



## **Reforestation Forecast Methodology Version 2.0 ERRATA AND CLARIFICATIONS**

The Climate Action Reserve (Reserve) published its Reforestation Forecast Methodology Version 2.0 in April 2022. While the Reserve intends for the methodology to be a complete, transparent document, it recognizes that correction of errors and clarifications will be necessary as the methodology is implemented and issues are identified. This document is an official record of all errata and clarifications applicable to the Reforestation Forecast Methodology Version 2.0.<sup>1</sup>

Per the Climate Forward Program Manual, both errata and clarifications are considered effective on the date they are first posted on the Climate Forward website. The effective date of each erratum or clarification is clearly designated below. All new and listed reforestation projects must incorporate and adhere to these errata and clarifications when they undergo confirmation, including those undergoing confirmation at the time any new errata or clarifications are issued. The Reserve will incorporate both errata and clarifications into future versions of the methodology.

All project proponents and confirmation bodies must refer to this document to ensure that the most current guidance is adhered to in project design and confirmation. Confirmation bodies shall refer to this document immediately prior to uploading any Confirmation Statement to assure all issues are properly addressed and incorporated into confirmation activities.

If you have any questions about the updates or clarifications in this document, please contact the Reserve team at [info@climateforward.org](mailto:info@climateforward.org) or (213) 891-1444.

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<sup>1</sup> See the policy memo dated June 6, 2023, or the Climate Forward Program Manual for an explanation of the Reserve's policies on methodology errata and clarifications. For document management and program implementation purposes, both errata and clarifications are contained in this single document.

*Please ensure that you are using the latest version of this document*

## Errata and Clarifications (arranged by methodology section)

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## Section 3.5

### 1. Regulatory Compliance Relevant to Project (CLARIFICATION – October 4, 2023)

**Section:** 3.5 (Regulatory Compliance)

**Context:** The current language indicating the regulatory compliance obligations of projects is overly broad and not reflective of the programmatic approach employed by the Reserve in interpretation of regulatory violations and embodied in programmatic documentation, including the Climate Forward Program Manual. The intended scope of the regulatory compliance requirement and violations contrary to it is generally limited to those legal obligations, and violations thereof, that have an impact on the GHG emissions reductions or carbon removals of a project and are caused by actions undertaken as part of the project activities.

**Clarification:** Section 3.5 shall now read as follows (bold text indicating new text):

“The project proponent must sign an Attestation of Regulatory Compliance prior to the commencement of project confirmation activities, attesting that **the project has not caused any material violations of applicable laws**, and provide an assessment of any aspects of the project that may present a risk of future regulatory violations. Where such risks are identified, the project proponent shall describe measures undertaken to reduce and/or mitigate these risks.

**Project proponents are required to disclose in writing to the confirmation body any and all instances of legal violations – material or otherwise – caused by the project activities. A violation would be considered to be “caused” by project activities if it can be reasonably argued that the violation would not have occurred in the absence of the project activities. If there is any question of causality, the project proponent shall disclose the violation to the confirmation body.**

The confirmation body shall endeavor to confirm that the project implementation did not result in any regulatory noncompliance, and also that appropriate measures have been implemented to avoid potential future noncompliance during the project crediting period. **If a confirmation body finds that project activities have caused a material violation, then the project will not be eligible to have FMUs issued. Individual violations due to administrative or reporting issues, or due to “acts of nature,” are not considered material and will not affect FMU crediting. However, recurrent administrative violations directly related to project activities may affect crediting. Confirmation bodies must determine if recurrent violations rise to the level of materiality. If the confirmation body is unable to assess the materiality of the violation, then the confirmation body shall consult with the Reserve.”**

## Section 3.8.1

### 2. Projects on Government-Owned Lands and Tonne-Tonne Accounting (CLARIFICATION – June 22, 2023)

**Section:** 3.8.1 (Ensuring Permanence – Tonne-Tonne Accounting)

**Context:** Section 3.8.1 identifies landowner and management conditions under which the Reserve is willing to issue credits based on tonne-tonne accounting. One condition indicated is locating a project on government-owned lands where the project proponent is able to demonstrate the management of the project area can be reasonably expected to result in each of two conditions. First, management will lead to forest carbon stocking levels on the project area that meet or exceed the levels associated with the year in which the culmination of mean annual increment (CMAI) is projected to occur (or 100 years after the start of the project if CMAI is not projected to occur prior to then). Second, management will maintain such stocking levels consistent with a 100-year permanence assumption. Project proponents must provide information supporting the assertion that both conditions will be met, including descriptions of management history, stated management objectives, and the likelihood of current management plans changing in the future in ways that are inconsistent with either required condition.

The Reserve recognizes that tribal trust lands, defined as land held in trust by the Bureau of Indian Affairs (US Department of Interior) or by a state for the benefit of a tribe, are managed under governance structures that are sufficiently similar to other government-owned lands. As such, the Reserve wishes to clarify that tribal trust lands are similarly eligible for the application of tonne-tonne accounting under the landowner class “government (secured),” as long as both conditions described above are demonstrated by the project proponent.

**Clarification:** The second paragraph immediately below Table 3.1 (Conservation Easement Terms) shall now read as follows (bold text indicating new text):

“Projects on government-owned lands **or on tribal trust lands**<sup>12</sup> also meet the permanence requirement using tonne-tonne accounting under certain conditions. To be eligible to use tonne-tonne accounting, projects on public **or tribal trust** lands must be able to demonstrate that management is expected to lead to increases in carbon stocks that: 1) meet or exceed those stocks projected for the project area for the lesser of either 100 years or the year at which the Culmination of Mean Annual Increment (CMAI) occurs, and 2) are maintained at or above such projected stocking levels. CMAI is a benchmark for measuring forest maturity which can be determined from the growth projections. Forest stands at CMAI are more likely to undergo a regeneration harvest. Although forests on public **or tribal trust** lands may very well grow beyond CMAI, considering the accumulation of carbon only to the point of CMAI is a conservative approach to quantification. To demonstrate consistency of management with the 100-year permanency of projected stock increases on a project area on public **or tribal trust** lands, the project proponent must provide a description of the following:

- Management history

<sup>12</sup> Land held in trust by the Bureau of Indian Affairs (US Department of Interior) or by a state for the benefit of a tribe.

- Management objectives
- Likelihood of management plan changing in the future in a way that will prevent projected increases in carbon stocks from being achieved.”

The first sentence of the subsequent paragraph is similarly corrected to read as follows (bold text indicating new text):

“In the case of a project either with a perpetual conservation easement including the requisite terms described above or on public **or tribal trust** lands capable of demonstrating management consistency with the long-term maintenance of projected carbon stock increases (hereafter referred to under the landowner class “government (secured)”), FMU issuance would be based on the tonne-tonne value projected for the crediting period, net of the programmatic *ex ante* and permanence risk discounts (see Sections 5.3 and 5.6).”

## Section 5

### 3. GHG Emissions Removals Equation (ERRATUM – October 4, 2023)

**Section:** 5 (Quantifying GHG Emission Removals)

**Context:** Section 5 includes Equation 5.1, which is the basis for calculating the FMUs to be issued to a project. The equation includes the following sub-equation for the calculation of emissions removals by forest type:

$$ER_f = \left[ \sum_{y=1}^{CP_f} \left( (\Delta AC_{tree,f,y} + (AC_{soil,f,y} - BC_{soil,f})) \times 1\% \times (CP_f - y + 1) \right) \right] \times \left( 1 - (CC_{tree,f} + S_f) \right) + MIN \left( 0, (AC_{shrub,f,CP} - BC_{shrub,f,0}) \right)$$

Embedded in that sub-equation are percentage-based deductions applied to gross removals based on estimates of pre-existing (i.e., baseline) mature trees ( $CC_{tree,f}$ ) and natural regeneration ( $S_f$ ). The current structure of the equation, whereby the percentage deductions are summed, is incorrect. Since the assessment of pre-existing natural regeneration is only intended to capture how much such regeneration will contribute to the future stand, the assumption is that any pre-existing canopy trees will continue occupying their current canopy area. As such, only those areas not currently occupied by canopy trees would be available for future occupation by trees growing from pre-existing natural regeneration. To reflect this, the equation should multiply the deductions rather than sum them.

**Correction:** Equation 5.1 shall now read as follows (bold text indicating corrected text):

$$ER_f = \left[ \sum_{y=1}^{CP_f} \left( (\Delta AC_{tree,f,y} + (AC_{soil,f,y} - BC_{soil,f})) \times 1\% \times (CP_f - y + 1) \right) \right] \times \left( (1 - CC_{tree,f}) \times (1 - S_f) \right) + MIN \left( 0, (AC_{shrub,f,CP} - BC_{shrub,f,0}) \right)$$

## 4. Baseline Natural Regeneration Assessment Requirements (ERRATUM – June 22, 2023)

**Section:** 5.1.2 (Estimating Baseline Stocks - Naturally Regenerating Seedlings)

**Context:** Section 5.1.2 describes the evaluation of pre-existing natural regeneration in the absence of site preparation activities that result in the promotion of natural regeneration as a means to account for baseline seedlings. Project proponents are to install sample plots where they are to perform an assessment of the contribution of pre-existing natural regeneration to the future canopy cover on the site. The section also describes how the results from plot assessments are entered into the Reforestation Communities Data File, which then automatically calculates the appropriate deduction to be applied. More specifically, the first paragraph immediately below Table 5.1 in Section 5.1.2 currently states: “Plot results are to be entered into the Reforestation Communities Data File, which automatically determines the Natural Regeneration Class for the project or for the forest type based on the mode of the sample results.”

**Correction:** The first paragraph immediately below Table 5.1 in Section 5.1.2 shall now read as follows (bold text indicating corrected text):

“Plot results are to be entered into the Reforestation Communities Data File, which automatically determines the Natural Regeneration Class for the project or for the forest type based on the **mean** of the sample results.”

## Section 8.4.2

## 5. Confirmation of Baseline Tree and Shrub Carbon Stocks (ERRATUM – June 22, 2023)

**Section:** 8.4.2 (Confirmation Items - Quantification)

**Context:** Table 8.2 (Quantification Confirmation Items), in reference to Section 5.1 (Estimating Baseline Carbon Stocks) describes the focus of the review of baseline carbon stocks by the confirmation body in relation to pre-existing trees and shrub cover. For both pools, an analysis of canopy cover (tree or shrub, respectively) is performed by the project proponent, with the results determining the applicable deduction applied to the project carbon stock projections. The confirmation body is to perform the same analyses using the plot locations supplied by the project proponent and comparing their results with those reported by the project proponent. The methodology currently states that the confirmation body is to perform the analysis as the project proponent did, including potentially using all of the sample points required to achieve a standard error less than +/-10% of the estimate. However, the intent of the methodology is not to require the same statistical threshold be achieved by the confirmation body, but to confirm whether the project proponent’s reported results reflect a reasonably accurate assessment of the imagery serving as the basis for the analysis. As such, the confirmation body is only required initially to sample a portion of the plot locations, comparing their individual plot results to determine whether they find a trend of agreement between their classifications and the project proponent’s classifications, with additional plot locations added if the plot results from the confirmation body do not appear to be aligning with the plot results reported for the project. If an initial trend of agreement is not

found, additional plots may be assessed by the confirmation body to determine if a trend of agreement can be achieved.

**Correction:** The first paragraph of the “Quantification Item” description in the first row below the headings in Table 8.2 shall now read as follows (bold text indicating corrected text):

“The baseline carbon stocks related to pre-existing trees or seedlings are estimated following the guidance in Section 5.1. Confirmation body is to replicate the evaluation of pre-existing tree canopy cover and baseline shrub cover **based on a sub-sampling of the sample points used by the project proponent. Confirmation is to be performed on a 10%/5% basis, where a random selection of 10% of the point locations used by the project proponent are assessed by the confirmation body for agreement, with the assessment outcome being satisfactory when there is 95% or greater agreement between the confirmation body’s and project proponent’s plot results.**

**If confirmation is not satisfied after the initial 10% of sample points are assessed, the confirmation body may continue sampling an additional random selection of 10% of the project sample points, combining the results of the initial 10% of points with the additional 10% of points to assess cumulative agreement. The addition of 10% of the project proponent’s sample points may be performed a third time if needed. Failure to find 95% agreement after three efforts results in failure of the ability to confirm the reported cover percentage and the project proponent must reassess the cover assignments at each point prior to continuing confirmation activities. In such cases, the confirmation body would perform a new review of the project proponent’s analysis based on the same procedure as indicated above using a newly randomized selection of points.”**

## 6. Confirmation of Baseline Shrub Carbon Stocks (ERRATUM – June 22, 2023)

**Section:** 8.4.2 (Confirmation Items - Quantification)

**Context:** The seventh row below the headings of Table 8.2 (Quantification Confirmation Items), in reference to Section 5.2.2 (5) (Determining Gross Forecasted GHG Removals), describes the review of photo plots associated with baseline shrub stocking to be performed by the confirmation body. That guidance is in reference to an approach to accounting for baseline shrub stocking that was present in the public comment draft of version 2.0 of the methodology but was replaced in the final release of the methodology, for which confirmation guidance is provided elsewhere in the same table. As such, the guidance referencing photo plots for baseline shrub stocking is no longer relevant to the project reporting requirements and is being removed.

**Correction:** The seventh row below the headings of Table 8.2 shall now be removed in its entirety (strikethrough text indicating text being removed):

<p>5.2.2 (5)                  Determining                  Gross                  Forecasted                  GHG Removals</p>	<p><del>Images from at least 5 photo plots taken to evaluate shrub carbon stocking are reviewed for each forest type. Plots to be reviewed are randomly selected from among the project’s sample plots and average results from carbon stocking based on the identification of corresponding fuel models must be within 10% of the average results reported by the project proponent.</del></p>	<p>Yes</p>
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## Appendix B

### 7. Remote Analysis of Tree and Shrub Cover (ERRATUM – July 5, 2023, and October 4, 2023)

**Section:** Appendix B (Quantification of Canopy Cover)

**Context:** [July 5, 2023] Appendix B provides the overarching approach to estimating the percentage of tree and shrub cover for the project using i-Tree Canopy and remotely sensed imagery relevant to the timing of the project. Included is an indication of the statistical accuracy that must be achieved before the project proponent may stop sampling the area of interest. The accuracy requirement is currently based on the standard error related to the estimated percent cover (tree or shrub). However, when performing the analysis on areas that have low percentages of cover, achieving the accuracy threshold may require an inordinate amount of sample points to be analyzed. This is because there are diminishing returns between more i-Tree sampling and reducing the standard error. Once a reasonably accurate estimate of the percent cover has been achieved, more sampling to achieve the specified accuracy threshold may have nearly insignificant changes to the cover estimate and standard error.

Given that the percentage of non-tree or non-shrub cover is being estimated simultaneously as part of the i-Tree Canopy analysis, the accuracy threshold may be achieved by either the cover or non-cover estimate and still result in a reasonably accurate outcome for estimating the percent cover for the purposes of the methodology.

[October 4, 2023] Two additional minimum sampling requirements are being added to help ensure the reliability of the analyses. Both new sampling requirements must be satisfied, along with reaching the standard error threshold, before sampling may be stopped. The first specifies the minimum number of points that must be assigned to each category (e.g., tree vs. non-tree). The second specifies the minimum total number of sample points that must be analyzed.

**Correction:** The third and fourth paragraphs of Appendix B are modified as follows (bold text indicating corrected text for erratum issued July 5, 2023, and italicized bold text indicating corrected text for erratum issued October 4, 2023):

“Sampling, whether for pre-existing tree canopy cover or for shrub cover, must ***meet each of the following three criteria:***”

- Achieve a standard error that is +/- 10 percent or less of the estimate of **percent cover for either the presence (tree or shrub) or absence (non-tree or non-shrub) category. For example**, if percent tree canopy cover is estimated as 35 percent, **with a corresponding non-tree cover estimate of 65 percent, sampling may be halted once a standard error of either 3.5 percent for the tree cover category or 6.5 percent for the non-tree cover category is achieved.**
- ***Assign a minimum of 10 points to each category. For example, if points are being classified as either “tree” or “non-tree,” then the analysis must continue until at least 10 points have been classified as “tree” and 10 as “non-tree.”***
- ***Analyze a minimum of 100 sample points in total.***



The methodology presented below is based on the use of i-Tree Canopy, which does not directly allow for the selection of specific imagery dates. As such, the analysis should be performed using i-Tree Canopy's instructions for comparing results to historical imagery, with imagery from other sources and from appropriate dates for the analysis used. To properly use imagery outside of the i-Tree Canopy interface, the project proponent should estimate the number of sample points required to achieve the target standard error of +/- 10 percent of the **estimated percent cover for either the presence or absence category**. Alternatively, sample points may be added in i-Tree Canopy until the target standard error is achieved based on the provided imagery (***in addition to having at least 10 sample points per category and 100 total sample points***); however, a comparison of the points initially sampled in i-Tree Canopy to the appropriate historical remote imagery may result in the need to add more sample points to properly achieve the target standard error."