entire section

Section 'Units & Issuance', subsection 'Compensation' (pages 50-52)

	• Delete '1.1.3. ERS Secretariat will not convert any PRUs for the given Verification Cycle.' • Delete '2.1.2. ERS Secretariat will not convert any PRUs for the given Verification Cycle.' *Section 'Project Deviation Procedures', subsection 'Project Expansion', subsection 'Inclusion Process', subsection '4. Units issuance' (page 54)* • Delete '4.1. PRUs. Units from the Project Expansion will be added to the Developer's account in the ERS Registry.' • Modify '~~4.2.~~ VRUs. ~~PRUs conversion into~~ VRUs will be converted with~~follow~~ the same Verification schedule as the initial Project~~PRUs~~. *Section 'Project Deviation Procedures', subsection 'Project Failure', subsection '6. Cancellation' (page 59)* • Delete '6.1. Remaining PRUs are cancelled.' *Section 'Governance & Safeguards', subsection 'Programme management', subsection 'Annual Third-Party Audits' (pages 74-75)* • Modify '5.5. Evaluation of the timely upload of Projects' documentation on the ERS Registry, and verification of the issuance ~~and conversion~~ of Verified Restoration Units.'

Registry Procedures

RP #10	
Document	Registry Procedures
Section & Page	Whole Document

Description	This revision consolidates various updates to the Registry Procedures to reflect the phase-out of PRUs. As such, several sections have been revised or deleted to reflect this shift toward a more streamlined approach based solely on VRUs. This revision removes mentions of PRUs across the Registry Procedures and proposes updates regarding sections linked to PRUs. In the "Registry Administration" section, the roles and permissions related to PRUs have been updated to focus exclusively on VRUs. The "Conversion" section in the Registry Operations has been removed, as it was related only to PRUs. The "Cancellation" section has been adjusted to remove references to Project underperformance, which are now no longer applicable without PRUs. Lastly, the "Serialisation" section has been updated to reflect that the serialisation will now be based solely on vintages. This revision may be refined following feedback from the TAB and the Public Comment Period.
Proposition	*Whole Document* • Mentions to 'Restoration Units' have been changed to 'Verified Restoration Units'. • Mentions to 'PRUs' are deleted. *Section 'Registry Administration', subsection 'Roles & Permissions in the Registry' (page 6)* • Modify '1.2. Secretariat. Secretariat users can issue and manage units, including the ability to convert, transfer and cancel PRUs and VRUs.' *Section 'Registry Operations', subsection 'Conversion' (page 14)* • Delete entire section. *Section 'Registry Operations', subsection 'Cancellation' (page 15)*

	• Delete section '1.1.4. A Project's underperformance. For more details about Project underperformance, please refer to the Over/Underperformance section in the ERS Programme.' *Section 'Labelling & Serialisation', subsection 'Serialisation' (page)* • Modify '6. ~~Issuance date (for PRU) or v~~Vintage~~ (for VRU)~~'
	1. Nathalie FLORES: '"Verified Ecosystem Restoration Units" would be aligned with ERS and also catchy.' Answer provided by ERS Secretariat: The idea of 'Verified Ecosystem Restoration Units' certainly has merit and aligns well with the objectives of ERS. We will take it into consideration as we continue to refine the methodology. ☐ The answer is deemed satisfactory.

Terminology & References

RP #11	
Document	Terminology & References
Section & Page	Section Glossary (page 1)
Description	Add several new definitions to enhance clarity and ensure consistent interpretation of updated sections in the Standard
Proposition	• Add: '**Secondary Forest Growth**[63]**:** refers to the natural regrowth of biomass within a previously degraded forest that begins to

	recover once active drivers of degradation, such as logging, agricultural encroachment, or grazing, are removed or controlled. This regrowth gradually restores canopy cover, species diversity, and ecosystem functionality. 63. Food and Agriculture Organization of the United Nations. (2005). Management of degraded forests and secondary forests in tropical America (FAO Forestry Paper No. 147). Available at: URL (Accessed 06/01/2024)' • Add: '**Degraded forest:** A type of degraded land where forest vegetation has been diminished either as biomass and/or species composition, affecting the forest's functionality, integrity and resilience due to human activity. See the definition of degraded land above for further details.' • Add: '**Business-as-usual scenario**: A projected scenario that models what would likely have occurred in the absence of the Project's interventions.'
Discussion Points from TAB members	1. Fidel CHIRIBOGA: Regarding the definition of Degraded forest, add in the definition that vegetation has been diminished 'either as biomass and/or species composition, affecting the forest's functionality, integrity and resilience' Answer provided by ERS Secretariat: We agree that adding the clarification on the diminution of vegetation will enhance the definition of Degraded Forest. We incorporated this suggestion directly into the revised definition. ☑ The answer is deemed satisfactory.

PROVISIONAL TIMELINE

Target deadline for TAB response (30 days): 20/12/2024

EXPECTED RISKS

List and describe the expected risks associated with the Standard Development Revision Proposition.

No risks have been identified by the Secretariat.

PUBLIC COMMENT PERIOD

Does the Secretariat consider that this Standard Development Revision Proposition requires a Public Comment Period?

- ☑ Yes
- ☐ No

If yes, please describe the scope of the expected Public Comment Period.

The ERS Secretariat suggests a Public Comment Period to gather stakeholder input on two key topics for the upcoming methodology: **the removal of Projected Restoration Units** (PRUs) and the **clarification of secondary forest growth definitions and quantification**. **PRUs** Since their introduction, PRUs have been a core component of the ERS Standard. They were initially developed as a tool to facilitate market transactions by providing Developers and Buyers with tangible assets immediately after Validation. This system allowed stakeholders to engage with the market early on, while Projects were still in their early phase.

However, following stakeholder feedback highlighting the complexity and potential confusion around the PRU mechanism, we would like to simplify ERS's unit mechanism. A formal consultation will be conducted to assess whether phasing out PRUs entirely is the best course of action. This consultation will determine whether focusing solely on the estimation and issuance of Verified Restoration Units (VRUs) within the PDD – without issuing any ex-ante credits – would be a more effective financing tool for the market.

Secondary Forest Growth

While M001.1 currently permits the restoration of all types of degraded lands as inland forests, the Project Scope of the methodology lacks definitions to explicitly include the possibility to issue Restoration Units for secondary forest growth arising from the conservation and/or rehabilitation of degraded forests.

The proposed updates focus on defining secondary forest growth more explicitly and establishing GHG quantification based on a conservative, dynamic baseline that credits net GHG removals only. This consultation will provide valuable insights to ensure that the definitions and quantification of secondary forest growth removals are presented in a clear, robust, and conservative manner in the updated methodology version.

TAB members decision

I agree that a public comment period is valuable for the scope outlined above

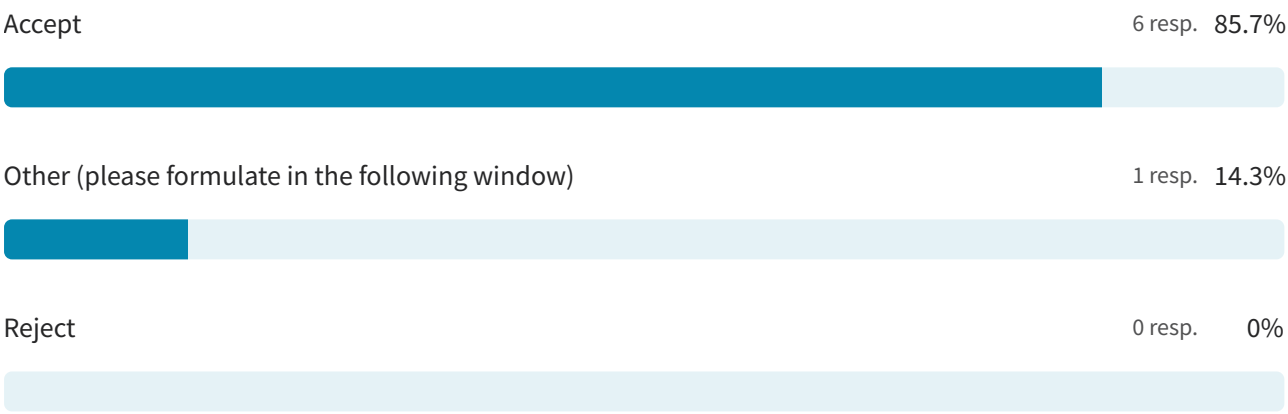
- ☑ Amy Bann
- ☑ Eduard Müller
- ☑ Fidel Chiriboga
- ☐ Nathalie Flores
- ☑ Robin Cole
- ☑ Sara Löfqvist

TAB Standard Revision Proposition RP003

7 responses

RP#1

7 out of 7 answered



RP#1

3 out of 7 answered

Take into account a legal framework check list.

All feedback for all sections are in the document

Accepted under the understanding that control plots are monitored over time with remote sensing only, and not with ground monitoring. If the latter is otherwise true, it's not clear what type of monitoring is expected to be performed in the control plots and to what extent, and land-tenure,

accessibility as well as amount of control plots (in nr and sizes) becomes relevant and should be described somewhere.

RP#2

7 out of 7 answered

Accept	7 resp.	100%
Other (please formulate in the following window)	0 resp.	0%
Reject	0 resp.	0%

RP#2

2 out of 7 answered

Legal framework checklist

Great approach

RP#3

7 out of 7 answered

Accept	7 resp.	100%
Other (please formulate in the following window)	0 resp.	0%
Reject	0 resp.	0%

RP#3

1 out of 7 answered

Take into account countries GHG inventiores (National comms, BTR and NFRL/FRL)

RP#4

7 out of 7 answered

Accept	7 resp.	100%
Other (please formulate in the following window)	0 resp.	0%

Reject 0 resp. 0%

RP#4

1 out of 7 answered

N/A

RP#5

7 out of 7 answered

Accept 7 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

RP#5

1 out of 7 answered

N/A

RP#6

7 out of 7 answered

Accept	7 resp.	100%
Other (please formulate in the following window)	0 resp.	0%
Reject	0 resp.	0%

RP#6

2 out of 7 answered

Legal definitions of restoration and degradation

Technical detail: Mentioning in 1.1 "Projects aiming to restore forest cover on degraded lands through active and passive restoration strategies" has the risk of criticism from experts for keeping these two as separated. This can give a connotation of them being the only 2 ways of restoring forests, without taking into account the multiple possibilities of the combination between active and passive

restoration. This is remark is too small to promote it as a necessary change in this RP, but just sharing it for your consideration and relation to outreach communication

RP#7

7 out of 7 answered

Accept	7 resp.	100%
Other (please formulate in the following window)	0 resp.	0%
Reject	0 resp.	0%

RP#7

1 out of 7 answered

N/A

RP#8

7 out of 7 answered

Accept 7 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

RP#8

1 out of 7 answered

N/A

RP#9

7 out of 7 answered

Accept 7 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

RP#9

1 out of 7 answered

N/A

RP#10

7 out of 7 answered

Accept 7 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

RP#10

1 out of 7 answered

Use of the ERS acronym, suggestion: Verified Ecosystme Restoration Units

RP#11

7 out of 7 answered

Accept	7 resp.	100%
Other (please formulate in the following window)	0 resp.	0%
Reject	0 resp.	0%

RP#11

1 out of 7 answered

Should be at the beginning of the document

Any final, general comments, questions, suggestions, remarks? (optional)

2 out of 7 answered

Given along the online document

Not a critical perspective, but in case feedback is valuable: This RP has somehow been relatively tricky to review, as proposing text edits has the risk of opening new loops of revisions that would extend the revision time unnecessarily. It's not always straightforward to know where and how there are possibilities for suggestions, questions and comments, which delays the delivery of the review.

Version:
V1.2

Contact:
Ecosystem Restoration Standard
25 Rue de Frémicourt
75015 Paris, FRANCE
info@ers.org

TEMPLATE

Standard and Methodology Revision Proposition

SUMMARY

This Standard Development Revision Proposition (RP) is issued by the Ecosystem Restoration Standard (ERS) Secretariat and outlines proposed revisions for the upcoming release of ERS 1.2 and M001.2. This document is intended for review by ERS's Technical Advisory Board (TAB).

READING NOTES

Colour code:

- Every element written in gold refers to a new addition to ERS Standard documentation in an existing paragraph. Entirely new sections will appear in black font.

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REFERENCE

Standard Development Revision ID: RP004

Issuance date: 10/03/2025

REVISION PROPOSITION SUMMARY

The ERS Secretariat submits Revision Proposition RP004 to the TAB, incorporating the latest advancements informed by internal Research & Development (R&D) efforts and certification experience for Version 1.2. This Revision Proposition consolidates the TAB-driven updates for Version 1.2 across multiple key areas, including:

- Removal of **51.6 coordinates** from M001 scope;
- Revisions to **permanence**, buffer, and unit monitoring requirements;
- Simplification of **reference site accessibility** requirements;
- Deletion of **environmental surplus** requirements during additionality assessment;
- Revisions to **working group** requirements and procedures;
- Updates to **fire prevention** requirements;
- Adjustments to **loss event thresholds**, shifting from a 1ha fixed value to a percentage of AGB;
- Addition of a **crediting period renewal** option;
- Introduction of a method for **carbon curve modeling**;
- Transition from **Woody/Non-woody masks** to AGB Provider data only;
- Specification of **thinning** requirements and best practices; and
- Clarified requirements related to introduction of **NTFPs**.

In parallel, the Secretariat is also undertaking a broader restructuring of the document architecture. A new core document called Standard will be introduced to clearly distinguish Standard requirements applicable to all Developers. The Programme document will include overarching rules related to roles, programme governance, and procedures. As part of this restructure, M001 requirements that apply to all projects (e.g., stakeholder consultation requirements) will be transferred to the Programme or Standard, as appropriate. While no new requirements will be introduced as part of the document restructure, the Secretariat informs the TAB that some revisions outlined below may be relocated to another section or a new document to align with the updated architecture.

The Secretariat invites the TAB to review this Revision Proposition and looks forward to the TAB feedback.

PROPOSED REVISIONS

Revision 1: Remove 51.6 coordinates from M001 scope

RP #1	
Document(s)	M001
Section & Page	Section 'Eligibility Criteria' (page 7)
Description	Given that our AGB Provider Chloris Geospatial can assess AGB beyond Global Ecosystem Dynamics Investigation (GEDI) coverage, latitude and longitude restriction should be removed as eligibility criteria from M001.
Proposition	Section 'Eligibility Criteria', subsection '1. Project Scope' (page 7) • Delete: '2. The Project must be situated in inland forest landscapes between latitudes 51.6° N and 51.6° S. This is due to limitations with the models used for AGB quantification of woody biomass.'

Discussion Points from TAB members	1. Fidel Chiriboga: With this update, would it be accurate to consider that all forest landscapes are within scope of ERS certification, now including non tropical and subtropical, but also temperate and boreal? Would it make sense to revisit the definitions of forest within scope, and make sure that this is formulated accordingly? Answer provided by ERS Secretariat: ERS acknowledges the concern and confirms that this point is already addressed under requirement 1.4 of the **Project Scope** in the M001, which states: *"The Project must be restored to one of the following biomes according to the IUCN Global Ecosystem Typology: 'Tropical-subtropical forests' (T1), 'Temperate-boreal forests' (T2), 'Trophic savannas' (T4.1), 'Pyric tussock savannas' (T4.2), 'Hummock savannas' (T4.3) or 'Temperate woodlands' (T4.4)."* This requirement ensures that the removal of the previous latitude-based eligibility criterion does not broaden the scope beyond these defined biomes. Forest landscapes eligible for ERS certification remain those that fall within the listed ecosystem categories, including temperate and boreal systems. However, ERS recognises that the term *forest* is not currently defined in the **Terminology & References** section. ERS will include a formal definition in the next revision of its documentation to ensure consistency and clarity. ERS may reach out to the TAB for additional feedback on this definition. ☑ The answer is deemed satisfactory.

Revision 2: Revise permanence, buffer, and unit monitoring requirements

RP #2A

Document(s)	M001
Section & Page	Section 'Carbon', subsection 'Methods', subsection 'Permanence' (pages 24-25)
Description	This revision updates the monitoring and compensation requirements for loss events within the Project Area. The changes clarify the duration of monitoring by ERS, specifying a fixed period of 100 years from the Project start date, instead of an indefinite timeframe. Additionally, the revision formalises the requirement for continuous monitoring of loss events throughout the crediting period.
Proposition	Modify '2.2. 'ERS continuously monitors loss events using remote sensing ~~throughout the Project's crediting period and as long as the organisation exists~~ for a period of 100 years from the Project start date.' Modify '2.2.1. Developers must ~~are also required to~~ monitor loss events in the Project Area continuously throughout the crediting period ~~on an ongoing basis~~.' Modify '2.3.2. If reversals occur during the crediting period, VRUs must be compensated through the Buffer Pool mechanism. Refer to the *Compensation* section in the ERS Programme for more details.'
Discussion Points from TAB members	1. Sara Löfqvist: Should anything be said here about how often updates on loss are required? Or how long after a loss event ERS needs to be informed? Answer provided by ERS Secretariat: Loss events are addressed through two reporting mechanisms in the Standard. First, Developers are required to report all identified loss events of the year in a

	dedicated section of the Annual Report. Secondly, as stated in the M001, if the Developer or ERS identify a loss event, they must notify the other party within thirty (30) calendar days from the date of loss identification. ☑ The answer is deemed satisfactory.

RP #2B	
Document(s)	Programme
Section & Page	Section 'Certification Procedures', subsection 'Monitoring', subsection 'GHG quantification' (page 39)
Description	Similarly, this revision clarifies our MRV procedures in the Programme regarding the duration of monitoring, specifying a fixed period of 100 years from the Project start date.
Proposition	Modify '1.2. To ensure the permanence of all VRUs issued during the crediting period, ERS continuously monitors Project Areas and their Leakage Belts remotely through satellite imagery over a 100-year period from the Project start date. ~~to track forest cover change and detect loss events~~ In the event of any Reversals, refer to the Compensation section for more details.'
Discussion Points from TAB members	1. Fidel Chiriboga: Are there any discussions on monitoring market leakage? I know this is much more complex but curious if you have any thoughts on this.

	Answer provided by ERS Secretariat: As of now, ERS is considering market leakage *de minimis* as our scope is limited to the development of project-based activities. However, while it's not a priority, it is part of our future improvements and limitations as stated in the corresponding document. ☑ The answer is deemed satisfactory.

Revision 3: Simplify reference site accessibility requirement

RP #3A	
Document(s)	Reference Ecosystem Guidelines
Section & Page	Section 'Reference Ecosystem Selection', subsection 'General Principles' (pages 3-4)
Description	This revision simplifies the accessibility requirements for Reference Sites, providing flexibility for Developers. The changes clarify that the Reference Site must be accessible up to the Project registration date rather than throughout the entire crediting period. Additionally, a new provision specifies what Developers should do if a 40-year-old Reference Site is unavailable, providing a clear pathway for selecting a younger site while ensuring it meets other necessary attributes.
Proposition	Modify '1.1 Be accessible to the Developer from the Project Feasibility Stage through to the Project registration date to collect reference data to inform baseline calculations and, if deemed necessary by the VVB,

	to undergo assessment during the Validation process. ~~when necessary, be validated during Validation.~~ Add new section '4. The Reference Site must be at least 40 years old. However, if the Developer is unable to locate a site of this age within the region, a younger Reference Site may be selected, provided it meets the other attributes defined in this section. In such cases, the Developer must follow the Project Deviation Procedures outlined in the ERS Programme.'
Discussion Points from TAB members	

RP #3B	
Document(s)	M001
Section & Page	Section 'Ecological Recovery', subsection 'Principles', subsection 'Ecosystem Restoration' (page 9)
Description	Similarly, this revision in M001 clarifies that the Reference Site must be accessible up to the Project registration date rather than throughout the entire crediting period.
Proposition	Modify '1.2.2. The Reference Site must be physically accessible by the Developer from the Project Feasibility Review through to the Project registration date ~~throughout the crediting period~~.'

Discussion Points from TAB members	1. Fidel Chiriboga: I wonder how ERS' methodology is developing towards biodiversity monitoring. My rationale here is that, with this new update, the reference forests have the possibility of being degraded or disappearing, so an appropriate assessment of their biodiversity for future comparisons would be ideal. I'm not on top of which diversity metrics, indicators, and methods are currently being used or are in the pipeline for future implementation, and I reckon this is likely in development, but it would be great to know how ERS would envision such proper assessments of reference forests. Furthermore, with my personal interpretation that this update allows the degradation or removal of reference forests (please correct me if I'm wrong), and thinking that this would be unfortunate conservation-wise, I wonder if future development of conservation of standing forests would favor such reference forests in particular, to promote extra incentives for their protection. 2. Sara Löfqvist: I have the same comment as Fidel. There are a lot of great work by Sophus zu Ermgassen on choosing counterfactuals to assess biodiversity impact. I am also curious if stronger monitoring safeguards for social impacts are in the planning, and if not if this is something we can discuss. Answer provided by ERS Secretariat: ERS acknowledges the importance of robust biodiversity monitoring, particularly in the context of long-term assessments linked to Reference Sites. The recent revision was introduced to acknowledge that Reference Sites, being external to the Project Area, may not always be under the Developer's control. As such, requiring guaranteed access for 40 years was considered unfeasible in many contexts. Nonetheless, ERS remains committed to monitoring both carbon and non-carbon benefits, including biodiversity. The current methodology includes ecological assessments of both Reference and Restoration Site(s) based on field data, guided by a set of indicators derived from the Society for Ecological Restoration (SER) Recovery Wheel. These

	indicators address key ecological dimensions, including species diversity, structure, and ecosystem function. Please refer to ERS Field Assessment Guidelines for more details. Regarding safeguards for social impacts, ERS currently requires annual reporting on social indicators through the implementation of a Social Additionality Plan. In addition, ERS is planning to strengthen the livelihood-related criteria in version 1.3 of M001. This includes the planned introduction of livelihood-specific audits during the Project crediting period, in order to ensure that social outcomes are adequately and independently verified over time. ERS appreciates the constructive suggestions and views the continuous refinement of biodiversity and social impact safeguards as a key priority in methodology evolution. ☑ The answer is deemed satisfactory.

Revision 4: Delete environmental surplus requirements in additionality assessment

RP #4	
Document(s)	M001
Section & Page	Section 'Carbon', subsection 'Principles', subsection 'Additionality' (page 18) Section 'Carbon', subsection 'Methods', subsection 'Additionality' (pages 21-23)
Description	This revision removes the Environmental Surplus assessment from the procedures for demonstrating Additionality. Since the dynamic

	baseline already enables this check at every verification, the Environmental Surplus assessment was redundant. Removing it streamlines the framework and avoids unnecessary duplication of work for all stakeholders involved.
Proposition	Section 'Carbon', subsection 'Principles', subsection 'Additionality' (page 18) • Delete section 'Environmental Surplus' Section 'Carbon', subsection 'Methods', subsection 'Additionality' (pages 21-23) • Delete section 'Environmental Surplus'
Discussion Points from TAB members	

Revision 5: Revise working group requirements and procedures

RP #5	
Document(s)	Technical Advisory Board
Section & Page	Section 'Composition of the Technical Advisory Board', subsection '1. Group Members' (page 5) Section 'Working Groups' (pages 7 and 8)
Description	The revision simplifies the appointment process for working groups by

	creating a new process distinct from the TAB appointment process. Working group members will be selected directly by the Secretariat team through a more flexible process without requiring a formal call for applications. This change aims to streamline decision-making and improve efficiency for Standard and Methodology revisions.
Proposition	Section 'Composition of the Technical Advisory Board', subsection '1. Group Members' (page 5) • Modify '1.1.2. Take the lead in the mandate ~~and organisation~~ of Working Groups' Section 'Working Groups' (pages 7 and 8) • Modify '3. Appointment Criteria': ~~The appointment criteria for Working Groups are the same as for TAB members.~~ The Secretariat appoints Working Group members using the following criteria: **3.1. Expertise**. Working Group members must demonstrate strong technical expertise in the specific area relevant to the Working Group. **3.2. Diversity**. The selection process must ensure that invitations are extended to a diverse range of candidates representing various stakeholder groups. Efforts must be made to engage individuals of different genders, ethnicities, age groups, geographic backgrounds and abilities. Consideration should also be given to supporting the participation of neurodivergent individuals and individuals with differing physical abilities by facilitating accessible application and work processes. 3.3. Where relevant, TAB members can lead and/or participate in a Working Group. In such cases, the Secretariat must assign TAB members roles within the

	Working Groups.' • Modify '4. Appointment Process': The appointment process for Working Groups is as follows: ~~the *Regular Appointment Process of the TAB.*~~ 4.1. The Secretariat may appoint members either by issuing a call for applications or by proactively reaching out to relevant Stakeholders to apply to the Working Group following the guidelines established in the section above. 4.2. The Secretariat compiles a shortlist of candidates from the candidate pool. 4.3. The Executive Team reviews the list and selects candidates for the Working Group based on the appointment criteria.
Discussion Points from TAB members	1. Sara Löfqvist: One suggestion is to highlight "age groups" as a metric under the point about diversity. You could also add that efforts should be made to ease the application and work processes for neurodivergent experts and/or experts with different physical abilities. Answer provided by ERS Secretariat: Both suggestions are highly relevant. ERS has updated section '3.2 Diversity' with both languages, in line with principles of inclusivity and equitable engagement. ☑ The answer is deemed satisfactory.

Revision 6: Revise fire prevention requirements

RP #6	
Document(s)	M001

Section & Page	Section 'Carbon', subsection 'Principles', subsection 'Permanence' (pages 19-20)
Description	This revision ensures that fire monitoring and response efforts can include multiple approaches beyond fixed fire towers.
Proposition	Replace 'Installing fire breaks and fire towers in the Project Area' with 'Preparing a fire prevention and management strategy for the Project Area. This strategy must include a risk assessment and corresponding mitigation actions (e.g., dedicated infrastructure, equipment, or training) to be implemented.'
Discussion Points from TAB members	

Revision 7: Revise requirements for loss events from 1ha to a percentage of AGB

RP #7A	
Document(s)	M001
Section & Page	Section 'Carbon', subsection 'Methods', subsection 'Permanence' (page 24).
Description	The revision adjusts the loss event reporting requirement to be more appropriate for large-scale Projects. Instead of using a fixed 1-hectare

	threshold, the new approach defines loss events based on a percentage of verified net GHG removals already achieved by the Project. This ensures that only significant losses trigger mandatory reporting, reducing excessive and unnecessary notifications while maintaining the integrity of permanence monitoring.
Proposition	Modify '2.2.2: If the Developer or ERS identify a loss event inside the Project Area that results in a cumulative carbon stock reduction exceeding 5% of previously verified net GHG removals in pools accounted for within the project boundary~~is 1 hectare or bigger~~, they must notify the other party within thirty (30) calendar days from the date of loss identification.'
Discussion Points from TAB members	This addresses my comment above! Great!

RP #7B	
Document(s)	Terminology & References
Section & Page	Section 'Carbon', subsection 'Methods', subsection 'Permanence' (page 24).
Description	Similarly, this revision defines loss events based on a percentage of verified net GHG removals already achieved by the Project and not on a 1-hectare fixed value.

Proposition	Modify definition of Loss events : 'Loss event: A specific occurrence that leads to the release of previously sequestered carbon back into the atmosphere, where the cumulative reduction exceeds 5% of previously verified net GHG removals in carbon pools accounted for within the project boundary. ~~For a loss event to be considered, its spatial extent must be equal or superior to one hectare.'~~
Discussion Points from TAB members	1. Fidel Chiriboga: Is there an option to see more on which grounds the 5% threshold has been calculated or decided upon? Answer provided by ERS Secretariat: The 5% threshold reflects a conservative buffer commonly used across carbon market standards to manage loss events. ☑ The answer is deemed satisfactory.

Revision 8: Add crediting period renewal option

RP #8	
Document(s)	Programme
Section & Page	Section 'General Project Requirements', subsection 'Key Project Dates & Crediting Period' (page 11) Section 'Certification Procedures' (page 37)
Description	The revision allows Projects to renew their crediting period if they can demonstrate continued ecological progress. Specifically, it ensures that Projects with verifiable evidence of ongoing restoration, such as

	biomass growth or ecosystem improvements, have a pathway to extend their crediting period and continue generating carbon benefits.
Proposition	Section 'General Project Requirements', subsection 'Project Start Date and Crediting Period' (page) • Modify '7. The crediting period cannot be extended ~~or renewed further~~.' • Add '8. The crediting period may be renewed in 20 year periods, not to exceed 100 years in total from the Project start date. In order to renew the crediting period and demonstrate that the Project still delivers measurable and additional impacts, Developers must: ○ Demonstrate conformance with the requirements in the latest versions of the ERS Programme and methodology. ○ Undergo reassessment by ERS and revalidation by a VVB. ○ Complete the crediting period renewal process within twelve (12) months after the end of the current crediting period. Refer to the *Renewal* section in the Certification Procedures for more details.' Section 'Certification Procedures' (page 37) • Add a new section Renewal to add all requirements: **'RENEWAL** 1. **Re-assessment**. The Project must demonstrate conformance with the latest version of the ERS Programme and methodology requirements for review and assessment by ERS. 1.1 Where necessary, Developers must update the Project Design Document, focusing on the following components:

	○ Baseline Scenario; ○ Additionality; ○ Ecological Recovery Baseline; ○ Community Consultation; ○ Safeguards Declaration; ○ Project Budget; ○ Risk Assessment. For more details about the review by ERS, please refer to the *Project Design Review* section. **2. Validation.** The Project must undergo third-party re-Validation in accordance with the Validation and Verification Procedure. 2.1. In the event of a successful Validation: ○ The Project crediting period is officially renewed. ○ The new Validation Report and the updated Project Design Document are published on the ERS Registry. **3. Timeline.** The Project must complete the renewal process within twelve (12) months following the end of the current crediting period. **4. Fee Schedule**. Refer to the ERS website for the detailed Fee Schedule for Renewal.'
Discussion Points from TAB members	1. Fidel Chiriboga: I wonder if future potential updates allowing for conservation methodologies would see the renewal of projects in scope of this update as conservation rather than restoration? A definition threshold would be interesting to formulate. If future updates go in that direction, it would be interesting to see how restoration projects that transition into

	conservation are favored or provided incentives for maintainance. 2. Sara Löfqvist: Agree with this! Answer provided by ERS Secretariat: ERS recognises the importance of this element. As ERS develops additional methodologies, such as one focused on conservation, it is anticipated that some Projects may seek to transition from restoration to conservation at the time of crediting period renewal. These implications will be carefully examined, and appropriate solutions will be identified during the development of any future methodology, including the definition of eligibility thresholds and a dedicated framework for such transitions under the ERS Programme. ☑ The answer is deemed satisfactory.

Revision 9: Add a method for carbon curve modelling

RP #9	
Document(s)	M001 - Quantification Methodology
Section & Page	Section 'Carbon Stock Quantification', subsection 'GHG removal capacity' (pages 16-17) Appendix 4 (page 49)
Description	This revision introduces carbon sequestration curves into the Project Design Document (PDD), ensuring greater transparency in carbon credit projections. The curve provides a structured projection of expected carbon credit issuance throughout the crediting period, based on a standardised methodology that applies conservative AGB

	growth rates across diverse climatic regions. Appendix 4 has been added to the M001 - Quantification Methodology to detail the scope, applicability and construction methodology of the carbon curve. The full section can be found in **Annex 1** of this Standard and Methodology Revision Proposition.
Proposition	Section 'Carbon Stock Quantification', subsection 'GHG removal capacity' (pages 16-17) • Add new section '2. **Carbon curve modelling** **2.1. Principles**. Carbon curves represent a projection of the expected issuance of VRUs throughout the crediting period. **2.2. Requirements.** The carbon curve must be included in the PDD and made publicly available on the Registry. 2.3. The carbon curve must be updated every four years as part of the Adaptive Management process to reflect any changes in the Project's conditions and to incorporate the latest available data related to the Project. For a detailed explanation of the carbon curve calculation methodology, including a comprehensive explanation of the calculation process, the assumptions made, and factors influencing the accuracy of projections, please refer to Appendix 4.' Appendix 4 (page 49) • Refer to the *Annex 1*
Discussion Points from TAB members	

Revision 10: Change Woody/Non-woody masks to AGB Provider data

RP #10	
Document(s)	M001 - Quantification Methodology
Section & Page	Section 'Carbon Stock Quantification' (pages 8-17)
Description	This revision removes the distinction between woody and non-woody vegetation masks, as our AGB Provider data now allows for a more robust and unified approach to assessing both vegetation types. By applying this method across the entire Restoration Site, this update simplifies the process, enhances consistency, and improves the accuracy of biomass assessments.
Proposition	Due to the extensive changes, including multiple deletions and modifications across paragraphs and subsections, the full revision can be accessed through the following links: • Version 1.1 with tracked modifications: link. • Final proposed version 1.2 language for clearer reference: link.
Discussion Points from TAB members	

Revision 11: Add thinning requirements and best practices

RP #11	
Document(s)	M001
Section & Page	Section 'Ecological Recovery', subsection 'Principles', subsection 'Restoration Interventions' (page 10)
Description	This revision introduces requirements and best practices for thinning as part of the Ecological Recovery requirements established in M001. It establishes clear guidelines to ensure that, if implemented, thinning is conducted as part of a sustainable management plan. Additionally, robust monitoring requirements are introduced to ensure conformance with the approved plan.
Proposition	**2.6. Thinning practices**. Thinning refers to the selective removal of trees or vegetation to reduce density and improve forest structure in order to support ecosystem restoration objectives.[1] Thinning may be used in the Restoration Site during the Project's lifetime. 2.6.1. Projects using thinning practices must design and implement a sustainable management plan. The plan must be detailed in the PDD and must include: • The ecological rationale, demonstrating the necessity of thinning for restoration; • The targeted species and restoration sites; • The thinning practices to be used and their expected outcomes; • The estimated percentage reduction in total biomass

	(including AGB and BGB) resulting from thinning activities, compared to the biomass levels recorded at the beginning of the current Adaptive Management cycle; • Measures to mitigate potential environmental impacts, such as erosion or biodiversity loss; • Plans for the utilisation or disposal of removed biomass (e.g., decomposed on-site, used for local sustainable projects, commercialised). 2.6.2. **Evaluation**. ERS must review the sustainable management plan and may reject them if the provided information is inadequate or lacks sufficient detail. **2.6.3. Monitoring**. ERS must monitor changes in AGB within the specific area and timeframe outlined in the Restoration Plan, comparing these measurements to the baseline or reference levels set in the previous year's assessment. • If the monitored AGB reduction exceeds the threshold set in the Restoration Plan, the Project must provide a comprehensive justification for the discrepancy. This justification must be included in the following Annual Report, detailing the reasons for the variation and any actions taken to address or mitigate it. • If ERS determines that the justification is insufficient or inadequate, the event will be classified as a Loss Event and must follow the reversal procedures outlined in the *Compensation* section of the Programme. [1] Cristina Gonçalves, A. (2021). Thinning: An Overview. IntechOpen. doi: 10.5772/intechopen.93436
Discussion Points from TAB members	

Revision 12: Modification to uncertainty calculation with Monte-Carlo

RP #12	
Document(s)	M001 - Quantification Methodology
Section & Page	Section 'Uncertainty & Conservativeness', subsection 'Uncertainty' (pages 37-39)
Description	This revision enhances the uncertainty quantification methodology to improve accuracy and spatial representation. The Monte Carlo approach now samples Aboveground Biomass (AGB) values from a log-normal distribution, ensuring positivity and better reflecting biomass variability. Additionally, a spatial correlation model is reintroduced and weighted directly by a correlation coefficient (ρ = 0.01) provided by our AGB Provider.
Proposition	Modify Section '3. **Quantification of Project Uncertainty** 3.1. The Monte Carlo approach involves ~~randomly~~ sampling AGB values at the pixel level from a log-normal probability density function ~~their respective probability density functions~~. These sampled values are then aggregated to calculate the overall AGB for the designated plot. 3.2. Through iterative sampling, the method constructs a comprehensive probability density function, capturing site-level uncertainty with precision. The key steps are outlined below: 3.2.1. For each pixel, a single AGB value is randomly selected from its predefined log-normal probability density function, where:

- The log-space mean μ_{log} and standard deviation σ_{log} are derived from the pixel's AGB estimate and standard error;

- Spatial correlation is incorporated by introducing a perturbation field composed of a global shock and a pixel-level independent noise term, weighted by a correlation coefficient ρ. In this methodology, a fixed value of ρ = 0.01 is used, as determined by our AGB Provider. This value reflects the low but non-negligible spatial dependence observed in biomass estimates~~probability density function and its associated standard error, reflecting the variability inherent at the pixel level.~~;

3.2.2. AGB values are expanded to include BGB estimates. Both AGB and BGB are transformed into their CO2e values;

3.2.3. The determined pixel-level GHG removals obtained are aggregated to estimate the total ~~net~~ GHG removals for the plot in the specific iteration. Once aggregated, deductions are made for leakage and baseline emissions from the verification cycle to derive the **net** GHG removals achieved during the cycle~~. This process ensures an accurate and conservative estimation of the project's actual contribution to GHG removal~~;

3.2.4. These steps are **iterated** to build a comprehensive probability distribution of net GHG removal at the plot level. During the iterations, the mean net GHG removal estimate stabilises as the simulation progresses. A minimum of 500 iterations must be~~is~~ performed to ensure robust and reliable results. More iterations may be conducted based on empirical observations.

	3.2.5. The resulting distribution represents the range of potential net GHG removal values.'
Discussion Points from TAB members	

Revision 13: Introduction of NTFP species in the Restoration Site(s)

RP #13	
Document(s)	M001
Section & Page	Section 'Non-Timber Forest Products (NTFPs)', subsection 'Planning' (page 34)
Description	The revision clarifies the requirements and extent to which Developers may introduce NTFP species to the Restoration Site(s).
Proposition	Modify Section '**7. Planning.** When~~Before~~ ~~initiating exploitation~~ introducing NTFP species to the Restoration Plan, Developers must: • ~~Assess and ensure compliance with the applicable regulatory framework.~~ • Determine potential species according to the requirements set out in the 'Ecological Recovery - Species Diversity' section . • Consult Stakeholders during the Community Consultation to understand their traditional practices, the cultural and/or spiritual value attributed to NTFPs, and their subsistence reliance on them. Feedback must be integrated into NTFP planning.

	• Demonstrate that the introduction of NTFP species is balanced, ensuring that they do not compete with other species for resources. The proportion of NTFP species within the overall species composition must be proposed by the Developer and justified based on site-specific ecological conditions. This justification must be supported by relevant peer-reviewed literature, ecological data, or other credible sources demonstrating alignment with the characteristics of the Reference Site.
Discussion Points from TAB members	1. Fidel Chiriboga: How has the 20% threshold calculated and decided upon? 2. Fidel Chiriboga: Would it be accurate to assume that allowed NTFPs are from native species? If so, would it make sense to mention it? If this is not necessarily the case (non-native NTFPS are allowed, which for socio-environmentally valuable non-invasive spp would make sense), how would this be handled? 3. Sara Löfqvist: Will there be any monitoring to ensure that the stakeholder consultation accounts for power-imbalances within communities, i.e. that it is not just the perspective of local elites that are captured? If so, what will this monitoring look like? Answer provided by ERS Secretariat: 1. The 20% limit was initially introduced as a conservative measure to align with ecological reference conditions and to minimise the risk of unintended impacts. However, we acknowledge that this threshold may be overly rigid in some contexts. In response to the TAB feedback, we have updated this revision to implement a case-by-case analysis. Projects should now propose a percentage, supported by a clear justification and relevant peer-reviewed literature or empirical evidence.

[redacted]	2. ERS does not currently require that all NTFPs be from native species. However, Developers must prioritise products that are traditionally harvested by local communities through Community Consultations and demonstrate that such practices do not threaten ecosystem structure or function. The selection of NTFPs must be justified in the Livelihood Matrix and assessed during project review. 3. To address power imbalances in stakeholder consultations, ERS has proposed updates to the Community Consultation Guidelines in the next revision proposition. These updates recommend that, where feasible, Developers may decide to gather input from additional community members (i.e., those who aren't leaders) through interviews or surveys to understand diverse perspectives outside of leadership. ERS welcomes feedback on this matter as part of the assessment of RP005. ☑ The answer is deemed satisfactory.

PROVISIONAL TIMELINE

Target deadline for TAB response (30 days): 10/04/2025

EXPECTED RISKS

List and describe the expected risks associated with the Standard Development Revision Proposition.

No risks have been identified by the Secretariat.

PUBLIC CONSULTATIONS

Does the Secretariat consider that this Standard Development Revision Proposition requires one or several Public Consultation(s)?

- ☐ Yes
- ☑ No

ANNEX 1

Appendix 4 – *Carbon Curve Modelling Methodology*

INTRODUCTION

1. Purpose

1.1. **Concept**. The carbon curve is a graphical representation of the projected issuance of Verified Restoration Units (VRUs) over the entire crediting period of the Project.

2. Scope of applicability

2.1. **Boundaries**. The carbon curve will operate within the same geographical and physical boundaries established in the Project's Zonation.

2.2. **Temporal framework**. Carbon curves must be aligned with the crediting period defined in the ERS Programme.

2.3. **Exclusions**. As per carbon curve methodological scope, Projects located in non-Tropical/non-Subtropical regions, or in Subtropical humid forest - Africa and Subtropical steppe - America as defined by IPCC[1], are excluded from this carbon curve framework.

METHODOLOGY

3. Principles

[1] For more details, refer to Food and Agriculture Organization of the United Nations (FAO). (2012). *Global ecological zones for FAO forest reporting: 2010 update*. FAO

1.1. Carbon curve modelling is conducted at the pixel level, for each pixel within the Restoration Site.

1.2. Each pixel's sequestration potential evolution is independently estimated and subsequently aggregated to produce the overall Project-level carbon curve.

1.3. The carbon curve must be included in the PDD, publicly available in ERS Registry.

4. Methods

1.4. General equation. ERS methodology is based on a sigmoid approach to model the curves, represented by the equation (34)

$$f(x) = C_{mean} \times (1 - e^{-(x/\lambda)^k}) \qquad (34)$$

Where:

- **k** is the shape parameter, controlling the initial acceleration of AGB growth and its asymptotic behaviour;
- $\mathbf{C_{mean}}$ represents the expected average AGB per hectare at maturity;
- **λ** is the scale parameter, specific to the studied biome, it governs the growth rate.

1.5. **Parameter Determination**. These parameters are based on a combination of empirical studies and established IPCC guidelines to ensure that the generated curves provided are both scientifically robust and aligned with ERS GHG removal quantification.

1.5.1. The value of **k** has been set between 1.5 and 2.5, based on empirical observations of forest growth patterns.

1.5.2. $\mathbf{C_{mean}}$ represents the expected average AGB per hectare at maturity of the pixel, delivered by the AGB Provider. Refer to the *Carbon Stock Quantification* Section for more details.

1.5.3. **λ** is calculated by deriving the general equation, ensuring that the inflexion point of the curve corresponds to the IPCC growth rates from the pixel's location and biome, as provided in the most recent IPCC Guidelines, "Table 4.10". Missing values are estimated by averaging existing values within the same biome.

1.6. **Uncertainty**. To account for uncertainties in growth rates and model parameters, we generate three distinct carbon sequestration curves:

1.6.1. The **default curve**, which represents the expected carbon sequestration using a baseline k value of 2 and the standard IPCC growth rate.

1.6.2. The **max boundary curve**, generated with a k value of 1.5 and the minimum growth rate.

1.6.3. The **min boundary curve**, generated with a k value of 2.5 and the maximum growth rate.

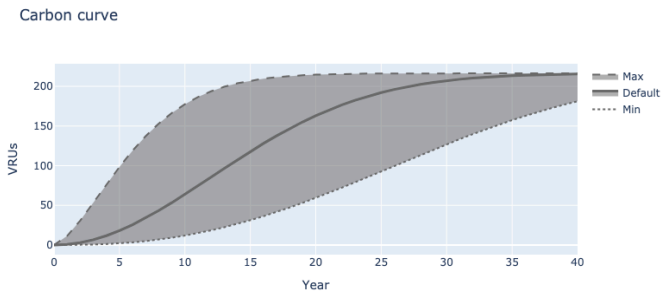

Figure 9. Example of a Carbon Sequestration curve in tCO2e

1.7. **Adjustment Factors**.

1.7.1. **Initial Stock**. The curves are adjusted based on the initial carbon stock of each specific land conversion. This adjustment involves shifting the curves along the x-axis (years) to ensure alignment with the initial carbon stock at year 0. This transformation minimises overall uncertainty, shifting the uncertainty curves closer to the default curve. Finally, the curve is adjusted along the y-axis to ensure it starts at 0 VRUs.

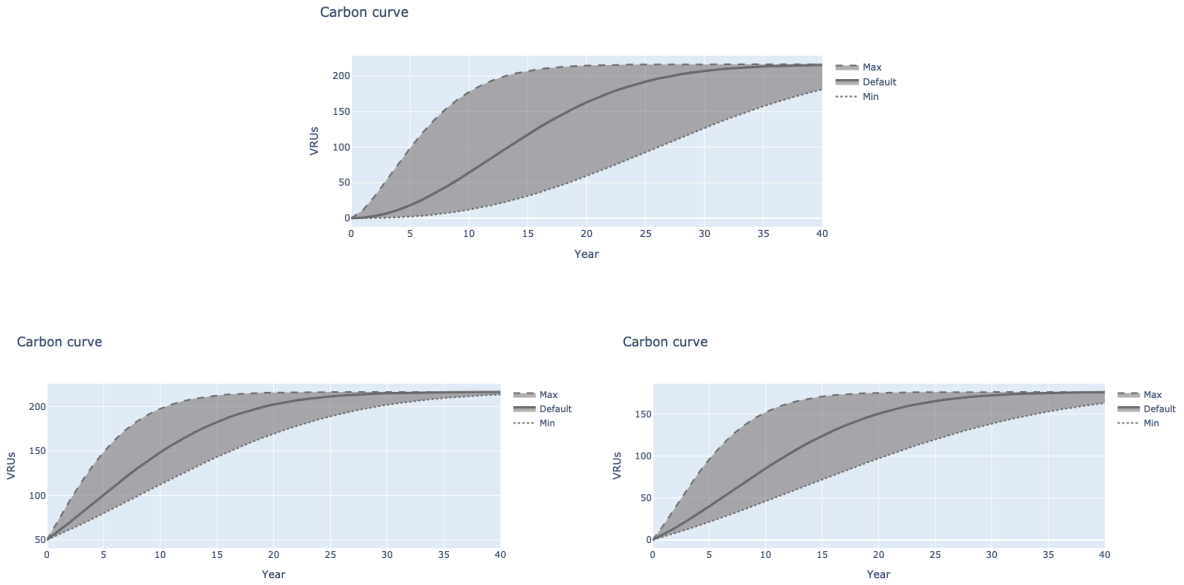

Figure 10. An Original curve compared to its shifted version starting at 50 tCO2e

1.7.2. **Activities Timing**. Carbon curves must start at the year specified in the Restoration Plan for plantation or intervention activities to ensure sequestration projections accurately reflect the timing of restoration interventions.

1.7.3. **Growth Rate**. If Developers provide substantiated evidence of an ecosystem-specific growth rate for the Project Area, supported by robust data and literature, the carbon curves may be adjusted. In such cases, rather than using the

IPCC's default growth rate, the curve will be matched with the newly provided growth rate, as detailed in the *Parameter Determination* Section.

1.8. **Curve implementation**. Once individual pixel-level carbon curves are generated, they are aggregated across the entire Restoration Site, weighting each pixel's contribution based on its area and sequestration capacity. The final carbon curve represents the total projected removals over the crediting period.

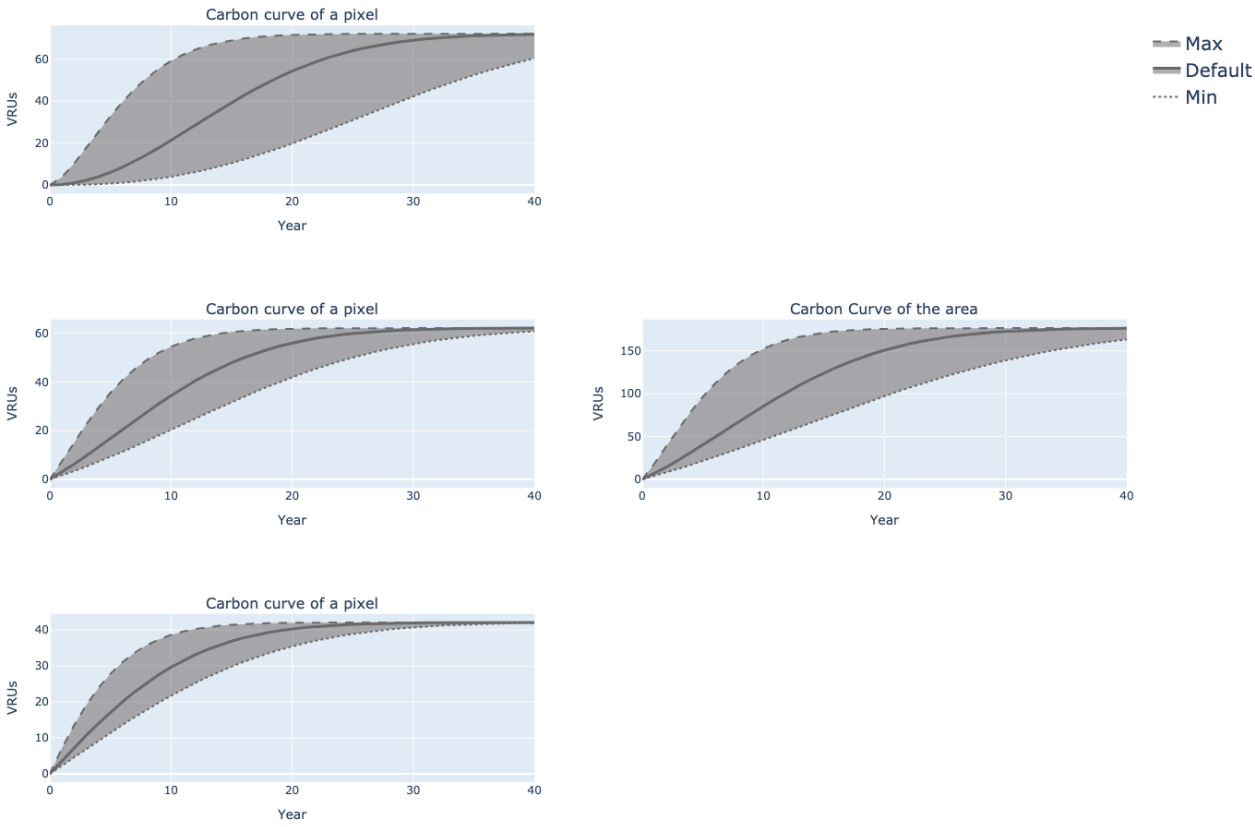

Figure 11. Example of a 3-pixels area

EX-POST TREATMENT

1. **Periodic Updates**. Carbon curves must be updated at every Verification Cycle to incorporate actual net GHG removals verified by VVBs. These updates ensure that the Project's credit issuance aligned with the actual project

performance rather than relying solely on projections made during earlier stages.

LIMITATIONS

1. This carbon curve methodology does not account for removals of species due to thinning or site preparation practices, and is solely focused on sequestration outcomes within the defined pools of the Project.

2. For more comprehensive details about the specific limitations and areas for potential improvement, please refer to the Future Improvements and Limitations documentation.

TAB Standard Revision Proposition RP004

6 responses

Revision 1

5 out of 6 answered

Accept	5 resp.	100%
Other (please formulate in the following window)	0 resp.	0%
Reject	0 resp.	0%

Revision 2

5 out of 6 answered

Accept	5 resp.	100%
Other (please formulate in the following window)	0 resp.	0%

Reject 0 resp. 0%

Revision 3

5 out of 6 answered

Accept 5 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

Revision 4

5 out of 6 answered

Accept 5 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

Revision 5

5 out of 6 answered

Accept 5 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

Revision 6

5 out of 6 answered

Accept 5 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

Revision 7

5 out of 6 answered

Accept 5 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

Revision 8

5 out of 6 answered

Accept 5 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

Revision 9

5 out of 6 answered

Accept 5 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

Revision 10

5 out of 6 answered

Accept 5 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

Revision 11

5 out of 6 answered

Accept 5 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

Revision 12

5 out of 6 answered

Accept 5 resp. 100%

Other (please formulate in the following window) 0 resp. 0%

Reject 0 resp. 0%

Revision 13

5 out of 6 answered

Accept 4 resp. 80%

Other (please formulate in the following window) 1 resp. 20%

Reject 0 resp. 0%

Version:
V1.2

Contact:
Ecosystem Restoration Standard
25 Rue de Frémicourt
75015 Paris, FRANCE
info@ers.org

TEMPLATE

Standard and Methodology Revision Proposition

SUMMARY

This Standard and Methodology Revision Proposition is issued by the Ecosystem Restoration Standard (ERS) Secretariat and outlines proposed revisions for the upcoming release of ERS v1.2. This document is intended for review by ERS's TAB.

READING NOTES

Colour code:

- Every element written in gold refers to a new addition to ERS Standard documentation in an existing paragraph. Entirely new sections will appear in black font.

- In the propositions, "(...)" is used for brevity and represents sections of text in the existing documentation that are unaffected by the revision proposition.

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REFERENCE

Standard Development Revision ID: RP005

Issuance date: 23/04/2025

Update date:

REVISION PROPOSITION SUMMARY

The Secretariat submits Revision Proposition RP005 to the TAB, incorporating the latest advancements informed by internal Research & Development (R&D) efforts and certification experience for Version 1.2. This Revision Proposition consolidates the TAB-driven updates for Version 1.2 across multiple key areas, including:

1. Development of a protocol for **field data collection**;
2. Addition of a process to allow for **deviations** and/or **exemptions** from Standard and methodological requirements;
3. Clarification to the certification process of **Pre-submission activities**;
4. Revision of the **carbon potential** approach and calculations;
5. Revision of **benefit-sharing mechanism** requirements;
6. Removal of **Final Revision Proposition** for Standard or Methodology revisions;
7. Revision of the **risk assessment matrix**;
8. Definition of **effective dates and grace periods** for all requirements;
9. Simplification of the **stakeholder mapping** requirements at Feasibility;
10. Revision of **VRU accounting methodology**;
11. Refine **percentile applied in Monte Carlo simulations** for carbon stock accounting;
12. Upgrades to the **random plot system** for the ecological recovery assessment;
13. Expansion of **site preparation requirements** & related emissions potential.

As a reminder, the Secretariat is undertaking a broader restructuring of the document architecture. A new core document called Standard will be introduced to clearly distinguish Standard requirements applicable to all Developers. The Programme document will include overarching rules related to roles, programme governance, and procedures. As part of this restructure, M001 requirements that apply to all projects (e.g., stakeholder consultation requirements) will be transferred to the Programme or Standard, as appropriate. While no new requirements will be introduced as part of the document restructure, some revisions

outlined below may be relocated to another section or a new document to align with the updated architecture.

The Secretariat invites the TAB to review this Revision Proposition and looks forward to the TAB feedback.

PROPOSED REVISIONS

Revision 1: Development of a protocol for field data collection

RP #1A	
Document	M001 - Quantification Methodology
Section & Page	Section 'Initial Carbon Stock' subsection 'Biomass Quantification of the Restoration Site' (p. 9) Section 'Final Carbon Stock', subsection '3. Carbon Stock at Reference Site' (p. 14) Section 'GHG removal capacity', subsection 'GHG removal capacity of the Restoration Site' (pp. 17-18)
Description	This revision introduces a new protocol for calibrating Above-Ground Biomass (AGB) values using field data, allowing Developers to improve the accuracy of biomass estimates when project-specific measurements are available. The Protocol applies to the initial carbon stock and carbon stock evolution of the Restoration Site, and the carbon stock at the Reference Site. Upon request, Developers may calibrate the default AGB values with field data, provided they follow all requirements outlined in the

	Protocol for Field Data Calibration. This Protocol ensures consistency and methodological rigor for field data collection. References to the Protocol have been added to relevant sections in the Quantification Methodology.

Proposition	• Protocol for Field Data Calibration can be found directly in *Annex 3* of this document.
	• Section 'Initial Carbon Stock' subsection 'Biomass Quantification of the Restoration Site' (p. 9)
	  ○ Add '2.1.2. At the Developer's request, the AGB value provided may be calibrated using field data. This calibration is subject to compliance with the specifications set out in the Protocol for Field Data Calibration.'
	• Section 'Final Carbon Stock', subsection '3. Carbon Stock at Reference Site' (p. 14)
	  ○ Add ' 3.1.1. The AGB value of the Restoration Site, referred $\mathbf{AGB}_{rest}$, is calculated using the AGB map provided through a Monte Carlo approach. Refer to the *Uncertainty & Conservativeness* section for more details.
	  3.1.2. At the Developer's request, the AGB value provided may be calibrated using field data. Calibration must conform with the specifications set out in the Protocol for Field Data Calibration.
	• Section 'GHG removal capacity', subsection 'GHG removal capacity of the Restoration Site' (pp 17-18)
	  ○ Add '1.2. At the Developer's request, the AGB value provided may be calibrated using field data. Calibration must conform with the specifications set out in the

	Protocol for Field Data Calibration.'
Discussion Points from TAB members	

RP #1B	
Document	Terminology & References
Section & Page	Section 'Carbon', subsection 'Future Improvements' (p. 5)
Description	This revision updates the section on future improvements to reflect ongoing efforts to enhance AGB model calibration using field data. It acknowledges current limitations—such as plot representativeness, timing alignment, and spatial resolution differences
Proposition	• Modify '**AGB model Calibration using Field Data.** Field data calibration enhances model precision, particularly in heterogeneous or data-sparse regions. However, certain limitations remain. Ensuring the representativeness of sample plots, aligning measurement timing with remote sensing data acquisition, and matching spatial resolutions between datasets are all critical to calibration quality. To address these challenges, ERS will continue to evaluate new data collection techniques and consider the integration of more advanced calibration models as needed. These improvements are designed to further strengthen the robustness and credibility of

	carbon estimates across Projects.'
Discussion Points from TAB members	

RP #1C	
Document	M001
Section & Page	Section 'MRV Procedures', subsection 'Indicators & Parameters' (p. 40)
Description	This revision introduces a dedicated section to M001 clarifying the process and timing for applying field calibration to carbon stock calculations.
Proposition	• Add a section '3. **Field calibration** 3.1. Field calibration may be applied to any carbon stock calculation. 3.2. For carbon potential accounting, Developers must submit their calibration request no later than thirty (30) calendar days after receiving the GHG Parameters and Baseline Calculation Report. 3.3. For VRU accounting, Developers must submit their calibration request no later than sixty (60) calendar

	days before submitting the Annual Report for the current year. 3.4. Requests submitted after these deadlines may not be accepted if they risk delaying the certification process. 3.5. Refer to the Protocol for Field Data Calibration for more details on calibration procedures.'
Discussion Points from TAB members	

Revision 2: Addition of Requirements and Procedures for Deviations

RP #2	
Document	Programme
Section & Page	Section 'Project Deviations Procedures' (p. 57)
Description	This revision does the following: • Defines the types of deviations that may be requested and implemented by Developers. • Sets out procedures to be followed by Developers to request deviations and ERS to review and approve or deny deviation requests.

Proposition	• Section 'Project Deviations Procedures' (p. 57) ○ Add '**Project Deviations**' section above '**Project Expansion**'. See *Annex 1* of this document for the full text.
Discussion Points from TAB members	

Revision 3: Clarified Principles and Requirements for Pre-Submission Activities

RP #3	
Document	Programme Terminology & References
Section & Page	Programme: Sections 'Pre-Submission Activities' (p. 12); 'Certification Procedures', subsection 'Project Feasibility Review' (p. 36); 'MRV Procedures, subsection 'Reporting', 'GHG Quantification' (pp. 44-45); 'MRV Procedures, subsection 'Reporting', 'Project Interventions' (pp. 45); 'Verification' (p. 48) Terminology & References (p. 13)
Description	The revisions better define and clarify the ERS requirements for pre-submission activities (i.e., Project activities and interventions implemented on or after the Project start date, but before the Project is submitted to ERS).

	All Project activities, including pre-submission and site preparation activities, are subject to the rules and requirements set out in the Programme and applied methodology. However, the new requirements leave some flexibility for Projects that started activities before the ERS Programme was released. Developers must clearly report on all pre-submission activities in the Feasibility Study Report and identify any potential non-conformities to be corrected.

Proposition	• **Terminology & References**
	  ○ Modify: **Pre-submission activities**: Project ~~Set of~~ activities ~~or tests~~ implemented ~~performed~~ by the Project on or after the Project start date and ~~Proponent~~ before ~~to test the viability, efficacy and efficiency of restoration practices in a particular area~~ before submitting a Project proposal ~~through~~ to ERS~~' website~~.
	• **Programme**
	  ○ New Section **'Pre-Submission Activities'** (after Section 'Ownership and Carbon Rights', p. 12, noting these sections will be restructured in v1.2)
	  ■ Pre-submission activities must meet the requirements set out in this document and the applied methodology.
	  ■ Projects must report on pre-submission activities during the Project Feasibility phase in line with the requirements set out in the 'Reporting' and 'Certification Procedures' sections below.
	  ○ Section 'Certification Procedures', subsection 'Project Feasibility Review' (p. 36)
	  ■ Modify: 2.1 Every Project must submit a ~~A~~ Feasibility Study Report ~~must be submitted per Project~~.
	  ■ Modify: 2.2 The Feasibility Study allows ERS to assess ~~verify~~ the Project's adherence to

Methodology ~~-specific~~ requirements and ~~to the following~~ Programme requirements, with particular attention to (…)

- New: 2.3 In the Feasibility Study, Projects must identify any requirements that pre-submission activities may not be in conformance with, and a plan to bring the Project into conformance. ERS assesses the potential non-conformities and may approve temporary deviations on a case-by-case basis.
- New: 💡ERS acknowledges that some Projects may have implemented pre-submission activities before the first version of the ERS Programme was released, and therefore were not able to implement activities in line with the rules and requirements. ERS considers any deviations from the requirements on a case-by-case basis following the Project Deviations procedures set out on p. 57 below.

- Section 'MRV Procedures, subsection 'Reporting', 'GHG Quantification' (pp. 44-45)
  - Modify: 1.1 ERS quantifies the Project's net GHG removals before each Verification throughout the crediting period. This includes quantifying emissions and removals associated with pre-submission activities and site preparation. Carbon parameters established in the Quantification Methodology are monitored and used for such measurement.
- Section 'MRV Procedures, subsection 'Reporting', 'Project Interventions' (pp. 45)
  - New: 2.1 Developers must report on and measure any pre-submission activities.
- Section 'Verification' (p. 48)
  - New: 2. Projects with pre-submission activities (i.e., Projects submitted to ERS after the Project

	start date) may either: • Undergo Validation alone, in which case the pre-submission activities will be included in the Verification; or • Undergo Verification at the same time as the initial Validation. ■ New: 📌 A Project with a start date of 1 January 2022 wants to begin the certification process with ERS. The Developer submits the Project to ERS on 1 January 2023. After passing through the Feasibility & Project Design phases, the Project begins validation & verification on 1 June 2023. The Project is validated and activities from 1 January 2022 until 1 January 2023 are verified. The activities that took place between 2 January 2023 - 30 May 2023 will be verified as part of the Project's next verification.
Discussion Points from TAB members	1. Sara Löfqvist: [Related to revision 'Modify: 2.2 The Feasibility Study allows ERS to assess ~~verify~~ the Project's adherence to Methodology ~~specific~~ requirements and ~~to the following~~ Programme requirements, with particular attention to(…)'] Is there a mistake here or will this be filled out later on? Answer provided by the ERS Secretariat: 1. The use of "(…)" was intentional and serves to abbreviate the sentence by omitting parts of the section not affected by the revision. A clarifying note has been added to the *Reading Notes* section of this Revision Proposition. ☑ The answer is deemed satisfactory.

Revision 4: Revision of the carbon potential approach and calculations

RP #4	
Document	M001 - Quantification Methodology
Section & Page	Section 'Carbon Stock Quantification', subsection 'Final Carbon Stock' (pp. 14-15)
Description	This revision introduces a new section outlining the different scenarios for assessing the carbon stock of the Reference Site, depending on whether it meets the age requirement. The update clarifies the step-by-step process ERS follows upon receiving the Reference Site shapefile, including how to proceed if the site meets all criteria or if it falls short on the age requirement.
Proposition	• New: **2. Assessment of the Reference Site** 2.1. Upon receipt of the Reference Site's shapefile, ERS assesses the characteristics of the Reference Site in accordance with the guidelines established in the Reference Ecosystem Guidelines. 2.2. If the Reference Site meets all required characteristics, the carbon stock value of the Reference Site is determined following the methods outlined in *3. Carbon stock at Reference Site*. 2.3. If the Reference Site meets all ecological criteria except for age, the following adjustment approaches apply: 2.3.1. If the Reference Site is older than 40 years, ERS must perform the calculation of the Carbon Stock value at the current age of the Reference Site and use the carbon curves derived from the Reference Site to adjust

	the Carbon Stock value. Refer to *Annex 4* for more details on carbon curve modelling. 2.3.2. If the Reference Site is younger than 40 years, ERS must assess the situation on a case-by-case basis. Alternative datasets may be used to ensure accurate estimation of the Carbon Stock value. • Modify section '3. **Carbon Stock at Reference Site** 3.1. Using the Reference Site's shapefile submitted, ~~Upon submission of the Reference Site's shapefile,~~ the AGB provider generates an AGB maps'
Discussion Points from TAB members	1. Robin Cole: What is the origin of this 40 year threshold? Answer provided by ERS Secretariat: The 40-year threshold aligns with the crediting period defined for all ERS projects under the Programme rules. ☑ The answer is deemed satisfactory.

Revision 5: Revision of benefit-sharing mechanism requirements

RP #5A	
Document	M001
Section & Page	Section 'Livelihoods', subsection 'Methods', subsection '3. Social Additionality Plan' (pp. 37-38)

Description	This revision refines the structure and content of the Social Additionality Plan to ensure clearer expectations and stronger alignment with related ERS requirements. The revised structure enhances usability for Developers and reinforces the link between social interventions and benefit-sharing commitments, supporting more measurable and sustainable social outcomes.
Proposition	Modify Section 3.1 'The Social Additionality Plan outlines the Project's commitment to delivering measurable and sustainable social benefits to the local community, in line with the ERS requirements. It must result from the Community Consultation on Livelihoods and the Livelihood Matrix baseline assessment. 3.1.1 Developers must ensure that all involved parties are heard and can freely express their needs, aspirations and concerns ~~desires~~.' Modify Section 3.2 : 'The Social Additionality Plan must include: **3.2.1. Summary**. An overview of the Social Additionality Plan, including the main objectives, interventions, key stakeholders impacted, and expected social outcomes. **3.2.2. Objectives**. A clear identification of the key social outcomes the Project aims to achieve. **3.2.3. Interventions**. Specific actions designed to meet the objectives. Each intervention should follow SMART criteria (Specific, Measurable, Achievable, Relevant, and Time-bound). Additionally, these interventions will contribute to the Benefit-Sharing Plan. Refer to the Benefit Sharing section in the ERS Programme for more details. **3.2.4. Non-Timber Forest Products (NTFPs)**. Where relevant, the Plan must outline NTFP harvesting and monitoring

	protocols. **3.2.6. Benefit Sharing.** The detailed benefit-sharing arrangements. Refer to the 'Benefit Sharing' section in the ERS Programme for more details.'
Discussion Points from TAB members	1. Sara Löfqvist: [Related to '3.1.1 Developers must ensure that all involved parties are heard and can freely express their needs and aspirations~~desires~~.'] I suggest adding "concerns" here to ensure also risks with the projects are captured. Answer provided by ERS Secretariat: The ERS Secretariat agrees with the suggestion and has updated the relevant section accordingly to better reflect the need to capture potential project risks. ☑ The answer is deemed satisfactory.

RP #5B	
Document	Programme
Section & Page	Section 'General Project Requirements', subsection 'Benefit Sharing' (pp 29-30) Section 'General Project Requirements', subsection 'Financing & Project Budget' (pp 34) Section 'MRV Procedures', subsection 'Monitoring' (pp 43-44)

	Section 'MRV Procedures', subsection 'Reporting' (pp 44-48)
Description	This revision comprehensively updates the Benefit Sharing section to clarify the scope, structure, and implementation of community benefits under the ERS Programme. It introduces more detailed requirements for the development of the Benefit-Sharing Plan, including eligibility criteria for community benefits, and alignment with the Social Additionality Plan. It also formalises the validation process through the Community Validation Statement and FPIC, ensuring transparent, inclusive, and culturally appropriate engagement with IPLCs. In addition, it establishes clearer monitoring, reporting, and corrective action requirements to ensure accountability and effective delivery of promised benefits over time. Finally, it revises project budget requirements to clarify the need for Annual Reporting on expenses specifically related to benefit-sharing.
Proposition	• Section 'General Project Requirements', subsection 'Benefit Sharing' (pp 29-30) Rework the entire section: '**1. Concept.** Benefit Sharing refers to the equitable distribution of social, environmental, and economic benefits derived from the Project among all Stakeholders, particularly IPLCs who contribute to or are affected by the Project. **2. Benefit-Sharing Plan.** Developers must establish a **Benefit-Sharing Plan** during the Project Design phase, ensuring alignment with national laws and regulations. **2.1. Community Benefits.** Developers must identify all community compensation mechanisms and investments in the Benefit-Sharing Plan, ensuring they are:

- Aligned with the **Social Additionality Plan**,
- Defined through **documented consultation with IPLCs**,
- **Formally validated** through a **Community Validation Statement.**

2.1.1. The following elements are considered community benefits:

- Compensation for community members involved in Project activities (e.g., restoration activities, monitoring, nurseries);
- Investments in local infrastructure (e.g., roads, water access, renewable energy installations);
- Direct financial contributions or financial mechanisms to local community members, cooperatives, or community-managed funds;
- Capacity-building programs that enhance skills, knowledge, or technical expertise for community members;
- Support for education and vocational training benefiting the local population; and
- Healthcare initiatives that improve community well-being.

2.1.2 The following elements are not considered community benefits under any circumstances:

- Operational and infrastructure costs solely for the Project use;
- Salaries or fees for Project staff, contractors, or consultants from outside the community;
- Certification costs—including Audit, Project expansion,

Project renewal, and monitoring;

- Bank fees; and
- Administrative fees.

2.1.3. For each community benefit identified, the Benefit-Sharing Plan must detail the following:

- The **form of the benefit**: monetary or in-kind;
- The **recipients of the benefit**: whether on an individual or communal/collective basis;
- The **timeline** and **frequency** of benefit distribution;
- The **amount** or **value of the benefit**: specifying the monetary value in percentage of the total Project Budget to be allocated for each benefit.
- A signed **Community Validation Statement**.
- If an infrastructure investment serves both the Project and the community, Developers must submit:
  - A proportionality assessment estimating what percentage of the infrastructure is for community benefit vs. Project use;
  - An agreement outlining any shared governance or maintenance responsibilities with the community.

2.3. The Benefit-Sharing Plan must be subject to the **FPIC process** before finalisation. In particular, this means that:

- IPLCs must be provided with sufficient time and resources to review and understand the plan.
- The plan must be shared in a transparent, culturally appropriate, and accessible manner, considering local

languages, literacy levels, and customary decision-making processes.

- Approval must be obtained through documented, community-led consultations, ensuring inclusive participation of all relevant community members, including marginalized groups.
- IPLCs must have the opportunity to propose modifications before the plan is finalised, in line with the procedures set out in the Community Consultation Guidelines.

2.4. The Benefit-Sharing Plan must be integrated within the Social Additionality Plan and publicly available in the PDD.

3. Benefit-Sharing Reporting

3.1. Monitoring. Developers must report annually to ERS on their expenses specifically related to Benefit-Sharing.

3.2. The Project Budget will facilitate the Benefit-Sharing reporting by clearly identifying all expenses related to community benefits.

3.3. All community benefits must be reported on, publicly accessible, and disclosed in the Annual Report.

3.4. Underperformance. If planned benefits are not distributed as planned, Developers must provide justification to ERS.
In such cases, Developers must submit a written explanation to ERS detailing the cause of underperformance within 60 days of the reporting deadline as well as the associated Corrective Action Plan (CAP). The CAP must include:

- Root cause analysis of why benefits were not delivered.
- A revised timeline for benefit distribution.
- Specific corrective actions, including financial

reallocations if necessary.

- Evidence of consultation with affected communities on proposed adjustments.

3.5. Grievances. IPLCs and other Stakeholders should use the ERS Grievance Mechanism to report any concerns, grievances, or suggestions. Refer to the *ERS Grievance Mechanism* section for more details.'

- Section 'General Project Requirements', subsection 'Financing & Project Budget' (p. 34)

  Modify entire section: '

  1. If Developers secure part of the funding through sources other than the sale of Verified Restoration Units, such sources ~~they~~ must be included in the Additionality demonstration and proven ~~justified as~~ insufficient to cover the total Project costs' ~~expenses~~.
  2. Developers must provide to ERS a comprehensive budget, detailing estimated and realised expenses. ~~transparency about the budget use.~~

     2.1. At the start of an Adaptive Management cycle ~~a four-year period,~~ Developers must provide an estimated budget for the next four (4) years. ~~inform the period's estimated budget in the Project Budget template.~~

     2.2. Every year, Developers must report the realised expenses related to Benefit-Sharing in the Project's Annual Report , publicly available on the ERS Registry.

- Section 'MRV Procedures', subsection 'Monitoring' (pp 43-44)

  Modify Section '2. Project interventions

	2.1. Developers must continuously monitor the indicators defined in the Monitoring Plan. 2.2. In addition, Developers must monitor: 2.2.1. Any Project deviations; 2.2.2. The realised expenses corresponding to activities detailed in~~, including~~ the Benefit Sharing Plan~~mechanism~~; 2.2.3. The overall progress on Ecological Recovery and Livelihoods interventions. • Section 'MRV Procedures', subsection 'Reporting' (pp 44-48) Modify Section '2. Project interventions 2.1. An Annual Report consolidating the results of the Project interventions monitoring over the past twelve (12) months must be submitted to ERS every year throughout the crediting period. 2.1.1. Developers must report on: • The Project's implementation status, including how the FPIC process was respected when carrying out interventions; • Project deviations; • Realised expenses corresponding to activities detailed in the Benefit Sharing Plan; • Results of the Monitoring Plan, including the evolution of indicators and a summary of performance and challenges encountered; • Adjustments for the subsequent year.
Discussion Points from TAB members	1. Sara Löfqvist: Maybe too much for this addition but I think it would also be useful to map the potential costs to community

[redacted]	members, and which identity groups within communities are most likely to experience costs/risks because of the project 2. Sara Löfqvist: [Related to 'IPLCs must have the opportunity to propose modifications before the plan is finalised.'] What will happen with these propositions? Are projects required to take them into account? Answers provided by ERS Secretariat: 1. The Benefit-Sharing Plan must be developed through an inclusive and transparent consultation process, in which potential community concerns and impacts are considered. While the Programme does not currently require a detailed mapping of potential costs or distribution across identity groups, the design of community benefits should be informed by such considerations during consultation. We will continue to explore how equity and differentiated impacts, including costs and risks to communities, can be best addressed in future revisions to the Programme. ☑ The answer is deemed satisfactory. 2. The management of IPLC feedback—including proposed modifications to the Benefit-Sharing Plan—is governed by our Community Consultation Guidelines, which set out the process for documenting, evaluating, and responding to community input. A reference to these guidelines has been added to the relevant section for clarification. ☑ The answer is deemed satisfactory.

RP #5C	
Document	Terminology & References

Section & Page	Section 'Glossary' (p. 3)
Description	This revision introduces a formal definition for the **Community Validation Statement**, establishing it as a key document for confirming that impacted communities—particularly Indigenous Peoples and Local Communities (IPLCs)—have been adequately consulted and have reviewed, understood, and endorsed essential aspects of the Project, including the Benefit-Sharing Plan.
Proposition	• Add definition of **Community Validation Statement**: 'formal attestation issued by legitimate representatives of the impacted community—particularly Indigenous Peoples and Local Communities (IPLCs)—confirming that they have been adequately consulted and have reviewed, understood, and endorsed specific components of the Project, including but not limited to the Benefit-Sharing Plan. This statement must be the documented outcome of a transparent, inclusive, and verifiable consultation process, and serves as a critical safeguard to ensure that project benefits are equitably shared and aligned with community priorities.'
Discussion Points from TAB members	

Revision 6: Removal of Final Revision Proposition for Standard or Methodology revisions

RP #6

Document	Standard Setting and Methodology Development Procedure
Section & Page	Section 'Standard Development and Revision Procedure', subsection 'Approval Phase' (p. 8) Section 'Methodology Development and Revision Procedure, subsection 'Approval Phase' (pp. 14-15)
Description	This revision streamlines and clarifies the **Approval Phase** for both Standard and Methodology development and revision procedures. It updates the process regarding updated responsibilities for the Secretariat in finalizing documentation, and simplified roles for the TAB in reviewing and approving final versions.
Proposition	• Section 'Standard Development and Revision Procedure', subsection 'Approval Phase' (pp 8) ◦ **Modify Section '3. Approval Phase** **3.1. Final Standard Revision.** If no Public Consultation~~Comment Period~~ is required, the Secretariat will directly finalise the Standard Revision~~submit the Final Standard Revision to the TAB~~. If a Public Consultation~~Comment Period~~ was required, the Secretariat must integrate the feedback and finalize the documentation accordingly.~~into the Final Standard Revision and send it to the TAB along with the corresponding Consultation Digest.~~ **3.2. Final TAB Review and Comments.** The Secretariat will send a final version of all revised documents to the TAB for comments. The TAB may provide feedback, which must be

considered before the final version is published.~~**Final Standard Revision**. The TAB can:~~

- ~~Accept the Final Standard Revision.~~
- ~~Deem the Final Standard Revision incomplete and send it back to the Secretariat for further revisions. This can be done an unlimited number of times. If a Public Comment Period is required, the TAB can deem its feedback was not properly integrated.~~

3.3. Public disclosure. The Secretariat then publishes the final version of the Standard and/or its affiliated documents on the ERS website.

- Section 'Methodology Development and Revision Procedure, subsection 'Approval Phase' (pp 14-15)
  - Modify Section '3. **Approval Phase**

    3.1. Methodology Development

    3.1.1. Final Methodology Version. If no Public Consultation~~Comment Period~~ is required~~warranted~~, the Secretariat must incorporate comments from the TAB (including independent experts if mandated) and submit the Methodology document to the TAB for final review and approval. Where there was a Public Consultation~~Comment Period~~, the Secretariat must incorporate relevant comments and suggestions into the Methodology document for review and approval by TAB.

    3.1.2. Final Standard Development~~/Revision~~. The TAB can:

    - Accept the Final Methodology document.

	■ Deem the Final Methodology version to be incomplete and send it back to the Secretariat for further revisions. This can be done an unlimited number of times. If a Public Comment Period was required, the TAB can deem its feedback was not properly integrated. **3.2. Methodology Revision** 3.2.1. If no Public Consultation is required, the Secretariat will directly finalise the Methodology Revision. If a Public Consultation was required, the Secretariat must integrate the feedback and finalize the documentation accordingly. **3.2.2. Final TAB Review and Comments**. The Secretariat will send a final version of all documents revised to the TAB for comments. The TAB may provide feedback, which must be considered before the final version is published. 3.3. **Public disclosure**. The Secretariat then publishes the final version of the Methodology and/or its affiliated tools on ERS' website.'
Discussion Points from TAB members	

Revision 7: Revisions to the Risk Assessment Matrix

RP #7

Document	Risk Assessment Matrix
Section & Page	Entire document
Description	This revision updates and improves the Risk Assessment Matrix to do the following: • Adjust wording of existing questions to improve clarity and accuracy. • Add new questions addressing overcrediting, permanence, and social risks, among others. • Ensure the risk assessment is robust, comprehensive, and reasonable.
Proposition	• The revised Risk Assessment Matrix can be found here. On the "Matrix v1.2" tab, the rows in **purple** will be removed, rows in **orange** have been revised, and rows in **yellow** are new. Justification for each change is detailed in Column G.
Discussion Points from TAB members	

Revision 8: Addition of Effective Dates & Grace Periods

RP #8

Document	Programme
Section & Page	Section 'Compliance with ERS Principles and Methods' (p. 10)
Description	This revision sets out high-level requirements stating that ERS will implement effective dates and grace periods for all new Programme and Methodology requirements. ERS will establish dates upon which new requirements go into effect, and release those dates with the publication of revised Standard or Methodology documents. Some requirements will go into effect immediately, while others will have associated grace periods (i.e., Projects will not have to conform to the new requirements until a set date).
Proposition	• Programme, Section 'Compliance with ERS Principles and Methods' (p. 10) ○ Add new section: "4. ERS establishes effective dates for all new and revised Standard and Methodology requirements. Effective dates may include grace periods for implementation. All Projects must comply with the effective dates and grace periods."
Discussion Points from TAB members	

Revision 9: Simplified Stakeholder Mapping Requirements during the Feasibility Phase

RP #9	
Document	Programme M001 Community Consultation Guidelines
Section & Page	Programme, Section 'Stakeholders Participation' (p. 21) M001, Section 'Stakeholder Engagement', Subsection 'Stakeholder Mapping' (p. 31) Community Consultation Guidelines, entire document
Description	This revision simplifies the stakeholder mapping requirements that Projects must apply during the Project Feasibility phase. Completing extensive stakeholder engagement leading up to and during the Feasibility Phase is expensive and time-consuming for Developers, particularly when the Project may not proceed beyond the Feasibility Phase. The proposed requirements ensure that core elements of stakeholder engagement, including stakeholder mapping, community buy-in, and initial consultations, take place during the Feasibility Phase, while robust FPIC processes and community engagement take place prior to and during the Project Design Phase. Note—as described in the introductory section of this document, ERS plans to restructure documents, and this includes moving requirements from guidelines documents into the Programme or Methodology. The majority of the requirements in the Community Consultation Guidelines will be transferred as part of the document restructure. We've submitted the proposed changes in the Community

	Consultation Guidelines document for ease of review.

Proposition	• Programme, Section 'Stakeholders Participation' (p. 21)
	  ○ Add: 💡 Further guidance on stakeholder mapping and stakeholder engagement can be found in the Consultation Guidelines document.
	  ○ Modify: FPIC. ~~The~~ Free, Prior and Informed Consent (FPIC) must be obtained ~~applied~~ prior to the start and throughout the crediting period of any Project directly or indirectly impacting the lands, territories, and/or customary rights and resources of Indigenous Peoples and Local Communities (IPLCs). 3.1. Projects must identify IPLCs during stakeholder mapping, address their concerns, and engage with their representatives.
	• M001, Section 'Stakeholder Engagement', Subsection 'Stakeholder Mapping' (p. 31)
	  ○ Add: 2.3.4 Developers must assess whether project activities could displace stakeholders or restrict their access to resources.
	• Community Consultation Guidelines
	  ○ v1.1 with proposed revisions in tracked changes
	  ○ v1.2 final proposed language

Discussion Points from TAB members	1. Sara Löfqvist: [Related to ' 3.1. Projects must identify IPLCs during stakeholder mapping, address their concerns, and engage with their representatives.] Why not directly with the IPLCs? There is a risk only the perspectives of the local elites will be elevated through representatives. Answer provided by ERS Secretariat: This concern is valid and has already been addressed in the revised version of the Community Consultation Guidelines submitted under this RP005. The Guidelines now clarify that while initial meetings are

	typically held with community leaders, Developers are encouraged to gather input from other community members—such as through interviews or surveys—to ensure a broader range of perspectives is captured. The ERS Secretariat has added a reference to the Community Buy-In Guidelines within this section to ensure the full consultation process is followed. ☑ The answer is deemed satisfactory.

Revision 10: Modify VRU accounting methodology

RP #10	
Document	M001 - Quantification Methodology
Section & Page	Section 'Carbon Stock Accounting', subsection 'VRU Accounting' (pp. 27-28)
Description	This revision updates the VRU accounting methods. Previously, VRU issuance relied on comparing carbon stock against the previous Verification Cycle, resulting in duplicated measurements and increased recalculation risk. The revised approach now compares **carbon stock at the current Verification Cycle (t)** with **baseline carbon stock**, incorporating corrections for prior issuances. This change allows for a more accurate and consistent estimation of net GHG removals.
Proposition	• Modify Section 'VRU ACCOUNTING' PRUs conversion into VRUs is performed every two (2) or four

(4) years after Verification, and throughout the Project's crediting period. Before each Verification and to ensure the most accurate conversion of units, ERS measures carbon stock change in the Restoration Site, factoring:

1. **Total Biomass evolution in the Restoration Site.** The carbon stock evolution at the Restoration Site is calculated by comparing the total biomass at Verification Cycle t, with the total biomass at Baseline~~Verification Cycle t−1.~~ This evaluation includes any loss events that occurred on the Restoration Site during Verification Cycle t.
2. **Leakage correction.** The leakage evolution observed during the Verification Cycle t. Note that leakage is quantified and corrected accordingly only until year four.
3. **Baseline correction.** The carbon stock evolution monitored in the control plots during the Ve rification Cycle t.
4. **Prior issuances correction.** The volume of VRUs issued in the previous Verification Cycle is subtracted from the updated net carbon removals to determine the number of new VRUs eligible for issuance.

The VRUs for a given Verification Cycle (t) are calculated using with the following equation:

$$\mathbf{VRU}_t = \mathbf{P}_{2.5}(\mathbf{C}_t - \mathbf{C}_{\text{rest}} - \Delta\mathbf{L}^{\mathbf{C}}_t - \Delta\mathbf{B}^{\mathbf{C}}_t) - \mathbf{VRU}_{t-1}$$

Where:

- $\mathbf{VRU}_t$ = Net GHG removals observed during the Verification Cycle t; tCO_2e.
- $\mathbf{P}_{2.5}$ = indicates the 2.5th percentile, which corresponds to the lower 95% of the distribution.

	• C_t = GHG removals achieved at the end of the Verification Cycle t; tCO_2e. • C_{rest} = Initial baseline of the Restoration Site; tCO_2e. • ΔL_t^c = Corrected Leakage at the Verification Cycle t ; if $t > 4$, $\Delta L_t^c = 0$; tCO_2e. • ΔB_t^c = Corrected Baseline at the Verification Cycle t; tCO_2e. • VRU_{t-1} = Net GHG removals observed during the Verification Cycle $t - 1$; tCO_2e.
Discussion Points from TAB members	

Revision 11: Refine percentile applied in Monte Carlo simulations for carbon stock accounting

RP #11	
Document	M001 - Quantification Methodology
Section & Page	Section 'Carbon Stock Accounting', subsection 'PRU Accounting' (p. 27) Section 'Carbon Stock Accounting', subsection 'VRU Accounting' (pp. 27-28)

Description	This revision adjusts the percentile applied to Monte Carlo simulation outputs for carbon stock estimates. The current use of the 2.5th percentile was identified as overly conservative. To better reflect the true confidence level of the estimates while maintaining a conservative approach, the percentile will be updated to the 15th percentile. This adjustment reduces the risk of systematically under-crediting Projects while still ensuring that VRU issuance remains based on cautious, statistically robust assumptions. A supporting document has also been developed to explain the rationale behind this change and demonstrate how the updated approach continues to apply a conservative safeguard to carbon stock estimations.
Proposition	• Section 'Carbon Stock Accounting', subsection 'PRU Accounting' (p. 27) The PRUs are calculated using the following equation: $$\mathbf{PRU} = \mathbf{P}_{15}(\mathbf{C}_{capacity} - \mathbf{B} - \mathbf{L})$$ Where: **PRU** = Projected Restoration Units; tCO_2e. $\mathbf{P}_{15}$ = indicates the 15~~2.5~~th percentile, which corresponds to the lower 70~~95~~% of the distribution. $\mathbf{C}_{capacity}$ = Project's GHG removal capacity; tCO_2e. **B** = Total estimate of the baseline GHG removals for the Project; tCO_2e.

	L = Total declared Leakage at Project start; tCO_2e. • Section 'Carbon Stock Accounting', subsection 'VRU Accounting' (pp. 27-28) The VRUs for a given Verification Cycle (t) are calculated using with the following equation: $$\mathbf{VRU}_t = \mathbf{P}_{15}(\Delta\mathbf{C}_t - \Delta\mathbf{L}_t^c - \Delta\mathbf{B}_t^c)$$ Where: $\mathbf{VRU}_t$ = Net GHG removals observed during the Verification Cycle t; tCO_2e. $\mathbf{P}_{15}$ = indicates the 15~~2.5~~th percentile, which corresponds to the lower 95% of the distribution. $\Delta\mathbf{C}_t$ = Carbon removals achieved during the Verification Cycle t; tCO_2e. $\Delta\mathbf{L}_t^c$ = Corrected Leakage at the Verification Cycle t ; if $t > 4$, $\Delta\mathbf{L}_t^c = 0$; tCO_2e. $\Delta\mathbf{B}_t^c$ = Corrected Baseline at the Verification Cycle t; tCO_2e.
Discussion Points from TAB members	

Revision 12: Upgrades to the random plot system for the ecological recovery assessment

RP #12	
Document	Field Assessment Guidelines
Section & Page	Section 'Field Assessment Guidelines', subsection 'Methods' (p. 4)
Description	As part of the Ecological Recovery Pillar, ERS requests a baseline assessment of the Project Area which includes a Field Assessment procedure. This consists of surveys to be filled out in randomly assigned plots across both the Reference Site and the Restoration Site(s). Up until now, ERS was randomly assigning 1 to 3 random 50-meter radius plots where the Developer could go and fill out the surveys. However, based on field experience, ERS came to the conclusion that this random plot assignment was not realistic enough since some plots were not physically accessible and did not provide a holistic understanding of the degradation drivers within and across all Restoration Site(s). Therefore, the random plot assignment system has been updated to better cater for ground conditions, as described below.
Proposition	• Replace Section 2: 'ERS must assign 3 random 50-metre radius plots for each Restoration Site indicated during the Zonation. If the zone cannot host 3 plots, the number is reduced accordingly, with 1 plot being the minimum amount allowed.' with: 'Random plot selection: ERS employs a K-means clustering algorithm to stratify Restoration Sites (predefined during

	Zonation) into a maximum of five "similar-looking" strata (based on AGB level, elevation, slope profile etc.), using historical data while prioritizing recent years. Each shape, resulting from this stratification, is extracted (i.e. a stratum can consist of multiple shapes spread across the Restoration Site(s)). Higher terrain diversity often results in more fragmented spatial patterns within strata, yielding a greater number of shapes per stratum. Post-clustering, a buffer is applied to all shapes to enforce minimum inter-plot distances. Shapes below a certain size are removed, while those exceeding a pre-defined size threshold are randomly split into compliant sub-shapes. From the filtered pool, three shapes per stratum are randomly selected as survey plots, ensuring ≤15 plots total (a maximum of 3 plots assigned across a maximum of 5 strata). Developers must conduct in-person Field Assessments within these plots, with unrestricted access to the entire assigned plot. Please refer to Appendix 1 for a detailed description of the procedure.' A detailed description of the process is accessible in Annex 2 of this RP005. That section will be included in the appendix of the Field Assessment Guidelines document.
Discussion Points from TAB members	

Revision 13: Expansion of site preparation requirements & related emissions potential

RP #13A

Document	M001
Section & Page	Section 'Ecological Recovery', sub-section 'Principles', sub-section 'Restoration Interventions' (p. 10)
Description	This revision establishes a comprehensive protocol governing site preparation activities, including requirements for more 'intensive' site preparation techniques. Currently, M001 prohibits the use of prescribed burns and chemical treatments, and remains vague on the use of transitory non-native species and mechanical intervention as site preparation techniques. These restrictions are rigid and do not account for practical on-the-ground challenges. To address this, the revised protocol outlines general requirements for any type of site preparation techniques, as well as conditional allowances for prescribed burns and chemical use, while establishing clear guidelines for the regulated use of transitory species and mechanical intervention.
Proposition	• Remove: '~~2.4. The Developer must strive to minimise the environmental impacts of restoration activities, including site preparation. More precisely, the Developer must not:~~ ~~2.4.1. Use fire for soil preparation;~~ ~~2.4.2. Invert the soil to a depth greater than twenty-five cm;~~ ~~2.4.3. Use nitrogen fertilisers.~~' • Add a section between '2. Restoration Interventions' and '3. Genetic Diversity' called '3. Site Preparation' • Add to that section the requirements enunciated on pages 2-3 of the Intensive Site Preparation Techniques - Requirements document. (These are general requirements that apply to all

	site preparation techniques.) • Add the rest of the document (page 4 onward) to the Appendix section of M001. (These include criteria and requirements for each intensive site preparation technique.)
Discussion Points from TAB members	

RP #13B	
Document	M001
Section & Page	Section 'Ecological Recovery', sub-section 'Principles', sub-section '8. Threats & Degradation Drivers' (p. 14)
Description	Based on updates enunciated under RP #11A, requirement 8.3 of M001 must also be adapted accordingly.
Proposition	• Modify: '8.3 The Developer must strive to eliminate emergent and recurring barriers to regeneration and forest regrowth, such as but not limited to invasive species, grazing, uncontrolled fire, soil erosion, flooding, pests, disease and smothering. 8.3.1. If invasive species and/or other aggressive woody and non-woody vegetation are present and interfere with natural forest recovery, they must be removed before the Project begins to lay the ground for restoration. All site preparation

	techniques must comply with requirements under section '3. Site Preparation' and Appendix X (if applicable). 8.3.2. The Developer must detail plans for the proper disposal of removed invasive floral species, focusing on minimising carbon emissions linked to their disposal.'
Discussion Points from TAB members	

RP #13C	
Document	M001 - Quantification Methodology
Section & Page	Section 'Adjustment Factors', sub-section 'Emissions' (p. 22)
Description	This revision introduces a dedicated section to ensure that any emissions related to Intensive Site Preparation Techniques are properly quantified and accounted for in the Project's net GHG removal calculation.
Proposition	• Add: '**5. Accounting for potential emissions related to Intensive Site Preparation Techniques** This section describes how any potential GHG emissions related to intensive site preparation techniques are quantified. Intensive site preparation techniques may include the use of chemicals, prescribed burns, transitory non-native species,

and mechanical intervention. Refer to 2.4 of M001 and Appendix X for more details. The table below indicates which techniques entail the potential quantification of GHG emissions and the corresponding methodology applied.

Site Preparation Technique	Emission(s) accounted for?	Methodology/Justification
Prescribed burn	Yes	See section 5.1.
Use of fertilisers	Yes	See section 5.2.
Transitory non-native species	Yes	The AGB change related to the planting and subsequent removal of transitory non-native species is already accounted for via the procedure described in the section 'Carbon Stock Quantification'.
Mechanical Intervention	No	The burning of fossil fuels related to the use of heavy machinery are considered *de minimis.* Since the current Methodology does not allow for soil inversion deeper than 25 cm, there are no implications on SOC.

5.1 Prescribed burn

5.1.1 ERS follows a Tier 1 Approach to estimate GHG emissions from prescribed burning, according to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.[1]

5.1.2 Under Tier 1 Approach, mass of fuel available for combustion only includes biomass (AGB and BGB). Tier 1 assumes that carbon stocks in dead wood and litter pools in non-forest land are zero.

5.1.3 Quantification of carbon dioxide (CO_2) emissions and non-carbon dioxide GHG emissions, including methane (CH_4) and nitrous oxide (N_2O), resulting from prescribed burning as a site preparation technique, is obtained using equation (#):

$$\mathbf{E}_{total} = \mathbf{E}_{burn} + \mathbf{E}_{burn}' \ (\#)$$

Where:

- $\mathbf{E}_{total}$ = Total amount of CO_2e emissions from prescribed burning across all intervention areas; tCO_2e
- $\mathbf{E}_{burn}$ = Amount of CO_2 emissions from prescribed burning across all intervention areas; tCO_2
- $\mathbf{E}_{burn}'$ = Amount of non-CO_2 emissions (CH_4 and N_2O) from prescribed burning across all intervention areas; tCO_2e

$$\mathbf{E}_{burn} = \sum (\mathbf{A}_{burn,i} \times \mathbf{ABG}_{site,i} \times (1+\mathbf{RS}) \times \mathbf{CF} \times \mathbf{fd} \times \mathbf{44/12}) \ (\#)$$

Where:

- $\mathbf{E}_{burn}$ = Amount of CO_2 emissions from prescribed burning across all intervention areas; tCO_2
- $\mathbf{A}_{burn,i}$ = Area burnt on intervention area *i*; ha

[1] Per the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, a tier defines a methodological complexity level for estimating greenhouse gas (GHG) emissions. Three tiers are outlined, with Tier 1 representing the least complex approach. Due to scaling constraints arising from the impracticality of collecting field data for every ERS-certified Project, ERS employs a Tier 1 methodology under M001. This approach may be revised in future iterations of the methodology.

- **$ABG_{site,i}$** = Mass of aboveground biomass stock available for combustion on intervention area *i*; $tDM \cdot Ha^{-1}$
- **RS** = Ratio of below-ground biomass to above-ground biomass; tDM BGB·tDM AGB^{-1}. Since ERS considers a Tier 1 approach, no changes of BGB are assumed and thus RS is considered to be zero.
- **CF** = Carbon fraction of dry biomass; $tC \cdot tDM^{-1}$. A default value of 0.47 is used.
- **fd** = Fraction of biomass lost in disturbance; dimensionless. (see note below)

  Note: The parameter **fd** defines the proportion of biomass that is lost from the biomass pool. It is assumed that a fire disturbance will "kill all" and therefore fd = 1 in all cases. Equation (#) does not specify the fate of the carbon removed from the biomass carbon stock. The Tier 1 assumption is that all of E_{burn} is emitted in the year of disturbance. Higher Tier methods assume that some of this carbon is emitted immediately and some is added to the dead organic matter pools (dead wood, litter) or HWP.

- **44/12** = Molecular weight ratio of CO_2 to C, which is 44/12; dimensionless.

$$E_{burn}' = \sum (A_{burn,i} \times ABG_{site,i} \times C_f \times G_{ef,g} \times GWP_g \times 10^6) \quad (\#)$$

Where:

- **E_{burn}'** = Amount of non-CO_2 emissions (CH_4 and N_2O) from prescribed burning across all intervention areas; tCO_2e
- **$A_{burn,i}$** = Area burnt on intervention area *i*; ha
- **$ABG_{site,i}$** = Mass of aboveground biomass stock available for combustion on intervention area *i*; $tDM.Ha^{-1}$
- **C_f** = Combustion factor; dimensionless. A default value is obtained from Table 2.6 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 2.

- $\mathbf{G}_{ef,g}$ = Emission factor of dry matter burnt per gas *g*; gGHG·kgDM^{-1}. A default value is obtained from Table 2.5 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 2.
- $\mathbf{GWP}_g$ = Global warming potential per gas *g*; dimensionless. This factor is used to convert the unit of the non-CO_2 gas into CO_2e. A default value is used as per 2.2.2 under the section 'General Principles' of ERS's Programme.

5.2 Use of fertilisers

5.2.1 Quantification of nitrous oxide (N_2O) emissions resulting from the use of fertilisers as a site preparation technique is obtained using equation (#):

$$\mathbf{E}_{chem} = \mathbf{E}_{Ndirect} + \mathbf{E}_{Nindirect} \quad (\#)$$

Where:

- $\mathbf{E}_{chem}$ = Amount of CO_2e emissions stemming from N_2O emissions from the use of nitrogen fertiliser; tCO_2e
- $\mathbf{E}_{Ndirect}$ = Amount of Direct CO_2e emissions stemming from N_2O emissions from the use of fertiliser on the intervention area(s); tCO_2e
- $\mathbf{E}_{Nindirect}$ = Amount of Indirect CO_2e emissions stemming from N_2O emissions from the use of fertiliser on the intervention area(s); tCO_2e

$$\mathbf{E}_{Ndirect} = \Sigma \left[(\mathbf{SF}_i + \mathbf{OF}_i) \times \mathbf{EF}_{Ndirect} \times \mathbf{44/28} \times \mathbf{GWP}_N \right] \quad (\#)$$

Where:

- $\mathbf{E}_{Ndirect}$ = Direct CO_2e emissions stemming from N_2O emissions from the use of fertiliser across all intervention areas; tCO_2e
- $\mathbf{SF}_i$ = Amount of synthetic nitrogen fertiliser applied in intervention area *i*; tN

- **OF_i** = Amount of organic nitrogen fertiliser applied in the intervention area *i*; tN
- **$EF_{Ndirect}$** = Emission factor for nitrous oxide emissions from N additions due to synthetic fertilisers, organic amendments and crop residues; $tN_2O\text{-}N \cdot tN^{-1}$ applied. A default value is obtained from Table 11.1 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 11.
- **44/28** = Molecular weight ratio of N_2O to Nitrogen, which is 44/28; dimensionless.
- **GWP_N** = Global Warming Potential for nitrous oxide; dimensionless. This factor is used to convert the unit of N_2O into CO_2e. A default value is used as per 2.2.2 under the section 'General Principles' of ERS's Programme.

$$SF_i = M_{SF,i} \times C_{SF,i} \ (\#)$$

Where:

- **SF_i** = Amount of synthetic nitrogen fertiliser applied in intervention area *i*; tN
- **$M_{SF,i}$** = Mass of N-containing synthetic fertiliser applied in intervention area *i*; t fertiliser
- **$C_{SF,i}$** = N content of synthetic fertiliser applied in intervention area *i*; $tN \cdot t\ fertiliser^{-1}$

$$OF_i = M_{OF,i} \times C_{OF,i} \ (\#)$$

Where:

- **OF_i** = Amount of organic nitrogen fertiliser applied in intervention area *i*; tN
- **$M_{OF,i}$** = Mass of N-containing organic fertiliser applied in intervention area *i*; t fertiliser
- **$C_{OF,i}$** = N content of organic fertiliser applied in intervention area *i*; $tN \cdot t\ fertiliser^{-1}$

$$E_{Nindirect} = \Sigma (V_{N,i} + L_{N,i}) \ (\#)$$

Where:

- $E_{Nindirect}$ = Indirect CO_2e emissions stemming from N_2O emissions from the use of fertiliser across all intervention areas; tCO_2e
- $V_{N,i}$ = CO_2e emissions stemming from indirect N_2O emissions produced from atmospheric deposition of N volatilised due to nitrogen fertiliser use in intervention area *i*; tCO_2e
- $L_{N,i}$ = CO_2e emissions stemming from indirect N_2O emissions produced from leaching and runoff of N, in regions where leaching and runoff occurs, due to nitrogen fertiliser use in intervention *i*; tCO_2e

$$V_{N,i} = [(SF_i \times F_{SFvol}) + (OF_i \times F_{OFvol})] \times EF_{Nv} \times 44/28 \times GWP_N \ (\#)$$

Where:

- $V_{N,i}$ = CO_2e emissions stemming from indirect N_2O emissions produced from atmospheric deposition of N volatilised due to nitrogen fertiliser use in intervention area *i*; tCO_2e
- SF_i = Amount of synthetic nitrogen fertiliser applied in intervention area *i*; tN
- F_{SFvol} = Fraction of all synthetic nitrogen added to soils, volatilising as NH_3 and NO_x; $(kg\ NH_3–N + NO_x–N)\cdot(kgN\ applied)^{-1}$. A default value is obtained from Table 11.3 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 11.
- OF_i = Amount of organic nitrogen fertiliser applied in intervention area *i*; tN
- F_{OFvol} = Fraction of all organic nitrogen added to soils, volatilising as NH_3 and NO_x; $(kg\ NH_3–N + NO_x–N)\cdot(kg\ N\ applied\ or\ deposited)^{-1}$. A default value is obtained from Table 11.3 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 11.

- **EF_{Nv}** = Emission factor for nitrous oxide emissions from atmospheric deposition of N on soils and water surfaces; kg N_2O–N·(kg NH_3–N + NO_x–N volatilised)$^{-1}$. A default value is obtained from Table 11.3 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 11.
- **44/28** = Molecular weight ratio of N_2O to Nitrogen, which is 44/28; dimensionless.
- **GWP_N** = Global Warming Potential for nitrous oxide; dimensionless. This factor is used to convert the unit of N_2O into CO_2e. default value is used as per 2.2.2 under the section 'General Principles' of ERS's Programme.

$$L_{N,i} = (SF_i + OF_i) \times F_{Fleach} \times EF_{Nl} \times 44/28 \times GWP_N \ (\#)$$

Where:

- **$L_{N,i}$** = CO_2e emissions stemming from indirect N_2O emissions produced from leaching and runoff of N, in regions where leaching and runoff occurs, due to nitrogen fertiliser use in intervention *i*; tCO_2e
- **SF_i** = Amount of synthetic nitrogen fertiliser applied in intervention area *i*; tN
- **OF_i** = Amount of organic nitrogen fertiliser applied in the intervention area *i*; tN
- **F_{Fleach}** = Fraction of synthetic or organic nitrogen added to soil lost through leaching and/or runoff, where applicable; kgN·(kg of N additions)$^{-1}$. A default value is obtained from Table 11.3 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 11.
- **EF_{Nl}** = Emission factor for nitrous oxide emissions from N leaching and/or runoff; kg N_2O–N·(kg N leaching/runoff)$^{-1}$. A default value is obtained from Table 11.3 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 11.
- **44/28** = Molecular weight ratio of N_2O to Nitrogen, which is 44/28; dimensionless.

	• **GWP_N** = Global Warming Potential for nitrous oxide; dimensionless. This factor is used to convert the unit of N_2O into CO_2e. default value is used as per 2.2.2 under the section 'General Principles' of ERS's Programme.
Discussion Points from TAB members	

RP #13D	
Document	M001 - Quantification Methodology
Section & Page	Section "Boundaries", sub-section "Emissions Sinks & Sources", sub-section "2. List of Relevant GHG Sources" (page 7)
Description	In the current version of the Quantification Methodology, ERS currently accounts only for carbon dioxide since it is the only significant GHG acting as both a source and a sink in inland ecosystem restoration projects. However, the inclusion of rules for site preparation techniques—primarily prescribed burns and chemical applications—necessitates the consideration of other GHGs like methane (CH_4) and nitrous oxide (N_2O) and their incorporation into carbon accounting (where applicable).
Proposition	• Remove: The table at the bottom of page 7 explaining which emission sources are being excluded.

	• Change the note below the table: '~~Note that the only GHG covered in the scope of this methodology is carbon dioxide.~~' to 'Note that this methodology covers only carbon dioxide (CO_2) as a greenhouse gas, except in cases where prescribed burns and chemicals/fertilisers are used as an intensive site preparation technique. In these instances, methane (CH_4) and nitrous oxide (N_2O) emissions are included in addition to CO_2.'
Discussion Points from TAB members	

RP #13E	
Document	M001 - Quantification Methodology
Section & Page	Appendix 3 - Carbon Parameters
Description	Based on updates in RP #11D, the QA/QC procedure for the newly added data/parameters must be updated accordingly.
Proposition	• Add new carbon parameters as described in Annex 4.

Question to the TAB	Some parameters ($\mathbf{EF}_{Ndirect}$; $\mathbf{F}_{SFvol}$; $\mathbf{F}_{OFvol}$; $\mathbf{EF}_{Nv}$; $\mathbf{F}_{Fleach}$; $\mathbf{EF}_{Nl}$) are default values from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, each accompanied by specified uncertainty ranges due to factors such as soil conditions, biome variability, and terrain topography. Due to a lack of scalable field data on a per Project basis, ERS has opted to use the upper bound of the uncertainty range to ensure conservatism. However, this approach risks overestimating emissions for the sake of caution, whereas accurate, site-specific data would provide greater reliability. Do you recommend a better approach in this version of the Quantification Methodology? What about in future versions?
Discussion Points from TAB members	1. Sara Löfqvist: This is not my core area of expertise, but to me this sounds good. Given all issues with over-crediting in this space I think it is better to risk over-estimating emissions (even if this approach is slightly less reliable), than risking under-estimating emissions. This will also mitigate reputational risks for ERS. Curious to hear what others think though. Answer provided by ERS Secretariat: Thank you for your feedback. In the absence of reliable, site-specific data, the ERS Secretariat has chosen to use the upper end of the IPCC default ranges as a precautionary measure. This conservative approach helps reduce the risk of over-crediting and supports the integrity of the Programme, even if it may slightly overestimate emissions in some cases. Improving the accuracy of these parameters remains crucial, and ERS will continue to explore options for incorporating more context-specific data in future updates to the Quantification Methodology. ☑ The answer is deemed satisfactory.

PROVISIONAL TIMELINE

Target deadline for TAB response (30 days): 23/05/2025

EXPECTED RISKS

List and describe the expected risks associated with the Standard and Methodology Revision Proposition.

No risks have been identified by the Secretariat.

PUBLIC CONSULTATIONS

Does the Secretariat consider that this Standard and Methodology Revision Proposition requires one or several Public Consultation(s)?

- ☐ Yes
- ☑ No

ANNEX 1

PROJECT DEVIATIONS

Principles

1. Deviations

1.1. **Methodology Deviation**. A Methodology Deviation occurs when a project deviates or is at risk of deviating from a requirement in the applied Methodology.

1.1.1. The Developer may request a Methodology Deviation at any time during the certification process or the crediting period. The Developer should strive to request deviations during the project feasibility phase and prior to entering the Project design phase.

1.1.2. Methodology Deviations may be designated as temporary (i.e., the project will comply with the Methodology requirement applied after a designated period of time) or permanent (i.e., the project will integrate the deviation for the remainder of the crediting period).

1.1.3. The Developer must describe and justify the Methodology Deviation. Methodology Deviations must not impact the conservativeness or completeness of quantification, or the integrity of the project.

1.1.4. Deviations from Methodology Eligibility Criteria are not permitted.

1.2. **Standard Deviation.** A Standard Deviation occurs when a Project deviates or is at risk of deviating from a requirement in the Standard.

1.2.1. The Developer may request a Standard Deviation at any time during the certification process or the crediting period.

1.2.2. Standard Deviations must be designated as temporary (i.e., the Project must comply with the Standard requirement after a designated period of time). The Developer must define a Corrective Action Plan and a timeline for bringing the Project back into conformance with the Standard requirement.

1.2.3. Deviations from the following requirements are not permitted:

- Ownership & Carbon Rights
- Stakeholder Participation and Free, Prior, and Informed Consent (FPIC)
- Benefit Sharing

1.3. **Design Deviation**. A Design Deviation occurs when a Project deviates from the last validated Project Design Document.

1.3.1. Design Deviations can be requested during a Verification Cycle, at least 60 days before submission of the Annual Report and prior to a Verification.

1.3.2. Design Deviations can be designated as temporary (i.e., the Project will revert back to its original validated design after a designated period of time) or permanent (i.e., the Project will integrate the deviation for the remainder of the crediting period).

1.3.3. The Developer must describe and justify the Design Deviation.

2. Precedents

2.1. All deviation requests are reviewed on a case-by-case basis and are not guaranteed to be precedent setting.

2.2. ERS may determine that an approved Methodology or Standard Deviation can be applied by other projects. ERS clearly defines the conditions under which other Projects can apply the approved Deviation. ERS may incorporate approved Deviations into the relevant Programme document during the next revision.

Procedures

1. Standard and Methodology Deviations

1.1. In order to request a Standard and/or Methodology Deviation, the Developer must submit a Deviation Request Form that includes:

1.1.1. The requirement(s) the Project cannot comply with.

1.1.2. The rationale for the deviation, with supporting evidence.

1.1.3. Whether the deviation will be temporary or permanent, noting that:

- Deviations from Standard requirements must be temporary.
- Deviations from Methodology requirements may be temporary or permanent.
- In the case of temporary deviations, the Developer must provide a Corrective Action Plan and describe when and/or under what conditions the Project will conform with the requirement.

1.1.4. The alternate approach to be implemented by the Project, if applicable.

1.1.5. The impact(s) of the deviation on the interventions of the Project.

1.1.6. Any additional information and supporting documents relating to the deviation.

1.2. Upon receipt of a Deviation Request Form, ERS assesses the request and the supporting evidence, and determines whether to approve or reject the request. ERS communicates the decision to the Developer, along with any additional requirements to be implemented by the Project. The

Deviation must be documented in the Project Design Document and/or the Annual Report.

1.3. The final decision about the Standard or Methodology Deviation is published on the Project record on the ERS Registry.

1.4. ERS may determine a Methodology Deviation from a requirement in a Quantification Methodology is necessary. In such cases, ERS ensures the final decision, including justification, is published on the Project record on the ERS Registry.

1.5. ERS may identify a non-conformity during the Certification process and/or Annual Report review process that should be reported as a Standard or Methodology Deviation. In such cases, ERS requests the Developer submit a Standard or Methodology Deviation request.

2. Design Deviations

2.1. When Design Deviations are identified, the Developer must report them in the dedicated section of the Annual Report, and indicate whether the deviations are temporary or permanent.

2.2. The Developer must provide a rationale for the deviation, together with supporting evidence.

2.3. During the Annual Report review, ERS determines if the Design Deviations conform with the Standard and applied Methodology. ERS may request additional information from the Developer.

2.3.1. If the Project remains in conformance, the deviation can be implemented as described.

2.3.2. If the Project is not in conformance, the deviation will be handled as a Methodology Deviation and follow the process in Section 1 above.

3. Projects applying permanent Design Deviations must report them in the subsequent Annual Report(s) until the end of the Verification Cycle. The Project

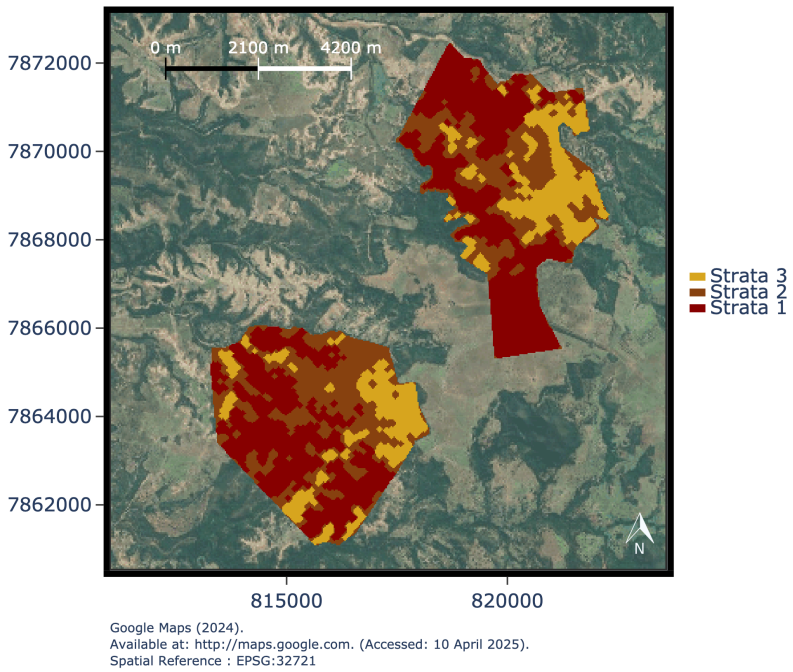
Design Document must be updated for the subsequent Adaptive Management Validation.

ANNEX 2

RANDOM PLOT PROCEDURE

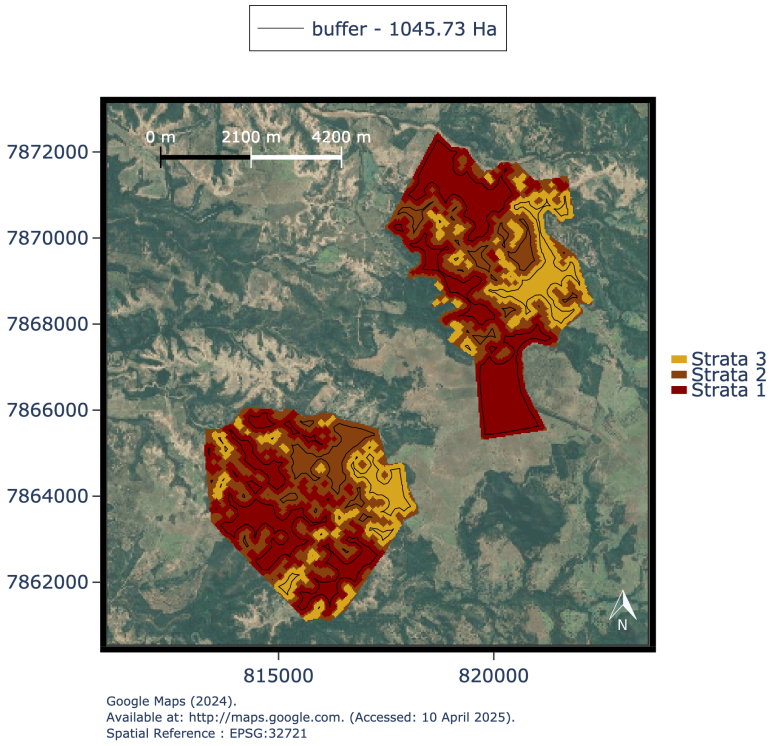
This Appendix details the step-by-step procedure used by ERS to randomly assign plots for the Field Assessment surveys:

1. The K-means clustering algorithm is applied to partition the Restoration Site(s) into a maximum of five strata (clusters), grouping zones with similar land profiles (e.g., AGB level, elevation, slope). Historical land-cover data is used for clustering, with recent years prioritized (or assigned higher weighting depending on data availability), as illustrated in Map 1 below:



Map 1. Stratification of the Project Area.

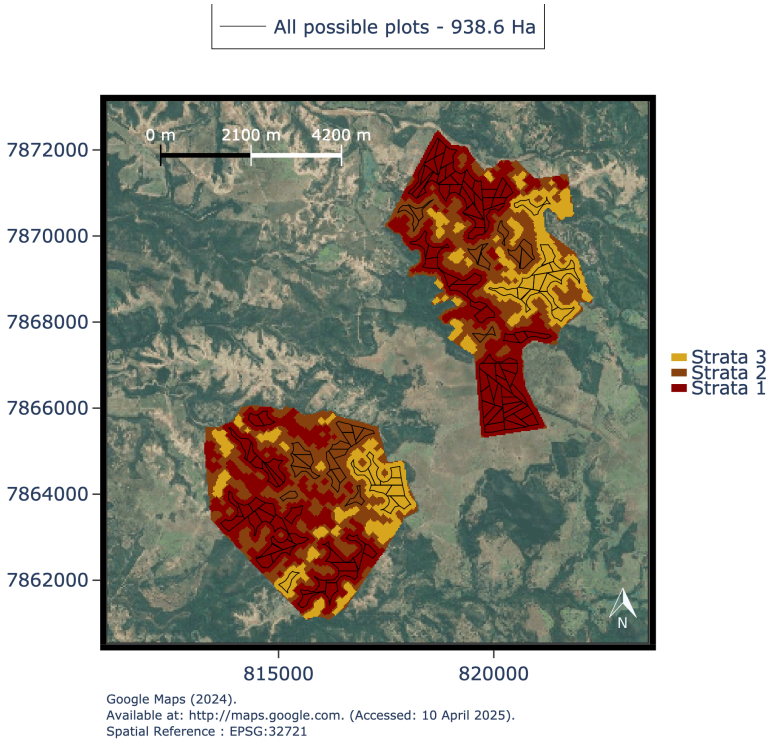
2. The resulting strata are extracted as distinct shapes. A buffer zone of 100 meters is applied around each shape to enforce a minimum inter-plot distance between survey plots of two different strata.



Map 2. Stratification with a 100m-buffer applied.

3. Ideally, each shape falls between 5 hectares and 10 hectares with a 100-meter buffer. However, if these parameters do not allow to find enough shapes, both the minimum plot size may be incrementally reduced down to 1 hectare (below that threshold, the shape would be removed), and the buffer may be incrementally reduced down to 10 meters. Additionally, shapes exceeding 10 hectares are randomly split into sub-shapes until all comply with the 10-hectare upper size limit (see Map 3 for visual examples of buffering and splitting).

   Therefore, an individual stratum is only produced if it contains at least one shape measuring 1 hectare or more after subtracting a 10 to 100-meter buffer.



Map 3. Sub-Division into compliant plot sizes.

4. A maximum of three survey plots per stratum are selected using weighted random sampling, resulting in up to 15 plots total (5 strata × 3 plots each). This method prioritizes larger shapes and spatial dispersion to increase the likelihood of achieving uniform coverage across all strata, as follows:
    a. First Plot Selection: The initial plot is chosen randomly, with selection probability weighted by shape area (larger shapes having higher odds).
    b. Subsequent Plot Selection: Each additional plot is selected based on a composite probability that favors both: larger shapes (area-weighted probability), and greater distance from already selected plots (distance-weighted probability). The following formula is used:

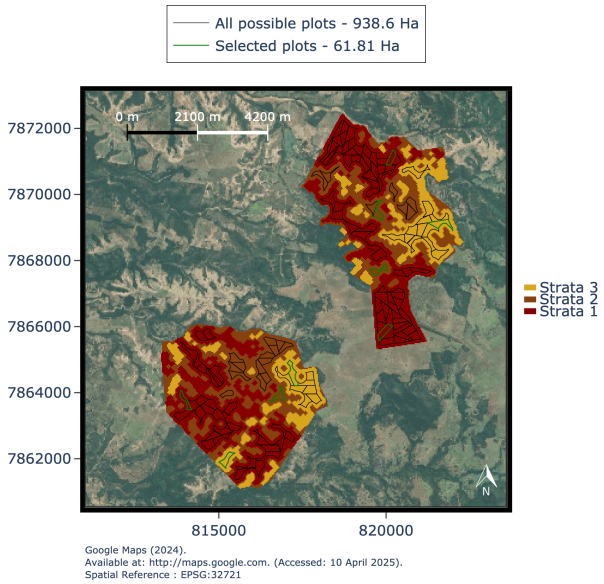
$$probability_i = \alpha \times (area_i / \sum_j area_j) + \beta \times [avg\_distance_i / max_j(avg\_distance_j)]$$

Where:

- α is the area weight score,
- β is the distance weight score,
- $area_i$ is the area of shape i,
- $avg\_distance_i$ is the average distance of shape i from previously selected shapes,
- $\sum_j area_j$ is the total area of all remaining shapes,
- $max_j(avg\_distance_j)$ is the maximum of the average distances from previously selected shapes.

c. Termination: The process stops once three plots per stratum are selected or all eligible shapes are evaluated.

Developers must conduct in-person field assessments within these plots, outlined in green on Map 4.



Map 4. Selection of random plots per strata.

ANNEX 3

PROTOCOL FOR FIELD DATA CALIBRATION

A. Introduction

I. Objective

1. This protocol provides guidelines for Developers on the collection of field data necessary to calibrate the calculation of the net GHG removals of their Project.

2. ERS uses the data gathered by Developers to enhance the accuracy of net GHG removals estimated and quantified using the ERS Quantification Methodology for Terrestrial Forest Restoration.

II. Scope & Applicability

1. This protocol applies to Projects calibrating Aboveground Biomass (AGB) values to enhance the accuracy of net GHG removal estimates.

2. Field calibration may occur under the following circumstances:

    2.1. **Developer-Initiated Calibration**. Developers formally request field calibration at the beginning of the Project Design Phase.

    2.2. **ERS-Recommended Calibration**. ERS detects inconsistencies or high variability in AGB values within its dataset. In such cases, ERS will notify Developers and recommend field calibration. If Developers choose not to proceed with field calibration, ERS must default to the most conservative dataset available.

3. Field data collection and calibration must be conducted in conformance with the procedures outlined in this protocol.

B. Data Extraction *Protocol*

This section outlines the procedures for extracting, processing, and submitting field data used to calibrate AGB estimates against ERS remote sensing outputs.

I. SAMPLE PLOT SELECTION AND MEASUREMENT

1. Sample Plot

1.1. Developers must strive to align field data collection schedules with remote sensing data acquisition periods to ensure direct comparability.

1.2. The selection of sample plots follows a stratified sampling approach to ensure representative coverage of the Project area. ERS must:

1.2.1. Define the location of sample plots based on the stratification of the Project Area, as well as the spatial resolution of the AGB Provider data.

1.2.2. Share the relevant shapefiles with the Developers to facilitate field data collection.

2. In-Situ Measurement

2.1. Developers must perform all measurements using LiDAR Scanning in each sample plot identified by ERS.

2.2. For each sample plot, Developers must document environmental conditions that could influence measurement accuracy (e.g., weather conditions, terrain, surface types).

2.3. Developers may record additional field measurements (e.g., tree height and diameter), but such measurements will not be considered for calibration in this version of the Protocol.

II. DATA QUALITY ASSURANCE

1. Quality Requirements

To maintain high data integrity, Developers must implement the following quality control measures, based on parameters defined by ERS after sample plots have been established:

1.1. Ensure the completeness of LiDAR scans before leaving each sample plot.

1.2. Perform secondary scans on a statistically representative subset of plots defined by ERS to assess consistency and repeatability.

1.3. Document and flag any measurement discrepancies exceeding predefined error thresholds defined by ERS for further review and resolution.

2. Data Submission

2.1. Developers must submit the following to ERS:

2.1.1. **Field data**. It must be processed in *LAS* format and consistently formatted for all sample plots.

2.1.2. **AGB maps**. The map must be based on LiDAR-derived metrics (e.g., tree height, canopy cover) and the application of appropriate biomass estimation models.

2.1.3. **Calibration Report**. Developers must use the template provided by ERS and include following information:

- **Objective and Scope.** A summary of the data collection process and its purpose.
- **Field Methods.** A detailed description of sampling strategies and LiDAR scanning techniques.

- **Data Summary.** A comprehensive table of recorded LiDAR measurements, including any identified inconsistencies.
- **AGB Calculation Methodology.** A detailed explanation of how the AGB values were derived from the LiDAR data, including any models or equations used, along with the assumptions made.
- **Challenges and Limitations.** Documentation of issues encountered and their potential impact on data quality.

III. DATA STORAGE AND ACCESS

1. All datasets, including raw LiDAR scans, shapefiles, geotiffs, calibration reports, and associated documentation, must be retained during the crediting period of the Project.
2. Developers must provide ERS and the VVB with full access to raw datasets for potential recalibration and auditing purposes.
3. Data management practices must fully comply with ERS's Privacy Policy and applicable national and international data security standards.

C. Recalibration of Carbon *Estimates*

This section sets out the procedures and requirements followed by ERS to assess and correct any systematic discrepancies between remote sensing-derived biomass estimates and field-collected data.

I. DATASET PREPARATION

1. ERS must compare the AGB maps derived from LiDAR-based data provided by the Developer with remote biomass estimates received from its AGB provider.

II. CALIBRATION METHODS

1. ERS must apply multiple regression models (e.g., linear, exponential, logarithmic, and others, as appropriate) and different functional forms (e.g., power or logarithmic transformations) to evaluate the relationship between the LiDAR-based field measurements and the biomass estimates from the AGB provider.
2. The modeling process should account for relevant site-specific variables, such as forest type, canopy structure, and other environmental factor

III. ADJUSTMENT IMPLEMENTATION

1. If a relationship between the two datasets is established, ERS must evaluate the model's performance and limitations using the available field data and a representative subset of remote estimates.
2. The decision to apply the model for calibration must depend on its statistical reliability and its ability to accurately represent the relationship between the datasets.

3. If the model is deemed sufficiently strong and consistent, ERS must apply the model to calibrate the remote AGB estimates for the entire dataset.

4. ERS must document a summary of the evaluation process and any adjustments made in the corresponding report, whether GHG Parameters and Baseline Calculation or GHG Monitoring Report. The results must be shared with the Developer prior to report publication.

ANNEX 4

QA/QC FOR NEWLY ADDED DATA/PARAMETERS

Data/Parameter	A_{burn}
Data unit	ha
Description	Project Area burnt due to prescribed burning as a site preparation technique.
Source of data	Calculated from GIS Data
Monitoring Procedure	ERS monitors the intervention area (delineated by the Developers via the ERS App) via satellite imagery and GIS data to ensure the fire remains within the designated boundaries.
Monitoring Frequency	Once before intervention, right after intervention (one (1) day after all fires have been extinguished) and seven (7) days after that date.
Quality Assurance	The Prescribed burn intervention area is validated visually using GIS tools and satellite data. There must be ≥95% alignment between planned vs. actual burn area.
Quality Control	Pre-burn: ERS validates the polygon geometry and cross-references it with the Fire Management Plan, allocated permits (if applicable), and any officially designated fire exclusion zones (protected areas). ERS ensures the submitted burn date matches the Fire Management Plan for any seasonal restrictions. During/Post-burn: - Calculate burn severity via NDVI/dNBR (Normalized Burn Ratio) from Sentinel-2. - Use NASA's FIRMS platform to cross-check fire data. - Compare pre- and post-burn imagery to confirm spatial compliance (e.g., ≤5% deviation).

Data/Parameter	**$AGB_{site,i}$**
Data unit	$tDM \cdot ha^{-1}$
Description	Above ground biomass density at site *i*
Source of data	AGB provider (Chloris)
Monitoring Procedure	Aboveground woody biomass is measured using satellite imagery.
Monitoring Frequency	Once before intervention and one (1) day after all fires have been extinguished (can be extended to seven (7) days after, if flare-ups have been identified).
Quality Assurance	- To identify the most suitable AGB provider for ERS, a benchmarking approach was done using independently referenced data, computed using a different approach than remote sensing models (Terrestrial Laser Scanning and Airborne Laser Scanning). The process overview is described below, for more detailed information refer to the AGB Benchmark Process. - The AGB model has to be trained on independent data distributed into multiple regions and biomes. - In order to generate robust and annual biomass change estimates, seasonal effects should be minimised using preprocessing techniques. - The validation of the model needs to be performed on independent higher-quality data spread across different regions and biomes collected using different kinds of approaches like ALS or field plots.
Quality Control	- Series of automated tests within the pipeline that detect anomalies (e.g. impossible values) and produce quality statistics are performed. - ERS performs a second Quality Control. Tests include: visual reviews for artefacts such as climatic anomalies or BRDF effects and, where required, cross-checks data with high resolution imagery.

Data/Parameter	**fd**

Data unit	Dimensionless (%)
Description	Fraction of biomass lost in disturbance event (i.e. prescribed burn in this case)
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 2 (page 18)
Value(s) applied	1
Quality Assurance	IPCC is a reputable source approved under the ERS Programme.
Quality Control	ERS regularly checks for IPCC updates and strives to integrate any changes in new versions of the ERS Programme and/or relevant Methodologies.

Data/Parameter	C_f
Data unit	Dimensionless
Description	Combustion factor (proportion of Pre-fire Fuel Biomass Consumed)
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 2, Table 2.6
Value(s) applied	Ecosystem dependant (see table in the IPCC document)
Quality Assurance	IPCC is a reputable source approved under the ERS Programme.
Quality Control	ERS regularly checks for IPCC updates and strives to integrate any changes in new versions of the ERS Programme and/or relevant Methodologies.

Data/Parameter	$G_{ef,g}$
Data unit	$gGHG \cdot kgDM^{-1}$
Description	Emission factor of dry matter burnt per gas g
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories,

	Volume 4, Chapter 2, Table 2.5
Value(s) applied	GHG dependant (see table in the IPCC document)
Quality Assurance	IPCC is a reputable source approved under the ERS Programme.
Quality Control	ERS regularly checks for IPCC updates and strives to integrate any changes in new versions of the ERS Programme and/or relevant Methodologies.

Data/Parameter	**GWP_g**
Data unit	Dimensionless
Description	Global warming potential per gas *g*
Source of data	IPCC's Sixth Assessment Report (AR6)
Value(s) applied	GHG dependant (see AR6)
Quality Assurance	IPCC is a reputable source approved under the ERS Programme.
Quality Control	ERS regularly checks for IPCC updates and strives to integrate any changes in new versions of the ERS Programme and/or relevant Methodologies.

Data/Parameter	**$EF_{Ndirect}$**
Data unit	$tN2O\text{-}N \cdot tN^{-1}$ applied
Description	Emission factor for nitrous oxide emissions from N additions due to synthetic fertilisers, organic amendments and crop residues.
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 11, Table 11.1
Value(s) applied	0.03 (The IPCC applies a default value of 0.01 with an uncertainty range of 0.003 - 0.03. Due to a lack of scalable field data on a per Project

	basis in this version of the Quantification Methodology, ERS applies the most conservation value).
Quality Assurance	IPCC is a reputable source approved under the ERS Programme.
Quality Control	ERS regularly checks for IPCC updates and strives to integrate any changes in new versions of the ERS Programme and/or relevant Methodologies.

Data/Parameter	$\mathbf{M}_{SF,i}$
Data unit	t fertiliser
Description	Mass of N-containing synthetic fertiliser applied in intervention area *i*
Source of data	Mass of synthetic fertiliser applied in the Project, as indicated by the Developer in the Restoration Plan.
Monitoring Procedure	ERS monitors the mass of synthetic fertilizer applied in the Project Area by reviewing the Annual Report and comparing it to the relevant indicators and application timeline specified in the Restoration Plan at the time of Certification.
Monitoring Frequency	ERS monitors the mass of synthetic fertilizer applied in the Project Area on an annual basis via the Annual Report.
Quality Assurance	- The Developer must sign the Restoration Plan to guarantee the veracity of information. - The Developer must provide invoices for the purchase of chemicals or fertilisers. - The Developer must indicate the volume applied for each chemical, as well as the method and time of application, in the Restoration Plan.
Quality Control	Once all fertilizer has been applied, ERS cross-checks the soil sampling results against the mass of synthetic fertilizer intended for application, as specified in the Restoration Plan.

Data/Parameter	$C_{SF,i}$
Data unit	tN·t fertiliser^{-1}
Description	N content of synthetic fertiliser applied in intervention area *i*
Source of data	N content is determined following the fertiliser manufacturer's specifications.
Value(s) applied	Product-dependant, as indicated in the Restoration Plan by the Developer
Quality Assurance	- The Developer must sign the Restoration Plan to guarantee the veracity of information. - The Developer must provide the name, brand and content for each chemical/fertiliser applied. - The Developer must indicate the N-content of the mass of chemical/fertiliser applied, which is cross-referenced with the name, brand, and content of said chemical/fertiliser provided in the Restoration Plan.
Quality Control	ERS proactively monitors manufacturer updates regarding the N-content of synthetic fertilizers used by the Developer, ensuring alignment with the latest product specifications.

Data/Parameter	$M_{OF,i}$
Data unit	t fertiliser
Description	Mass of N-containing organic fertiliser applied in intervention area *i*
Source of data	Mass of organic fertiliser applied in the Project, as indicated by the Developer in the Restoration Plan.
Monitoring Procedure	ERS monitors the mass of organic fertilizer applied in the Project by reviewing the Annual Report and comparing it to the relevant indicators and application timeline specified in the Restoration Plan at the time of Certification.
Monitoring Frequency	ERS monitors the mass of organic fertilizer applied in the Project Area on an annual basis via the Annual Report.

Quality Assurance	- The Developer must sign the Restoration Plan to guarantee the veracity of information. - The Developer must provide invoices for the purchase of chemicals or fertilisers. - Before applying any chemicals or fertilisers, the Developer must carry out soil sampling and cross-reference it with scientific literature on the specific soil conditions of the Project's biome/ecosystem. - The Developer must indicate the volume applied for each chemical, as well as the method and time of application, in the Restoration Plan.
Quality Control	Once all fertilizer has been applied, ERS cross-checks the soil sampling results against the mass of organic fertilizer intended for application, as specified in the Restoration Plan.

Data/Parameter	$C_{OF,i}$
Data unit	$tN \cdot t\ fertiliser^{-1}$
Description	N content of organic fertiliser applied in intervention area *i*
Source of data	N content is determined following the fertiliser manufacturer's specifications.
Value(s) applied	Product-dependant, as indicated in the Restoration Plan by the Developer
Quality Assurance	- The Developer must sign the Restoration Plan to guarantee the veracity of information. - The Developer must provide the name, brand and content for each chemical/fertiliser applied. - The Developer must indicate the N-content of the mass of chemical/fertiliser applied, which is cross-referenced with the name, brand, and content of said chemical/fertiliser provided in the Restoration Plan.
Quality Control	ERS proactively monitors manufacturer updates regarding the N-content of organic fertilizers used by the Developer, ensuring alignment with the latest product specifications.

Data/Parameter	F_{SFvol}
Data unit	$(kgNH3–N + NOx–N)\cdot(kgN\ applied)^{-1}$
Description	Fraction of all synthetic nitrogen added to soils, volatilising as NH3 and NOx.
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 11, Table 11.3 (page 24).
Value(s) applied	0.3 (The IPCC applies a default value of 0.10 with an uncertainty range of 0.03 - 0.3. Due to a lack of scalable field data on a per Project basis in this version of the Quantification Methodology, ERS applies the most conservation value).
Quality Assurance	IPCC is a reputable source approved under the ERS Programme.
Quality Control	ERS regularly checks for IPCC updates and strives to integrate any changes in new versions of the ERS Programme and/or relevant Methodologies.

Data/Parameter	F_{OFvol}
Data unit	$(kgNH3–N + NOx–N)\cdot(kg\ N\ applied\ or\ deposited)^{-1}$
Description	Fraction of all organic nitrogen added to soils, volatilising as NH3 and NOx
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 11, Table 11.3 (page 24)
Value(s) applied	0.5 (The IPCC applies a default value of 0.20 with an uncertainty range of 0.05 - 0.5. Due to a lack of scalable field data on a per Project basis in this version of the Quantification Methodology, ERS applies the most conservation value).
Quality Assurance	IPCC is a reputable source approved under the ERS Programme.

Quality Control	ERS regularly checks for IPCC updates and strives to integrate any changes in new versions of the ERS Programme and/or relevant Methodologies.

Data/Parameter	EF_{Nv}
Data unit	$kgN2O–N·(kgNH3–N + NOX–N\ volatilised)^{-1}$
Description	Emission factor for nitrous oxide emissions from atmospheric deposition of N on soils and water surfaces.
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 11, Table 11.3 (page 24).
Value(s) applied	0.05 (The IPCC applies a default value of 0.010 with an uncertainty range of 0.002 - 0.05. Due to a lack of scalable field data on a per Project basis in this version of the Quantification Methodology, ERS applies the most conservation value).
Quality Assurance	IPCC is a reputable source approved under the ERS Programme.
Quality Control	ERS regularly checks for IPCC updates and strives to integrate any changes in new versions of the ERS Programme and/or relevant Methodologies.

Data/Parameter	F_{Fleach}
Data unit	$kgN·(kg\ of\ N\ additions)^{-1}$
Description	Fraction of synthetic or organic nitrogen added to soil lost through leaching and/or runoff, where applicable.
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 11, Table 11.3 (page 24).
Value(s) applied	0.8 (The IPCC applies a default value of 0.30 with an uncertainty

	range of 0.1 - 0.8. Due to a lack of scalable field data on a per Project basis in this version of the Quantification Methodology, ERS applies the most conservation value).
Quality Assurance	IPCC is a reputable source approved under the ERS Programme.
Quality Control	ERS regularly checks for IPCC updates and strives to integrate any changes in new versions of the ERS Programme and/or relevant Methodologies.

Data/Parameter	EF_{NI}
Data unit	$tN2O\text{-}N \cdot (tN\ leached\ and/or\ runoff)^{-1}$
Description	Emission factor for nitrous oxide emissions from N leaching and/or runoff.
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 11, Table 11.3 (page 24).
Value(s) applied	0.025 (The IPCC applies a default value of 0.0075 with an uncertainty range of 0.0005 - 0.025. Due to a lack of scalable field data on a per Project basis in this version of the Quantification Methodology, ERS applies the most conservation value).
Quality Assurance	IPCC is a reputable source approved under the ERS Programme.
Quality Control	ERS regularly checks for IPCC updates and strives to integrate any changes in new versions of the ERS Programme and/or relevant Methodologies.

TAB Standard Revision Proposition RP005

4 responses

Revision 1: Do you approve this revision proposition?

4 out of 4 answered

Accept	4 resp.	100%
Other (Please detail below)	0 resp.	0%
Reject	0 resp.	0%

Revision 2: Do you approve this revision proposition?

4 out of 4 answered

Accept	4 resp.	100%
Other (Please detail below)	0 resp.	0%
Reject	0 resp.	0%

Revision 3: Do you approve this revision proposition?

4 out of 4 answered

Accept	4 resp.	100%
Other (Please detail below)	0 resp.	0%
Reject	0 resp.	0%

Revision 4: Do you approve this revision proposition?

4 out of 4 answered

Accept	4 resp.	100%
Other (Please detail below)	0 resp.	0%
Reject	0 resp.	0%

Revision 5: Do you approve this revision proposition?

4 out of 4 answered

Accept 4 resp. 100%

Other (Please detail below) 0 resp. 0%

Reject 0 resp. 0%

Revision 6: Do you approve this revision proposition?

4 out of 4 answered

Accept 4 resp. 100%

Other (Please detail below) 0 resp. 0%

Reject 0 resp. 0%

Revision 7: Do you approve this revision proposition?

4 out of 4 answered

Accept 4 resp. 100%

Other (Please detail below) 0 resp. 0%

Reject 0 resp. 0%

Revision 8: Do you approve this revision proposition?

4 out of 4 answered

Accept 4 resp. 100%

Other (Please detail below) 0 resp. 0%

Reject 0 resp. 0%

Revision 9: Do you approve this revision proposition?

4 out of 4 answered

Accept 4 resp. 100%

Other (Please detail below) 0 resp. 0%

Reject 0 resp. 0%

Revision 10: Do you approve this revision proposition?

4 out of 4 answered

Accept 4 resp. 100%

Other (Please detail below) 0 resp. 0%

Reject 0 resp. 0%

Revision 11: Do you approve this revision proposition?

4 out of 4 answered

Accept 4 resp. 100%

Other (Please detail below) 0 resp. 0%

Reject 0 resp. 0%

Revision 12: Do you approve this revision proposition?

4 out of 4 answered

Accept 4 resp. 100%

Other (Please detail below) 0 resp. 0%

Reject 0 resp. 0%

Revision 13: Do you approve this revision proposition?

4 out of 4 answered

Accept 4 resp. 100%

Other (Please detail below) 0 resp. 0%

Reject 0 resp. 0%

Any final, general comments, questions, suggestions, remarks? (optional)

1 out of 4 answered

All comments left in manuscript.

Publication Date:
31/07/2025

Version:
v1.2

Contact:
Ecosystem Restoration Standard
25 Rue de Frémicourt
75015 Paris, FRANCE
info@ers.org

Final Implementation Adjustments

SUMMARY

This document outlines final revisions implemented for the upcoming release of v1.2 of the Equitable Earth Programme, for transparency and informational purposes.

READING NOTES

Colour code:

- Every element written in gold refers to a new addition to Equitable Earth Standard documentation in an existing paragraph. Entirely new sections will appear in black font.

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INTRODUCTION

Over the past year, Equitable Earth (formerly ERS) worked closely with all TAB members to validate key revisions to the Programme via three formal revision propositions (RP003, RP004, and RP005). These revisions reflected the core changes agreed upon and documented through the TAB revision process.

During the final stages of implementation and prior to the publication of v1.2 of the Programme Manual, Standard, and methodology, the Secretariat implemented a few additional TAB revisions. These changes were essential to ensure internal consistency, resolve gaps in the documentation, or reflect practical implementation insights. These propositions, while omitted from the earlier RPs, support the intent and direction of the approved revisions.

This document provides a summary of these additional revisions for TAB awareness and feedback.

REFERENCE

Standard and Methodology Revision ID: RP006

Issuance date: 31/07/2025

REVISION PROPOSITION SUMMARY

The Secretariat submits this RP006 to the TAB. This document consolidates additional updates for v1.2 across multiple key areas, including:

1. Improvement of the **leakage approach**
2. Reinstatement of the **environmental surplus** requirement
3. Revision of the **internal audit recurrence**
4. Update on the **identification of reference site(s)** requirements for projects with multiple biomes

As a reminder, the Secretariat undertook a broader restructuring of the document architecture. A new core document called the Equitable Earth Standard has been

introduced, including all requirements applicable to all projects. The Programme (renamed Programme Manual) still includes all overarching rules related to roles, programme governance, and procedures.

REVISIONS

Revision 1: Improvement of the leakage approach

RP #1	
Document	M001
Section & Page	• M001, section 'Carbon stock and baseline estimation', subsection 'Adjustment factors', subsection 'Initial leakage quantification' (pp. 51-52) • M001, section 'Carbon quantification for VRU accounting', subsection 'Adjustment factors', subsection 'Leakage estimation' (pp. 70-71)
Description	This revision strengthens the treatment of leakage in projects without identified hosting areas by introducing two key improvements. • Equitable Earth established a methodology to quantify leakage during the verification period using the leakage belt: a per-hectare carbon loss is conservatively estimated based on the 95th upper percentile of pixel-level carbon loss observed within the leakage belt. • Equitable Earth revised the initial leakage estimation approach for projects without identified hosting area(s). Instead of using the mean carbon stock in the leakage belt — which may underestimate leakage — the revised method applies the 95th

	upper percentile of pixel-level carbon stock to reflect the higher likelihood of leakage occurring in more carbon-dense areas. Both changes aim to ensure more conservative and robust accounting of leakage impacts.
Proposition	• M001, section 'Carbon stock and baseline estimation', subsection 'Adjustment factors', subsection ' Initial leakage quantification' (pp. 51-52) **New 'Displaced activity areas' section**: 'If the developer cannot provide the hosting area(s), they must identify the displaced activity area(s) within the project area. It is assumed that activities within this area will be displaced outside of the project area. The developer must provide an estimate of the percentage of the activities that will be displaced and result in leakage. This percentage should reflect changes in land use practices, including, but not limited to, the introduction of more efficient processes or elimination of activities due to retirement or job changes[1]. 1. To estimate the potential impact of the displacement(s), ERS must estimate the conservative per-hectare carbon stock of the leakage belt by identifying the 5th upper-percentile of the carbon stock distribution across all pixels within the leakage belt, as detailed in equation (10): $$\mathbf{C}_{max-lb,0} = \mathbf{P}_{95}(\mathbf{C}_{lb-pixel,0}) \qquad (10)$$ Where:

[1] Pi = 1 indicates no improvements in practices, Pi = 0.5 indicates the displaced activity is 50% less intensive as a result of practice improvements

- $\mathbf{C}_{max-lb,0}$= Conservative estimate of the leakage belt per-hectare carbon stock at baseline; tCO2e/ha.
- $\mathbf{P}_{95}$ = indicates the 95th percentile, which corresponds to the upper 90% of the distribution.
- $\mathbf{C}_{lb-pixel,0}$ = Distribution of pixel-level per-hectare carbon stock in the leakage belt at baseline; tCO2e/ha.

2. The estimated leakage is obtained using equation (11):

$$\mathbf{L}_i^{da} = \mathbf{A}_i \times \mathbf{C}_{max-lb,0} \times \mathbf{P}_i \qquad (11)$$

Where:

- $\mathbf{L}_i^{da}$ = Estimated leakage of the displaced activity area i at baseline; tCO_2e.
- $\mathbf{A}_i$ = Size of the displaced activity area i; ha.
- $\mathbf{C}_{max-lb,0}$ = Conservative estimate of the leakage belt per-hectare carbon stock at baseline; tCO_2e/ha.
- $\mathbf{P}_i$ = Declared % of activity displacement in the displaced activity area i at baseline; dimensionless."

- M001, section 'Carbon quantification for VRU accounting', subsection 'Adjustment factors', subsection 'leakage estimation' (pp. 70-71)

New 'Displaced activity areas' section: 'If the developer cannot provide the hosting area(s), ERS must use the leakage belt to estimate a conservative quantification of leakage.

1.1.1. To estimate the carbon stock loss associated with the unknown hosting area(s), ERS analyses the leakage belt and identifies all pixels where forest loss has occurred during the previous verification period.

1.1.2. A conservative estimate of carbon loss is then calculated by determining the 95th percentile of the distribution of carbon stock loss across these pixels. This value is used to represent the mean carbon stock loss for leakage accounting purposes.

$$\mathbf{C}_{max-loss,t} = \mathbf{P}_{95}(\mathbf{C}_{loss-lb,t}) \qquad (30)$$

Where:

- $\mathbf{C}_{max-loss,t}$ = Conservative estimate of the leakage belt per-hectare carbon loss during the last verification period; tCO2e/ha.
- $\mathbf{P}_{95}$ = indicates the 95th percentile, which corresponds to the upper 90% of the distribution.
- $\mathbf{C}_{loss-pixel,t}$ = Distribution of pixel-level per-hectare carbon loss in the leakage belt during the last verification period; tCO2e/ha.

The resulting leakage from the activity is determined using equation (31):

$$\mathbf{L}_{i,t}^{da,\,period} = \mathbf{A}_i \times \mathbf{C}_{max-loss,t} \times \mathbf{P}_i, \quad t \geq 1 \qquad (31)$$

	Where: • $L_{i,t}^{da,period}$ = Leakage identified during the last verification period in the displaced activity area i; tCO_2e. • A_i = Size of the displaced activity area i; ha. • $C_{max-loss,t}$ = Conservative estimate of the leakage belt per-hectare carbon loss during the last verification period; tCO2e/ha. • P_i = Declared % of activity displacement of the activity in the displaced activity area i at baseline; dimensionless.

Revision 2: Reinstatement of the environmental surplus requirement

RP #2	
Document	M001
Section & Page	Section 'Eligibility Criteria', subsection 'eligibility criteria' (p. 7)
Description	In RP003, the environmental surplus requirement was removed from the additionality section because the dynamic baseline was considered sufficient to capture baseline fluctuations. However, where restoration site(s) have experienced significant anthropogenic deforestation before the project starts to benefit from carbon finance, the dynamic baseline cannot fully account for this, since control plots may represent similar sites but without the same 'activity-driven' degradation. Therefore, this revision reintroduces a requirement in the 'Eligibility

	Criteria' section of the methodology, stating that in such cases, developers must demonstrate that the deforestation was not carried out with the intent to benefit from voluntary carbon market revenues.
Proposition	Add 2.3: 'Projects that have experienced significant anthropogenic degradation within the ten years prior to the project start date, developers must provide evidence that such degradation was not conducted with the intent to benefit from additional carbon revenues.'

Revision 3: Revision of the internal audit recurrence

RP #3	
Document	Programme Manual
Section & Page	Section 'Governance & Safeguards', subsection 'Programme Management', subsection '4. Annual Third-Party Audit' (p. 54)
Description	This revision updates the internal audit requirement for Equitable Earth from an annual to a periodic schedule. While internal audits are crucial for maintaining quality and compliance, conducting them every year has proven resource-intensive without yielding proportional benefits at this stage. By adjusting the frequency, Equitable Earth aims to balance operational efficiency with rigorous oversight, enabling the team to gather more experience and data to determine the most appropriate audit frequency in the future. This flexible approach supports continuous improvement while reducing unnecessary burden on project developers and auditors.

Proposition	• Change title '4. ~~Annual~~ Third-Party Audits' • Modify first section 'Equitable Earth is audited regularly ~~annually~~ by an external and independent auditing firm.'

Revision 4: Update of the identification of reference site(s) requirement for projects with multiple biomes

RP #4	
Document	M001
Section & Page	• Section 'Ecological Recovery', subsection 'Principles', subsection 'Reference Ecosystem' (p. 11) • Section 'Ecological Recovery', subsection 'Methods', subsection 'Reference Ecosystem' (pp. 20-21)
Description	This revision updates the requirements for identifying separate reference sites in projects that span multiple biomes. Previously, developers were required to provide at least one reference site per biome. This is now revised to a more flexible requirement. The change acknowledges the reality of ecological gradients and transitional zones between biomes. Given that ERS relies on global datasets that carry inherent assumptions and generalisations, requiring multiple reference sites in such cases was unnecessarily rigid. This update allows for more context-specific and scientifically robust decision-making.
Proposition	• Section 'Ecological Recovery', subsection 'Principles',

	subsection 'Reference Ecosystem' (p. 11) Modify 'In the case of landscape scale projects encompassing multiple biomes and/or ecosystems, one reference site may ~~must~~ be selected per group.' • Section 'Ecological Recovery', subsection 'Methods', subsection 'Reference Ecosystem' (pp. 20-21) Modify 'If the project has multiple biomes or ecosystem types, developers may ~~must~~ select one reference site for each and indicate the link between restoration sites and corresponding reference sites in the Project Zonation.'