SCM0006: Public Comments

Methodology for the Conservation of Areas of Biodiversity Importance

Version 2.0 of this methodology was open for public comment for the dates 14 August 2023 – 14 September 2023.

Comment Submitted by: Aurélien Vivancos, Head of Research and Development

Organization: C3 Ambiental

Date received: 14th September 2023

Country: Brazil

This comment was received via email to the Social Carbon Foundation

Comment:

6.2.1: Deforestation/degradation rate:

Specific case of the Atlantic Forest:

The Atlantic Forest is a biome considered as one of the most important biodiversity hotspot in the world (Myers *et al*., 2000) and has been heavily affected from deforestation, with only 28% of its original cover remaining intact (Rezende *et al*. 2018)

Loss of primary forest cover through deforestation continues, but secondary forest cover is increasing despite increase deforestation rate in recent years (see table 1): regeneration rate outpace deforestation, which makes the total forest cover to increase (Piffer *et al*., 2021). However, overall, the biome continues to deteriorate (Rosa *et al*. 2021).

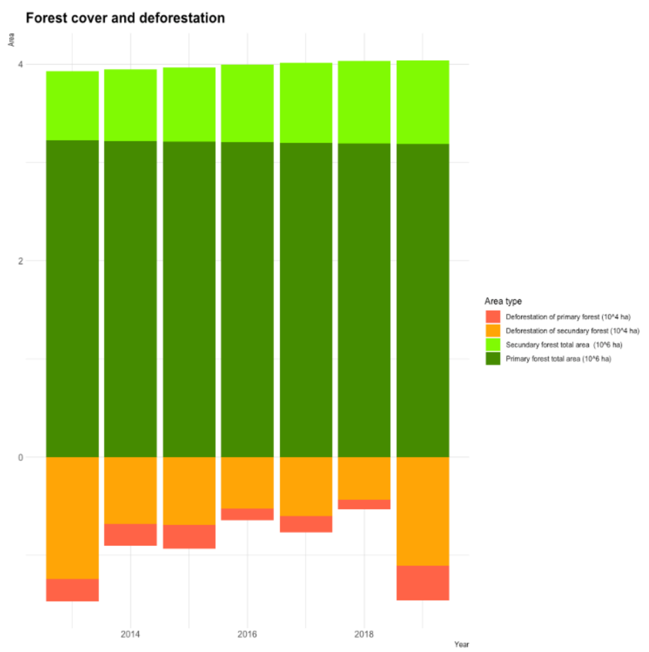

Table 1: Forest cover (x10^6 ha) and deforested areas (x10^4 ha) of primary and secondary forest in the biome Atlantic Forest: in São Paulo state, for the years 2013 to 2019)

(Data from *Mapbiomas* (2023), processed by C3 Ambiental)

Consequently, considering deforested areas of both secondary and primary forest is more relevant than raw loss of forest cover to estimate deforestation rate. We therefore propose the following equation to quantify deforestation rate in biomes with this kind of forest cover dynamic:

$$Deforestation\ rate_y = \frac{Total\ area\ deforested_y}{Total\ forested\ area_{y-1}} * 100$$

Where:

$Total\ area\ deforested_y$ = Deforested areas within the reference region in year y in both primary and secondary forest (ha).

$Total\ forested\ area_{y-1}$ = Total forest cover (primary and secondary forest) in the reference region in year y-1.

8.1 Baseline Removals

Canopy cover

The equation 2 used to quantify carbon removal of the project is currently the following in the version 2.0:

BRy= $C\ vc,y$ × $Areavc$ × (44/12)

It removes a factor of proportionality with forest cover that existed in the version 1.0 (namely $Coveragevc$), which was the ratio of vegetation cover biomass per hectare in land having a crown cover of 100%.

Forest cover was intended to take into consideration Tree Canopy Cover (TTC), which is correlated to above ground woody biomass (AGWB, Li, 2019) and consequently, to carbon removal. However, this relationship is extremely complex (Li, 2020) and using a simple factor of proportionality can be excessively conservative when it comes to quantify AGWB, particularly in secondary forest, as small trees are usually not detected through remote sensing (Barbosa, 2014, Karlson, 2015). In this regard, we agree on the change made by Social Carbon.

However, we still think that TCC needs to be taken into consideration in order to properly estimate carbon removal from forest, as it is a good proxy for trees density. We therefore suggest using the TCC threshold used by Hansen (2013) to define forest cover (30%). In this case, forest with a TCC of 30% or above, will be allocated 100% of the carbon removal rate of this given forest class.

Age limit of secondary forest for the biome Atlantic forest.

Social carbon is suggesting an age limit of 20 years for transitioning from secondary forest to primary forest. For the case of the Atlantic Forest, and following the default value of carbon sequestration from the MCTI (Table A1.18), it means that a forest between 10 and 20 years old would remove 5.35 tons of carbon per year, while a forest of 21 years old would remove just 0.35 tons of carbon per year, almost 19 times less. However, recent studies investigating carbon sequestration of restored areas of Atlantic Forest show that the maturation period is longer than 20 years. For example, Shinamoto *et al*. (2016) showed that area mixed with both fast, and slow-growing tree species, are reaching their peak sequestration rate much later in their development (Figure 1). It is also worth noting that there is no age limit clearly defined for secondary forest by the MCTI.

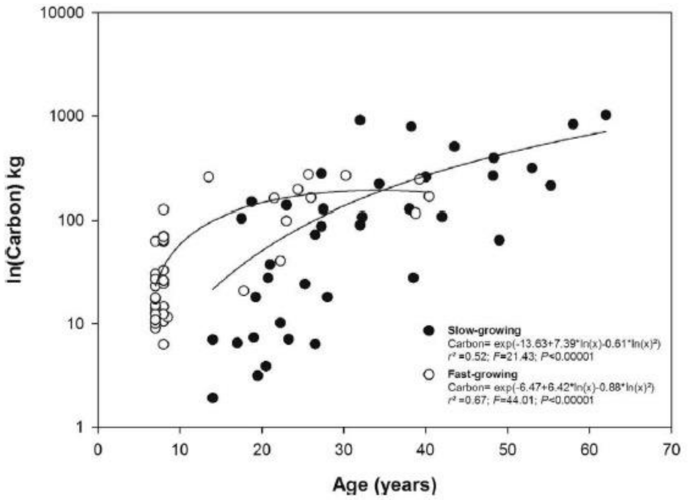

Fig. 2. Relationship between tree age and total carbon (50% AGB) in fast-growing and slow-growing species of the Atlantic forest in the southern coast of Brazil.

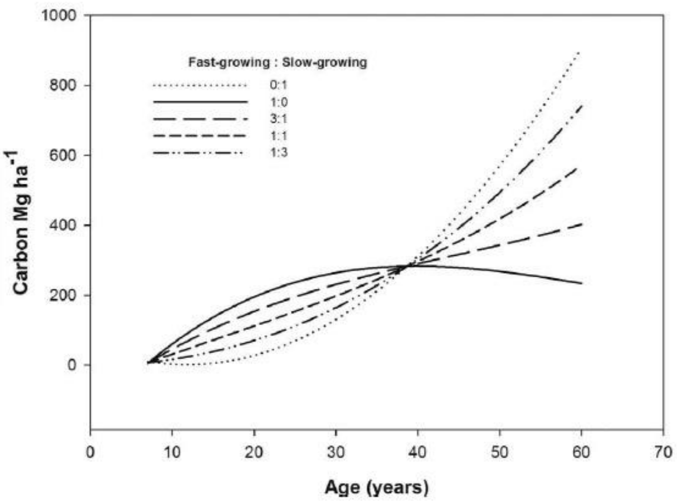

Fig. 3. Total carbon (50% of AGB) in simulated ecological restoration area using different proportions of fast-growing and slow-growing species.

Figure 1: Reproduction from Shinamoto et al. (2016)

Another important point is that the forest classification performed by Mapbiomas considers any forest that recovered from a deforestation event occurring since 1987 as secondary forest (see Deforestation and secondary Vegetation – Appendix, collection 7.1, version 1). This is further confirmed in the "*Age of Secondary forest*" layer from Mapbiomas, where some areas categorized as secondary forest by Mapbiomas can reach up to 37 years. With the current rule of the methodology, the classification of these areas should be changed, and considered as primary forest. We therefore suggest to implement one of the two following approaches for the definition of forest classes:

Increase the age limit of maturation of secondary forest to 35 years, or

Implement a progressive diminution of carbon sequestration rate of 30% per decade after 20 years (i.e. removal rate of forest between 20 and 30 years old will be 70% of the default value, 30 to 40 years old would be 70% of the removal rate from the previous decade, etc...).

We believe these changes would bridge the gap between the actual version of the methodology and the information available in the current literature, and better fit the methodology of classification from Mapbiomas. Also, it will further valorize older secondary forest of the Atlantic Forest, and consolidate their process of regeneration, which is known to be the main issue in the conservation of this biome (Piffer *et al.* 2021).

References:

- Barbosa, J. M., Broadbent, E. N., & Bitencourt, M. D. (2014). Remote sensing of aboveground biomass in tropical secondary forests: A review. *International Journal of Forestry Research*, *2014*.
- Hansen, M. C., Potapov, P. V., Moore, R., Hancher, M., Turubanova, S. A., Tyukavina, A., ... & Townshend, J. (2013). High-resolution global maps of 21st-century forest cover change. *science*, *342*(6160), 850-853.
- Karlson, M., Ostwald, M., Reese, H., Sanou, J., Tankoano, B., & Mattsson, E. (2015). Mapping tree canopy cover and aboveground biomass in Sudano-Sahelian woodlands using Landsat 8 and random forest. *Remote Sensing*, *7*(8), 10017-10041.
- Li, C., Li, Y., & Li, M. (2019). Improving forest aboveground biomass (AGB) estimation by incorporating crown density and using landsat 8 OLI images of a subtropical forest in Western Hunan in Central China. *Forests*, *10*(2), 104.
- Li, C., Li, M., & Li, Y. (2020). Improving estimation of forest aboveground biomass using Landsat 8 imagery by incorporating forest crown density as a dummy variable. *Canadian Journal of Forest Research*, *50*(4), 390-398.
- Myers, N., Mittermeier, R. A., Mittermeier, C. G., Da Fonseca, G. A., & Kent, J. (2000). Biodiversity hotspots for conservation priorities. *Nature*, *403*(6772), 853-858.
- Piffer, P. R., Rosa, M. R., Tambosi, L. R., Metzger, J. P., & Uriarte, M. (2022). Turnover rates of regenerated forests challenge restoration efforts in the Brazilian Atlantic forest. *Environmental Research Letters*, *17*(4), 045009.
- Rezende, C. L., Scarano, F. R., Assad, E. D., Joly, C. A., Metzger, J. P., Strassburg, B. B. N., ... & Mittermeier, R. A. (2018). From hotspot to hopespot: An opportunity for the Brazilian Atlantic Forest. *Perspectives in ecology and conservation*, *16*(4), 208-214.
- Rosa, M. R., Brancalion, P. H., Crouzeilles, R., Tambosi, L. R., Piffer, P. R., Lenti, F. E., ... & Metzger, J. P. (2021). Hidden destruction of older forests threatens Brazil's Atlantic Forest and challenges restoration programs. *Science advances*, *7*(4), eabc4547.
- Shimamoto, C. Y., Botosso, P. C., & Marques, M. C. (2014). How much carbon is sequestered during the restoration of tropical forests? Estimates from tree species in the Brazilian Atlantic forest. *Forest Ecology and Management*, *329*, 1-9.

Comment Submitted by: Maria Fernanda Buitrago

Organization: South Pole

Date received: 15th September 2023

These comments were received via email to the Social Carbon Foundation.

Comments:

Section	Sentence	Comment
4. Applicability conditions	"The project area is located on registered indigenous land; or The project area is located in (in full or partially) or is located a maximum of 1km from a terrestrial area of biodiversity importance; and" • The project embeds local communities into the project activities to ensure local knowledge and cultures are applied within the project activities; and • The project activities exclusively focus on conservation and/or restoration of the project area, with no conversion to non-native habitat / land use (i.e. conversion of forest to agricultural land); and SOCIALCARBON Methodology: SCM0006 v2.0 To illegally hunt or catch (game or fish) on land that is not one's own or in contravention of official protection. where it is understood that human activities have not caused any significant changes in its original characteristics of structure and composition during a minimum period of 20 years prior to the project start date. There has been no conversion to alternative land use within the area or any degradation that would bring about a regression in its status within the process of ecological succession. The maintaining of someone or something in life or existence. This does not include the sale of raw commodities for economic income e.g. logging. The project shall design and implement strategies	Does this mean one of these two conditions? Or being in indigenous land OR being at 1 km from a terrestrial area of biodiversity importance SC Response: Yes, at least one of these conditions must be met. If condition two (1km from terrestrial area of biodiversity importance), the subsequent conditions must also be met. How do we demonstrate that it is an area of biodiversity importance? SC Response: See definition in the methodology.

	to remove or manage invasive species[2] from within the project area; and The project area is vulnerable to degradation and/or deforestation if not conserved; and At least 60% of existing and/or historical[3] conservation activities within the project area prior to the project start date are not financed, or have been/are expected to be financed through donations and/or grants[4]; and Poaching of keystone species[5] within the project area must not exceed 5% of the baseline population. If this threshold is passed, no conservation removals can be claimed for that given year.	
5.3 Defining…	Note: any ARR activities within the conservation crediting boundary (green area) will be included in the GHG removal calculations for that area. Also, if the total project area is equal to or less than 15,000 hectares, the total project area will come under the classification "Eligible crediting area for removals from conservation activities". Under this scenario there will be no separate crediting area from ARR activities outside of the conservation crediting boundary (blue area). Table 6 further outlines how the crediting areas can be determined.	Will credits have a label of Removal credits even if they are associated with the conservation area? SC Response: Yes – this methodology quantified emission removals not emission reductions.
8.2 Project removals	The annual carbon increment for the class of vegetation cover can be calculated through two approaches: 1. Default values. Using peer-reviewed academic literature or the most recent government-published default values for annual biomass growth per hectare for the native vegetation cover class (an example of this can be found in Appendix 1: Example default values for incremental biome growth in Brazil). 2. Measurement. Measuring changes in carbon stocks for the class of vegetation cover.	When no peer reviewed data, government results or local measurements of growth, Is it possible to use satellite imagery to calculate the current biomass and annual carbon increments? SC Response: Further details on this approach can be found within the methodology document.
8.2 Project removals	Projects utilizing default values must conduct ground truthing on their sample sites at least once every 5 years. Ground truthing must align	1. Is there a required accuracy for these estimations in the field (Ground truthing)? To calculate

<table>
<tr>
<td></td>
<td>with the procedures outlined in the section below "2. Measurement".

When ground truthing, the project must calculate the average $CI_{vc,y}$ between ground truthing events (i.e. minimum 5 years). This shall be calculated by dividing the difference in average biomass of the vegetation class per hectare between the two ground truthing events by the number of years between each time point e.g. the first ground truthing event of a project would be y+5, the average annual $CI_{vc,y}$ shall be calculation as follows (assuming y = project start date):

$CI_{vc} = CI_{vc,y+5} - CI_{vc,y\ GT,t}\ 5$

If the mean annual ground truthed value ($CI_{vcGT,y}$) is greater than the default values' mean annual CI_{vc} applied, then the project is permitted to claim the total difference in $CI_{vc,y}$ for the most recent monitoring period only. If the ground truthed value ($CI_{vcGT,y}$) is lower than the default values' mean annual value, then the project must deduct the total difference in $CI_{vc,y}$ for the past 5 years' (or alternative period between ground truthing events) from the next monitoring period's net emission reduction.</td>
<td>the sample size in the field?

SC Response:

Ground truthing must align with the procedures outlined in the section below "2. Measurement". Field studies should be conducted using the procedures outlined in the latest version of the CDM methodological tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities".</td>
</tr>
<tr>
<td>8.2 Project removals</td>
<td>Estimating emission removals from deadwood

Changes in the deadwood carbon pool shall be measured using the procedures outlined in the latest version of the CDM methodological tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities".</td>
<td>Can deadwood be calculated with default value from the IPCC tables?

SC Response:

Yes provided the project meets the CDM requirements for use of default values.</td>
</tr>
<tr>
<td>8.2 Project removals</td>
<td>Table 7: Estimating emissions from degradation or deforestation in a class of vegetation cover.

<table><tr><th>Carbon Stock of the class of Vegetation Cover before degradation or deforestation (tCO_2e per hectare)</th><th>Carbon Stock of the class of Vegetation Cover before degradation or deforestation (tCO_2e per hectare)</th><th>The emissions from the change in class of vegetation cover (tCO_2e per hectare)</th></tr><tr><td>e.g. 302 tCO_2e per hectare</td><td>e.g. 120 tCO_2e per hectare</td><td>e.g. 182 tCO_2e per hectare
(302 tCO_2e – 120 tCO_2e)</td></tr></table></td>
<td>Both columns have the same title: "Carbon Stock of the class of Vegetation Cover before degradation or deforestation (tCO2e per hectare)"

SC Response:

Error has now been fixed.</td>
</tr>
</table>